

Enclosures & Components

Elmaset

Standard products, customisation and services for a wide range of application and a multiplicity of market segments.

- Sub Racks
- Instrument and Compact Cases
- Front Panels, Handles and Plug-in Units
- 19" and General Accessories
- Customisation and Services

Local Service – global resources



Elma is a global manufacturer of products for housing electronic systems. The company provides everything from components such as modular enclosures, cabinets and backplanes up to complete standard or custom system platforms. Elma also manufactures precision rotary switches. The company offers fast, flexible response to customer needs and extensive practical knowledge in tailoring solutions to specific applications.

Founded in 1960, Elma is an industry innovator in the design and manufacture of electronic enclosures and passive electronic components. With vast expertise in Eurocard-based platforms, standard architectures include AdvancedTCA, CompactPCI, MicroTCA, Rugged COTS/ATR, VME, VME64x, VPX, VXI, VXS, and more. The company also tailors customised solutions to individual applications ensuring fast and cost-effective results. As a global company, Elma has production and assembly facilities in 8 countries and has representatives in over 40 countries. Elma has a broad base of customers in diverse industries such as telecommunications, industrial control, medical electronics, defense and aerospace.

We provide products superior in quality, reliability, performance, and consistently presents new, innovative designs to the market. Elma also offers design and integration services backed by responsive and knowledgeable technical support.

Our leading quality level is reached through training of all employees and following of systematic procedures per ISO 9001 standards to which Elma has been registered.

Why choose Elma?

Flexibility	Elma tailors solutions to individual applications to ensure fast and cost-effective results.
Experience	Extensive practical experience in packaging electronic systems is used to minimise the time taken to develop new customised solutions without compromising system performance or reliability.
Compatibility	Because the two key electromechanical components – enclosures and backplanes – are made in-house, Elma guarantees compatibility, consistency and reliability.
Global Resources	With manufacturing in Europe, Asia and the USA, customers benefit from local service backed by global resources.

Custom Solutions

Custom Solutions

Customisation is the standard at Elma. With an extensive offering of modular standard products as a foundation, we are able to leverage existing solutions and proven design concepts to meet any custom application. This approach ensures that Elma will provide quality, compliant solutions with significantly reduced lead time, cost and risk.

Combined with our integration capability for both embedded systems and switches, we provide a single solution to your outsourcing needs.

Allow us to take your latest product from prototype to production quickly, cost effectively and with reduced risk.

Design Capabilities

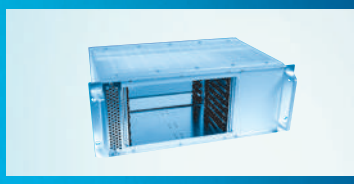
Elma has been a leader in design innovation for over 45 years. We use advanced design software and equipment to perfect your design. We can utilise our vast resource of experienced designers and engineers from facilities all over the world. The result is a superb design solution, completed to your specifications in a timely and cost-efficient manner.

Production Capabilities

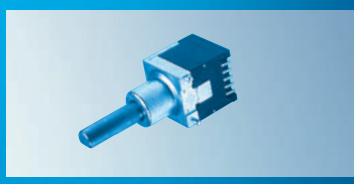
From base components to fully-integrated computing systems, Elma can be your solution partner each step of the way. With production and assembly facilities worldwide, we can meet nearly any need – whether prototypes or high volumes, quickturn deliveries, or highly complex custom designs.











Custom system platforms

- Over 20 years of expertise in system design with emphasis on thermal management
- Specialists in EMC, shock/vibration, system monitoring, reliability and maintainability
- Applications for industrial and rugged environment

Custom backplanes

- Modified standards for all PICMG and VITA specifications
- NSC (non standard-based custom) design
- Proven, reliable high-speed designs with data rates up to 10 Gbps per differential pair

Custom enclosures & components

- Modified standards for IEC, IEEE, ATCA, MicroTCA mechanics or proprietary solutions
- IP protection classes
- EMC security

Custom cabinets

- Industrial, Rugged, Datacom/Server, or Shielded
- Highly complex or unusual configurations in any volume
- Silk screening, painting, tool making, validation testing, and agency certification

Custom rotary switches

- Modifiable switches & LEDs
- Integration of switches, panels and other components
- Custom switch bracket fabrication

19" Chassis and Sub Racks

Sub racks are carrier for plug-in units and can be built in 19"-cabinets. The product range goes from 19"-module for non-standard components up to EMC sub rack with highest flexibility.

1: Slimkit 10	A | 1_1
2: Ecokit 11	A | 2_1
3: EMC Sub-Rack Magic-/Spirit-Kit 11	A | 3_1
4: Systemkit 12K	A | 4_1
5: Systemkit 12K Rail	A | 5_1

Instrument and Compact Cases

The universal product range of instrument cases offers many design approaches in order to package electronics appropriately.

1: Unibox 14	B | 1_1
2: Stylebox 15	B | 2_1
3: Stylebox e-motion	B | 3_1
4: Stylebox 15 smart	B | 4_1
5: iD-Box16	B | 5_1
6: Classicbox 32	B | 6_1
7: Guardbox 33	B | 7_1
8: Guardbox 33 easy	B | 8_1
9: Varietybox 35	B | 9_1

Front Panels, Handles and Plug-in Units

Comprehensive range of products and services for board manufacturers and accessories for system integrators.

1: Front Panels for Sub Racks	C | 1_1
2: Front Panels for Plug-In Units	C | 2_1
3: Handles	C | 3_1
4: Cassettes and Modules	C | 4_1
5: Ventilation	C | 5_1

19" Accessories

Supporting products in connection with the 19" cabinet system.

1: 19" Front Panels	D | 5
2: 19" Front Panel Frames	D | 7
3: Telescopic Rails	D | 9
4: 19" Ventilations	D | 13
5: Keyboards	D | 19

General Accessories

1: Card Guides	E | 1_1
2: Assembly Material	E | 2_1
3: PCB Accessories	E | 3_1
4: Handles / Feet	E | 4_1
5: Gaskets	E | 5_1
6: Extrusions	E | 6_1

Do you have your own ideas and want to realise them? If so, Elma has some interesting accessories for you!

Customisation and Services

Customisation is the standard at Elma. With an extensive offering of modular products as a foundation, Elma is able to leverage existing solutions and proven design concepts to meet any custom application. This approach ensures that Elma will provide quality and compliant solutions with significantly reduced lead time, cost and risk. Our worldwide team with experience in design, EMC, FEM, thermal simulation and state-of-the-art CAD system, are ready to develop solutions to meet your next project challenge.

Technical Information

In this chapter you can find updated content of the most important mechanical dimensions and technical information about the topics EMC, IP and ventilation. This helps you to build up electronic packaging according to proven modular concepts which provides a wide range of standard products.

19" Chassis and Sub Racks


824
Fastener Insertion System
Haeger

Chapter Overview

1. Slimkit 10

The new slim 19-inch EMC chassis with an overall height of 1 U



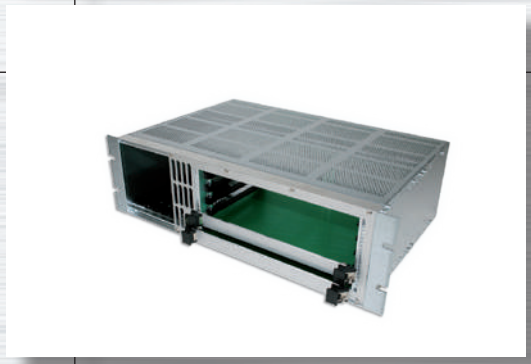
2. Ecokit 11

The economic way to build up a simple card cage in different variants



3. Magic- /Spirit-Kit 11

EMC sub rack in sheet steel with a very fast assembly and EMC without gaskets



4. Systemkit 12K

Modern designed EMC sub rack with a large selection of assembly options



5. Systemkit 12K Rail

Sub rack solutions for demanding railway applications



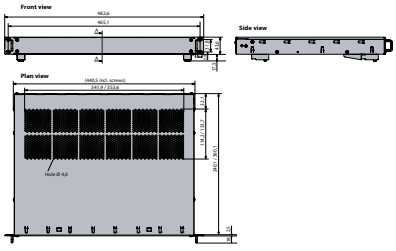


1: Slimkit 10









1.1 EMC-Slimkit 10 Overview **A | 1_2**

1.2 Slimkit 10 EMC Chassis **A | 1_5**

1.2.1 Slimkit 10 Basic Tray A | 1_5

1.2.2 Front Panel A | 1_6

1.2.3 Rear Panel A | 1_6

1.2.4 Top Cover A | 1_7

1.2.5 Mounting Chassis A | 1_7

1.3 Accessories **A | 1_8**

1.3.1 Earthing Set A | 1_8

1.3.2 Case Feet A | 1_8

1.4 Technical Information **A | 1_9**

1.4.1 Line Drawings for Slimkit 10 A | 1_9

1.4.2 Assembly SHEETtracs® Screw A | 1_9



1.1 EMC-Slimkit 10 Overview

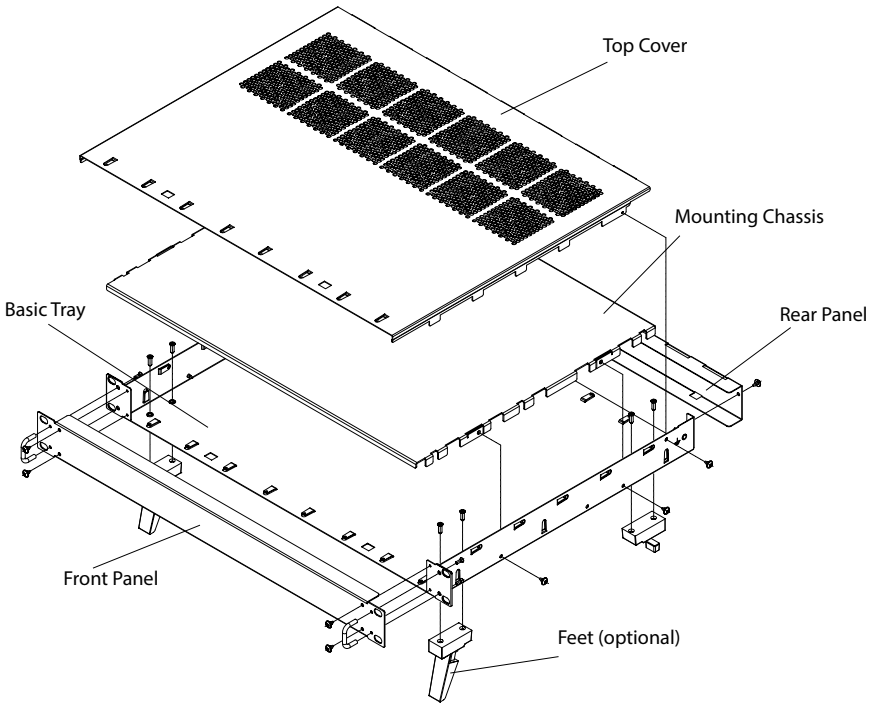
- 19" EMC chassis 1 U
- Basic model can be transformed into a complete case by adding a rear panel, top cover as well as a mounting chassis
- Design allows numerous combinations to be assembled according to the application
- Hard and wear resistant aluminium front panel
- With or without perforations for optimised thermal solution
- EMC-Slimkit 10 can be presented in a number of attractive finishes for individual product tailoring

Technical features

- 19" chassis with excellent EMC feature
- Front panel: aluminium, frame construction: sheet steel, pre-galvanised
- Vibration-proof
- EMC shielding without gaskets is standard
- Fast assembly
- Easy access
- Front- and rear panel can be removed for easy machining

Applications

- Accommodates flat components
- Slim test equipment
- Controls
- Telecommunication equipment
- Audio and radio equipment
- Signal Converters



EMC

"Electromagnetic comptability is the ability of a system to operate in the intended environment without causing or suffering unacceptable degradation of performance due to unintentinal electromagnetic radiation or response."
The EMC characterstics of a system therefore consist of an appropriate immunity from interference (noise immunity) and a limited emission of interference (noise emission).

Elma's EMC concept describes three levels of electromagnetic shielding performance (Performance Level). The attenuation levels will simplify the selection of sub racks for the user.
Test setup: The first measurement E1 is without the enclosure. The next measurement E2 is made with the transmitting antenna installed inside the enclosure. The difference between the received signal without and with the enclosure represents the shielding effectiveness in dB.

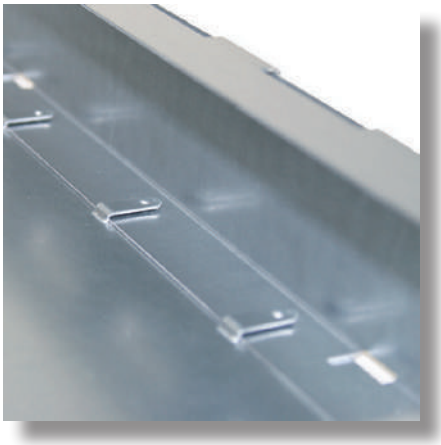
Performance Level	30 - 230 MHz	230 - 1000 MHz	1000 - 2000 MHz
1 / Elma: Basic level	20 dB	10 dB	0 dB
2 / Elma: Advanced level	40 dB	30 dB	20 dB
3 / Elma: Superior level	60 dB	50 dB	40 dB

The standard configuration will provide you with an advanced EMC level (Basic level with perforation).

The integrated EMC solution



EMC contacts
- Top cover to rear panel



EMC contacts
- Bottom tray to rear panel
- Bottom tray to front panel
- Top cover to front panel



EMC contacts
- Top cover to bottom tray

Configuration





Basic Tray
1.2.1

- 1 U
- 240 mm / 360 mm
- Solid / perforated

Front Panel
1.2.2

- With / without handles
- Different colours

Rear Panel
1.2.3

Top Cover
1.2.4

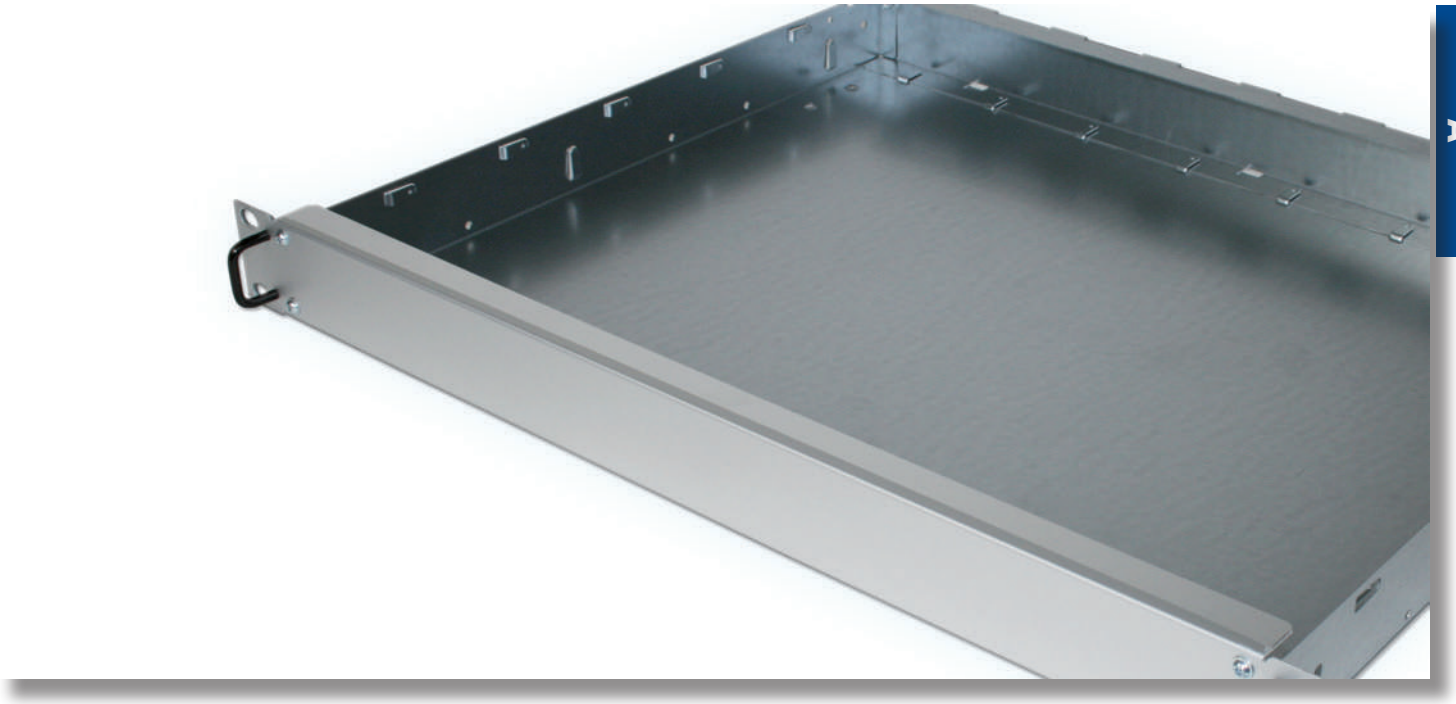
- 240 mm / 360 mm
- Solid / perforated

Mounting Chassis
1.2.5

- 240 mm / 360 mm

Accessories
1.3

- Earthing Kit
- Case feet



1.2 Slimkit 10 EMC Chassis

1.2.1 Slimkit 10 Basic Tray

- 0.75 mm sheet steel, pre-galvanised
- With holes for fastening of mounting chassis, feet, earthing terminals, front / rear panel, top cover
- **Scope of delivery:**
  - Basic Tray
  - Assembly material for mounting front panel, rear panel, mounting chassis, top cover (12 round head SHEETtracs® screws 3,0 x 6, Torx T10)
- Front Panel see 1.2.2
- Rear Panel see 1.2.3
- Top Cover see 1.2.4
- Mounting Chassis see 1.2.5



1.2.1 Slimkit 10 Basic Tray

Height	Depth		Perforation	Air Passage		Part-No.
	mm	inch		mm^2	sq. inch	
1 U	240	9.45	Solid	-	-	10-91100-00
1 U	240	9.45	Perforated	18095	28.04	10-91101-00
1 U	360	14.17	Solid	-	-	10-91110-00
1 U	360	14.17	Perforated	21714	33.65	10-91111-00

1.2.2 Front Panel

- 1.0 mm aluminium
- Rear: conductive, front: clear anodised / powder coated black (RAL 9005) / powder coated light grey (RAL 7035)
- With or without black handles
- Customised front panel upon request (see front panel service)
- **Scope of delivery:**
  - Front panel
  - Handle set (2 black U-handles, 4 countersunk screws M2.5 x 8, Torx T8) in handle versions only
- Assembly material for mounting front panel included in basic tray set



1.2.2 Front Panel

Height	Front	Handles	Part-No.
1 U	Clear anodised	Yes	10-46100-00
1 U	Clear anodised	No	10-451-00
1 U	Black powder coated	Yes	10-46160-00
1 U	Black powder coated	No	10-451-60
1 U	Light grey powder coated	Yes	10-46130-00
1 U	Light grey powder coated	No	10-451-30

1.2.3 Rear Panel

- 0.75 mm sheet steel, pre-galvanised
- Rear panel with customised cut outs upon request
- **Scope of delivery:**
  - Rear panel
- Assembly material for mounting rear panel included in basic tray set



1.2.3 Rear Panel

Description	Part-No.
Slimkit 10 Rear Panel 1 U	10-901-00

1.2.4 Top Cover

- 0.75 mm sheet steel, pre-galvanised
- With or without air perforation
- **Scope of delivery:**
  - Top cover
- Assembly material for mounting top cover included in basic tray set

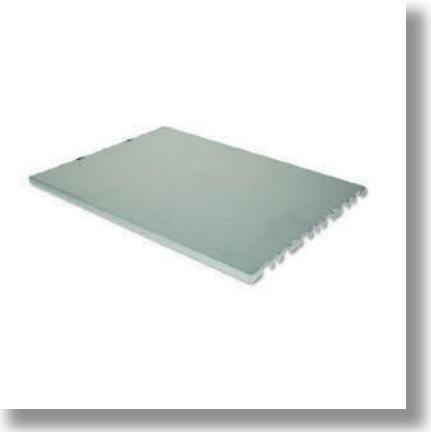


1.2.4 Top Cover

Depth		Perforation	Air Passage		Part-No.
mm	inch		mm^2	sq. inch	
240	9.45	Solid	-	-	10-920-00
240	9.45	Perforated	18095	28.04	10-920-01
360	14.17	Solid	-	-	10-920-10
360	14.17	Perforated	21714	33.65	10-920-11

1.2.5 Mounting Chassis

- For mounting components
- Mounting chassis 240 mm can be mounted in Slimkit 10 with depth 360 mm
- 1.25 mm sheet steel, pre-galvanised
- Mounting chassis with customised cut outs upon request
- **Scope of delivery:**
  - Mounting chassis
- Assembly material for mounting chassis included in basic tray set



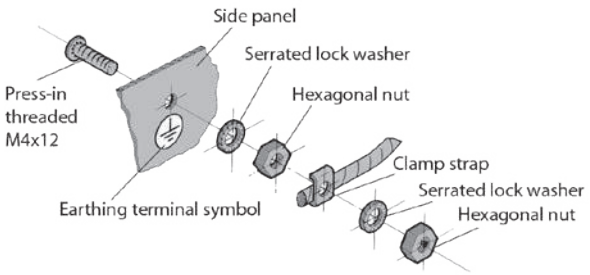
1.2.5 Mounting Chassis

Description	Part-No.
Slimkit 10 mounting chassis 240 mm	10-930-50
Slimkit 10 mounting chassis 360 mm	10-931-50

1.3 Accessories

1.3.1 Earthing Set

- Enables cases to be earthed in conformance with EN / VDE / SEV
- **Scope of delivery:**
  - 1 press-in threaded bolt M4
  - 2 serrated lock washers
  - 2 hexagonal nuts M4
  - 1 terminal clamp
  - 1 earthing symbol



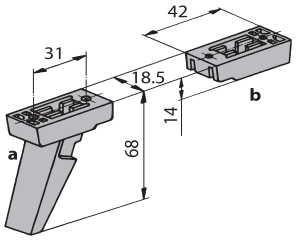


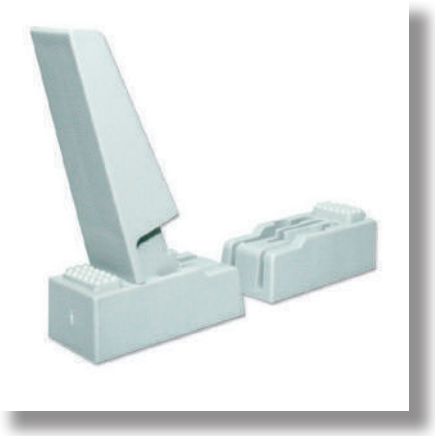
1.3.1 Earthing Set

Description	Part-No.
Earthing set according to EN VDE / SEV	63-174

1.3.2 Case Feet

- Tilt foot / Non-tilt foot
- Choice of colours: light grey (RAL 7035) or black (RAL 9005)
- Glass-fiber reinforced plastic, UL94 V-0
- Up to 30 kg carrying capacity per set
- **Scope of delivery:**
  - 1 set of feet
  - Assembly material (8 cross recessed countersunk PT-screw 3.5 x 8)





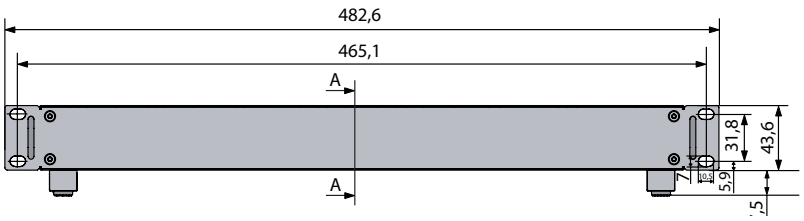
1.3.2 Case Feet

Description	Colour	Part-No.
Case feet, 4 x b	Light grey (RAL 7035)	63-019
Case feet, 4 x b	Black (RAL 9005)	63-321
Case feet, 2 x a + 2 x b	Light grey (RAL 7035)	63-018
Case feet, 2 x a + 2 x b	Black (RAL 9005)	63-320

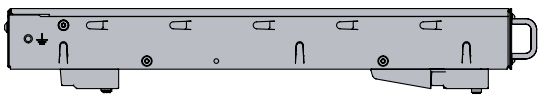
1.4 Technical Information

1.4.1 Line Drawings for Slimkit 10

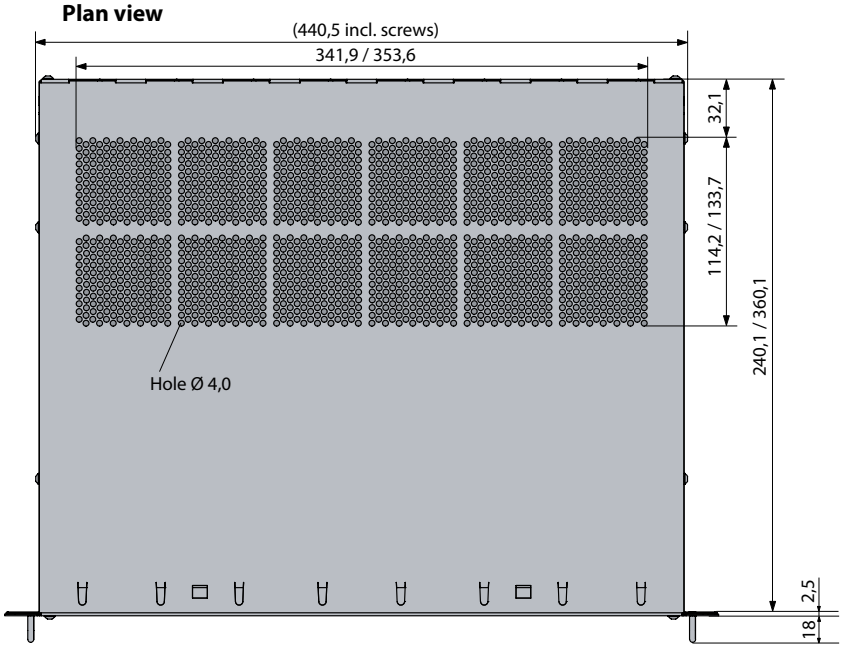
Front view

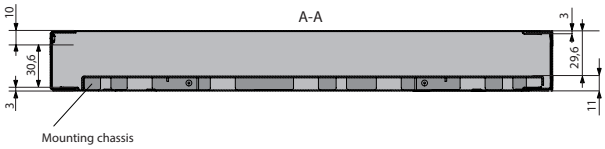


Side view



Plan view





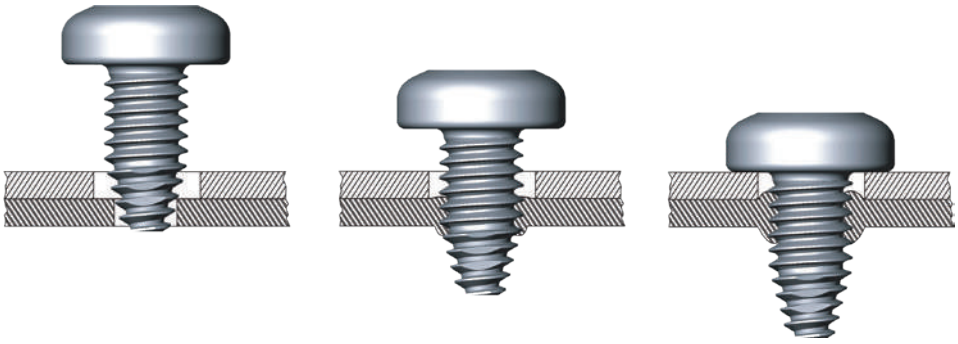
1.4.2 Assembly SHEETtracs® Screw

- For a secure thin sheet metal joint with pre-hole



1.4.2 SHEETtracs® Screw

Description	Material	Part-No.
3 x 6, Torx T10	Steel, zinc-plated	5477-01



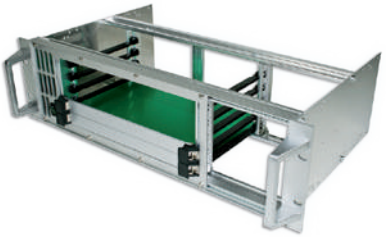
1. Initial position
2. Thread grooving
3. Tightening

2: Ecokit 11









2.1 Ecokit 11 Overview **A | 2_3**

2.2 Ecokit 11 Sub Rack Configuration **A | 2_5**

2.2.1 Width A | 2_5

2.2.2 Height / Depth A | 2_6

2.2.3 Handles A | 2_6

2.2.4 Line Drawing A | 2_7

2.3 Adaptation Kits **A | 2_8**

2.3.1 Adaptation Kit A | 2_8

2.3.2 Front Sub Division Horizontal IEC for Card Guides A | 2_9

2.3.3 Front Sub Division Horizontal IEC A | 2_9

2.3.4 Edge Connector Extrusion 66-145 A | 2_10

2.3.5 Edge Connector Extrusion 66-147 A | 2_10

2.4 Assembly Accessories **A | 2_11**

2.4.1 Front Sub Division Vertical 6 U / 3 U A | 2_11

2.4.2 Horizontal Card Mounting Kit A | 2_12



2.5 General Accessories **A | 2_13**

2.5.1 Perforated Cover Plates A | 2_13

2.5.2 Earthing Set A | 2_14

2.5.3 Card Guides IEC A | 2_15

2.5.4 Flat Front Panels A | 2_17

2.5.5 Fan Front Panel for Horizontal Ventilation A | 2_18

2.5.6 Fan Front Panels for Direct Fan Mounting A | 2_19

2.5.7 Extruded Front Panels A | 2_20

2.5.8 Front Panel with Cutouts for IEC Ejector Handles A | 2_22

2.5.9 Ergonomic Ejector Handles acc. to IEC A | 2_22

2.5.10 Card Locks and Card Handles A | 2_23

2.5.11 Card Holder acc. to IEC Standard A | 2_25

2.5.12 Middle Part A | 2_26

2.5.13 Protective Cover for 6 U Printed Board A | 2_26

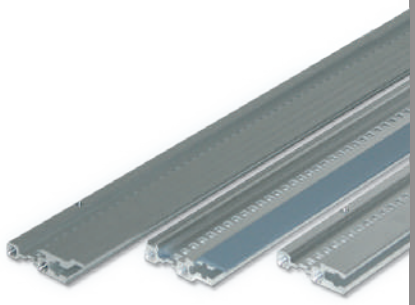
2.5.14 Spacers A | 2_27

2.5.15 Mounting Plates A | 2_28

2.5.16 Hexagonal Spacers M3 Thread A | 2_28

2.5.17 Covering Caps A | 2_29

2.5.18 Mounting Bracket A | 2_29



2.6 Extrusions **A | 2_30**

2.6.1 Front Extrusions A | 2_30

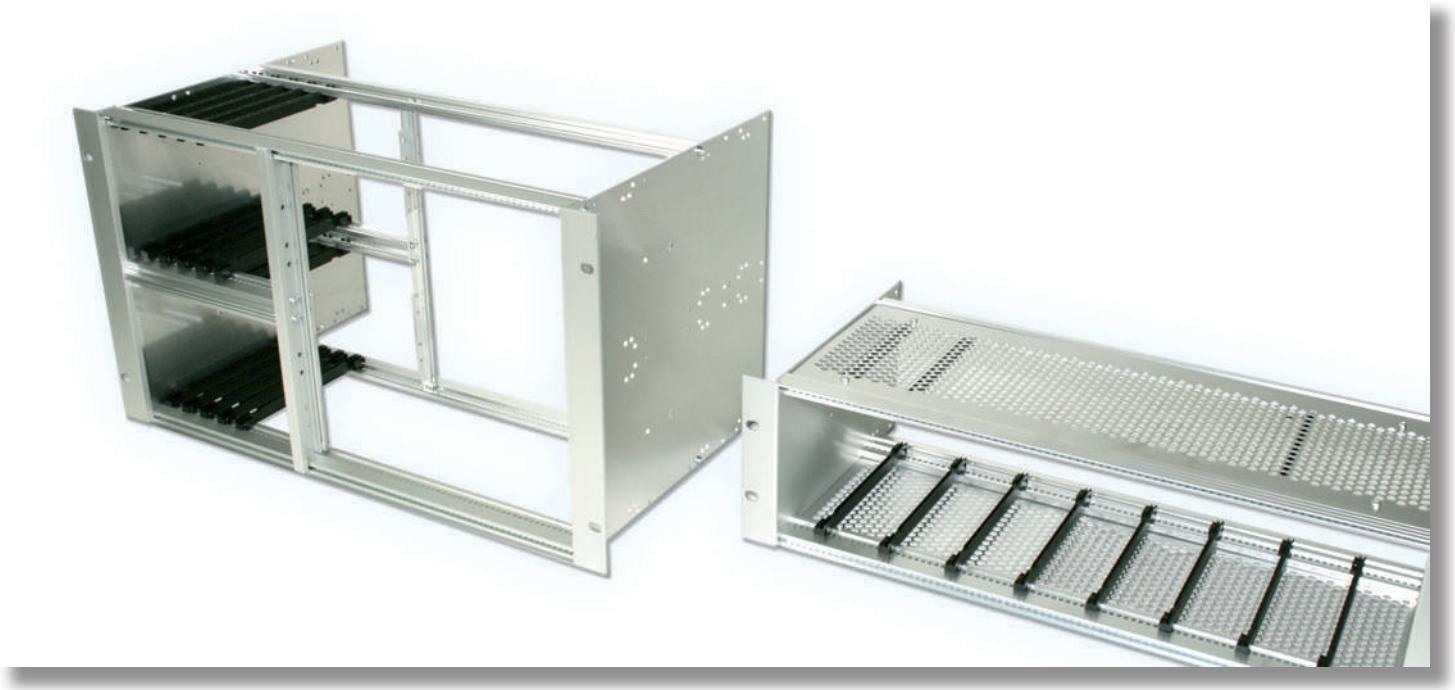
2.6.2 Height Extrusions A | 2_31

2.6.3 Internal Extrusions A | 2_31

2.6.4 Center Extrusions A | 2_33

2.6.5 Edge Connector Extrusions A | 2_34

2: Ecokit 11

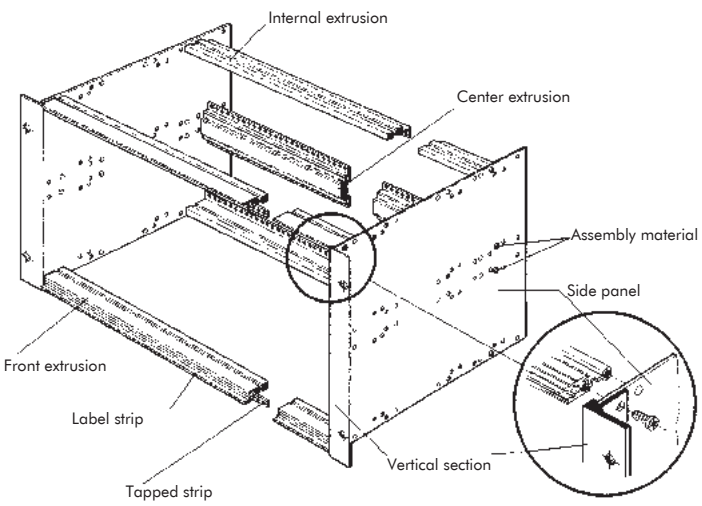


2.1 Ecokit 11 Overview

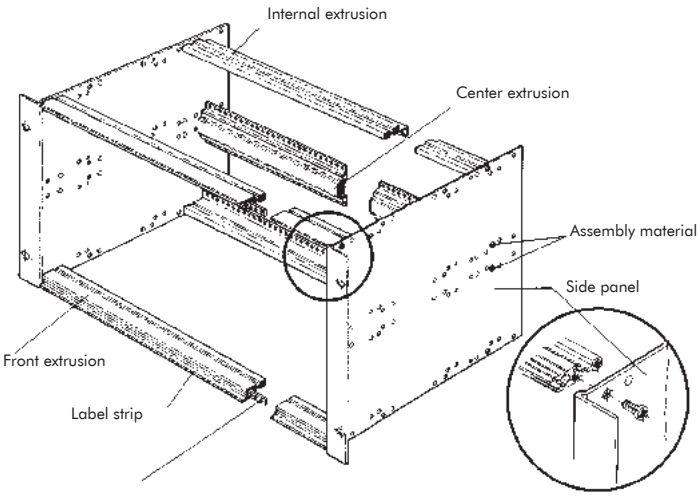
- Side panels are of 2 mm sheet aluminium
- The extruded aluminium 19" mounting sections have an effective thickness of 3 mm (Standard only)
- For mounting PCBs and plug-in units based on standard Eurocard sizes with depths of 160, 220 and 280 mm
- The use of cover plates is recommended where the sub rack is subjected to continuous vibration
- Side panel with integrated 19" section as a cost-saving solution for Ecokit 11 Integrated
- Features on the side panels allows the extrusions to be fixed with only half the number of screws

Assembly example:

Ecokit 11 Standard



Ecokit 11 Integrated



Configuration

Sub Rack





Width 2.2.1

- 42 HP / 84 HP (incl. assembly material)

2.2.1.1 Label Strips

Height / Depth 2.2.2

- 3 U / 6 U
- With / without holes for handles
- Standard / integrated
- 216 mm / 336 mm

2.2.3 Handles

2.3 Adaptation Kits

2.4 Assembly Accessories

2.5 General Accessories

2.6 Extrusions



2.2 Ecokit 11 Sub Rack Configuration

2.2.1 Width

- Choose the width of your sub rack
- Set with or without centre extrusion
- **Scope of delivery:**
  - 2 front extrusions, aluminium, clear anodised
  - 4 tapped strips M2.5 (6 for version with centre extrusion)
  - 2 internal extrusions
  - 1 centre extrusion (version with centre extrusion only)
  - Insulating strips (Backplane mounting only)
  - Assembly material (Torx screws)
- Label strips see below
- Choose the right height and depth on the next step (see 2.2.2)



2.2.1 Width

Description	42 HP	84 HP
Set Standard without centre extrusion	11E101	11E103
Set insulated backplane mounting without centre extrusion	11E104	11E106
Set Standard with centre extrusion	11E107	11E109
Set insulated backplane mounting with centre extrusion	11E110	11E112

Other widths available on request

2.2.1.1 Label Strips

- **Scope of delivery:**
  - 1 label strip consisting of 4 single tapes

Scope of Delivery	42 HP (01-42/42-01)	84 HP (01-84/84-01)
2 pcs. each (upper and lower)	63-142	63-046

2.2.2 Height / Depth

- Choose the height and depth of your sub rack
- Side panel with integrated 19" section on "Integrated" Version
- **Scope of delivery:**
  - 2 side panels, 2.0 mm aluminium, raw (Integrated: clear anodised)
  - 2 height extrusions, aluminium, clear anodised (standard version only)
- Handles see 2.2.3

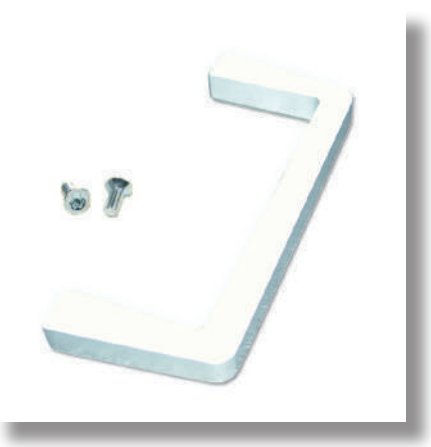


2.2.2 Height/Depth

Height	Description	Depth	
		216 mm 8.50"	336 mm 13.22"
3 U	Standard without holes for handles	11E201	11E203
	Standard with holes for handles	11E204	11E206
	Integrated without holes for handles	11E207	-
6 U	Standard without holes for handles	11E209	11E211
	Standard with holes for handles	11E212	11E214
	Integrated without holes for handles	11E215	-

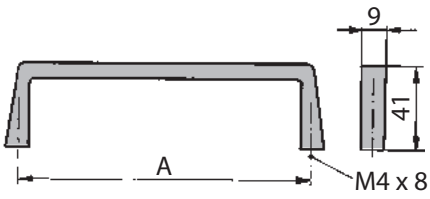
Other heights and depths available upon request

2.2.3 Handles



2.2.3.1 U-Handle Aluminium, Anodised

- Anodised aluminium extrusion
- Width: 9 mm
- **Scope of delivery:**
  - 1 aluminium handle
  - 2 Torx countersunk screws M4 x 10 (T20)

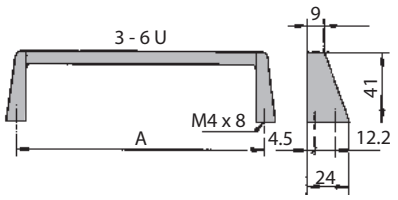


For Case Height	A		Part-No.
	mm	inch	
3 U	88.9	3.50	60-573
6 U	222.3	8.75	60-576



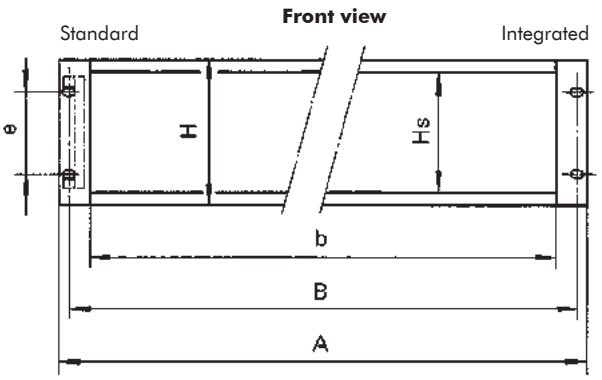
2.2.3.2 Die Cast Aluminium Handle

- Universal handle
- Wet painted white aluminium (Ral 9006)
- **Scope of delivery:**
  - 1 aluminium handle
  - 2 Torx countersunk screws M4 x 10 (T20)

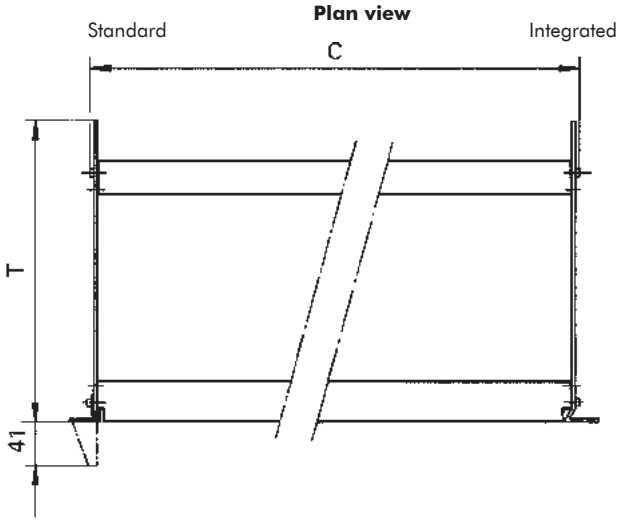


For Case Height	A		Part-No.
	mm	inch	
3 U	88.9	3.50	60-563
6 U	222.3	8.75	60-566

2.2.4 Line Drawing

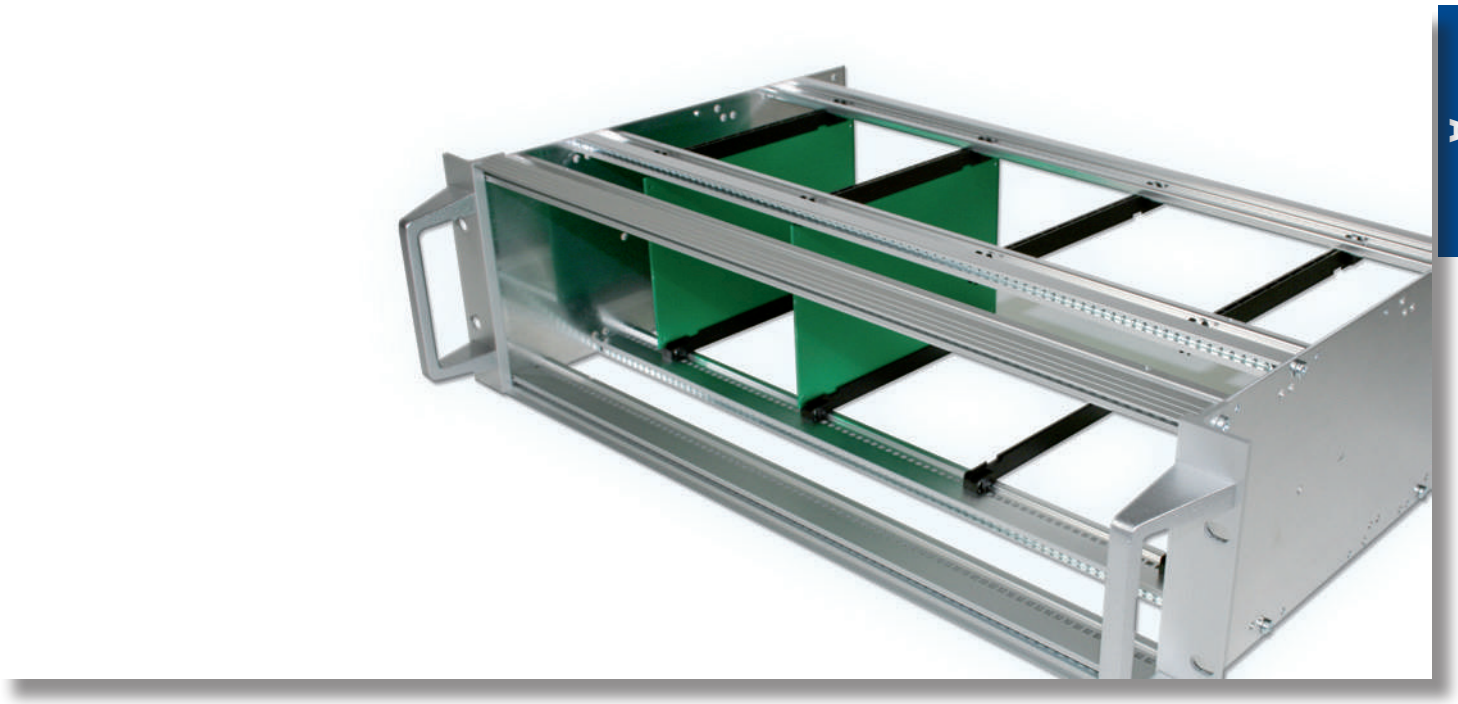


Dimension "e" see Appendix



Height			Depth
for	H	Hs	T
3 U	132.5 mm 5.21"	112.5 mm 4.43"	216/336 mm 8.5/13.22"
6 U	265.85 mm 10.47"	245.85 mm 9.68"	216/336 mm 8.5/13.22"

Width				
	A	B	b	C
42 HP	269.2 mm 10.60"	252.5 mm 9.94"	213.3 mm 8.40"	226.8 mm 8.93"
84 HP	482.6 mm 19.00"	465.9 mm 18.34"	426.7 mm 16.80"	440.2 mm 17.33"



2.3 Adaptation Kits

2.3.1 Adaptation Kit

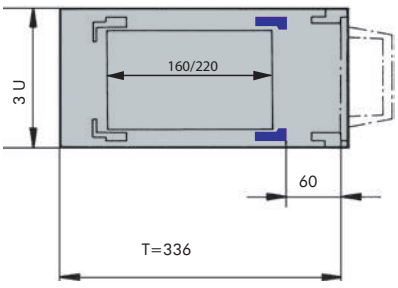
- For recessed mounting of Eurocard without front panels
- **Scope of delivery:**
  - 2 internal extrusions
  - 2 tapped strips M2.5
  - Assembly material (8 Torx cylinder head screws M4 x 10, size T20)

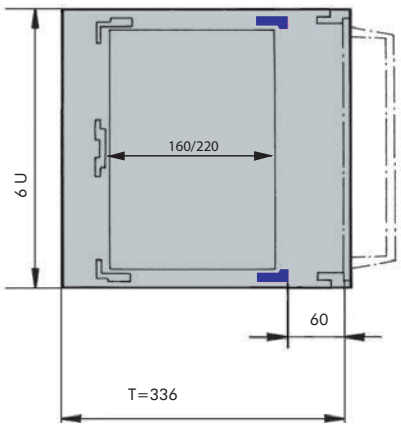


2.3.1 Adaptation Kit

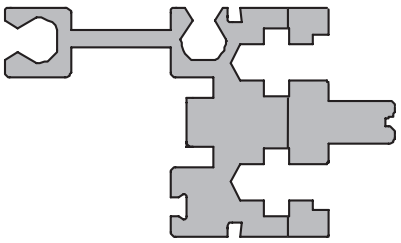
Description	Width	Part-No.
Mounting for recessed eurocards without front panels	84 HP	11E530

Other widths available on request





2.3.2 Front Sub Division Horizontal IEC for Card Guides



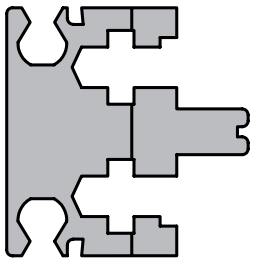
- For sub division of front
- Card guides can be applied
- Only one special extrusion needed
- Easy and quick assembly
- Cost effective solution
- Delivered in kit form
- Usable width: 84 HP
- Other sizes available on request
- **Scope of delivery:**
  - 1 pc. front double extrusion IEC-Special clear passivated
  - 2 pcs. tapped strips M2.5
  - 4 pcs. Torx cylinder head screws M4 x 10 (T20)



2.3.2 Front Sub Division Horizontal IEC

Description	Part-No.
EMC front sub division horizontal IEC for card guides	63K837-24

2.3.3 Front Sub Division Horizontal IEC



- For sub division of front
- Without possibility of using card guides
- Only one special extrusion needed
- Easy and quick assembly
- Cost effective solution
- Delivered in kit form
- Usable width: 84 HP
- Other sizes available on request
- **Scope of delivery:**
  - 1 pc. front double extrusion IEC-Special clear passivated
  - 2 pcs. tapped strips M2.5
  - 4 pcs. Torx cylinder head screws M4 x 10 (T20)

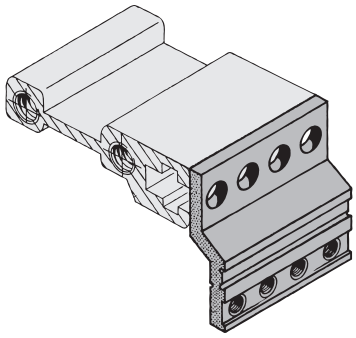


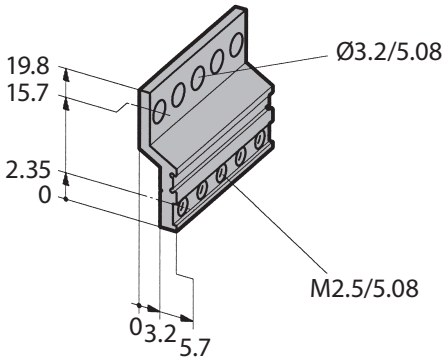
2.3.3 Front Sub Division Horizontal IEC

Description	Part-No.
EMC front sub division horizontal IEC	63K837-22

2.3.4 Edge Connector Extrusion 66-145

- For use with standard extrusion 66-144
- Edge connector extrusion without assembly material





1.7.5.1 Edge Connector Extrusion 66-145

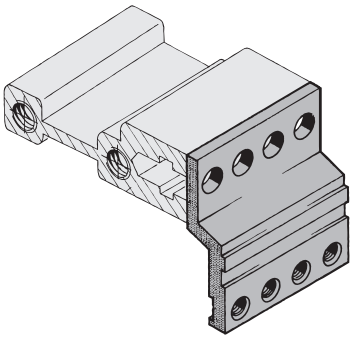
Length			Part-No.	
for HP	mm	inch	clear passivated	raw
8	40.6	1.59	66-145-40	-
18	91.4	3.59	66-145-41	-
28	142.2	5.60	66-145-42	-
42	213.4	8.40	66-145-63	-
63	320.0	12.60	66-145-65	-
81	411.5	16.20	66-145-22	-
84	426.7	16.80	66-145-52	-
	1350.0	53.14	-	66-145-19

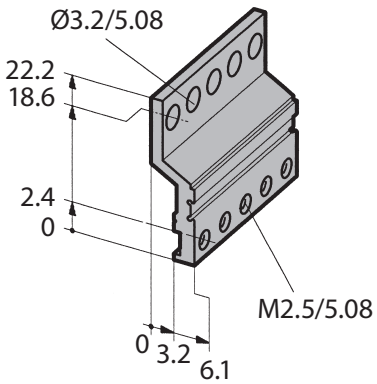
Assembly Material

Description	Part-No.
Assembly material M2.5 (for 2 supplementary extrusions)	63-214

2.3.5 Edge Connector Extrusion 66-147

- For use with extrusions for backplanes 66-193
- Edge connector extrusion without assembly material





7.4.2.1 Edge Connector Extrusion

Length			Part-No.	
for HP	mm	inch	clear passivated	raw
8	40.6	1.59	66-147-40	-
18	91.4	3.59	66-147-41	-
28	142.2	5.60	66-147-42	-
42	213.4	8.40	66-147-63	-
63	320.0	12.60	66-147-65	-
81	411.5	16.20	66-147-22	-
84	426.7	16.80	66-147-52	-
	1350.0	53.14	-	66-147-19

Assembly Material

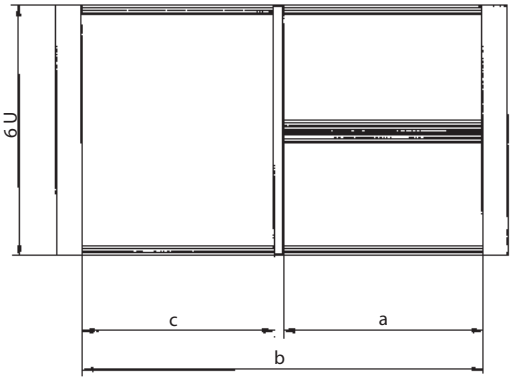
Description	Part-No.
Assembly material M2.5 (for 2 supplementary extrusions)	63-214

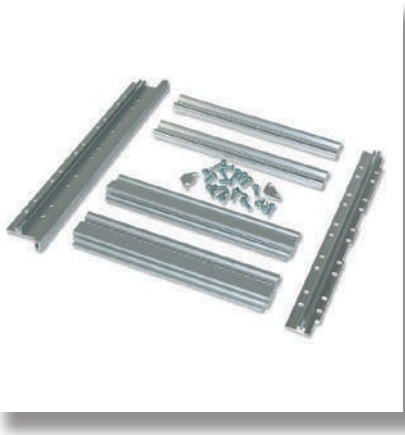


2.4 Assembly Accessories

2.4.1 Front Sub Division Vertical 6 U / 3 U

- Allows both single and double eurocards to be mounted together in a 6 U Ecokit 11
- **Scope of delivery:**
  - 1 divider extrusion front
  - 1 divider extrusion rear
  - 2 front extrusions
  - 2 internal extrusions
  - 1 set assembly material (cross recessed)
- Tapped strip see below
- Card guides see 2.5.3





2.4.1 Front Sub Division Vertical 6 U / 3 U

Usable Width a	Width b 42 HP	84 HP	Part-No.
32 HP	c = 8 HP	c = 50 HP	11-959-2

Other versions on request

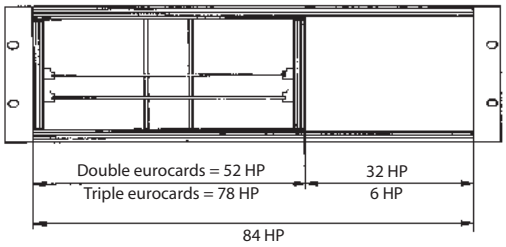
2.4.1.1 Tapped Strips for Front Extrusion

Scope of Delivery	Description	Part-No.
1 pc. tapped strip	M2.5 32 HP = 162.56 mm	61-463



2.4.2 Horizontal Card Mounting Kit

- For double eurocards (6 U)
- Independent of card depth
- **Scope of delivery:**
  - 4 distance plates (2 front / 2 rear)
  - 4 length extrusions (2 front / 2 rear)
  - 1 centre extrusion
  - 6 tapped strips M2.5
  - 1 set assembly material (Torx)
- Top and bottom cover plate when no overall fan front panel (2.4.3) is used
- Top and bottom cover plate has to be ordered separately (see table)
- Fan front panels for horizontal mounting kits see 2.4.3
- Card guides see 2.5.3
- Extruded front panels see 2.5.7





2.4.2 Horizontal Card Mounting Kit

Mounting Height	Usable Height	Backplane	Cover plate top*	Cover plate bottom*
3 U	20 HP	14K971-60	21N602-90	21N602-90
6 U	48 HP	14K991-60	21N606-90	21N607-90

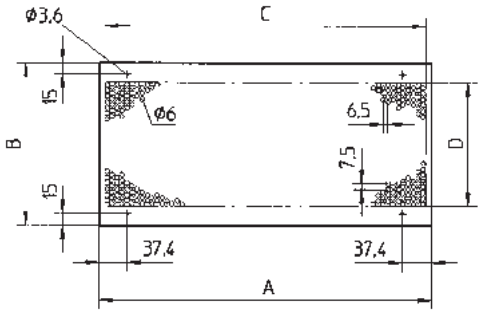
* Assembly material for cover plate see 2.4.3.1

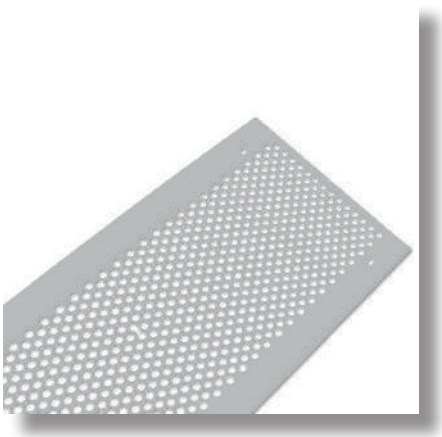


2.5 General Accessories

2.5.1 Perforated Cover Plates

- 1 mm sheet aluminium, perforated
- Front extrusions and internal extrusions are pre-drilled to accept the fixing screws
- Provides mechanical protection for the card area
- **Scope of delivery:**
  - 1 perforated cover plate
- Assembly material see below
- Cover plates for card depths 300 mm and 400 mm upon request





2.5.1 Perforated Cover Plates

Case Width	Card Depth	A	B	C	D	Part-No.
42 HP	160 mm 6.30"	217.64 mm 8.56"	149 mm 5.86"	207.5 mm 8.16"	107.25 mm 4.22"	11-701
	220 mm 8.66"	217.64 mm 8.56"	209 mm 8.22"	207.5 mm 8.16"	159.75 mm 6.28"	11-702
84 HP	160 mm 6.30"	431 mm 16.96"	149 mm 5.86"	415.5 mm 16.35"	107.25 mm 4.22"	11-706
	220 mm 8.66"	431 mm 16.96"	209 mm 8.22"	415.5 mm 16.35"	159.75 mm 6.28"	11-707
	280 mm 11.02"	431 mm 16.96"	269 mm 10.59"	415.5 mm 16.35"	212.25 mm 8.35"	11-708

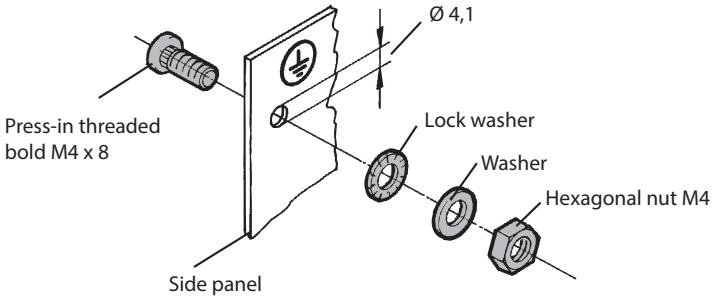
Other widths and depths available on request

Assembly Material

Description	Scope of Delivery	Part-No.
Cross recessed screw M3x6	Pack size 8 pieces	63-195
	1 piece	61-283
Torx cylinder head earthing screw M3x6, size T10	1 piece	5443-04

2.5.2 Earthing Set

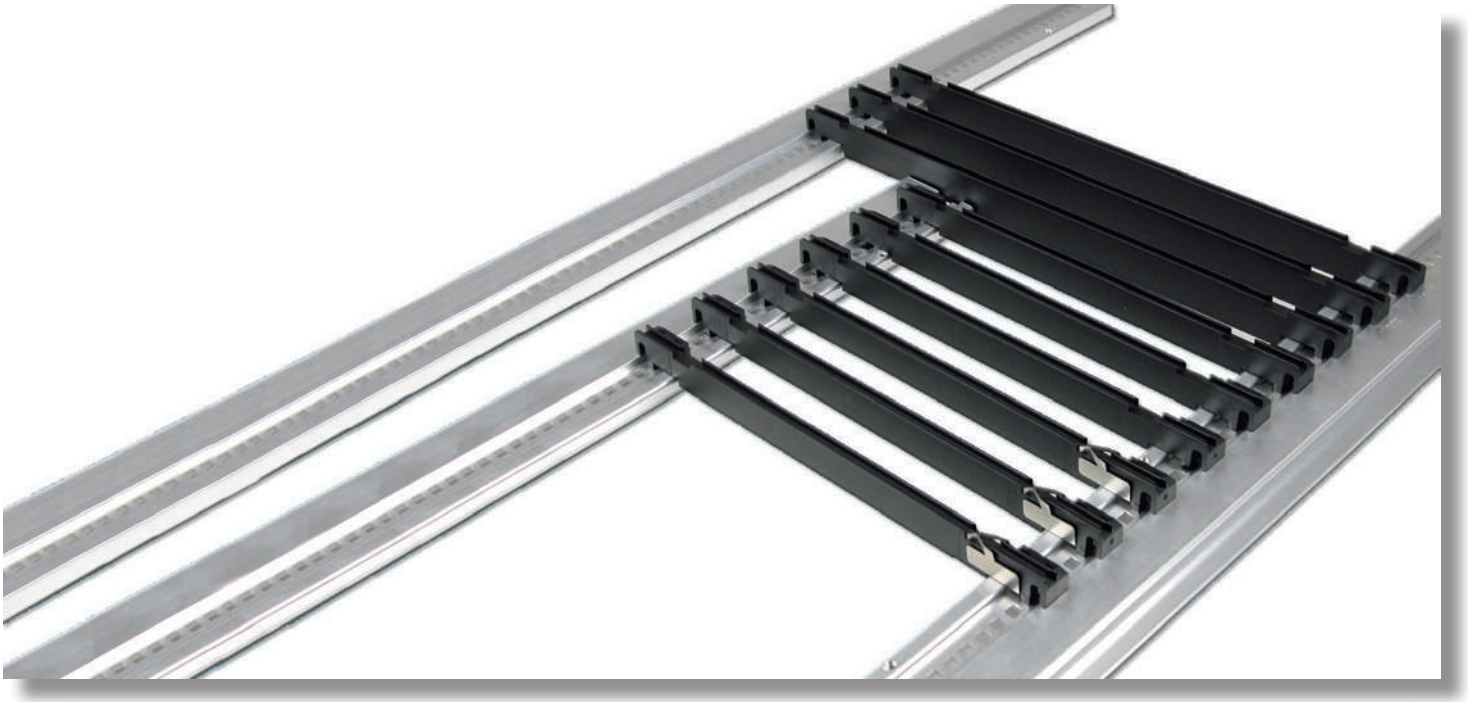
- Enables cases to be earthed in conformance with EN / VDE / SEV
- **Scope of delivery:**
  - 1 press-in threaded bolt M4 x 8
  - 1 washer
  - 1 serrated lock washer
  - 1 hexagonal nut M4





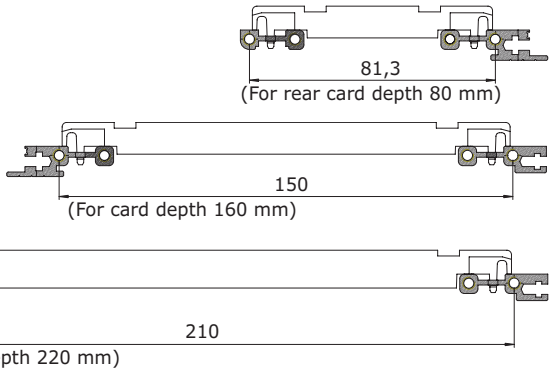
2.5.2 Earthing Set

Description	Part-No.
Earthing set according to EN / VDE / SEV	63-127



2.5.3 Card Guides Standard acc. to IEC

- For positive location of circuit boards and plug-in units conforming to the dimensions of card depths 80 mm, 160 mm, 220 mm and 280 mm
- The card guides are non-flammable, made from a high quality plastic material reinforced with fibreglass (UL94 V-0)
- Including ESD provisions



2.5.3.1 Card Guides 1-Slot



2.5.3.1 Card Guides 1-Slot

- **Scope of delivery:**
  - Card guide black plastic UL94 V-0
- ESD Clip see below (not usable for card depth 80 mm)

Card Thickness		Card Depth		Part-No.
mm	inch	mm	inch	
1.6	0.06	80	3.15	61-019
		160	6.30	61-044
		220	8.66	61-039
		280	11.02	61-017
2.0	0.08	160	6.30	61-087
		220	8.66	61-039
		280	11.02	61-169



2.5.3.2 ESD Clips

- Connecting PCB with case

Description	Part-No.
ESD clip front bottom/rear top	61-419-01
ESD clip front top/rear bottom	61-419-02



2.5.3.3 Card Guides 7-Slot in 4 HP Steps, IEC

- For reduced assembly time of multiple slot applications
- For use with single, double and triple eurocards with a depth of 160 mm
- For card thickness: 1.6 mm / 0.06"
- Black plastic, UL94 V-0
- ESD Clip not usable

Card Thickness		Card Depth		Part-No.
mm	inch	mm	inch	
1.6	0.06	160	6.30	61-076



2.5.3.4 Aluminium Card Guides 1-Slot, 3 Parts, IEC

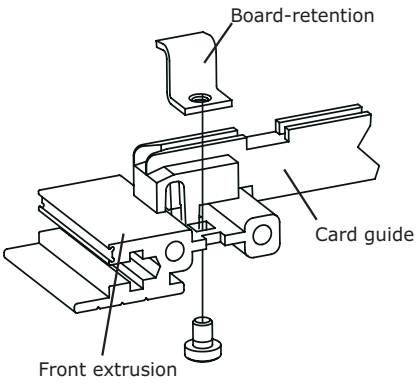
- Extrusion: Aluminium
- End feet: plastic, UL94 HB
- For card thickness: 1.6 mm / 0.06"
- Card guide extrusion, aluminium, clear anodised
- ESD clip not usable

Extrusion

Card Depth		Length		Part-No. Aluminium
mm	inch	mm	inch	
160	6.30	112.5	4.43	66-122-20
220	8.66	172.5	6.79	66-122-21
280	11.02	232.5	9.15	66-122-22
340	13.38	292.5	11.51	66-122-23
400	15.74	352.5	13.87	66-122-24
-	-	1350	53.15	66-122-14

End Feet

Description	Part-No. 1 Pair
End feet plastic, UL94 HB	61-069

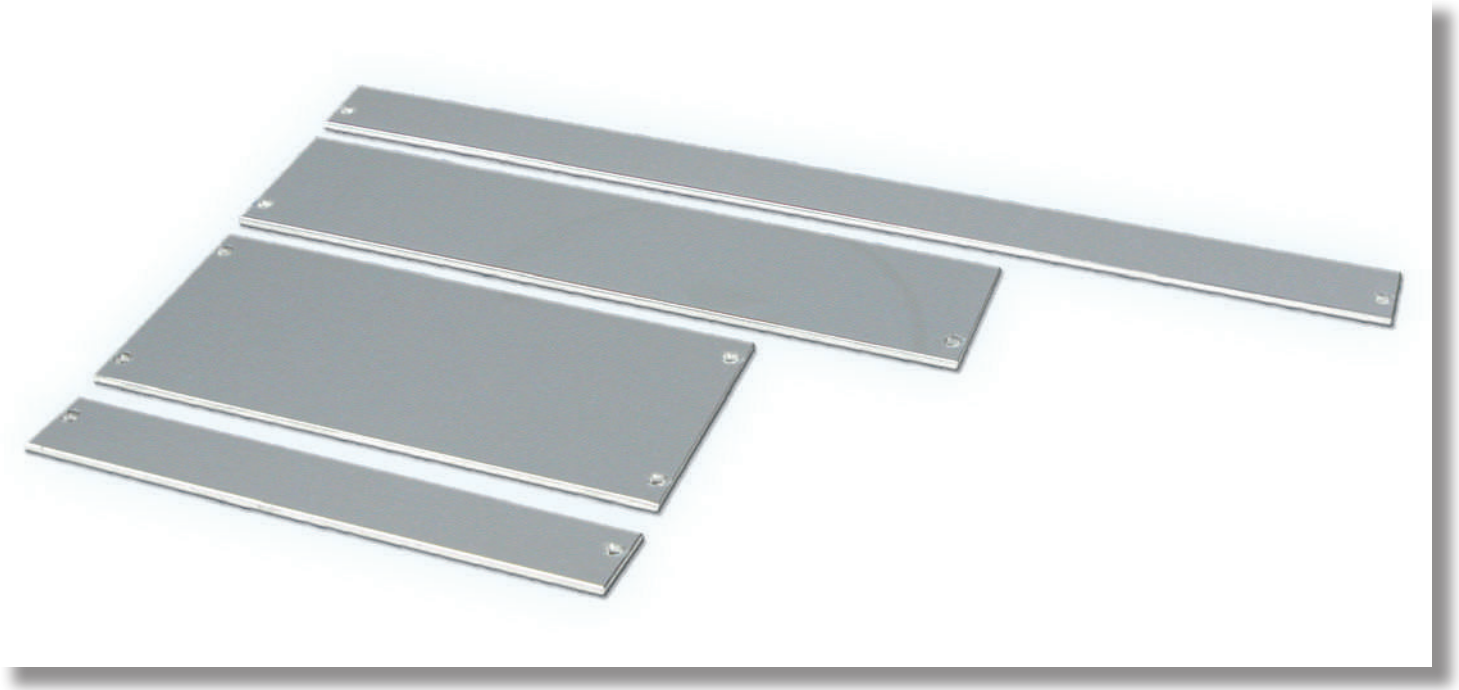


2.5.3.5 Card Guide Board-Retention Bar

Description	Part-No. 20 pcs.
Board-retention bar, zinc-plated steel	61-291

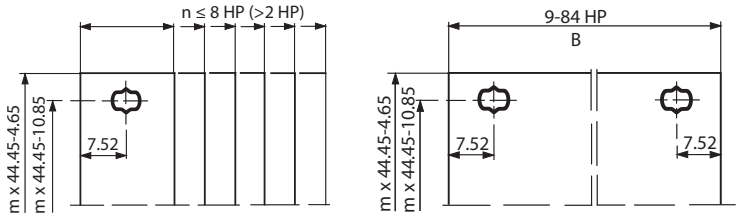
Assembly Material

Description	Part-No.
Cross recessed round head screw M3 x 4	5331-04
Torx cylinder head screw M3 x 4, size T10	5470-01



2.5.4 Flat Front Panels

- For sub racks and enclosures, solid
- Aluminium 2.5 mm, clear anodised (non-conductive)
- **Scope of delivery:**
  - Flat front panel
- Front panel screws, see below
- 2 HP screw retainer can not be fitted



2.5.4 Flat Front Panels for Sub Racks and Enclosures, Solid

Width	B		Part-No.	
	mm	inch	3 U 128.7mm	6 U 262.0mm
2 HP	10.0	0.39	21N302	21N602
3 HP	15.2	0.59	21N303	21N603
4 HP	20.1	0.79	21N304	21N604
5 HP	25.2	0.99	21N305	21N605
6 HP	30.3	1.19	21N306	21N606
7 HP	35.3	1.38	21N307	21N607
8 HP	40.4	1.59	21N308	21N608
10 HP	50.6	1.99	21N310	21N610
11 HP	55.7	2.19	21N311	-
12 HP	60.7	2.38	21N312	21N612
14 HP	70.9	2.79	21N314	21N614
16 HP	81.1	3.19	21N316	21N616
20 HP	101.4	3.59	21N320	21N620
21 HP	106.5	4.19	21N321	21N621
28 HP	142.0	5.59	21N328	21N628
32 HP	162.3	6.38	21N332	-
42 HP	213.1	8.38	21N342	21N642
52 HP	263.9	10.38	21N352	21N652
63 HP	319.8	12.59	21N363	21N663
81 HP	411.3	16.19	21N381	21N681
84 HP	426.5	16.79	21N384	21N684

- Other front panels see chapter C

2.5.4.1 Front Panel Screws

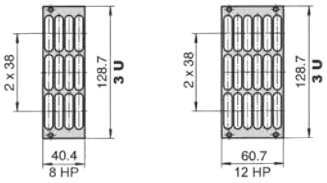
- Set of 10 screws, with screw retainer

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3, size T8 with plastic screw retainer	63K159
Rounded head screws recessed M2.5 x 11.3 with plastic screw retainer	63-159



2.5.5 Fan Front Panel for Horizontal Ventilation

- Aluminium 2.5 mm, clear anodised (non-conductive)
- **Scope of delivery:**
  - 1 perforated fan front panel
- Front panel screws see below





2.5.5 Fan Front Panel for Horizontal Ventilation

Height	Width	Air passage		Part-No.
		mm²	sq. inch	
3 U	8 HP	3195	4.95	21N308-01
	12 HP	4793	7.42	21N312-01

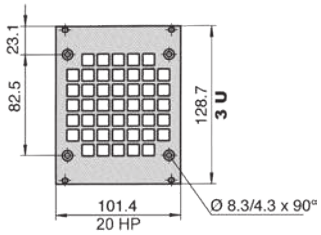
2.5.5.1 Front Panel Screws

- Set of 10 screws
- With screw retainer
- Fan front panel width up to 8 HP = 2 screws; ≥ 12 HP = 4 screws

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3, size T8 with plastic screw retainer	63K159
Rounded head screws recessed M2.5 x 11.3 with plastic screw retainer	63-159

2.5.6 Fan Front Panels for Direct Fan Mounting

- Aluminium 2.5 mm, clear anodised (non-conductive)
- **Scope of delivery:**
  - 1 perforated fan front panel
- Front panel screws see below
- Assembly material for fan mounting has to be ordered separately





2.5.6 Fan Front Panels for Direct Fan Mounting

Description	Height	Width	Air passage		Part-No.
			mm^2	sq. inch	
Without switch opening	3 U	20 HP	4051	6.27	21N320-04

2.5.6.1 Front Panel Screws

- Set of 10 screws
- With screw retainer
- Per front panel 4 screws are needed

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3, size T8 with plastic screw retainer	63K159
Rounded head screws recessed M2.5 x 11.3 with plastic screw retainer	63-159

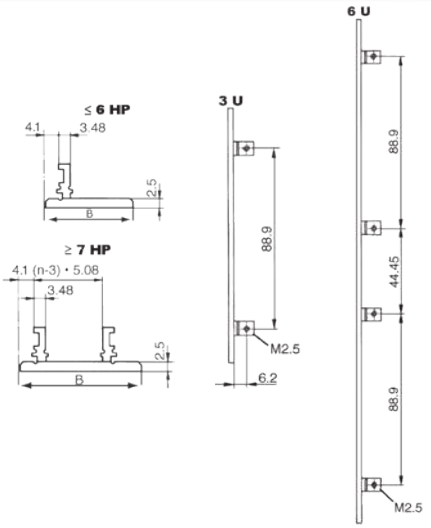
2.5.6.2 Assembly Material for Fan Mounting

Description	Part-No.
Countersunk screw, cross recessed M4 x 10	5342-10
Hexagonal nut M4, 0.8D	5620-51



2.5.7 Extruded Front Panels

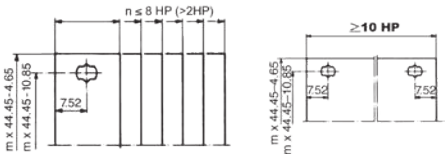
- Aluminium 2.5 mm, clear anodised (non-conductive)
- PCB mounting lugs are formed on the rear face of the panel
- No PCB fixing screws on the front face of the panel, leaving more space for silk screening and mounting front panel components
- Suitable for all sub racks and cases
- Thickness of the mounting lugs (3.48 mm) allows PCBs to be mounted on either side
- At rear drill marks for handle fixing holes
- **Scope of delivery:**
  - Extruded front panel, clear anodised
- Front panel screws see below





2.5.7 Extruded Front Panels, without Openings

Width	B		Part-No. 3 U	Part-No. 6 U
	mm	inch		
3 HP	15.0	0.59	26N303	26N603
4 HP	20.1	0.79	26N304	26N604
5 HP	25.2	0.99	26N305	26N605
6 HP	30.3	1.19	26N306	26N606
7 HP	35.3	1.38	26N307	26N607
8 HP	40.4	1.59	26N308	26N608
10 HP	50.6	1.99	26N310	26N610
12 HP	60.7	2.38	26N312	26N612
14 HP	70.9	2.79	26N314	-
16 HP	81.1	3.19	26N316	26N616
21 HP	106.5	4.19	26N321	-



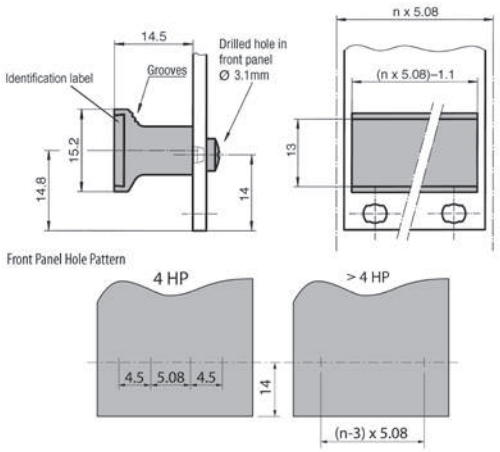
2.5.7.1 Front Panel Screws

- Set of 10 screws
- With screw retainer
- Front panel width up to 9 HP = 2 screws; ≥ 10 HP = 4 screws

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3, size T8, with plastic screw retainer	63K159
Rounded head screws recessed M2.5 x 11.3, with plastic screw retainer	63-159

2.5.7.2 Rigid-Mounted Unit Handles with Identification Label

- Black, plastic UL94 V-0, label aluminium anodised
- **Scope of delivery:**
  - Rigid-mounted handle
  - Identification label
- Assembly material see below





2.5.7.2 Rigid-Mounted Handle with Identification Label

Width	Scope of Delivery	Part-No.
4 HP	10 pcs.	60-200-04
5 HP	10 pcs.	60-200-05
6 HP	10 pcs.	60-200-06
7 HP	10 pcs.	60-200-07
8 HP	10 pcs.	60-200-08
10 HP	10 pcs.	60-200-10
12 HP	10 pcs.	60-200-12
14 HP	1 pc.	60-200-14

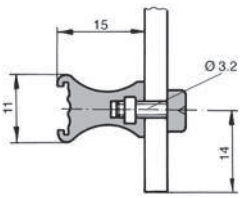
- Other sizes (up to 84 HP) are available upon request

Assembly Material

Description	Part-No.
Cross recessed round head screw	61-276

2.5.7.3 Fluted Handles

- Extruded aluminium handles, shaped to facilitate withdrawal of plug-in units
- Two grooves in the front face will accept identification strips (0.5 x 9 mm)
- **Scope of delivery:**
  - Extruded handle, clear anodised
  - Assembly material



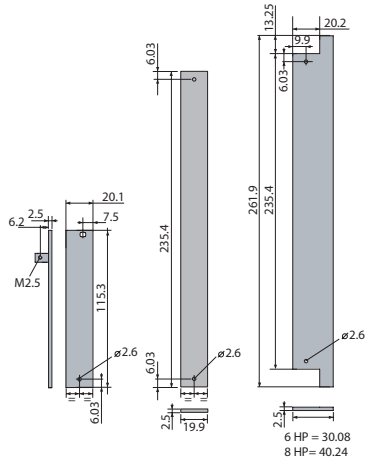


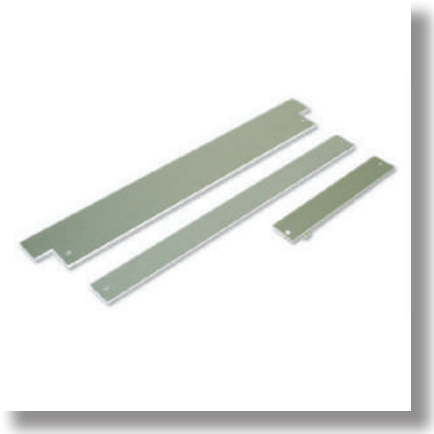
2.5.7.3 Fluted Handles for Front Panels to IEC

Front Panel Width HP	Width mm	Width inch	Handle Length mm	Handle Length inch	Part-No.
3 HP	15.0	0.59	12.5	0.49	60-103
4 HP	20.1	0.79	17.6	0.69	60-104
5 HP	25.2	0.99	22.6	0.88	60-105
6 HP	30.3	1.19	27.7	1.09	60-106
7 HP	35.3	1.38	33.5	1.31	60-107
8 HP	40.4	1.59	37.9	1.49	60-108
10 HP	50.6	1.99	48.0	1.88	60-110
12 HP	60.8	2.39	58.2	2.29	60-112
14 HP	70.9	2.79	69.1	2.72	60-114
16 HP	81.1	3.19	78.5	3.09	60-116
21 HP	106.5	4.18	104.6	4.11	60-121
30 HP	152.2	5.99	149.6	5.88	60-130
40 HP	203.0	7.99	200.4	7.88	60-140
60 HP	304.6	11.99	302.0	11.88	60-160
84 HP	426.5	16.79	424.0	16.69	60-184

2.5.8 Front Panel with Cutouts for IEC Ejector Handles

- Aluminium 2.5 mm, clear anodised (non-conductive)
- PCB mounting lugs are formed on the rear face of the panel (3 U Version only)
- No PCB fixing screws on the front face of the panel, leaving more space for silk screening and mounting front panel components
- Suitable for all sub racks and cases
- 3 U front panels prepared for one handle
- 6 U front panels prepared for two handles
- **Scope of delivery:**
  - Front panel, clear anodised
- Front panel screws see below (for 3 U-Version only)
- IEC ejector handles, see 2.5.9





2.5.8 Front Panel with Cutout for IEC Ejector Handle

Width	B		Part-No. 3 U	Part-No. 6 U
	mm	inch		
4 HP	20.0	0.79	26N304-51	21N604-51
6 HP	30.2	1.19	-	21N606-51
8 HP	40.3	1.59	-	21N608-51

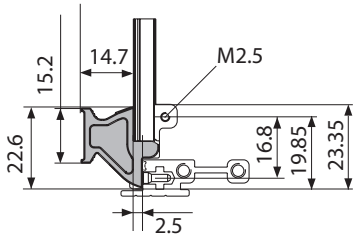
Front Panel Screws (for 3 U-Version only)

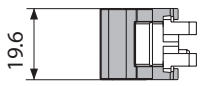
- Set of 10 screws
- With screw retainer
- Front panel 3 U = 1 screw

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3, size T8, with plastic screw retainer	63K159
Rounded head screws recessed M2.5 x 11.3, with plastic screw retainer	63-159

2.5.9 Ergonomic Ejector Handles acc. to IEC

- Simple assembly of plug-in units
- Allows trouble free extraction of electronic units with multipole connectors
- Main features in one part: card holder, ejector handle and centring pin
- Reset spring for safe insertion
- One version for top and bottom only
- Handle is injection moulded, glass-reinforced plastic, UL94 V-0
- Card holder is zinc die-cast, nickel plated
- Reset spring is stainless steel
- **Scope of delivery:**
  - Ejector handle
  - Assembly material (cross recessed screws M2.5 for fixing of card holder/printed board/front panel)
- Front panel with special cutouts have to be ordered separately





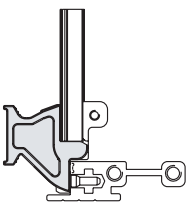


2.5.9 Ejector Handle acc. to IEC

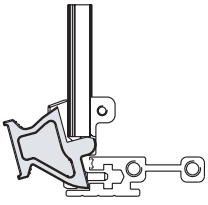
Description	Part-No.
Ejector handle black	81-233
Ejector handle grey	81-234

Extraction process:

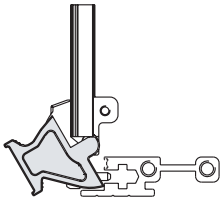
Rest position



Extraction

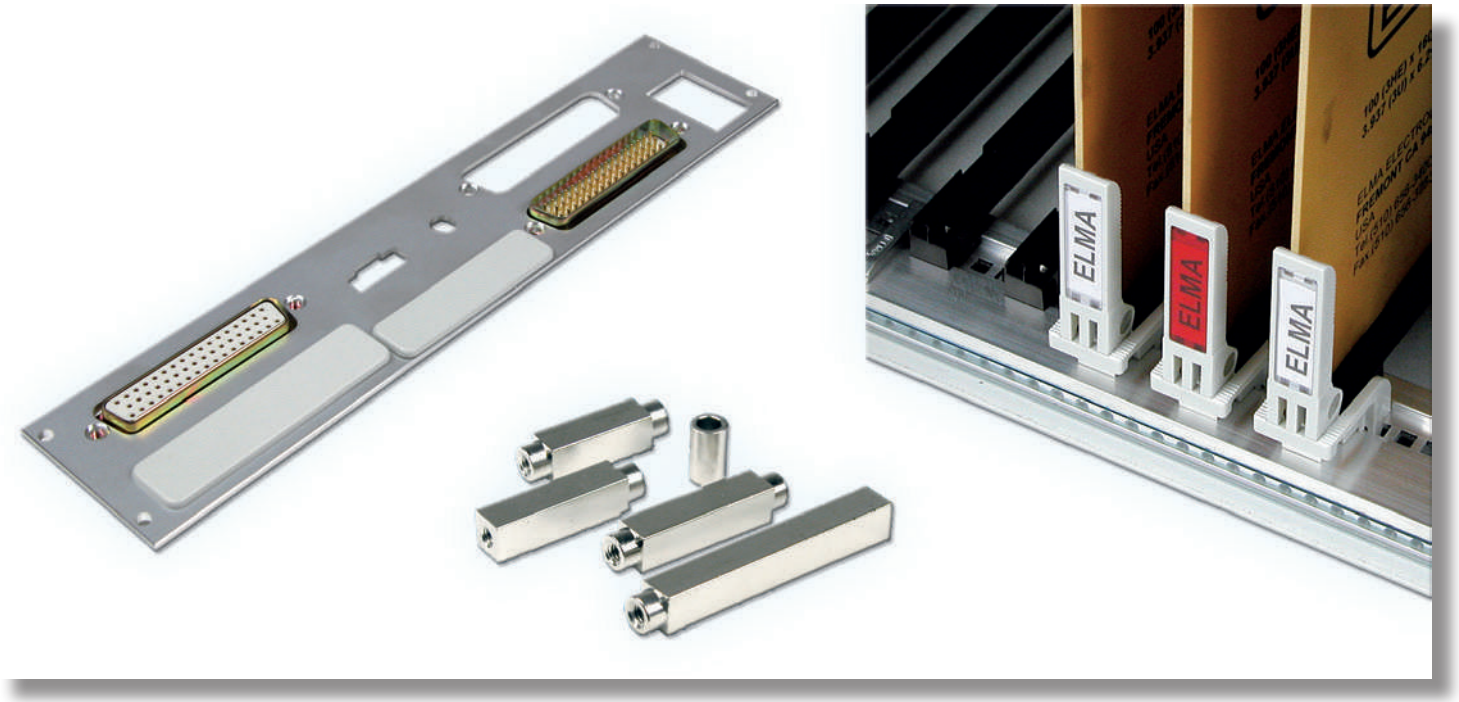


End position



Label

Description	Part-No.
1 sheet A4 of 220 labels	81-031



2.5.10 Card Locks and Card Handles

- The card lock is easily mounted onto the upper or lower front profile
- When the PCB is pushed home, it is automatically locked into position
- The card eject mechanism can be attached to the top or bottom front edge of the PCB and is used in conjunction with the card lock
- The lever action ensures smooth and jerk-free card removal, especially useful when multi-pole connectors are being used
- Transparent windows in different colours and self-adhesive labels set into the front face of the eject mechanism make card identification easy
- The card lock and eject mechanism does not inhibit the use of front panels
- For recessed cards, a special card lock is available, suitable for use with profile 66-144
- **Scope of delivery:**
  - Card locks, eject mechanisms, windows and labels



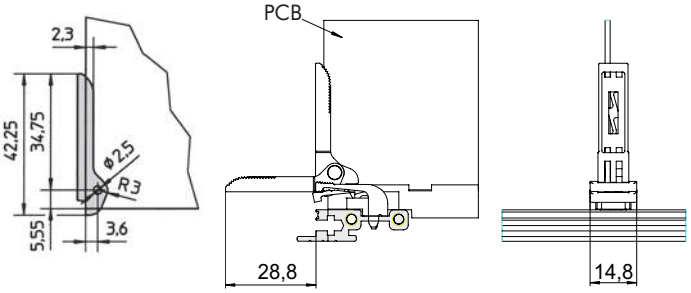
2.5.10.1 Card Locks, Card Injector/Ejector Handles

Description	Colour	Part-No. 1 pc.	Part-No. 10 pcs.
Card ejector handles	-	-	63-151
Card locks	-	61-126	-
Card locks to 66-144	-	61-144	-
Transparent window	Clear	-	63-155-1

Labels

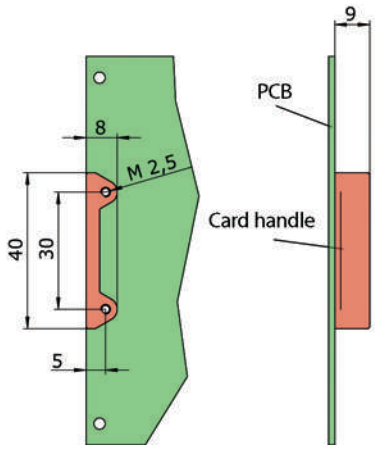
Description	Part-No.
1 sheet A4 of 105	63-161





2.5.10.2 Card Handles

- Coloured, transparent handles which will accept labels facilitate the handling and identification of PCBs
- **Scope of delivery:**
  - 1 card handle
- Two screws M2.5 x 5 are needed per handle and have to be ordered separately



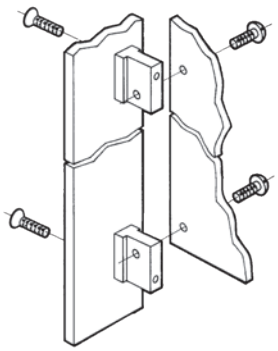


2.5.10.2 Card Handles

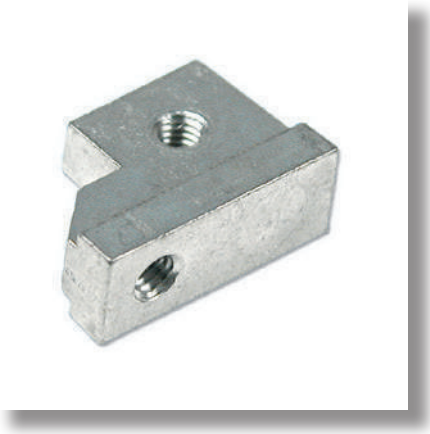
Description	Colour	Part-No. 1 pc.
Card handle	clear	1091-51
	red	1091-54
Cylindrical recessed screw M2.5 x 5		5571-05
Torx cylinder head screw M2.5 x 5, size T8		5470-07

- Other colours (blue, yellow, green, orange) upon request

2.5.11 Card Holder acc. to IEC Standard

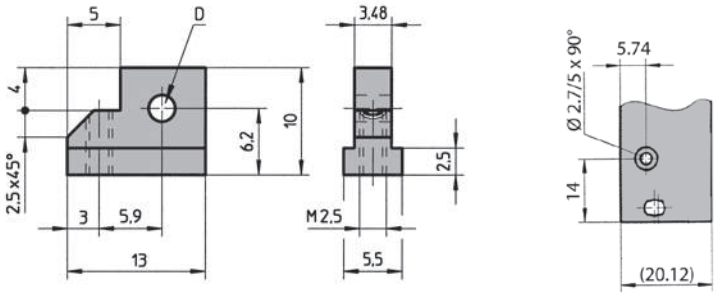


- By using the zinc die-cast card holder, flat front panels can be connected to a PCB to form a plug-in unit to IEC 60297
- The card can be mounted both in the standard position and offset 1 HP (5.08 mm)
- For better positioning of 6 U cards, there is a card holder centre piece made of nylon (see 2.5.13)
- The injector-/ejector handle can be used with the card holder
- **Scope of delivery:**
  - 1 card holder
- Assembly material see 2.5.12.3



2.5.11.1 Card Holder without Swivel Stop

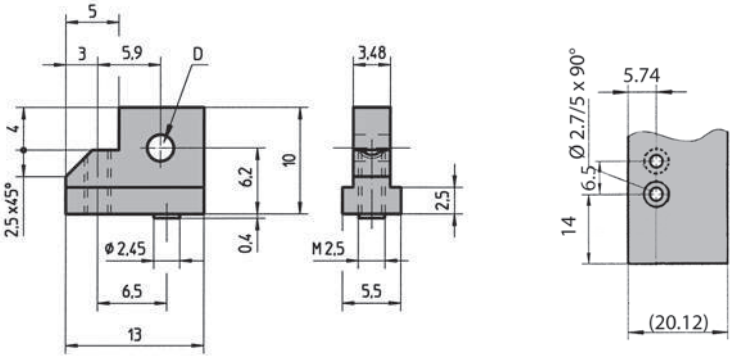
Description	Application	D	Part-No.
Card holder without swivel stop	Without injector/ejector handle	M2.5	61-156
Card holder without swivel stop	With injector/ejector handle	Ø 2.5	61-155





2.5.11.2 Card Holder with Swivel Stop

Description	Application	D	Part-No.
Card holder with swivel stop	Without injector/ejector handle	M2.5	61-156-01
Card holder with swivel stop	With injector/ejector handle	Ø 2.5	61-155-01

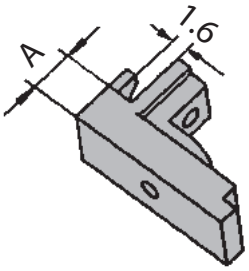




2.5.11.3 Assembly Material

Description	Application	Part-No.
Cross recessed countersunk screw M2.5 x 8	For card holder	5322-08
Torx countersunk screw M2.5 x 8, size T8	For card holder	5470-21
Slotted pan head screw M2.5 x 6	For printed board	5571-06
Torx cylinder head screw M2.5 x 6, size T8	For printed board	5470-04

2.5.12 Middle Part



- Usable for all front panels
- For positioning and fixing of 6 U and 9 U PCB
- Card thickness 1.6 mm
- Self-adhesive, can optionally be screwed onto front panel and printed board
- Material: Plastic black UL94 V-0
- **Scope of delivery:**
  - Plastic middle part
- Assembly material, see below

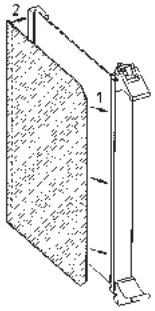


2.5.12 Middle Part

For Front Panels out of	A		Part-No.
	mm	inch	
Aluminium 2.5 mm	2.5	0.10	61-960

Assembly Material

Description	Part-No.
PT-countersunk screw, 2.5 x 6	5534-06



2.5.13 Protective Cover for 6 U Printed Board

1. Slide protective cover between front panel and printed board
2. Press adhesive tape on protective cover through pins of connectors to attach onto printed board



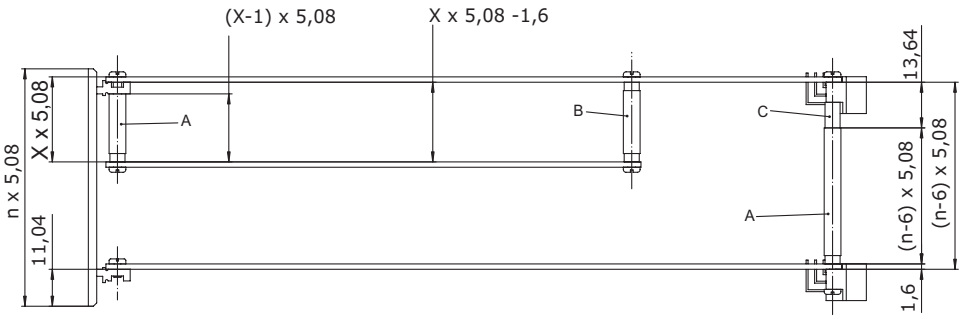
2.5.13 Protective Cover for 6 U Printed Board

- Material: Polyester film mat, thickness 0.2 mm, UL94 VTM-2
- Mechanical protection of soldering side

For Card Depth		Part-No.
mm	inch	
160	6.30	81-010-02

2.5.14 Spacers

- Four-sided, nickel-plated brass spacers with M2.5 internal threads at both ends
- Using these spacers, additional PCBs may be mounted at a horizontal pitch of 5.08 mm
- Mounting plate is 1.5 mm galvanized steel with mounting holes corresponding to PCBs conforming to IEC 60297



n * 5.08 = theoretical width of front panel
x * 5.08 = distance of printed PCBs
n = multiple of the 5.08 pitch of the selected front panel
x = selected multiple of the 5.08 pitch for the distance of printed PCBs



2.5.14.1 Spacers Series A

- Use between PCB mounting lugs and PCBs
- Gives 5.08 mm pitch

Length L		Part-No.
mm	inch	
10.16	0.40	61-300
15.24	0.60	61-301
20.32	0.80	61-302

Other lengths available on request

2.5.14.2 Spacers Series B

- Use between two PCBs
- Gives 5.08 mm pitch

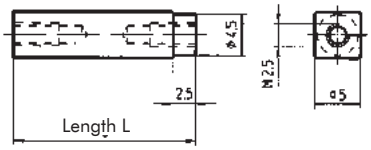
Length L		Part-No.
mm	inch	
13.64	0.53	61-320
18.72	0.73	61-321
23.80	0.93	61-322

2.5.14.3 Spacers Series C

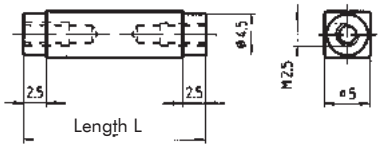
- Use between a PCB with connector and a second PCB

Length L		Part-No.
mm	inch	
7.64	0.30	61-340

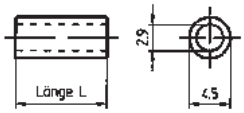
Series A



Series B

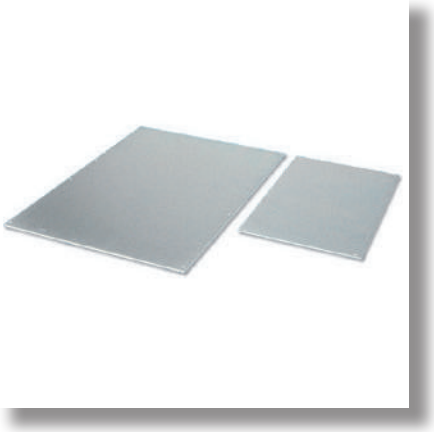


Series C



2.5.15 Mounting Plates

- Dimensions identical to eurocard dimensions
- 1.5 mm galvanized sheet steel
- **Scope of delivery:**
  - 1 mounting plate
- Assembly material, see below



2.5.16 Mounting Plates

Height	Dimensions	Part-No.
3 U	100 x 160 mm (3.93" x 6.29")	61-350
6 U	233.35 x 160 mm (9.18" x 6.29")	61-351

Assembly Material

Description	Part-No.
Screws recessed M2.5 x 5	5571-05

2.5.16 Hexagonal Spacers M3 Thread

- Galvanised steel
- Ideal for use as supports or spacers
- **Scope of delivery:**
  - 1 spacer

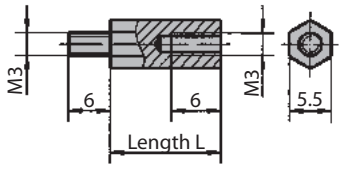


2.5.16 Hexagonal Spacers, M3 Thread

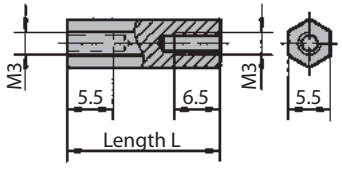
Length L		Part-No.
mm	inch	
10	0.39	1922-01
15	0.59	1922-02
30	1.18	1922-05
40	1.57	1922-07

Length L		Part-No.
mm	inch	
8.5	0.33	1923-01
13.5	0.53	1923-02

1922-0x

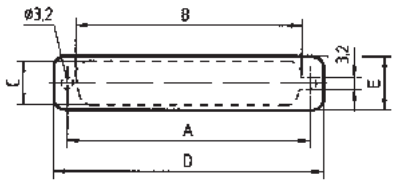


1923-0x



2.5.17 Covering Caps

- The caps, fit openings for D-Sub connectors and can be fitted without special tools
- Material: ABS grey UL94-HB
- **Scope of delivery:**
  - Plastic covering caps



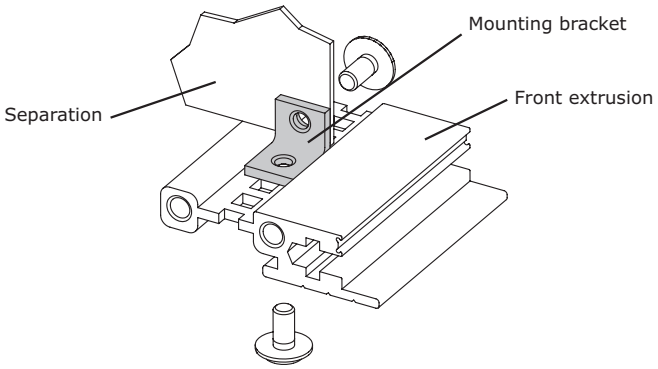


2.5.17 Covering Caps

Opening		A mm	B mm	C mm	D mm	E mm	Part-No.
DB9	9-pole	25.0	20.5	11.4	32.0	14.0	61-920
DB15	15-pole	33.3	28.8	11.4	40.3	14.0	61-921
DB25	25-pole	47.0	42.5	11.4	54.0	14.0	61-922
DB37	37-pole	63.5	59.1	11.4	70.5	14.0	61-923

2.5.18 Mounting Bracket

- Assembly of a separation
- Separations are manufactured as required by the customer
- Sheet steel
- **Scope of delivery:**
  - 1 mounting bracket
- Assembly material, see below





2.5.18 Mounting Bracket

Description	Part-No.
Mounting brackets	61-416

Assembly Material

Description	Part-No.
Rounded head screws cross recessed M3 x 6	5335-06
Rounded head screws Torx M3 x 6, size T10	5473-01

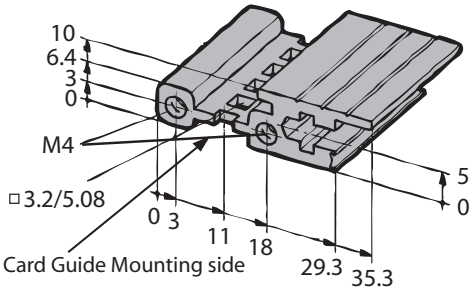


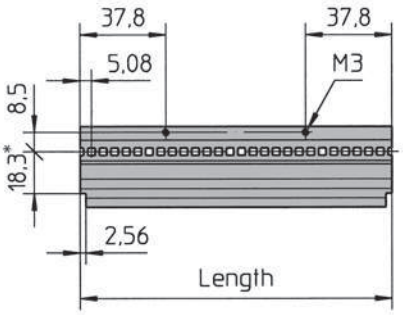
2.6 Extrusions

2.6.1 Front Extrusions

2.6.1.1 Front Extrusion 66-111, IEC

- For sub rack and cases front
- Accept 2 x 6 mm tapped strips
- **Scope of delivery:**
  - 1 front extrusion without assembly material



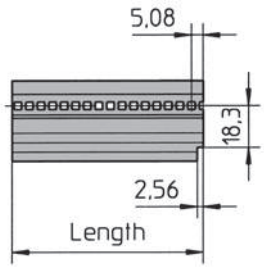


* 14,0 for Systemkit 12K

2.6.1.1 Standard Version

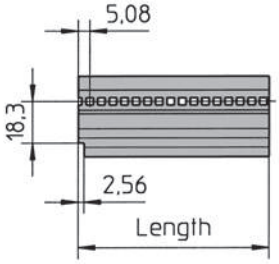
Length for HP	mm	inch	Part-No. clear anodised	clear passivated	raw
21	111.8	4.40	66-111-26	-	-
28	147.3	5.80	66-111-25	-	-
32	167.6	6.80	66-111-62	-	-
42	218.4	8.60	66-111-60	66-111-75	-
42	218.4	8.60	-	66-111-160*	-
63	325.1	12.80	66-111-61	66-111-76	-
81	416.6	16.40	66-111-22	66-111-77	-
84	431.8	17.00	66-111-23	66-111-78	-
	1350.0	53.15	-	-	66-111-19

* for Systemkit 12K



2.6.1.2 Height Divider Right

Length for HP	mm	inch	Part-No. anodised
8.5	43.18	1.70	66-111-71
12.5	63.50	2.50	66-111-72



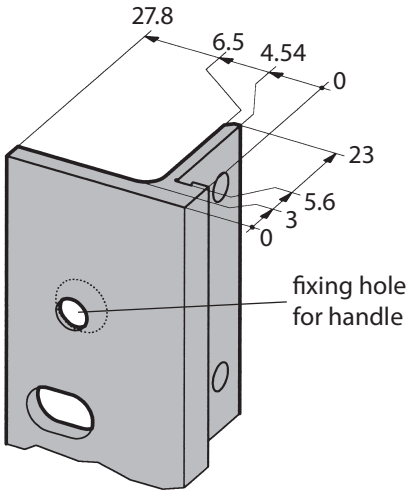
2.6.1.3 Height Divider Left

Length for HP	mm	inch	Part-No. anodised
8.5	43.18	1.70	66-111-81
12.5	63.50	2.50	66-111-82

2.6.2 Height Extrusions

2.6.2.1 Height Extrusion 19" 66-175

- 19" height extrusion type 11
- For standard side panel 2 mm
- **Scope of delivery:**
  - 1 height extrusion without assembly material

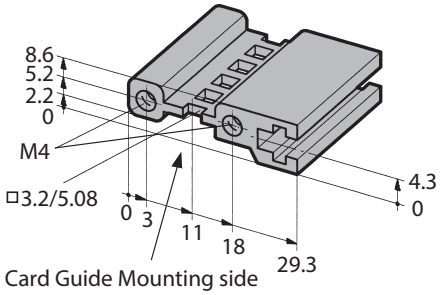


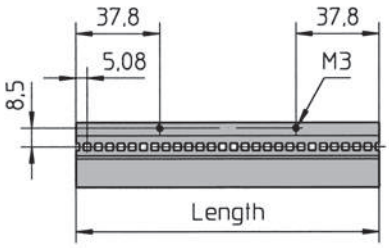
Length for U	mm	inch	Part-No. clear anodised fixing hole for handle without	with
3	132.5	5.20	66-175-23	66-175-33
4	177.0	6.96	66-175-24	66-175-34
6	165.9	10.46	66-175-26	66-175-36
7	310.3	12.20	66-175-27	66-175-37
8	354.8	13.96	66-175-28	66-175-38
9	399.2	15.71	66-175-29	66-175-39
10	443.7	17.47	-	66-175-40
12	532.6	20.96	66-175-32	-

2.6.3 Internal Extrusions

2.6.3.1 Standard Internal Extrusion 66-144

- Standard extrusion for mounting supplementary edge connector extrusions in sub racks and cases
- Accept 2 x 6 mm tapped strips
- **Scope of delivery:**
  - 1 internal extrusion without assembly material



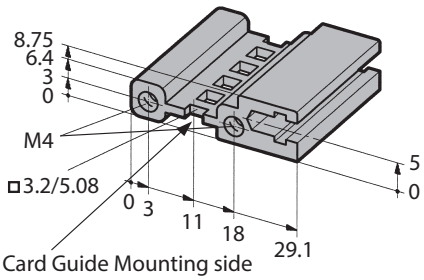


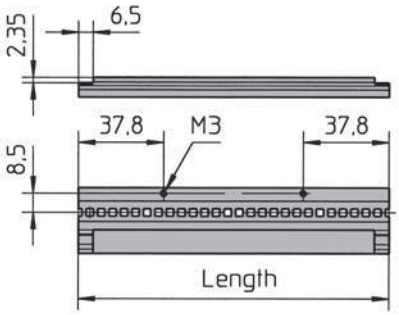
2.6.3.1 Standard Version

Length for HP	mm	inch	Part-No. clear passivated	raw
42	218.4	8.60	66-144-60	-
63	325.1	12.80	66-144-61	-
81	416.6	16.40	66-144-22	-
84	431.8	17.00	66-144-23	-
	1350.0	53.14	-	66-144-19

2.6.3.2 Internal Extrusion 66-193 for Insulated Backplane Mounting

- For mounting backplanes in sub racks
- Insulating strip see 2.6.3.3
- Accept 1.8 x 5 mm tapped strips
- **Scope of delivery:**
  - 1 extrusion without assembly material



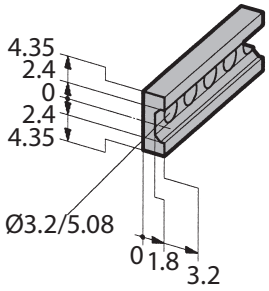


2.6.3.2 Internal Extrusion 66-193 for Use of Insulating Strip

Length for HP	mm	inch	Part-No. clear passivated
81	416.6	16.40	66-193-24
84	431.8	17.00	66-193-25

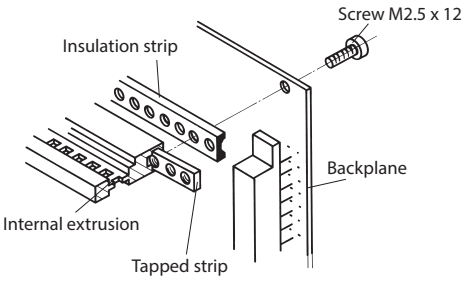
2.6.3.3 Insulating Strips 66-901

- Plastic grey
- In use with extrusions 66-112, 66-192, 66-193, 66-288
- **Scope of delivery:**
  - 1 insulating strip without assembly material



2.6.3.3 Insulating Strips 66-901

Length for HP	mm	inch	Part-No.
42	216.44	8.52	66-901-20
63	323.12	12.72	66-901-21
81	414.56	16.32	66-901-22
84	429.80	16.92	66-901-23

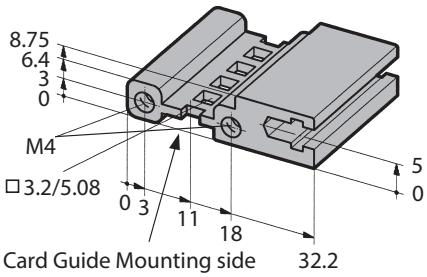


Mounting with Insulation Strips

Description	Part-No.
Cross recessed cylinderhead earthing screw M2.5 x 12	5325-12

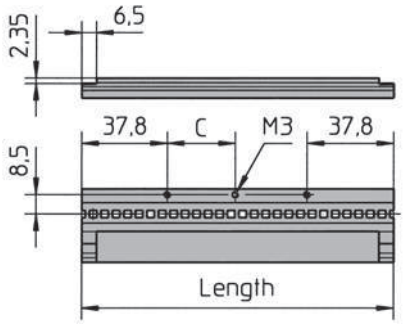
2.6.3.4 Internal Extrusion 66-194 for Conductive Backplane Mounting

- For mounting backplanes without an insulating strip
- **Scope of delivery:**
  - 1 extrusion without assembly material



2.6.3.4 Internal Extrusion 66-194 without Use of Insulating Strip

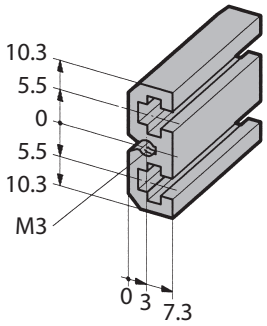
Length for HP	mm	inch	Holes n x C	Part-No. clear passivated
81	416.6	16.40	2 x 170.48	66-194-24
84	431.8	17.00	2 x 178.1	66-194-25
84	431.8	17.00	4 X 89.05	66-194-29



2.6.4 Center Extrusions

2.6.4.1 Double Extrusion 66-192 for Insulated Backplane Mounting

- For mounting backplanes, matches 66-193, 66-288
- For use with insulating strips
- Insulating strip see 2.6.3.3
- Accept 2 x 6 mm tapped strips
- **Scope of delivery:**
  - 1 extrusion without assembly material



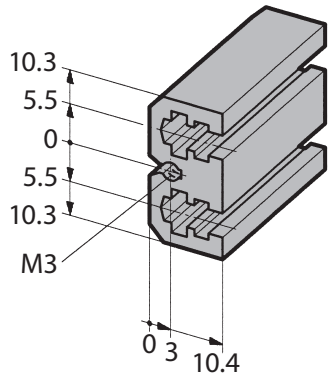
Length			Part-No.	
for HP	mm	inch	clear passivated	raw
84	431.8	17.00	66-192-24	-
	1350.0	53.14	-	66-192-14

Length			Part-No.
for HP	mm	inch	clear passivated
42	213.4	8.40	66-192-20
63	320.0	12.59	66-192-21
81	411.5	16.20	66-192-22
84	426.7	16.79	66-192-23

Assembly material with adapter: 63-175 (63K175 with Torx)

2.6.4.2 Double Extrusion 66-195 for Conductive Backplane Mounting

- For mounting backplanes without insulating strips
- Matches 66-194, 66-289, 66-290
- Accept 2 x 6 mm tapped strips
- **Scope of delivery:**
  - 1 extrusion without assembly material

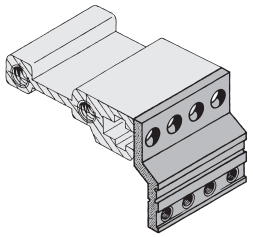


Length			Part-No.
for HP	mm	inch	clear passivated
84	431.8	17.00	66-195-24

Length			Part-No.
for HP	mm	inch	clear passivated
81	411.5	16.20	66-195-22
84	426.7	16.77	66-195-23

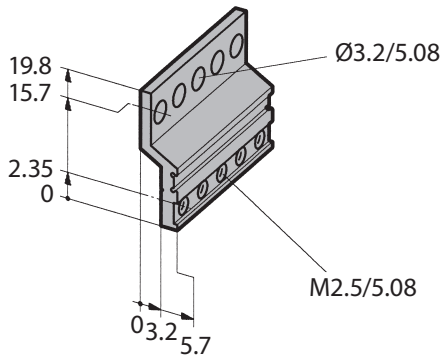
Assembly material with adapter: 63-175 (63K175 with Torx)

2.6.5 Edge Connector Extrusions



2.6.5.1 Edge Connector Extrusion 66-145

- Supplementary edge connector extrusion for IEC 60603-2 connectors
- Matches 66-144, 66-133 and 66-124
- **Scope of delivery:**
  - 1 supplemenatry edge connector extrusion without assembly material

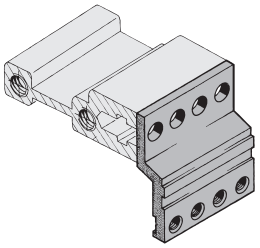


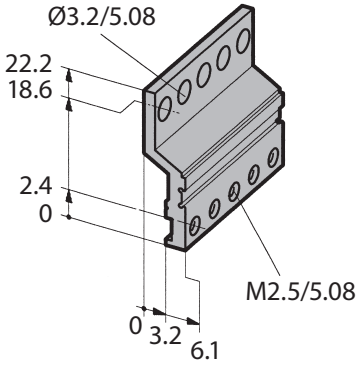
2.6.5.1 Edge Connector Extrusion 66-145

Length			Part-No.	
for HP	mm	inch	clear passivated	raw
8	40.6	1.59	66-145-40	-
18	91.4	3.59	66-145-41	-
28	142.2	5.60	66-145-42	-
42	213.4	8.40	66-145-63	-
63	320.0	12.60	66-145-65	-
81	411.5	16.20	66-145-22	-
84	426.7	16.80	66-145-52	-
	1350.0	53.14	-	66-145-19

2.6.5.2 Edge Connector Extrusion 66-147

- Supplementary edge connector extrusion for IEC 60603-2
- Matches 66-112, 66-192 and 66-193
- **Scope of delivery:**
  - 1 supplemenatry edge connector extrusion without assembly material



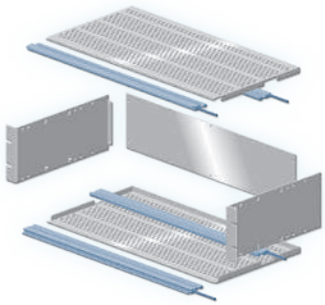


2.6.5.2 Edge Connector Extrusion 66-147

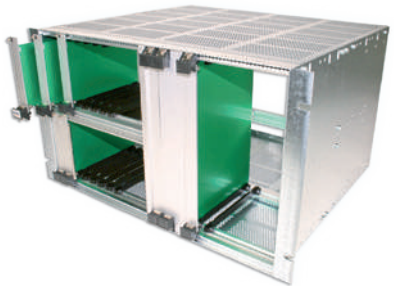
Length			Part-No.	
for HP	mm	inch	clear passivated	raw
8	40.6	1.59	66-147-40	-
18	91.4	3.59	66-147-41	-
28	142.2	5.60	66-147-42	-
42	213.4	8.40	66-147-63	-
63	320.0	12.60	66-147-65	-
81	411.5	16.20	66-147-22	-
84	426.7	16.80	66-147-52	-
	1350.0	53.14	-	66-147-19

3: EMC Sub Rack Magic-/Spirit-Kit 11









3.1 Magic- /Spirit-Kit 11 Overview **A | 3_3**

3.2 Basic Case **A | 3_7**

3.2.1 Magic-Kit 11 (IEC 60297) A | 3_7

3.2.2 Spirit-Kit 11 (IEEE 1101.10 and CompactPCI) A | 3_7

3.2.3 Rear Panel A | 3_7

3.2.4 Line Drawings A | 3_8

3.3 Adaptation Kit **A | 3_9**

3.3.1 Adaptation Kit A | 3_9

3.3.2 Edge Connector Extrusion 66-147 A | 3_9

3.4 Assembly Accessories **A | 3_10**

3.4.1 Front Sub Division Vertical for 6 U System or 6 U Assembly A | 3_10

3.4.2 EMC Front Sub Division Vertical Small A | 3_11

3.4.3 Horizontal Card Mounting Kit for Double Eurocards (6 U) A | 3_11

3.4.4 Mounting Chassis A | 3_13

3.4.5 EMC Contact Strips (Advanced EMC-level) A | 3_13

3.4.6 Earthing Set A | 3_14







3.5 General Accessories **A | 3_14**

3.5.1 Card Guides IEC A | 3_14

3.5.2 Card Guides acc. to IEEE A | 3_16

3.6 Front Panels **A | 3_19**

3.6.1 Flat Front Panels A | 3_19

3.6.2 EMC Flat Front Panels A | 3_20

3.6.3 Fan Front Panels A | 3_23

3.6.4 Hinged Front Panels A | 3_25

3.6.5 Plug-In Units acc. to IEC A | 3_27

3.6.6 EMC Plug-In Units acc. to IEC A | 3_30

3.6.7 Plug-In Units acc. to IEEE A | 3_34

3.7 Extrusions **A | 3_38**

3.7.1 Front Extrusions A | 3_38

3.7.2 Internal Extrusions A | 3_40



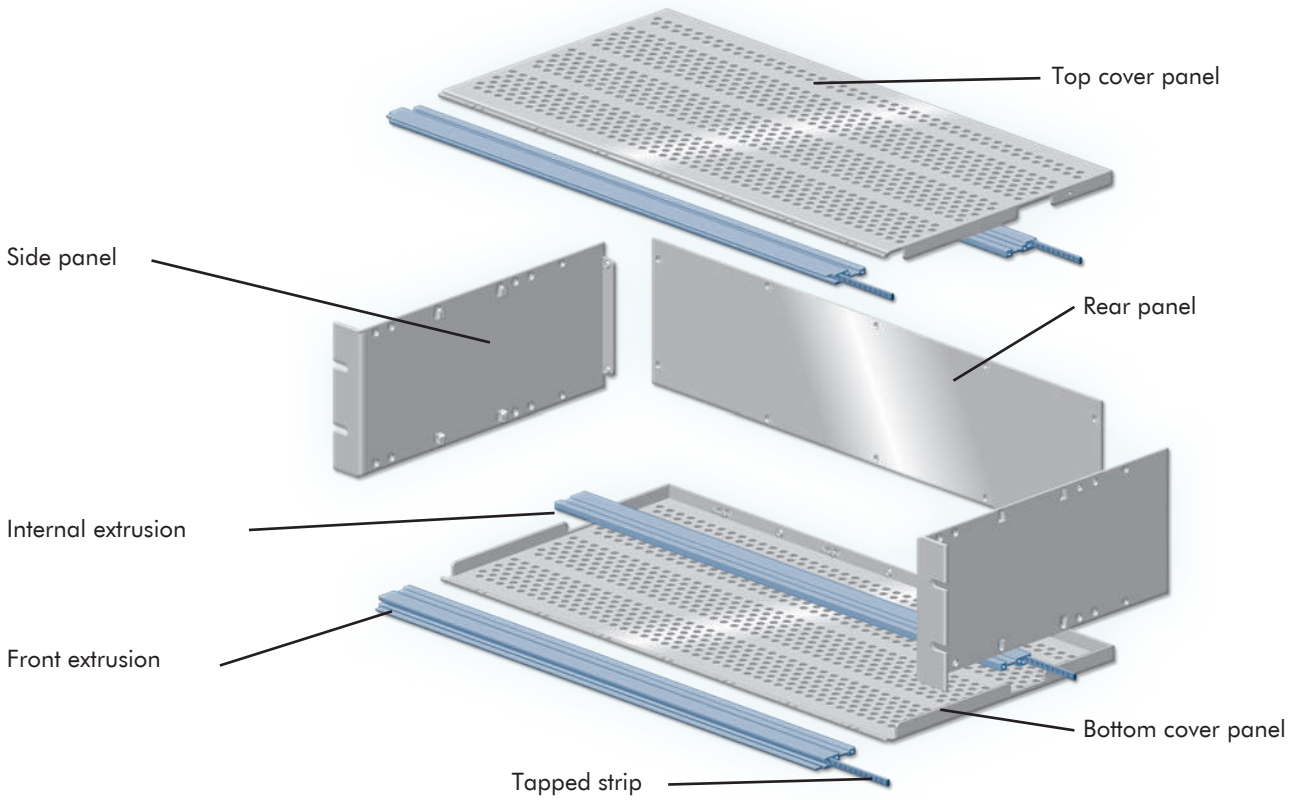
3.1 Magic- /Spirit-Kit 11 Overview

Technical features

- Advanced EMC shielding without gaskets is standard
- Internal adaption parts freely accessible
- Rapid assembly
- Easy access for maintenance
- Sheet steel, pre-galvanised
- Vibration-proof
- Dimensions and adaptations according to IEC 60297
- Suitable for IEC 60297 or IEEE 1101.10

Scope of delivery

- Numerous accessories
- Vertical and horizontal card mounting



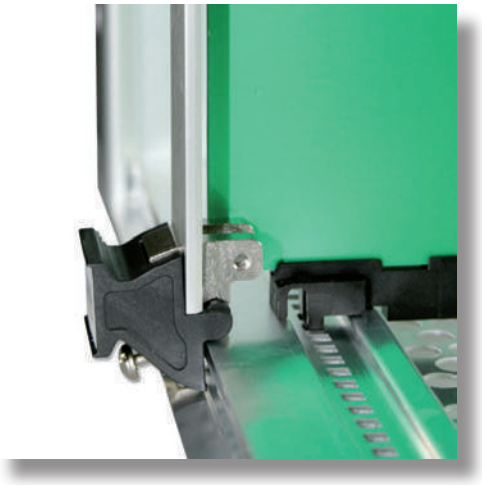
3: EMC Sub Rack Magic-/Spirit-Kit 11

Magic-Kit 11

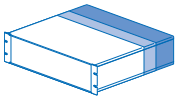
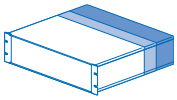
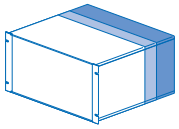
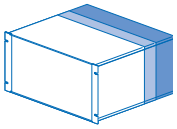
Front extrusions according to IEC 60297 specifications.

Spirit-Kit 11

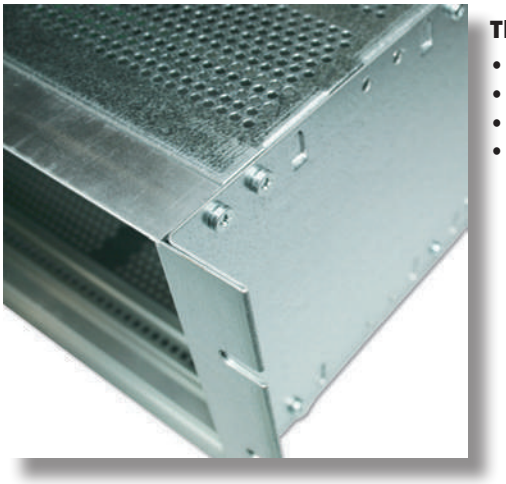
Front extrusions according to IEEE 1101.10 and CompactPCI specifications, specially designed for plug-in units with high insert / extract forces.





Width	84 HP	
Height	Magic-Kit 11	Spirit-Kit 11
3 U		
6 U		

Depth ☐ 240 mm 9.44" ■ 300 mm 11.81" ■ 390 mm 15.35"



The cost-optimised solution

- by integrated 19"-lugs
- by use of sheet steel, pre-galvanised
- by integrated EMC contacts
- by fast assembly

EMC

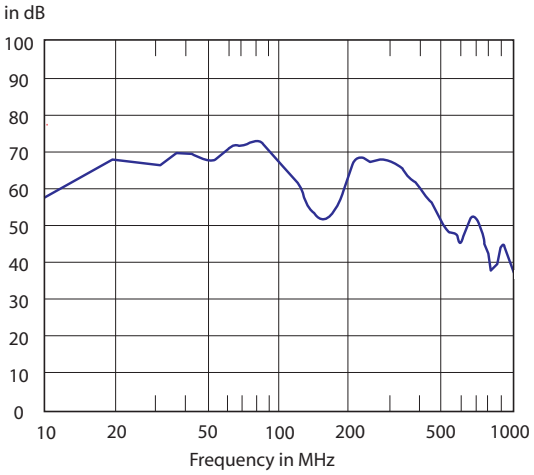
"Electromagnetic comptability is the ability of a system to operate in the intended environment without causing or suffering unacceptable degradation of performance due to unintentinal electromagnetic radiation or response." The EMC characterstics of a system therefore consist of an appropriate immunity from interference (noise immunity) and a limited emission of interference (noise emission).

Elma's EMC concept describes three levels of electromagnetic shielding performance (Performance Level). The attenuation levels will simplify the selection of sub racks for the user. Test setup: The first measurement E1 is without the enclosure. The next measurement E2 is made with the transmitting antenna installed inside the enclosure. The difference between the received signal without and with the enclosure represents the shielding effectiveness in dB.

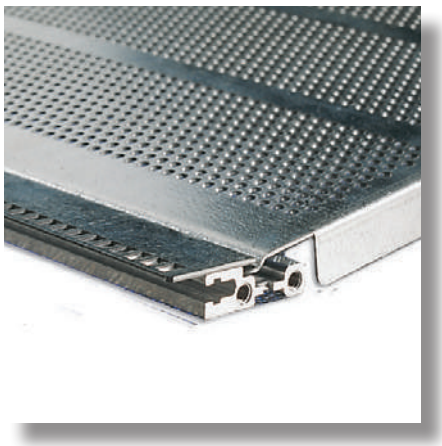
Performance Level	30 - 230 MHz	230 - 1000 MHz	1000 - 2000 MHz
1 / Elma: Basic level	20 dB	10 dB	0 dB
2 / Elma: Advanced level	40 dB	30 dB	20 dB
3 / Elma: Superior level	60 dB	50 dB	40 dB

The standard configuration will provide you with an advanced EMC level. If you require a superior EMC level for your system, you need to talk to an engineer.

Typical shielding effectiveness for Magic-/Spirit-Kit 11



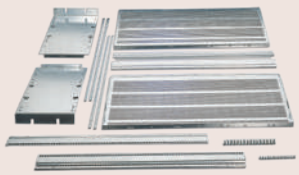
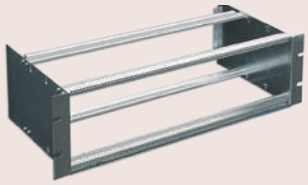
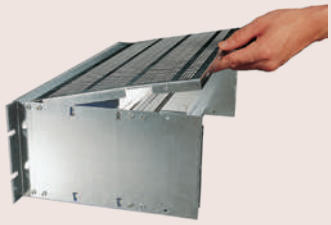
By means of standard snap-fit and screw connections suitable for demanding applications.







Economical 5-minute assembly

	1 min 	Open the package and lay out the parts...
	4 min 	...screw together the two side panels, four extrusions and four tapped strips - and the frame is ready.
	4.5 min 	Insert top and bottom cover, tighten four screws...
	5 min 	 ...and your EMC sub rack is fully assembled - without additional gaskets.



3.2 Basic Case

- Advanced EMC shielding is standard
- Dimensions according to IEC 60297
- Rapid assembly
- Top and bottom covers fully perforated
- Aluminium extrusions, electrically conductive
- Side plates, top and bottom covers of pre-galvanised sheet steel

- **Scope of delivery:**
  - 2 side panels
  - 2 front extrusions
  - 2 internal extrusions
  - 4 tapped strips (6 pcs. for 6 U Version)
  - 2 insulating strips (for backplane, insulated mounting only); 4 pcs. for 6 U Version
  - 2 top / bottom covers, perforated
  - Assembly material
  - EMC-gasket for front / side
  - 1 double extrusion (6 U Version only)
- Rear panel has to be ordererd separately



3.2.1 Magic-Kit 11 (IEC 60297)

Height U	Width HP	Backplane Mounting	Depth 240 mm/9.44"	300 mm/11.81"	390mm/ 15.35"
3 U	84	Insulated	11A131-6	11A132-6	11A133-6
3 U	84	Conductive	-	-	11A133-7
6 U	84	Insulated	-	11A162-6	-
6 U	84	Conductive	-	11A162-7	11A163-7

Other versions on request

3.2.2 Spirit-Kit 11 (IEEE 1101.10 and CompactPCI)

Height U	Width HP	Backplane Mounting	Depth 240 mm/9.44"	300 mm/11.81"	390mm/ 15.35"
3 U	84	Insulated	11B131-6	-	-
3 U	84	Conductive	11B131-7	11B132-7	-
6 U	84	Insulated	11B161-6	-	-
6 U	84	Conductive	-	-	-

Other versions on request

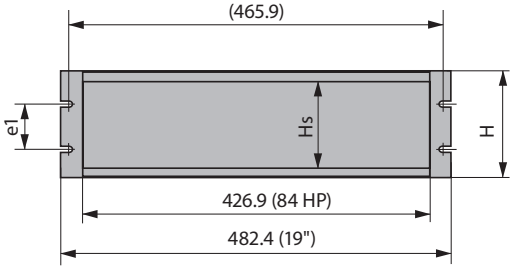
3.2.3 Rear Panel

- Galvanized sheet steel
- **Scope of delivery:**
  - 1 rear panel
- Assembly material included in case

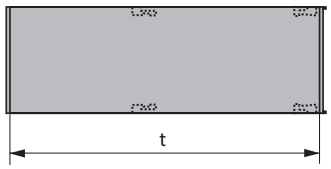
Height	Description	Part-No.
3 U	Rear panel	22-384
6 U	Rear panel	22-684

3.2.4 Line Drawings

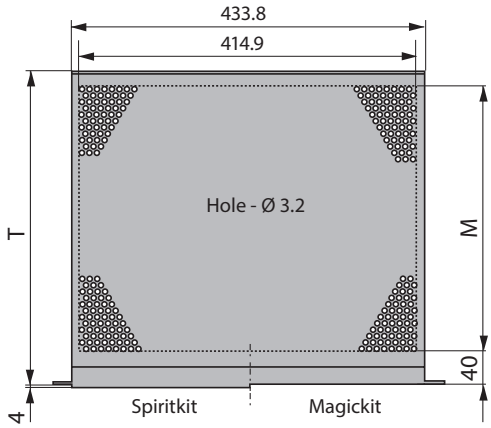
Front view



Side view



Top view



Heights

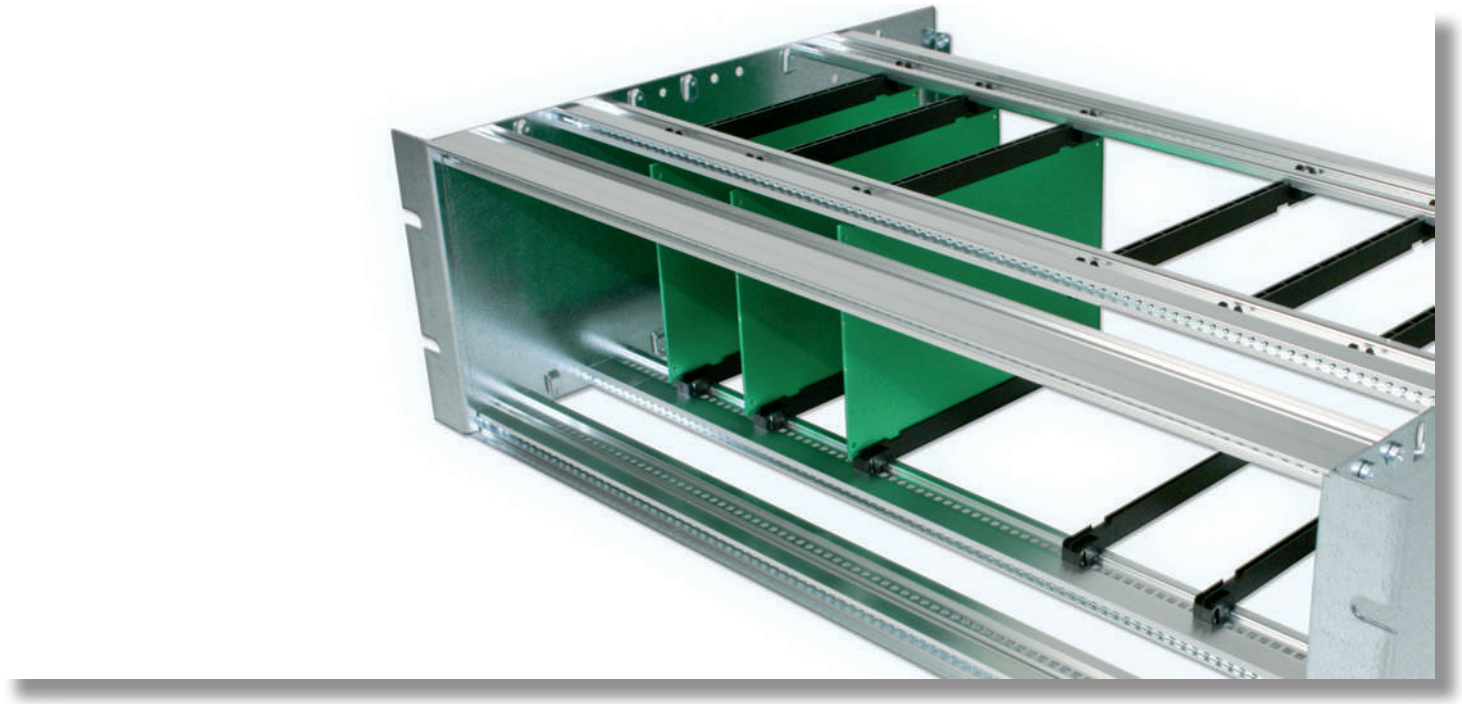
for	H		Hs		e1	
	mm	inch	mm	inch	mm	inch
3 U	132.50	5.21	112.50	4.42	57.20	2.25
6 U	265.85	10.46	245.85	9.67	190.55	7.50

Depths

T		t	
mm	inch	mm	inch
240	9.44	232.6	9.15
300	11.81	292.6	11.51
390	15.35	382.6	15.06

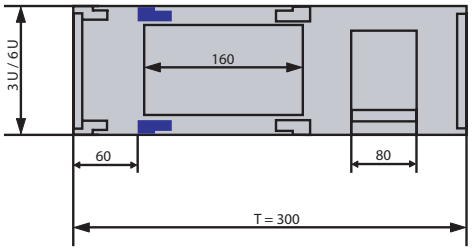
Air flow

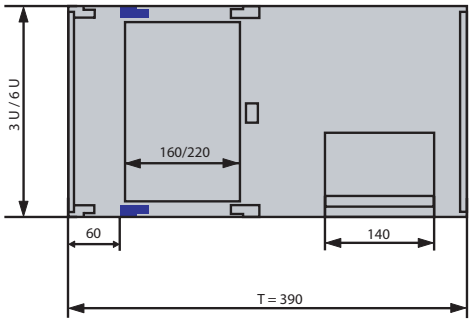
Depth		M		Air flow	
mm	inch	mm	inch	mm^2	sq. inch
240	9.44	186.8	7.35	28953	44.87
300	11.81	244.0	9.60	37638	58.33
390	15.35	333.2	13.11	52115	80.77



3.3 Adaptation Kit

3.3.1 Adaptation Kit





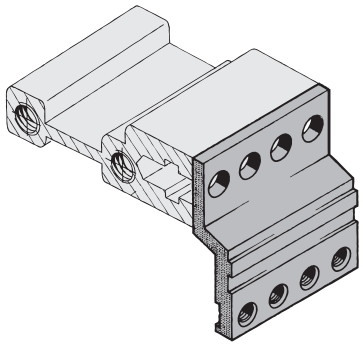
3.3.1 Adaptation Kit

- **Range of Application:**
  - Recessed mounting of single / double eurocards, depth 160 – 220 mm
  - Without individual front panels
- **Scope of delivery:**
  - 2 internal extrusions
  - 2 tapped strips
  - 1 set assembly material

Description	84 HP
Recessed mounting of single / double eurocards without front panels	11-530

3.3.2 Edge Connector Extrusion 66-147

- For use with extrusions for backplanes 66-193
- **Scope of delivery:**
  - 1 aluminium extrusion, clear passivated (conductive)

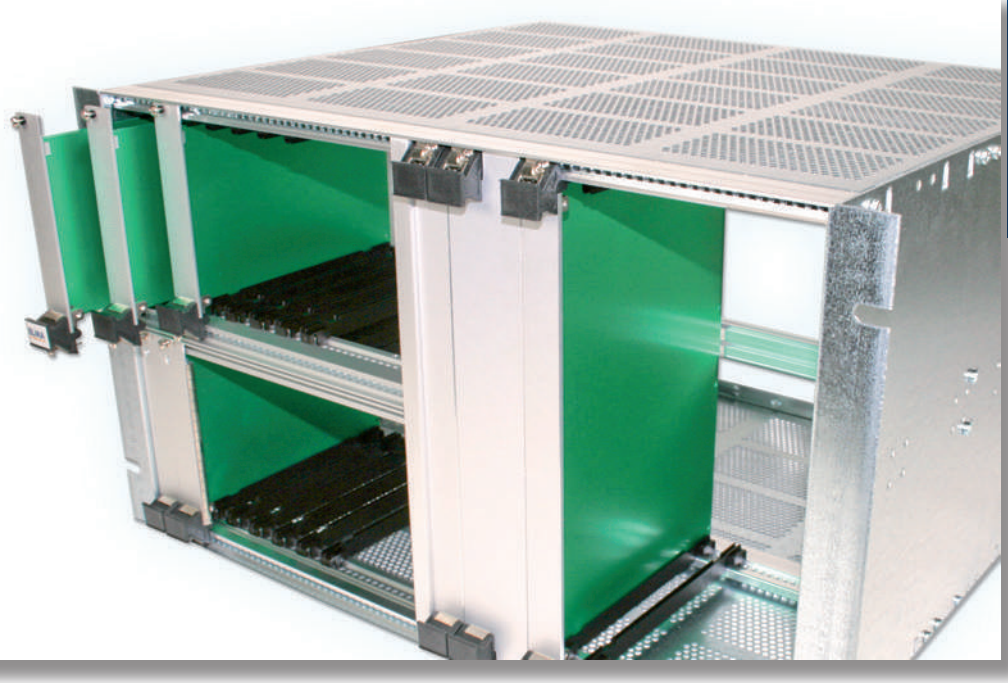


3.3.6 Edge Connector Extrusion

Description	8 HP	18 HP	28 HP	42 HP	63 HP	84 HP
For edge connector, IEC 60603-2	66-147-40	66-147-41	66-147-42	66-147-63	66-147-65	66-147-52

Assembly Material

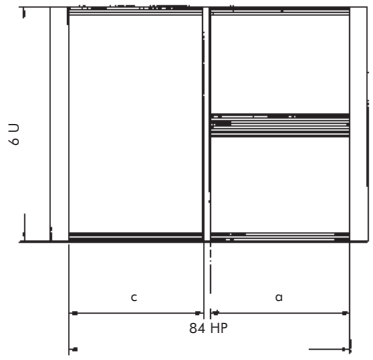
Description	Part-No.
Assembly material M2.5 (for 2 supplementary extrusions)	63-214



3.4 Assembly Accessories

3.4.1 Front Sub Division Vertical for 6 U System or 6 U Assembly

- Allows both single and double eurocards to be mounted together in a 6 U Magic-/Sprit-Kit 11
- **Scope of delivery:**
  - 1 divider extrusion front
  - 1 divider extrusion rear
  - 2 front extrusions
  - 2 internal extrusions
  - 1 assembly material
- Tapped strips for front extrusion see below
- Card guides see 3.5.1





3.4.1 Front Sub Division Vertical for 6 U Assembly

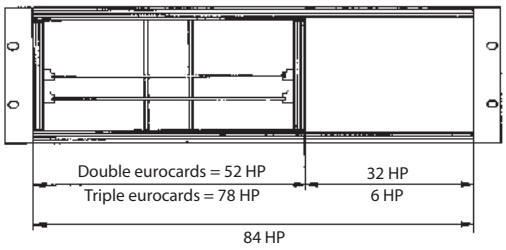
Nominal Width		Part-No.
6 U (c)	2 x 3 U (a)	IEC 60297
50 HP	32 HP	11-959-2

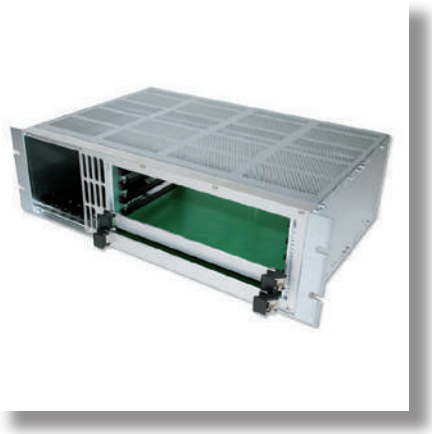
Tapped Strips for Front Extrusion

Scope of Delivery	Description	Part-No.
1 pc. tapped strip	M2,5 32 HP = 162.56 mm	61-463

3.4.2 Horizontal Card Mounting Kit for Double Eurocards (6 U)

- For double eurocards (6 U)
- Independent of card depth
- **Scope of delivery:**
  - 4 distance plates (2 front / 2 rear)
  - 4 length extrusions (2 front / 2 rear)
  - 1 centre extrusion
  - 6 tapped strips M2.5
  - 1 set assembly material
- Top and bottom cover plate when no overall fan front panel (3.4.4) is used
- Top and bottom cover plate has to be ordered separately
- Fan front panels for horizontal mounting kits see 3.4.4
- Card guides see 3.5.1
- Extruded front panels see 3.6.5





3.4.3 Horizontal Card Mounting Kit

Mounting height	Usable height	IEC 60603-2	Backplane	Cover plate top*	Cover plate bottom*
3 U	20 HP	14-971-30	14-971-60	21N602-90	21N602-90

* Assembly material for cover plate see below

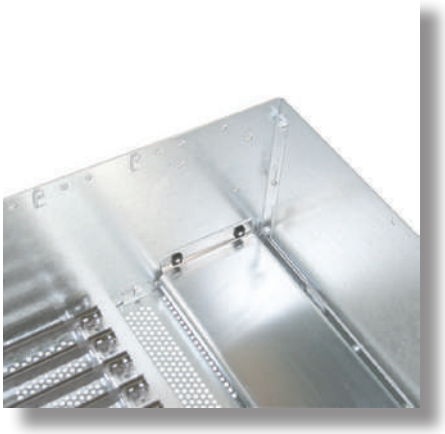
3.4.3.1 Front Panel Screws

- For cover panel
- Set of 10 screws
- With screw retainer

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3 , size T8, with plastic screw retainer	63K159
Rounded head screws recessed M2.5 x 11.3, with plastic screw retainer	63-159

3.4.4 Mounting Chassis

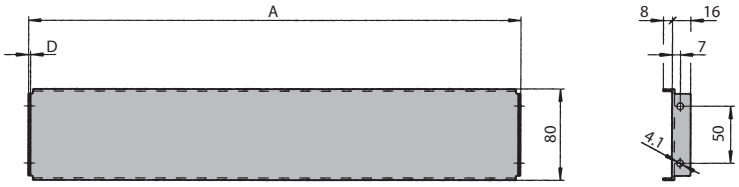
- For mounting non-standard modules and components
- Mounting chassis is fixed directly to the side panel
- **Scope of delivery:**
  - 1 mounting chassis
  - 1 set of assembly material (4 earthing nuts, 4 screws M4 x 6)



3.4.4.1 For Mounting of Power Supplies, etc.

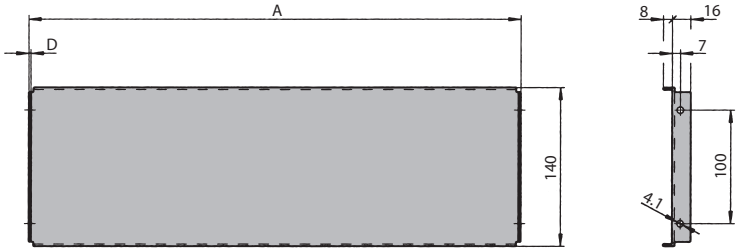
Chassis depth 80 mm

Frame Width	A		D		Part-No.
	mm	inch	mm	inch	
84 HP	431.5	16.98	2	0.08	14-832-50



Chassis depth 140 mm

Frame Width	A		D		Part-No.
	mm	inch	mm	inch	
84 HP	431.5	16.98	2.0	0.08	14-836-50



3.4.5 EMC Contact Strips (Advanced EMC-level)

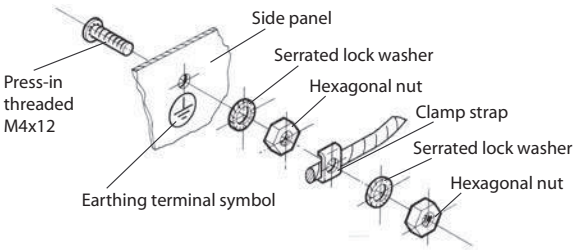
- 2 contact strips
- For front panels, fixing on extrusion
- Self-adhesive



For HP	Length	Part-No.
84	424.2 mm	63-836-70

3.4.6 Earthing Set

- Enables cases to be earthed in conformance with EN / VDE / SEV
- **Scope of delivery:**
  - 1 press-in threaded bolt M4
  - 2 serrated lock washers
  - 2 hexagonal nuts M4
  - 1 terminal clamp
  - 1 earthing symbol





3.4.7 Earthing Set

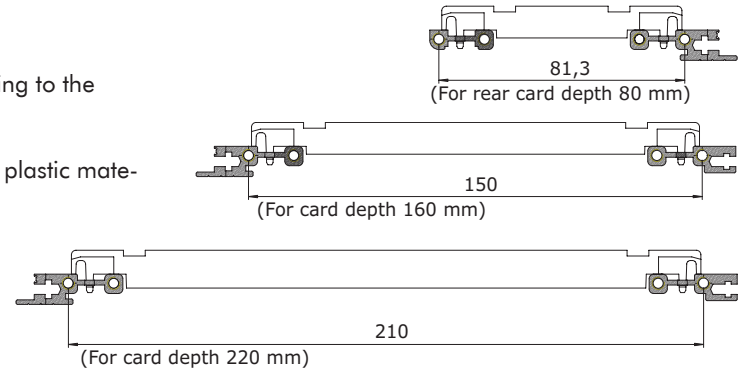
Description	Part-No.
Earthing set according to EN VDE / SEV	63-174



3.5 General Accessories

3.5.1 Card Guides Standard acc. to IEC

- For positive location of circuit boards and plug-in units conforming to the dimensions of card depths 80 mm, 160 mm, 220 mm and 280 mm
- The card guides are non-flammable, made from a high quality plastic material reinforced with fibreglass (UL94 V-0)
- Including ESD provisions



3.5.1.1 Card Guides 1-Slot



3.5.1.1 Card Guides 1-Slot

- **Scope of delivery:**
  - Card guide black plastic UL94 V-0
- ESD Clip see below (not usable for card depth 80 mm)

Card Thickness		Card Depth		Part-No.
mm	inch	mm	inch	
1.6	0.06	80	3.15	61-019
		160	6.30	61-044
		220	8.66	61-039
		280	11.02	61-017
2.0	0.08	160	6.30	61-087
		220	8.66	61-039
		280	11.02	61-169



ESD Clips

- Connecting PCB with case

Description	Part-No.
ESD clip front bottom/rear top	61-419-01
ESD clip front top/rear bottom	61-419-02



3.5.1.2 Card Guides 7-Slot in 4 HP Steps, IEC

- For reduced assembly time of multiple slot applications
- For use with single, double and triple eurocards with a depth of 160 mm
- For card thickness: 1.6 mm / 0.06"
- Black plastic, UL94 V-0
- ESD Clip not usable

Card Thickness		Card Depth		Part-No.
mm	inch	mm	inch	
1.6	0.06	160	6.30	61-076



3.5.1.3 Aluminium Card Guides 1-Slot, 3 Parts, IEC

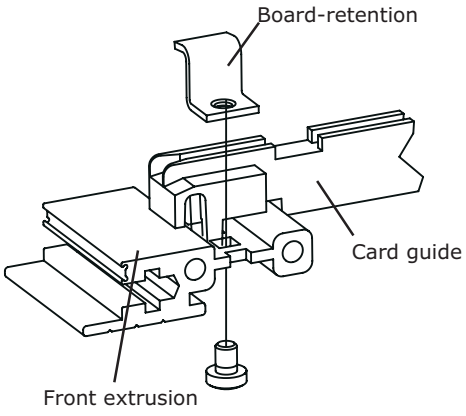
- Extrusion: Aluminium
- End feet: plastic, UL94 HB
- For card thickness: 1.6 mm / 0.06"
- Card guide extrusion, aluminium, clear anodised
- ESD clip not usable

Extrusion

Card Depth		Length		Part-No. Aluminium
mm	inch	mm	inch	
160	6.30	112.5	4.43	66-122-20
220	8.66	172.5	6.79	66-122-21
280	11.02	232.5	9.15	66-122-22
340	13.38	292.5	11.51	66-122-23
400	15.74	352.5	13.87	66-122-24
-	-	1350	53.15	66-122-14

End Feet

Description	Part-No. 1 Pair
End feet plastic, UL94 HB	61-069

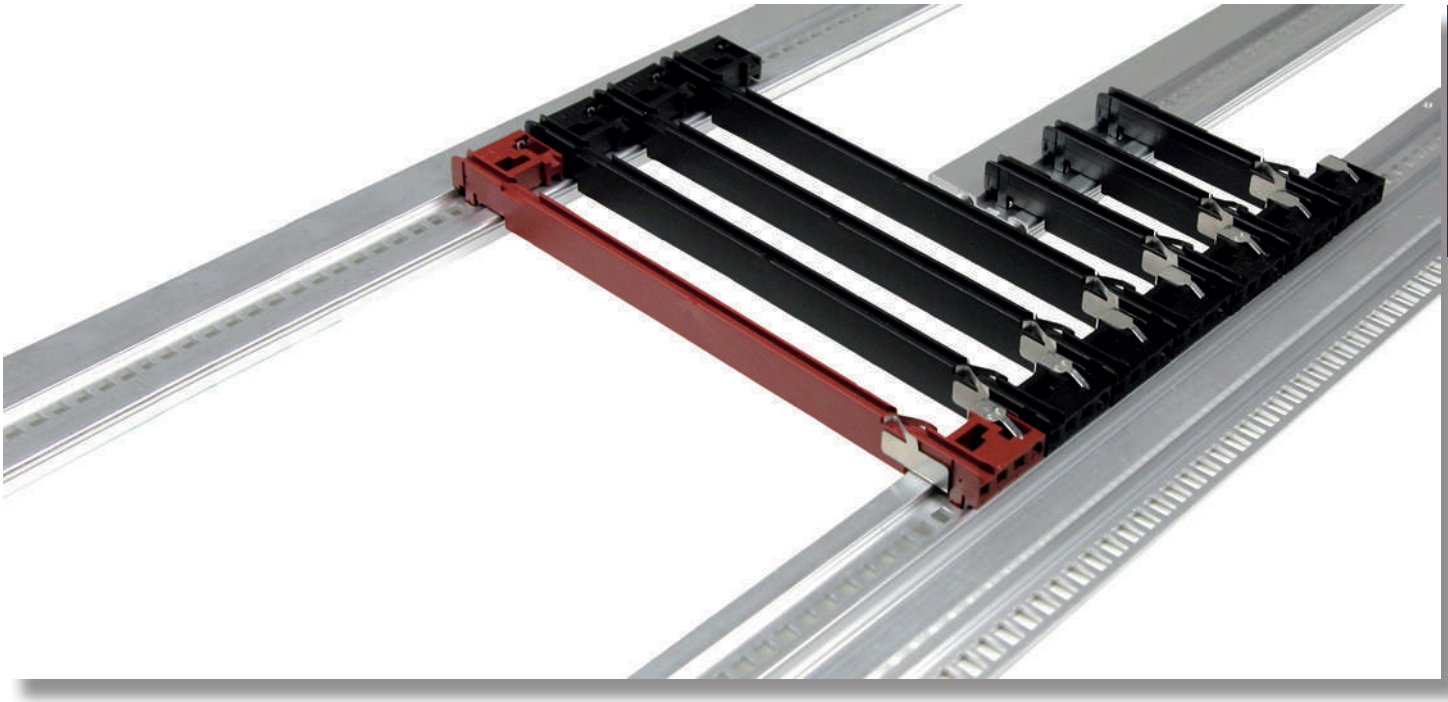


3.5.1.4 Card Guide Board-Retention Bar

Description	Part-No. 20 pcs.
Board-retention bar, zinc-plated steel	61-291

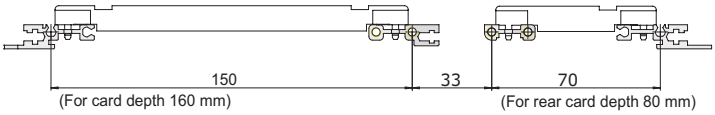
Assembly Material

Description	Part-No.
Cross recessed round head screw M3 x 4	5331-04
Torx cylinder head screw M3 x 4, size T10	5470-01



3.5.2 Card Guides acc. to IEEE

- For positive location of PCBs and plug-in units conforming to the dimensions of card depths 80 mm, 160 mm, 220 mm, 280 mm and 340 mm
- The card guides are non-flammable, made from a high quality plastic material reinforced with fibreglass UL94 V-0
- With ESD provisions
- With keying and alignment pin possibilities





3.5.2.1 Card Guides 1-Slot, IEEE

- Card thickness 1.6 mm / 0.06" and 2.0 mm / 0.08"
- Plastic UL94 V-0

Card Depth mm	Card Depth inch	Colour	Part-No. 1 Pair
80	3.15	black	61-949-01

Card Depth mm	Card Depth inch	Colour	Part-No. 1 pc.
160	6.30	black	61-950-01
160	6.30	red	61-950-03

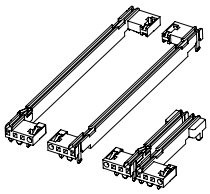


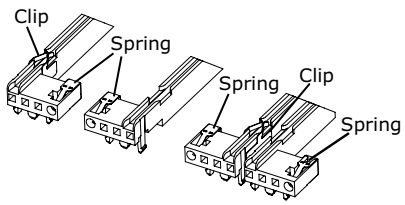
3.5.2.2 Card Guides 1-Slot, incl. mounted ESD-Components, IEEE

- Bottom: 1 ESD clip and 1 ESD spring
- Top: 1 ESD spring
- Black plastic UL94 V-0

Card Depth mm	Card Depth inch	Description	Part-No. 1 Pair
80	3.15	1 pair top/ bottom	61-949-02

Card Depth mm	Card Depth inch	Description	Part-No. 1 pc.
160	6.30	1 piece bottom	61-950-02
160	6.30	1 piece top	61-950-04







3.5.2.3.1 Aluminium Card Guides 1-Slot, 3 Parts, IEEE

- Extrusion: Aluminium
- End feet: Plastic UL94 V-0
- For card thickness 1.6 mm / 0.06" and 2.0 mm / 0.08"

Extrusion

Card Depth mm	Card Depth inch	Part-No. 1 pc.
160	6.30	66-452-20
220	8.66	66-452-25
280	11.02	66-452-30
340	13.38	66-452-35

End Feet

Colour	Part-No. 1 Pair
Black	61-955-01
Red	61-955-03

End Feet Offset

Colour	Part-No. 1 Pair
Pearlwhite	61-961-01



3.5.2.3.2 Aluminium Card Guides 1-Slot, 3 Parts, IEEE

- Extrusion: Aluminium
- End feet: Plastic UL94 V-0
- For card thickness 2.4 mm / 0.094"

Extrusion

Card Depth mm	Card Depth inch	Part-No. 1 pc.
160	6.30	66-453-20
220	8.66	66-453-25
280	11.02	66-453-30
340	13.38	66-453-35

End Feet

Colour	Part-No. 1 Pair
Black	61-956-01



3.5.2.4 ESD Clips

- Connecting PCB with case

Description	Part-No.
ESD clip front bottom/rear top	61-419-01
ESD clip front top/rear bottom	61-419-02



3.5.2.5 ESD Spring

- Connecting ESD pin with case
- BeCu tinned
- Note: Notch inward-looking

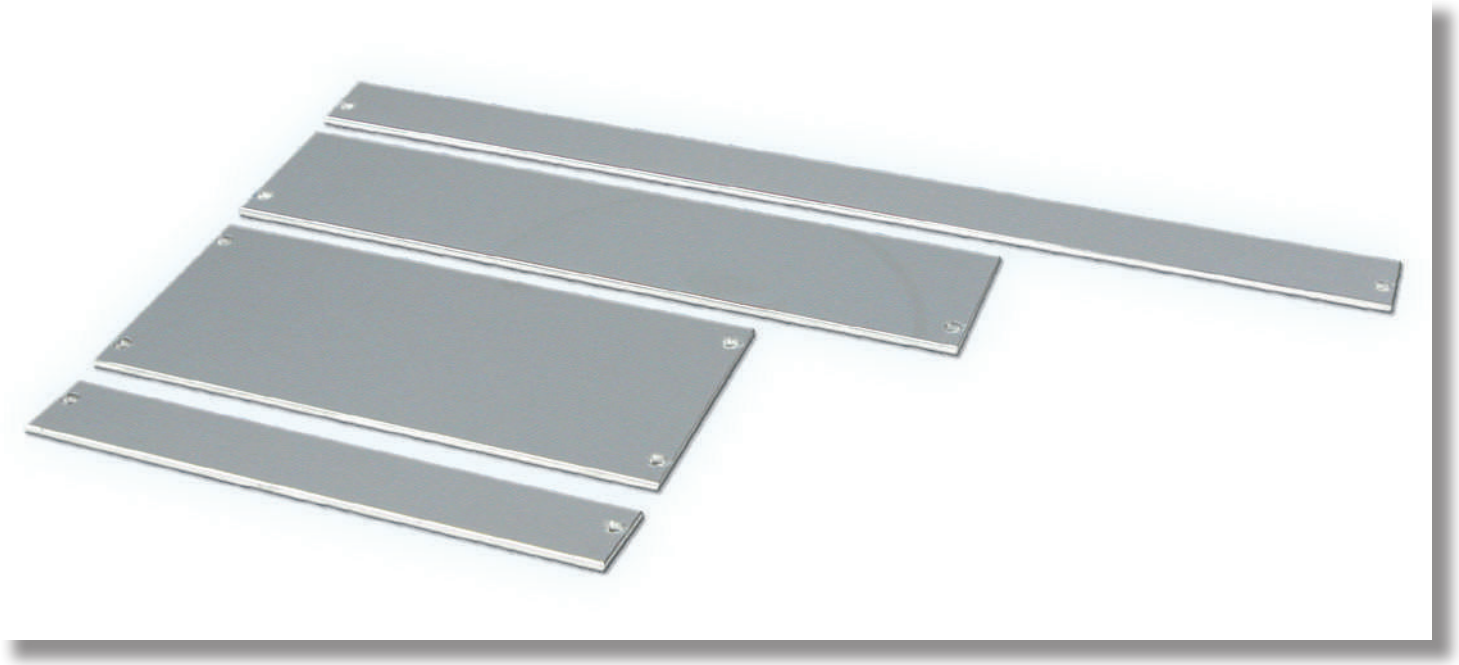
Description	Part-No. 1
ESD spring	61-420



3.5.2.6 Coding Pins

- Acc. to IEC 60297-3-103
- Plastic, UL94 V-0
- Can be rotated in 4 positions

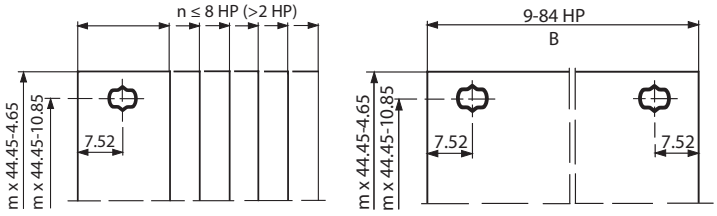
Description	Part-No.
Grey	81-054-02
Dark red	81-054-06
Black	81-054-04



3.6 Front Panels

3.6.1 Flat Front Panels

- For sub racks and enclosures, solid
- Aluminium 2.5 mm, clear anodised (non-conductive)
- **Scope of delivery:**
  - Flat front panel
- Front panel screws, see below
- 2 HP screw retainer can not be fitted



3.6.1 Flat Front Panels for Sub Racks and Enclosures, Solid

Width	B		Part-No.	
	mm	inch	3 U 128.7mm	6 U 262.0mm
2 HP	10.0	0.39	21N302	21N602
3 HP	15.2	0.59	21N303	21N603
4 HP	20.1	0.79	21N304	21N604
5 HP	25.2	0.99	21N305	21N605
6 HP	30.3	1.19	21N306	21N606
7 HP	35.3	1.38	21N307	21N607
8 HP	40.4	1.59	21N308	21N608
10 HP	50.6	1.99	21N310	21N610
11 HP	55.7	2.19	21N311	-
12 HP	60.7	2.38	21N312	21N612
14 HP	70.9	2.79	21N314	21N614
16 HP	81.1	3.19	21N316	21N616
20 HP	101.4	3.59	21N320	21N620
21 HP	106.5	4.19	21N321	21N621
28 HP	142.0	5.59	21N328	21N628
32 HP	162.3	6.38	21N332	-
42 HP	213.1	8.38	21N342	21N642
52 HP	263.9	10.38	21N352	21N652
63 HP	319.8	12.59	21N363	21N663
81 HP	411.3	16.19	21N381	21N681
84 HP	426.5	16.79	21N384	21N684

- Other front panels see chapter C

2.5.4.1 Front Panel Screws

- Set of 10 screws, with screw retainer

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3, size T8 with plastic screw retainer	63K159
Rounded head screws recessed M2.5 x 11.3 with plastic screw retainer	63-159

3.6.2 EMC Flat Front Panels

3.6.2.1 EMC Filler Panel with EMC Gasket

- High stability (U-profile)
- Extruded aluminium
- Pressed-in centring pin and bushes M2.5
- Front side clear anodised, rear side conductive
- **Scope of delivery:**
  - EMC front panel incl. pressed-in centering pin and bushes M2.5
- EMC-gasket see below
- Front panel screw see below



3.6.2.1 EMC Front Panel

Width	Part-No. 3 U	Part-No. 6 U
4 HP	66-514-73	66-514-76
5 HP	66-515-73	66-515-76
6 HP	66-516-73	66-516-76
8 HP	66-518-73	66-518-76
9 HP	66-519-73	66-519-76
10 HP	66-520-73	66-520-76
12 HP	66-522-73	66-522-76
14 HP	66-534-73	66-534-76

EMC Gasket (Stainless Steel)

Height	Part-No.
3 U	81-062-03
6 U	81-062-06

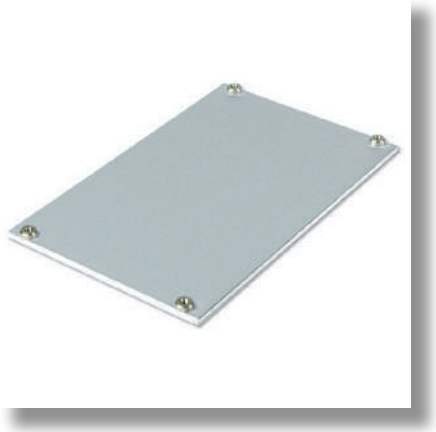
Front Panel Screws

- Front panel width up to 8 HP = 2 screws; ≥ 9 HP = 4 screws

Description	Part-No.
Torx screw, M2.5 x 11.3, size T8	5443-08
Rounded head screw, cross recessed M2.5 x 12.7	61-287

3.6.2.2 EMC Filler Panel without EMC-Gasket

- Front panel standard, solid
- Front clear anodised
- Rear conductive
- Basic level EMC
- **Scope of delivery:**
  - 1 front panel incl. press-fit bushes M2.5 (pressed-in)
- Front panel screws, see below
- Spacer see next page



3.6.2.2 EMC Filler Panel without Gasket

Width	Part-No. 3 U	Part-No. 6 U
4 HP	21B304	-
10 HP	21B310	-
12 HP	21B312	-
16 HP	21B316	-
21 HP	21B321	-
42 HP	21B342	21B642
63 HP	21B363	-
84 HP	21B384	21B684

Front Panel Screws

- Front panel width up to 9 HP = 2 screws; ≥ 10 HP = 4 screws

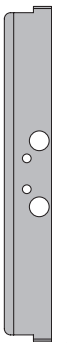
Description	Part-No.
Torx screw, M2.5 x 11.3, size T8	5443-08
Rounded head screw, cross recessed M2.5 x 12.7	61-287



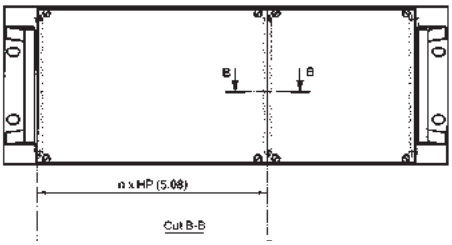
Spacer for EMC Front Panel Flat

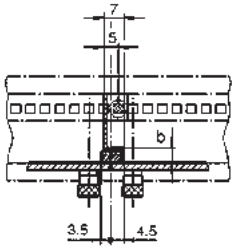
- EMC-Level: Advanced
- **Scope of delivery:**
  - 1 spacer incl. gasket
  - 2 Torx sheet metal screws 2.9 x 6.5; size T 10

Height	Part-No.
3 U	81K023



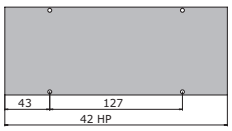
Holes in some cases needed for mounting telescopic rails

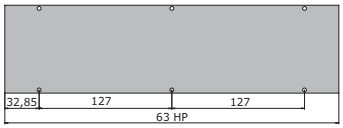


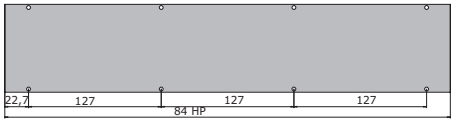


3.6.2.3 EMC Flat Front Panels

- Aluminium 2.5 mm (conductive)
- Closes the front or rear of the sub rack with very high shielding effectiveness
- Contact between the flat front panel and the case is made via EMC gaskets







3.6.2.3 Advanced EMC Level

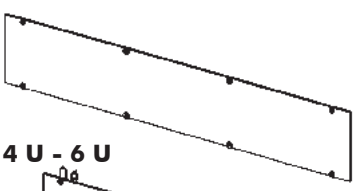
- **Scope of delivery:**
  - EMC flat front panel
  - Contact angle, incl. screws (6 U version only)
  - EMC gasket for contact angle (6 U version only)
- Front panel screws see below
  - Front panel width 42 HP = 4 screws
  - Front panel width 63 HP = 6 screws
  - Front panel width 84 HP = 8 screws

Width	Part-No. 3 U	Part-No. 6 U
42 HP	21C342	-
63 HP	21C363	-
84 HP	21C384	21C684

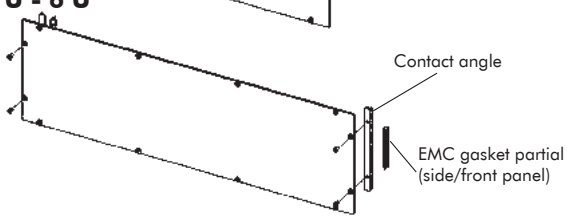
Front Panel Screws

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3, size T8, with press-fit bush	63K480
Screw recessed M2.5 x 11.3, with press-fit bush	63-444
Screw cross recessed M2.5 x 12.7, with press-fit bush	63-480

1 U - 3 U



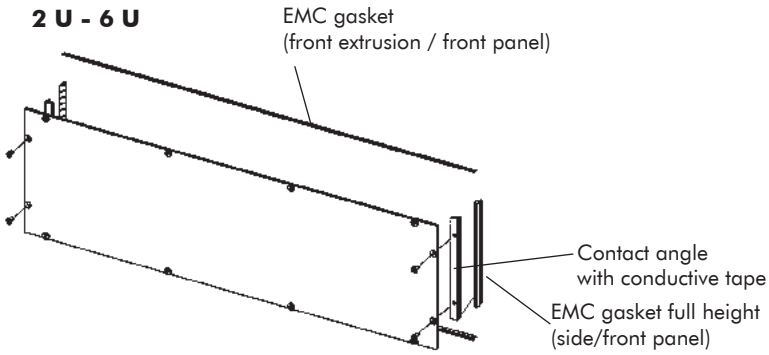
4 U - 6 U



3.6.2.4 Superior EMC Level

- **Scope of delivery:**
  - EMC flat front panel
  - Contact angle, incl. screws
  - EMC gasket for contact angle
  - EMC gasket for front extrusion/front panel
- Front panel screws, see below
  - Front panel width 42 HP = 4 screws
  - Front panel width 63 HP = 6 screws
  - Front panel width 84 HP = 8 screws

2 U - 6 U



Width	Part-No. 3 U	Part-No. 6 U
42 HP	21D342	
84 HP	21D384	21D684

Front Panel Screws

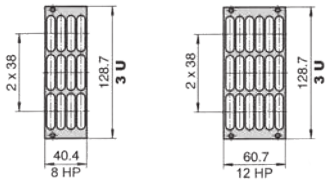
Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3, size T8, with press-fit bush	63K480
Screw recessed M2.5 x 11.3, with press-fit bush	63-444
Screw cross recessed M2.5 x 12.7, with press-fit bush	63-480

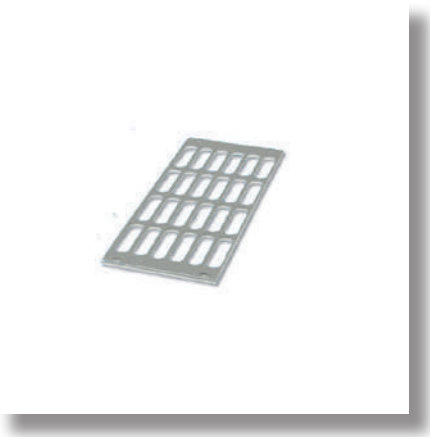


3.6.3 Fan Front Panels

3.6.3.1 Fan Front Panel for Horizontal Ventilation

- Aluminium 2.5 mm, clear anodised (non-conductive)
- **Scope of delivery:**
  - 1 perforated fan front panel
- Front panel screws see below





2.5.5 Fan Front Panel for Horizontal Ventilation

Height	Width	Air passage		Part-No.
		mm^2	sq. inch	
3 U	8 HP	3195	4.95	21N308-01
	12 HP	4793	7.42	21N312-01

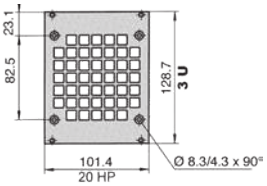
2.5.5.1 Front Panel Screws

- Set of 10 screws
- With screw retainer
- Fan front panel width up to 8 HP = 2 screws; ≥ 12 HP = 4 screws

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3, size T8 with plastic screw retainer	63K159
Rounded head screws recessed M2.5 x 11.3 with plastic screw retainer	63-159

3.6.3.2 Fan Front Panels for Direct Fan Mounting

- Aluminium 2.5 mm, clear anodised (non-conductive)
- **Scope of delivery:**
  - 1 perforated fan front panel
- Front panel screws see below
- Assembly material for fan mounting has to be ordered separately





3.6.3.2 Fan Front Panels for Direct Fan Mounting

Description	Height	Width	Air passage		Part-No.
			mm^2	sq. inch	
Without switch opening	3 U	20 HP	4051	6.27	21N320-04

2.5.6.1 Front Panel Screws

- Set of 10 screws
- With screw retainer
- Per front panel 4 screws are needed

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3, size T8 with plastic screw retainer	63K159
Rounded head screws recessed M2.5 x 11.3 with plastic screw retainer	63-159

2.5.6.2 Assembly Material for Fan Mounting

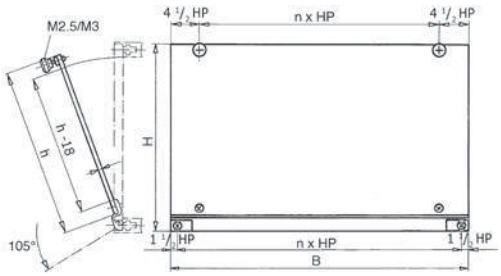
Description	Part-No.
Countersunk screw, cross recessed M4 x 10	5342-10
Hexagonal nut M4, 0.8D	5620-51



3.6.4 Hinged Front Panels

3.6.4.1 Top/Bottom-Hinged Front Panel

- Hinges are attached to the front extrusions of the sub rack or case
- Aluminium 2.5 mm, clear anodised (non-conductive)
- **Scope of delivery:**
  - Front panel
  - Hinge extrusion
  - Assembly material M2.5, incl. hinges





3.6.4.1 Top/Bottom-Hinged Front Panel

Width	Part-No. 3 U	Part-No. 6 U
84 HP	25N384-19	25N684-19

Dimensions

Nominal Width			Width B	
HP	mm	inch	mm	inch
84 HP	426.72	16.80	426.5	16.79

Nominal Height	Height H		Height h	
U	mm	inch	mm	inch
3 U	128.7	5.07	117	4.61
6 U	262.05	10.31	250.3	9.85

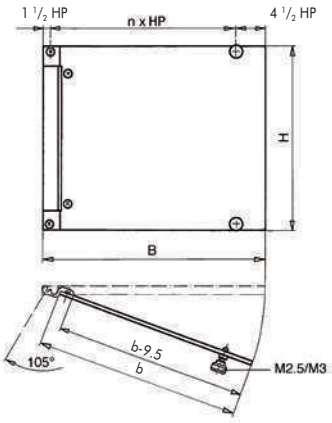
3.6.4.2 EMC Top / Bottom-Hinged Front Panel

- Width: 84 HP
- Offers optimum protection from electromagnetic interference
- Aluminium 2.5 mm, front anodised, rear conductive
- **Scope of delivery:**
  - EMC front panel
  - Hinge extrusions
  - Assembly material M2.5, incl. hinges
  - EMC gaskets



3.6.4.2 EMC Top / Bottom-Hinged Front Panel

EMC Level	Part-No. 3 U	Part-No. 6 U
Advanced	25C384-11	-
Superior	-	25D684-11



3.6.4.3 Side-Hinged Front Panel

- Aluminium 2.5 mm, clear anodised (non-conductive)
- **Scope of delivery:**
  - Front panel
  - Hinge extrusion
  - Assembly material M2.5, incl. hinges



3.6.4.3 Side-Hinged Front Panel

Width	Part-No. 3 U	Part-No. 6 U
84 HP	25N384-29	25N684-29

Other widths and heights available on request

Dimensions

Nominal Width			Width B		Width b	
HP	mm	inch	mm	inch	mm	inch
84 HP	426.72	16.80	426.5	16.79	414.3	16.31

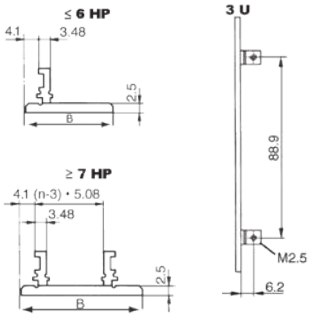
Nominal Height	Height H	
U	mm	inch
3 U	128.7	5.06
6 U	262.05	10.31



3.6.5 Plug-In Units acc. to IEC

3.6.5.1 Extruded Front Panel

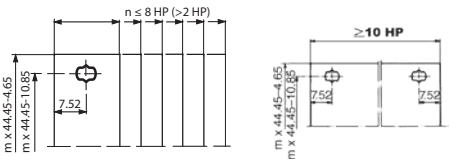
- Aluminium 2.5 mm, clear anodised (non-conductive)
- PCB mounting lugs are formed on the rear face of the panel
- No PCB fixing screws on the front face of the panel, leaving more space for silk screening and mounting front panel components
- Suitable for all sub racks and cases
- Thickness of the mounting lugs (3.48 mm) allows PCBs to be mounted on either side of the lugs
- Drill marks at rear for handle-fixing holes
- **Scope of delivery:**
  - Extruded front panel, clear anodised
- Front panel screws see below





3.6.5.1 Extruded Front Panels, without Openings

Width	B		Part-No. 3 U	Part-No. 6 U
	mm	inch		
3 HP	15.0	0.59	26N303	26N603
4 HP	20.1	0.79	26N304	26N604
5 HP	25.2	0.99	26N305	26N605
6 HP	30.3	1.19	26N306	26N606
7 HP	35.3	1.38	26N307	26N607
8 HP	40.4	1.59	26N308	26N608
10 HP	50.6	1.99	26N310	26N610
12 HP	60.7	2.38	26N312	26N612
14 HP	70.9	2.79	26N314	-
16 HP	81.1	3.19	26N316	26N616
21 HP	106.5	4.19	26N321	-



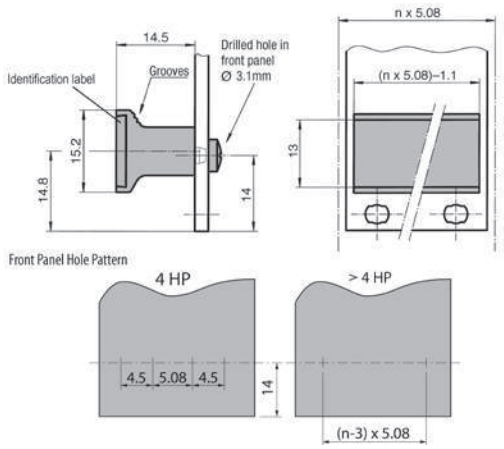
Front Panel Screws

- Set of 10 screws
- With screw retainer
- Front panel width up to 9 HP = 2 screws; ≥ 10 HP = 4 screws

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3 , size T8, with plastic screw retainer	63K159
Rounded head screws recessed M2.5 x 11.3, with plastic screw retainer	63-159

3.6.5.2 Rigid-Mounted Unit Handles with Identification Label

- Black, plastic UL94 V-0, label aluminium anodised
- **Scope of delivery:**
  - Rigid-mounted handle
  - Identification label
- Assembly material see below





Rigid-Mounted Handle with Identification Label

Width	Scope of Delivery	Part-No.
4 HP	10 pcs.	60-200-04
5 HP	10 pcs.	60-200-05
6 HP	10 pcs.	60-200-06
7 HP	10 pcs.	60-200-07
8 HP	10 pcs.	60-200-08
10 HP	10 pcs.	60-200-10
12 HP	10 pcs.	60-200-12
14 HP	1 pc.	60-200-14

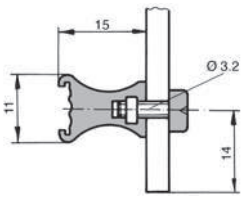
- Other sizes (up to 84 HP) are available upon request

Assembly Material

Description	Part-No.
Cross recessed round head screw	61-276

3.6.5.3 Fluted Handles

- Extruded aluminium handles, shaped to facilitate withdrawal of plug-in units
- Two grooves in the front face will accept identification strips (0.5 x 9 mm)
- **Scope of delivery:**
  - Extruded handle, clear anodised
  - Assembly material



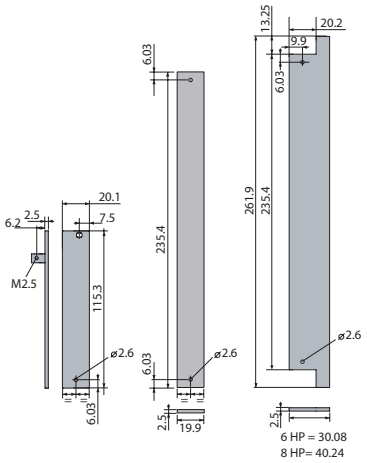


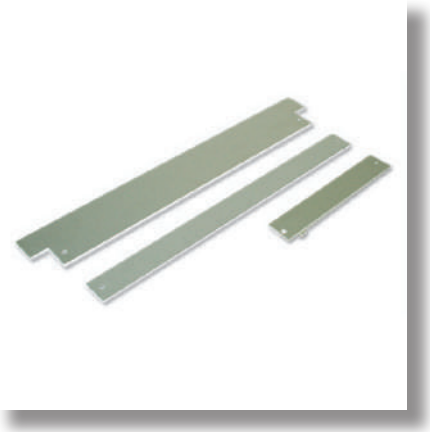
Fluted Handles for Front Panels to IEC

Front Panel Width			Handle Length		Part-No.
	mm	inch	mm	inch	
3 HP	15.0	0.59	12.5	0.49	60-103
4 HP	20.1	0.79	17.6	0.69	60-104
5 HP	25.2	0.99	22.6	0.88	60-105
6 HP	30.3	1.19	27.7	1.09	60-106
7 HP	35.3	1.38	33.5	1.31	60-107
8 HP	40.4	1.59	37.9	1.49	60-108
10 HP	50.6	1.99	48.0	1.88	60-110
12 HP	60.8	2.39	58.2	2.29	60-112
14 HP	70.9	2.79	69.1	2.72	60-114
16 HP	81.1	3.19	78.5	3.09	60-116
21 HP	106.5	4.18	104.6	4.11	60-121
30 HP	152.2	5.99	149.6	5.88	60-130
40 HP	203.0	7.99	200.4	7.88	60-140
60 HP	304.6	11.99	302.0	11.88	60-160
84 HP	426.5	16.79	424.0	16.69	60-184

3.6.5.4 Front Panel with Cutouts for IEC Ejector Handles

- Aluminium 2.5 mm, clear anodised (non-conductive)
- PCB mounting lugs are formed on the rear face of the panel (3 U-Version only)
- No PCB fixing screws on the front face of the panel, leaving more space for silk screening and mounting front panel components
- Suitable for all sub racks and cases
- 3 U front panels prepared for one handle
- 6 U front panels prepared for two handels
- **Scope of delivery:**
  - Front panel, clear anodised
- Front panel screws see below (for 3 U-Version only)
- IEC ejector handles, see 3.6.5.5





3.6.5.4 Front Panel with Cutout for IEC Ejector Handle

Width	B		Part-No. 3 U	Part-No. 6 U
	mm	inch		
4 HP	20.0	0.79	26N304-51	21N604-51
6 HP	30.2	1.19		21N606-51
8 HP	40.3	1.59		21N608-51

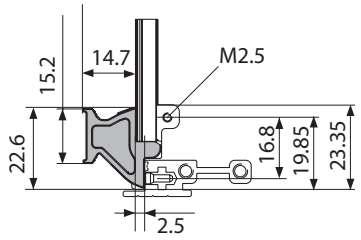
Front Panel Screws (for 3 U-Version only)

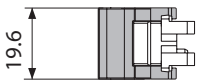
- Set of 10 screws
- With screw retainer
- Front panel 3 U = 1 screw

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3, size T8, with plastic screw retainer	63K159
Rounded head screws recessed M2.5 x 11.3, with plastic screw retainer	63-159

3.6.5.5 Ergonomic Ejector Handles acc. to IEC

- Simple assembly of plug-in units
- Allows trouble-free extraction of electronic units with multi-pole connectors
- Main features in one part: card holder, ejector handle and centring pin
- Reset spring for safe insertion
- One version for top and bottom only
- Handle is injection moulded, glass-reinforced plastic, UL94 V-0
- Card holder is zinc die-cast, nickel plated
- Reset spring is stainless steel
- **Scope of delivery:**
  - Ejector handle
  - Assembly material (cross recessed screws M2.5 for fixing of card holder/printed board/front panel)
- Front panel with special cutouts have to be ordered separately





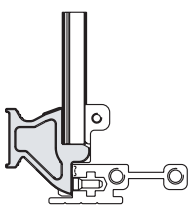


3.6.5.5 Ejector Handle acc. to IEC

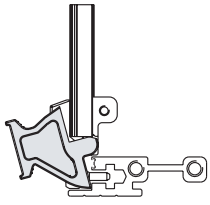
Description	Part-No.
Ejector handle black	81-233
Ejector handle grey	81-234

Extraction process:

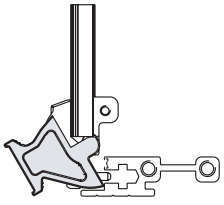
Rest position



Extraction

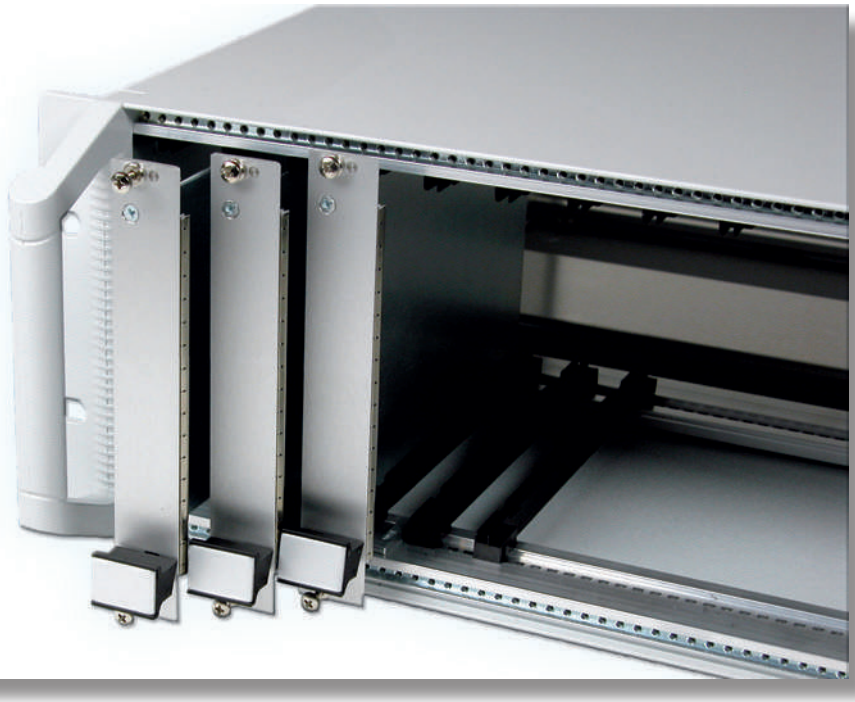


End position



Label

Description	Part-No.
1 sheet A4 of 220 labels	81-031



3.6.6 EMC Plug-In Units acc. to IEC

- Excellent EMC shielding
- Made of aluminium extrusions
- Rear side: conductive surface finish (clear passivated)
- Used in the assembly of plug-in units
- The EMC-gasket is integrated into the front panel profile to protect it from damage
- A pressfit centering pin guarantees optimum positioning of the panel as well as the right pressure between the contact strip and the next panel



3.6.6.1 EMC Filler Panel without Openings

- High stability
- Extruded aluminium
- Pressed-in centring pin and bushes M2.5
- Front side clear anodised, rear side conductive
- **Scope of delivery:**
  - EMC front panel, incl. pressed-in centering pin and bushes M2.5
- EMC-gasket see below
- Front panel screw see below
- Handles and card holders cannot be fitted with this type of front panel

Width	Part-No. 3 U	Part-No. 6 U
4 HP	66-514-73	66-514-76
6 HP	66-516-73	66-516-76
8 HP	66-518-73	66-518-76



EMC Gasket (Stainless Steel)

Height	Part-No.
3 U	81-062-03
6 U	81-062-06

Front Panel Screws

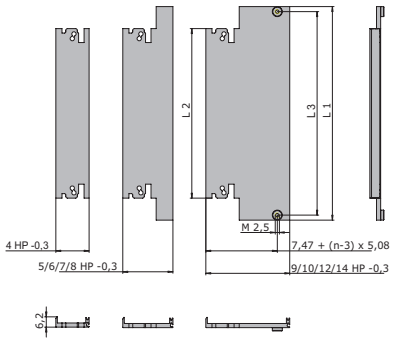
- Front panel width up to 8 HP = 2 screws

Description	Part-No.
Torx screw, M2.5 x 11.3, size T8	5443-08
Round head screw, cross recessed M2.5 x 12.7	61-287

Use Elma's font panel service for machining and screen printing of your panels!

3.6.6.2 EMC Front Panels for IEC Plug-In Units with Cutouts for Ejector Handles acc. to IEC

- EMC Front Panels Aluminium with EMC Gasket
- Excellent EMC shielding
- Immune to snagging
- EMC-gasket slides onto the extrusion
- **Scope of delivery:**
  - EMC front panel, incl. pressed-in bushes M2.5 (size ≥ 9 HP)
- EMC-gasket see below
- Handle has to be ordered separately, see 3.6.6.4
- Front panel screw (size ≥10 HP), see below





3.6.6.2 Front Anodised, Rear Conductive (2 cutouts)

- With 2 cutouts (bottom + top)

Width	Part-No. 3 U	Part-No. 6 U	Part-No. 9 U
4 HP	66-514-23	66-514-26	66-514-29
5 HP	66-515-23	66-515-26	-
6 HP	66-516-23	66-516-26	66-516-29
7 HP	66-517-23	66-517-26	-
8 HP	66-518-23	66-518-26	66-518-29
9 HP	66-519-23	66-519-26	-
10 HP	66-520-23	66-520-26	66-520-29
12 HP	66-522-23	66-522-26	-
14 HP	66-534-23	66-534-26	-

3.6.6.2.1 Front Anodised, Rear Conductive (1 cutout)

- With 1 cutout (bottom)
- Incl. pressed-in centring pin and bush M2.5 (top)
- Incl. cutout for mounting of card holder 61-156 (top) with screw 5322-08 (see 3.6.6.5)

Width	Part-No. 3 U
4 HP	66-514-43
5 HP	66-515-43
6 HP	66-516-43
8 HP	66-518-43
10 HP	66-520-43
12 HP	66-522-43
14 HP	66-534-43

Dimensions

Height	L1 mm	L1 inch	L2 mm	L2 inch	L3 mm	L3 inch
3 U	128.55	5.06	102.05	4.01	122.50	4.82
6 U	261.90	10.31	235.40	9.27	255.85	10.07
9 U	395.25	15.56	368.75	14.51	389.20	15.32



3.6.6.3 EMC-Gasket (Stainless Steel)

Unit	Part-No. 3 U	Part-No. 6 U	Part-No. 9 U
1 pc.	81-062-03	81-062-06	81-062-09

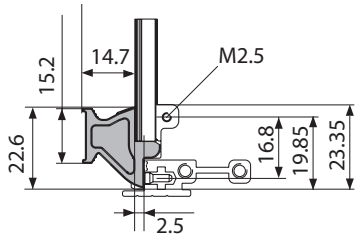
3.6.6.3.1 Front Panel Screw

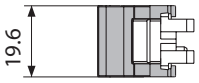
- For EMC front panels size ≥ 9 HP = 2 additional screws are needed

Description	Part-No.
Cross recessed round head screws M2.5 x 12.7	61-287
Torx screws M2.5 x 11.3, size T8	5443-08

3.6.6.4 Ergonomic Ejector Handles acc. to IEC

- Simple assembly of plug-in units
- Allows trouble-free extraction of electronic units with multi-pole connectors
- Main features in one part: card holder, ejector handle and centring pin
- Reset spring for safe insertion
- One version for top and bottom only
- Handle is injection moulded, glass-reinforced plastic, UL94 V-0
- Card holder is zinc die-cast, nickel plated
- Reset spring is stainless steel
- **Scope of delivery:**
  - Ejector handle
  - Assembly material (cross recessed screws M2.5 for fixing of card holder/printed board/front panel)
- Front panel with special cutouts have to be ordered separately





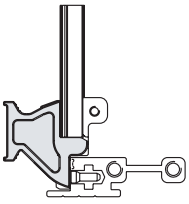


3.6.6.4 Ejector Handle acc. to IEC

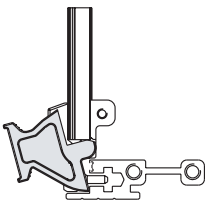
Description	Part-No.
Ejector handle black	81-233
Ejector handle grey	81-234

Extraction process:

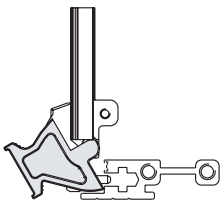
Rest position



Extraction



End position

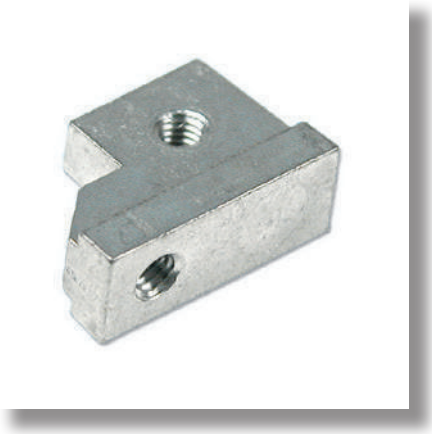


Label

Description	Part-No.
1 sheet A4 of 220 labels	81-031

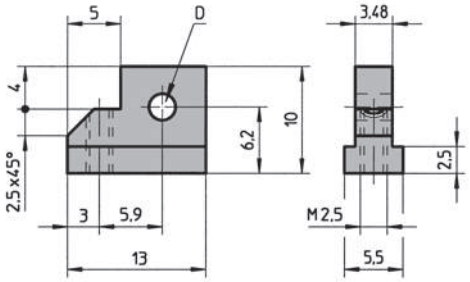
3.6.6.5 Card Holder acc. to IEC Standard

- By using the zinc die-cast card holder, flat front panels and EMC front panels acc. to IEC can be connected to a PC card to form a plug-in unit
- The card can be mounted both in the standard position and offset 1 HP (5.08 mm)
- **Scope of delivery:**
  - Card holder
- Assembly material see below



3.6.6.5 Card Holder without Swivel Stop

Description	Application	D	Part-No.
Card holder without swivel stop	Without injector / ejector handle	M2.5	61-156



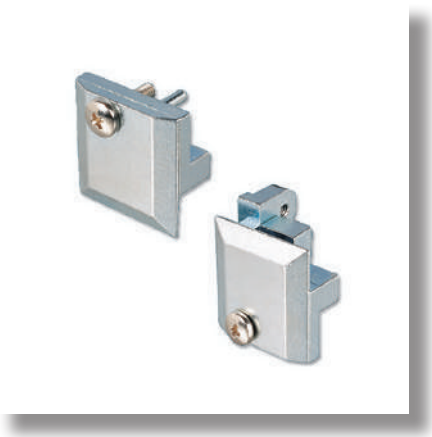


Assembly Material

Description	Application	Part-No.
Cross recessed countersunk screw M2.5 x 8	For card holder	5322-08
Torx countersunk screw M2.5 x 8, size T8	For card holder	5470-21
Slotted pan head screw M2.5 x 6	For printed board	5571-06
Torx cylinder head screw M2.5 x 6, size T8	For printed board	5470-04

3.6.6.6 Card Holder/End Piece without ESD Pin

- **Scope of delivery:**
  - End piece card holder (zinc die-cast, nickel plated)
  - Assembly material
    (screws M2.5 for fixing of front panel/card holder/printed board)



Card Holder/End Piece *without* ESD Pin

Description	Part-No.
Top	81-018-01
Bottom	81-019-01



3.6.7 Plug-In Units acc. to IEEE

3.6.7.1 EMC Front Panels Aluminium with EMC Gasket acc. IEEE

- Excellent EMC shielding
- Immune to snagging
- EMC-gasket slides onto the extrusion
- **Scope of delivery:**
  - EMC front panel, incl. press-in bushes M2.5 (size ≥ 10 HP)
- EMC gasket see below
- Handle has to be ordered separately, see 3.6.7.5
- Front panel screw (size ≥10 HP), see below



3.6.7.1 Front Anodised, Side Conductive (2 cutouts)

- With 2 cutouts (bottom + top)

Width	Part-No. 3 U	Part-No. 6 U
4 HP	66-514-23	66-514-26
5 HP	66-515-23	66-515-26
6 HP	66-516-23	66-516-26
7 HP	66-517-23	66-517-26
8 HP	66-518-23	66-518-26
9 HP	66-519-23	66-519-26
10 HP	66-520-23	66-520-26
12 HP	66-522-23	66-522-26
14 HP	66-534-23	66-534-26

3.6.7.2 Front Anodised, Rear Conductive (1 cutout)

- With 1 cutout (bottom)
- Incl. pressed-in centring pin and bush M2.5 (top)
- Incl. cutout for mounting of card holder 61-156 (top) with screw 5322-08 (see 2.7.6.2)

Width	Part-No. 3 U
4 HP	66-514-43
5 HP	66-515-43
6 HP	66-516-43
8 HP	66-518-43
10 HP	66-520-43
12 HP	66-522-43
14 HP	66-534-43



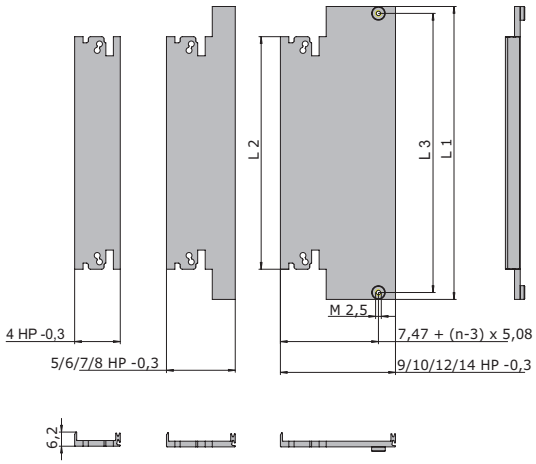
EMC-Gasket (Stainless Steel)

Unit	Part-No. 3 U	Part-No. 6 U
1 pc.	81-062-03	81-062-06

Front Panel Screw

- For EMC front panels size ≥ 9 HP = 2 additional screws are needed

Description	Part-No.
Cross recessed round head screws M2.5 x 12.7	61-287
Torx screws M2.5 x 11.3, size T8	5443-08



Dimensions

Height	L1 mm	L1 inch	L2 mm	L2 inch	L3 mm	L3 inch
3 U	128.55	5.06	102.05	4.01	122.50	4.82
6 U	261.90	10.31	235.40	9.27	255.85	10.07



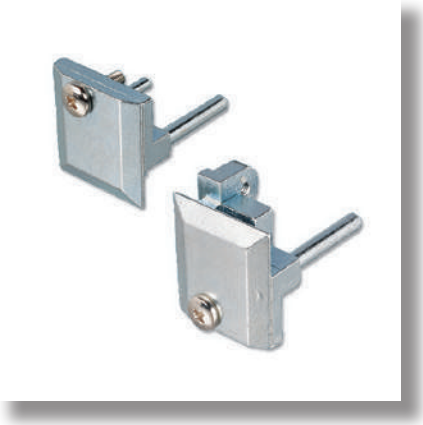
3.6.7.5 Injector/Ejector Handles acc. to IEEE

Type			Mounting	ESD Pin	Colour	Part-No.
Ergonomic			Bottom	With ESD-pin	Black	81-076
Ergonomic			Top	With ESD-pin	Black	81-075
Ergonomic			Bottom	Without ESD-pin	Black	81-076-01
Ergonomic			Top	Without ESD-pin	Black	81-075-01
Ergonomic	Hot Swap		Bottom	With ESD-pin	Black	81-096
Ergonomic	Hot Swap		Top	With ESD-pin	Black	81-095
Ergonomic	Hot Swap		Bottom	Without ESD-pin	Black	81-096-01
Ergonomic	Hot Swap		Top	Without ESD-pin	Black	81-095-01
Ergonomic	Hot Swap	Offset	Bottom	With ESD-pin	Black	81-185
Ergonomic	Hot Swap	Offset	Top	With ESD-pin	Black	81-184
Classic			Bottom	With ESD-pin	Black	81-261
Classic			Top	With ESD-pin	Black	81-260
Classic		Offset	Bottom	With ESD-pin	Black	81-161
Classic		Offset	Top	With ESD-pin	Black	81-160
Classic	Hot Swap		Bottom	With ESD-pin	Black	81-256
Classic	Hot Swap		Top	With ESD-pin	Black	81-255
Classic	Hot Swap	Offset	Bottom	With ESD-pin	Black	81-156
Classic	Hot Swap	Offset	Top	With ESD-pin	Black	81-155
Telecom	Hot Swap		Bottom	With ESD-pin	Black	81-206
Telecom	Hot Swap		Top	With ESD-pin	Black	81-205
Telecom	Hot Swap		Bottom	Without ESD-pin	Black	81-206-01
Telecom	Hot Swap		Top	Without ESD-pin	Black	81-205-01
Telecom	Hot Swap	Offset	Bottom	With ESD-pin	Black	81-189
Telecom	Hot Swap	Offset	Top	With ESD-pin	Black	81-188
Telecom long	Hot Swap		Bottom	With ESD-pin	Black	81-215
Telecom long	Hot Swap		Top	With ESD-pin	Black	81-214
Telecom long	Hot Swap	Offset	Bottom	With ESD-pin	Black	81-116
Telecom long	Hot Swap	Offset	Top	With ESD-pin	Black	81-117
Microswitch						81-088-1 (10 pcs.)

For more information refer to chapter C | 3 "Handles".

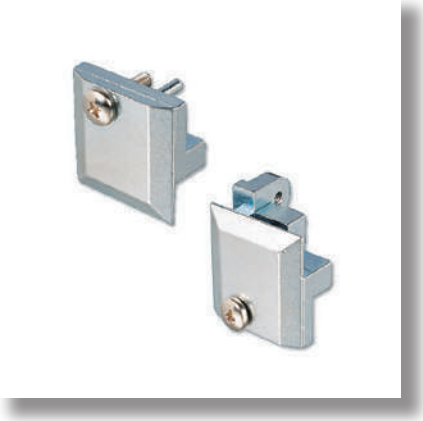
3.6.7.6 Card Holder and Coding Pins acc. to IEEE

- **Scope of delivery:**
  - End piece card holder (zinc die-cast, nickel plated)
  - Assembly material
    (screws M2.5 for fixing of front panel/card holder/printed board)



Card Holder/End Piece *with* ESD Pin

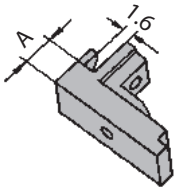
Description	Part-No.
Top	81-018
Bottom	81-019



Card Holder/End Piece *without* ESD Pin

Description	Part-No.
Top	81-018-01
Bottom	81-019-01





Middle Part

- Usable for all front panels
- For positioning and fixing of 6 U and 9 U cards, card thickness 1.6 mm
- Material: Plastic UL94 V-0

Description	A		Part-No.
	mm	inch	
Aluminium 2.5 mm	2.5	0.10	61-960

Assembly Material

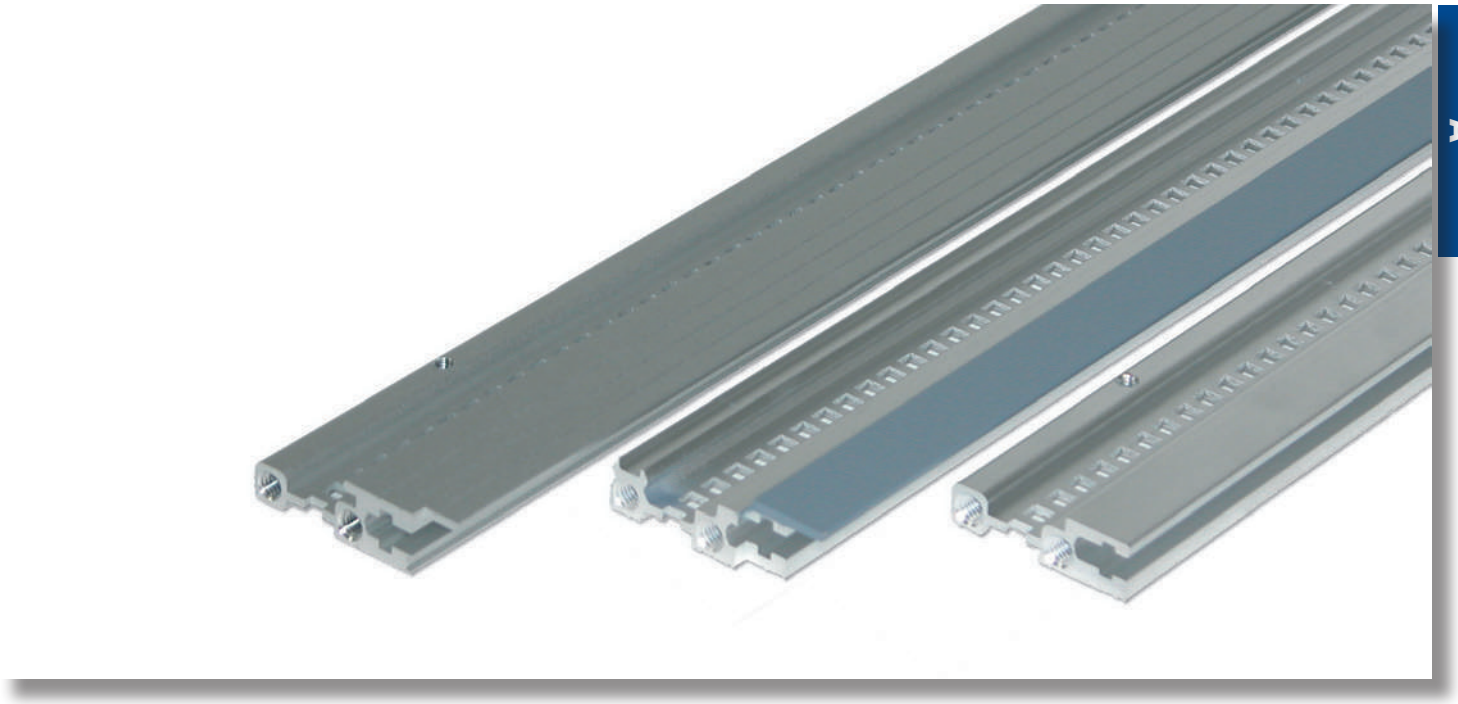
Description	Part-No.
PT-countersunk, 2.5 x 6	5534-06



Coding Pins

- Acc. to IEC 60297-3-103
- Plastic, UL94 V-0
- Can be rotated in 4 positions

Description	Part-No.
Grey	81-054-02
Dark red	81-054-06
Black	81-054-04

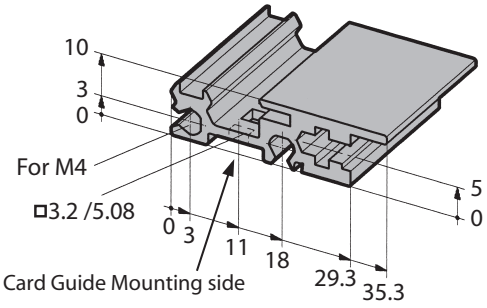


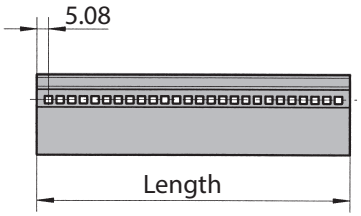
3.7 Extrusions

3.7.1 Front Extrusions

3.7.1.1 Front Extrusion 66-665

- For Magic-Kit 11 according to IEC/EN standard
- Accept 2 x 6 mm tapped strips
- **Scope of delivery:**
  - 1 front extrusion without assembly material



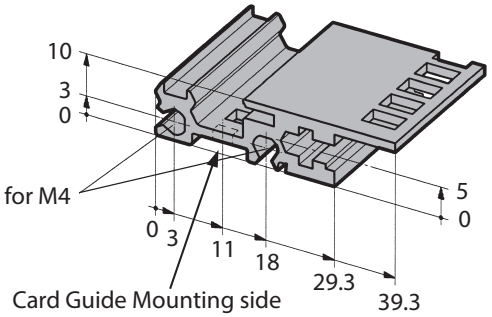


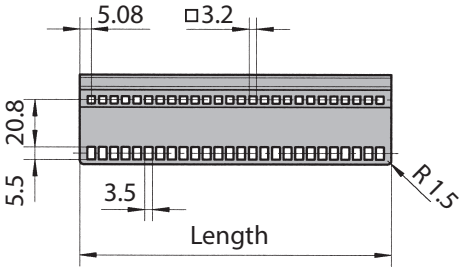
3.7.1.1 Standard Version

Length			Part-No.
for HP	mm	inch	**clear passivated**
84	431.8	17.00	66-665-53

3.7.1.2 Front Extrusion 66-666

- For Spirit-Kit 11 according to IEEE standard
- Accept 2 x 6 mm tapped strips
- **Scope of delivery:**
  - 1 front extrusion without assembly material



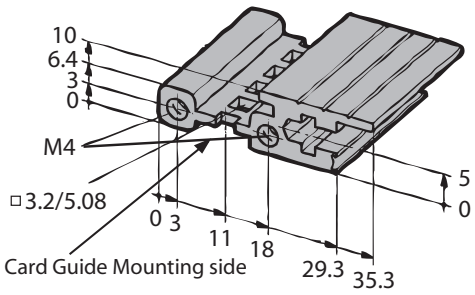


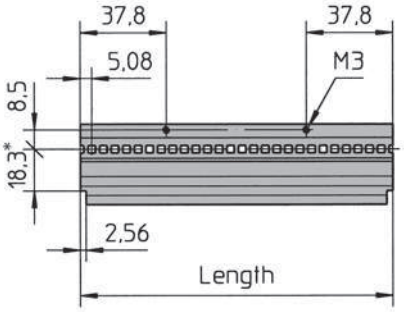
3.7.1.2 Standard Version

Length			Part-No.
for HP	mm	inch	**clear passivated**
84	431.8	17.00	66-666-53

3.7.1.3 Front Extrusion 66-111, IEC

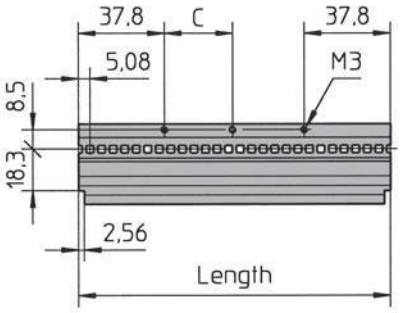
- For sub racks and cases front
- Accept 2 x 6 mm tapped strips
- **Scope of delivery:**
  - 1 front extrusion without assembly material





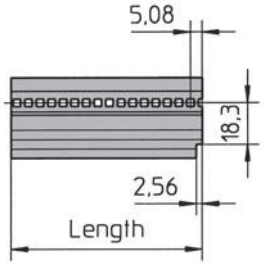
Standard Version

Length for HP	mm	inch	Part-No. clear anodised	black anodised	clear passivated	raw
21	111.8	4.40	66-111-26	-	-	-
28	147.3	5.80	66-111-25	-	-	-
32	167.6	6.80	66-111-62	-	-	-
42	218.4	8.60	66-111-60	-	66-111-75	-
63	325.1	12.80	66-111-61	-	66-111-76	-
81	416.6	16.40	66-111-22	-	66-111-77	-
84	431.8	17.00	66-111-23	66-111-56	66-111-78	-
	1350.0	53.15	-	-	-	66-111-19



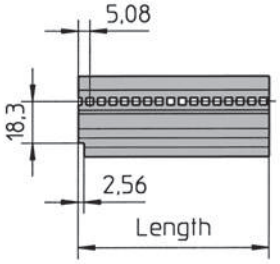
EMC Version

Length for HP	mm	inch	Holes n x C	Part-No. clear passivated
42	218.4	8.60	2 x 71.42	66-111-50
63	325.1	12.80	3 x 83.17	66-111-51
81	416.6	16.40	4 x 85.24	66-111-52
84	431.8	17.00	4 x 89.05	66-111-53



Height Divider Right

Length for HP	mm	inch	Part-No. anodised
8.5	43.18	1.70	66-111-71
12.5	63.50	2.50	66-111-72



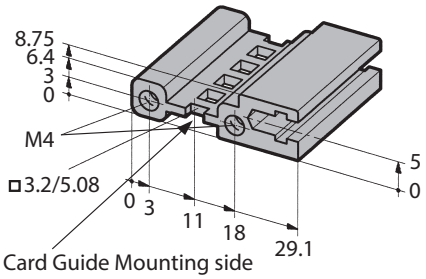
Height Divider Left

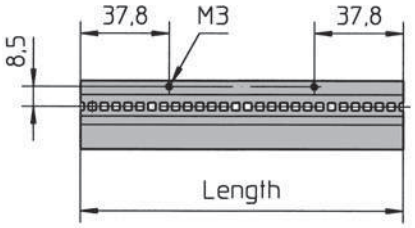
Length for HP	mm	inch	Part-No. anodised
8.5	43.18	1.70	66-111-81
12.5	63.50	2.50	66-111-82

3.7.2 Internal Extrusions

3.7.2.1 Internal Extrusion 66-193 for Insulated Backplane Mounting

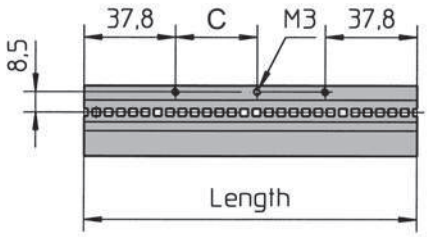
- For mounting backplanes in sub racks
- Insulating strip see 3.7.2.5
- **Scope of delivery:**
  - 1 extrusion without assembly material





Standard Version

Length			Part-No.	
for HP	mm	inch	**clear passivated**	**raw**
32	167.6	6.60	66-193-26	
42	218.4	8.60	66-193-20	
63	325.1	12.80	66-193-21	
81	416.6	16.40	66-193-22	
84	431.8	17.00	66-193-23	
	1350.0	53.14		66-193-19

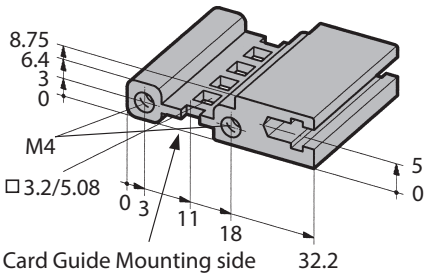


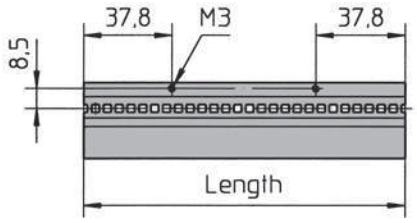
EMC Version

Length			Part-No.
for HP	mm	inch	**clear passivated**
84	431.8	17.00	66-193-63

3.7.2.2 Internal Extrusion 66-194 for Conductive Backplane Mounting

- For mounting backplanes without an insulating strip
- **Scope of delivery:**
  - 1 extrusion without assembly material



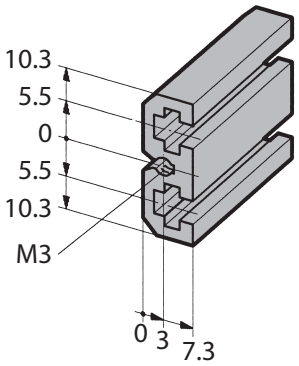


Standard Version

Length			Part-No.	
for HP	mm	inch	**clear passivated**	**raw**
84	431.8	17.00	66-194-23	
	1350.0	53.14		66-194-19

3.7.2.3 Double Extrusion 66-192 for Insulated Backplane Mounting

- For mounting backplanes, matches 66-193, 66-288
- For use with insulating strips
- Insulating strip see 3.7.2.5
- **Scope of delivery:**
  - 1 extrusion without assembly material



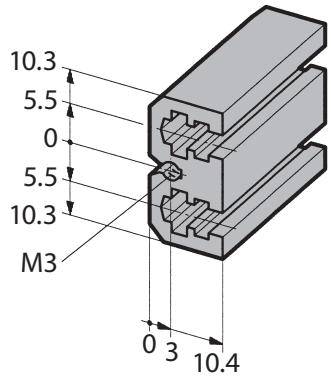
Length for HP	mm	inch	Part-No. clear passivated	raw
84	431.8	17.00	66-192-24	
	1350.0	53.14		66-192-14

Length for HP	mm	inch	Part-No. clear passivated
42	213.4	8.40	66-192-20
63	320.0	12.59	66-192-21
81	411.5	16.20	66-192-22
84	426.7	16.79	66-192-23

Assembly material with adapter: 63-175

3.7.2.4 Double Extrusion 66-195 for Conductive Backplane Mounting

- For mounting backplanes without insulating strips
- Matches 66-194, 66-289, 66-290
- **Scope of delivery:**
  - 1 extrusion without assembly material



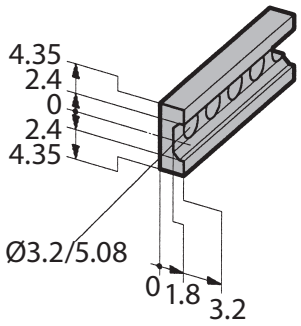
Length for HP	mm	inch	Part-No. clear passivated
84	431.8	17.00	66-195-24

Length for HP	mm	inch	Part-No. clear passivated
81	411.5	16.20	66-195-22
84	426.7	16.77	66-195-23

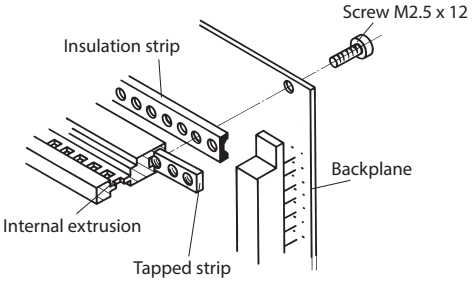
Assembly material with adapter: 63-175

3.7.2.5 Insulating Strip 66-901

- Plastic grey
- Use with extrusions 66-112, 66-192, 66-193, 66-288



Length for HP	mm	inch	Part-No.
42	216.44	8.52	66-901-20
63	323.12	12.72	66-901-21
81	414.56	16.32	66-901-22
84	429.80	16.92	66-901-23

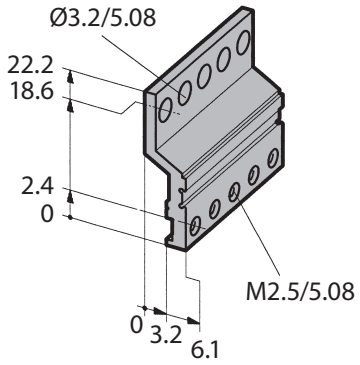


Mounting with Insulation Strips

Description	Part-No.
Cross recessed cylinderhead earthing screw M2.5 x 12	5325-12

3.7.2.6 Edge Connector Extrusion 66-147

- Supplementary edge connector extrusion for IEC 60603-2
- Matches 66-112, 66-192, 66-193
- **Scope of delivery:**
  - 1 extrusion without assembly material



Edge Connector Extrusion 66-147

Length for HP	mm	inch	Part-No. clear passivated	raw
8	40.6	1.59	66-147-40	-
18	91.4	3.59	66-147-41	-
28	142.2	5.60	66-147-42	-
42	213.4	8.40	66-147-63	-
63	320.0	12.60	66-147-65	-
81	411.5	16.20	66-147-22	-
84	426.7	16.80	66-147-52	-
	1350.0	53.14	-	66-147-19



Source: TransiNor AS, Norway

Notes

4: Systemkit 12K











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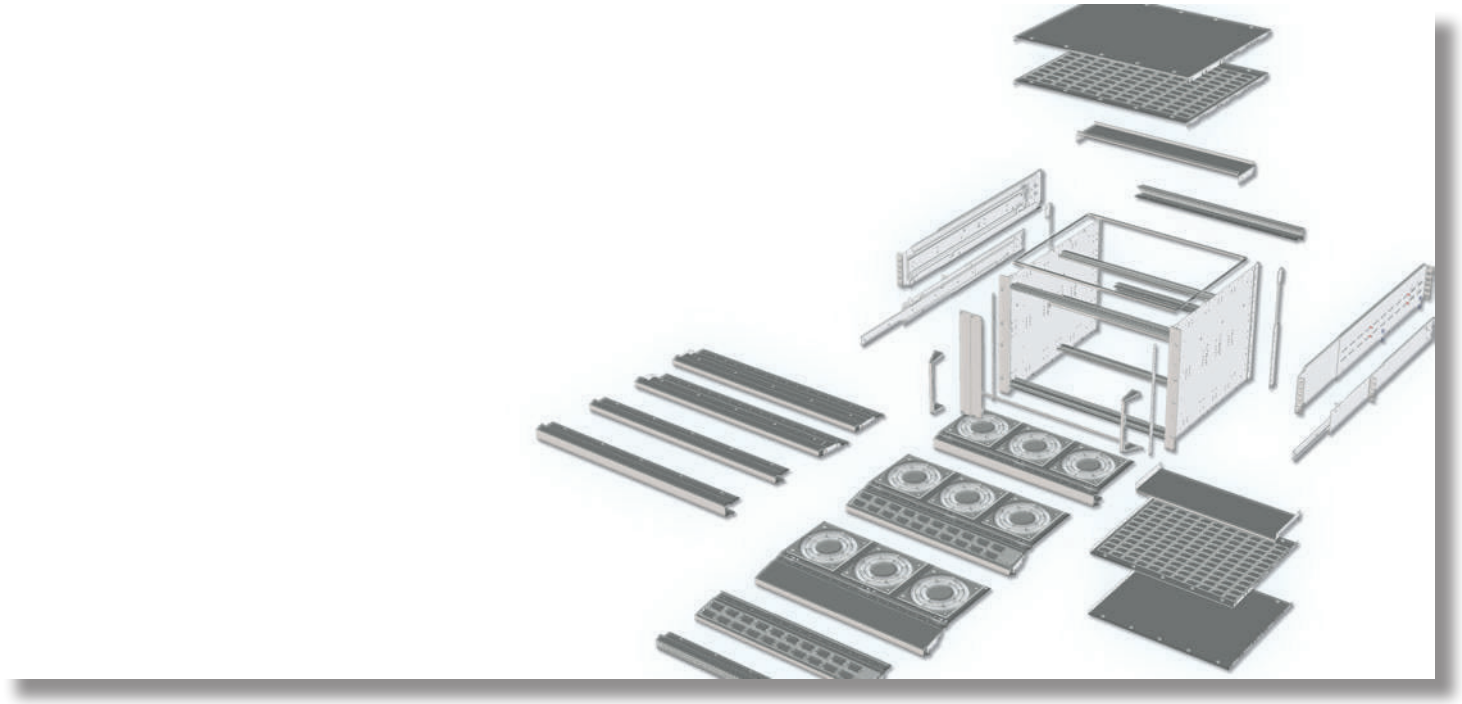


4.8 Step G: Extrusions **A | 4_41**

4.8.1 Front Extrusions A | 4_41

4.8.2 Internal Extrusions A | 4_41

4.8.3 Height Extrusions A | 4_44



4.1 Systemkit 12K Overview

The origin of the Systemkit 12K is our highly succesful type 12. The Systemkit has several advantages, already in the standard version:

- Choose between a VME, a VME64x or a CPCI application
- Possibility for Rear I/O card mounting
- A basic EMC level is attained with the basic version (without additional EMC parts)
- Choose from the most common case heights and depths as standard version
- New sets have been created to facilitate the order of complementary parts

and last but not least:

- The Systemkit 12K gives the ideal platform basis for modified standards and **customised products**

CPCI/VME/VME64X

The first step when ordering your system is to choose the application. This can be either CPCI, VME64x or VME. Some of the parts shown in this catalogue are for CPCI, VME64x or for VME only. Whenever there is **no indication** on neither CPCI, VME64x or VME the part can be **used for all applications**.

Modified Standards

Examples for **possible modifications** are:

- Other dimensions for mounting different card depth
- Combination of rear I/O and recessed mounting
- Other materials and/or colours
- For more information contact our sales support

EMC

"Electromagnetic comptability is the ability of a system to operate in the intended environment without causing or suffering unacceptable degradation of performance due to unintentinal electromagnetic radiation or response." The EMC characterstics of a system therefore consist of an appropriate immunity from interference (noise immunity) and a limited emission of interference (noise emission).

Elma's EMC concept describes three levels of electromagnetic shielding performance (Performance Level). The attenuation levels will simplify the selection of sub racks for the user. Test setup: The first measurement E1 is without the enclosure. The next measurement E2 is made with the transmitting antenna installed inside the enclosure. The difference between the received signal without and with the enclosure represents the shielding effectiveness in dB.

Performance Level	30 - 230 MHz	230 - 1000 MHz	1000 - 2000 MHz
1 / Elma: Basic level	20 dB	10 dB	0 dB
2 / Elma: Advanced level	40 dB	30 dB	20 dB
3 / Elma: Superior level	60 dB	50 dB	40 dB

The standard configuration will provide you with a basic EMC level. If you require an advanced EMC level for your system, you need to order **additional EMC parts**. Throughout the catalogue we have put these EMC parts **in a yellow table**.

RoHS - the Systemkit 12K is 100% RoHS Compliant

"**R**estriction **o**f the use of certain **h**azardous **s**ubstances in electrical and electronic equipment"

Elma Electronic AG is fully aware of its responsibilities towards its customers and the environment and therefore started a corresponding project which is finished in the meantime.

The new sub rack family Systemkit 12K fulfils the directive 2002/95/EG (RoHS)!

After our present knowledge all parts found in this catalogue do not contain materials, whose placing on the market is forbidden in accordance with RoHS. So it is specially mentioned that for the optimisation of the corrosion and wear protection as well as the improvement of the electrical conductivity as basis of an optimal EMC protection of the electronics the metal surfaces are electro-plated. In co-operation with proven specialised experts we have analysed different RoHS conformal procedures which fulfils our high requirements concerning quality, EMC, corrosion protection and optics.

The procedure for the RoHS compliant surface treatment, selected by us, obtained outstanding results with all tests and examinations. It is particularly worth mentioning that with the climatic test in accordance with IEC 61587-1 the highest requirement (Performance level C3 and A3) were successfully fulfilled by our products.

Substantial results of the surface treatment:

- Optically identical surfaces to the past procedures (colourless)
- High EMC protection
- Optimal adhesion for coloured surface coatings
- Fulfils the highest performance level (C3, A3) of climatic tests in accordance to IEC 61587-1 (*)

(*) acc. to IEC 61587-1:

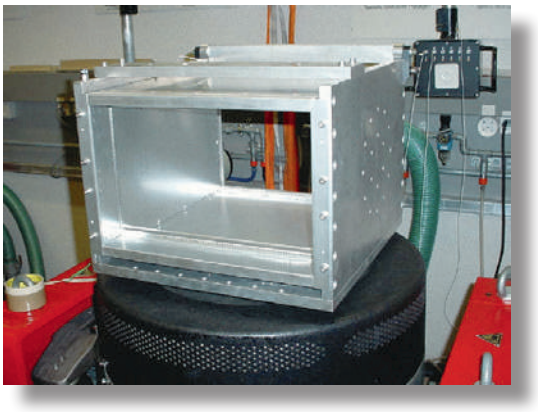
Performance Level: C3 (Cold, dry heat and damp heat, cyclic)

- Example of use: Extreme climatic impact (eg. outdoor, tropical environment) with temperature between -40°C and +85°C, relative humidity of 20% to 95%, no condensation

Performance Level: A3 (Industrial atmosphere)

- Example of use: strong concentration of toxic substances and exposure through maritime climate at the same time (eg. off-shore chemical engineering, oil platform) with concentration of acc. to IEC 60654-4:
  - SO_2 at average: 5 cm^3/m^3, max. 15 cm^3/m^3
  - H_2S at average: 10 cm^3/m^3, max. 50cm^3/m^3

Climatic and Mechanical Tests



The Systemkit 12K fulfils the following test according to:

• Vibration	EN 60068-2-6
• Shock	EN 60068-2-27
• Dry Heat	EN 60068-2-2
• Damp heat, cyclic	EN 60068-2-30
• Cold	EN 60068-2-1
• Salt Spray test	DIN 50021

The functionality of the sub rack was ensured during all tests.

Detail information to climatic and mechanical tests:

- **Vibration** EN 60068-2-6

  Resonance search:

  Frequency: 3 Hz to 100Hz, Sweeprate: 1 Oct/min.
  1 Cycle / Axle (X, Y, Z)

  Resonance stay: (Z: 50.7 Hz, Y = 89.5Hz, X = 70.9Hz)

10 m/s^2	15 min
30 m/s^2	2 min

- **Shock** EN 60068-2-27

  Shockform: Halfsinus Acceleration: 50 m/s^2 Duration: 11 ms
  Number of Shocks: 3 per Axle Total: 18 Shocks

- **Dry heat** EN 60068-2-2

  Temperature: +85 °C Duration: 16 h

- **Damp heat, cyclic** EN 60068-2-30

  Upper temperature: +55 °C Duration: 9 h Damp: 95 % r.H.
  Lower temperature: +25 °C Duration: 9 h Damp: 95 % r.H.
  Ramp: In 3h from +25 °C to +55 °C and in 3 h back again.
  Number of cycles: 2 Time: 24 h Total time: 48 h

- **Cold** EN 60068-2-1

  Temperature: -40 °C Duration: 16 h

- **Salt Spray test** DIN 50021

  Salt concentration: 50 g/l Duration: 16 h Temperature: +35 °C

Configuration



4.2 Step A:
Application

- Basic Set CPCI, VME, VME64X
- Internal Extrusion

4.3 Step B:
Application Range

- Height Extrusion 19"



4.4 Step C:
Assembly Options

- Reduction Kit $^1/_2$ + $^1/_2$
- Reduction Kit $^1/_3$ + $^2/_3$
- Front or Recessed Mounting
- Bottom/Top Panel Solid and Perforated



4.5 Step D:
Assembly Accessories

- Rear I/O Card Mounting
- Front Sub Divisions
- Horizontal Mounting Kits
- Drive Modules

4.6 Step E:
EMC Shielding

4.7 Step F:
General Accessories

4.8 Step G:
Extrusions

4.1.1 Basic Set-up Overview

CPCI (IEEE1101.10/IEEE1101.11) Standard Configurations**

Height	3 U		4 U			
Depth	**289 mm**	**400 mm**	**289 mm**	**400 mm**	**500 mm**	**289 mm**
Width	19"	19"	19"	19"	19"	19"
Part-No.	12K001	12K041	12K002	12K003	12K004	12K008
For card size	3 U	3 U	3 U	3 U	3 U	3 U / 6 U
For card depth	160 mm	160 mm 220 mm	160 mm	160 mm 220 mm	160 mm 220 mm	160 mm
Rear I/O card depth*	80 mm	-	80 mm	80 mm	80 mm	80 mm
Max. Slot	21	21	21	21	21	21
Front mounting	possible	possible	possible	possible	possible	possible
Recessed mounting	-	-	possible	possible	possible	possible (3 U)
Height reduction	-	-	possible	possible	possible	possible (3 U)
Base material	aluminium	aluminium	aluminium	aluminium	aluminium	aluminium
Surface treatment	conductive	conductive	conductive	conductive	conductive	conductive
Possible EMC level	advanced	advanced	advanced	advanced	advanced	advanced

VME (IEEE1101.10/IEEE1101.11) Standard Configurations**

Height	3 U		4 U				
Depth	**291 mm**	**400 mm**	**291 mm**	**371 mm**	**400 mm**	**500 mm**	**291 mm**
Width	19"	19"	19"	19"	19"	19"	19"
Part-No.	12K023	12K024	12K025	12K026	12K027	12K028	12K029
For card size	3 U	3 U	3 U	3 U	3 U	3 U	3 U / 6 U
For card depth	160 mm 220 mm	160 mm 220 mm	160 mm 220 mm	160 mm 220 mm	160 mm 220 mm	160 mm 220 mm	160 mm 220 mm
Rear I/O card depth*	-	-	-	160 mm	160 mm	160 mm	-
Max. Slot	21	21	21	21	21	21	21
Front mounting	possible	possible	possible	possible	possible	possible	possible
Recessed mounting	-	-	possible	-	possible	possible	possible (3 U)
Height reduction	-	-	possible	possible	possible	possible	possible (3 U)
Base material	aluminium	aluminium	aluminium	aluminium	aluminium	aluminium	aluminium
Surface treatment	conductive	conductive	conductive	conductive	conductive	conductive	conductive
Possible EMC level	advanced	advanced	advanced	advanced	advanced	advanced	advanced

VME (IEC 60297) Standard Configurations**

Height	3 U			4 U				
Depth	**291 mm**	**400 mm**	**500 mm**	**291 mm**	**371 mm**	**400 mm**	**500 mm**	**291 mm**
Width	19"	19"	19"	19"	19"	19"	19"	19"
Part-No.	12K019	12K020	12K044	12K038	12K005	12K006	12K007	12K039
For card size	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U / 6 U
For card depth	160 mm 220 mm	160 mm 220 mm	160 mm 220 mm	160 mm 220 mm	160 mm 220 mm	160 mm 220 mm	160 mm 220 mm	160 mm 220 mm
Rear I/O card depth*	-	-	-	-	160 mm	160 mm	160 mm	-
Max. Slot	21	21	21	21	21	21	21	21
Front mounting	possible	possible	possible	possible	possible	possible	possible	possible
Recessed mounting	-	-	-	possible	-	possible	possible	possible (3 U)
Height reduction	-	-	-	possible	possible	possible	possible	possible (3 U)
Base material	aluminium	aluminium	aluminium	aluminium	aluminium	aluminium	aluminium	aluminium
Surface treatment	conductive	conductive	conductive	conductive	conductive	conductive	conductive	conductive
Possible EMC level	advanced	advanced	advanced	advanced	advanced	advanced	advanced	advanced

*Rear I/O possible, when front cards 160 mm, only. No recessed mounting possible in combination with rear I/O

6 U		7 U			9 U	
400 mm	**500 mm**	**289 mm**	**400 mm**	**500 mm**	**400 mm**	**500 mm**
19"	19"	19"	19"	19"	19"	19"
12K042	12K043	12K011	12K012	12K013	12K021	12K022
3 U / 6 U	3 U / 6 U	3 U / 6 U	3 U / 6 U	3 U / 6 U	3 U / 6 U	3 U / 6 U
160 mm 220 mm	160 mm 220 mm	160 mm	160 mm 220 mm	160 mm 220 mm	160 mm 220 mm	160 mm 220 mm
-	-	80 mm	80 mm	80 mm	80 mm	80 mm
21	21	21	21	21	21	21
possible	possible	possible	possible	possible	possible	possible
possible (3 U)	possible (3 U)	possible	possible	possible	possible	possible
possible (3 U)	possible (3 U)	possible	possible	possible	possible	possible
aluminium	aluminium	aluminium	aluminium	aluminium	aluminium	aluminium
conductive	conductive	conductive	conductive	conductive	conductive	conductive
advanced	advanced	advanced	advanced	advanced	advanced	advanced

6 U		7 U				9 U	
400 mm	**500 mm**	**291 mm**	**371 mm**	**400 mm**	**500 mm**	**400 mm**	**500 mm**
19"	19"	19"	19"	19"	19"	19"	19"
12K030	12K031	12K032	12K033	12K034	12K035	12K036	12K037
3 U / 6 U	3 U / 6 U	3 U / 6 U	3 U / 6 U	3 U / 6 U	3 U / 6 U	3 U / 6 U	3 U / 6 U
160 mm 220 mm	160 mm 220 mm	160 mm 220 mm	160 mm 220 mm	160 mm 220 mm	160 mm 220 mm	160 mm 220 mm	160 mm 220 mm
-	-	-	160 mm	160 mm	160 mm	160 mm	160 mm
21	21	21	21	21	21	21	21
possible	possible	possible	possible	possible	possible	possible	possible
possible (3 U)	possible (3 U)	possible	-	possible	possible	possible	possible
possible (3 U)	possible (3 U)	possible	possible	possible	possible	possible	possible
aluminium	aluminium	aluminium	aluminium	aluminium	aluminium	aluminium	aluminium
conductive	conductive	conductive	conductive	conductive	conductive	conductive	conductive
advanced	advanced	advanced	advanced	advanced	advanced	advanced	advanced

6 U		7 U				9 U	
400 mm	**500 mm**	**291 mm**	**371 mm**	**400 mm**	**500 mm**	**400 mm**	**500 mm**
19"	19"	19"	19"	19"	19"	19"	19"
12K009	12K010	12K040	12K014	12K015	12K016	12K017	12K018
3 U / 6 U	3 U / 6 U	3 U / 6 U	3 U / 6 U	3 U / 6 U	3 U / 6 U	3 U / 6 U	3 U / 6 U
160 mm 220 mm	160 mm 220 mm	160 mm 220 mm	160 mm 220 mm	160 mm 220 mm	160 mm 220 mm	160 mm 220 mm	160 mm 220 mm
-	-	-	160 mm	160 mm	160 mm	160 mm	160 mm
21	21	21	21	21	21	21	21
possible	possible	possible	possible	possible	possible	possible	possible
possible (3 U)	possible (3 U)	possible	-	possible	possible	possible	possible
possible (3 U)	possible (3 U)	possible	possible	possible	possible	possible	possible
aluminium	aluminium	aluminium	aluminium	aluminium	aluminium	aluminium	aluminium
conductive	conductive	conductive	conductive	conductive	conductive	conductive	conductive
advanced	advanced	advanced	advanced	advanced	advanced	advanced	advanced

**Other configurations on request as modified standard, please contact our sales support



4.2 Step A: Applications

4.2.1 CPCI, VME, VME64x 19" Basic Set

- **Scope of delivery:**
  - 2 side panels
  - 4 front extrusions
  - 4 tapped strips M2.5
  - 1 set assembly material (16 cylinder head screws M4 x 10, Torx T20)



4.2.1.1 CPCI Applications (IEEE1101.10/IEEE1101.11)

Depth	3 U 132.5 mm	4 U 177.0 mm	6 U 265.9 mm	7 U 310.3 mm	9 U 399.2 mm
289 mm	12K001	12K002	12K008	12K011	-
400 mm	12K041	12K003	12K042	-	12K021
500 mm	-	12K004	-	-	-

4.2.1.2 VME64x Applications (IEEE1101.10/IEEE1101.11)

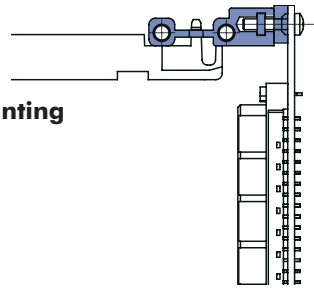
Depth	3 U 132.5 mm	4 U 177.0 mm	6 U 265.9 mm	7 U 310.3 mm	9 U 399.2 mm
291 mm	12K023	12K025	12K029	12K032	-
400 mm	12K024	12K027	12K030	12K034	12K036
500 mm	-	-	12K031	12K035	12K037

4.2.1.3 VME Applications (IEC60297)

Depth	3 U 132.5 mm	4 U 177.0 mm	6 U 265.9 mm	7 U 310.3 mm	9 U 399.2 mm
291 mm	12K019	12K038	12K039	12K040	-
371 mm	-	12K005	-	-	-
400 mm	12K020	12K006	12K009	12K015	12K017
500 mm	12K044	12K007	12K010	12K016	12K018

4.2.2 Internal Extrusion



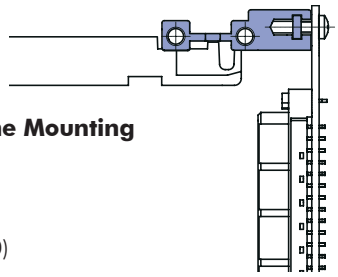


4.2.2.1 Internal Extrusion for Insulatad Backplane Mounting

- **Scope of delivery:**
  - 2 internal extrusions
  - 2 tapped strips M2.5
  - 2 insulating strips
  - Assembly material (8 cylinder head screws M4 x 10, Torx T20)

Description	Part-No.
Insulated mounting of backplane	12K506

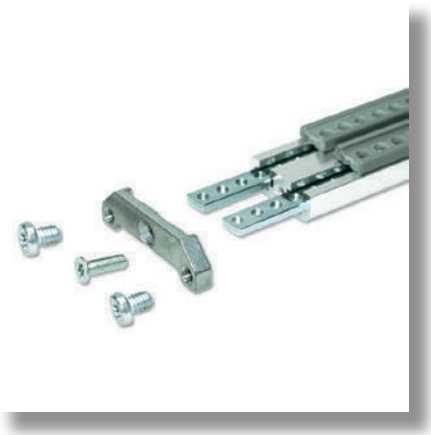


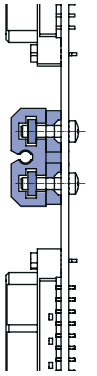


4.2.2.2 Internal Extrusions for Non-Insulated Backplane Mounting

- **Scope of delivery:**
  - 2 internal extrusions
  - 2 tapped strips M2.5
  - Assembly material (8 cylinder head screws M4 x 10, Torx T20)

Description	Part-No.
Non-insulated mounting of backplane	12K507

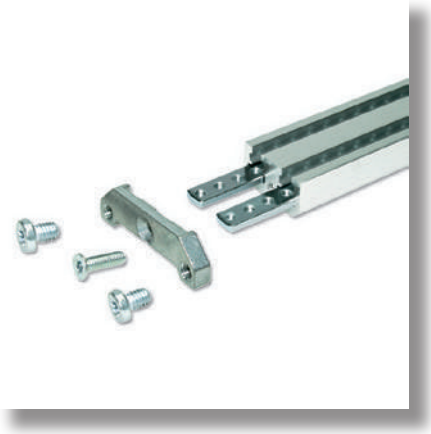


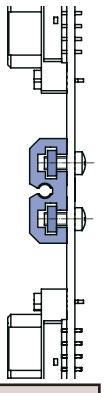


4.2.2.3 Double Extrusion for Insulated Backplane Mounting

- For 6 U cards only
- Stiffener for VME Monolithic
- Fixing for J1 and J2 Backplanes
- **Scope of delivery:**
  - 1 double extrusion
  - 2 tapped strips
  - 2 insulating strips
  - Assembly material (8 x M4 x 6, Torx T20, 2 x M3 x 10, Torx T20, 2 x adapter)

Description	Part-No.
1 set double extrusion for insulated backplane mounting	12K508





4.2.2.4 Double Extrusion for Non-Insulated Backplane Mounting

- For 6 U cards only
- Stiffener for VME Monolithic
- Fixing for J1 and J2 Backplanes
- **Scope of delivery:**
  - 1 double extrusion
  - 2 tapped strips M2.5
  - Assembly material (8 x M4 x 6, Torx T20 2 x M3 x 10, Torx T20 2 x adapter)

Description	Part-No.
1 set double extrusion for non-insulated backplane mounting	12K509



4.3 Step B: Applications Range

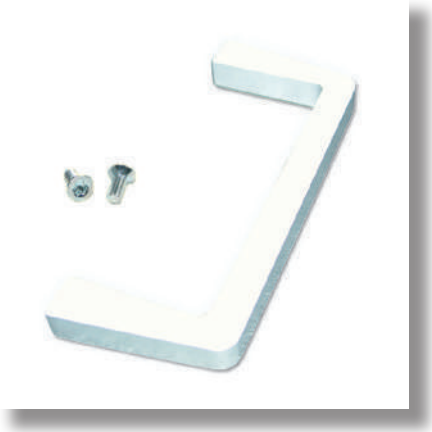
4.3.1 Height Extrusions for 19" Version

- Not suitable for telescopic rail mounting (see 4.3.2)
- **Scope of delivery:**
  - 2 height extrusions 19" (front)
  - 2 height extrusions (rear)
- Handles, see below
- EMC-gaskets see 4.6.4

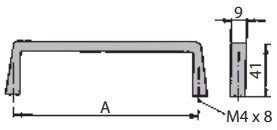


4.3.1. Height Extrusions for 19" Version

Height:	3 U	4 U	6 U	7 U	9 U
Part-No.:	12K200	12K201	12K202	12K203	12K204



4.2.1.1 Aluminium Handle 9 mm (Anodised)



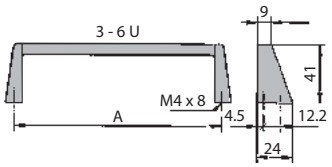
- **Scope of delivery:**
  - 1 handle for height extrusion
  - 2 countersunk screws M4 x 10, Torx T20
- Per sub rack 2 handles have to be ordered

Case size:	3 U	4 U	6 U	7 U	9 U
Handle size (A):	3 U (88.9 mm)	4 U (133.4 mm)	6 U (222.3 mm)	4 U (133.4 mm)	6 U (222.3 mm)
Part-No.:	60-573	60-574	60-576	60-574	60-576



4.3.1.2 Die Cast Aluminium Handle (Wet painted RAL 9006)

- **Scope of delivery:**
  - 1 handle for height extrusion
  - 2 countersunk screws M4 x 10, Torx T20
- Per sub rack 2 handles have to be ordered



Case size:	3 U	4 U	6 U	7 U	9 U
Handle size (A):	3 U (88.9 mm)	4 U (133.4 mm)	6 U (222.3 mm)	4 U (133.4 mm)	6 U (222.3 mm)
Part-No.:	60-563	60-564	60-566	60-564	60-566

4.3.2 Height Extrusions for 19" Version (for Telescopic Rails)

- Suitable for telescopic rail mounting
- **Scope of delivery:**
  - 2 height extrusions (19" front)
  - 2 height extrusions (rear)
  - 2 die cast aluminium handles
  - Assembly material (4 countersunk screws M4 x 10, Torx T20)
- Telescopic rails, see below
- EMC-gaskets see 4.6.4



4.3.2 Height Extrusions for 19" Version (for Telescopic Rails)

Height:	3 U	6 U
Part-No.:	12K400	12K402

Other heights available on request



4.3.2.1 Telescopic Rails, Set (Load Capacity up to 60 kg/Pair)

- Telescopic rails, suitable for all heights
- **Scope of delivery:**
  - 2 telescopic rails
  - Mounting bracket and assembly material for mounting into cabinet and on module

Max. withdraw	Usable depth		Part-No.
	min.	max.	
511.2 mm	463 mm	681.8 mm	65-051
596.4 mm	564.6 mm	783.4 mm	65-052
719.6 mm	666.2 mm	885.0 mm	65-053

Rugged telescopic rails, load capacity up to 90 kg/pair available on request



4.4 Step C: Assembly Options

4.4.1 Reduction Kit ⅓ U + ⅔ U for Front Mounting, Solid

- Material: Aluminium 1.5 mm, conductive, depth independent (to be used in conjunction with the bottom/top panel)
- For 160 mm card depth, for 4 U case (eurocard) / for 7 U case (double eurocard)
- **Scope of delivery:**
  - 1 adapter top ($^1/_3$ U), 1 adapter bottom ($^2/_3$ U) incl. fan panel
  - 1 set assembly material (6x M3 x 8, Torx T10/ 4x M4 x 10, Torx T20)



4.4.1 Reduction Kit ⅓ U + ⅔ U for Front Mounting, Solid

Description	Part-No.
Reduction kit solid incl. fan panel	12K732

4.4.1.1 Additional fan plate

- For easy access and maintenance of the fans
- **Scope of delivery:**
  - 1 fan plate
  - 8 milled edge screws M3 x 5, Torx T10

Description	Part-No.
Additional fan plate incl. 1 set assembly material	12K737

4.4.2 Reduction Kit ⅓ U + ⅔ U for 60 mm Recessed Mounting

- Material: Aluminium 1.5 mm, conductive, depth independent (to be used in conjunction with the bottom/top panel)
- For 60 mm recessed only, for 160 mm card depth, for 4 U case (eurocard) / for 7 U case (double eurocard)
- **Scope of delivery:**
  - 1 adapter top ($^1/_3$ U), 1 adapter bottom ($^2/_3$ U) incl. fan panel
  - 1 set assembly material (6x M3 x 8 Torx T10, 4x M4 x 10 Torx T20)



4.4.2 Reduction Kit ⅓ U + ⅔ U for 60 mm Recessed Mounting

Part-No. perforated*	Part-No. solid
12K500	12K501

* only bottom part ($^2/_3$ U) is perforated

4.4.2.1 Additional fan plate

- For easy access and maintenance of the fans
- **Scope of delivery:**
  - 1 fan plate
  - 8 milled edge screws M3 x 5, Torx T10

Description	Part-No.
Additional fan plate incl. 1 set assembly material	12K737

4.4.3 Reduction Kit ½ U + ½ U for Front Mounting

- Material: Aluminium 1.5 mm, conductive, depth independent (to be used in conjunction with the bottom/top panel)
- For 4 U case (eurocard) / for 7 U case (double eurocard)
- **Scope of delivery:**
  - 1 adapter (½ U)
  - No assembly material needed
- Per sub rack 2 pcs. (4 pcs. with Rear I/O) have to be used (ordered)



4.4.3 Reduction Kit ½ U + ½ U for Front Mounting

Part-No. solid
12K710

Perforated version available on request

4.4.4 Reduction Kit ½ U + ½ U for 60 mm Recessed Mounting

- Material: Aluminium 1.5 mm, conductive, depth independant (to be used in conjunction with the bottom/top panel)
- For 4 U case (eurocard) / for 7 U case (double eurocard)
- **Scope of delivery:**
  - 1 adapter (½ U)
  - 1 set assembly material (2 cylinder head screws M4 x 10, Torx T20)
- Per sub rack 2 pcs. have to be used (ordered)

! the depth independent ½ U adapter are to be used in conjunction with the bottom/top panel



4.4.4 Reduction Kit ½ U + ½ U for 60 mm Recessed Mounting

Part-No. solid
12K730

Perforated version available on request

4.4.5 Bottom / Top Panel Solid

- Material: Aluminium 1.5 mm, conductive
- EMC-level: basic (for an advanced EMC-level use EMC-sets, see 4.6)
- **Scope of delivery:**
  - 1 bottom/top panel solid
  - 1 set assembly material (18 cylinder head screws M3 x 6 Torx T10)



4.4.5 Bottom / Top Panel Solid

Depth	Part-No.
289 mm	12K746
291 mm	12K720
371 mm	12K722
400 mm	12K723
500 mm	12K724

4.4.6 Bottom / Top Panel Perforated

- Material: Aluminium 1.5 mm, conductive
- EMC-level: basic (for an advanced EMC-level use EMC-sets, see 4.6)
- **Scope of delivery:**
  - 1 bottom/top panel perforated
  - 1 set assembly material (18 cylinder head screws M3 x 6 Torx T10)



4.4.6 Bottom / Top Panel Perforated

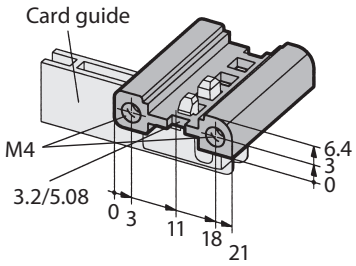
Depth	Part-No.
289 mm	12K749
291 mm	12K725
400 mm	12K728
500 mm	12K729



4.5 Step D: Assembly Accessories

4.5.1 Rear I/O Card Mounting

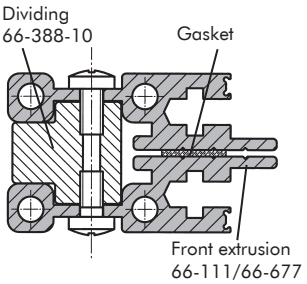
- For 80 mm card depth (CPCI), for 160 mm card depth (VME & VME64x)
- **Scope of delivery:**
  - 2 internal extrusions for rear I/O card mounting
  - Assembly material (4 cylinder head screws M4 x 10 Torx T20)





4.5.1 Rear I/O Card Mounting

Description	Part-No.
Internal extrusions for rear I/O card mounting	12K504



4.5.2 Front Sub Divisions

4.5.2.1 EMC Front Sub Division Horizontal for 84 HP System

- Advanced EMC-level
- For card guides be applied on upper and lower card cage side



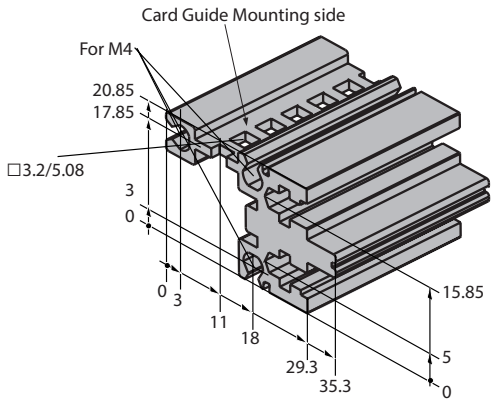
4.5.2.1 EMC Front Sub Division Horizontal for 84 HP System

- **Scope of delivery:**
  - 2 front extrusions
  - 1 EMC-gasket
  - 3 dividings
  - 1 set assembly material (8 cylinder head screws M4 x 10 Torx T20
    6 cylinder head screws M3 x 6 Torx T10)
  - 2 tapped strips M2.5

Part-No. VME	Part-No. CPCI/VME64x
63K837-84	63K837-85

4.5.2.2 EMC Front Sub Division Horizontal IEC for Card Guides

- For sub division of front or rear
- Card guides can be applied
- Superior EMC-level
- Only one special extrusion needed
- Easy and quick assembly
- Cost effective solution
- Delivered in kit form
- Usable width: 84 HP
- Other sizes available on request
- **Scope of delivery:**
  - 1 front double extrusion IEC-Special clear passivated
  - 2 tapped strips M2.5
  - 4 Torx cylinder head screws M4 x 10 (T20)
- For HF spring see 4.5.2.4.1
- For EMC contact strips see 4.5.2.4.2



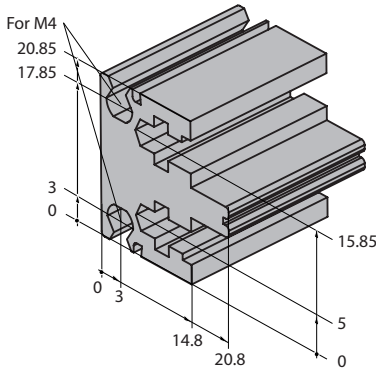


4.5.2.2 EMC Front Sub Division Horizontal IEC

Description	Part-No.
EMC front sub division horizontal IEC for card guides	63K837-24

4.5.2.3 EMC Front Sub Division Horizontal IEC

- For sub division of front or rear
- Without possibility of using card guides
- Superior EMC-level
- Only one special extrusion needed
- Easy and quick assembly
- Cost effective solution
- Delivered in kit form
- Usable width: 84 HP
- Other sizes available on request
- **Scope of delivery:**
  - 1 front double extrusion IEC-Special clear passivated
  - 2 tapped strips M2.5
  - 4 Torx cylinder head screws M4 x 10 (T20)
- For HF spring see 4.5.2.4.1
- For EMC contact strips see 4.5.2.4.2



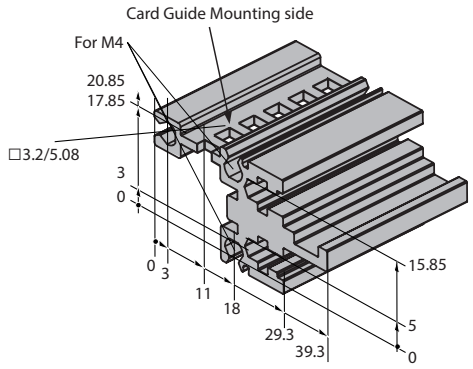


4.5.2.3. EMC Front Sub Division Horizontal IEC

Description	Part-No.
EMC front sub division horizontal IEC	63K837-22

4.5.2.4 EMC Front Sub Division Horizontal IEEE for card guides

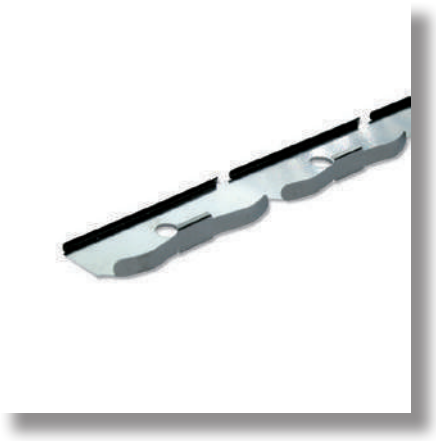
- Superior EMC-level
- Only one special extrusion needed
- Card guides can be applied
- Easy and quick assembly
- Cost effective solution
- Usable width: 84 HP
- Other sizes available on request
- **Scope of delivery:**
  - 1 front double extrusion IEEE-Special clear passivated
  - 2 tapped strips M2.5
  - 4 Torx cylinder head screws M4 x 10 (T20)
- For HF spring see below
- For EMC contact strips see below





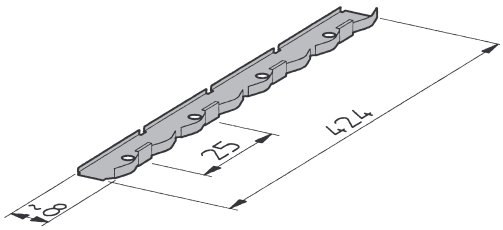
4.5.2.4 EMC Front Sub Division Horizontal IEEE

Description	Part-No.
EMC front sub division horizontal IEEE	63K837-23



4.5.2.4.1 HF Spring

- Stainless steel
- Snapped-in on the extrusion
- **Scope of delivery:**
  - 2 HF spring 84 HP

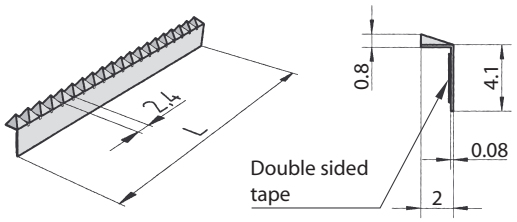


Description	Part-No.
1 set of 2 HF spring 84 HP	7739-14-4



4.5.2.4.2 EMC Contact Strips

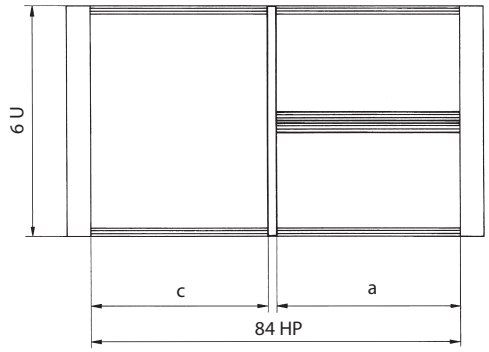
- BeCu galvanized
- For front panels, fixing on extrusion
- Self-adhesive
- **Scope of delivery:**
  - 2 EMC contact strips



For HP	Length		Part-No.
	mm	inch	
84	424.2	16.70	63-836-70

4.5.2.5 Front Sub Division Vertical for 6 U System or 6 U Assembly

- **Scope of delivery:**
  - 1 divider extrusion front
  - 1 divider extrusion rear
  - 2 front extrusion
  - 2 internal extrusion
  - Assembly material
    (16 cylinderhead screws M4 x 10, Torx T20
    (4 cylinderhead screws M3 x 12, Torx T10)
- Tapped strips for front extrusion see below





4.5.2.5 Front Sub Division Vertical for 6 U System or 6 U Assembly

Nominal width 6 U (c)	Nominal width 2 x 3 U (a)	Part-No. IEC60297	Part-No. IEEE1101.10
50 HP	32 HP	-	12K959-3
40 HP	42 HP	12K949-2	-

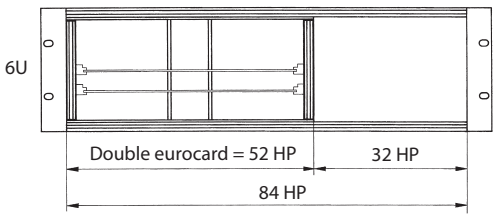
Tapped Strips for Front Extrusion

Scope of delivery	Description	Part-No.
1 pc. tapped strip	M2,5 32 HP = 162.56 mm	61-463
1 pc. tapped strip	M2,5 42 HP = 213.36 mm	61-464

4.5.3 Horizontal Card Mounting Kits

4.5.3.1 Horizontal Card Mounting Kit for Double Eurocards (6 U) (for VME)

- Card depth independent
- Installation width: 52 HP
- **Scope of delivery:**
  - 1 complete set incl. assembly material
- Assembly material for cover plates see below





4.4.7 Horizontal Card Mounting Kit for Double Eurocards (6 U) (for VME)

Height/nominal width	Part-No.	Part-No. for cover plate top	Part-No. for cover plate bottom
3 U - 20 HP	14K971-60	21N602-90	21N602-90
4 U - 28 HP	14K981-60	21N602-90	21N603-90
6 U - 48 HP	14K991-60	21N606-90	21N607-90

Front Panel Screws

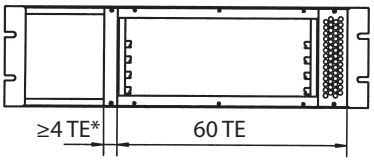
- Set of 10 screws, with screw retainer

Description	Part-No.
Torx screws M2.5 x 11.3, size T8 with plastic screw retainer	63K159
Rounded head screws recessed M2.5 x 11.3 with plastic screw retainer	63-159

4.5.3.2 EMC Horizontal Card Mounting Kit for Double Eurocards (6 U)

- For 160 mm card depth
- For backplane mounting
- **Scope of delivery:**
  - Card mounting kit incl. fan tray and connector
  - Assembly material included

! Fan module has to be on the right side of the horizontal card mounting kit
- Fan not included in the scope of delivery



*This space is necessary for the air flow.
Assemble blind panel or monitoring module



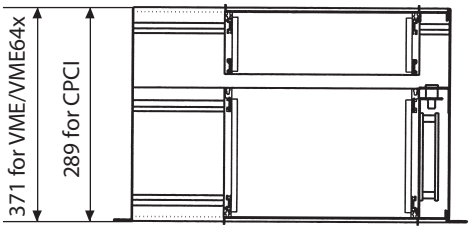
4.5.3.2 EMC Horizontal Card Mounting Kit for Double Eurocards (6 U)

U	Nominal height	Part-No. CPCI	Part-No. VME64x
4	28 HP	14K987-60	14K988-60

4.5.3.3 EMC Horizontal Card Mounting for 80 / 160 mm Rear I/O Double Eurocards (6 U)

- For 160 mm card depth (VME + VME64x)
- For 80 mm card depth (CPCI)
- For backplane mounting
- **Scope of delivery:**
  - 1 complete set incl. assembly material and cover on side

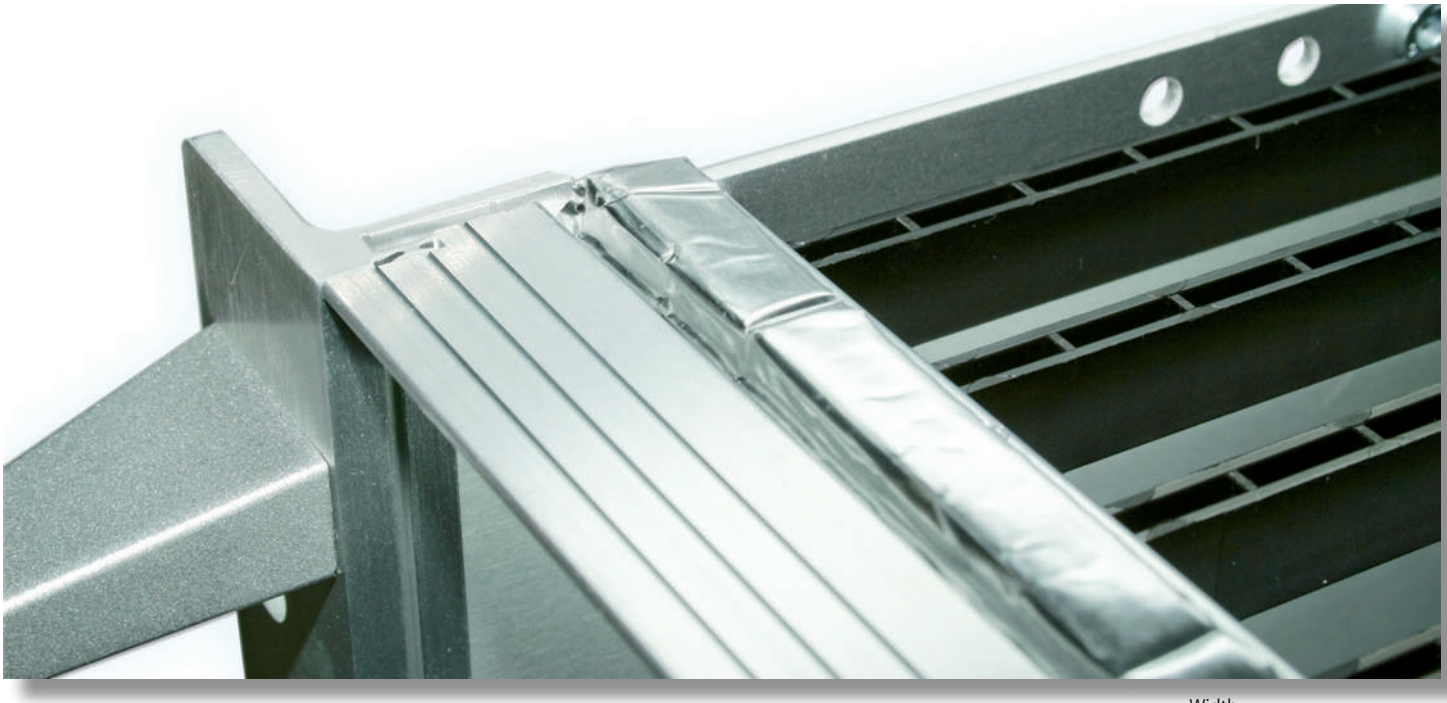
Top view





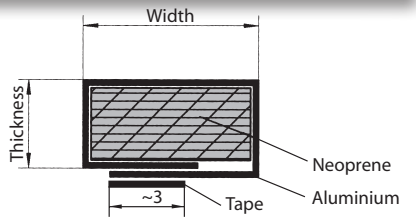
4.5.3.3 EMC Horizontal Card Mounting for 80 / 160 mm Rear I/O Double Eurocards (6 U)

U	Nominal height	Part-No. CPCI	Part-No. VME64x
4	28 HP	14K988-10	14K990-10

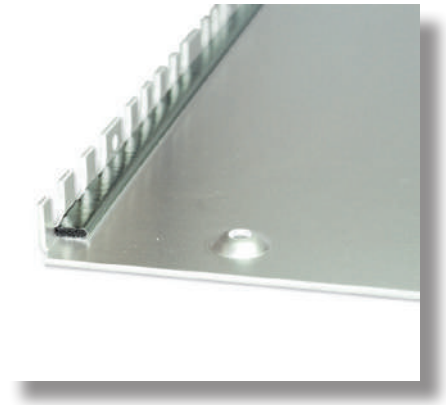


4.6 Step E: EMC Shielding

4.6.1 EMC-Set for Bottom/Top Panel, Depth (Advanced EMC-level)



- Use in conjunction with 4.6.2
- **Scope of delivery:**
  - 4 EMC-gasket for depth



4.6.1 EMC-Set for Bottom/Top Panel, Depth (Advanced EMC-level)

Depth	Part-No.
289 / 291 mm	63K836-15
371 mm	63K836-16
400 mm	63K836-04
500 mm	63K836-05

4.6.2 EMC-Set for Bottom / Top Panel, Width (Advanced EMC-level)

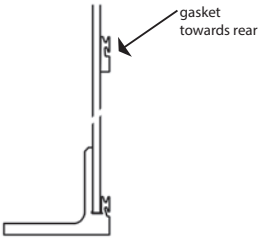
- Use in conjunction with 4.6.1
- **Scope of delivery:**
  - 4 EMC-gasket for width



4.6.2 EMC-Set for Bottom / Top Panel, Width (Advanced EMC-level)

Description	Part-No.
4 gaskets, 4 mm x 7 mm x 84 HP, when using height reduction kits 4.4.1 - 4.4.4 at front and rear	63K836-01
4 gaskets, 6 mm x 7 mm x 84 HP, use without height reduction kits (only extrusions)	63K836-02
2 gaskets, 6 mm x 7 mm x 84 HP and 2 gaskets 4 mm x 7 mm x 84 HP, when using only one height reduction kit 4.4.1 - 4.4.4 at front or rear	63K836-03

4.6.3 Extrusion for Recessed EMC Mounting (Basic EMC-level)



- Interior fitting: extrusion bolts with side panel
- **Scope of delivery:**
  - 2 EMC-extrusions
  - 8 cylinderhead screws M2.5 x 4, Torx T8
- Application: recessed installation of front panel

! Can be used in conjunction with EMC sets 4.6.1 + 4.6.2 and gasket (4.6.4) to achieve advanced EMC level



4.6.3 Extrusion for Recessed EMC Mounting (Advanced EMC-level)

System height	Extrusion height	in mm	Part-No.
4 U	~3 U	140 mm	63K608
7 U	~6 U	280 mm	63K609

4.6.4 EMC-Gasket for Height Extrusion, Front Panel (Advanced EMC-level)

- Front / rear recessed mounting
- Front panels; 1. slot
- Application: height extrusion front/rear, front panel
- The gasket is installed onto the extrusion
- Use the EMC-gasket in card height whenever used in additon with cards
- When a height reduction is used, choose height between reductions

! Can be used in conjunction with EMC sets (4.6.1 - 4.6.3) to achieve advanced EMC level



4.6.4 EMC-Gasket for Height Extrusion, Font Panel (Advanced EMC-level)

U	in mm	Part.-No.
3	101.60 mm	81-062-03
4	146.05 mm	81-062-04
6	234.95 mm	81-062-06
7	279.40 mm	81-062-07
9	368.30 mm	81-062-09

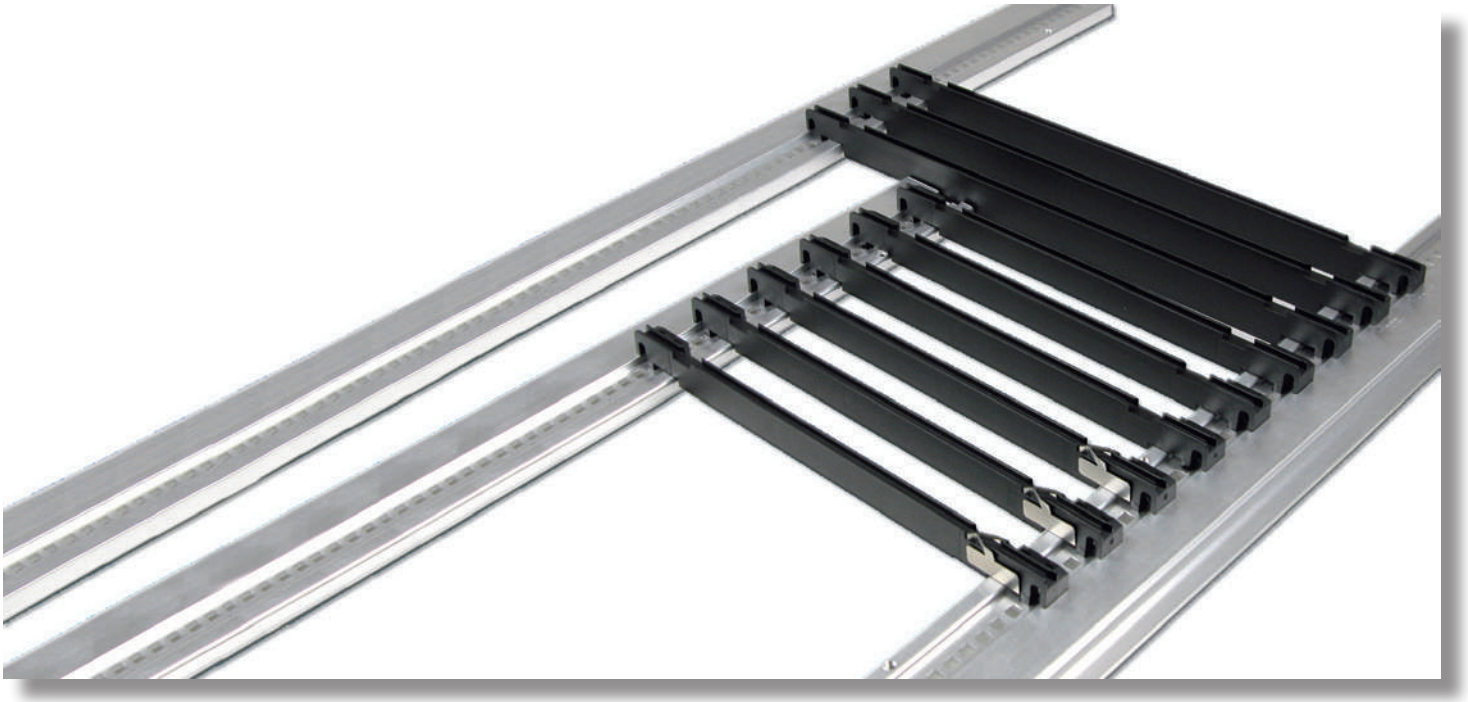
4.6.5 EMC Contact Strips (Advanced EMC-level)

- For front panels, fixing on extrusion
- Self adhesive
- **Scope of delivery:**
  - 2 contact strips



4.6.5 EMC Contact Strips (Advanced EMC-level)

HP	Length	Part-No.
42	212.1 mm = 8.48"	63-836-67
84	424.2 mm = 16.97"	63-836-70

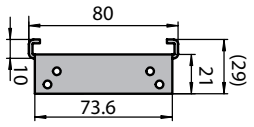


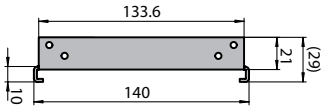
4.7 Step F: General Accessories

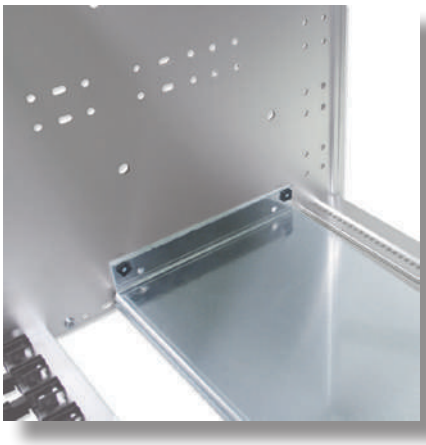
4.7.1 Mounting Chassis

4.7.1.1 Mounting Chassis, Rugged Design (Aluminium, 2 mm)

- **Scope of delivery:**
  - Assembly material included
    (4 earthing nuts M4, 4 cylinderhead screws M4 x 6, Torx T20)
  - Mounting chassis 85 HP (431.8 mm)





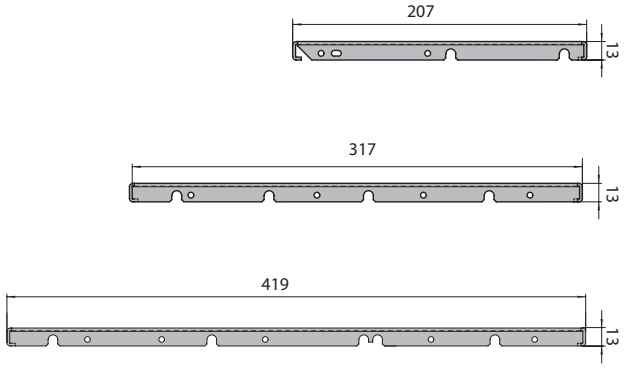


4.7.1.1 Mounting Chassis, Rugged Design (Aluminium, 2 mm)

Description	Part-No.
Depth: 140 mm	14K836-50

4.7.1.2 Mounting Chassis Full Depth of Systemkit 12K

- For mounting non-standard modules and components
- Mounting chassis is fixed directly on the side panel
- Aluminium 2.0 mm, raw
- **Scope of delivery:**
  - 1 mounting chassis
- Assembly material see below
- Mounting chassis depth 207 mm can be mounted with 4 screws (317mm with 8 screws, 419mm with 10 screws)





4.7.1.2 Mounting Chassis, Rugged Design (Aluminium, 2 mm)

Sub Rack Depth		Chassis Depth		Part-No.
mm	inch	mm	inch	
289 / 291 mm	11.37 / 11.45	207 mm	8.15	14K850
400 mm	15.74	317 mm	12.48	14K851
500 mm	19.68	419 mm	16.49	14K852

Assembly Material

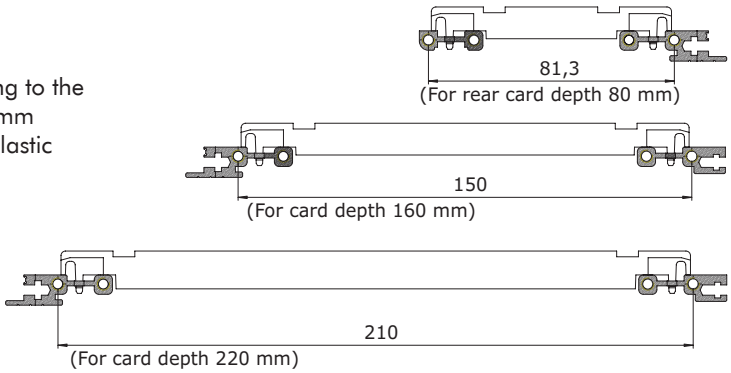
- For one mounting chassis
- **Scope of delivery:**
  - 4 Torx cylinder head screw M4 x 6, size T20
  - 4 earthing nut M4

Description	Part-No.
Assembly material for mounting chassis with Torx-Screws	63K861

4.7.2 Card Guides

4.7.2.1 Card Guides IEC

- For positive location of circuit boards and plug-in units conforming to the dimensions of card depths 80 mm, 160 mm, 220 mm and 280 mm
- The card guides are non-flammable, made from a highquality plastic material reinforced with fibreglass UL94 V-0
- Including ESD provisions





4.7.2.1.1 Card Guides 1-Slot, IEC

- **Scope of delivery:**
  - Card guide black plastic UL94 V-0
- ESD Clip see below (not usable for card depth 80 mm)

Card Thickness		Card Depth		Part-No.
mm	inch	mm	inch	
1.6	0.06	80	3.15	61-019
		160	6.30	61-044
		220	8.66	61-039
		280	11.02	61-017
2.0	0.08	160	6.30	61-087
		220	8.66	61-039
		280	11.02	61-169



4.7.2.1.2 ESD Clips

- Connecting printed board with case
- Stainless steel

Description	Part-No.
ESD clip front bottom/rear top	61-419-01
ESD clip front top/rear bottom	61-419-02



4.7.2.1.3 Card Guides 7-Slot in 4 HP Steps, IEC

- For reduced assembly time of multiple slot applications
- For use with single, double and triple eurocards with a depth of 160 mm
- For card thickness: 1.6 mm / 0.06"
- Black plastic, UL94 V-0
- ESD Clip not usable

Card Thickness		Card Depth		Part-No.
mm	inch	mm	inch	
1.6	0.06	160	6.30	61-076



4.7.2.1.4 Aluminium Card Guides 1-Slot, 3 Parts, IEC

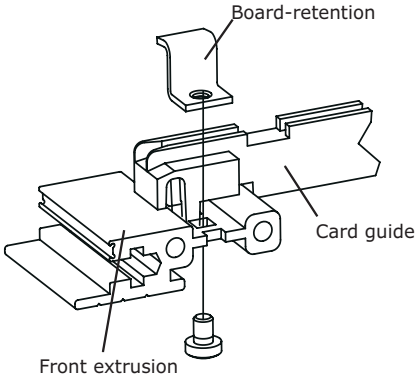
- Extrusion: Aluminium
- End feet: plastic, UL94 HB
- For card thickness: 1.6 mm / 0.06"
- Card guide extrusion, aluminium, clear anodised
- ESD clip not usable

Extrusion

Card Depth		Length		Part-No. Aluminium
mm	inch	mm	inch	
160	6.30	112.5	4.43	66-122-20
220	8.66	172.5	6.79	66-122-21
280	11.02	232.5	9.15	66-122-22
340	13.38	292.5	11.51	66-122-23
400	15.74	352.5	13.87	66-122-24
-	-	1350	53.15	66-122-14

End Feet

Description	Part-No. 1 Pair
End feet plastic, UL94 HB	61-069

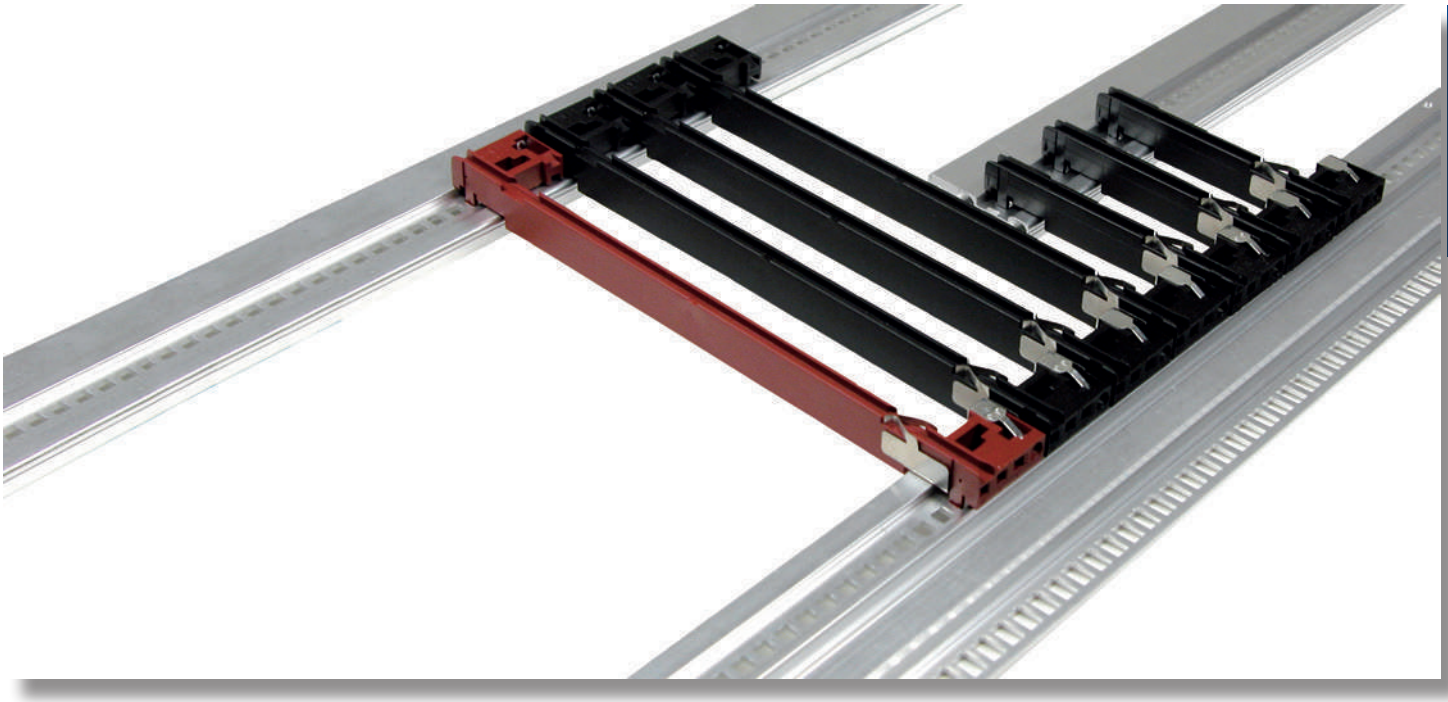


4.7.2.1.5 Card Guide Board-Retention Bar

Description	Part-No. 20 pcs.
Board-retention bar, zinc-plated steel	61-291

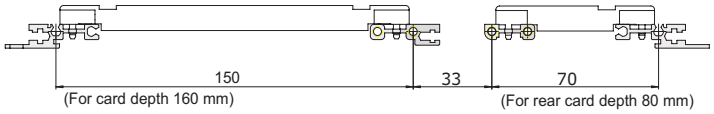
Assembly Material

Description	Part-No.
Cross recessed round head screw M3 x 4	5331-04
Torx cylinder head screw M3 x 4, size T10	5470-01



4.7.2.2 Card Guides acc. to IEEE

- For positive location of PCBs and plug-in units conforming to the dimensions of card depths 80 mm, 160 mm, 220 mm, 280 mm and 340 mm
- The card guides are non-flammable, made from a highquality plastic material reinforced with fibreglass UL94 V-0
- With ESD provisions
- With keying and alignment pin possibilities





4.7.2.2.1 Card Guides 1-Slot, IEEE

- Card thickness 1.6 mm / 0.06" and 2.0 mm / 0.08"
- Plastic UL94 V-0

Card Depth mm	Card Depth inch	Colour	Part-No. 1 Pair
80	3.15	black	61-949-01

Card Depth mm	Card Depth inch	Colour	Part-No. 1 pc.
160	6.30	black	61-950-01
160	6.30	red	61-950-03

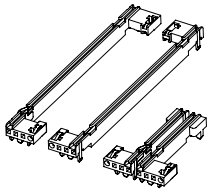


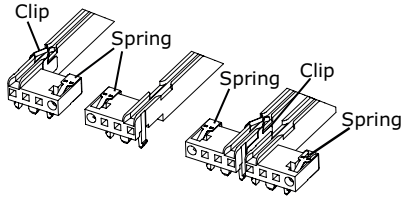
4.7.2.2.2 Card Guides 1-Slot, incl. mounted ESD-Components, IEEE

- Bottom: 1 ESD clip and 1 ESD spring
- Top: 1 ESD spring
- Black plastic UL94 V-0

Card Depth mm	Card Depth inch	Description	Part-No. 1 Pair
80	3.15	1 pair top/bottom	61-949-02

Card Depth mm	Card Depth inch	Description	Part-No. 1 pc.
160	6.30	1 piece bottom	61-950-02
160	6.30	1 piece top	61-950-04







4.7.2.2.3 Aluminium Card Guides 1-Slot, 3 Parts, 1.6 mm, IEEE

- Extrusion: Aluminium
- End feet: Plastic UL94 V-0
- For card thickness 1.6 mm / 0.06" and 2.0 mm / 0.08"

Extrusion

Card Depth		Part-No.
mm	inch	
160	6.30	66-452-20
220	8.66	66-452-25
280	11.02	66-452-30
340	13.38	66-452-35

End Feet

Colour	Part-No. 1 Pair
Black	61-955-01
Red	61-955-03

End Feet Offset

Colour	Part-No. 1 Pair
Pearlwhite	61-961-01



4.7.2.2.4 Aluminium Card Guides 1-Slot, 3 Parts, 2.4 mm, IEEE

- Extrusion: Aluminium
- End feet: Plastic UL94 V-0
- For card thickness 2.4 mm / 0.094"

Extrusion

Card Depth		Part-No. 1 pc.
mm	inch	
160	6.30	66-453-20
220	8.66	66-453-25
280	11.02	66-453-30
340	13.38	66-453-35

End Feet

Colour	Part-No. 1 Pair
Black	61-956-01



4.7.2.2.5 ESD Clips

- Connecting printed board with case

Description	Part-No.
ESD clip front bottom/rear top	61-419-01
ESD clip front top/rear bottom	61-419-02



4.7.2.2.6 ESD Spring

- Connecting ESD pin with case
- BeCu tinned
- Note: Notch inward-looking

Description	Part-No.
ESD spring	61-420



4.7.2.2.7 Coding Pins

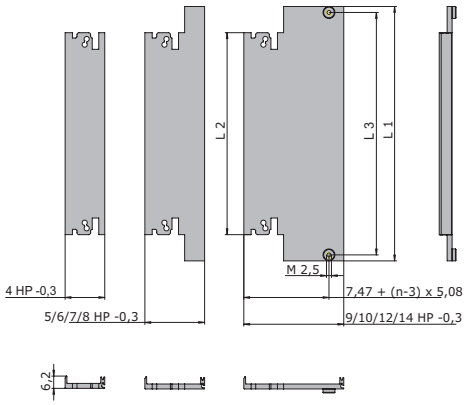
- Acc. to IEC 60297-3-103
- Plastic, UL94 V-0
- Can be rotated in 4 positions

Description	Part-No.
Grey	81-054-02
Dark red	81-054-06
Black	81-054-04

4.7.3 Plug-in Units

4.7.3.1 EMC Front Panels for IEC Plug-In Units with Cutouts for Ejector Handles acc. to IEC

- EMC Front Panels Aluminium with EMC Gasket
- Excellent EMC shielding
- Immune to snagging
- EMC-gasket slides onto the extrusion
- **Scope of delivery:**
  - EMC front panel, incl. pressed-in bushes M2.5 (size ≥ 10 HP)
- EMC-gasket see below
- Handle has to be ordered separately, see 4.7.3.2
- Front panel screw (size ≥10 HP), see below





4.7.3.1.1 Front Anodised, Rear Conductive (2 cutouts)

- With 2 cutouts (bottom + top)

Width	Part-No. 3 U	Part-No. 6 U	Part-No. 9 U
4 HP	66-514-23	66-514-26	66-514-29
5 HP	66-515-23	66-515-26	-
6 HP	66-516-23	66-516-26	66-516-29
7 HP	66-517-23	66-517-26	-
8 HP	66-518-23	66-518-26	66-518-29
9 HP	66-519-23	66-519-26	-
10 HP	66-520-23	66-520-26	66-520-29
12 HP	66-522-23	66-522-26	-
14 HP	66-534-23	66-534-26	-

4.7.3.1.2 Front Anodised, Rear Conductive (1 cutout)

- With 1 cutout (bottom)
- Incl. pressed-in centring pin and bush M2.5 (top)
- Incl. cutout for mounting of card holder 61-156 (top) with screw 5322-08 (see 2.2.2.7)

Width	Part-No. 3 U
4 HP	66-514-43
5 HP	66-515-43
6 HP	66-516-43
8 HP	66-518-43
10 HP	66-520-43
12 HP	66-522-43
14 HP	66-534-43

Dimensions

Height	L1 mm	L1 inch	L2 mm	L2 inch	L3 mm	L3 inch
3 U	128.55	5.06	102.05	4.01	122.50	4.82
6 U	261.90	10.31	235.40	9.27	255.85	10.07
9 U	395.25	15.56	368.75	14.51	389.20	15.32



4.7.3.1.4 EMC-Gasket (Stainless Steel)

Unit	Part-No. 3 U	Part-No. 6 U	Part-No. 9 U
1 pc.	81-062-03	81-062-06	81-062-09

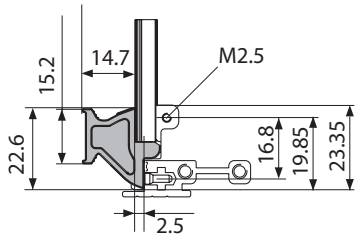
Front Panel Screw

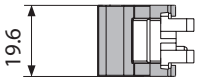
- For EMC front panels size ≥ 10 HP = 2 additional screws are needed

Description	Part-No.
Cross recessed round head screws M2.5 x 12.7	61-287
Torx screws M2.5 x 11.3, size T8	5443-08

4.7.3.2 Ergonomic Ejector Handles acc. to IEC

- Simple assembly of plug-in units
- Allows trouble-free extraction of electronic units with multi-pole connectors
- Main features in one part: card holder, ejector handle and centring pin
- Reset spring for safe insertion
- One version for top and bottom only
- Handle is injection moulded, glass-reinforced plastic, UL94 V-0
- Card holder is zinc die-cast, nickel plated
- Reset spring is stainless steel
- **Scope of delivery:**
  - Ejector handle
  - Assembly material (cross recessed screws M2.5 for fixing of card holder/printed board/front panel)
- Front panel with special cutouts have to be ordered separately



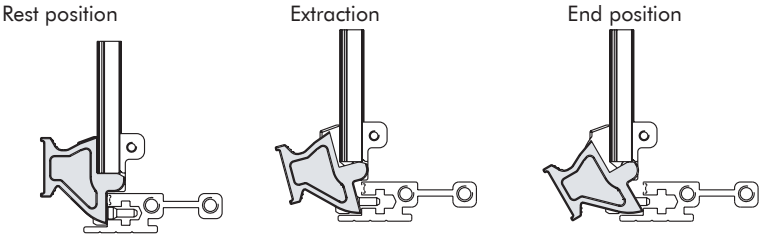




4.7.3.2 Ergonomic Ejector Handles acc. to IEC

Description	Part-No.
Ejector handle black	81-233
Ejector handle grey	81-234

Extraction process:

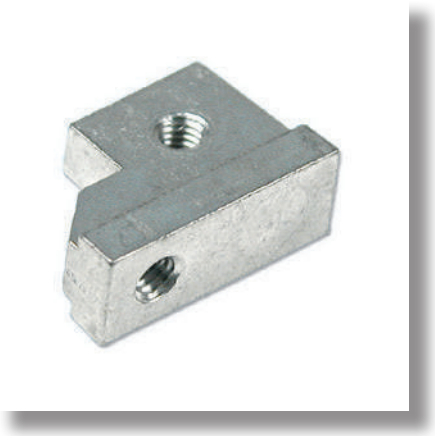


Label

Description	Part-No.
1 sheet A4 of 220 labels	81-031

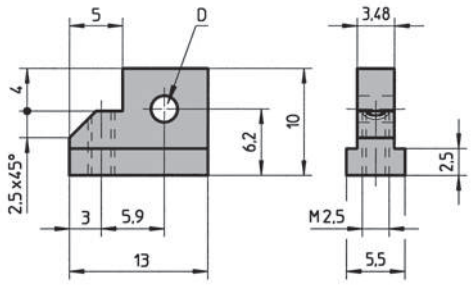
4.7.3.3 Card Holder acc. to IEC Standard

- By using the zinc die-cast card holder, flat front panels and EMC front panels acc. to IEC can be connected to a PC card to form a plug-in unit
- The card can be mounted both in the standard position and offset 1 HP (5.08 mm)
- **Scope of delivery:**
  - Card holder
- Assembly material see below



4.7.3.3.1 Card Holder without Swivel Stop

Description	Application	D	Part-No.
Card holder without swivel stop	Without injector / ejector handle	M2.5	61-156



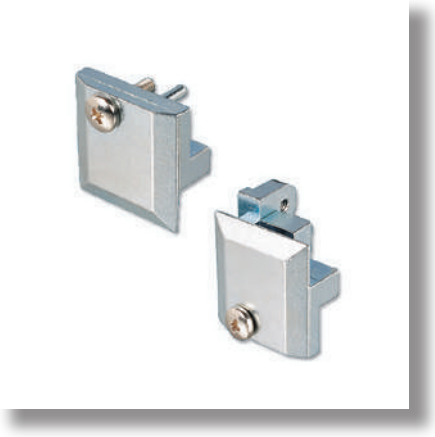


Assembly Material

Description	Application	Part-No.
Cross recessed countersunk screw M2.5 x 8	For card holder	5322-08
Torx countersunk screw M2.5 x 8, size T8	For card holder	5470-21
Slotted pan head screw M2.5 x 6	For printed board	5571-06
Torx cylinder head screw M2.5 x 6, size T8	For printed board	5470-04

4.7.3.4 Card Holder/End Piece without ESD Pin

- **Scope of delivery:**
  - End piece card holder (zinc die-cast, nickel plated)
  - Assembly material
    (screws M2.5 for fixing of front panel/card holder/printed board)



4.7.3.4 Card Holder/End Piece *without* ESD Pin

Description	Part-No.
Top	81-018-01
Bottom	81-019-01

4.7.3.5 EMC Front Panels Aluminium with EMC Gasket acc. IEEE

- Excellent EMC shielding
- Immune to snagging
- EMC-gasket slid onto the extrusion
- **Scope of delivery:**
  - EMC front panel, incl. press-in bushes M2.5 (size ≥ 10 HP)
- EMC-gasket see below
- Handle has to be ordered separately, see 4.7.3.7
- Front panel screw (size ≥9 HP), see 4.7.3.5.5



4.7.3.5.1 Front Anodised, Rear Conductive (2 cutouts)

- With 2 cutouts (bottom + top)

Width	Part-No. 3 U	Part-No. 6 U
4 HP	66-514-23	66-514-26
5 HP	66-515-23	66-515-26
6 HP	66-516-23	66-516-26
7 HP	66-517-23	66-517-26
8 HP	66-518-23	66-518-26
9 HP	66-519-23	66-519-26
10 HP	66-520-23	66-520-26
12 HP	66-522-23	66-522-26
14 HP	66-534-23	66-534-26

4.7.3.5.2 Front Anodised, Rear Conductive (1 cutout)

- With 1 cutout (bottom)
- Incl. pressed-in centring pin and bush M2.5 (top)
- Incl. cutout for mounting of card holder 61-156 (top) with screw 5322-08 (see 2.2.2.4)

Width	Part-No. 3 U
4 HP	66-514-43
5 HP	66-515-43
6 HP	66-516-43
8 HP	66-518-43
10 HP	66-520-43
12 HP	66-522-43
14 HP	66-534-43



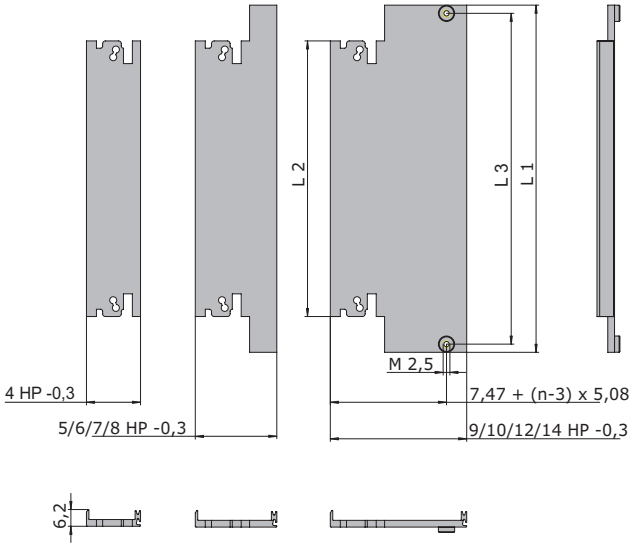
4.7.3.5.4 EMC-Gasket (Stainless Steel)

Unit	Part-No. 3 U	Part-No. 6 U
1 pc.	81-062-03	81-062-06

4.7.3.5.5 Front Panel Screw

- For EMC front panels size ≥ 9 HP = 2 additional screws are needed

Description	Part-No.
Cross recessed round head screws M2.5 x 12.7	61-287
Torx screws M2.5 x 11.3, size T8	5443-08



Dimensions

Height	L1 mm	L1 inch	L2 mm	L2 inch	L3 mm	L3 inch
3 U	128.55	5.06	102.05	4.01	122.50	4.82
6 U	261.90	10.31	235.40	9.27	255.85	10.07



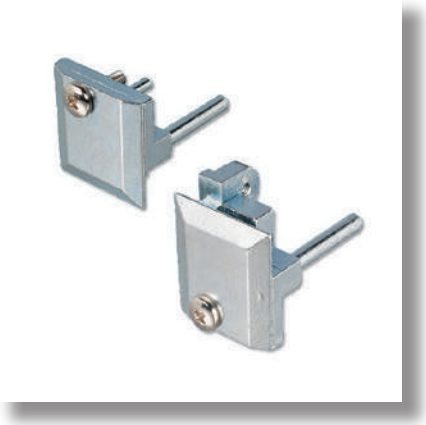
4.7.3.7 Injector/Ejector Handles acc. to IEEE

Type			Mounting	ESD Pin	Colour	Part-No.
Ergonomic			Bottom	With ESD-pin	Black	81-076
Ergonomic			Top	With ESD-pin	Black	81-075
Ergonomic			Bottom	Without ESD-pin	Black	81-076-01
Ergonomic			Top	Without ESD-pin	Black	81-075-01
Ergonomic	Hot Swap		Bottom	With ESD-pin	Black	81-096
Ergonomic	Hot Swap		Top	With ESD-pin	Black	81-095
Ergonomic	Hot Swap		Bottom	Without ESD-pin	Black	81-096-01
Ergonomic	Hot Swap		Top	Without ESD-pin	Black	81-095-01
Ergonomic	Hot Swap	Offset	Bottom	With ESD-pin	Black	81-185
Ergonomic	Hot Swap	Offset	Top	With ESD-pin	Black	81-184
Classic			Bottom	With ESD-pin	Black	81-261
Classic			Top	With ESD-pin	Black	81-260
Classic		Offset	Bottom	With ESD-pin	Black	81-161
Classic		Offset	Top	With ESD-pin	Black	81-160
Classic	Hot Swap		Bottom	With ESD-pin	Black	81-256
Classic	Hot Swap		Top	With ESD-pin	Black	81-255
Classic	Hot Swap	Offset	Bottom	With ESD-pin	Black	81-156
Classic	Hot Swap	Offset	Top	With ESD-pin	Black	81-155
Telecom	Hot Swap		Bottom	With ESD-pin	Black	81-206
Telecom	Hot Swap		Top	With ESD-pin	Black	81-205
Telecom	Hot Swap		Bottom	Without ESD-pin	Black	81-206-01
Telecom	Hot Swap		Top	Without ESD-pin	Black	81-205-01
Telecom	Hot Swap	Offset	Bottom	With ESD-pin	Black	81-189
Telecom	Hot Swap	Offset	Top	With ESD-pin	Black	81-188
Telecom long	Hot Swap		Bottom	With ESD-pin	Black	81-215
Telecom long	Hot Swap		Top	With ESD-pin	Black	81-214
Telecom long	Hot Swap	Offset	Bottom	With ESD-pin	Black	81-116
Telecom long	Hot Swap	Offset	Top	With ESD-pin	Black	81-117
Microswitch						81-088-1 (10 pcs.)

For more information refer to chapter C|3 "Handles".

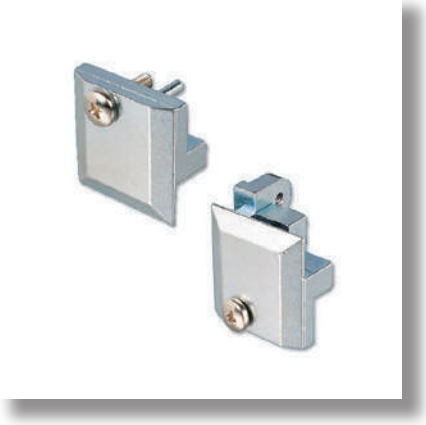
4.7.8.8 Card Holder and Coding Pins acc. to IEEE

- **Scope of delivery:**
  - End piece card holder (zinc die-cast, nickel plated)
  - Assembly material
    (screws M2.5 for fixing of front panel/card holder/printed board)



4.7.3.8.1 Card Holder/End Piece *with* ESD Pin

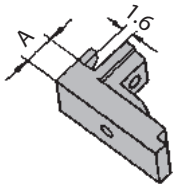
Description	Part-No.
Top	81-018
Bottom	81-019



4.7.3.8.2 Card Holder/End Piece *without* ESD Pin

Description	Part-No.
Top	81-018-01
Bottom	81-019-01





4.7.3.8.3 Middle Part

- Usable for all front panels
- For positioning and fixing of 6 U and 9 U cards, card thickness 1.6 mm
- Material: Plastic UL94 V-0

Description	A		Part-No.
	mm	inch	
Aluminium 2.5 mm	2.5	0.10	61-960

Assembly Material

Description	Part-No.
PT-countersunk, 2.5 x 6	5534-06



4.7.3.8.4 Coding Pins

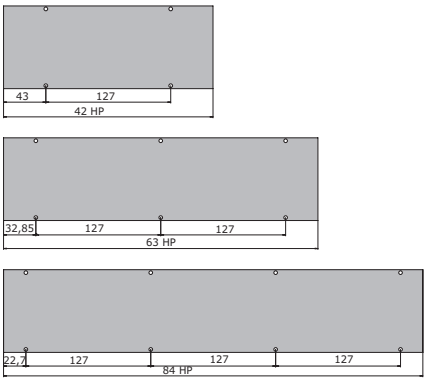
- Acc. to IEC 60297-3-103
- Plastic, UL94 V-0
- Can be rotated in 4 positions

Description	Part-No.
Grey	81-054-02
Dark red	81-054-06
Black	81-054-04

4.7.4 Front Panels

4.7.4.1 EMC Flat Front Panels

- Aluminium 2.5 mm (conductive)
- Closes the front or rear of the sub rack with very high shielding effectiveness
- Contact between the flat front panel and the case is made via EMC gaskets

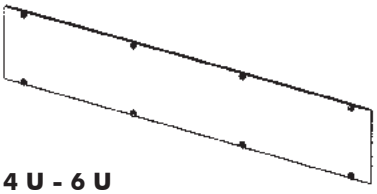


4.7.4.1.1 Advanced EMC Level

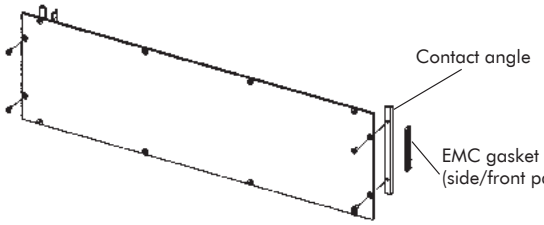
- **Scope of delivery:**
  - EMC flat front panel
  - Contact angle, incl. screws (4 + 6 U version only)
  - EMC gasket for contact angle (4 + 6 U version only)
- Front panel screws see below
  - Front panel width 42 HP = 4 screws
  - Front panel width 63 HP = 6 screws
  - Front panel width 84 HP = 8 screws

Width	Part-No. 1 U	Part-No. 2 U	Part-No. 3 U	Part-No. 4 U	Part-No. 6 U
42 HP	-	-	21C342	-	-
63 HP	-	21C263	21C363	21C463	-
84 HP	21C184	21C284	21C384	21C484	21C684

1 U - 3 U



4 U - 6 U



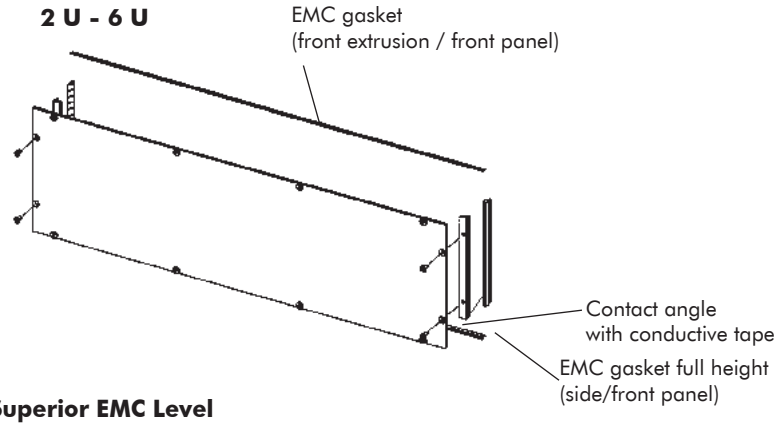
4.7.4.1.2 Front Panel Screws

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3, size T8, with press-fit bush	63K480
Screw recessed M2.5 x 11.3, with press-fit bush	63-444
Screw cross recessed M2.5 x 12.7, with press-fit bush	63-480

4.7.4.2 Superior EMC Level

- **Scope of delivery:**
  - EMC flat front panel
  - Contact angle, incl. screws
  - EMC gasket for contact angle
  - EMC gasket for front extrusion/front panel
- Front panel screws, see below
  - Front panel width 42 HP = 4 screws
  - Front panel width 63 HP = 6 screws
  - Front panel width 84 HP = 8 screws

2 U - 6 U



4.7.4.2 Superior EMC Level

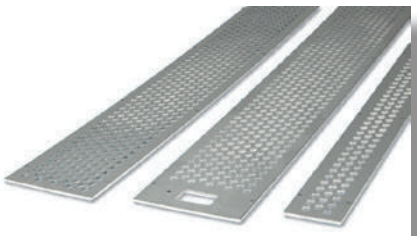
Width	Part-No. 2 U	Part-No. 3 U	Part-No. 4 U	Part-No. 6 U
84 HP	21D284	21D384	21D484	21D684

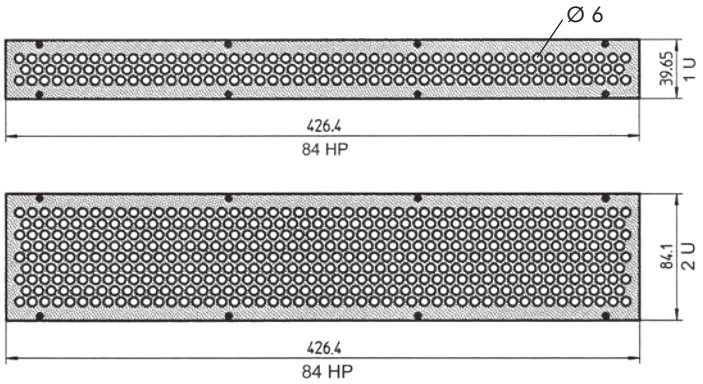
4.7.4.2.1 Front Panel Screws

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3, size T8, with press-fit bush	63K480
Screw recessed M2.5 x 11.3, with press-fit bush	63-444
Screw cross recessed M2.5 x 12.7, with press-fit bush	63-480

4.7.4.3 Perforated EMC Front Panel 84 HP

- Front anodised, rear conductive
- Advanced EMC level
- Width: 84 HP
- **Scope of delivery:**
  - Perforated flat front panel
- Front panel screws see below
- On-off switch see below





4.7.4.3 Perforated EMC Front Panel 84 HP

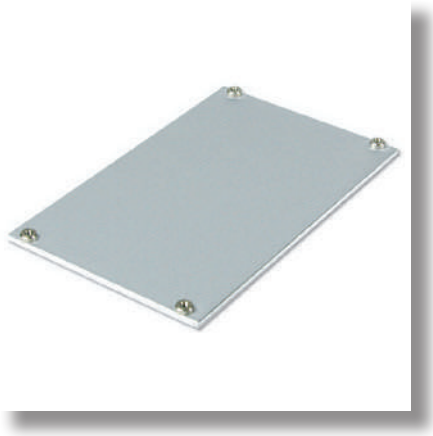
Height			Air Passage	Switch Opening Part-No. without
1 U	39.65 mm	1.56"	4'100 mm²	21C184-01
2 U	84.1 mm	3.31"	12'300/11'700 mm²	21C284-01

Front Panel Screws

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3, size T8, with press-fit bush	63K480
Screws recessed M2.5 x 11.3, with press-fit bush	63-444
Screws cross recessed M2.5 x 12.7, with press-fit bush	63-480

4.7.4.4 EMC Filler Panel without EMC-Gasket

- Front panel standard, solid
- Front clear anodised
- Rear conductive
- Basic level EMC
- **Scope of delivery:**
  - 1 front panel incl. press-fit bushes M2.5 (pressed-in)
- Front panel screws, see below
- Spacer see below



4.7.4.4 EMC Filler Panel without Gasket

Width	Part-No. 3 U	Part-No. 4 U	Part-No. 6 U
4 HP	21B304	-	-
10 HP	21B310	-	-
12 HP	21B312	-	-
16 HP	21B316	21B416	-
21 HP	21B321	21B421	-
42 HP	21B342	21B442	21B642
63 HP	21B363	21B463	-
84 HP	21B384	21B484	21B684

Front Panel Screws

- Front panel width up to 9 HP = 2 screws; ≥ 10 HP = 4 screws

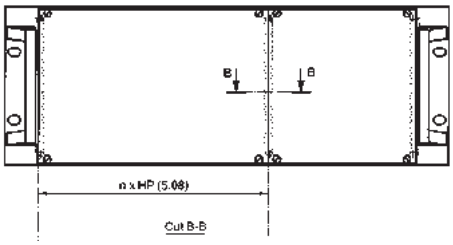
Description	Part-No.
Torx screw, M2.5 x 11.3, size T8	5443-08
Round head screw, cross recessed M2.5 x 12.7	61-287

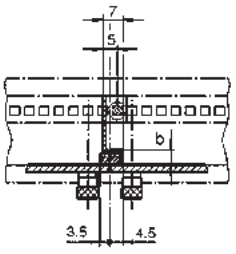


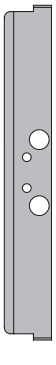
4.7.4.4.1 Spacer for EMC Front Panel Flat

- EMC-Level: Advanced
- **Scope of delivery:**
  - 1 spacer incl. gasket
  - 2 Torx sheet metal screws 2.9 x 6.5; size T 10

Height	Part-No.
3 U	81K023
4 U	81K024
7 U	81K027





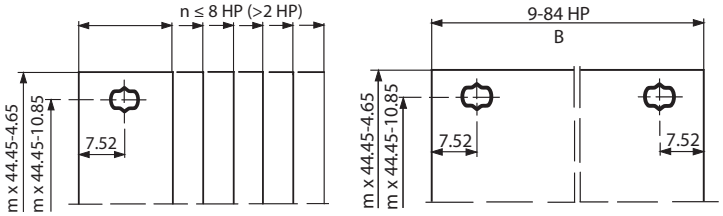


Holes in some cases needed for mounting telescopic rails



4.7.4.5 Flat Front Panels

- For sub racks and enclosures, solid
- Aluminium 2.5 mm, clear anodised (non-conductive)
- **Scope of delivery:**
  - Flat front panel
- Front panel screws, see below



4.7.4.5.1 Flat Front Panels for Sub Racks and Enclosures, Solid

Width	B		Height			Part-No.				
	mm	inch	1 U 39.8 mm	ca. 1 U* 42.15 mm	2 U 84.2 mm	3 U 128.7 mm	4 U 173.1 mm	6 U 262.0 mm	7 U 306.5 mm	9 U 395.4 mm
2 HP	10.0	0.39	-	-	-	21N302	-	21N602	-	-
3 HP	15.2	0.59	-	-	-	21N303	21N403	21N603	-	-
4 HP	20.1	0.79	-	-	-	21N304	21N404	21N604	-	21N904
5 HP	25.2	0.99	-	-	-	21N305	21N405	21N605	-	-
6 HP	30.3	1.19	-	-	-	21N306	21N406	21N606	-	-
7 HP	35.3	1.38	-	-	-	21N307	21N407	21N607	-	-
8 HP	40.4	1.59	-	-	-	21N308	21N408	21N608	-	-
10 HP	50.6	1.99	-	-	-	21N310	21N410	21N610	-	-
11 HP	55.7	2.19	-	-	-	21N311	-	-	-	-
12 HP	60.7	2.38	-	-	-	21N312	21N412	21N612	-	-
14 HP	70.9	2.79	-	-	-	21N314	21N414	21N614	-	-
16 HP	81.1	3.19	-	-	-	21N316	21N416	21N616	-	-
20 HP	101.4	3.59	-	-	-	21N320	21N420	21N620	-	-
21 HP	106.5	4.19	-	-	-	21N321	-	21N621	-	-
28 HP	142.0	5.59	-	-	-	21N328	-	21N628	-	-
32 HP	162.3	6.38	-	-	-	21N332	21N432	-	-	-
42 HP	213.1	8.38	-	-	21N242	21N342	21N442	21N642	-	-
52 HP	263.9	10.38	-	-	-	21N352	21N452	21N652	-	-
63 HP	319.8	12.59	-	-	21N263	21N363	21N463	21N663	-	-
81 HP	411.3	16.19	-	-	21N281	21N381	21N481	-	-	-
84 HP	426.5	16.79	21N184	21N084*	21N284	21N384	21N484	21N684	21N784	21N984

* Coverplates for 1 U fan opening

Front Panel Screws

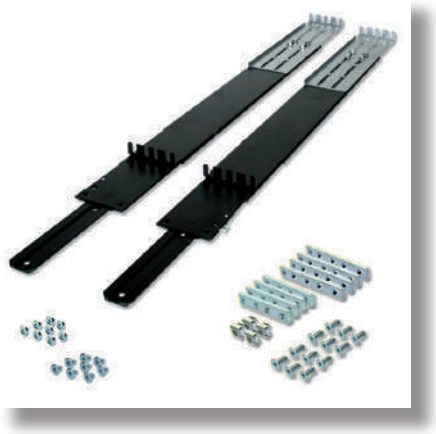
- Set of 10 screws, with screw retainer

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3, size T8 with plastic screw retainer	63K159
Rounded head screws recessed M2.5 x 11.3 with plastic screw retainer	63-159

4.7.5 Telesopic Rails

4.7.5.1 Telescopic Rails, Set (Load Capacity up to 60 kg/Pair)

- Telescopic rails, suitable for all heights
- **Scope of delivery:**
  - 2 telescopic rails
  - Mounting bracket
  - Assembly materal for mounting into cabinet and on module



4.7.5.1 Telescopic Rails, Set (Load Capacity up to 60 kg/Pair)

Max. withdraw	Usable depth min.	max.	Part-No.
511.2 mm	463 mm	681.8 mm	65-051
596.4 mm	564.6 mm	783.4 mm	65-052
719.6 mm	666.2 mm	885.0 mm	65-053

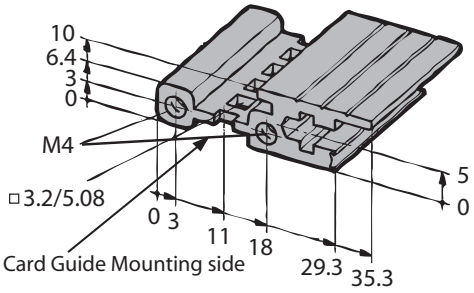
Rugged telescopic rails (load capacity up to 90 kg/pair) on request

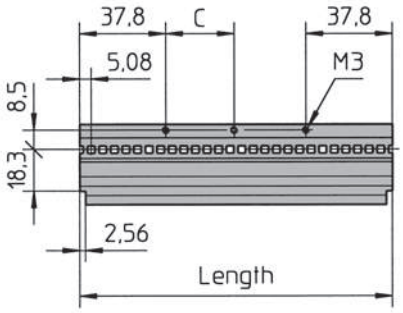
4.8 Step G: Extrusions

4.8.1 Front Extrusions

4.8.1.1 Front Extrusion, VME

- For sub racks and cases front
- Accept 2 x 6 mm tapped strips
- **Scope of delivery:**
  - 1 front extrusion without assembly material



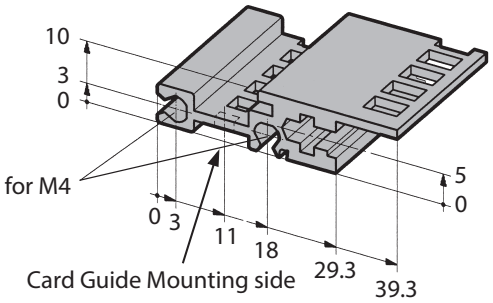


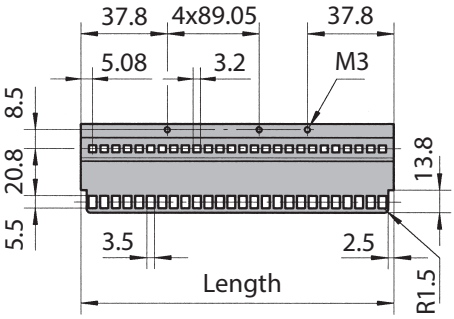
4.8.1.1 EMC Version

Length for HP	mm	inch	Holes n x C	Part-No. clear passivated
84	431.8	17.00	4 x 89.05	66-111-153

4.8.1.2 Front Extrusion, CPCI / VME64x

- Front separation extrusion according to IEEE standard
- Accept 2 x 6 mm tapped strips
- **Scope of delivery:**
  - 1 front extrusion without assembly material





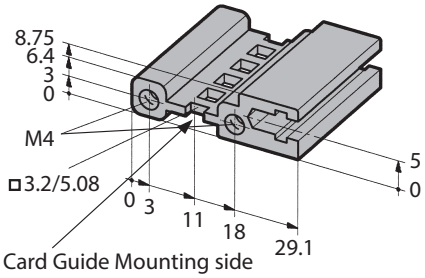
4.8.1.2 Version for Systemkit 12K according to IEEE standard

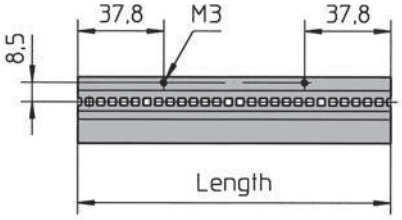
Length for HP	mm	inch	Part-No. clear passivated
84	431.8	17.00	66-677-33

4.8.2 Internal Extrusions

4.8.2.1 Internal Extrusion 66-193 for Insulated Backplane Mounting

- For mounting backplanes in sub racks
- Insulating strip see 4.8.2.7
- Accept 1.8 x 5 mm tapped strips
- **Scope of delivery:**
  - 1 extrusion without assembly material



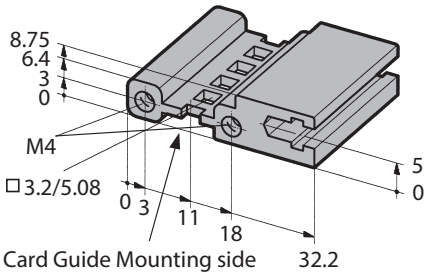


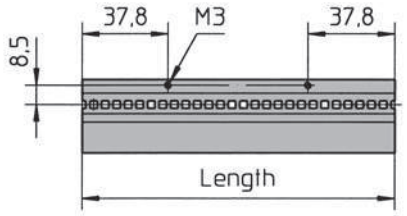
4.8.2.1 Standard Version

Length for HP	mm	inch	Part-No. clear passivated
84	431.8	17.00	66-193-23

4.8.2.2 Internal Extrusion 66-194 for Conductive Backplane Mounting

- For mounting backplanes without an insulating strip
- Accept 1.8 x 5 mm tapped strips
- **Scope of delivery:**
  - 1 extrusion without assembly material



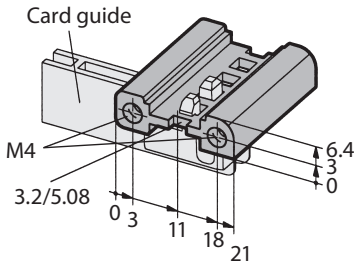


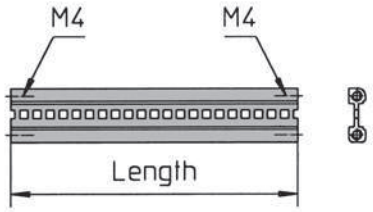
4.8.2.2 Internal Extrusion 66-194 for Conductive Backplane Mounting

Length for HP	mm	inch	Part-No. clear passivated
84	431.8	17.00	66-194-23

4.8.2.3 Internal Extrusion 66-138 for Card Guides

- For mounting card guides
- Tapped strip not required
- **Scope of delivery:**
  - 1 extrusion without assembly material



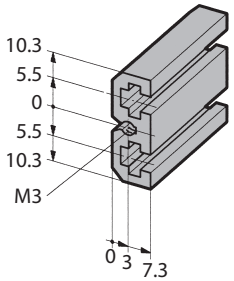


4.8.2.3. Standard Version

Length for HP	mm	inch	Part-No. clear passivated
84	431.8	17.00	66-138-23

4.8.2.5 Double Extrusion 66-192 for Insulated Backplane Mounting

- For mounting backplanes, matches 66-193, 66-288
- For use with insulating strips
- Insulating strip see 4.8.2.7
- Accept 2 x 6 mm tapped strips
- **Scope of delivery:**
  - 1 extrusion without assembly material



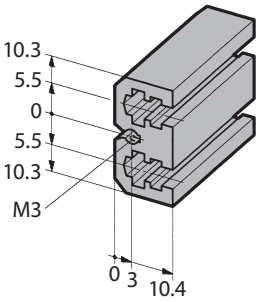
4.8.2.4 Double Extrusion 66-192 for Insulated Backplane Mounting

Length for HP	mm	inch	Part-No. clear passivated
84	426.7	16.79	66-192-23

Assembly material with adapter: 63-175 (63K175 with Torx)

4.8.2.5 Double Extrusion 66-195 for Conductive Backplane Mounting

- For mounting backplanes without insulating strips
- Matches 66-194, 66-289, 66-290
- Accept 2 x 6 mm tapped strips
- **Scope of delivery:**
  - 1 extrusion without assembly material



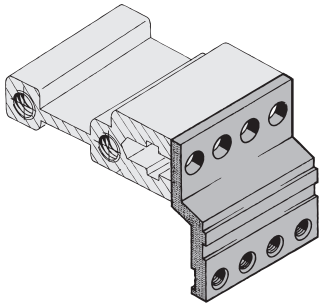
4.8.2.5 Double Extrusion 66-195 for Conductive Backplane Mounting

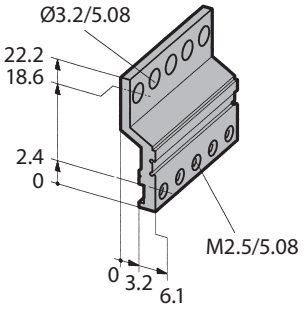
Length for HP	mm	inch	Part-No. clear passivated
84	426.7	16.77	66-195-23

Assembly material with adapter: 63-175 (63K175 with Torx)

4.8.2.6 Edge Connector Extrusion 66-147

- For use with extrusions for backplanes 66-193
- **Scope of delivery:**
  - Edge connector extrusion without assembly material





4.8.2.6 Edge Connector Extrusion

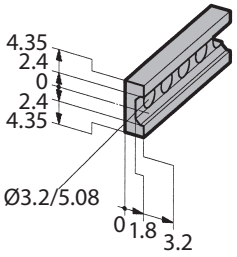
Length			Part-No.	
for HP	mm	inch	clear passivated	raw
8	40.6	1.59	66-147-40	-
18	91.4	3.59	66-147-41	-
28	142.2	5.60	66-147-42	-
42	213.4	8.40	66-147-63	-
63	320.0	12.60	66-147-65	-
81	411.5	16.20	66-147-22	-
84	426.7	16.80	66-147-52	-
	1350.0	53.14	-	66-147-19

Assembly Material

Description	Part-No.
Assembly material M2.5 (for 2 supplementary extrusions)	63-214

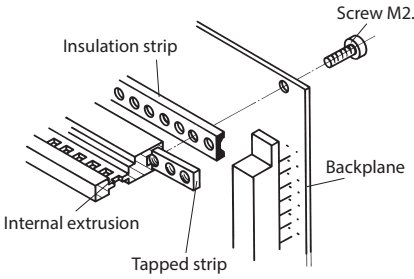
4.8.2.7 Insulating Strips 66-901

- Plastic grey
- In use with extrusions 66-112, 66-192, 66-193, 66-288
- **Scope of delivery:**
  - 1 insulating strip without assembly material



4.8.2.7 Insulating Strips 66-901

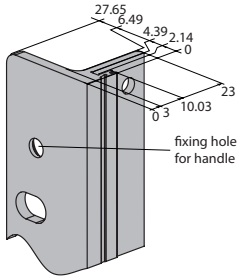
Length			Part-No.
for HP	mm	inch	
42	216.44	8.52	66-901-20
63	323.12	12.72	66-901-21
81	414.56	16.32	66-901-22
84	429.80	16.92	66-901-23



Mounting with Insulation Strips

Description	Part-No.
Cross recessed cylinderhead earthing screw M2.5 x 12	5325-12

4.8.3 Height Extrusions



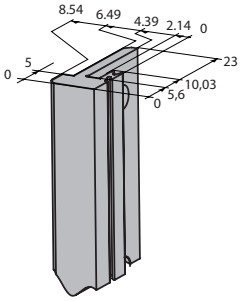
4.8.3.1 Height Extrusions 19" 66-275

- 19" height extrusion type Systemkit 12K
- For standard side panel 2 mm
- Shape to direct mounting of the EMC-gasket 81-062-XX
- **Scope of delivery:**
  - 1 height extrusion without assembly material



4.8.3.1 Height Extrusions 19" 66-275

Length for U	mm	inch	Part-No. clear passivated fixing hole for handle without	with
3	132.5	5.20	66-275-23	66-275-33
4	177.0	6.96	66-275-24	66-275-34
6	265.9	10.46	66-275-26	66-275-36
7	310.3	12.21	66-275-27	66-275-37
9	399.2	15.71	-	66-275-39



4.8.3.2 Height Extrusions 66-274

- 19" height extrusion type Systemkit 12K
- For standard side panel 2 mm
- Shape to direct mounting of the EMC-gasket 81-062-XX
- **Scope of delivery:**
  - 1 height extrusion without assembly material



4.8.3.2 Height Extrusions 66-274

Length for U	mm	inch	Part-No. clear passivated
3	132.5	5.20	66-274-23
4	177.0	6.96	66-274-24
6	265.9	10.46	66-274-26
7	310.3	12.21	66-274-27
9	399.2	15.71	66-274-29

4.8.3.3 Height Extrusions with Cut-out for Telescopic Rails

- 19" height extrusion type Systemkit 12K
- For standard side panel 2 mm
- Cut-out for telescopic rails
- Shape to direct mounting of the EMC-gasket 81-062-XX
- **Scope of delivery:**
  - 1 height extrusion without assembly material



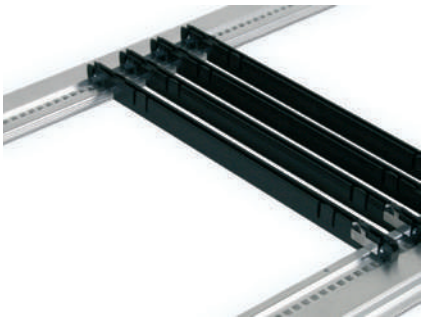
4.8.3.3 Height Extrusions with Cut-out for Telescopic Rails

Length for U	mm	inch	Part-No. clear passivated left	right
3	132.5	5.20	66-274-63	
4	177.0	6.96	66-274-64	
6	265.9	10.46	66-274-66	66-274-76
7	310.3	12.21	66-274-67	66-274-77
9	399.2	15.71	66-274-69	66-274-79



5: Systemkit 12K Rail







5.1 Sub Racks A | 5_2

5.1.1 Systemkit 12 K Rail SNCF, unshielded A | 5_2

5.1.1.1 Bottom / Top Panel A | 5_3

5.1.1.2 Bottom / Top Panel at the Rear A | 5_3

5.1.2 Systemkit 12 K Rail EN 50155, unshielded A | 5_4

5.1.2.1 Bottom / Top Panel for EMC-Shielding A | 5_5

5.2 Card Guides A | 5_6

5.2.1 Rugged Screw-mount Card Guides acc. to IEC A | 5_6

5.2.1.1 Standard Mounting A | 5_7

5.2.2.2 Optional Mounting A | 5_7

5.2.2.3 ESD Clips A | 5_7

5.2.2 Rugged Screw-mount Card Guide acc. to IEEE A | 5_8

5.2.2.1 Standard Mounting A | 5_8

5.2.2.2 Optional Mounting A | 5_9

5.2.2.3 ESD Clips A | 5_9

5.2.2.4 ESD Spring A | 5_9

5.2.2.5 Coding Pins A | 5_9

5.3 General Accessories A | 5_10

5.3.1 Coding Stud A | 5_10

5.3.2 EMC-Shielding material A | 5_10

5.3.2.1 Backplane-Shielding Vertical A | 5_10

5.3.2.2 EMC Contact Strips A | 5_11

5.3.2.3 EMC Gasket for Height Extrusion, Front Panel A | 5_11



5.1. Sub Racks

5.1.1 Systemkit 12 K Rail SNCF, unshielded

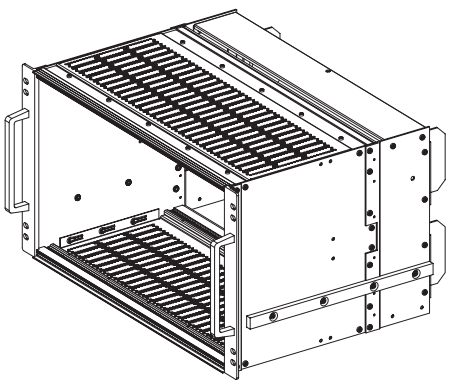
- SNCF listing No. 1306/058
- Tested to NF F61-005 and NFF 60-002 / NF F67-012
- 3 U and 6 U, 21 T, 320 mm for board depth 160 mm and 220 mm
- **Scope of delivery**
  - 2 side panels
  - 2 side panels extrusions
  - 2 external guide rails
  - 2 front extrusions
  - 2 internal extrusions
  - 2 height extrusions
  - 2 insulation strips (4pcs. for 6U-Version)
  - 1 double extrusion (6U-Version only)
  - 4 tapped strips (6 pcs. for 6U-Version)
  - 1 rear frame (2 pcs. for 6U-Version)
  - 2 protection brackets SNCF (4 pcs. for 6U-Version)
  - 2 handles
  - Assembly material (Torx)
- Bottom / Top panel see 1.1.1 and 1.1.2
- Card guides see 2.1
- Coding bolt for back frames see 3.1
- EMC-shielding material see 3.2

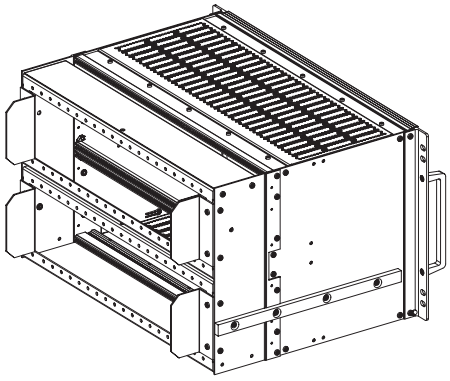


5.1.1 Systemkit 12 K Rail SNCF, unshielded

Description	Part-No.
Systemkit 12 K Rail SNCF 3 U x 84 HP (21T) x 320 mm	12KR384-10
Systemkit 12 K Rail SNCF 6 U x 84 HP (21T) x 320 mm	12KR684-10

Note: 1T = 4 HP = 20.32 mm, Version 9T (36 HP) available upon request

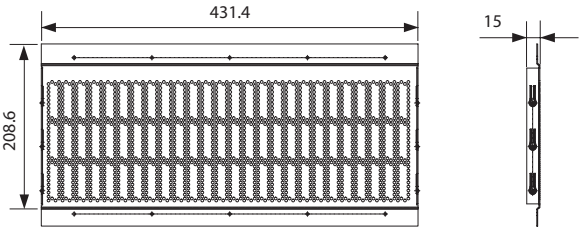




View with mounted front and rear cover panels

5.1.1.1 Bottom / Top Panel for EMC-Shielding

- To shield and protect the sub rack
- Material: Aluminium, 1 mm
- Incl. EMC-contacts
- **Scope of delivery**
  - 1 bottom / top cover panel
  - Assembly material (10 Torx screws M3 x 6)





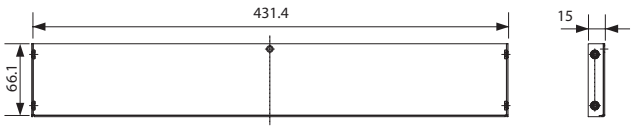
5.1.1.1 Bottom / Top Panel

Description	Part-No.
Bottom / Top panel perforated 84HP (21T), 208.6 mm (card depth 220 mm)	12KR100
Bottom / Top panel perforated 84HP (21T), 148.6 mm (card depth 160 mm)	12KR102

Note: 1T = 4 HP = 20.32 mm, Version 9T (36 HP) available upon request

5.1.1.2 Bottom / Top Panel at the Rear

- Material: Aluminium, 1 mm
- SNCF-specific protection
- **Scope of delivery**
  - 1 bottom / top cover panel
  - Assembly material (4 Torx M4 x 6, 1 countersunk cross recessd M4 x 5)



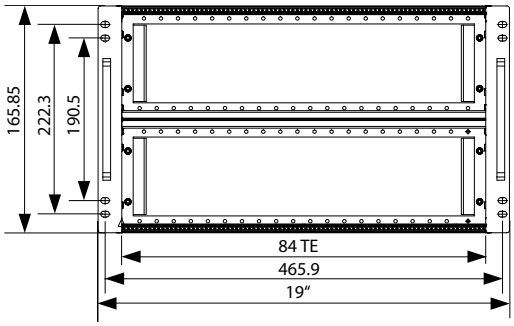


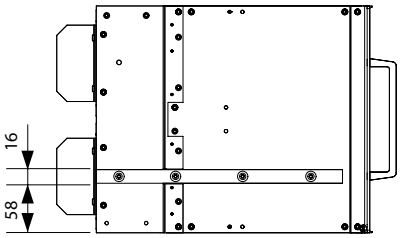
5.1.1.2 Bottom / Top Panel at the Rear

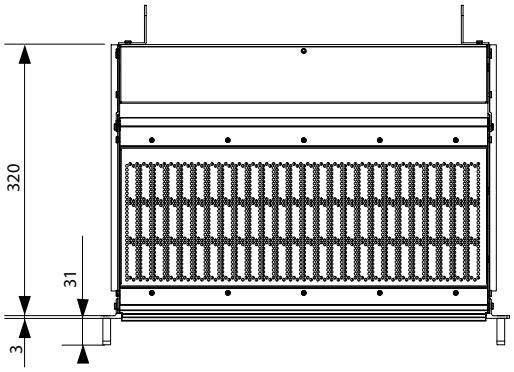
Description	Part-No.
Bottom / top panel at the rear, solid, 66,1 mm	12KR101

Note: 1T = 4 HP = 20.32 mm, Version 9T (36 HP) available upon request

Drawing of Systemkit 12 K Rail SNCF, 6 U-Version









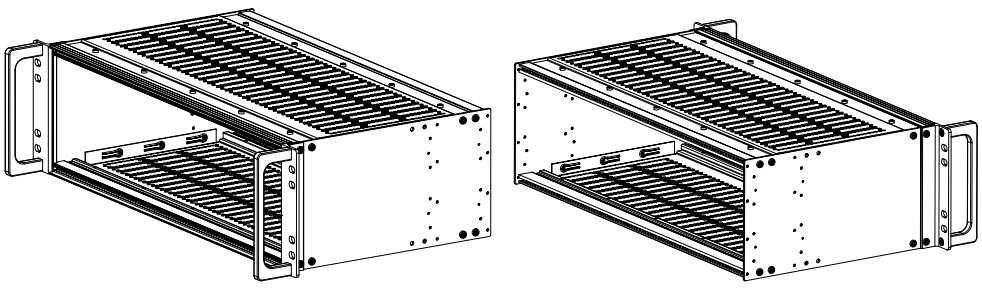
5.1.2 Systemkit 12 K Rail EN 50155, unshielded

- Sub Rack according to IEC and IEEE (CompactPCI)
- Tested to EN 50155
- 3 U and 6 U, 84 HP
- 240 mm for card depth 160 mm and 220 mm
- IEEE-version needs additional bottom / top panels
- **Scope of delivery**
  - 2 side panels
  - 2 front extrusions
  - 2 internal extrusions
  - 2 height extrusions
  - 1 double extrusion (6 U-Version IEC only)
  - 4 tapped strips (6 pcs. for 6 U-Version IEC only)
  - 2 handles
  - Assembly material (Torx)
- Bottom / top panels see 1.2.1
- Card guides see 2.1 and 2.2
- EMC shielding material see 3.2



1.2 Systemkit 12 K Rail SNCF, unshielded

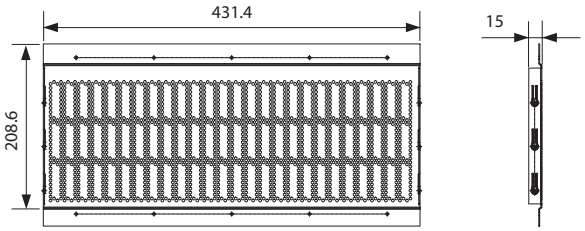
Description	Part-No.
Systemkit 12 K Rail EN 50155, 3 U x 84 HP x 240 mm, IEC	12KR384-20
Systemkit 12 K Rail EN 50155, 6 U x 84 HP x 240 mm, IEC	12KR684-20
Systemkit 12 K Rail EN 50155, 3 U x 84 HP x 240 mm, IEEE	12KR384-21
Systemkit 12 K Rail EN 50155, 6 U x 84 HP x 240 mm, IEEE	12KR684-21



View with mounted cover panels, 3 U-Version

5.1.2.1 Bottom / Top Panel for EMC-Shielding

- To shield and protect the Sub Rack
- Material: Aluminium, 1 mm
- Incl. integrated EMC-Contacts
- **Scope of delivery**
  - 1 bottom / top panel
  - Assembly material (10 Torx screws M3 x 6)

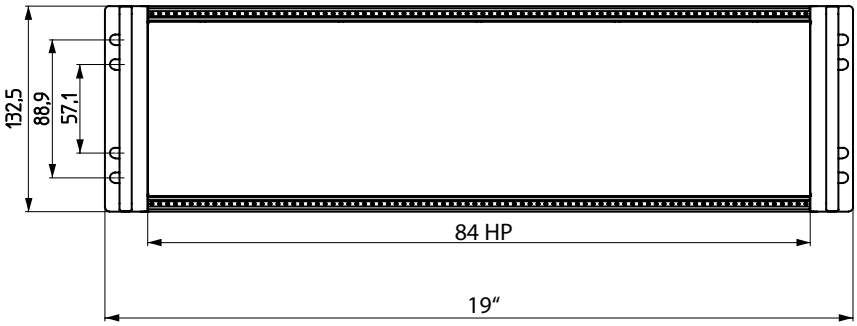


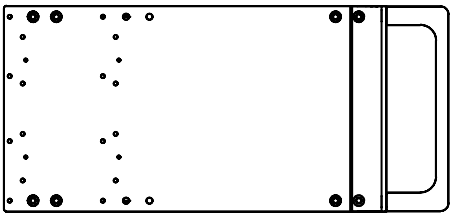


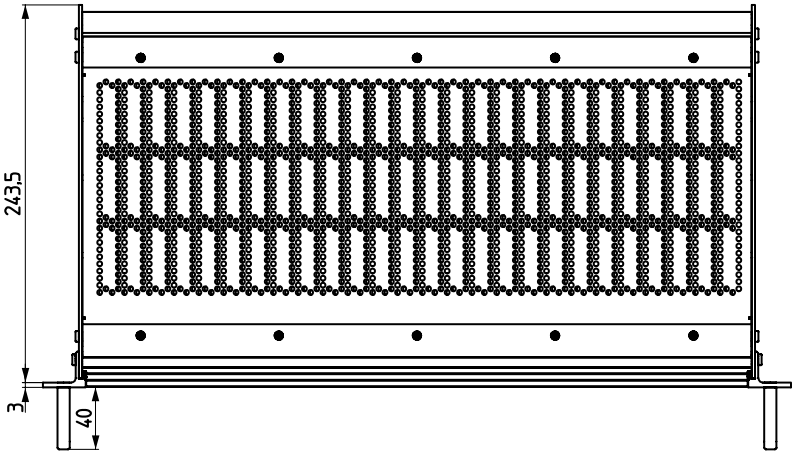
1.2.1 Bottom / Top Panel for EMC-Shielding

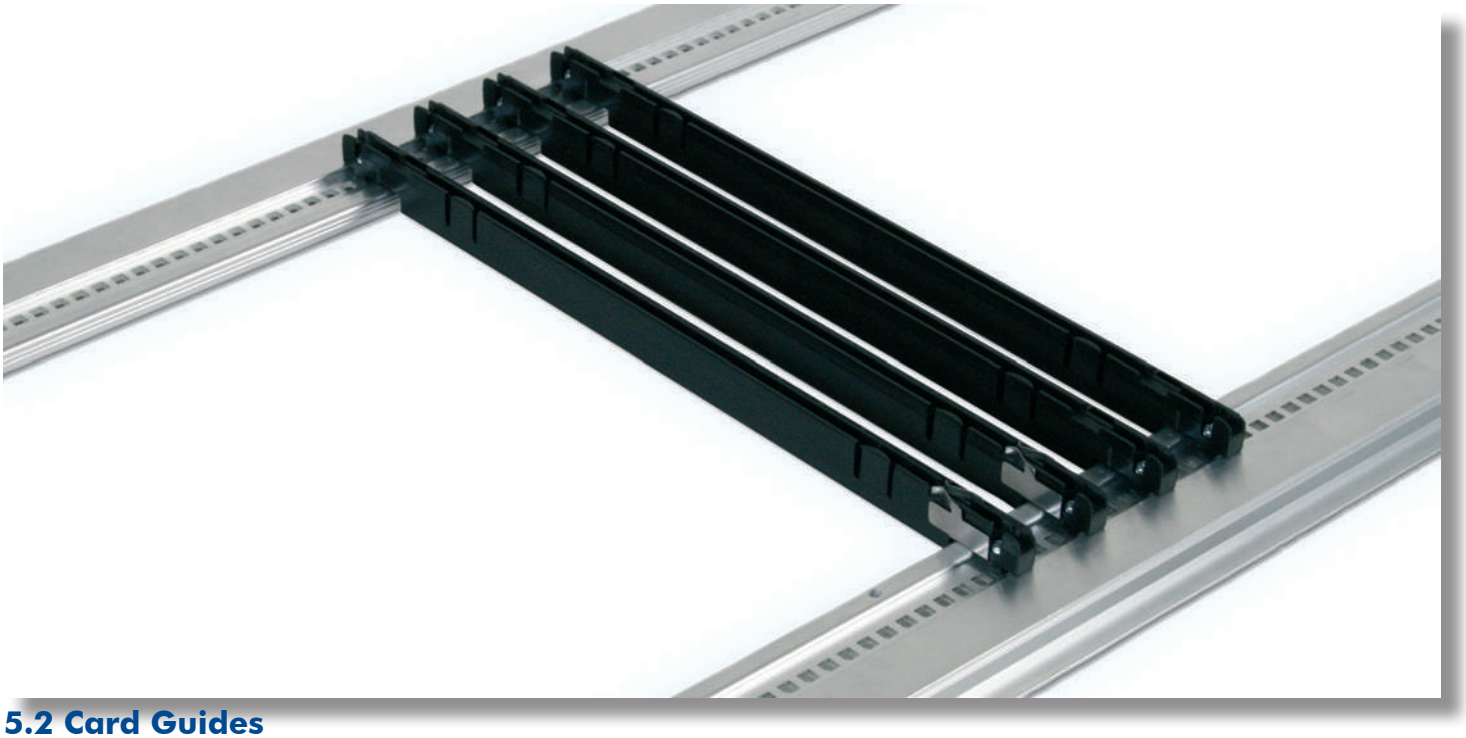
Description	Part-No.
Bottom / Top panel perforated 84 HP, 208.6 mm (card depth 220 mm)	12KR100
Bottom / Top panel perforated 84 HP, 148.6 mm (card depth 160 mm)	12KR102

Drawing of Systemkit 12 K Rail EN 50155, 3 U-Version









5.2 Card Guides

5.2.1 Rugged Screw-mount Card Guides acc. to IEC

- Simple assembly comparable to anchoring
- Very high retention force
- Shock and vibration proof
- For positive location of circuit boards and plug-in units
- For card thickness 1.6 mm / 0.06" and 2.0 mm/0.08" with anti-vibration feature
- The card guides are not-inflammable, made from a high-quality plastic material reinforced with fibreglass (UL94 V-0)
- With ESD provision
- Stainless steel PT-screw, Torque: 0,36 Nm



2.1 Rugged Screw-mount Card Guides acc. to IEC

- **Scope of delivery:**
  - Card guide, plastic UL94 V-0
- Security screw see 2.1.1. (at least one must be used)
- Optional mounting see 2.1.2
- ESD clip see 2.1.3

Card Depth		**Colour**	**Part-No. 1 pcs.**
mm	inch		
160	6.30	black	61-975
220	8.66	black	61-976

5.2.1.1 Standard Mounting



2.1.1 Standard Mounting

- with stainless steel security screw (from top)

Description	Part-No. 1 pc.
Cross recessed pan head PT-screw, Inox	5588-08

Note: For highest security 2 screws per card guide are necessary



1. Insert Card Guide
2. Shift Card Guide
3. Protection by Screwing

5.2.1.2 Optional Mounting



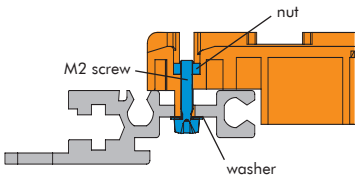
2.1.2 Optional Mounting

- with M2 screw, washer and nut (from bottom)

Description	Part-No. 1 set (1 each)	Part-No. 1 pc.
Cross recessed pan head screw M2, Inox	63-485	5304-13
Hexagonal nut M2 Inox		5620-12
Serrated lock washer		5708-12

Note: For highest security 2 sets per card guide are necessary





5.2.1.3 ESD Clips

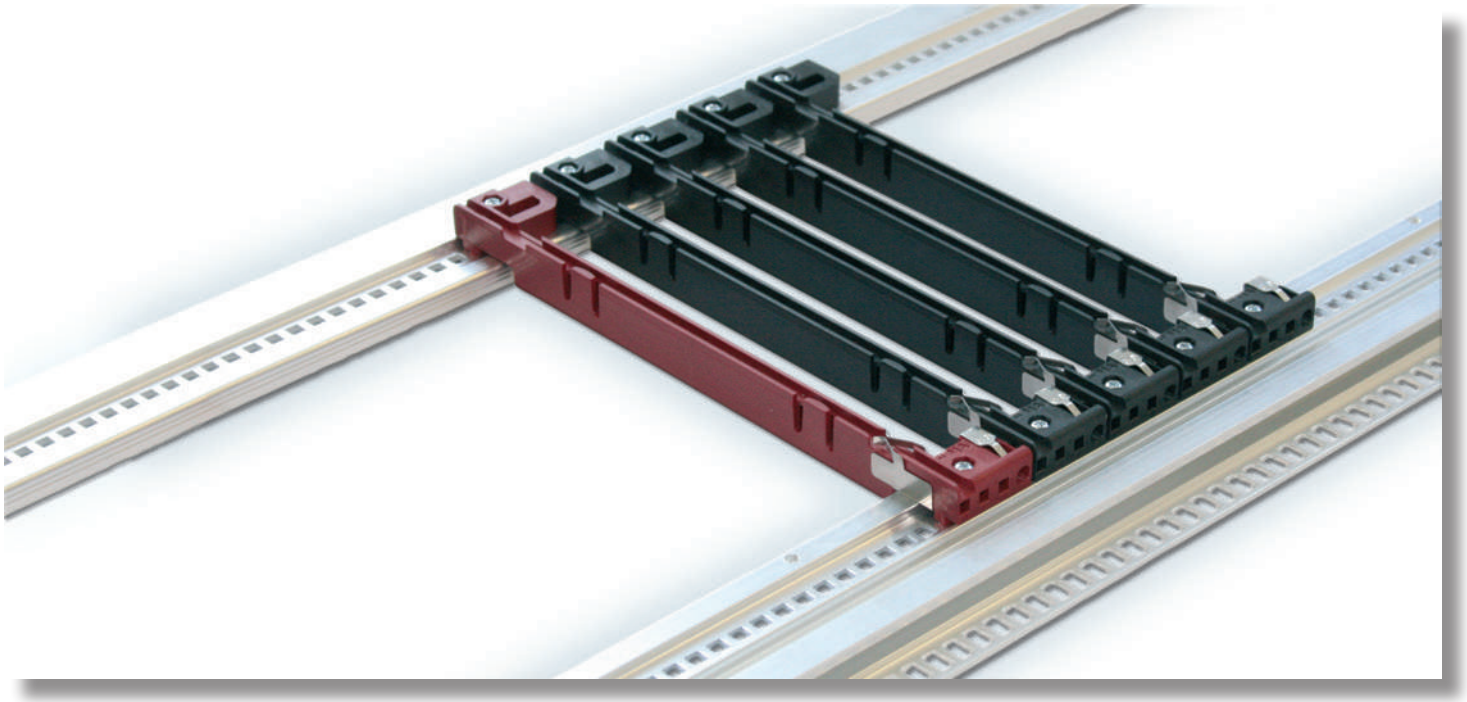


2.1.3 ESD Clips

- Connecting printed board with case

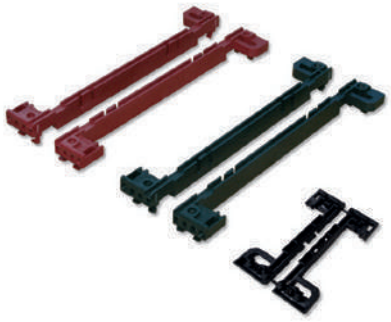
Description	Part-No. 1 pcs.
ESD clip front bottom/rear top	61-419-01
ESD clip front top/rear bottom	61-419-02

Our ability to adapt existing components to your application, makes Elma your prefered solution partner.



5.2.2 Rugged Screw-mount Card Guide acc. to IEEE

- Simple assembly comparable to anchoring
- Very high retention force
- Shock and vibration proof
- For positive location of circuit boards and plug-in units
- For card thickness 1.6 mm / 0.06" and 2.0 mm/0.08" with anti-vibration feature
- The card guides are not-inflammable, made from a high-quality plastic material reinforced with fibreglass (UL94 V-0)
- With ESD provision
- Stainless steel PT-screw, Torque: 0,36 Nm



2.2 Rugged Screw-mount Card Guides acc. to IEEE

- **Scope of delivery:**
  - Card guide, plastic UL94 V-0
- Security screw see 2.2.1 (at least one must be used)
- Optional mounting see 2.2.2
- ESD-clip, ESD-spring and coding pin see 2.2.3 - 2.2.5

Card Depth mm	Card Depth inch	Colour	Part-No. 5 pairs	Part-No. 50 pairs
160	6.30	black	61-970-01-1	61-970-01-2
160	6.30	red	61-970-03-1	61-970-03-2
160	6.30	pearlwhite/offset	61-972	-

5.2.2.1 Standard Mounting

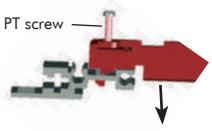
- with stainless steel security screw (from top)



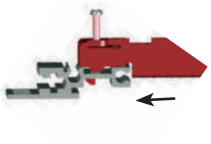
2.2.1 Standard Mounting

Description	Part-No. 1 pc.	Part-No. 100 pcs.
Cross recessed pan head PT-screw, Inox	5535-12	63-490

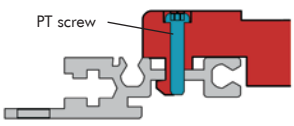
Note: For highest security 2 screws per card guide are necessary



1. Insert Card Guide



2. Shift Card Guide



3. Protection by Screwing

5.2.2.2 Optional Mounting

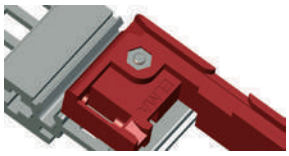
- with M2 screw, washer and nut (from bottom)

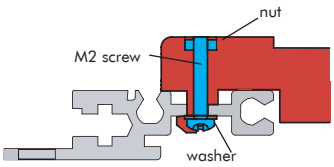


2.2.2 Optionale Befestigung

Description	Part-No. 1 set (1 each)	Part-No. 100 pcs.
Cross recessed pan head screw M2, Inox	63-484	63-491
Hexagonal nut M2 Inox		63-492
Serrated lock washer		63-493

Note: For highest security 2 sets per card guide are necessary





5.2.2.3 ESD Clips

- Connecting printed board with case



2.2.3 ESD Clips

Description	Part-No. 1 pcs.
ESD clip front bottom/rear top	61-419-01
ESD clip front top/rear bottom	61-419-02

5.2.2.4 ESD Spring

- Connecting ESD pin with case
- Note: Notch inward-looking



2.2.4 ESD Spring

Description	Part-No. 1 pcs.
ESD spring	61-420

5.2.2.5 Coding Pins

- Acc. to IEC60297-3-103
- Plastic, UL94 V-0
- Can be rotated in 4 positions



2.2.5 Coding Pins

Description	Part-No. 1 pc.
Grey	81-054-02
Dark red	81-054-06
Black	81-054-04

5.3 General Accessories

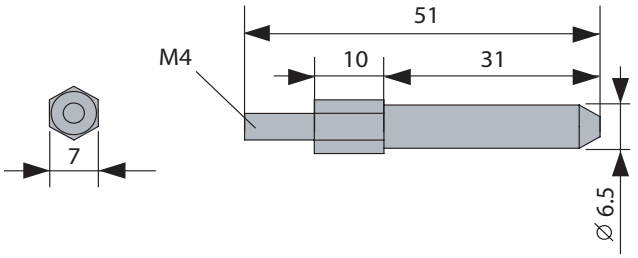
5.3.1 Coding Stud



3.1 Coding Stud

- For SNCF back frame
- Galvanised steel

Description	Part-No. 1 pc.
Coding stud	61-217



5.3.2 EMC-Shielding Material

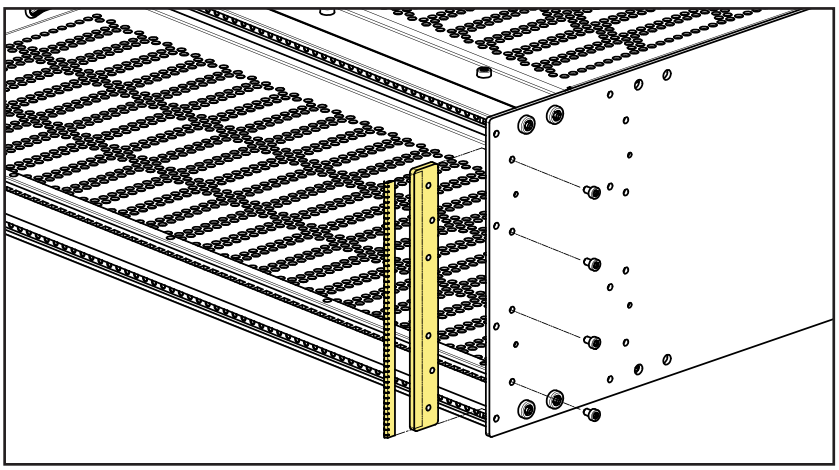
5.3.2.1 Backplane-Shielding Vertical

- With fitting design the Backplane can be used as a shielding rear panel of the Systemkit 12 K Rail
- For horizontal contact the internal extrusion has to be mounted without insulation strips
- Carrying plate has to be mounted directly on the side panel
- **Scope of delivery**
  - 2 carrying plates, aluminium, conductive
  - 2 EMC contact strips
  - Assembly material (Torx)
- For 6 U-Version 2 sets are necessary



5.3.2.1 Backplane-Shielding Vertical

Description	Part-No.
Set Backplane-Shielding vertical 3 U	12KR110



5.3.2.2 EMC Contact Strips

- 2 contact strips
- For front panels, fixing on extrusion
- Self-adhesive



For HP	Length	Part-No.
42	212.1 mm	63-836-67
63	318.1 mm	63-836-68
84	424.2 mm	63-836-70

5.3.2.3 EMC Gasket for Height Extrusion, Front Panel

- Front Panels: 1st Slot
- Application: height extrusion front/rear, front panel
- Gasket slides onto extrusion



5.3.2.3 EMC Gasket for Height Extrusion, Front Panel

U	in mm	1 pc.	10 pcs.	100 pcs.
3	101.60 mm	81-062-03	81-062-03	81-062-03
6	234.95 mm	81-062-06	81-062-06	81-062-06

Front Panels and Plug-In Units as well as more Accessories are available in the Elmaset catalogue.

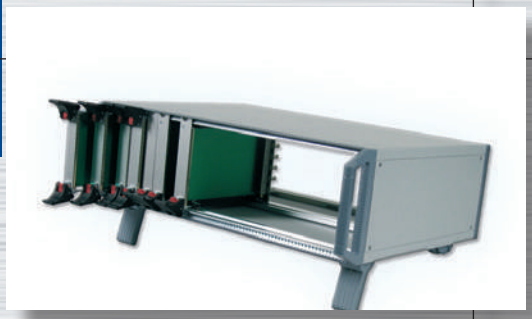
Instrument and Compact Cases

Chapter Overview



1. Unibox 14

Universal case usable as sub rack
or as desktop case



2. Stylebox 15

Elegantly designed EMC desktop or
19″ case with excellent product features



3. Stylebox 15 e-motion

Attractive looking EMC desktop or 19″ case



4. Stylebox 15 smart

Smart housing solution for demanding
EMC requirements



5. iD-Box 16

Individual design housing for high-quality
electronics



6. Classicbox 32

The classic of the desktop cases

7. Guardbox 33

Rugged EMC compact case with
protection up to IP65



8. Guardbox 33 easy

Rugged small enclosure with
stylish design



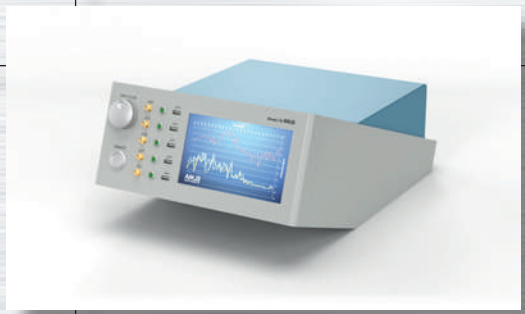
9. Varietybox 35

Compact case with a very large variability
and unlimited form factor



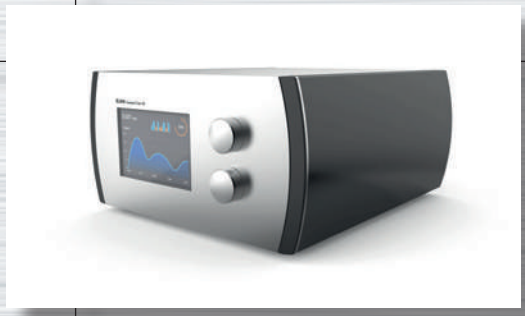
10. iD-Case 18

Designgehäuse mit vielfältigen Möglichkeiten



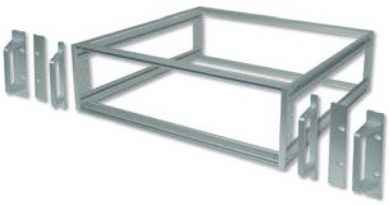
11. Compact Case 20

Designgehäuse

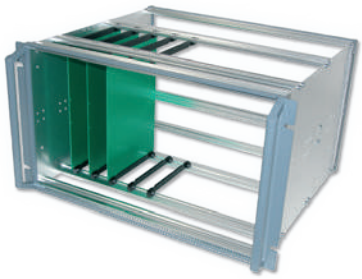


1: Unibox 14











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1.2.2 Height B | 1_7

1.2.3 Depth B | 1_8

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1.3.4 Drawing B | 1_11

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1.4.2 Adaptation Kit b B | 1_13

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1.4.4 Tapped Strips B | 1_14

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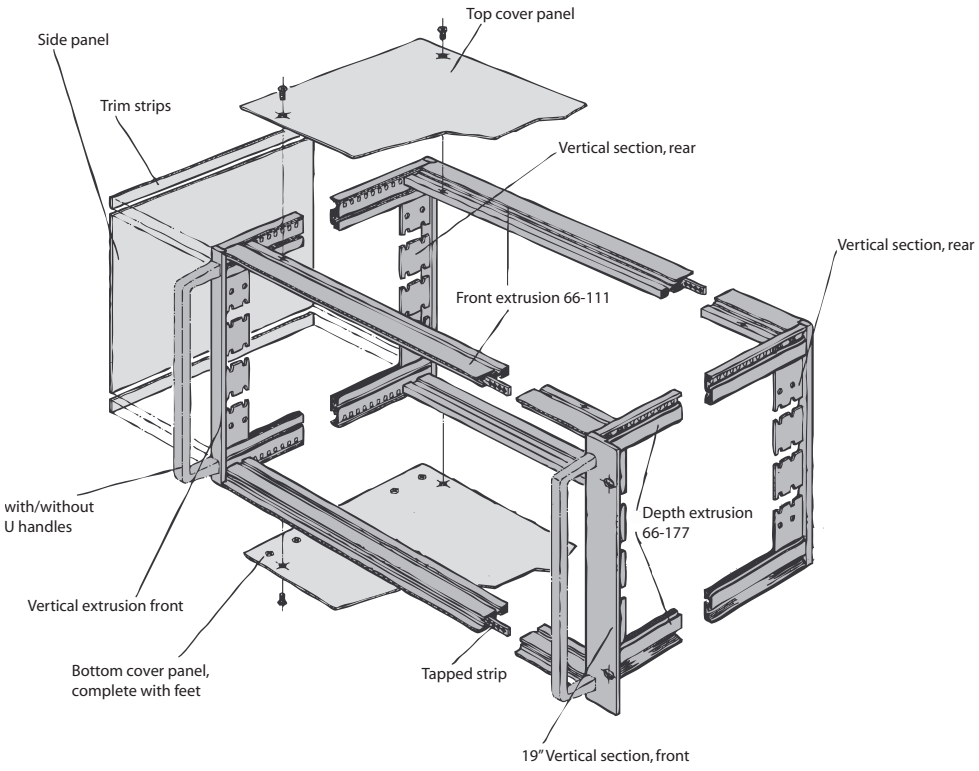
1.7.4 Internal Extrusions B | 1_40

1.7.5 Edge Connector Extrusions B | 1_42



1.1 Unibox 14 Overview

- Usable as sub rack or as desktop case
- Card mounting from front and back
- Dimensions according to IEC 60297
- Numerous adaptation options
- The extruded aluminium frame can be used as a sub rack as when clad powder- or with a set of easily fitted cover plates, transformed into a small table-top instrument case
- Rack mount complete with cover plates possible
- Panels and modules can be mounted from the front or the back
- Adaptation kits available for mounting modules
- Fitting of telescopic rails or guide rails only possible for 81 HP (upon request only)
- Can be employed as a desktop case or sub rack for mounting in 19" cabinets
- In either configuration it will accept PCBs and plug-in units based on standard card sizes conforming to DIN 41494 or IEC 60297
- Recessed mounting with a pitch of 7.5 mm is possible
- With metal cover plates fitted, the sub rack is suitable for use where it is subjected to continous vibration



1.1.1 Complete Unibox 14 Kits

You can find the most used complete kits below.

With the new order structure (see "Configuration" B|1_6) you have however the possibility of configure your individual housing in different steps. Use this offer or contact us for further information or any other help.



1.1.1.1 Unibox 14 Frame Kit

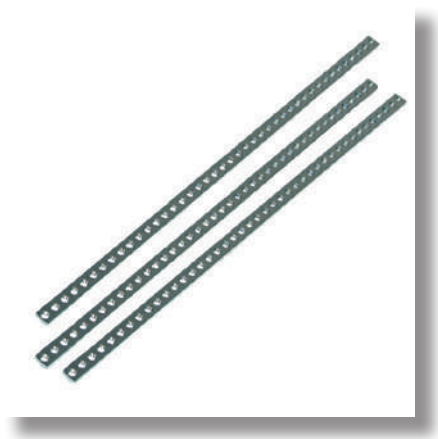
- **Scope of delivery:**
  - 2 front height extrusions (detail see 1.2.2)
  - 2 rear height extrusions (detail see 1.2.2)
  - 4 front/rear extrusions (detail see 1.2.1)
  - 4 depth extrusions (detail see 1.2.3)
  - 2 handles 9mm (detail see 1.2.2)
  - 1 label strip (detail see 1.2.1)
  - 1 set assembly material
- Tapped strips have to be ordered separately, see below
- Front / rear panel have to be ordered separately, see 1.6.5
- Cover panels have to be ordered separately, see below or 1.3

Frame without 19" vertical sections, with handles

Height	Width	Depth			
		232.6 mm 9.15"	292.6 mm 11.51"	412.6 mm 16.24"	532.6 mm 20.96"
2 U	42 HP	14B522	-	-	-
	84 HP	-	14B123	14B125	-
3 U	42 HP	14B532	14B533	-	-
	63 HP	14B432	14B433	-	-
	84 HP	-	14B133	14B135	14B137
4 U	84 HP	-	14B143	14B145	14B147
6 U	84 HP	-	14B163	14B165	-

Frame with 19" vertical sections, with handles

Height	Width	Depth			
		232.6 mm 9.15"	292.6 mm 11.51"	412.6 mm 16.24"	532.6 mm 20.96"
2 U	84 HP	14B022	14B023	14B025	-
3 U	84 HP	14B032	14B033	14B035	14B037
4 U	84 HP	14B042	14B043	14B045	14B047
6 U	84 HP	14B062	14B063	14B065	14B067
7 U	84 HP	-	-	14B075	14B077



1.1.1.2 Tapped Strips

- Steel, zinc-plated
- **Scope of delivery:**
  - 1 tapped strip

Size	42 HP	63 HP	84 HP
M2.5 / 2 x 6 mm	01-464	61-469	61-468



1.1.1.3 Unibox 14 Cover panel Kit

- **Scope of delivery:**
  - 1 top cover panel, solid, light grey (detail see 1.3.1)
  - 1 bottom cover panel with feet, solid, light grey (detail see 1.3.2)
  - 2 side panels, solid, light grey (detail see 1.3.3)
  - 1 set of trim strips (detail see 1.3.3.1)
  - 1 set of rubber bands (detail see 1.3.3.2)
  - 1 set assembly material

Height	Width	Depth			
		232.6 mm 9.15"	292.6 mm 11.51"	412.6 mm 16.24"	532.6 mm 20.96"
2 U	42 HP	14Z422-10	-	-	-
	84 HP	-	14Z123-10	14Z125-10	-
3 U	42 HP	14Z432-10	14Z433-10	-	-
	84 HP	-	14Z133-10	14Z135-10	14Z137-10
4 U	84 HP	-	14Z143-10	14Z145-10	14Z147-10
6 U	84 HP	14Z162-10	14Z163-10	14Z165-10	-
7 U	84 HP	-	-	14Z175-10	14Z177-10

1.1.1.4 Unibox 14 Cover panel Kit

- Scope of delivery:
  - 1 top cover panel, solid, RAL7035 fine structure silk gloss
  - 1 bottom cover panel with feet, solid, RAL7035 fine structure silk gloss
  - 2 side panels, solid, RAL7035 fine structure silk gloss
  - 1 set of trim strips, RAL7035 fine structure silk gloss
  - 1 set of rubber bands (detail see 1.3.3.1)
  - 1 set assembly material (detail see 1.3.3.2)

Height	Width	Depth			
		232.6 mm	292.6 mm	412.6 mm	532.6 mm
2 U	42 HP	140Z422-10	140Z423-10	-	-
	63 HP	140Z322-10	140Z323-10	140Z325-10	-
	84 HP	140Z122-10	140Z123-10	140Z125-10	-
3 U	42 HP	140Z432-10	140Z433-10	140Z435-10	-
	63 HP	140Z332-10	140Z333-10	140Z335-10	-
	84 HP	140Z132-10	140Z133-10	140Z135-10	140Z137-10
4 U	42 HP	140Z442-10	140Z443-10	140Z445-10	-
	63 HP	140Z342-10	140Z343-10	140Z345-10	-
	84 HP	140Z142-10	140Z143-10	140Z145-10	140Z147-10
6 U	42 HP	140Z462-10	140Z463-10	140Z465-10	-
	63 HP	140Z362-10	140Z363-10	140Z365-10	-
	84 HP	140Z162-10	140Z163-10	140Z165-10	140Z167-10

Configuration

Frame



Width 1.2.1
- 42 HP / 63 HP / 84 HP (incl. assembly material)

1.2.1.2 Label Strips

Height 1.2.2
- 2 U / 3 U / 4 U / 6 U / 7 U
- slim/19"
- with/without holes for handles

1.2.2.1 Handles

Depth 1.2.3
- 232.6 mm, 292.6 mm, 532.6 mm, 412.6 mm

Covers



Top Cover 1.3.1
- light grey
- solid/perforated
- width 42 HP, 63 HP, 84 HP
- formed for backplane mounting

Assembly Material
- for top cover

Bottom Cover 1.3.2
- light grey
- solid/perforated
- width 42 HP, 63 HP, 84 HP
- formed for backplane mounting

Assembly Material
- for bottom cover

Side Panels 2.2.6 / 2.3.6
- light grey
- solid/perforated
- height 2 U, 3 U, 4 U, 6 U, 7 U
- depth 232.6 mm, 292.6 mm, 412.6 mm, 532.1 mm

Trim Strip 1.3.3.1
- colour: light grey
- depth: 232.6 mm, 292.6 mm, 412.6 mm, 532.6 mm

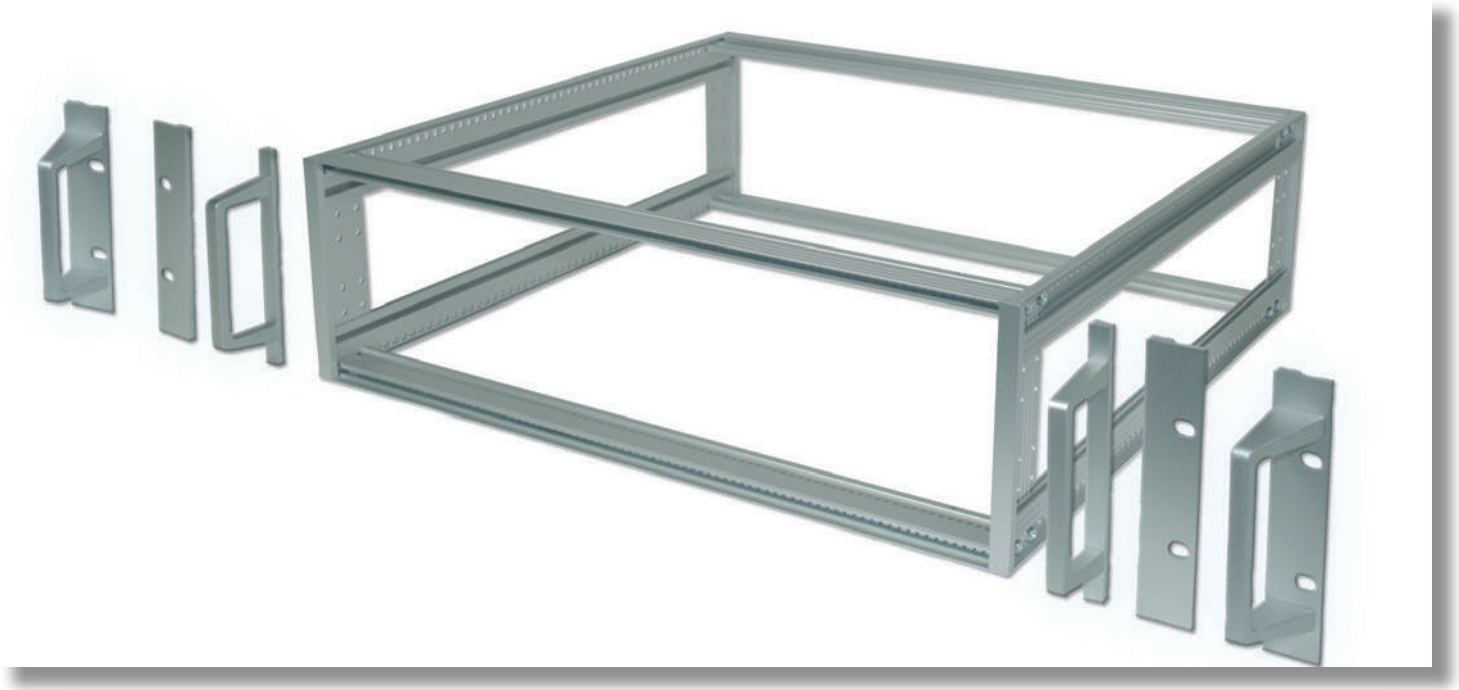
Assembly Material 1.3.3.2
- for side panels and trim strips

1.4 Adaptation Kits

1.5 Assembly Accessories

1.6 General Accessories

1.7 Extrusions



1.2 Frame for Unibox 14

- Usable as sub rack
- Different possibilities of card mounting
- Dimensions according to IEC 60297



1.2.1 Width

- **Scope of delivery:**
  - 4 front/rear extrusions
  - 4 tapped strips M2.5
  - Assembly material: 1 set of screws cross recessed M4x10 (63-109)

42 HP	63 HP	84 HP
14M001	14M002	14M003

Label Strips

- **Scope of delivery:**
  - 1 label strip consisting of 4 single tapes

Scope of Delivery	42 HP (01-42/42-01)	63 HP (01-63/63-01)	84 HP (01-84/84-01)
2 pcs. each (upper and lower)	63-142	63-143	63-046



1.2.2 Height

- **Scope of delivery:**
  - 2 height extrusions
- 2 sets have to be ordered (for front and rear)

Description	2 U	3 U	4 U	6 U	7 U
Slim without holes for handle	14M004	14M005	14M006	14M007	14M008
Slim with holes for handle	14M009	14M010	14M011	14M012	14M013
19" section without holes for handle	14M014	14M015	14M016	14M017	14M018
19" section with holes for handle	14M019	14M020	14M021	14M022	14M023

1.2.2.1 Handles

- **Scope of delivery:**
  - 1 handle
- 2 handles have to be ordered per case
- 2 screws per handle have to be ordered separately

Description	2 U	3 U	4 U	6 U	7 U
9 mm	60-527	60-528	60-529	60-531	60-529
Universal handle (for 19" section only)		60-553	60-554	60-556	60-554

Screws cross sloted countersunk M4 x 10	5342-10



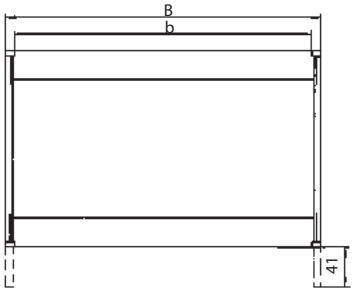
1.2.3 Depth

- **Scope of delivery:**
  - 4 depth extrusions

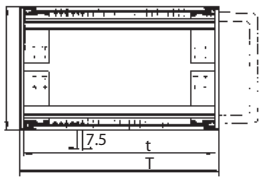
232.6 mm 9.15"	**292.6 mm 9.15"**	**412.6 mm 16.24"**	**532.6 mm 20.96"**
14M024	14M025	14M026	14M027

Line drawings for sub rack without 19" vertical sections

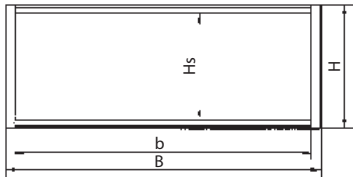
Plan view



Side view section



Front view



Heights

for	**H** mm	**H** inch	**Hs** mm	**Hs** inch
2 U	88.05	3.46	68.05	2.67
3 U	132.50	5.21	112.50	4.42
4 U	176.95	6.96	156.95	6.17
6 U	265.85	10.46	245.85	9.67
7 U	310.30	12.21	290.30	11.42

Depths

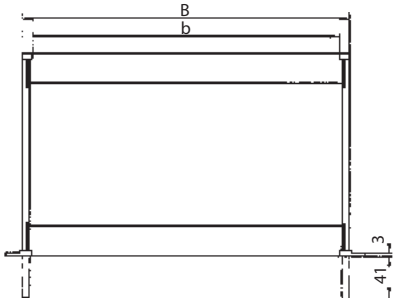
T mm	**T** inch	**t** mm	**t** inch
244.6	9.62	232.6	9.15
304.6	11.99	292.6	11.51
424.6	16.71	412.6	16.24
544.6	21.44	532.6	20.96

Width

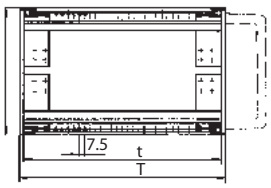
for	**B** mm	**B** inch	**b** mm	**b** inch
42 HP	234.32	9.22	213.32	8.39
63 HP	341.00	13.42	320.00	12.59
84 HP	447.68	17.62	426.68	16.79

Line drawings for sub rack with 19" vertical sections

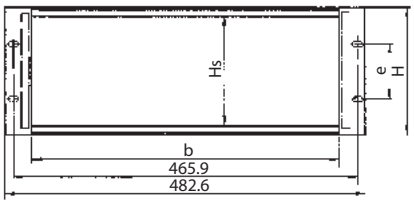
Plan view



Side view section



Front view



Heights

for	**H** mm	**H** inch	**Hs** mm	**H** inch
2 U	88.05	3.46	68.05	2.67
3 U	132.50	5.21	112.50	4.42
4 U	176.95	6.96	156.95	6.17
6 U	265.85	10.46	245.85	9.67
7 U	310.30	12.21	290.30	11.42

Depths

T mm	**T** inch	**t** mm	**t** inch
244.6	9.62	232.6	9.15
304.6	11.99	292.6	11.51
424.6	16.71	412.6	16.24
544.6	21.44	532.6	20.96

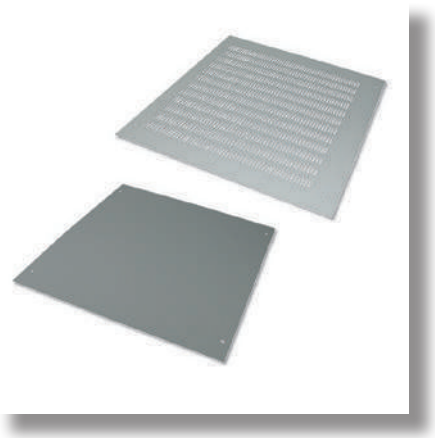
Width

for	**B** mm	**B** inch	**b** mm	**b** inch
84 HP	447.68	17.62	426.68	16.79



1.3 Cover Panel for Unibox 14

- One sided film powder coated or laminated sheet aluminium 1.5 mm
- Perforated top and bottom covers are available for better ventilation
- Bottom cover plates are supplied with feet attached
- Sub rack can be mounted complete with cover plates in a cabinet
- Formed top and bottom cover panels available for 84 HP for accomodation of backplane (drawing see 1.3.4.1)



1.3.1 Top Cover Panel

- **Scope of delivery:**
  - 1 top cover panel

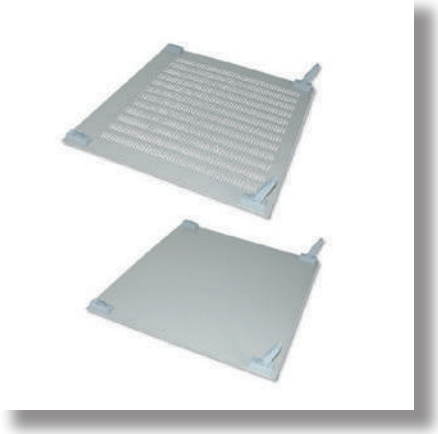
Description	Depth Width	232.6mm	292.6mm	412.6mm	532.6mm
solid, powder coated, RAL7035	42 HP	140-817-10	140-818-10	140-820-10	-
perforated, powder coated, RAL7035		140-817-11	140-818-11	140-820-11	-
solid, light grey, laminated plastic		14-817-10	14-818-10	14-820-10	-
perforated, light grey, laminated plastic		14-817-11	14-818-11	14-820-11	-
solid, powder coated, RAL7035	63 HP	140-812-10	140-813-10	140-815-10	-
perforated, powder coated, RAL7035		140-812-11	140-813-11	140-815-11	-
solid, light grey, laminated plastic		14-812-10	14-813-10	14-815-10	-
perforated, light grey, laminated plastic		14-812-11	14-813-11	14-815-11	-
solid, powder coated, RAL7035	84 HP	140-802-10	140-803-10	140-805-10	140-828-10
perforated, powder coated, RAL7035		140-802-11	140-803-11	140-805-11	140-828-11
solid, light grey, laminated plastic		14-802-10	14-803-10	14-805-10	14-828-10
perforated, light grey, laminated plastic		14-802-11	14-803-11	14-805-11	14-828-11
solid, powder coated, RAL7035, cranked	84 HP	-	140-702-10	140-704-10	140-706-10
perforated, powder coated, RAL7035, cranked		-	140-702-11	140-704-11	140-706-11
solid, light grey, laminated plastic, cranked		-	14-702-10	14-704-10	14-706-10
perforated, light grey, laminated plastic, cranked		-	14-702-11	14-704-11	14-706-11

Assembly Material

- For mounting 1 top and 1 bottom cover onto the frame

Description	Part-No.
1 set of cross recessed screws	63-111
1 set of cross recessed screws for cranked version M3x6	63-195

1.3.2 Bottom Cover Panel with Attached Feet



1.3.2 Bottom Cover Panel with Attached Feet

- **Scope of delivery:**
  - 1 bottom cover panel

Description	Depth Width	232.6mm 9.15"	292.6mm 11.51"	412.6mm 16.24"	532.6mm 20.96"
solid, powder coated, RAL7035	42 HP	140-867-10	140-868-10	140-870-10	-
perforated, powder coated, RAL7035		140-867-11	140-868-11	140-870-11	-
solid, light grey, laminated plastic		14-867-10	14-868-10	14-870-10	-
perforated, light grey, laminated plastic		14-867-11	14-868-11	14-870-11	-
solid, powder coated, RAL7035	63 HP	140-862-10	140-863-10	140-865-10	-
perforated, powder coated, RAL7035		140-862-11	140-863-11	140-865-11	
solid, light grey, laminated plastic		14-862-10	14-863-10	-	-
perforated, light grey, laminated plastic		14-862-11	14-863-11	-	-
solid, powder coated, RAL7035	84 HP	140-852-10	140-853-10	140-855-10	140-848-10
perforated, powder coated, RAL7035		140-852-11	140-853-11	140-855-11	140-848-11
solid, light grey, laminated plastic		14-852-10	14-853-10	14-855-10	14-848-10
perforated, light grey, laminated plastic		14-852-11	14-853-11	14-855-11	14-848-11
solid, powder coated, RAL7035, cranked	84 HP	-	140-766-10	140-768-10	140-770-10
perforated, powder coated, RAL7035, cranked		-	140-766-11	140-768-11	140-770-11
solid, light grey, laminated plastic, cranked		-	14-766-10	14-768-10	14-770-10
perforated, light grey, laminated plastic, cranked		-	14-766-11	14-768-11	14-770-11

Assembly Material

- For mounting 1 top and 1 bottom cover onto the frame

Description	Part-No.
1 set of cross recessed screws M3x8	63-111
1 set of cross recessed screws for cranked version M3x6	63-195

1.3.3 Side Panels

- **Scope of delivery:**
  - 1 side panel
- 2 pieces have to be ordered (for left and right side)
- Trim strips see 1.3.3.1
- Assembly material see 1.3.3.2



1.3.3 Side Panels

Description		2 U	3 U	4 U	6 U	7 U
solid, powder coated, RAL7035	232.6	140-30-902-1	140-30-907-1	140-30-912-1	140-30-922-1	-
solid, light grey, laminated plastic		30-902-1	30-907-1	30-912-1	30-922-1	-
solid, powder coated, RAL7035	292.6	140-30-903-1	140-30-908-1	140-30-913-1	140-30-923-1	140-30-962-1
perforated, powder coated, RAL7035		140-752-1	140-783-1	140-793-1	140-759-1	-
solid, light grey, laminated plastic		30-903-1	30-908-1	30-913-1	30-923-1	30-962-1
perforated, light grey, laminated plastic		14-752-1	14-783-1	14-793-1	14-759-1	-
solid, powder coated, RAL7035	412.6	140-30-905-1	140-30-910-1	140-30-915-1	140-30-925-1	140-603-10
perforated, powder coated, RAL7035		140-754-1	140-785-1	140-795-1	140-761-1	-
solid, light grey, laminated plastic		30-905-1	30-910-1	30-915-1	30-925-1	14-603-10
perforated, light grey, laminated plastic		14-754-1	14-785-1	14-795-1	14-761-1	-
solid, powder coated, RAL7035	532.6	-	140-30-988-1	140-30-989-1	140-30-991-1	140-613-10
perforated, powder coated, RAL7035		-	140-787-1	140-797-1	140-763-1	-
solid, light grey, laminated plastic		-	30-988-1	30-989-1	30-991-1	14-613-10
perforated, light grey, laminated plastic			14-787-1	14-797-1	14-763-1	-



1.3.3.1 Trim Strips

- 4 trim strips

Description	Depth 232.6 mm	292.6 mm	412.6 mm	532.6 mm
Solid, powder coated, RAL7035	140-30-932-1	140-30-933-1	140-30-935-1	140-30-944-1
Solid, light grey, laminated plastic	30-932-1	30-933-1	30-935-1	30-944-1

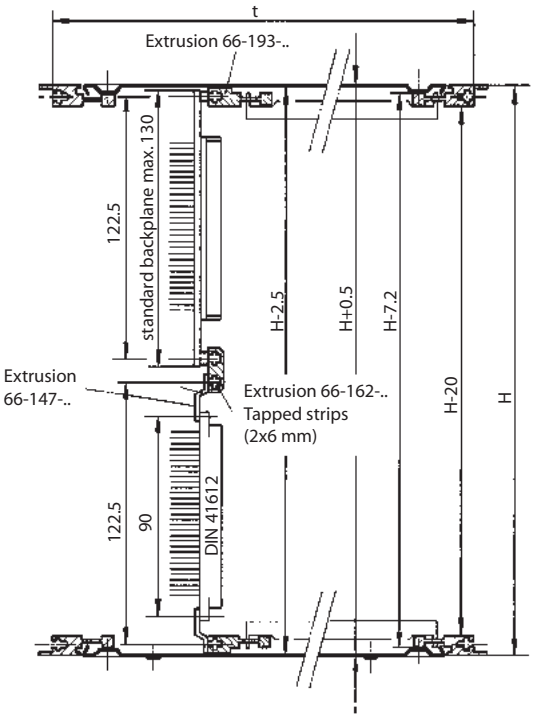
Black versions available on request.

1.3.3.2 Assembly Material

Description	Depth mm	Depth inch
1 set of rubber tubing	232.6 mm	63-096
1 set of rubber tubing	292.6 mm	63-097
1 set of rubber tubing	412.6 mm	63-099
1 set of rubber tubing	532.6 mm	63-141

1.3.4 Drawing

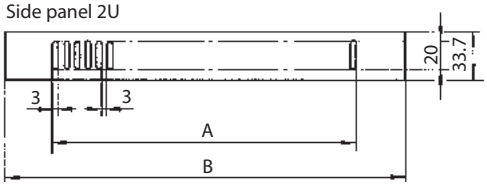
1.3.4.1 Line Drawing Cover Panel Formed for Accomodation of Backplane



for	H	
	mm	inch
3 U	132.50	5.21
4 U	176.95	6.96
6 U	265.85	8.71
7 U	310.30	10.46

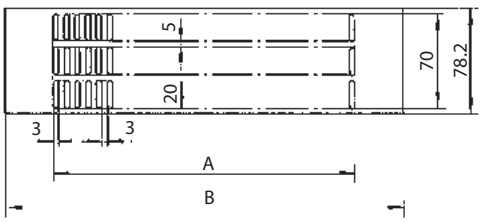
1.3.4.2 Line Drawing of Side Panel for Crossflow Ventilation

Side panel 2U

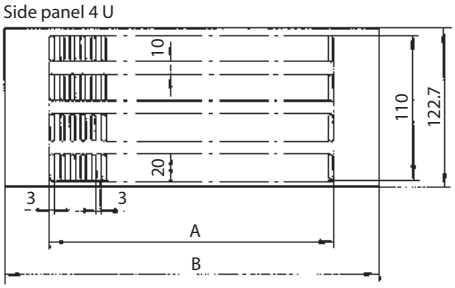


Case Depth t		A		B	
mm	inch	mm	inch	mm	inch
292.6	11.51	225	8.85	292.3	11.50
412.6	16.24	345	13.58	412.3	16.23
532.6	20.96	465	18.30	532.3	20.95

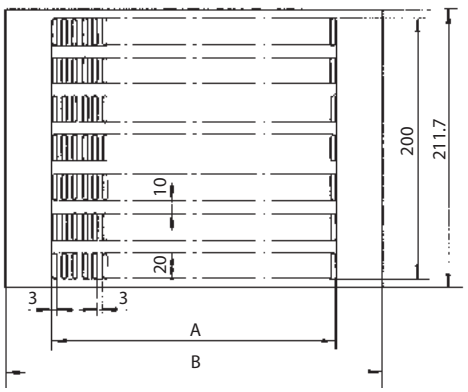
Side panel 3 U



Side panel 4 U



Side panel 6 U





1.4 Adaptation Kits

- Adaptation kits are used to subdivide the basic frame both in depth and height
- Tapped strips have to be ordered separately, see 1.4.7

Note:

Information for Adaptation kits a - e:

- 14-xxx- [X] for mounting:
  - **0** = standard extrusions, 66-144/66-124
    (when supplementary edge connector extrusions are also used, see 1.4.8)
  - **6** = backplane mounting 66-193
    (insulating strips see 1.7.4.3)
- Scope of delivery is shown in blue in the following illustrations
- Tapped strip see 1.4.7

1.4.1 Adaptation Kit a

- **Range of Application:**
  - Single eurocard depth 160 – 400 mm
  - Connector to IEC 60603-2/DIN 41617/MIL-C-21097
  - Motherboard
  - Modules, cassettes, plug-in units
  - Set for horizontal mounting of single, double triple eurocards, depth 160 + 400 mm
  - Crossflow ventilation with 3 U fan module
  - Drive mechanism receptacles $3^1/_2$"/$5^1/_4$"



1.4.1 Adaptation Kit a

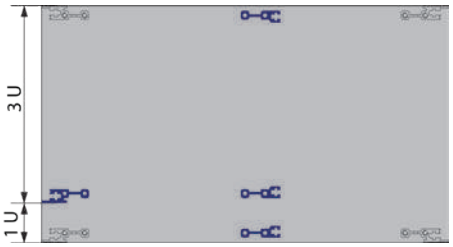
- **Scope of delivery:**
  - 2 internal extrusions
  - 1 set assembly material

Description	84 HP
Front-mounting of single eurocards	14-910-0
	14-910-6

Other widths available on request.

1.4.2 Adaptation Kit b

- **Range of Application:**
  - Single eurocards, depth 160 – 400 mm
  - Connector to IEC 60603-2
  - Motherboard
  - Modules, cassettes, plug-in units
  - Vertical ventilation with 1 U fan module
  - Set for horizontal mounting of single, double, triple eurocards, depth 160 – 400 mm
  - Crossflow ventilation with 3 U fan module
  - Drive mechanism receptacles $3^1/_2$" / $5^1/_4$"



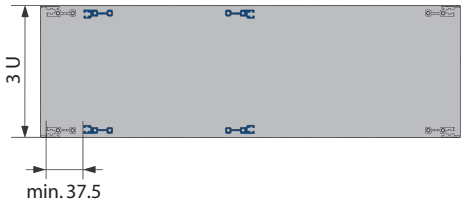
1.4.2 Adaptation Kit b

- **Scope of delivery:**
  - 3 internal extrusions
  - 1 front extrusion
  - 2 depth dividers
  - 1 set assembly material

Description	Depth		84 HP
	mm	inch	
Front-mounting of single eurocards in a 4 U case with possibility of crossflow ventilation	292.6	11.51	14-913-65
	412.6	16.24	14-915-65

1.4.3 Additional Extrusions Recessed Card Mounting

- For recessed mounting of Eurocards without individual front panels
- **Scope of delivery:**
  - 2 internal extrusions
  - 1 set assembly material
- For recessed card mounting two sets are necessary

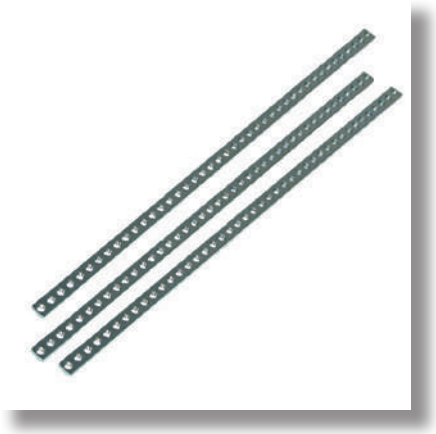


1.4.3 Additional Extrusions Recessed Card Mounting

Description	84 HP
For frame width	14-910-0

1.4.4 Tapped Strips

- Steel, zinc-plated
- **Scope of delivery:**
  - 1 tapped strip



1.4.7.1 Tapped Strips for Use with Extrusion 66-144, 66-124

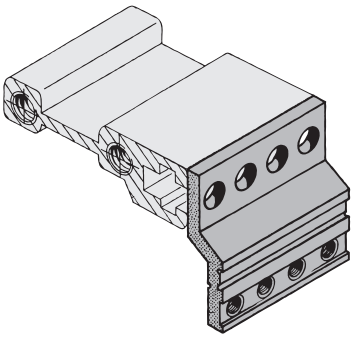
Size	42 HP	63 HP	84 HP
M2.5 / 2 x 6 mm	61-464	61-469	61-468

1.4.7.2 Tapped Strips for Use with Extrusion 66-193

Size	42 HP	63 HP	84 HP
M2.5 / 1.8 x 5 mm	61-471	61-472	61-474

1.4.5 Edge Connector Extrusion 66-145-xx

- For use with standard extrusion 66-144
- **Scope of delivery:**
  - 1 aluminium extrusion, clear passivated (conductive)



1.4.8 Supplementary Edge Connector Extrusion

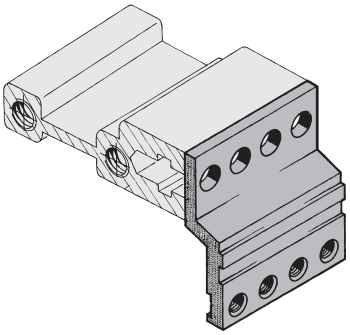
Description	8 HP	18 HP	28 HP	42 HP	63 HP	84 HP
For edge connector, IEC 60603-2	66-145-40	66-145-41	66-145-42	66-145-63	66-145-65	66-145-52

1.4.8.1. Assembly Material

Description	Part-No.
Assembly material M2.5 (for 2 supplementary extrusions)	63-214

1.4.6 Edge Connector Extrusion 66-147-xx

- For use with extrusions for backplanes 66-193
- **Scope of delivery:**
  - 1 aluminium extrusion, clear passivated (conductive)

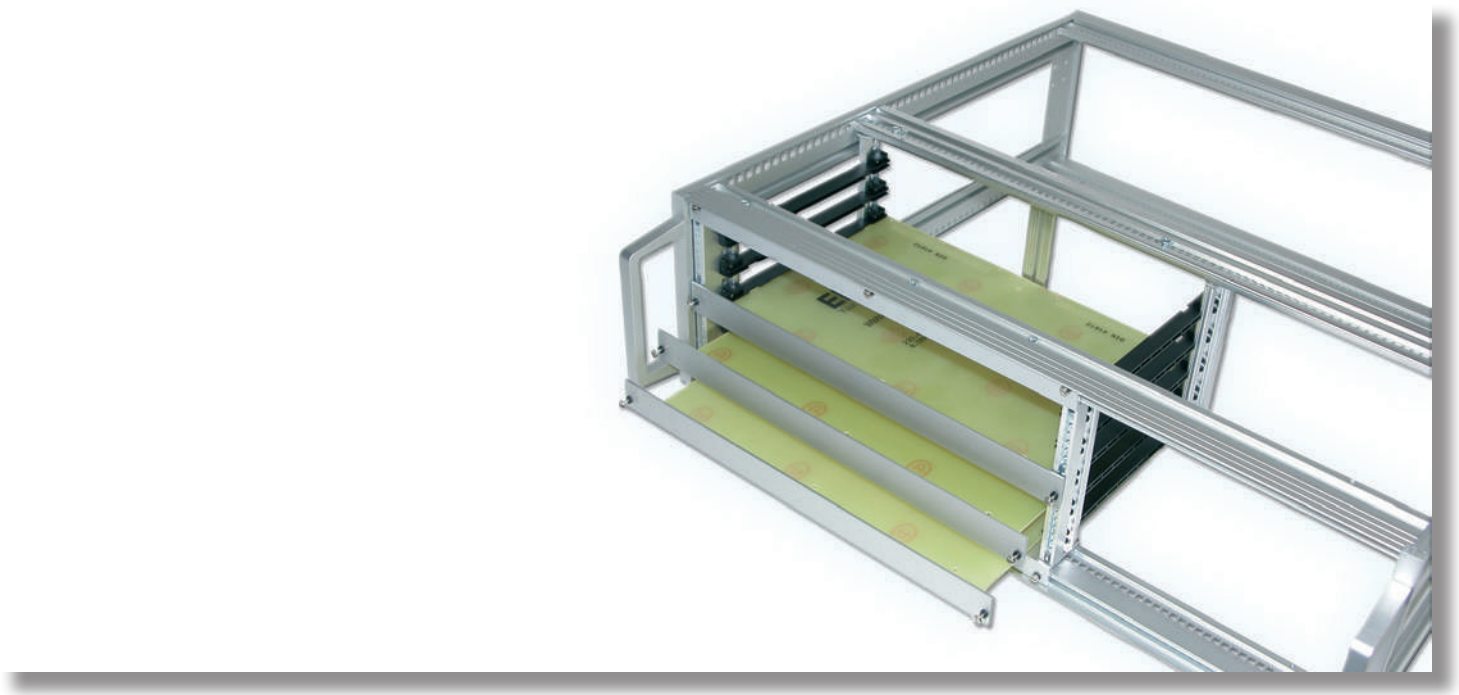


1.4.9 Edge Connector Extrusion

Description	8 HP	18 HP	28 HP	42 HP	63 HP	84 HP
For edge connector, IEC 60603-2	66-147-40	66-147-41	66-147-42	66-147-63	66-147-65	66-147-52

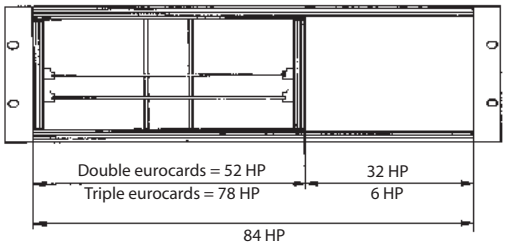
Assembly Material

Description	Part-No.
Assembly material M2.5 (for 2 supplementary extrusions)	63-214



1.5 Assembly Accessories

1.5.1 Horizontal Card Mounting Kit



- For double eurocards (6 U)
- Independent of card depth
- The horizontal card mounting kit can be fitted recessed within the Unibox 14 by using two additional extrusions
- **Scope of delivery:**
  - 4 distance plates (2 front / 2 rear)
  - 4 length extrusions (2 front / 2 rear)
  - 1 centre extrusion
  - 6 tapped strips M2.5
  - 1 set assembly material
- Top and bottom cover plate when no overall fan front panel (1.5.2.1) is used
- Top and bottom cover plate has to be ordered separately (see table)
- Fan front panels for horizontal mounting kits see 1.5.2.1
- Card guides see 1.6.4
- Extruded front panels see 1.6.11



1.5.2 Horizontal Card Mounting Kit

Mounting Height	Usable Height	IEC 60603-2	Backplane	Cover plate top*	Cover plate bottom*
2 U	12 HP	-	14-961-60	21N604-90	21N605-90
3 U	20 HP	14-971-30	14-971-60	21N602-90	21N602-90
4 U	28 HP	-	14-981-60	21N602-90	21N603-90
6 U	48 HP	-	14-991-60	21N606-90	21N607-90

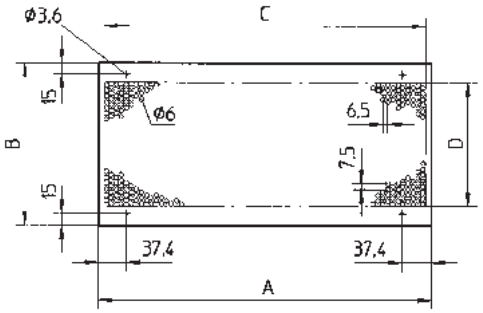
* Assembly material for cover plate see 1.5.2.2

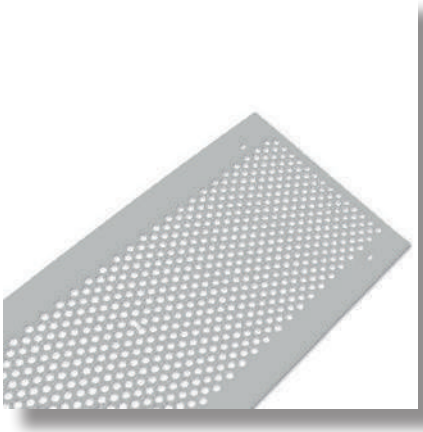


1.6 General Accessories

1.6.1 Perforated Cover Plates

- 1mm sheet aluminium, perforated
- Front extrusions and internal extrusions are pre-drilled to accept the fixing screws
- Provides mechanical protection for the card area
- **Scope of delivery:**
  - 1 perforated cover plate
- Assembly material see below
- Cover plates for card depths 300 mm and 400 mm upon request





1.6.1 Perforated Cover Plates

Case Width	Card Depth	A	B	C	D	Part-No.
42 HP	160 mm 6.30″	217.64 mm 8.56″	149 mm 5.86″	207.5 mm 8.16″	107.25 mm 4.22″	11-701
	220 mm 8.66″	217.64 mm 8.56″	209 mm 8.22″	207.5 mm 8.16″	159.75 mm 6.28″	11-702
84 HP	160 mm 6.30″	431 mm 16.96″	149 mm 5.86″	415.5 mm 16.35″	107.25 mm 4.22″	11-706
	220 mm 8.66″	431 mm 16.96″	209 mm 8.22″	415.5 mm 16.35″	159.75 mm 6.28″	11-707
	280 mm 11.02″	431 mm 16.96″	269 mm 10.59″	415.5 mm 16.35″	212.25 mm 8.35″	11-708

Assembly Material

Description	Scope of Delivery	Part-No.
Cross recessed screw M3x6	Pack size 8 pieces	63-195
	1 piece	61-283



1.6.2 Mounting Chassis

1.6.2.1 Mounting Chassis Full Depth of Unibox 14

- For mounting non-standard modules and components
- Mounting chassis is fixed directly to the depth extrusion
- Aluminium 2.0 mm, raw
- **Scope of delivery:**
  - 1 mounting chassis
- Assembly material see below
- Mounting chassis depth < 230 mm can be mounted with 4 screws (> 230 mm with 6 screws)



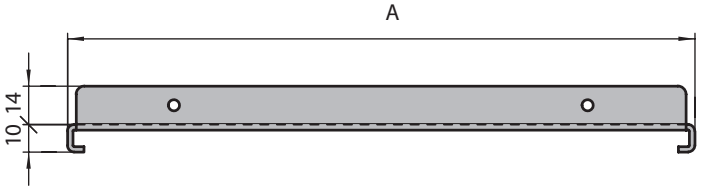
1.6.2.1 Mounting Chassis Full Depth of Unibox 14

Frame Depth		Chassis Depth A		Part-No.		
mm	inch	mm	inch	42 HP	63 HP	84 HP
232.6	9.15	168	6.61	14M028	14M029	14M030
292.6	11.52	228	8.97	14M031	14M032	14M033
412.6	16.24	318	12.52	-	14M034	14M035
532.6	20.96	423	16.65	-	-	14M036

Assembly Material

- For one mounting chassis
- **Scope of delivery:**
  - 4 cross recessed cylinder head screw M4 x 6
  - 4 earthing nut M4
  - 4 retaining ring 2 mm

Description	Part-No.
Assembly material for mounting chassis	63-314



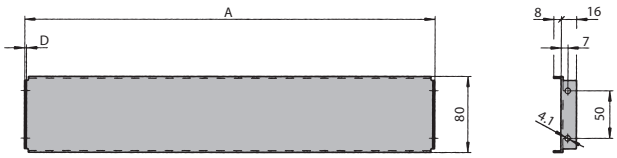
1.6.2.2 Mounting Chassis

- For mounting non-standard modules and components
- Mounting chassis is fixed directly to the depth extrusion
- The hole pattern of 200 mm - version allows Elma standard extrusions to be installed for the accomodation of single, double and triple Eurocard-units
- **Scope of delivery:**
  - 1 mounting chassis
- Assembly material see 1.6.2.5



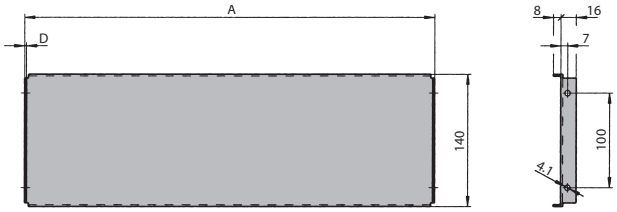
1.6.2.2 Mounting Chassis Depth 80mm

Frame Width	A		D		Part-No.
	mm	inch	mm	inch	
84 HP	431.5	16.98	2.0	0.07	14-832



1.6.2.3 Mounting Chassis Depth 140 mm

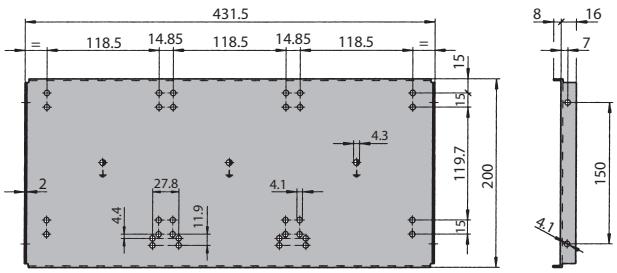
Frame Width	A		D		Part-No.
	mm	inch	mm	inch	
63 HP	324.9	12.79	1.5	0.05	14-834
84 HP	431.5	16.98	2.0	0.07	14-836

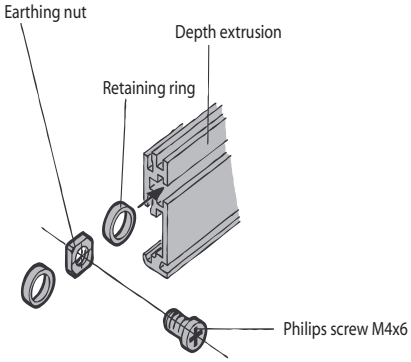


1.6.2.4 Mounting Chassis Depth 200 mm

- The hole pattern allows single, double and triple eurocards to be mounted
- Mounting set see 2.5.6.4

Frame Width	A		B		C		D		Part-No.
	mm	inch	mm	inch	mm	inch	mm	inch	
84 HP	431.5	16.98	23.15	0.91	15	0.59	2	0.07	14-840



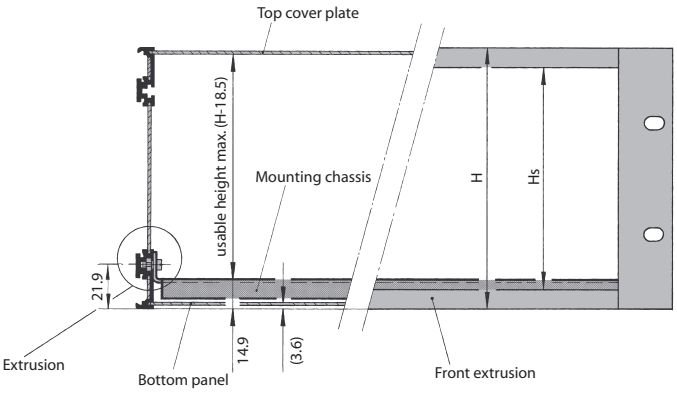


1.6.2.5 Assembly Material

Description	Part-No.
For one mounting chassis	63-314

or

Description	Part-No.
Earthing nut M4	61-095
Retaining ring 2 mm	61-015
Philips screw M4x6	5340-06

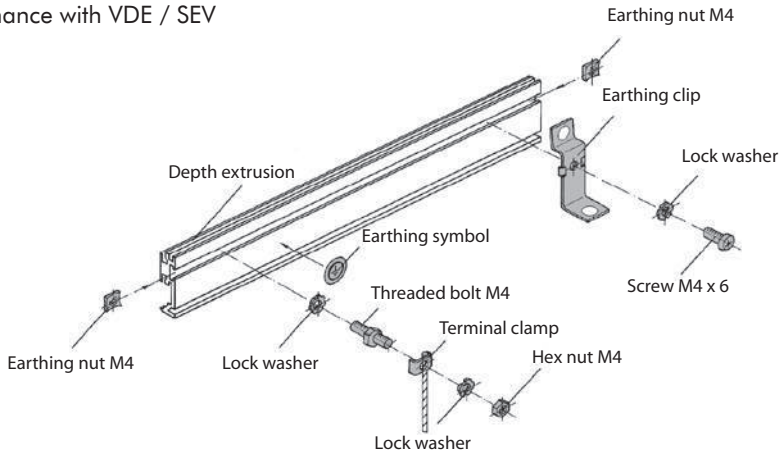


for		2 U	3 U	4 U	5 U	6 U	7 U	8 U	9 U	10 U	12 U
H	mm	88.05	132.50	176.95	221.40	265.85	310.30	354.75	399.20	443.65	532.55
	inch	3.46	5.21	6.96	8.71	10.46	12.21	13.96	15.71	17.46	20.96
Hs	mm	68.05	112.50	156.95	201.40	245.85	290.30	334.75	379.20	423.65	512.55
	inch	2.67	4.42	6.17	7.92	9.67	11.42	13.17	14.92	16.67	20.17

1.6.3 Earthing Set

- Enable sub racks and cases to be earthed in conformance with VDE / SEV
- **Scope of delivery:**
  - 1 earthing nut M4
  - 1 threaded bolt M4
  - 1 terminal clamp
  - 2 lock washer
  - 1 nut M4
  - 2 retaining rings 2 mm
  - 1 earthing symbol

  Additional in set for Unibox 14 with cover plates:
  - 2 earthing nut M4
  - 2 lock washer
  - 4 retaining rings 2 mm
  - 2 earthing clips
  - 2 cross recessed screws M4x6





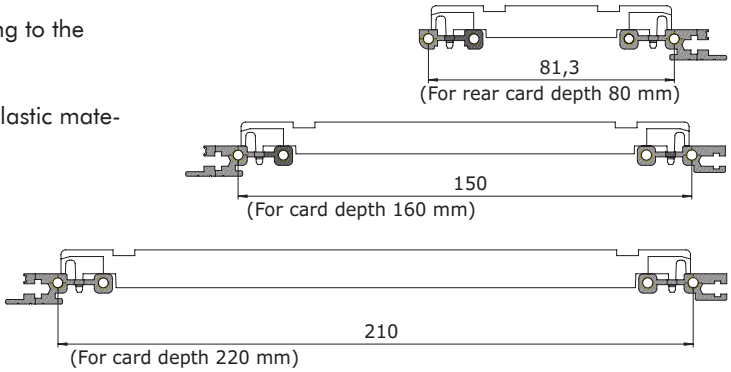
1.6.3 Earthing Set

Description	Part-No.
Earthing set for sub racks without cover plates	63-172
Earthing set for sub racks with cover plates	63-173



1.6.4 Card Guides IEC

- For positive location of circuit boards and plug-in units conforming to the dimensions of card depths of 80 mm, 160 mm, 220 mm and 280 mm
- The card guides are non-flammable, made from a highquality plastic material reinforced with fibreglass
- Including ESD provisions





1.6.4.1 Card Guides 1-Slot, IEC

- **Scope of delivery:**
  - Card guide black plastic UL94 V-0
- ESD Clip see below (not usable for card depth 80 mm)

Card Thickness mm	Card Thickness inch	Card Depth mm	Card Depth inch	Part-No. 1 pcs.	Part-No. 10 pcs.	Part-No. 1 pcs.
1.6	0.06	80	3.15	61-019	–	–
		160	6.30	61-044	–	61-044
		220	8.66	61-039	–	61-039
		280	11.02	61-017	–	61-017
2.0	0.08	160	6.30	61-087	–	–
		220	8.66	61-039	63-303	–
		280	11.02	61-017	–	–



ESD Clips

- Connecting printed board with case
- Stainless steel

Description	Part-No. 1 pcs.
ESD clip front bottom/rear top	61-419-01
ESD clip front top/rear bottom	61-419-02



1.6.4.2 Card Guides 7-Slot in 4 HP Steps

- For reduced assembly time of multiple slot applications
- For use with single, double and triple eurocards with a depth of 160 mm
- For card thickness: 1.6 mm / 0.06"
- Black plastic, UL94 V-0
- ESD Clip not usable

Card Thickness		Card Depth		Part-No.
mm	inch	mm	inch	
1.6	0.06	160	6.30	61-076



1.6.4.3 Card Guides 1-Slot, 3 Parts

- Extrusion: Aluminium / Plastic ABS, (UL 94 V-O)
- End feet: plastic, UL94 HB
- For card thickness: 1.6 mm / 0.06"
- Card guide extrusion, single, clear anodised or plastic grey
- ESD clip not usable

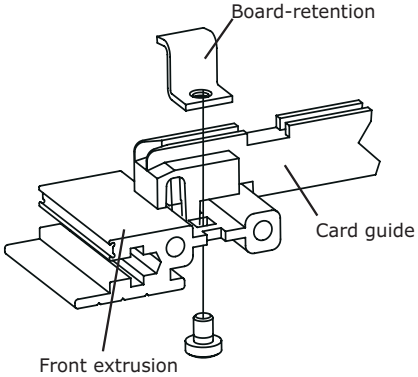
Extrusion

Card Depth		Length		Part-No. Plastic	Part-No. Aluminium
mm	inch	mm	inch		
160	6.30	112.5	4.43	61-051	66-122-20
220	8.66	172.5	6.79	61-052	66-122-21
280	11.02	232.5	9.15	61-053*	66-122-22
340	13.38	292.5	11.51	61-054*	66-122-23
400	15.74	352.5	13.87	61-055*	66-122-24
-	-	1350	53.15	61-059	66-122-14

End Feet

Description	Part-No. 1 Pair
End feet plastic, UL94 HB	61-069

* Card guides must be supported in the middle by an additional extrusion (66-138)



1.6.4.4 Card Guide Board-Retention Bar

Description	Part-No. 20 pcs.
Board-retention bar, zinc-plated steel	61-291

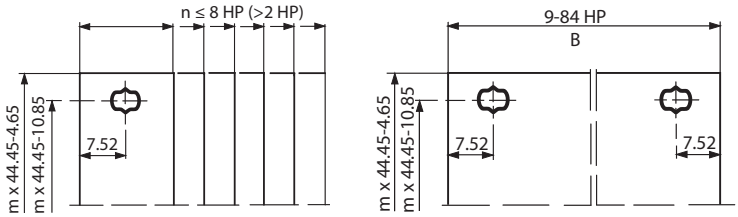
Assembly Material

Description	Part-No.
Cross recessed rounded head screw M3 x 4	5331-04
Torx cylinder head screw M3 x 4, size T10	5470-01



1.6.5 Flat Front Panels

- For sub racks and enclosures, solid
- Aluminium 2.5 mm, clear anodised (non-conductive)
- **Scope of delivery:**
  - Flat front panel
- Front panel screws, see below
- 2 HP version: screw retainer can not be filled



1.6.5 Flat Front Panels for Sub Racks and Enclosures, Solid

Width		B	Height			Part-No.				
	mm	inch	1 U 39.8 mm	ca. 1 U* 42.15 mm	2 U 84.2 mm	3 U 128.7 mm	4 U 173.1 mm	6 U 262.0 mm	7 U 306.5 mm	9 U 395.4 mm
2 HP	10.0	0.39	—	—	—	21N302	—	21N602	—	—
3 HP	15.2	0.59	—	—	—	21N303	21N403	21N603	—	—
4 HP	20.1	0.79	—	—	—	21N304	21N404	21N604	—	21N904
5 HP	25.2	0.99	—	—	—	21N305	21N405	21N605	—	—
6 HP	30.3	1.19	—	—	—	21N306	21N406	21N606	—	—
7 HP	35.3	1.38	—	—	—	21N307	21N407	21N607	—	—
8 HP	40.4	1.59	—	—	—	21N308	21N408	21N608	—	—
10 HP	50.6	1.99	—	—	—	21N310	21N410	21N610	—	—
11 HP	55.7	2.19	—	—	—	21N311	—	—	—	—
12 HP	60.7	2.38	—	—	—	21N312	21N412	21N612	—	—
14 HP	70.9	2.79	—	—	—	21N314	21N414	21N614	—	—
16 HP	81.1	3.19	—	—	—	21N316	21N416	21N616	—	—
20 HP	101.4	3.59	—	—	—	21N320	21N420	21N620	—	—
21 HP	106.5	4.19	—	—	—	21N321	—	21N621	—	—
28 HP	142.0	5.59	—	—	—	21N328	—	21N628	—	—
32 HP	162.3	6.38	—	—	—	21N332	21N432	—	—	—
42 HP	213.1	8.38	—	—	21N242	21N342	21N442	21N642	—	—
52 HP	263.9	10.38	—	—	—	21N352	21N452	21N652	—	—
63 HP	319.8	12.59	—	—	21N263	21N363	21N463	21N663	—	—
81 HP	411.3	16.19	—	—	21N281	21N381	21N481	21N681	—	—
84 HP	426.5	16.79	21N184	21N084*	21N284	21N384	21N484	21N684	21N784	21N984

* Coverplates for 1 U fan opening

Front Panel Screws

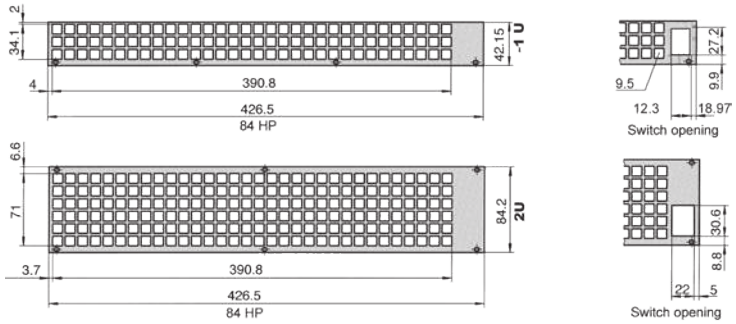
- Set of 10 screws, with screw retainer

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3, size T8 with plastic screw retainer	63K159
Rounded head screws recessed M2.5 x 11.3 with plastic screw retainer	63-159



1.6.6 Fan Front Panel 84 HP for Vertical Ventilation

- Fan front panels are flat, perforated and designed to ensure an optimum air flow rate
- Available with or without switch cut-out (switch opening 22 x 30.6 mm)
- Aluminium 2.5 mm, clear anodised (non-conductive)
- **Scope of delivery:**
  - 1 perforated fan front panel
- Front panel screws see 1.6.6.1
- On-off switch see 1.6.6.2





1.6.6 Fan Front Panel 84 HP for Vertical Ventilation

Description	Height	Air passage		Part-No.
		mm²	sq. in.	
Without switch opening	~ 1 U	8664	13.42	21N084-01
With switch opening	~ 1 U	8664	13.42	21N084-02
Without switch opening	2 U	17328	26.85	21N284-01
With switch opening	2 U	17328	26.85	21N284-02

1.6.6.1 Front Panel Screws

- Set of 10 screws
- With screw retainer
- Fan front panel ~1 U = 4 screws; 2 U= 6 screws

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3, size T8, with plastic screw retainer	63K159
Rounded head screws recessed M2.5 x 11.3, with plastic screw retainer	63-159



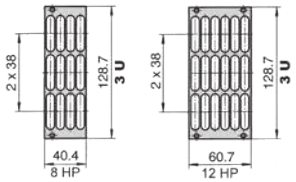
1.6.6.2 On-Off Switch

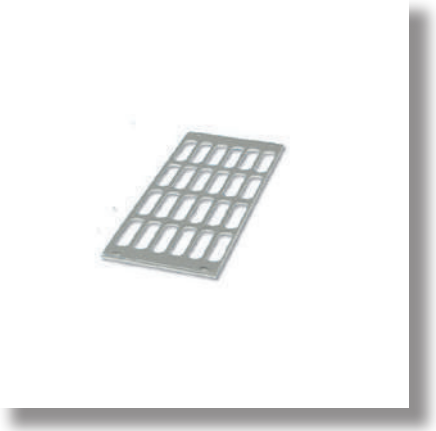
- Black body, plastic
- 2 pole (only on-off switches)
- 250V, 16A
- Quick-connect terminal 6.3 x 0.8 mm
- Panel cut-out for 4426-00: 22 x 30.6 mm (0.87" x 1.20")
- Panel cut-out others: 12.3 x 27.2 mm (0.48 x 1.07")

Description	Part-No.
On-off switch, indicator light green	69-410-04
On-off switch, without signal light	69-410-09

1.6.7 Fan Front Panel for Horizontal Ventilation

- Aluminium 2.5 mm, clear anodised (non-conductive)
- **Scope of delivery:**
  - 1 perforated fan front panel
- Front panel screws see below





1.6.7 Fan Front Panel for Horizontal Ventilation

Height	Width	Air passage		Part-No.
		mm²	sq. inch	
3 U	8 HP	3195	4.95	21N308-01
	12 HP	4793	7.42	21N312-01

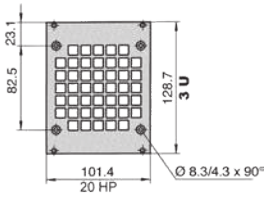
Front Panel Screws

- Set of 10 screws
- With screw retainer
- Fan front panel width up to 8 HP = 2 screws; ≥ 12 HP = 4 screws

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3, size T8 with plastic screw retainer	63K159
Rounded head screws recessed M2.5 x 11.3 with plastic screw retainer	63-159

1.6.8 Fan Front Panels for Direct Fan Mounting

- Aluminium 2.5 mm, clear anodised (non-conductive)
- **Scope of delivery:**
  - 1 perforated fan front panel
- Front panel screws see 1.6.8.1
- Assembly material for fan mounting has to be ordered separately





1.6.8 Fan Front Panels for Direct Fan Mounting

Description	Height	Width	Air passage		Part-No. 1 pc.
			mm²	sq. inch	
Without switch opening	3 U	20 HP	4051	6.27	21N320-04

1.6.8.1 Front Panel Screws

- Set of 10 screws
- With screw retainer
- Per front panel 4 screws are needed

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3, size T8 with plastic screw retainer	63K159
Rounded head screws recessed M2.5 x 11.3 with plastic screw retainer	63-159

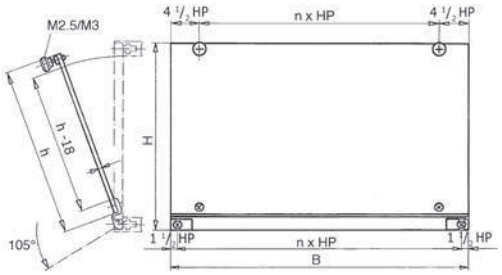
1.6.8.2 Assembly Material for Fan Mounting

Description	Part-No.
Countersunk screw, cross recessed M4 x 10	5342-10
Hexagonal nut M4, 0.8D	5620-51



1.6.9 Top / Bottom-Hinged Front Panel

- Hinges are attached to the front extrusions of the sub rack or case
- Aluminium 2.5 mm, clear anodised (non-conductive)
- **Scope of delivery:**
  - Front panel
  - Hinge extrusion
  - Assembly material M2.5, incl. hinges





1.6.9 Top/Bottom-Hinged Front Panel

Width	Part-No. 3 U	Part-No. 4 U	Part-No. 6 U	Part-No. 7 U
84 HP	25N384-19	25N484-19	25N684-19	25N784-19

Dimensions

Nominal Width			Width B	
HP	mm	inch	mm	inch
84 HP	426.72	16.80	426.5	16.79

Nominal Height	Height H		Height h	
U	mm	inch	mm	inch
3 U	128.7	5.07	117	4.61
4 U	173.15	6.81	161.4	6.35
6 U	262.05	10.31	250.3	9.85
7 U	306.5	12.07	294.8	11.60

1.6.10 Side-Hinged Front Panel

- Aluminium 2.5 mm, clear anodised (non-conductive)
- **Scope of delivery:**
  - Front panel
  - Hinge extrusion
  - Assembly material M2.5, incl. hinges



1.6.10 Side-Hinged Front Panel

Width	Part-No. 3 U	Part-No. 6 U	Part-No. 7 U
84 HP	25N384-29	25N684-29	25N784-29

Dimensions

Nominal Width			Width B		Width b	
HP	mm	inch	mm	inch	mm	inch
84 HP	426.72	16.80	426.5	16.79	414.3	16.31

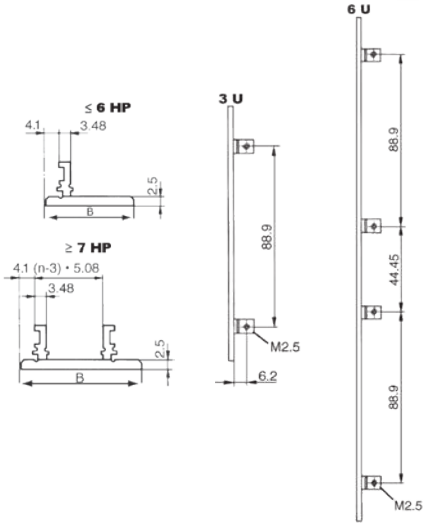
Nominal Height	Height H	
U	mm	inch
3 U	128.7	5.06
6 U	262.05	10.31
7 U	306.5	12.07

Use Elma's front panel service for machining and screen printing of your panels!

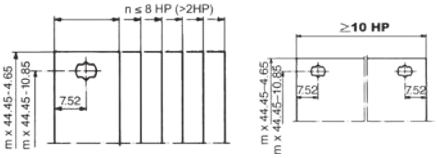


1.6.11 Extruded Front Panels

- Aluminium 2.5 mm, clear anodised (non-conductive)
- PCB mounting lugs are formed on the rear face of the panel
- No PCB fixing screws on the front face of the panel, leaving more space for silk screening and mounting front panel components
- Suitable for all sub racks and cases
- Thickness of the mounting lugs (3.48 mm) allows PCBs to be mounted on either side of the lugs
- At rear drill marks for handle-fixing holes
- **Scope of delivery:**
  - Extruded front panel, clear anodised
- Front panel screws see 1.6.11.1







1.6.11 Extruded Front Panels, without Openings

Width	B		Part-No. 3 U	Part-No. 6 U
	mm	inch		
3 HP	15.0	0.59	26N303	26N603
4 HP	20.1	0.79	26N304	26N604
5 HP	25.2	0.99	26N305	26N605
6 HP	30.3	1.19	26N306	26N606
7 HP	35.3	1.38	26N307	26N607
8 HP	40.4	1.59	26N308	26N608
10 HP	50.6	1.99	26N310	26N610
12 HP	60.7	2.38	26N312	26N612
14 HP	70.9	2.79	26N314	26N614
16 HP	81.1	3.19	26N316	26N616
21 HP	106.5	4.19	26N321	-

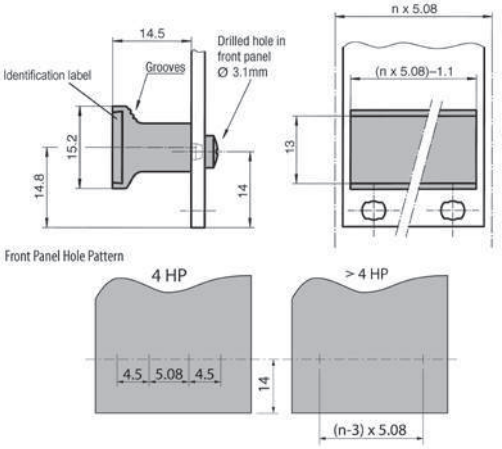
1.6.11.1 Front Panel Screws

- Set of 10 screws
- With screw retainer
- Front panel width up to 9 HP = 2 screws; ≥ 10 HP = 4 screws

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3, size T8, with plastic screw retainer	63K159
Rounded head screws recessed M2.5 x 11.3, with plastic screw retainer	63-159

1.6.11.2 Rigid-Mounted Unit Handles with Identification Label

- Black, plastic UL94 V-0, label aluminium anodised
- **Scope of delivery:**
  - Rigid-mounted handle
  - Identification label
- Assembly material see below





1.6.11.2 Rigid-Mounted Handle with Identification Label

Width	Scope of Delivery	Part-No.
4 HP	10 pcs.	60-200-04
5 HP	10 pcs.	60-200-05
6 HP	10 pcs.	60-200-06
7 HP	10 pcs.	60-200-07
8 HP	10 pcs.	60-200-08
10 HP	10 pcs.	60-200-10
12 HP	10 pcs.	60-200-12
14 HP	1 pc.	60-200-14

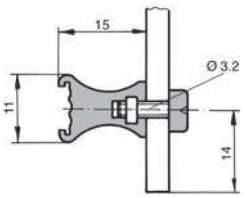
- Other sizes (up to 84 HP) are available upon request

Assembly Material

Description	Part-No.
Cross recessed rounded head screw	61-276

1.6.11.3 Fluted Handles

- Extruded aluminium handles, shaped to facilitate withdrawal of plug-in units
- Two grooves in the front face will accept identification strips (0.5 x 9 mm)
- **Scope of delivery:**
  - Extruded handle, clear anodised
  - Assembly material



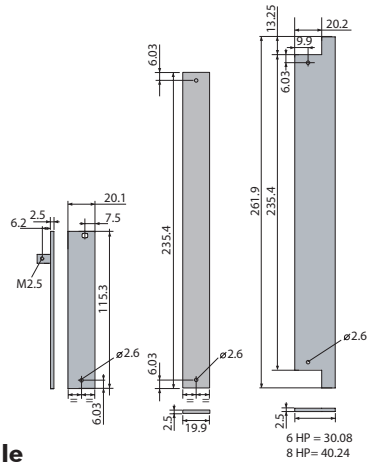


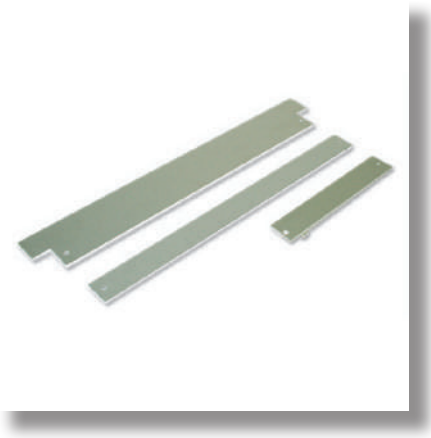
1.6.11.3 Fluted Handles for Front Panels to IEC

Front Panel Width HP	Width mm	Width inch	Handle Length mm	Handle Length inch	Part-No.
3 HP	15.0	0.59	12.5	0.49	60-103
4 HP	20.1	0.79	17.6	0.69	60-104
5 HP	25.2	0.99	22.6	0.88	60-105
6 HP	30.3	1.19	27.7	1.09	60-106
7 HP	35.3	1.38	33.5	1.31	60-107
8 HP	40.4	1.59	37.9	1.49	60-108
10 HP	50.6	1.99	48.0	1.88	60-110
12 HP	60.8	2.39	58.2	2.29	60-112
14 HP	70.9	2.79	69.1	2.72	60-114
16 HP	81.1	3.19	78.5	3.09	60-116
21 HP	106.5	4.18	104.6	4.11	60-121
30 HP	152.2	5.99	149.6	5.88	60-130
40 HP	203.0	7.99	200.4	7.88	60-140
60 HP	304.6	11.99	302.0	11.88	60-160
84 HP	426.5	16.79	424.0	16.69	60-184

1.6.12 Front Panel with Cutout for IEC Ejector Handle

- Aluminium 2.5 mm, clear anodised (non-conductive)
- PCB mounting lugs are formed on the rear face of the panel (only 3 U-Version)
- No PCB fixing screws on the front face of the panel, leaving more space for silk screening and mounting front panel components
- Suitable for all sub racks and cases
- 3 U front panels prepared for one handle
- 6 U front panels prepared for two handels
- **Scope of delivery:**
  - Front panel, clear anodised
- Front panel screws see 2.1.2.1 (for 3 U-Version only)
- IEC ejector handles, see 2.1.2.2





2.1.2 Front Panel with Cutout for IEC Ejector Handle

Width	B		Part-No. 3 U	Part-No. 6 U
	mm	inch		
4 HP	20.0	0.79	26N304-51	21N604-51
6 HP	30.2	1.19		21N606-51
8 HP	40.3	1.59		21N608-51

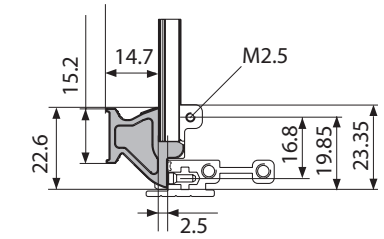
2.1.2.1 Front Panel Screws (for 3 U-Version only)

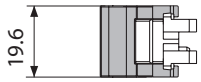
- Set of 10 screws
- With screw retainer
- Front panel 3 U = 1 screw

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3, size T8, with plastic screw retainer	63K159
Rounded head screws recessed M2.5 x 11.3, with plastic screw retainer	63-159

1.6.12.2 Ergonomic Ejector Handles acc. to IEC

- Simple assembly of plug-in units
- Allows trouble-free extraction of electronic units with multi-pole connectors
- Main features in one part: card holder, ejector handle and centring pin
- Reset spring for safe insertion
- One version for top and bottom only
- Handle is injection moulded, glass-reinforced plastic, UL94 V-0
- Card holder is zinc die-cast, nickel plated
- Reset spring is stainless steel
- **Scope of delivery:**
  - Ejector handle
  - Assembly material (screws M2.5 for fixing of card holder/printed board/front panel)
- Front panel with special cutouts have to be ordered separately





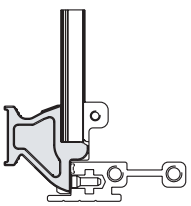


2.1.2.2 Ejector Handle acc. to IEC

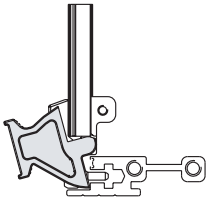
Description	Part-No.
Ejector handle black	81-233
Ejector handle grey	81-234

Extraction process:

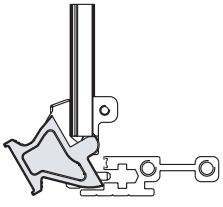
Rest position



Extraction

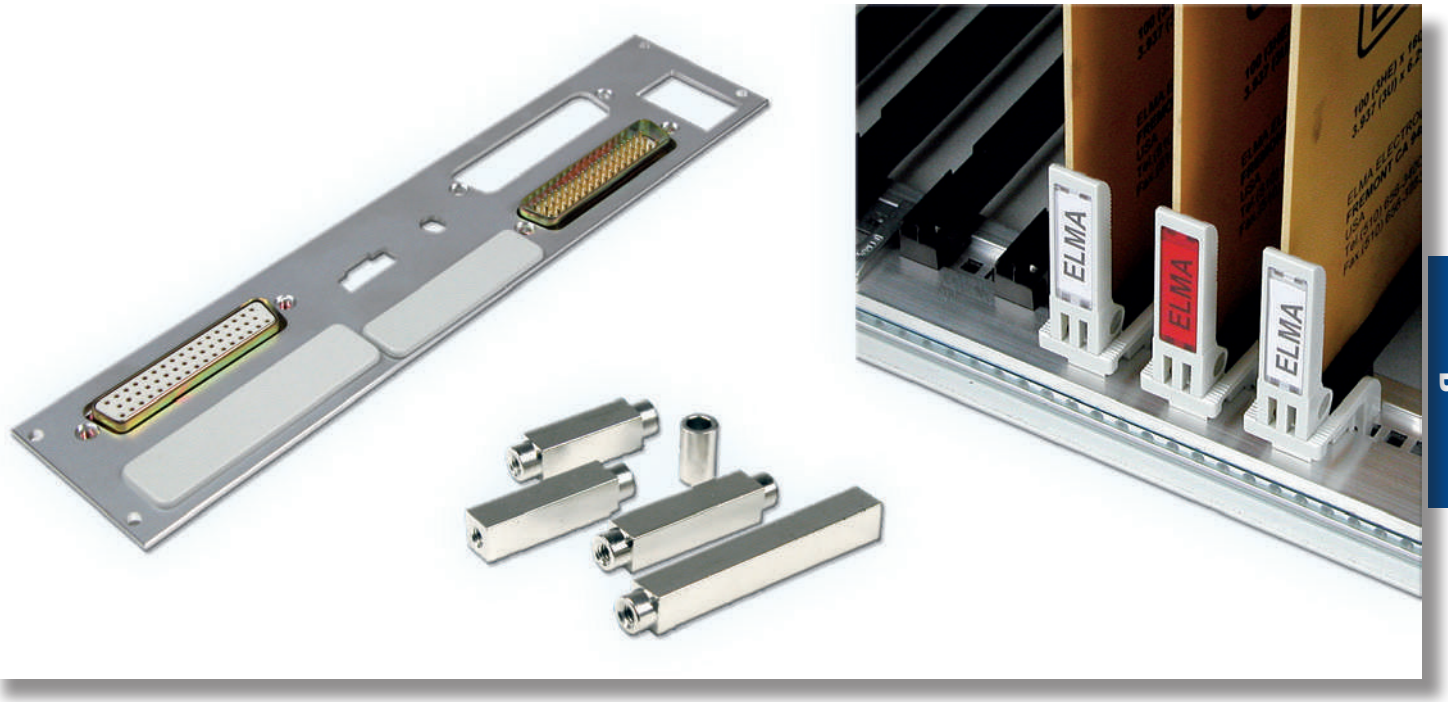


End position



Label

Description	Part-No.
1 sheet A4 of 220 labels	81-031



1.6.13 Card Locks and Card Handles

- The card lock is easily mounted onto the upper or lower front profile
- When the PCB is pushed home, it is automatically locked into position
- The card eject mechanism can be attached to the top or bottom front edge of the PCB and is used in conjunction with the card lock
- The lever action ensures smooth and jerk-free card removal, especially useful when multi-pole connectors are being used
- Transparent windows in different colours and self-adhesive labels set into the front face of the eject mechanism make card identification easy
- The card lock and eject mechanism does not inhibit the use of front panels
- For recessed cards, a special card lock is available, suitable for use with profile 66-144
- **Scope of delivery:**
  - Card locks, eject mechanisms, windows and labels

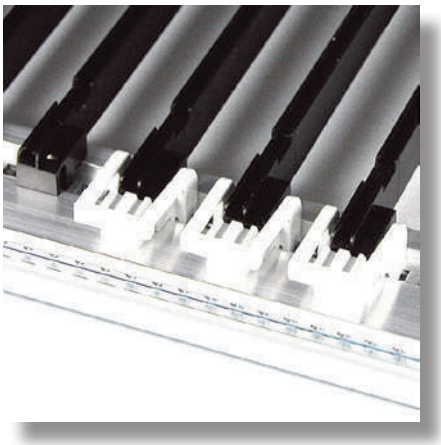


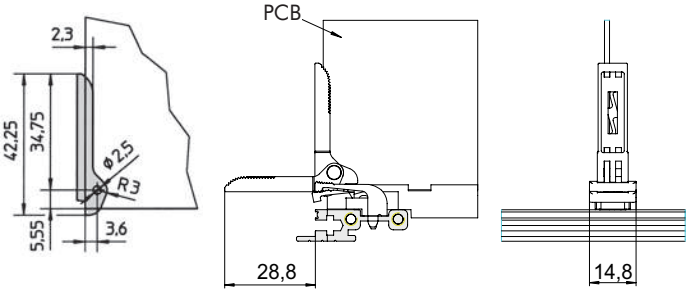
1.6.13.1 Card Locks, Card Injector/Ejector Handles

Description	Colour	Part-No.	
		1 pc.	10 pcs.
Card ejector handles		-	63-151
Card locks		61-126	-
Card locks to 66-144		61-144	-
Transparent window	Clear	-	63-155-1

1.6.13.2 Labels

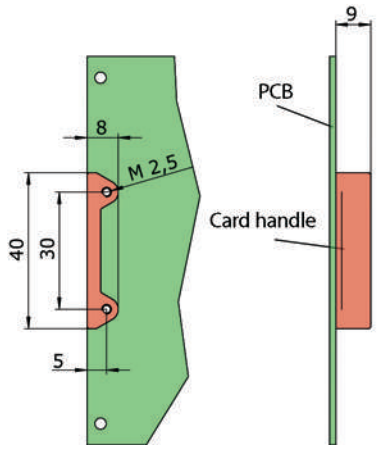
Description	Part-No.
1 sheet A4 of 105	63-161





1.6.13.3 Card Handles

- Coloured, transparent handles which will accept labels facilitate the handling and identification of PCBs
- **Scope of delivery:**
  - 1 card handle
- Two screws M2.5 x 5 are needed per handle and have to be ordered separately



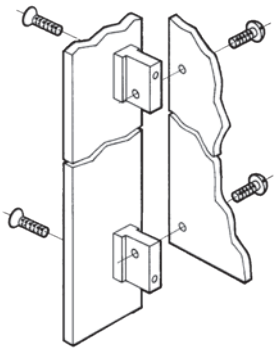


1.6.13.3 Card Handles

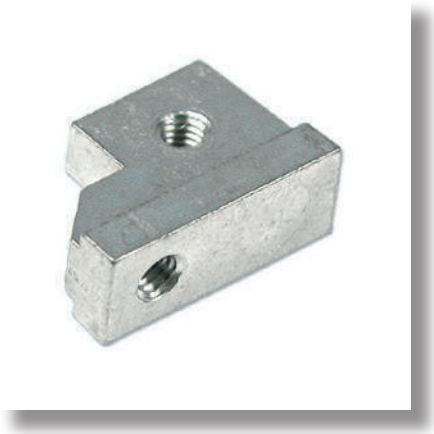
Description	Colour	Part-No.
Card handle	clear	1091-51
	red	1091-54
Cylindrical screw M2.5 x 5		5571-05
Torx cylinder head screw M2.5 x 5, size T8		5470-07

- Other colours (blue, yellow, green, orange) upon request

1.6.14 Card Holder acc. to IEC Standard

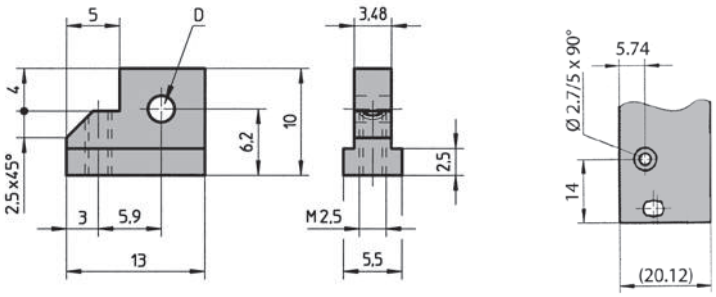


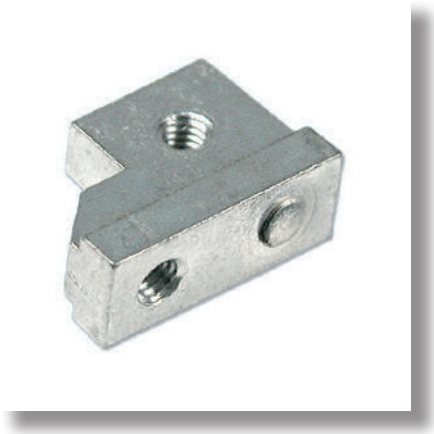
- By using the zinc die-cast card holder, flat front panels can be connected to a PC card to form a plug-in unit to IEC 60297
- The card can be mounted both in the standard position and offset 1 HP (5.08 mm)
- For better positioning of 6 U cards, there is a card holder centre piece made of nylon (see 1.6.15)
- The injector-/ejector handle can be used with the card holder
- **Scope of delivery:**
  - 1 card holder
- Assembly material see 1.6.14.3



1.6.14.1 Card Holder without Swivel Stop

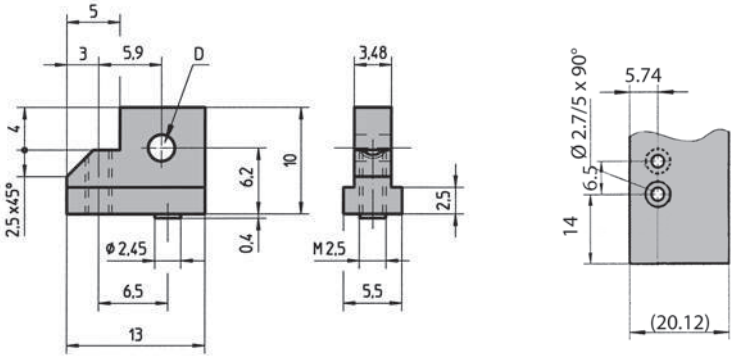
Description	Application	D	Part-No.
Card holder without swivel stop	Without injector/ejector handle	M2.5	61-156
Card holder without swivel stop	With injector/ejector handle	Ø 2.5	61-155





1.6.14.2 Card Holder with Swivel Stop

Description	Application	D	Part-No.
Card holder with swivel stop	Without injector/ejector handle	M2.5	61-156-01
Card holder with swivel stop	With injector/ejector handle	Ø 2.5	61-155-01



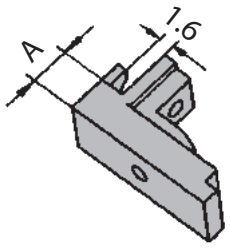


1.6.14.3 Assembly Material

Description	Application	Part-No.
Cross recessed countersunk screw M2.5 x 8	For card holder	5322-08
Torx countersunk screw M2.5 x 8, size T8	For card holder	5470-21
Slotted pan head screw M2.5 x 6	For printed board	5571-06
Torx cylinder head screw M2.5 x 6, size T8	For printed board	5470-04

1.6.15 Middle Part

- Usable for all front panels
- For positioning and fixing of 6 U and 9 U card circuit
- Card thickness 1.6 mm
- Self-adhesive, can optionally be screwed onto front panel and printed board
- Material: Plastic black UL94 V-0
- **Scope of delivery:**
  - Plastic middle part
- Assembly material, see 1.6.15.1





1.6.15 Middle Part

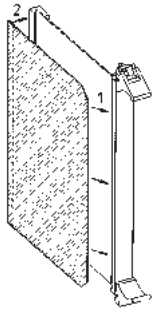
For Front Panels out of	A		Part-No.
	mm	inch	
Aluminium 2.5 mm	2.5	0.10	61-960

1.6.15.1 Assembly Material

Description	Part-No.
PT-countersunk, 2.5 x 6	5534-06

1.6.16 Protective Cover for 6 U Printed Board

1. Slide protective cover between front panel and printed board
2. Press adhesive tape on protective cover through pins of connectors to attach onto printed board





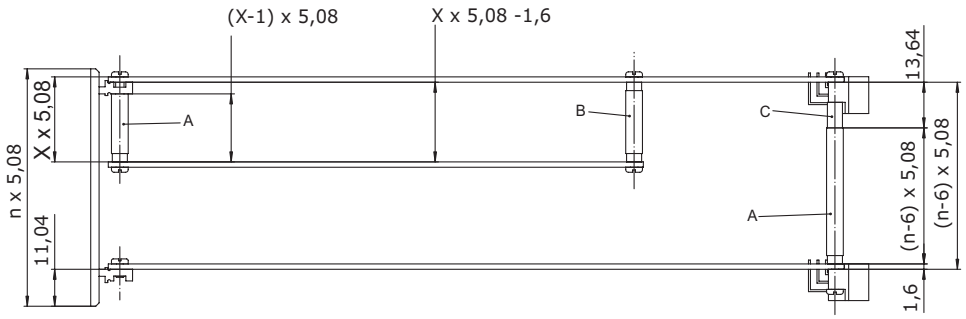
1.6.16 Protective Cover for 6 U Printed Board

- Material: Polyester film mat, thickness 0.2 mm, UL94 VTM-2
- Mechanical protection of soldering side

For Card Depth		Part-No.
mm	inch	
160	6.30	81-010-02

1.6.17 Spacers

- Four-sided, nickel-plated brass spacers with M2.5 internal threads at both ends
- Using these spacers, additional PCBs may be mounted at a horizontal pitch of 5.08 mm
- Mounting plate is 1.5 mm galvanized steel with mounting holes corresponding to PCBs conforming to IEC 60297



n * 5.08 = theoretical width of front panel
x * 5.08 = distance of printed PCBs
n = multiple of the 5.08 pitch of the selected front panel
x = selected multiple of the 5.08 pitch for the distance of printed PCBs



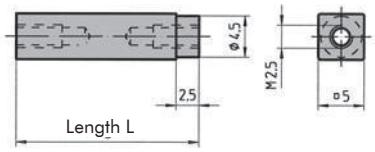
1.6.17.1 Spacers Series A

- Use between PCB mounting lugs and PCBs
- Gives 5.08 mm pitch

Length L		Part-No.
mm	inch	
10.16	0.40	61-300
15.24	0.60	61-301
20.32	0.80	61-302

Other lengths available on request.

Series A

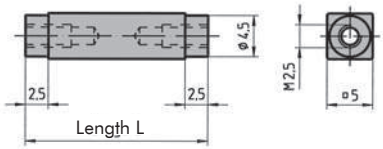


1.6.17.2 Spacers Series B

- Use between two PCBs
- Gives 5.08 mm pitch

Length L		Part-No.
mm	inch	
13.64	0.53	61-320
18.72	0.73	61-321
23.80	0.93	61-322

Series B

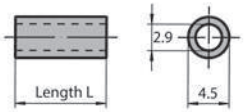


1.6.17.3 Spacers Series C

- Use between a PCB with connector and a second PCB

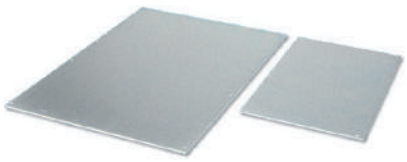
Length L		Part-No.
mm	inch	
7.64	0.30	61-340

Series C



1.6.18 Mounting Plates

- Dimensions identical to eurocard dimensions
- 1.5 mm galvanized sheet steel
- **Scope of delivery:**
  - 1 mounting plate
- Assembly material, see below



1.6.18 Mounting Plates

Height	Dimensions	Part-No.
3 U	100 x 160 mm (3.93" x 6.29")	61-350
6 U	233.35 x 160 mm (9.18" x 6.29")	61-351

Assembly Material

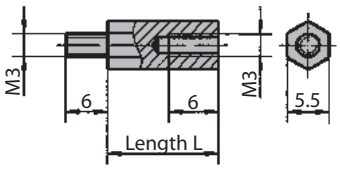
Description	Part-No.
Screws recessed M2.5 x 5	5571-05

1.6.19 Hexagonal Spacers M3 Thread

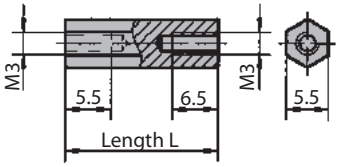
- Galvanised steel
- Ideal for use as supports or spacers
- **Scope of delivery:**
  - 1 spacer



1922-0x



1923-0x



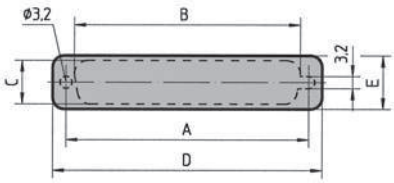
1.6.19 Hexagonal Spacers, M3 Thread

Length L		Part-No.
mm	inch	
10	0.39	1922-01
15	0.59	1922-02
30	1.18	1922-05
40	1.57	1922-07

Length L		Part-No.
mm	inch	
8.5	0.33	1923-01
13.5	0.53	1923-02

1.6.20 Covering Caps

- The caps, fit openings for D-Sub connectors and can be fitted without special tools
- Material: ABS grey UL94 HB
- **Scope of delivery:**
  - Plastic covering caps





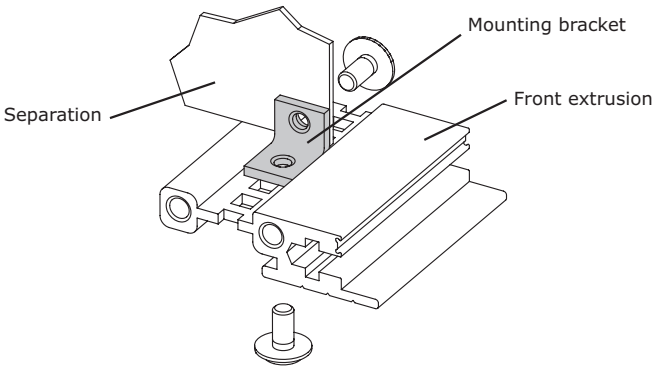
1.6.20 Covering Caps

Opening		A	B	C	D	E	Part-No.
		mm	mm	mm	mm	mm	
DB9	9-pole	25.0	20.5	11.4	32.0	14.0	61-920
DB15	15-pole	33.3	28.8	11.4	40.3	14.0	61-921
DB25	25-pole	47.0	42.5	11.4	54.0	14.0	61-922
DB37	37-pole	63.5	59.1	11.4	70.5	14.0	61-923

1.6.21 Mounting Bracket

- Assembly of a separation
- Separations are manufactured as required by the customer
- Sheet steel
- **Scope of delivery:**
  - 1 mounting bracket
- Assembly material, see below



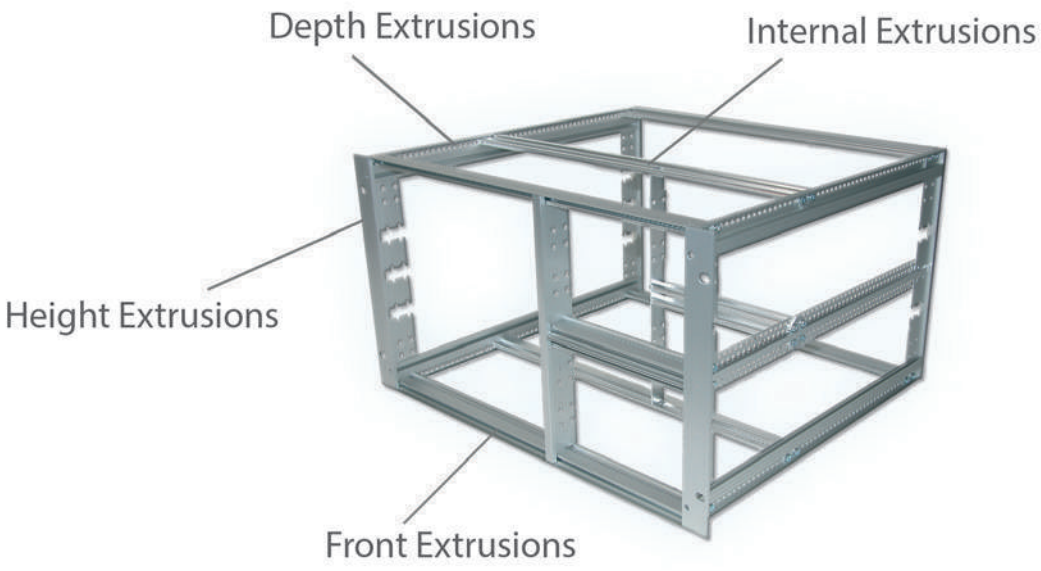


1.6.21 Mounting Bracket

Description	Part-No.
Mounting brackets	61-416

Assembly Material

Description	Part-No.
Rounded head screws cross recessed M3 x 6	5335-06
Rounded head screws Torx M3 x 6, size T10	5473-01

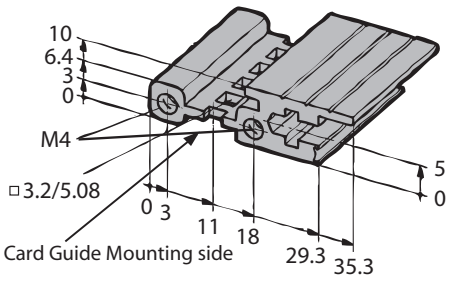


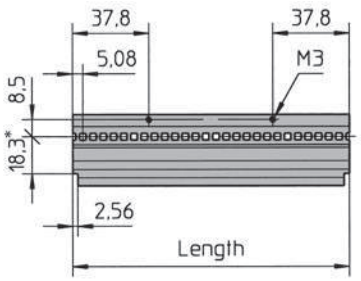
1.7 Extrusions

1.7.1 Front Extrusions

1.7.1.1 Front Extrusion 66-111, IEC

- For sub rack and cases front
- **Scope of delivery:**
  - 1 front extrusion without assembly material

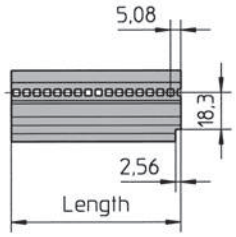




Standard version

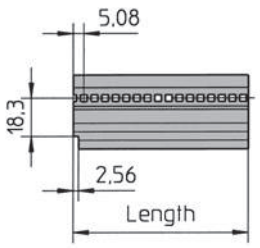
Length for HP	mm	inch	Part-No. clear anodised	black anodised	clear passivated	raw
21	111.8	4.40	66-111-26			
28	147.3	5.80	66-111-25			
32	167.6	6.80	66-111-62			
42	218.4	8.60	66-111-60		66-111-75	
63	325.1	12.80	66-111-61		66-111-76	
81	416.6	16.40	66-111-22		66-111-77	
84	431.8	17.00	66-111-23	66-111-56	66-111-78	66-111-28
	1350.0	53.15				66-111-19

Note: Throughout the catalogue all EMC parts are highlighted in yellow



Height divider right

Length for HP	mm	inch	Part-No. anodised
8.5	43.18	1.70	66-111-71
12.5	63.82	2.54	66-111-72



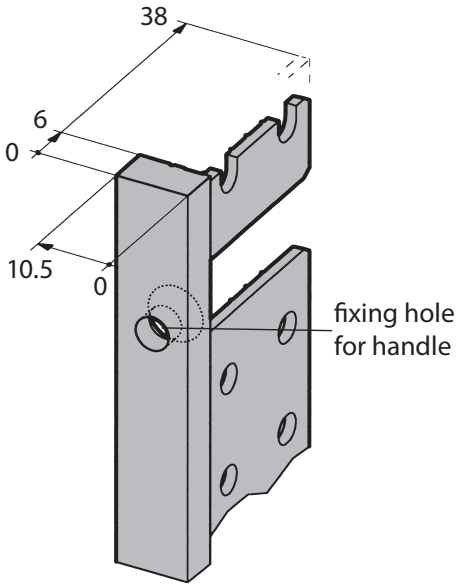
Height divider left

Length for HP	mm	inch	Part-No. anodised
8.5	43.18	1.70	66-111-81
12.5	63.82	2.54	66-111-82

1.7.2 Height Extrusions

1.7.2.1 Height Extrusion 66-173

- Height extrusion for Unibox 14
- Slim version with or without fixing hole for handle
- **Scope of delivery:**
  - 1 height extrusion without assembly material

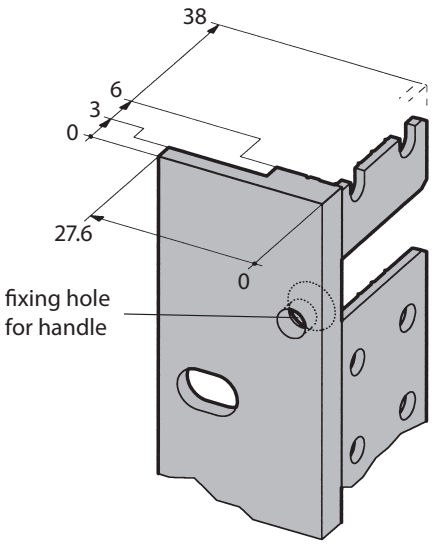


1.7.2.1 Height Extrusion 66-173

Length for U	mm	inch	Part-No. clear anodised fixing hole for handle without	with
2	88.1	3.46	66-173-20	66-173-21
3	132.5	5.20	66-173-22	66-173-23
4	177.0	6.96	66-173-24	66-173-25
5	221.5	8.72	66-173-26	66-173-27
6	265.9	10.46	66-173-28	66-173-29

1.7.2.2 Height Extrusion 66-179

- With or without fixing hole for handle
- 19" height extrusion for Unibox 14 / 84 HP
- **Scope of delivery:**
  - 1 height extrusion without assembly material



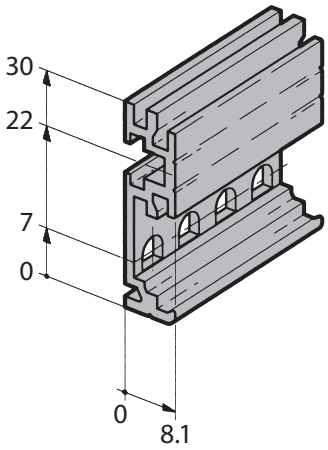
1.7.2.2 Height Extrusion 66-179

Length for U	mm	inch	Part-No. clear anodised fixing hole for handle without	with
2	88.1	3.46	66-179-22	66-179-32
3	132.5	5.20	66-179-23	66-179-33
4	177.0	6.96	66-179-24	66-179-34
5	221.5	8.72	66-179-25	66-179-35
6	265.9	10.46	66-179-26	66-179-36
7	310.3	12.20	66-179-27	66-179-37
8	354.8	13.96	66-179-28	66-179-38
9	399.2	15.71	66-179-29	66-179-39

1.7.3 Depth Extrusions

1.7.3.1 Depth Extrusion 66-177

- Depth extrusion for universal sub rack Unibox 14
- **Scope of delivery:**
  - 1 depth extrusion without assembly material

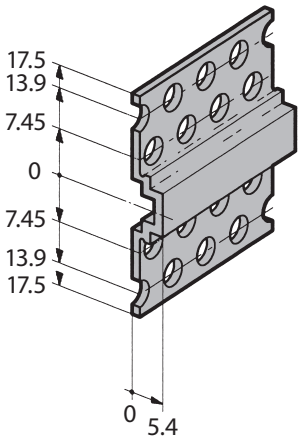


1.7.3.1 Depth Extrusion 66-177

Length		Part-No. clear
232.6	9.15	66-177-21
292.6	11.51	66-177-22
352.6	13.55	66-177-23
412.6	16.24	66-177-24
532.6	20.96	66-177-26

1.7.3.2 Depth Divider Extrusion 66-176

- Depth divider extrusion for universal sub rack Unibox 14
- **Scope of delivery:**
  - 1 depth extrusion without assembly material



1.7.3.2 Depth Divider Extrusion 66-176

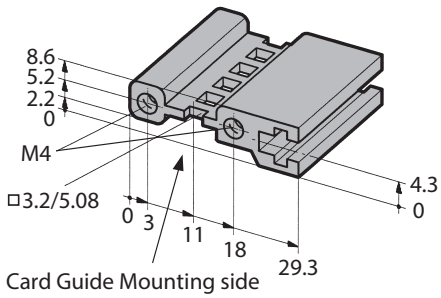
Length mm	inch	Part-No. clear passivated
292	11.49	66-176-22
412	16.22	66-176-24
532	20.94	66-176-26

Note: Throughout the catalogue all EMC parts are highlighted in yellow

1.7.4 Internal Extrusions

1.7.4.1 Standard Internal Extrusion 66-144

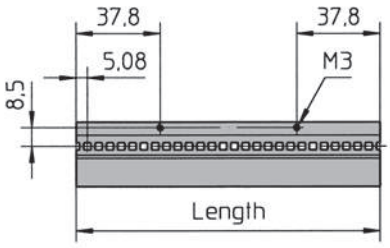
- Standard extrusion for mounting supplementary edge connector extrusions in sub racks and cases
- **Scope of delivery:**
  - 1 internal extrusion without assembly material



1.7.4.1 Standard Internal Extrusion 66-144

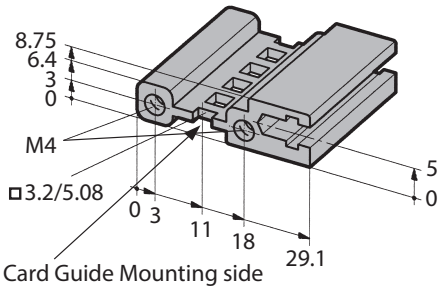
Length			Part-No.	
for HP	mm	inch	**clear passivated**	**raw**
42	218.4	8.60	66-144-60	-
63	325.1	12.80	66-144-61	-
81	416.6	16.40	66-144-22	-
84	431.8	17.00	66-144-23	-
	1350.0	53.14	-	66-144-19

Note: Throughout the catalogue all EMC parts are highlighted in yellow



1.7.4.2 Internal Extrusion 66-193 for Insulated Backplane Mounting

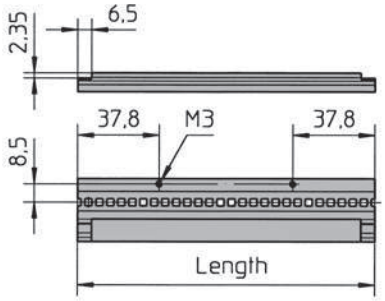
- For mounting backplanes in sub racks, grooved to accept 1.8 x 5 mm tapped strips
- To use with insulation strips 66-901
- **Scope of delivery:**
  - 1 internal extrusion without assembly material



1.7.4.2 Internal Extrusion 66-193 for Use of Insulating Strip

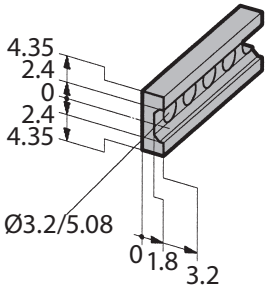
Length			Part-No.
for HP	mm	inch	**clear passivated**
81	416.6	16.40	66-193-24
84	431.8	17.00	66-193-25

Note: Throughout the catalogue all EMC parts are highlighted in yellow



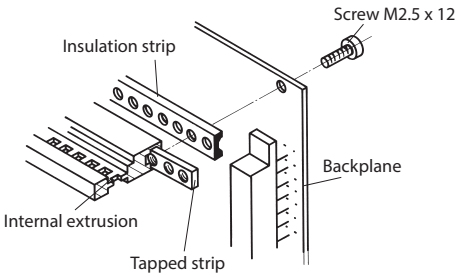
1.7.4.3 Insulating Strips 66-901

- Plastic grey
- In use with extrusions 66-112, 66-192, 66-193, 66-288



1.7.4.3 Insulating Strips 66-901

Length for HP	mm	inch	Part-No.
42	216.44	8.52	66-901-20
63	323.12	12.72	66-901-21
81	414.56	16.32	66-901-22
84	429.80	16.92	66-901-23

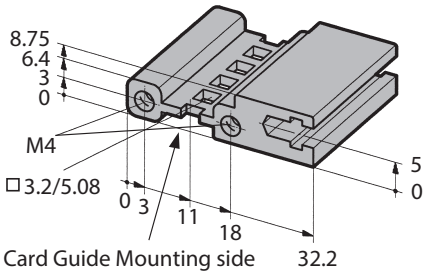


Mounting with Insulation Strips

Part	Part-No.
Screw to insulation extrusion	5325-12

1.7.4.4 Internal Extrusion 66-194 for Conductive Backplane Mounting

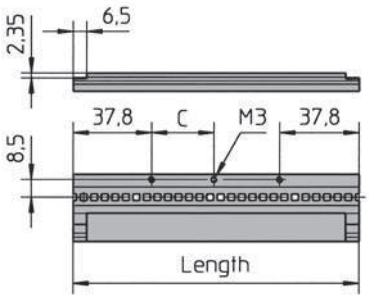
- For mounting backplanes without an insulating strip
- Grooved to accept 1.8 x 5 mm tapped strips
- **Scope of delivery:**
  - 1 internal extrusion without assembly material



1.7.4.4 Internal Extrusion 66-194 without Use of Insulating Strip

Length for HP	mm	inch	Holes n x C	Part-No. clear passivated
81	416.6	16.40	2 x 170.48	66-194-24
84	431.8	17.00	2 x 178.1	66-194-25

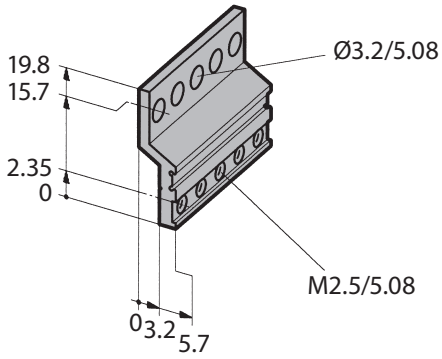
Note: Throughout the catalogue all EMC parts are highlighted in yellow



1.7.5 Edge Connector Extrusions

1.7.5.1 Edge Connector Extrusion 66-145

- Supplementary edge connector extrusion for IEC 60603-2 connectors
- Matches 66-144, 66-133 and 66-124
- **Scope of delivery:**
  - 1 supplemenatry edge connector extrusion without assembly material



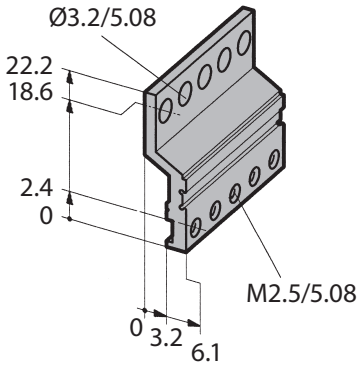
1.7.5.1 Edge Connector Extrusion 66-145

Length			Part-No.	
for HP	mm	inch	clear passivated	raw
8	40.6	1.59	66-145-40	
18	91.4	3.59	66-145-41	
28	142.2	5.60	66-145-42	
42	213.4	8.40	66-145-63	
63	320.0	12.60	66-145-65	
81	411.5	16.20	66-145-22	
84	426.7	16.80	66-145-52	
	1350.0	53.14		66-145-19

Note: Throughout the catalogue all EMC parts are highlighted in yellow

1.7.5.2 Edge Connector Extrusion 66-147

- Supplementary edge connector extrusion for IEC 60603-2
- Matches 66-112, 66-192 and 66-193
- **Scope of delivery:**
  - 1 supplemenatry edge connector extrusion without assembly material



1.7.5.2 Edge Connector Extrusion 66-147

Length			Part-No.	
for HP	mm	inch	clear passivated	raw
8	40.6	1.59	66-147-40	
18	91.4	3.59	66-147-41	
28	142.2	5.60	66-147-42	
42	213.4	8.40	66-147-63	
63	320.0	12.60	66-147-65	
81	411.5	16.20	66-147-22	
84	426.7	16.80	66-147-52	
	1350.0	53.14		66-147-19

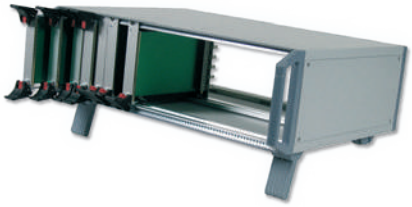
Note: Throughout the catalogue all EMC parts are highlighted in yellow



Source: Ibak, Germany

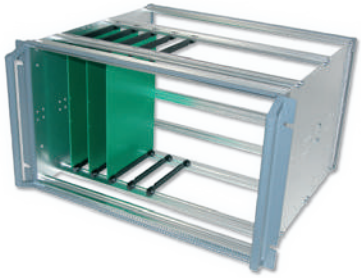
Notes

2: Stylebox 15









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2.1.2 Stylebox 15 Standard Kit B | 2_8

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2.2.2 Height Bezel B | 2_11

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2.2.4 Top Cover Panel B | 2_12

2.2.5 Bottom Cover B | 2_12

2.2.6 Side Panel B | 2_13

2.2.7 Rear Panel B | 2_14

2.2.8 Portable Desktop Handle B | 2_14

2.3 Stylebox 15 Standard **B | 2_15**

2.3.1 Width B | 2_16

2.3.2 Height Bezel B | 2_16

2.3.3 Depth B | 2_16

2.3.4 Top Cover B | 2_17

2.3.5 Bottom Cover B | 2_17

2.3.6 Side Panel B | 2_18

2.3.7 Portable Desktop Handle B | 2_18

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2.4.1 Adaptation Kit a B | 2_22

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2.6.2 Card Guides acc. to IEEE B | 2_33

2.7 Front Panels **B | 2_36**

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2.7.3 Fan Front Panels B | 2_40

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2.7.6 EMC Plug-In Units acc. to IEC B | 2_47

2.7.7 Plug-In Units acc. to IEEE B | 2_51

2.8 Extrusions **B | 2_55**

2.8.1 Front Extrusions B | 2_55

2.8.2 Internal Extrusions B | 2_57









2.1 Stylebox 15 Overview

- The Elma Stylebox 15 case system consists of four longitudinal sections and two side panels as loadbearing frame and casing
- The top and bottom covers are provided with spring catches, which engage in special slots on the longitudinal sections. They are also screwed at the side to increase the torsional rigidity of the case
- The lateral cover plates are secured with a simple Velcro fastener
- The front of the case can be fitted as required with cover panels, front handles or 19" fixing brackets. This permits subsequent conversion from a desktop case to a 19" module unit and vice-versa
- The mounting dimensions at front and rear comply with IEC 60297
- The side panels are passivated. The supporting surfaces of the longitudal sections and top/bottom plates are clear and clear passivated. This provides a large contact area for long-term EMI/RFI protection
- The top design and the variety of sizes and models, together with the full range of Elma accessories, are ideal solutions for a wide range of applications, including measuring units, controllers, computer systems, etc.

Sturdy, flexible and portable

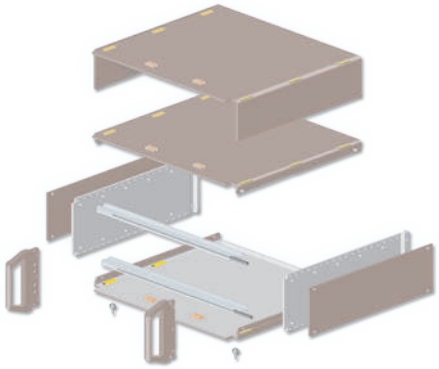
Technical features
- Superior EMC-shielding options available
- Easy conversion from desktop to 19" rack mount case
- Dimensions to IEC 60297
- Simple assembly
- Easy access
- Elegant design

Options
- Numerous accessories
- Internal mounting chassis
- Horizontal and vertical insertion of eurocards
- Cooling

Applications
- Measurement and test instruments
- Lab and field service instruments
- Controls
- Computers

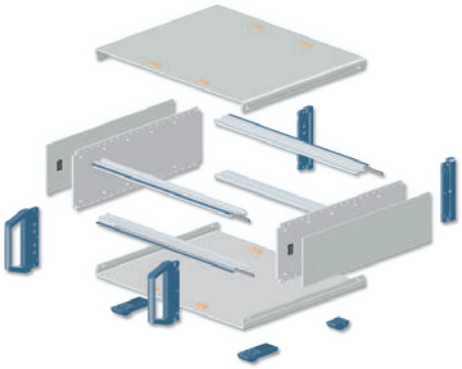
Colours
- Stylebox 15 Smart
  - Light grey (RAL 7035)
- Stylebox 15 Standard
  - Case elements powder-coated light-grey (NCS 2502-B)
  - Frame powder-coated, feet plastic dark-grey (NCS 5010-R90B)
- Other colours available upon request, see section F "Customisation and Services"

Types and Sizes



Stylebox 15 Smart

- Extrusions and sides aluminium
- Covers of galvanized steel
- Advanced EMC-shielding as standard



Stylebox 15 Standard

- Extrusions and inner sides aluminium
- Aluminium covers
- EMC-shielding basic as standard

Desktop Case without Handles



Desktop Case with Front Handles

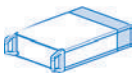
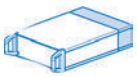
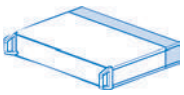
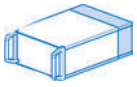
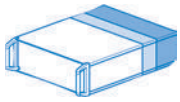
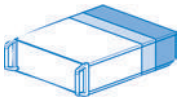
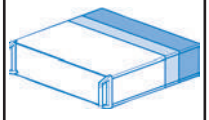
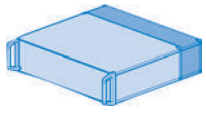
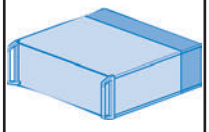
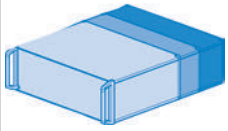
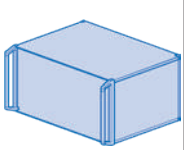
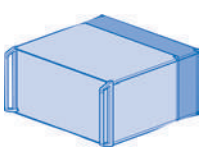
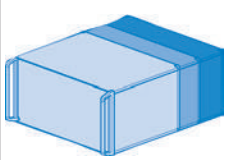


Portable Desktop Case



19" Case with Front Handles



Width	42 HP		63 HP		84 HP	
Height	Smart	Standard	Smart	Standard	Smart	Standard
2 U						
3 U						
4 U						
6 U						

Depth ☐ 245 mm 9.64" ☐ 305 mm 12.00" ☐ 395 mm 15.55" ■ 500 mm 19.68"

EMC

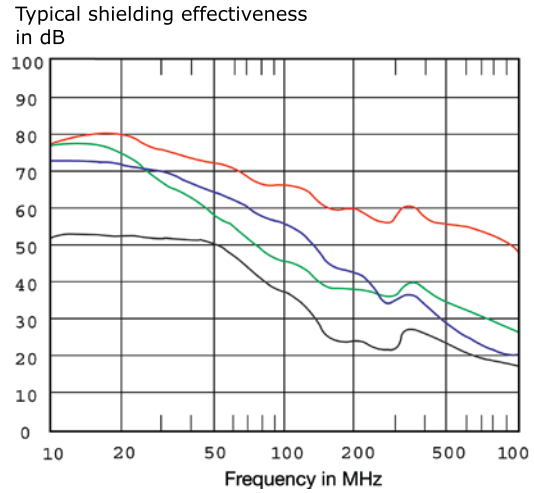
"Electromagnetic comptability is the ability of a system to operate in the intended environment without causing or suffering unacceptable degradation of performance due to unintentinal electromagnetic radiation or response." The EMC characterstics of a system therefore consist of an appropriate immunity from interference (noise immunity) and a limited emission of interference (noise emission).

Elma's EMC concept describes three levels of electromagnetic shielding performance (Performance Level). The attenuation levels will simplify the selection of sub racks for the user. Test setup: The first measurement E1 is without the enclosure. The next measurement E2 is made with the transmitting antenna installed inside the enclosure. The difference between the received signal without and with the enclosure represents the shielding effectiveness in dB.

Performance Level	30 - 230 MHz	230 - 1000 MHz	1000 - 2000 MHz
1 / Elma: Basic level	20 dB	10 dB	0 dB
2 / Elma: Advanced level	40 dB	30 dB	20 dB
3 / Elma: Superior level	60 dB	50 dB	40 dB

The standard configuration will provide you with a basic (Stylebox 15 Standard) or an advanced EMC level (Stylebox 15 Smart). If you require an advanced or superior EMC level for your system, you need to order **additional EMC parts**. Throughout the catalogue we have put all EMC parts **in a yellow table**.

Typical Attenuation



EMC basic level — Case size 4 U-x-42 HP-x-245 mm (9.64")
with standard front panels
(cover panels perforated and unperforated)

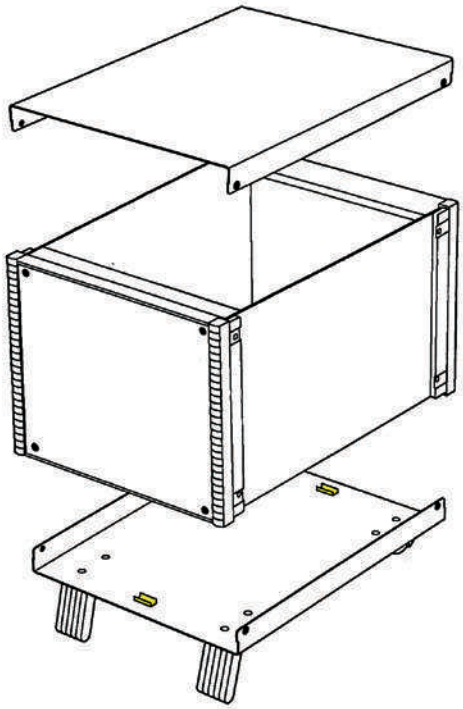
EMC basic level — Case size 4 U-x-84 HP-x-395 mm (15.55")
with standard front panels
(cover panels perforated and unperforated)

Advanced EMC level — Case size 4 U-x-84 HP-x-395 mm (15.55")
with EMC front panels and gasket set for advanced EMC level
(cover panels perforated and unperforated)

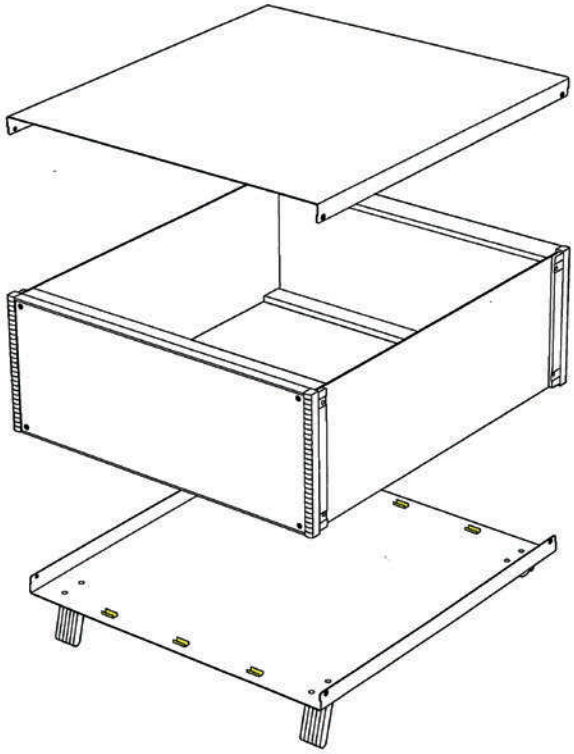
Superior EMC level — Case size 4 U-x-84 HP-x-395 mm (15.55")
with EMC front panels and gasket set for superior EMC level
(cover panels perforated and unperforated)

EMC Layout & Configuration Options

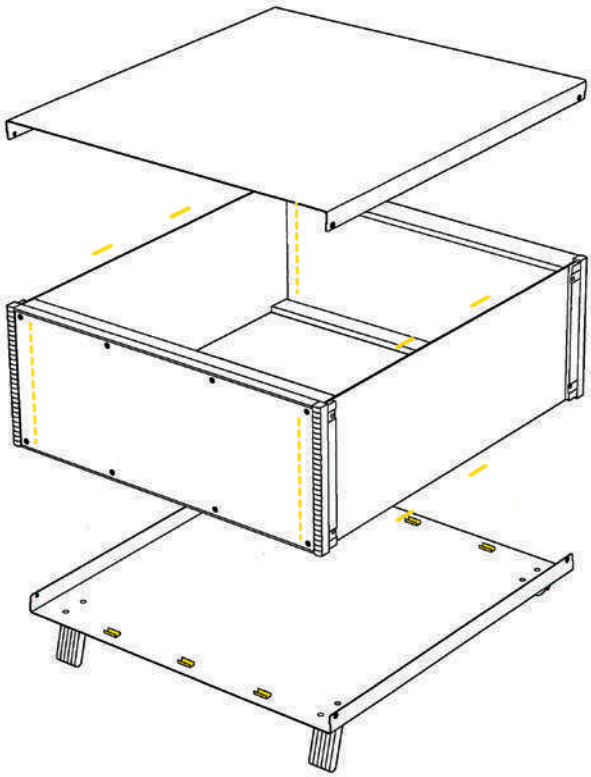
Basic Level
Stylebox 15 Standard
Size 4 U x 42 HP x 245 mm
with standard front panels
(cover plates perforated or unperforated)



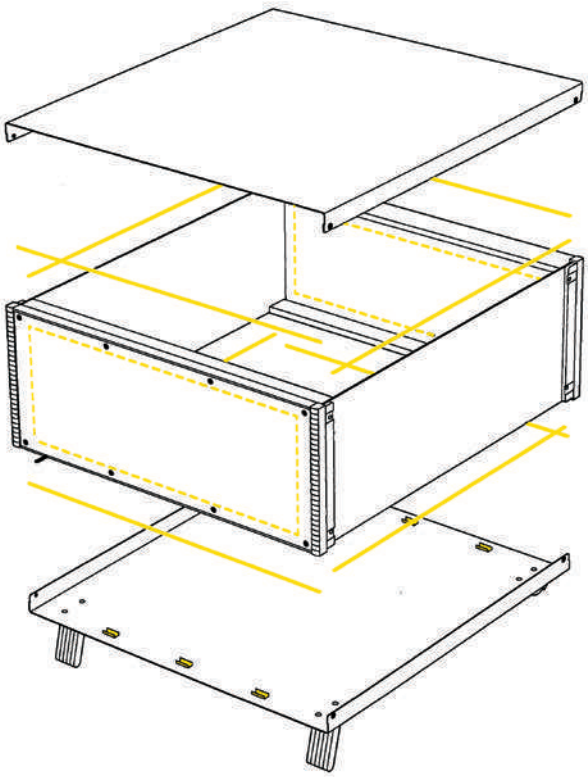
Basic Level
Stylebox 15 Standard
Size 4 U x 84 HP x 395 mm
with standard front panels
(cover plates perforated or unperforated)



Advanced Level
Stylebox 15 Standard
Size 4 U x 84 HP x 395 mm
with EMC front panels and gasket kit
(cover plates perforated or unperforated)



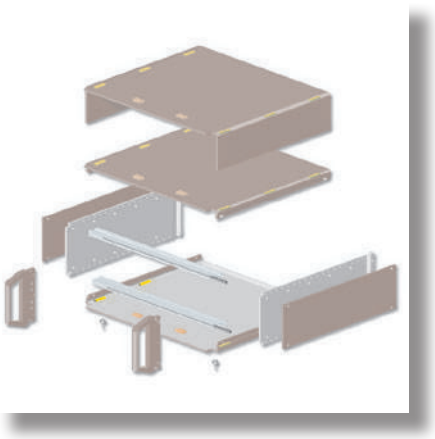
Superior Level
Stylebox 15 Standard
Size 4 U x 84 HP x 395 mm
with EMC front panels and gasket kit
(cover plates perforated or unperforated)



2.1.1 Complete Stylebox 15 Kits

You can find the most used complete kits below.

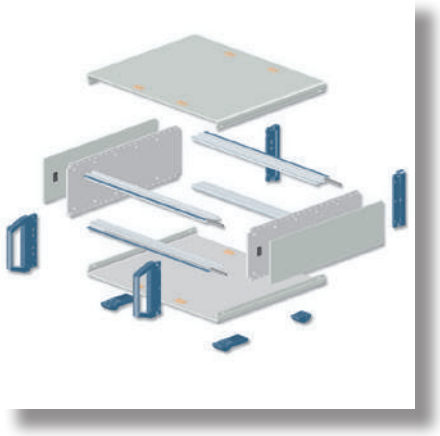
With the new order structure (see "Configuration" on page 2_9) you have however the possibility of configure your individual housing in different steps. Use this offer or contact us for further information or any other help.



2.1.1 Stylebox 15 Smart Kit

- **Scope of delivery:**
  - 2 height bezels (detail see 2.2.2)
  - 2 front extrusions (detail see 2.2.1)
  - 2 tapped strips M2.5 (detail see 2.2.1)
  - 1 top cover panel, solid, light grey (detail see 2.2.4)
  - 1 bottom cover panel, solid, light grey (detail see 2.2.5)
  - 2 internal side panels (detail see 2.2.3)
  - 2 external side panels, solid, light grey (detail see 2.2.6)
  - 1 set of 4 pieces plastic feet (detail see 2.2.5.2)
  - 1 set assembly material
  - 1 set of EMC gaskets (detail see 2.5.8.1)
- Rear panel have to be ordered separately, see 2.2.7

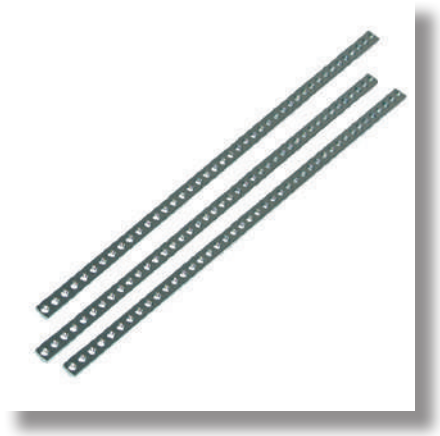
Description	Height	Width	Depth		
			245 mm 9.64"	305 mm 12.00"	395 mm 15.55"
Desktop with front handles	2 U	42 HP	15A02212-30	-	-
Desktop with front handles		63 HP	-	15A02223-30	-
Desktop With front handles		84 HP	-	15A02243-30	-
19" case with front handles		84 HP	15A03242-30	15A03243-30	-
Desktop with front handles	3 U	42 HP	15A02312-30	-	-
Desktop with front handles		63 HP	15A02322-30	15A02323-30	-
Desktop With front handles		84 HP	-	15A02343-30	15A02344-30
19" case with front handles		84 HP	15A03342-30	15A03343-30	15A03344-30
19" case with front handles	4 U	84 HP	-	15A03443-30	15A03444-30



2.1.2 Stylebox 15 Standard Kit

- **Scope of delivery:**
  - 2 front height bezels (detail see 2.3.2)
  - 2 rear height bezels (detail see 2.3.2)
  - 4 front/rear extrusions IEC (detail see 2.3.1)
  - 1 top cover panel, solid, light grey (detail see 2.3.4)
  - 1 bottom cover panel incl. feet, solid, light grey (detail see 2.3.5)
  - 2 internal side panels (detail see 2.3.3)
  - 2 external side panels, solid, light grey (detail see 2.3.6)
  - 1 set assembly material
- Tapped strips have to be ordered separately, see below
- Front / Rear panel have to be ordered separately, see 2.7

Description	Height	Width	Depth		
			245 mm 9.64"	305 mm 12.00"	395 mm 15.55"
Desktop with front handles	2 U	42 HP	15-02212-10	15-02213-10	-
Desktop with front handles		63 HP	15-02222-10	15-02223-10	15-02224-10
19" case with front handles		84 HP	-	15-03243-10	15-03244-10
Desktop with front handles	3 U	42 HP	15-02312-10	15-02313-10	-
Desktop with front handles		63 HP	15-02322-10	15-02323-10	-
Desktop With front handles		84 HP	-	15-02343-10	15-02344-10
19" case with front handles		84 HP	-	15-03343-10	15-03344-10
Desktop with front handles	4 U	63 HP	-	15-02423-10	15-02424-10
Desktop With front handles		84 HP	-	15-02443-10	15-02444-10
19" case with front handles		84 HP	-	-	15-03444-10
19" case with front handles	6 U	84 HP	-	-	15-03644-10



2.1.2.1 Tapped Strips

- Steel, zinc-plated
- **Scope of delivery:**
  - 1 tapped strip

Size	42 HP	63 HP	84 HP
M2.5 / 2 x 6mm	61-464	61-469	61-468

Configuration



Type



Stylebox 15 Smart Follow 2.2

Stylebox 15 Standard Follow 2.3

Frame

Width 2.2.1 / 2.3.1
- 42 HP / 63 HP / 84 HP

Height 2.2.2 / 2.3.2
- 2 U / 3 U / 4 U / 6 U (Standard only)
- Without / with handles
- Portable desktop
- 19" with front handles

Depth 2.2.3 / 2.3.3
- 245 mm / 305 mm / 395 mm / 500 mm (Standard only)

Covers

Top Cover 2.2.4 / 2.3.4
- Solid / perforated
- Width: 42 HP / 63 HP / 84 HP

Bottom Cover 2.2.5 / 2.3.5
- Solid / perforated
- Width: 42 HP / 63 HP / 84 HP

Feet

Side Panels 2.2.6 / 2.3.6
- Height: 2 U / 3 U / 4 U
- Width: 42 HP / 63 HP / 84 HP
- Solid / solid for portable desktop

Rear Panel 2.2.7 / 2.3.7
- Height: 2 U / 3 U / 4 U / 6 U (Standard only)
- Depth: 245 mm / 305 mm / 395 mm / 500 mm (Standard only)

Portable Desktop Handle 2.2.8 / 2.3.8

2.4 Adapation Kits

2.5 Assembly Accessories

2.6 General Accessories

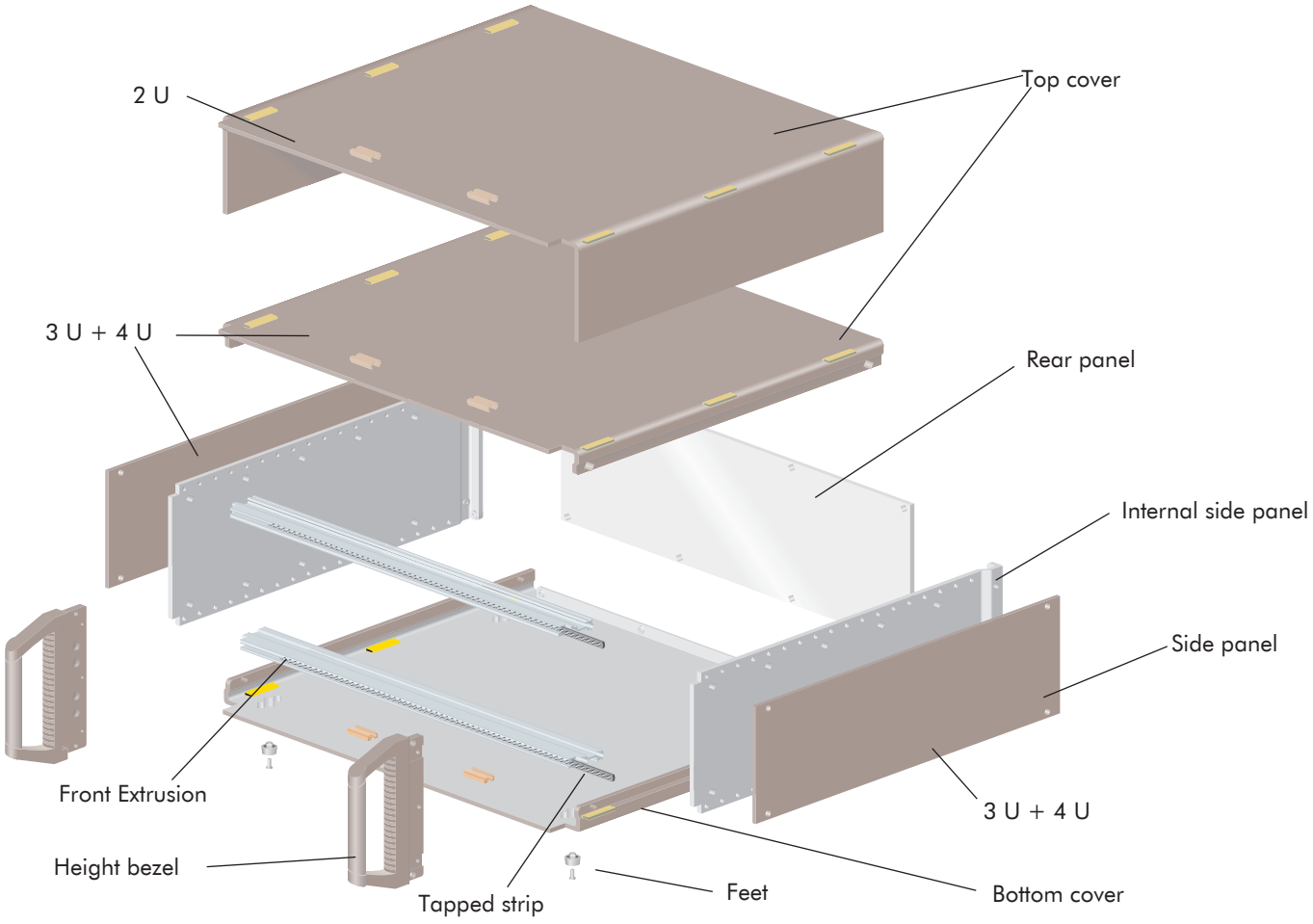
2.7 Front Panels

2.8 Extrusions



2.2 Stylebox 15 Smart

- Extrusions and sides aluminium
- Covers of galvanized steel
- Advanced EMC-shielding as standard
- Dimensions to IEC 60297
- Modern design
- Simple assembly
- Conductive contact surfaces
- Visible surfaces are powder-coated
- Colour: Light grey (RAL 7035)



2.2.1 Width

- For Stylebox 15 Smart
- Extrusions: Aluminium, conductive
- **Scope of delivery:**
  - 2 front extrusions
  - 2 tapped strips M2.5
  - 1 set of 8 screws cross recessed M4 x 10

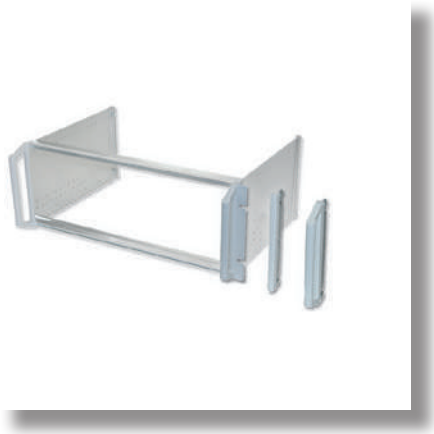


2.2.1 Width

42 HP	63 HP	84 HP
15S001	15S002	15S003

2.2.2 Height Bezel

- For Stylebox 15 Smart
- Die cast parts: Aluminium, powder coated
- Contact area conductive
- **Scope of delivery:**
  - 2 height bezels



2.2.2 Height Bezel

Description	2 U	3 U	4 U
Without handles	15S010	15S011	15S012
With front handles	15S013	15S014	15S015
19" with front handles	15S016	15S017	15S018

2.2.3 Depth

- For Stylebox 15 Smart
- 2.0 mm Aluminium, clear passivated
- **Scope of delivery:**
  - 1 internal side panel
- 2 pcs. have to be ordered (for left and right side)



2.2.3 Depth

For Height	245 mm 9.64"	305 mm 12.00"	395 mm 15.55"
2 U	15A520	15A522	-
3 U	15A530	15A532	15A534
4 U left	-	15A542	15A544
4 U right	-	15A543	15A545

2.2.4 Top Cover Panel

- For Stylebox 15 Smart
- 0.75 mm sheet steel, powder coated, contact area conductive
- **Scope of delivery:**
  - 1 top cover panel
- Assembly material see below



2.2.4.1 Versions for Height 2 U

Description	Width	Depth	
		245 mm 9.64"	305 mm 12.00"
Solid, light grey	42 HP	15A221-30	15A222-30
Perforated, light grey		15A221-31	15A222-31
Solid, light grey	63 HP	15A226-30	15A227-30
Perforated, light grey		-	15A227-31
Solid, light grey	84 HP	15A231-30	15A232-30
Perforated, light grey		15A231-31	15A232-31

2.2.4.2 Versions for Height > 2 U

Description	Width	Depth		
		245 mm 9.64"	305 mm 12.00"	395 mm 15.55"
Solid, light grey	42 HP	15A201-30	15A202-30	-
Perforated, light grey		15A201-31	15A202-31	-
Solid, light grey	63 HP	15A206-30	15A207-30	-
Perforated, light grey		15A206-31	15A207-31	-
Solid, light grey	84 HP	15A211-30	15A212-30	15A213-30
Perforated, light grey		15A211-31	15A212-31	15A213-31

2.2.4.3 Assembly material

- For 2 U Version, 4 screws are needed

Description	Part-No.
Cross recessed countersunk screw M3x6 (4 x M3x6)	5332-76

2.2.5 Bottom Cover

- For Stylebox 15 Smart
- 0.75 mm sheet steel, powder coated, contact area conductive
- **Scope of delivery:**
  - 1 bottom cover panel
- Feet for bottom cover panel see 2.2.5.2

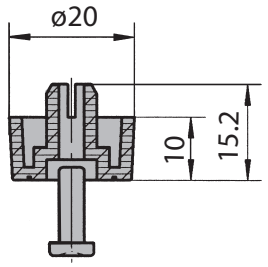


2.2.5.1 Bottom Cover Panel

Description	Width	Depth		
		245 mm 9.64"	305 mm 12.00"	395 mm 15.55"
Solid, light grey	42 HP	15A301-30	15A302-30	-
Perforated, light grey		15A301-31	15A302-31	-
Solid, light grey	63 HP	15A306-30	15A307-30	-
Perforated, light grey		15A306-31	15A307-31	-
Solid, light grey	84 HP	15A311-30	15A312-30	15A313-30
Perforated, light grey		15A311-31	15A312-31	15A313-31

2.2.5.2 Feet

- For Stylebox 15 Smart
- Plastic, UL 94 V0
- Easy and fast mounting without tools
- **Scope of delivery:**
  - Set of 4 pieces plastic feet
  - Incl. push rivet





2.2.5.2 Feet

Description	Part-No.
Set of case feet light grey (RAL 7035)	63-529
Set of case feet black (RAL 9005)	63-528

2.2.6 Side Panel

- For Stylebox 15 Smart
- Outer side, visible surface
- 0.75 mm sheet steel, powder coated
- **Scope of delivery:**
  - 1 side panel
- 2 pieces have to be ordered (for left and right side)
  (Side panels for 2U-Version integrated in top cover, see 2.2.4.1)
- Assembly material see below



2.2.6.1 Side Panel

Description	Depth		Height	
	mm	inch	3 U	4 U
Solid, light grey	245	9.64	15A606-30	-
Solid, light grey	305	12.00	15A607-30	15A612-30
Solid, light grey portable desktop			15A662-30	15A667-30
Solid, light grey	395	15.55	15A608-30	15A613-30

2.2.6.2 Assembly material

- 4 screws are needed for 1 side panel.

Description	Part-No.
Cross recessed countersunk screw M3x6	5332-76

2.2.7 Rear Panel

- For Stylebox 15 Smart
- 2.5 mm Aluminium, front anodised, rear conductive
- **Scope of delivery:**
  - 1 rear panel
- Rear panel drawing see 2.3.8
- Assembly material see below



2.2.7.1 Rear Panel

Description	Width	Height		
		2 U	3 U	4 U
Solid	42 HP	21A242	21A342	-
Solid	63 HP	21A263	21A363	-
Solid	84 HP	21A284	21A384	21A484

2.2.7.2 Assembly Material for Rear Panel

- For 1 backplane are needed:
  - 42 TE: 6 screws
  - 63 TE: 8 screws
  - 84 TE: 10 screws

Description	Part-No.
Cross recessed pan shead screw M3x8	5330-08

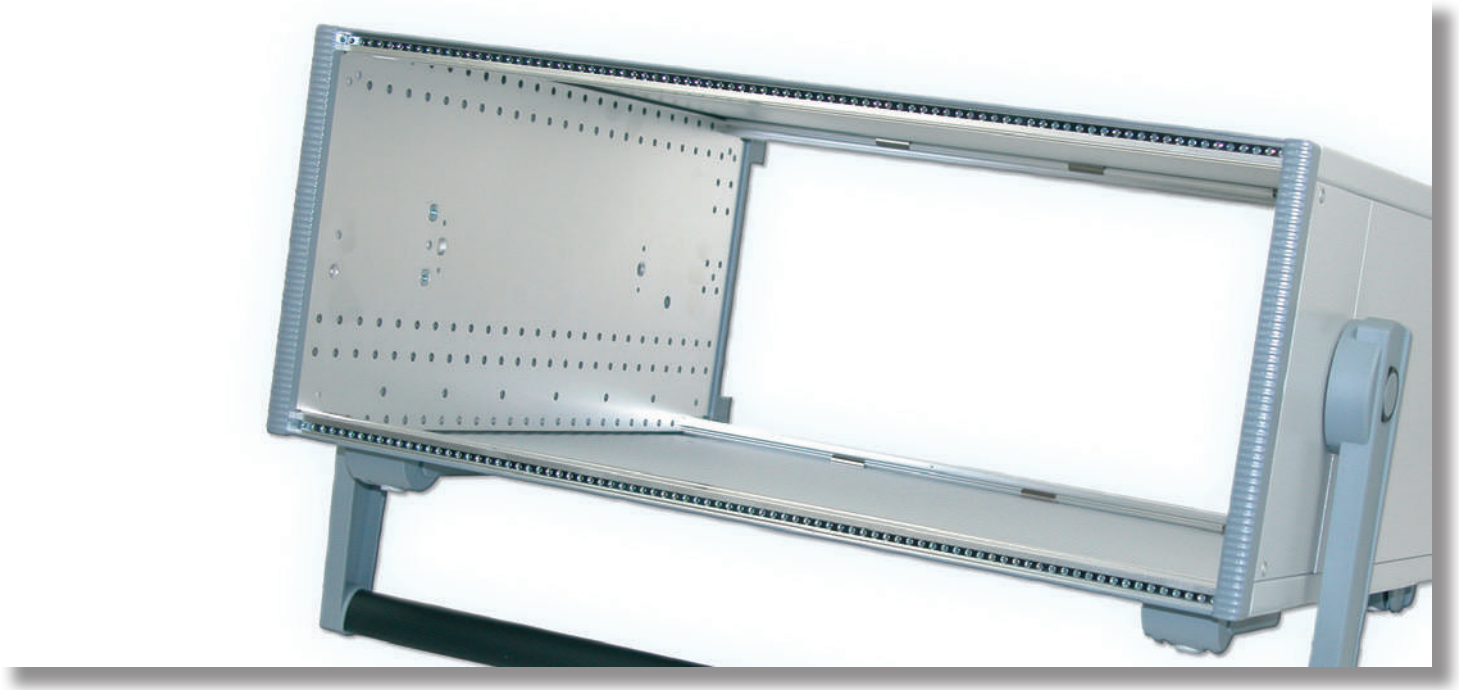
2.2.8 Portable Desktop Handle

- For Stylebox 15 Smart
- **Scope of delivery:**
  - 2 adapters / 2 side parts / 1 handle extrusion, softfeel
  - Assembly material



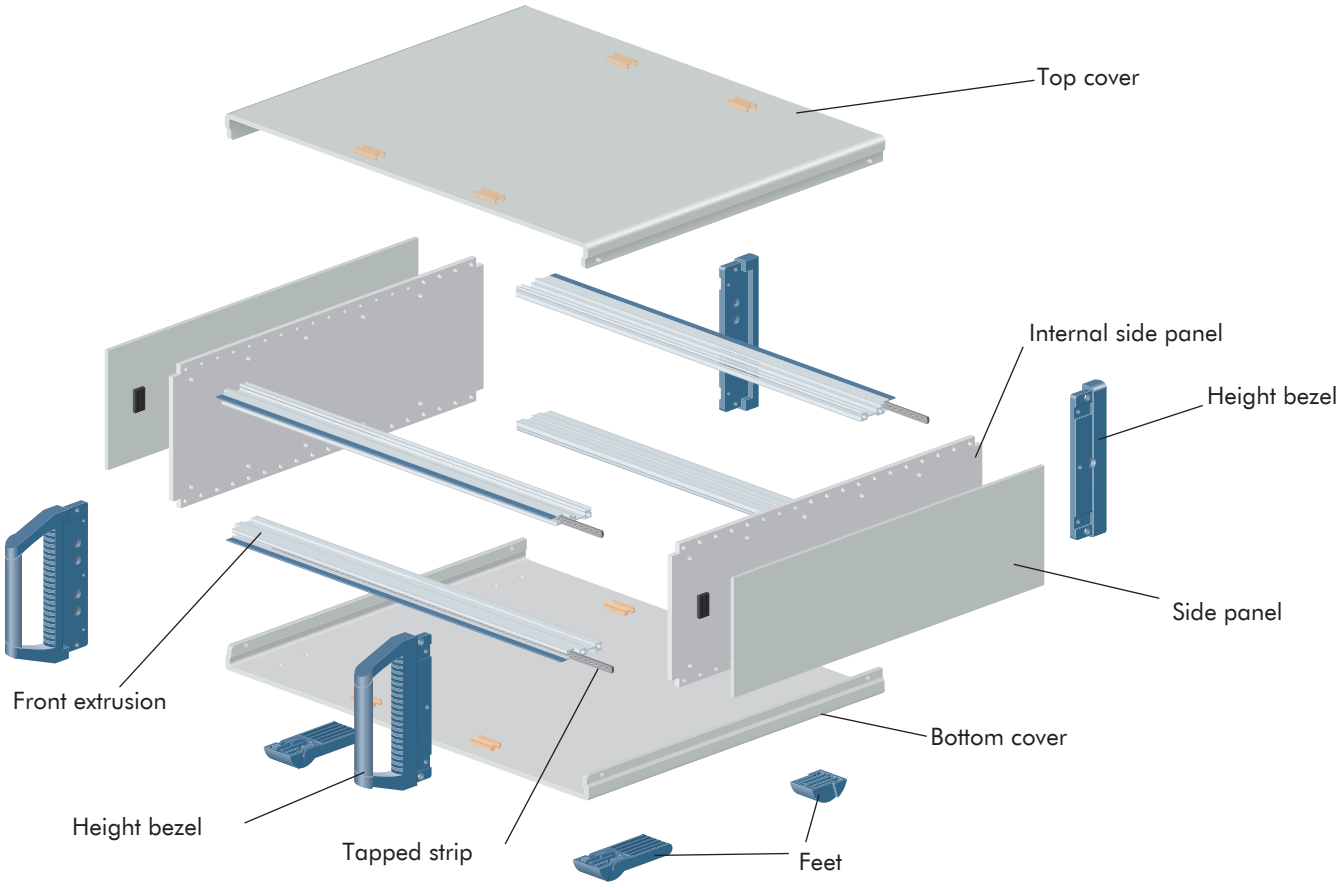
2.2.8 Portable Desktop Handle

63 HP	84 HP
15S041	15S042



2.3 Stylebox 15 Standard

- Extrusions and inner sides aluminium
- Aluminium covers
- EMC-shielding basic as standard
- Identical front and rear for insertion of boards, modules, etc.
- Dimensions to IEC 60297
- Top design
- Simple assembly
- Lightweight and sturdy
- Conductive contact surfaces
- Visible surfaces are powder-coated
- Colour: Cover light grey (NCS 2502-B), frame and feet dark grey (NCS 5010-R90B)



2.3.1 Width

- For Stylebox 15 Standard
- Extrusions: Aluminium, conductive
- **Scope of delivery:**
  - 4 front/rear extrusions
  - 4 tapped strips M 2.5
  - 1 set of 16 screws (Cross recessed M4x10)

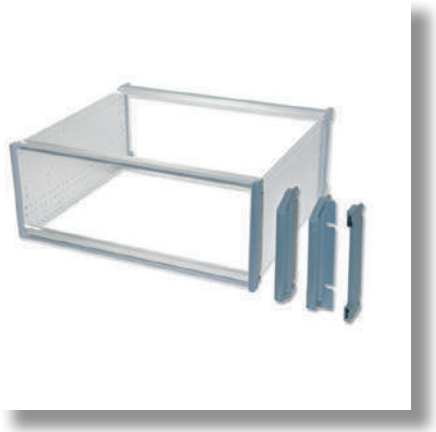


2.3.1 Width

Description	42 HP	63 HP	84 HP
IEC Application	15S004	15S005	15S006
IEEE Application	15S007	15S008	15S009

2.3.2 Height Bezel

- For Stylebox 15 Standard
- Die cast parts: Aluminium, powder coated
- Contact area conductive
- **Scope of delivery:**
  - 2 height bezels
- 2 sets have to be ordered (for front and rear side)



2.3.2 Height Bezel

Description	2 U	3 U	4 U	6 U
Without handles	15S020	15S021	15S022	15S023
With front handles	15S024	15S025	15S026	-
Portable desktop (rear)	15S027	15S028	15S029	-
19" with front handles	15S030	15S031	15S032	15S033

2.3.3 Depth

- For Stylebox 15 Standard
- 2.0 mm Aluminium, clear passivated
- **Scope of delivery:**
  - 1 internal side panel
- 2 pieces have to be ordered (for left and right side)



2.3.3 Depth

For Height	245 mm 9.64"	305 mm 12.00"	395 mm 15.55"	500 mm 19.68"
2 U	15-520	15-522	15-524	-
3 U	15-530	15-532	15-534	15-536
4 U left	15-540	15-542	15-544	15-546
4 U right	15-541	15-543	15-545	15-547
6 U	-	15-562	15-564	15-566

2.3.4 Top Cover

- For Stylebox 15 Standard
- 1.0 mm Aluminium, powder coated, contact area conductive
- **Scope of delivery:**
  - 1 top cover panel



2.3.4 Top Cover

Description	Width	Depth			
		245 mm 9.64"	305 mm 12.00"	395 mm 15.55"	500 mm 19.68"
solid, light grey	42 HP	15-201-10	15-202-10	15-203-10	15-204-10
perforated, light grey		15-201-11	15-202-11	15-203-11	15-204-11
solid, light grey	63 HP	15-206-10	15-207-10	15-208-10	15-209-10
perforated, light grey		15-206-11	15-207-11	15-208-11	15-209-11
solid, light grey	84 HP	15-211-10	15-212-10	15-213-10	15-214-10
perforated, light grey		15-211-11	15-212-11	15-213-11	15-214-11

2.3.5 Bottom Cover

- For Stylebox 15 Standard
- 1.0 mm Aluminium, powder coated, contact area conductive
- **Scope of delivery:**
  - 1 bottom cover with mounted feet



2.3.5 Bottom Cover

Description	Width	Depth			
		245 mm 9.64"	305 mm 12.00"	395 mm 15.55"	500 mm 19.68"
Solid, light grey	42 HP	15-351-10	15-352-10	15-353-10	15-354-10
Perforated, light grey		15-351-11	15-352-11	15-353-11	15-354-11
Solid, light grey	63 HP	15-356-10	15-357-10	15-358-10	15-359-10
Perforated, light grey		15-356-11	15-357-11	15-358-11	15-359-11
Solid, light grey	84 HP	15-361-10	15-362-10	15-363-10	15-364-10
Perforated, light grey		15-361-11	15-362-11	15-363-11	15-364-11

2.3.6 Side Panel

- For Stylebox 15 Standard
- Outer side, visible surface
- 1.0 mm Aluminium, powder coated
- **Scope of delivery:**
  - 2 side panels
  - Assembly material (8 cross recessed countersunk screw M3x6, 2 hock-and-loop fastener)



2.3.6 Side Panel

Description	Depth		Height			
	mm	inch	2 U	3 U	4 U	6 U
Solid, light grey	245	9.64	15S070	15S071	15S072	-
Solid, light grey portable desktop			15S060	15S061	-	-
Solid, light grey	305	12.00	15S073	15S074	15S075	15S076
Solid, light grey portable desktop			15S062	15S063	15S064	-
Solid, light grey	395	15.55	15S077	15S078	15S079	15S080
Solid, light grey portable desktop			15S066	15S067	15S068	-
Solid, light grey	500	19.68	-	-	15S081	15S082
Solid, light grey portable desktop			-	-	15S069	-

2.3.7 Portable Desktop Handle

- For Stylebox 15 Standard
- **Scope of delivery:**
  - 2 adapters
  - 2 side parts
  - 1 handle extrusion, softfeel
  - Assembly material



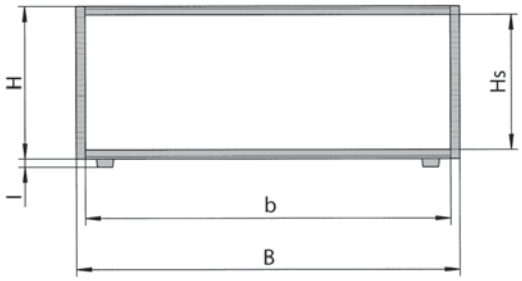
2.3.7 Portable Desktop Handle

Height	42 HP	63 HP	84 HP
2 U	15S043	15S044	15S045
3/4 U	15S046	15S047	15S048

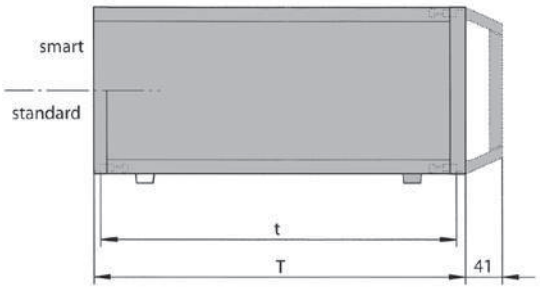
Our ability to adapt existing components to your application, make Elma your preferred solution partner.

2.3.8 Drawing Stylebox 15 Smart and Standard

Front view



Side view



Heights

U	H		Hs	
	mm	inch	mm	inch
2 U	88.05	3.46	68.05	2.67
3 U	132.50	5.21	112.50	4.42
4 U	176.95	6.96	156.95	6.17
6 U	265.85	10.46	245.85	9.67

Widths

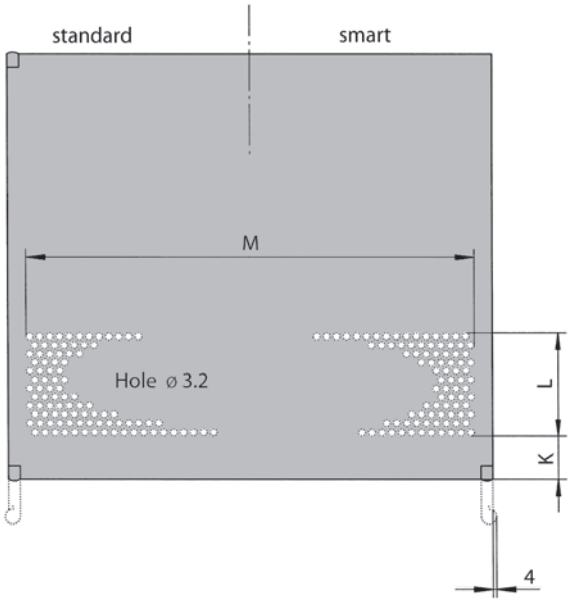
HP	B		b	
	mm	inch	mm	inch
42 HP	235.2	9.25	213.4	8.40
63 HP	341.9	13.46	320.1	12.60
84 HP	448.6	17.66	426.8	16.80

Depths

T		t	
mm	inch	mm	inch
245	9.64	232.6	9.15
305	12.00	292.6	11.51
395	15.55	382.6	15.06
500	19.68	487.6	19.19

Feet / Type	l	
	mm	inch
smart	10.0	0.39
standard	21.5	0.89

Top view



Air Flow Stylebox 15 Smart

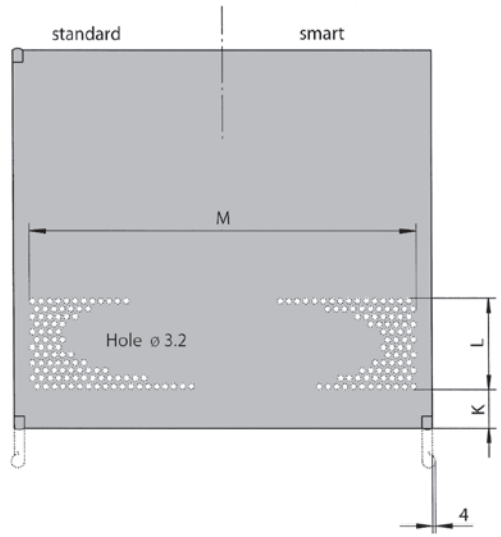
mm

HP	M		K	L
	mm	mm^2	mm	mm
42 HP	208	8685	40	105
63 HP	323	13510	40	105
84 HP	415	17370	40	105

inch

HP	M		K	L
	inch	sq. inch	inch	inch
42 HP	8.18	13.46	1.57	4.13
63 HP	12.71	20.94	1.57	4.13
84 HP	16.33	26.92	1.57	4.13

Top view



Air Flow Stylebox 15 Standard

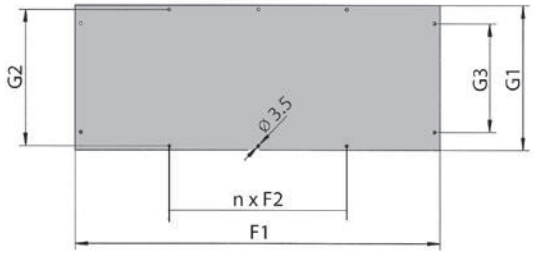
mm

HP	Depth	M		K	L
	mm	mm	mm²	mm	mm
42 HP	245/305	208	4340	64	47.2
63 HP	245/305	415	6270	64	47.2
	395/500	415	11580	40	95.2
84 HP	245/305	300	8680	64	47.2
	395/500	300	16400	40	95.2

inch

HP	Depth	M		K	L
	inch	inch	sq. inch	inch	inch
42 HP	9.64/12.00	8.18	6.72	2.51	1.85
63 HP	9.64/12.00	16.33	9.71	2.51	1.85
	15.55/12.00	16.33	17.94	1.57	3.74
84 HP	9.64/12.00	11.81	13.45	2.51	1.85
	15.55/19.68	11.81	25.42	1.57	3.74

Rear Panel Smart



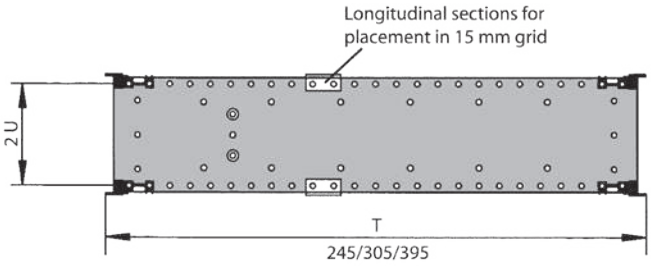
Dimensions Rear Panel Stylebox 15 Smart

Height	G1		G2		G3	
	mm	inch	mm	inch	mm	inch
2 U	84.35	3.32	74.05	2.91	74.05	2.91
3 U	128.80	5.07	118.50	4.66	118.50	4.66
4 U	173.25	6.82	162.95	6.41	129.95	5.11

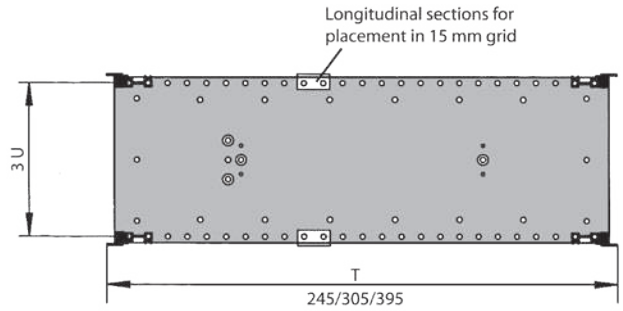
Width	F1		F2		n
	mm	inch	mm	inch	
42 HP	229.3	9.02	107.9	4.24	2
63 HP	336.0	13.22	107.5	4.23	3
84 HP	442.7	17.42	107.3	4.22	4

Drawing Side Panels

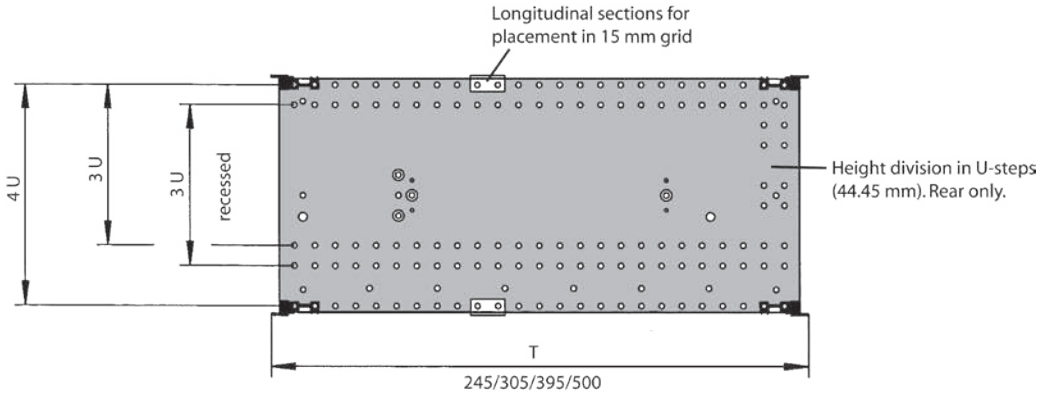
2 U



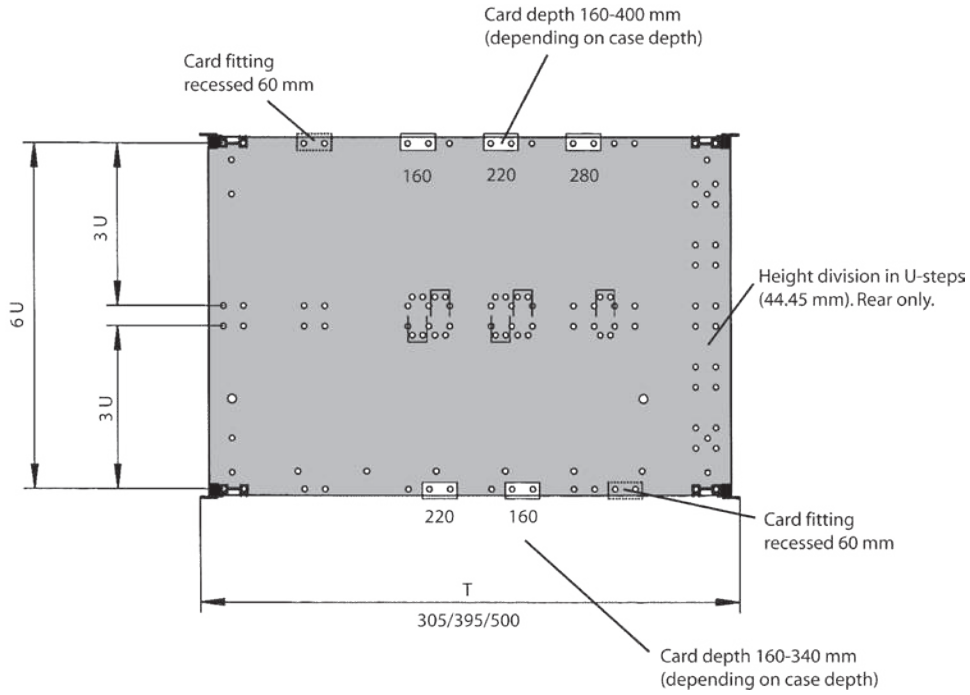
3 U

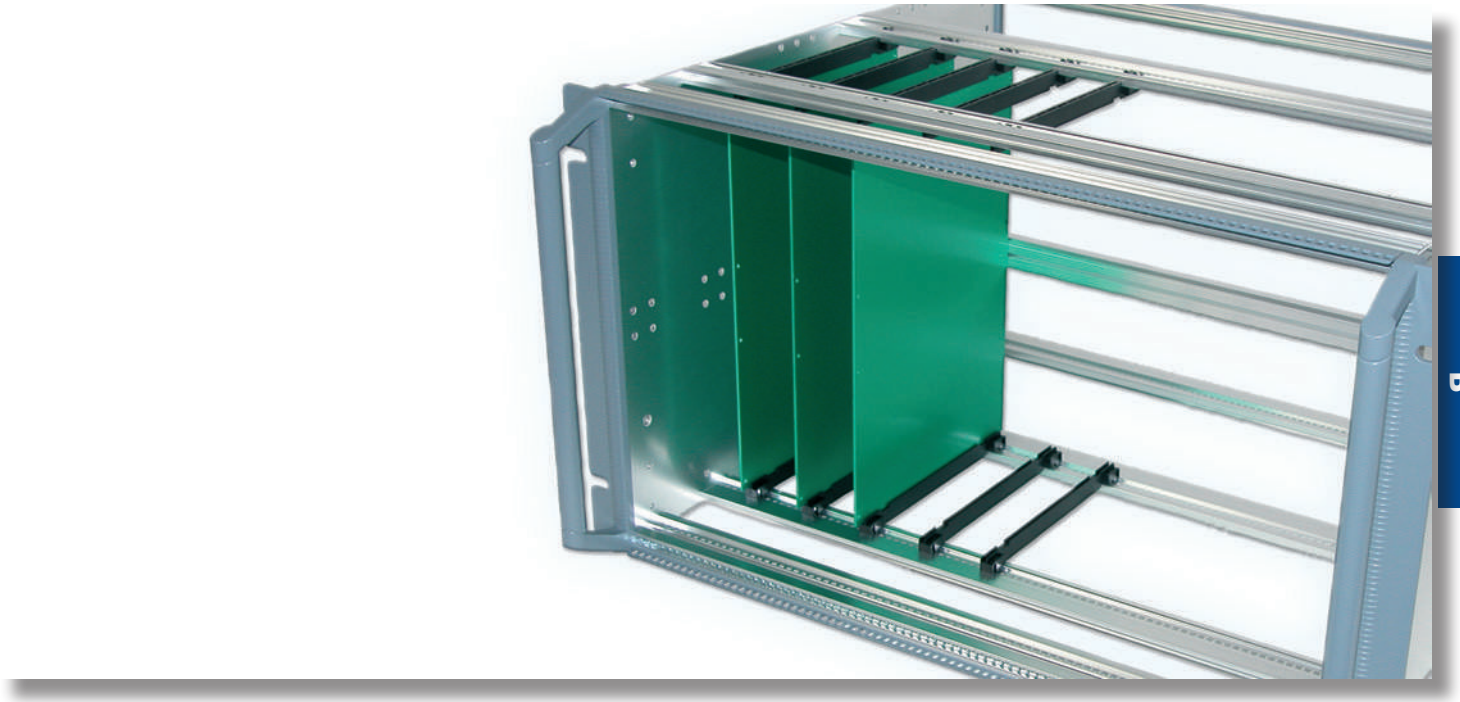


4 U



6 U





2.4 Adaptation Kits

- Adaptation kits are used to subdivide the Stylebox 15 both in its depths and heights
- The adaptation kits for the flush or recessmounted circuit boards or cassettes include the necessary internal extrusions and assembly material
- Scope of delivery is show in blue in the following illustrations

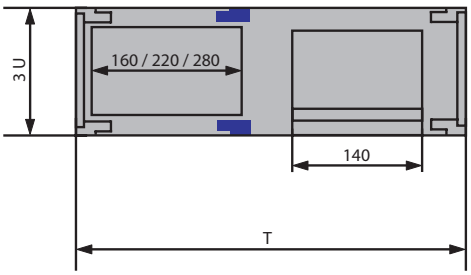
Note:

Information for Adaptation Kits a - e:

15-xxx- ☒ for mounting:
6 = 66-193, for insulated backplane mounting
7 = 66-194, for conductive backplane mounting

2.4.1 Adaptation Kit a

- **Range of Application:**
  - Single eurocard depth 160 – 280 mm
  - Motherboard
  - Modules, cassettes, plug-in units
  - Set for horizontal mounting of single, double triple eurocards, depth 160 – 280mm
  - Crossflow ventilation with 3 U fan module
  - Drive mechanism receptacles $3^1/_2$"/$5^1/_4$"



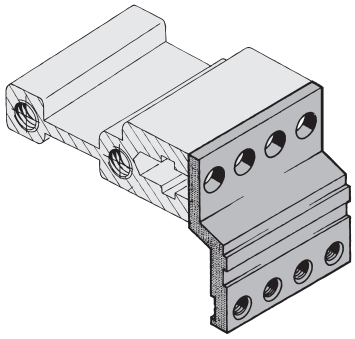
2.4.1 Adaptation Kit a

- **Scope of delivery:**
  - 2 internal extrusions
  - 2 insulating strips (-6 only)
  - 2 tapped strips M2.5
  - 1 set assembly material

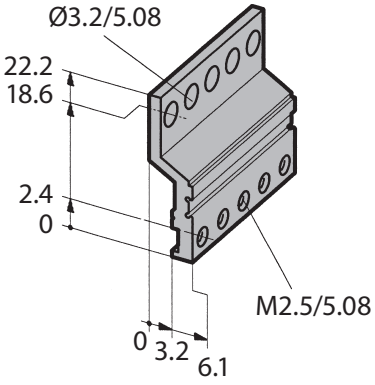
Description	84 HP
Flush front-mounting of single eurocards	15-011-6
	15-011-7

Other widths available on request.

2.4.2 Edge Connector Extrusion 66-147-xx



- For use with extrusions for backplanes 66-193
- **Scope of delivery:**
  - 1 aluminium extrusion, clear passivated (conductive)

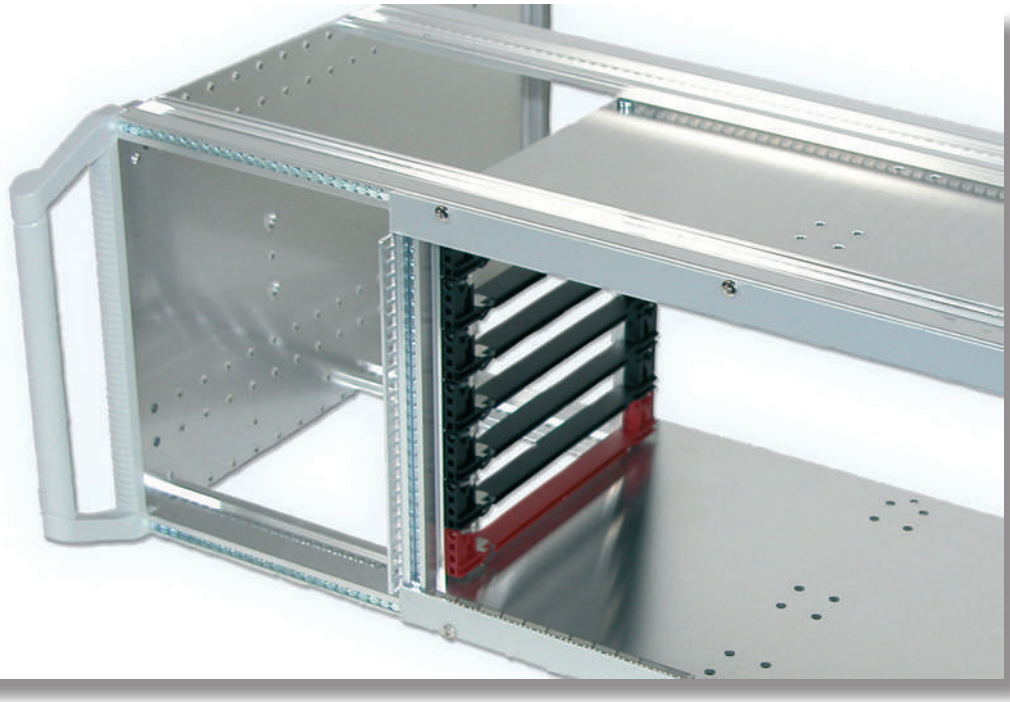


2.4.6 Edge Connector Extrusion

Length			Part-No.	
for HP	mm	inch	**clear passivated**	**raw**
8	40.6	1.59	66-147-40	
18	91.4	3.59	66-147-41	
28	142.2	5.60	66-147-42	
42	213.4	8.40	66-147-63	
63	320.0	12.60	66-147-65	
81	411.5	16.20	66-147-22	
84	426.7	16.80	66-147-52	
	1350.0	53.14		66-147-19

Assembly Material

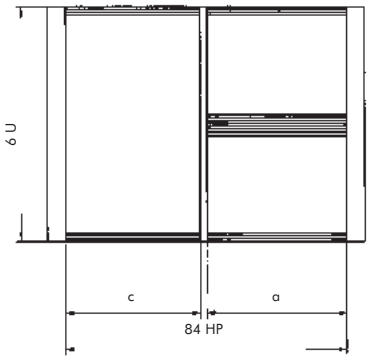
Description	Part-No.
Assembly material M2.5 (for 2 supplementary extrusions)	63-214



2.5 Assembly Accessories

2.5.1 Front Sub Division Vertical for 6 U System or 6 U Assembly

- Allows both single and double eurocards to be mounted together in a 6 U Stylebox 15
- **Scope of delivery:**
  - 1 divider extrusion front
  - 1 divider extrusion rear
  - 2 front extrusions
  - 2 internal extrusions
  - 1 assembly material
- Tapped strips for front extrusion see below
- Card guides see 2.6.1





2.5.1 Front Sub Division Vertical for 6 U Assembly

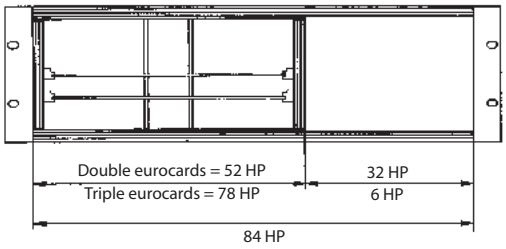
Nominal Width		Part-No.
6 U (c)	2 x 3 U (a)	IEC 60297
50 HP	32 HP	11-959-2

Tapped Strips for Front Extrusion

Scope of Delivery	Description	Part-No.
1 pc. tapped strip	M2,5 32 HP = 162.56 mm	61-463

2.5.2 Horizontal Card Mounting Kit for Double Eurocards (6 U)

- For double eurocards (6 U)
- Independent of card depth
- The horizontal card mounting kit can be fitted recessed within the Stylebox 15 by using two additional extrusions
- **Scope of delivery:**
  - 4 distance plates (2 front / 2 rear)
  - 4 length extrusions (2 front / 2 rear)
  - 1 centre extrusion
  - 6 tapped strips M2.5
  - 1 set assembly material
- Top and bottom cover plate when no overall fan front panel (2.5.4) is used
- Top and bottom cover plate has to be ordered separately
- Fan front panels for horizontal mounting kits see 2.5.4
- Card guides see 26.1
- Extruded front panels see 2.7.5





2.5.3 Horizontal Card Mounting Kit

Mounting height	Usable height	IEC 60603-2	Backplane	Cover plate top*	Cover plate bottom*
3 U	20 HP	14-971-30	14-971-60	21N602-90	21N602-90

* Assembly material for cover plate see 2.5.4.1
* Other versions available on request.

2.5.3 Mounting Chassis

2.5.3.1 Mounting Chassis Full Depth of Stylebox 15 Standard

- For mounting non-standard modules and components
- Mounting chassis is fixed directly on the side panels
- Aluminium 2.0 mm, raw
- **Scope of delivery:**
  - 1 mounting chassis
- Assembly material see below
- Mounting chassis depth < 230 mm can be mounted with 4 screws (> 230 mm with 6 screws)



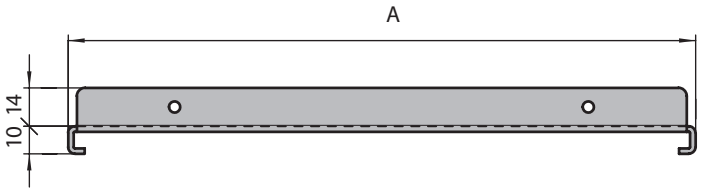
2.5.6.1 Mounting Chassis Full Depth of Stylebox 15 Standard

Case Depth		Chassis Depth A		Part-No.		
mm	inch	mm	inch	42 HP	63 HP	84 HP
245	9.64	168	6.61	14M028	14M029	14M030
305	12.00	228	8.97	14M031	14M032	14M033
395	15.55	318	12.52	-	14M034	14M035
500	19.68	428	16.65	-	-	14M036

Assembly Material

- For one mounting chassis
- **Scope of delivery:**
  - 4 cross recessed cylinder head screw M4 x 6
  - 4 earthing nut M4

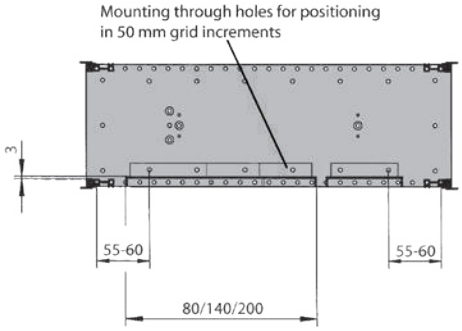
Description	Part-No.
Assembly material for mounting chassis	63-861



2.5.6.2 Mounting Chassis Full Depth of Stylebox 15 Smart

- For mounting non-standard modules and components
- Mounting chassis is fixed directly to the side panel
- **Scope of delivery:**
  - 1 Mounting Chassis
  - 1 set of assembly material (4 earthing nut, 4 screw M4 x 6)

Case Depth		Chassis Depth		42 HP	63 HP	84 HP
mm	inch	mm	inch			
245	9.64	195	7.67	15A101-01	15A102-01	15A103-01
305	12.00	255	10.03	15A104-01	15A105-01	15A106-01
395	15.55	345	13.58	-	15A108-01	15A109-01

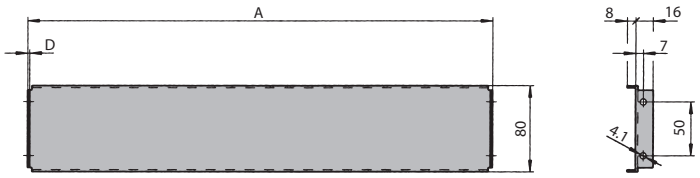




2.5.3.2 Mounting Chassis Small for Mounting of Power Supplies, etc.

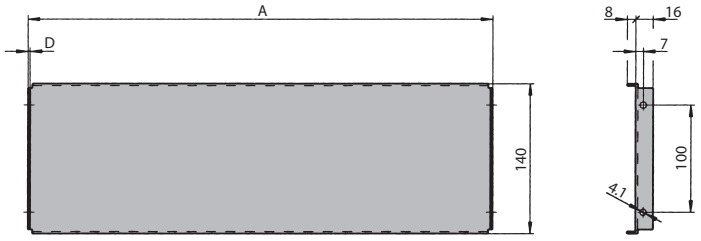
Chassis depth 80 mm

Case Width	A		D		Part-No.
	mm	inch	mm	inch	
84 HP	431.5	16.98	2	0.08	14-832-50



Chassis depth 140 mm

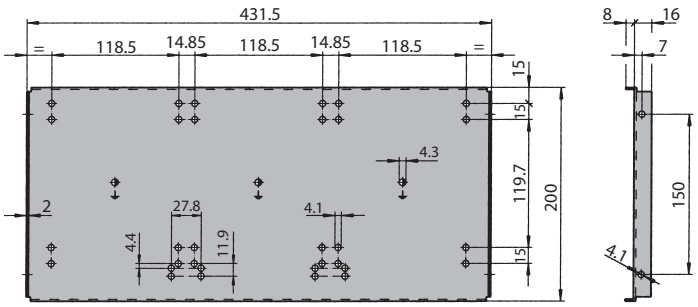
Case Width	A		D		Part-No.
	mm	inch	mm	inch	
84 HP	431.5	16.98	2.0	0.08	14-836-50



2.5.3.3 Mounting Chassis for Horizontal Mounting of Eurocards

- Chassis depth 200 mm
- The hole pattern allows single, double and triple eurocards to be mounted

Case Width	Part-No.
84 HP	14-840-50



Mounting Set for One Eurocard

- **Scope of delivery:**
  - 2 front extrusions
  - 2 internal extrusions
  - Card guides (2 - 6 pcs.)
  - tapped strips
  - Assembly material

Extrusion Length		Part-No.
8.5 HP	IEC	80-208-11
12.5 HP	IEC	80-212-11

2.5.4 Rear Feet for Stylebox 15 Standard

- Protects the Stylebox 15 from damage when the case is lifted and set down by using the case handle
- **Scope of delivery:**
  - 2 height bezels rear
  - 4 rear feet
  - 4 screws M4x10
  - 4 plastic inserts



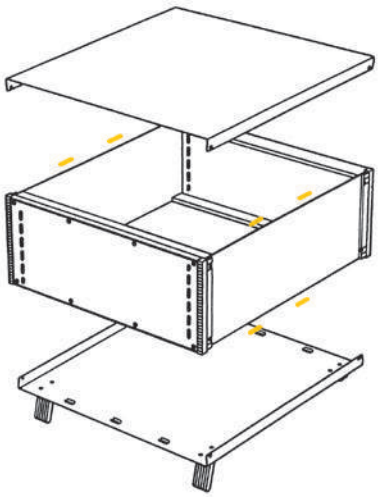
2.5.7 Rear Feet for Stylebox 15 Standard

Case Height Standard	Description Dark grey (NCS 5010-R90B)	Part-No.
2 U	Pair of rear feet 2 U incl. height bezel	15-112-5
3 U	Pair of rear feet 3 U incl. height bezel	15-113-5
4 U	Pair of rear feet 4 U incl. height bezel	15-114-5

2.5.5 EMC Shielding

2.5.5.1 Gaskets for Advanced EMC level (Stylebox 15 Standard)

- Vertical gaskets for cover plates (partial)
- To achive an advanced EMC level with Stylebox 15 Standard
- No additional gaskets for width necessary
- Drawing shows the position of the gaskets

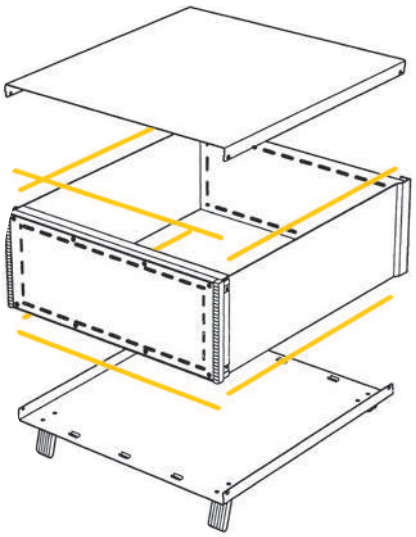


Depth Gaskets for Covers

Case Depth		Scope of Delivery	Part-No.
mm	inch		
245	9.64	4 self-adhesive HF gaskets L = 30 mm	63-836-07
305	12.00	4 self-adhesive HF gaskets L = 30 mm	63-836-07
395	15.55	8 self-adhesive HF gaskets L = 30 mm	63-836-08
500	19.68	12 self-adhesive HF gaskets L = 30 mm	63-836-09

2.5.5.2 Gaskets for Superior EMC Level (Stylebox 15 Smart)

- Vertical and horizontal gaskets for cover plates (overall)
- To achive a superior EMC level with Stylebox 15 Smart
- Order 1 set each for width, depth and rear panel
- Drawing shows the position of the gaskets



Width Gaskets for Covers

Width	Scope of Delivery	Part-No.
42 HP	2 self-adhesive HF gaskets L = 216.5 mm	63-836-33
63 HP	2 self-adhesive HF gaskets L = 323 mm	63-836-34
84 HP	2 self-adhesive HF gaskets L = 430 mm	63-836-35

Depth Gaskets for Covers

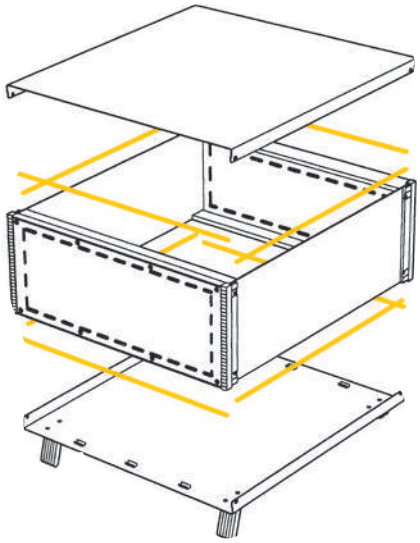
Depth		Scope of Delivery	Part-No.
mm	inch		
245	9.64	4 self-adhesive HF gaskets L = 195 mm	63-836-10
305	12.00	4 self-adhesive HF gaskets L = 255 mm	63-836-11
395	15.55	4 self-adhesive HF gaskets L = 345 mm	63K836-04

Gasket Set for Rear Panel

Length		Scope of Delivery	Part-No.
mm	inch		
430	16.92	2 pieces	63-836-80

2.5.5.3 Gaskets for Superior EMC level (Stylebox 15 Standard)

- Vertical and horizontal gaskets for cover plates (overall)
- To achive superior EMC level with Stylebox 15 Standard
- Order 1 set each for width and depth
- Drawing shows the position of the gaskets



Width Gaskets for Covers

Width	Scope of Delivery	Part-No.
42 HP	4 self-adhesive HF gaskets L = 216.5 mm	63-836-20
63 HP	4 self-adhesive HF gaskets L = 323 mm	63-836-21
84 HP	4 self-adhesive HF gaskets L = 430 mm	63-836-23

Depth Gaskets for Covers

Depth		Scope of Delivery	Part-No.
mm	inch		
245	9.64	4 self-adhesive HF gaskets L = 195 mm	63-836-10
305	12.00	4 self-adhesive HF gaskets L = 255 mm	63-836-11
395	15.55	4 self-adhesive HF gaskets L = 345 mm	63K836-04
500	19.68	4 self-adhesive HF gaskets L = 445 mm	63K836-05

2.5.5.4 EMC Contact Strips (Advanced EMC-level)

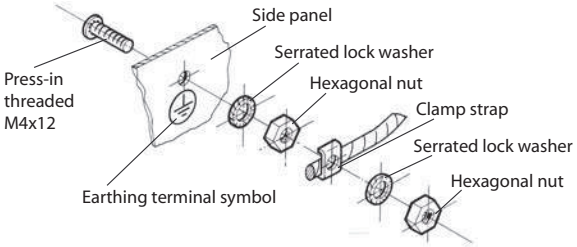
- 2 contact strips
- For front panels, fixing on extrusion
- Self-adhesive



For HP	Length	Part-No.
42	212.1 mm	63-836-67
63	318.1 mm	63-836-68
84	424.2 mm	63-836-70

2.5.6 Earthing Set

- Enables cases to be earthed in conformance with EN / VDE / SEV
- **Scope of delivery:**
  - 1 press-in threaded bolt M4
  - 2 serrated lock washers
  - 2 hexagonal nuts M4
  - 1 terminal clamp
  - 1 earthing symbol





2.5.9 Earthing Set

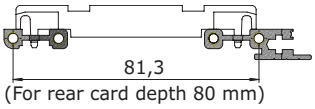
Description	Part-No.
Earthing set according to EN VDE / SEV	63-174



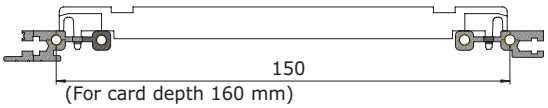
2.6 General Accessories

2.6.1 Card Guides IEC

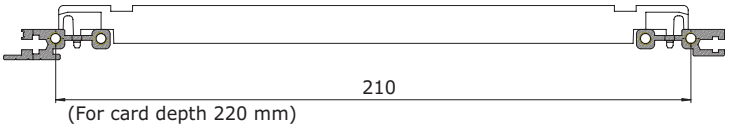
- For positive location of PCBs and plug-in units conforming to the dimensions of card depths of 80 mm, 160 mm, 220 mm and 280 mm
- The card guides are non-flammable, made from a high quality plastic material reinforced with fibreglass
- Including ESD provisions



(For rear card depth 80 mm)



(For card depth 160 mm)



(For card depth 220 mm)



2.6.1.1 Card Guides 1-Slot, IEC

- **Scope of delivery:**
  - Card guide black plastic UL94 V-0
- ESD Clip see below (not usable for card depth 80 mm)

Card Thickness		Card Depth		Part-No. 1pcs.	Part-No. 10 pcs.	Part-No. 1000 pcs.
mm	inch	mm	inch			
1.6	0.06	80	3.15	61-019	-	-
		160	6.30	61-044	-	61-044
		220	8.66	61-039	-	61-039
		280	11.02	61-017	-	61-017
2.0	0.08	160	6.30	61-087	-	-
		220	8.66	61-039	63-303	-
		280	11.02	61-017	-	-



ESD Clips

- Connecting PCB with case
- Stainless steel

Description	Part-No. 10 pcs.
ESD clip front bottom/rear top	61-419-01
ESD clip front top/rear bottom	61-419-02



2.6.1.2 Card Guides 7-Slot in 4 HP Steps

- For reduced assembly time of multiple slot applications
- For use with single, double and triple eurocards with a depth of 160 mm
- For card thickness: 1.6 mm / 0.06"
- Black plastic, UL94 V-0
- ESD Clip not usable

Card Thickness		Card Depth		Part-No.
mm	inch	mm	inch	
1.6	0.06	160	6.30	61-076



2.6.1.3 Card Guides 1-Slot, 3 Parts

- Extrusion: Aluminium / Plastic ABS, (UL 94 V-O)
- End feet: plastic, UL94 HB
- For card thickness: 1.6 mm / 0.06"
- Card guide extrusion, single, clear anodised or plastic grey
- ESD clip not usable

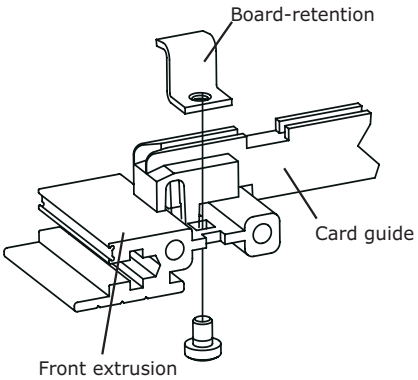
Extrusion

Card Depth		Length		Part-No. Plastic	Part-No. Aluminium
mm	inch	mm	inch		
160	6.30	112.5	4.43	61-051	66-122-20
220	8.66	172.5	6.79	61-052	66-122-21
280	11.02	232.5	9.15	61-053*	66-122-22
340	13.38	292.5	11.51	61-054*	66-122-23
400	15.74	352.5	13.87	61-055*	66-122-24
-	-	1350	53.15	61-059	66-122-14

End Feet

Description	Part-No. 1 Pair
End feet plastic, UL94 HB	61-069

* Card guides must be supported in the middle by an additional extrusion (66-138)

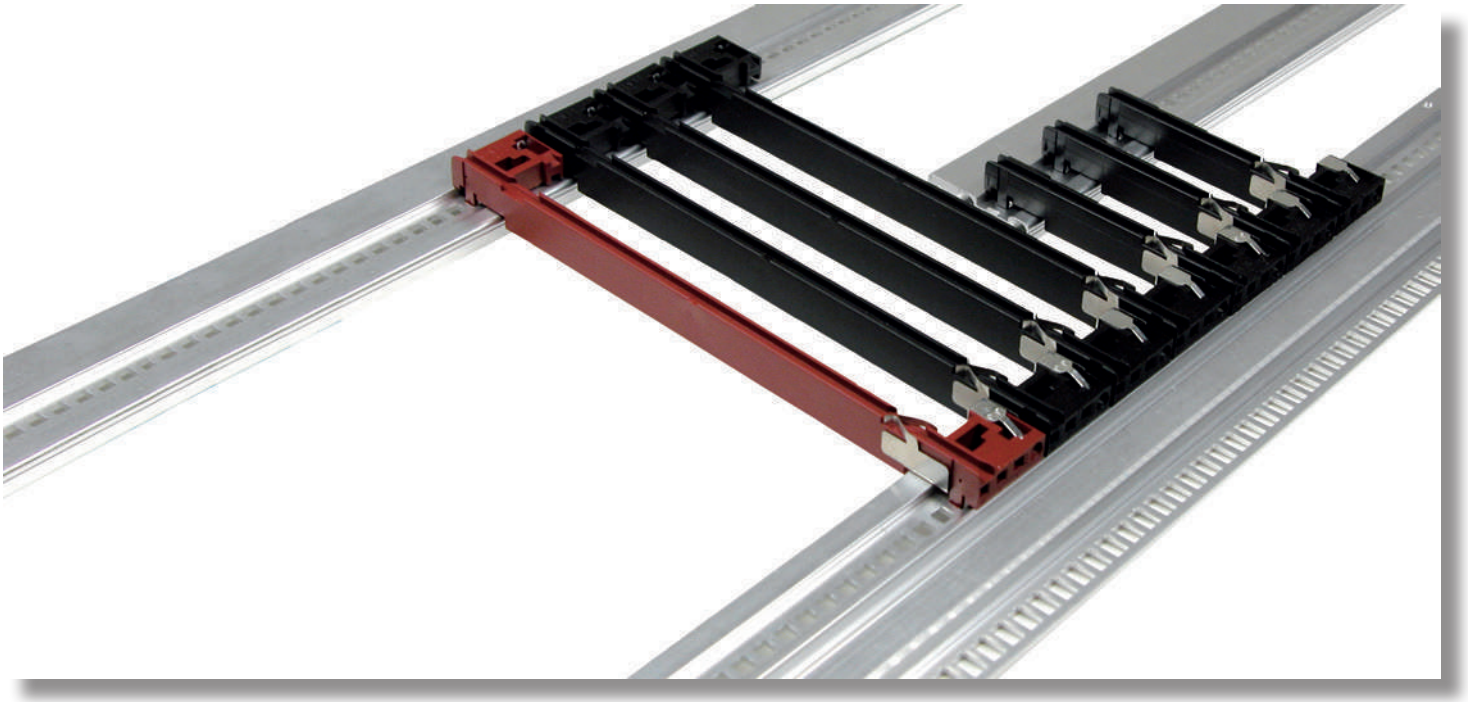


2.6.1.4 Card Guide Board-Retention Bar

Description	Part-No. 20 pcs.
Board-retention bar, zinc-plated steel	61-291

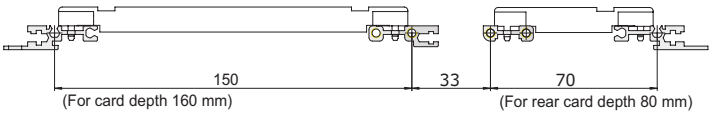
Assembly Material

Description	Part-No.
Cross recessed rounded head screw M3 x 4	5331-04
Torx cylinder head screw M3 x 4, size T10	5470-01



2.6.2 Card Guides Standard acc. to IEEE

- For positive location of PCBs and plug-in units conforming to the dimensions of card depths 80 mm, 160 mm, 220 mm, 280 mm and 340 mm
- The card guides are nonflammable, made from a high quality plastic material reinforced with fibreglass (UL94 V-0)
- With ESD provisions
- With keying and alignment pin possibilities





2.6.2.1 Card Guides 1-Slot

- Card thickness 1.6 mm / 0.06" and 2.0 mm / 0.08"
- Plastic UL94 V-0

Card Depth mm	Card Depth inch	Colour	Part-No. 1 Pair
80	3.15	black	61-949-01

Card Depth mm	Card Depth inch	Colour	Part-No.
160	6.30	black	61-950-01
160	6.30	red	61-950-03

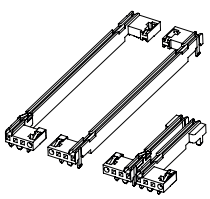


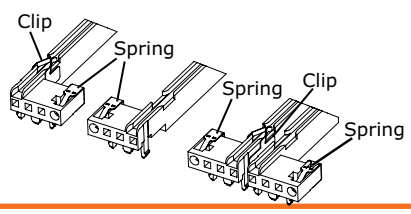
2.6.2.2 Card Guides 1-Slot, incl. mounted ESD-Components

- Bottom: 1 ESD clip and 1 ESD spring
- Top: 1 ESD spring
- Black plastic UL94 V-0

Card Depth mm	Card Depth inch	Description	Part-No. 1 Pair
80	3.15	1 pair top/bottom	61-949-02

Card Depth mm	Card Depth inch	Description	Part-No.
160	6.30	1 piece bottom	61-950-02
160	6.30	1 piece top	61-950-04







2.6.2.3.1 Aluminium Card Guides 1-Slot, 3 Parts, 1.6 mm

- Extrusion: Aluminium
- End feet: Plastic UL94 V-0
- For card thickness 1.6 mm / 0.06" and 2.0 mm / 0.08"

Extrusion

Card Depth		Part-No.
mm	inch	
160	6.30	66-452-20
220	8.66	66-452-25
280	11.02	66-452-30
340	13.38	66-452-35

End Feet

Colour	Part-No. 1 Pair
Black	61-955-01
Red	61-955-03

End Feet Offset

Colour	Part-No. 1 Pair
Pearlwhite	61-961-01



2.6.2.3.2 Aluminium Card Guides 1-Slot, 3 Parts, 2.4 mm

- Extrusion: Aluminium
- End feet: Plastic UL94 V-0
- For card thickness 2.4 mm / 0.094"

Extrusion

Card Depth		Part-No.
mm	inch	
160	6.30	66-453-20
220	8.66	66-453-25
280	11.02	66-453-30
340	13.38	66-453-35

End Feet

Colour	Part-No. 1 Pair
Black	61-956-01



2.6.2.4 ESD Clips

- Connecting printed board with case

Description	Part-No.
ESD clip front bottom/rear top	61-419-01
ESD clip front top/rear bottom	61-419-02



2.6.2.5 ESD Spring

- Connecting ESD pin with case
- Note: Notch inward-looking

Description	Part-No.
ESD spring	61-420



2.6.2.6 Coding Pins

- Acc. to IEC 60297-3-103
- Plastic, UL94 V-0
- Can be rotated in 4 positions

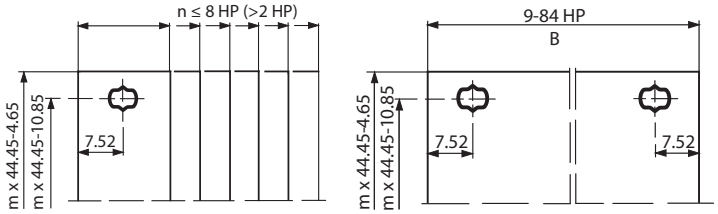
Colour	Part-No.
Grey	81-054-02
Dark red	81-054-06
Black	81-054-04



2.7 Front Panels

2.7.1 Flat Front Panels

- For sub racks and enclosures, solid
- Aluminium 2.5 mm, clear anodised (non-conductive)
- **Scope of delivery:**
  - Flat front panel
- Front panel screws, see below
- 2 HP version: screw retainer can not be fitted



2.7.1 Flat Front Panels for Sub Racks and Enclosures, Solid

Width	B		Height			Part-No.		
	mm	inch	1 U 39.8 mm	ca. 1 U* 42.15 mm	2 U 84.2 mm	3 U 128.7 mm	4 U 173.1 mm	6 U 262.0 mm
2 HP	10.0	0.39	—	—	—	21N302	—	21N602
3 HP	15.2	0.59	—	—	—	21N303	21N403	21N603
4 HP	20.1	0.79	—	—	—	21N304	21N404	21N604
5 HP	25.2	0.99	—	—	—	21N305	21N405	21N605
6 HP	30.3	1.19	—	—	—	21N306	21N406	21N606
7 HP	35.3	1.38	—	—	—	21N307	21N407	21N607
8 HP	40.4	1.59	—	—	—	21N308	21N408	21N608
10 HP	50.6	1.99	—	—	—	21N310	21N410	21N610
11 HP	55.7	2.19	—	—	—	21N311	—	—
12 HP	60.7	2.38	—	—	—	21N312	21N412	21N612
14 HP	70.9	2.79	—	—	—	21N314	21N414	21N614
16 HP	81.1	3.19	—	—	—	21N316	21N416	21N616
20 HP	101.4	3.59	—	—	—	21N320	21N420	21N620
21 HP	106.5	4.19	—	—	—	21N321	—	21N621
28 HP	142.0	5.59	—	—	—	21N328	—	21N628
32 HP	162.3	6.38	—	—	—	21N332	21N432	—
42 HP	213.1	8.38	—	—	21N242	21N342	21N442	21N642
52 HP	263.9	10.38	—	—	—	21N352	21N452	21N652
63 HP	319.8	12.59	—	—	21N263	21N363	21N463	21N663
81 HP	411.3	16.19	—	—	21N281	21N381	21N481	21N681
84 HP	426.5	16.79	21N184	21N084*	21N284	21N384	21N484	21N684

* Coverplates for 1 U fan opening

Front Panel Screws

- Set of 10 screws, with screw retainer

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3, size T8 with plastic screw retainer	63K159
Rounded head screws recessed M2.5 x 11.3 with plastic screw retainer	63-159

2.7.2 EMC Flat Front Panels

2.7.2.1 EMC Filler Panel with EMC Gasket

- High stability (U-profile)
- Extruded aluminium
- Pressed-in centring pin and bushes M2.5
- Front side clear anodised, rear side conductive
- **Scope of delivery:**
  - EMC front panel incl. pressed-in centering pin and bushes M2.5
- EMC-gasket see below
- Front panel screw see below



2.7.2.1 EMC Front Panel

Width	Part-No. 3 U	Part-No. 4 U	Part-No. 6 U
4 HP	66-514-73	66-514-74	66-514-76
5 HP	66-515-73	-	66-515-76
6 HP	66-516-73	66-516-74	66-516-76
8 HP	66-518-73	66-518-74	66-518-76
9 HP	66-519-73	-	66-519-76
10 HP	66-520-73	-	66-520-76
12 HP	66-522-73	-	66-522-76
14 HP	66-534-73	-	66-534-76

EMC Gasket (Stainless Steel)

Height	Part-No. 1 pc.
3 U	81-062-03
4 U	81-062-04
6 U	81-062-06

Front Panel Screws

- Front panel width up to 9 HP = 2 screws; ≥ 10 HP = 4 screws

Description	Part-No.
Torx screw, M2.5 x 11.3, size T8	5443-08
Round head screw, cross recessed M2.5 x 12.7	61-287

2.7.2.2 EMC Filler Panel without EMC-Gasket

- Front panel standard, solid
- Front clear anodised
- Rear conductive
- Basic level EMC
- **Scope of delivery:**
  - 1 front panel incl. press-fit bushes M2.5 (pressed-in)
- Front panel screws, see below
- Spacer see next page



2.7.2.2 EMC Filler Panel without Gasket

Width	Part-No. 3 U	Part-No. 4 U	Part-No. 6 U
4 HP	21B304	-	-
10 HP	21B310	-	-
12 HP	21B312	-	-
16 HP	21B316	21B416	-
21 HP	21B321	21B421	-
42 HP	21B342	21B442	21B642
63 HP	21B363	21B463	-
84 HP	21B384	21B484	21B684

Front Panel Screws

- Front panel width up to 8 HP = 2 screws; ≥ 9 HP = 4 screws

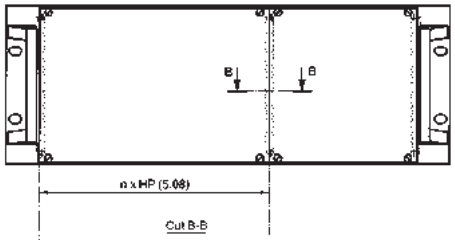
Description	Part-No.
Torx screw, M2.5 x 11.3, size T8	5443-08
Rounded head screw, cross recessed M2.5 x 12.7	61-287

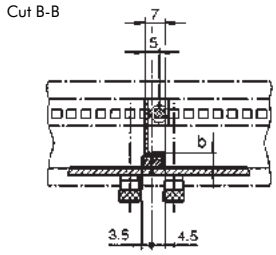


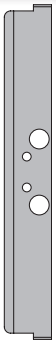
Spacer for EMC Front Panel Flat

- EMC-Level: Advanced
- **Scope of delivery:**
  - 1 spacer incl. gasket
  - 2 Torx sheet metal screws 2.9 x 6.5; size T 10

Height	Part-No.
3 U	81K023
4 U	81K024
7 U	81K027





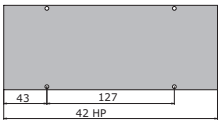


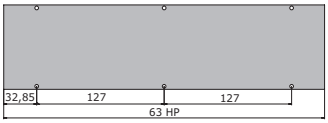
Holes in some cases needed for mounting telescopic rails

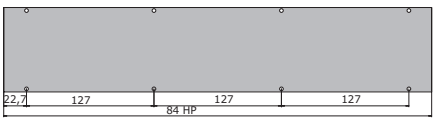


2.7.2.3 EMC Flat Front Panels

- Aluminium 2.5 mm (conductive)
- Closes the front or rear of the sub rack with very high shielding effectiveness
- Contact between the flat front panel and the case is made via EMC gaskets







2.7.2.3 EMC Flat Front Panels for Advanced EMC Level

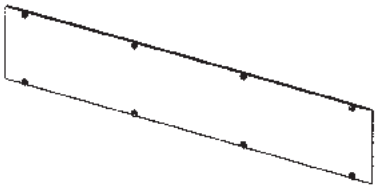
- **Scope of delivery:**
  - EMC flat front panel
  - Contact angle, incl. screws (4 + 6 U version only)
  - EMC gasket for contact angle (4 + 6 U version only)
- Front panel screws see below
  - Front panel width 42 HP = 4 screws
  - Front panel width 63 HP = 6 screws
  - Front panel width 84 HP = 8 screws

Width	Part-No. 1 U	Part-No. 2 U	Part-No. 3 U	Part-No. 4 U	Part-No. 6 U
42 HP	-	-	21C342	-	-
63 HP	-	21C263	21C363	21C463	-
84 HP	21C184	21C284	21C384	21C484	21C684

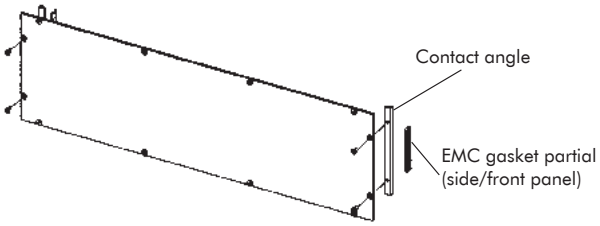
Front Panel Screws

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3, size T8, with press-fit bush	63K480
Screw recessed M2.5 x 11.3, with press-fit bush	63-444
Screw cross recessed M2.5 x 12.7, with press-fit bush	63-480

1 U - 3 U

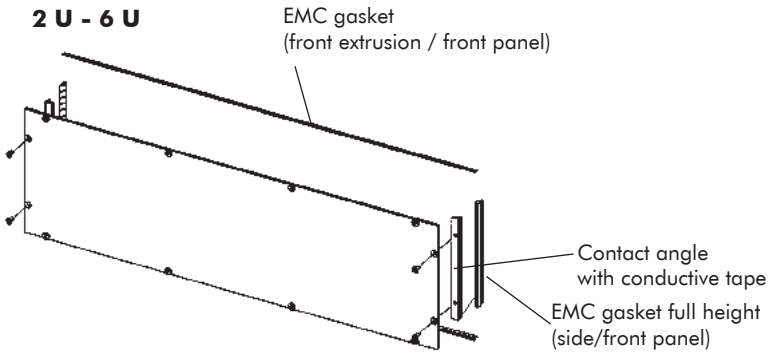


4 U - 6 U



2.7.2.4 EMC Flat Front Panels for Superior EMC Level

- **Scope of delivery:**
  - EMC flat front panel
  - Contact angle, incl. screws
  - EMC gasket for contact angle
  - EMC gasket for front extrusion/front panel
- Front panel screws, see below
  - Front panel width 42 HP = 4 screws
  - Front panel width 63 HP = 6 screws
  - Front panel width 84 HP = 8 screws



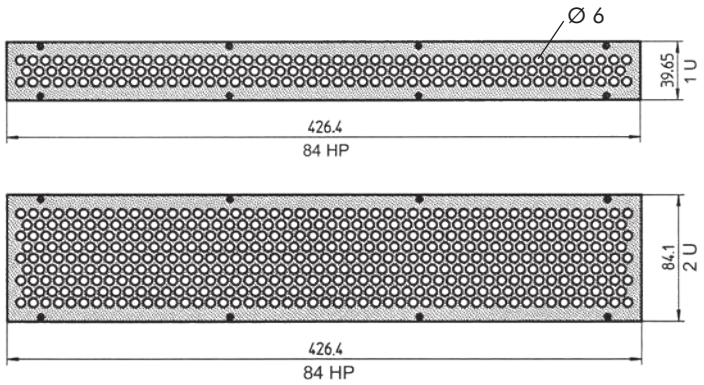
Width	Part-No. 2 U	Part-No. 3 U	Part-No. 4 U	Part-No. 6 U
84 HP	21D284	21D384	21D484	21D684

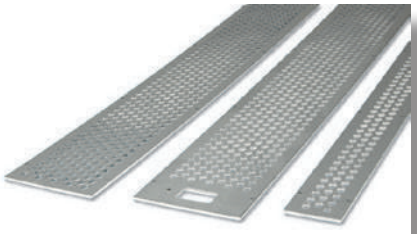
Front Panel Screws

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3, size T8, with press-fit bush	63K480
Screw recessed M2.5 x 11.3, with press-fit bush	63-444
Screw cross recessed M2.5 x 12.7, with press-fit bush	63-480

2.7.2.5 Perforated EMC Front Panel 84 HP

- Front anodised, rear conductive
- Advanced EMC level
- Width: 84 HP
- **Scope of delivery:**
  - Perforated flat front panel
- Front panel screws see below
- On-off switch see below





2.7.2.5 Perforated EMC Front Panel 84 HP

Height			Air Passage	Switch Opening Part-No. without
1 U	39.65 mm	1.56"	4'100 mm²	21C184-01
2 U	84.1 mm	3.31"	12'300/11'700 mm²	21C284-01

Front Panel Screws

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3, size T8, with press-fit bush	63K480
Screws recessed M2.5 x 11.3, with press-fit bush	63-444
Screws cross recessed M2.5 x 12.7, with press-fit bush	63-480



On-Off Switch

- Black body, plastic
- 2 pole
- 250V, 16A
- Quick-connect terminal 6.3 x 0.8 mm
- Cut-out: 12.3 x 27.2 mm (0.48" x 1.07")

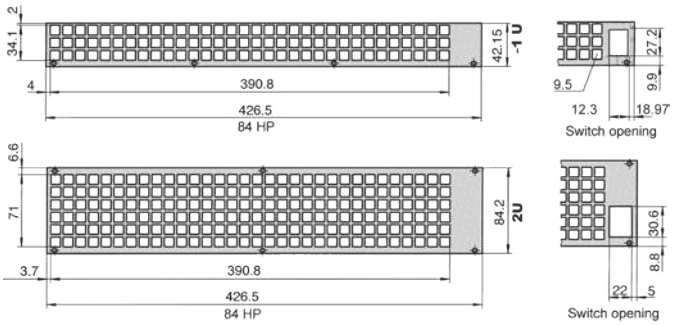
Description	Part-No.
On-off switch, indicator light green	69-410-04
On-off switch, without signal light	69-410-09



2.7.3 Fan Front Panels

2.7.3.1 Fan Front Panel 84 HP for Vertical Ventilation

- Fan front panels are flat, perforated and designed to ensure an optimum air flow rate
- Available with or without switch cut-out (switch opening 22 x 30.6 mm)
- Aluminium 2.5 mm, clear anodised (non-conductive)
- **Scope of delivery:**
  - 1 perforated fan front panel
- Front panel screws see below
- On-off switch see below



2.7.3.1 Fan Front Panel 84 HP for Vertical Ventilation

Description	Height	Air passage		Part-No.
		mm²	sq. inch	
Without switch opening	~ 1 U	8664	13.42	21N084-01
With switch opening	~ 1 U	8664	13.42	21N084-02
Without switch opening	2 U	17328	26.85	21N284-01
With switch opening	2 U	17328	26.85	21N284-02



Front Panel Screws

- Set of 10 screws
- With screw retainer
- Fan front panel ~1 U = 4 screws; 2 U= 6 screws

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3 , size T8, with plastic screw retainer	63K159
Rounded head screws recessed M2.5 x 11.3, with plastic screw retainer	63-159

On-Off Switch

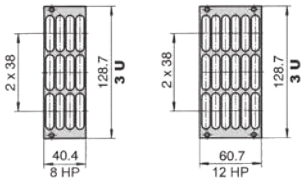
- Black body, plastic
- 2 pole
- 250V, 16A
- Quick-connect terminal 6.3 x 0.8 mm
- Cut-out for 4426-00: 22 x 30.6 mm (0.87" x 1.20")
  Cut-out others: 12.3 x 27.2 mm (0.48 x 1.07")

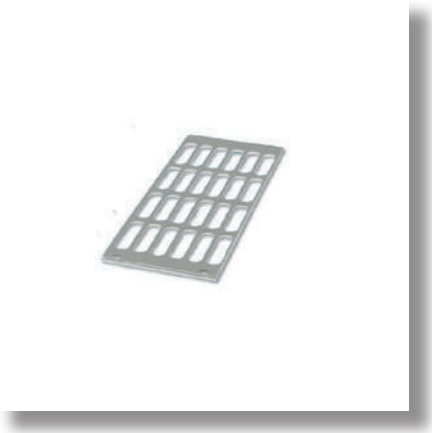


Description	Part-No.
On-off switch, indicator light green	69-410-04
On-off switch, without signal light	69-410-09

2.7.3.2 Fan Front Panel for Horizontal Ventilation

- Aluminium 2.5 mm, clear anodised (non-conductive)
- **Scope of delivery:**
  - 1 perforated fan front panel
- Front panel screws see below





2.7.3.2 Fan Front Panel for Horizontal Ventilation

Height	Width	Air passage		Part-No.
		mm²	sq. inch	
3 U	8 HP	3195	4.95	21N308-01
	12 HP	4793	7.42	21N312-01

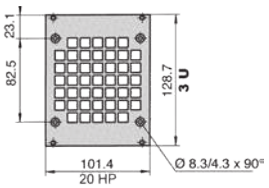
Front Panel Screws

- Set of 10 screws
- With screw retainer
- Fan front panel width up to 8 HP = 2 screws; ≥ 12 HP = 4 screws

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3 , size T8, with plastic screw retainer	63K159
Rounded head screws recessed M2.5 x 11.3, with plastic screw retainer	63-159

2.7.3.3 Fan Front Panels for Direct Fan Mounting

- Aluminium 2.5 mm, clear anodised (non-conductive)
- **Scope of delivery:**
  - 1 perforated fan front panel
- Front panel screws see below
- Assembly material for fan mounting has to be ordered separately





2.7.3.3 Fan Front Panels for Direct Fan Mounting

Description	Height	Width	Air passage		Part-No.
			mm²	sq. inch	
Without switch opening	3 U	20 HP	4051	6.27	21N320-04

Front Panel Screws

- Set of 10 screws
- With screw retainer
- Per front panel 4 screws are needed

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3 , size T8, with plastic screw retainer	63K159
Milled edge screws recessed M2.5 x 11.3, with plastic screw retainer	63-159

Assembly Material for Fan Mounting

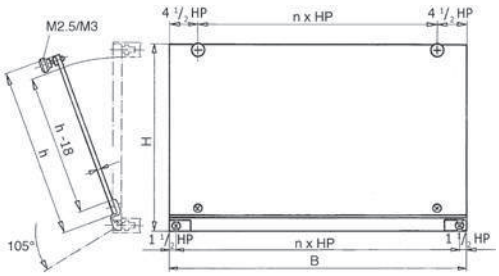
Description	Part-No.
Countersunk screw, recessed M4 x 10	5342-10
Hexagonal nut M4, 0.8D	5620-51



2.7.4 Hinged Front Panels

2.7.4.1 Top / Bottom-Hinged Front Panel

- Hinges are attached to the front extrusions of the sub rack or case
- Aluminium 2.5 mm, clear anodised (non-conductive)
- **Scope of delivery:**
  - Front panel
  - Hinge extrusion
  - Assembly material M2.5, incl. hinges





2.7.4.1 Top/Bottom-Hinged Front Panel

Width	Part-No. 3 U	Part-No. 4 U	Part-No. 6 U
84 HP	25N384-19	25N484-19	25N684-19

Dimensions

	Nominal Width		Width B	
HP	mm	inch	mm	inch
84 HP	426.72	16.80	426.5	16.79

Nominal Height	Height H		Height h	
U	mm	inch	mm	inch
3 U	128.7	5.07	117	4.61
4 U	173.15	6.81	161.4	6.35
6 U	262.05	10.31	250.3	9.85

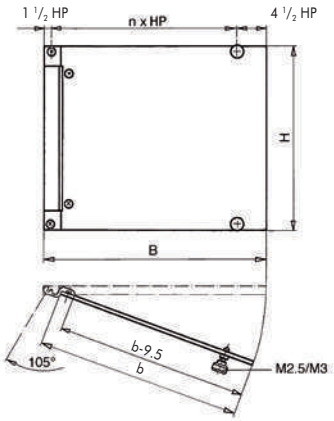
2.7.4.2 EMC Top / Bottom-Hinged Front Panel

- Width: 84 HP
- Offers optimum protection from electromagnetic interference
- Aluminium 2.5 mm, front anodised, rear conductive
- **Scope of delivery:**
  - EMC front panel
  - Hinge extrusions
  - Assembly material M2.5, incl. hinges
  - EMC gaskets



2.6.4.2 EMC Top / Bottom-Hinged Front Panel

EMC Level	Part-No. 3 U	Part-No. 6 U
Advanced	25C384-11	-
Superior	-	25D684-11



2.7.4.3 Side-Hinged Front Panel

- Aluminium 2.5 mm, clear anodised (non-conductive)
- **Scope of delivery:**
  - Front panel
  - Hinge extrusion
  - Assembly material M2.5, incl. hinges



2.7.4.3 Side-Hinged Front Panel

Width	Part-No. 3 U	Part-No. 6 U
84 HP	25N384-29	25N684-29

Other widths and heights available on request.

Dimensions

Nominal Width			Width B		Width b	
HP	mm	inch	mm	inch	mm	inch
84 HP	426.72	16.80	426.5	16.79	414.3	16.31

Nominal Height	Height H	
U	mm	inch
3 U	128.7	5.06
6 U	262.05	10.31

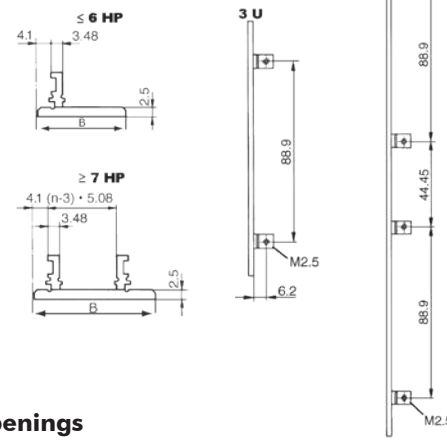
Use Elma's front panel service for machining and screen printing of your panels see chapter 6!



2.7.5 Plug-In Units acc. to IEC

2.7.5.1 Extruded Front Panel

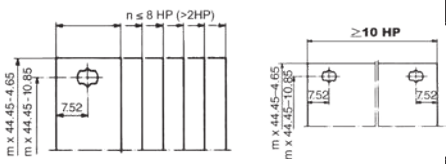
- Aluminium 2.5 mm, clear anodised (non-conductive)
- PCB mounting lugs are formed on the rear face of the panel
- No PCB fixing screws on the front face of the panel, leaving more space for silk screening and mounting front panel components
- Suitable for all sub racks and cases
- Thickness of the mounting lugs (3.48 mm) allows PCBs to be mounted on either side of the lugs
- Drill marks at rear for handle-fixing holes
- **Scope of delivery:**
  - Extruded front panel, clear anodised
- Front panel screws see below





2.7.5.1 Extruded Front Panels, without Openings

Width	B		Part-No. 3 U	Part-No. 6 U
	mm	inch		
3 HP	15.0	0.59	26N303	26N603
4 HP	20.1	0.79	26N304	26N604
5 HP	25.2	0.99	26N305	26N605
6 HP	30.3	1.19	26N306	26N606
7 HP	35.3	1.38	26N307	26N607
8 HP	40.4	1.59	26N308	26N608
10 HP	50.6	1.99	26N310	26N610
12 HP	60.7	2.38	26N312	26N612
14 HP	70.9	2.79	26N314	26N614
16 HP	81.1	3.19	26N316	26N616
21 HP	106.5	4.19	26N321	



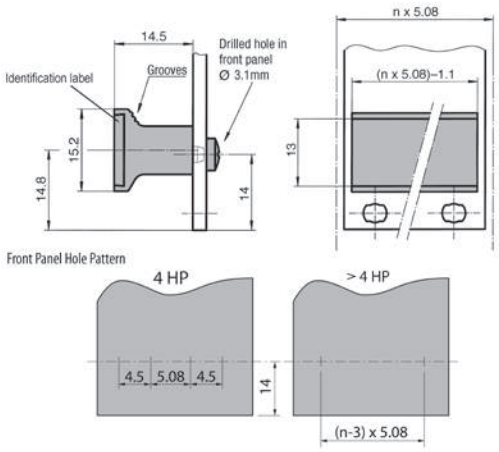
Front Panel Screws

- Set of 10 screws
- With screw retainer
- Front panel width up to 9 HP = 2 screws; ≥ 10 HP = 4 screws

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3 , size T8, with plastic screw retainer	63K159
Rounded head screws recessed M2.5 x 11.3, with plastic screw retainer	63-159

Rigid-Mounted Unit Handles with Identification Label

- Black, plastic UL94 V-0, label aluminium anodised
- **Scope of delivery:**
  - Rigid-mounted handle
  - Identification label
- Assembly material see below





Rigid-Mounted Handle with Identification Label

Width	Scope of Delivery	Part-No.
4 HP	10 pcs.	60-200-04
5 HP	10 pcs.	60-200-05
6 HP	10 pcs.	60-200-06
7 HP	10 pcs.	60-200-07
8 HP	10 pcs.	60-200-08
10 HP	10 pcs.	60-200-10
12 HP	10 pcs.	60-200-12
14 HP	1 pc.	60-200-14

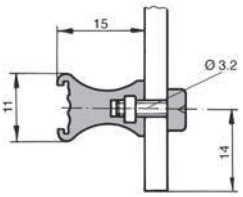
- Other sizes (up to 84 HP) are available upon request

Assembly Material

Description	Part-No.
Cross recessed round head screw	61-276

Fluted Handles

- Extruded aluminium handles, shaped to facilitate withdrawal of plug-in units
- Two grooves in the front face will accept identification strips (0.5 x 9 mm)
- **Scope of delivery:**
  - Extruded handle, clear anodised
  - Assembly material



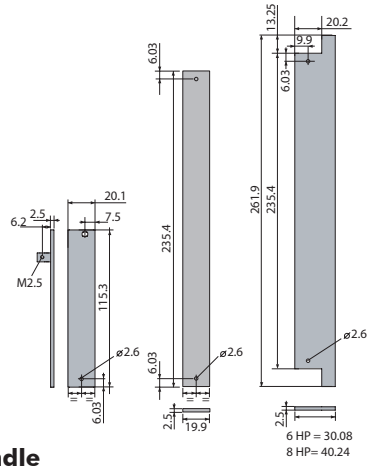


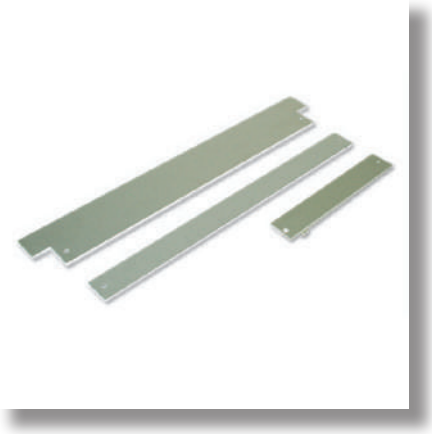
Fluted Handles for Front Panels to IEC

Front Panel	Width		Handle Length		Part-No.
Width HP	mm	inch	mm	inch	
3 HP	15.0	0.59	12.5	0.49	60-103
4 HP	20.1	0.79	17.6	0.69	60-104
5 HP	25.2	0.99	22.6	0.88	60-105
6 HP	30.3	1.19	27.7	1.09	60-106
7 HP	35.3	1.38	33.5	1.31	60-107
8 HP	40.4	1.59	37.9	1.49	60-108
10 HP	50.6	1.99	48.0	1.88	60-110
12 HP	60.8	2.39	58.2	2.29	60-112
14 HP	70.9	2.79	69.1	2.72	60-114
16 HP	81.1	3.19	78.5	3.09	60-116
21 HP	106.5	4.18	104.6	4.11	60-121
30 HP	152.2	5.99	149.6	5.88	60-130
40 HP	203.0	7.99	200.4	7.88	60-140
60 HP	304.6	11.99	302.0	11.88	60-160
84 HP	426.5	16.79	424.0	16.69	60-184

2.7.5.2 Front Panel with Cutout for IEC Ejector Handle

- Aluminium 2.5 mm, clear anodised (non-conductive)
- PCB mounting lugs are formed on the rear face of the panel (3 U-Version only)
- No PCB fixing screws on the front face of the panel, leaving more space for silk screening and mounting front panel components
- Suitable for all sub racks and cases
- 3 U front panels prepared for one handle
- 6 U front panels prepared for two handels
- **Scope of delivery:**
  - Front panel, clear anodised
- Front panel screws see 2.1.2.1 (for 3 U-Version only)
- IEC ejector handles, see 2.1.2.2





2.7.5.2 Front Panel with Cutout for IEC Ejector Handle

Width	B		Part-No. 3 U	Part-No. 6 U
	mm	inch		
4 HP	20.0	0.79	26N304-51	21N604-51
6 HP	30.2	1.19		21N606-51
8 HP	40.3	1.59		21N608-51

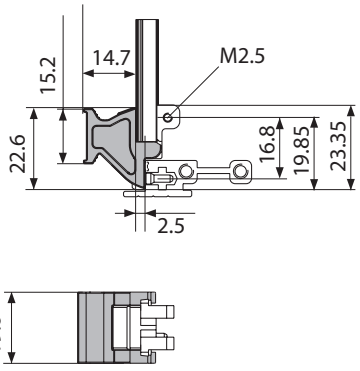
Front Panel Screws (for 3 U-Version only)

- Set of 10 screws
- With screw retainer
- Front panel 3 U = 1 screw

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3, size T8, with plastic screw retainer	63K159
Rounded head screws recessed M2.5 x 11.3, with plastic screw retainer	63-159

2.7.5.3 Ergonomic Ejector Handles acc. to IEC

- Simple assembly of plug-in units
- Allows trouble-free extraction of electronic units with multi-pole connectors
- Main features in one part: card holder, ejector handle and centring pin
- Reset spring for safe insertion
- One version for top and bottom only
- Handle is injection moulded, glass-reinforced plastic, UL94 V-0
- Card holder is zinc die-cast, nickel plated
- Reset spring is stainless steel
- **Scope of delivery:**
  - Ejector handle
  - Assembly material (cross recessed screws M2.5 for fixing of card holder/printed board/front panel)
- Front panel with special cutouts have to be ordered separately



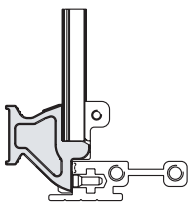


2.7.5.3 Ejector Handle acc. to IEC

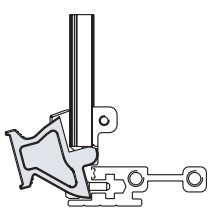
Description	Part-No.
Ejector handle black	81-233
Ejector handle grey	81-234

Extraction process:

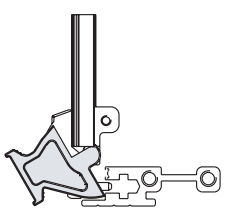
Rest position



Extraction

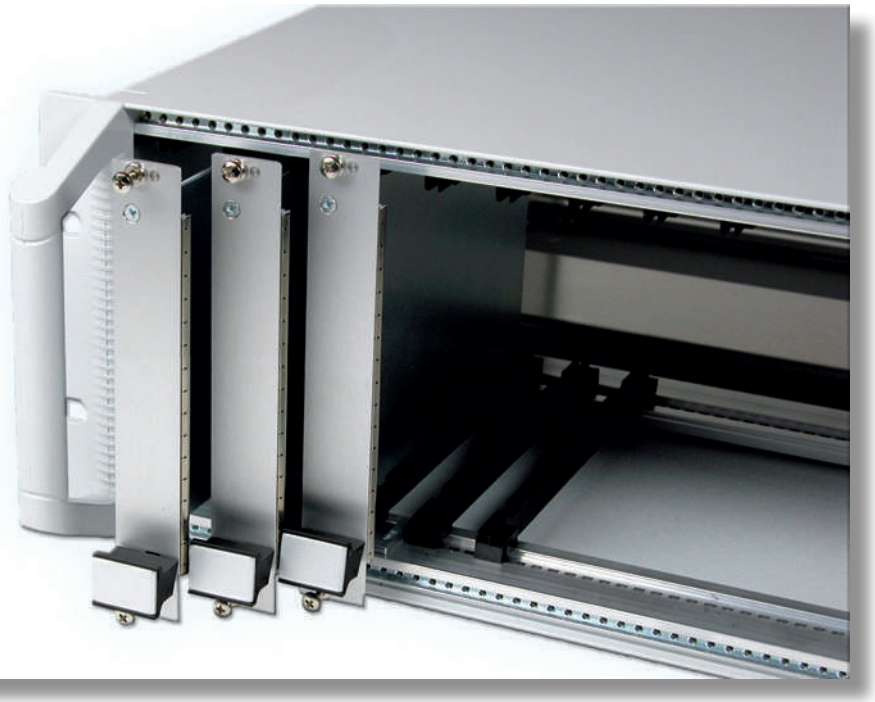


End position



Label

Description	Part-No.
1 sheet A4 of 220 labels	81-031



2.7.6 EMC Plug-In Units acc. to IEC

- Excellent EMC shielding
- Made of aluminium extrusions
- Rear side: conductive surface finish (clear passivated)
- Used in the assembly of plug-in units
- The EMC-gasket is integrated into the front panel profile to protect it from damage
- A pressfit centering pin guarantees optimum positioning of the panel as well as the right pressure between the contact strip and the next panel



2.7.6.1 EMC Filler Panel without Openings

- High stability
- Extruded aluminium
- Pressed-in centring pin and bushes M2.5
- Front side clear anodised, rear side conductive
- **Scope of delivery:**
  - EMC front panel, incl. pressed-in centering pin and bushes M2.5
- EMC-gasket see below
- Front panel screw see below
- Handles and card holders cannot be fitted with this type of front panel

Width	Part-No. 3 U	Part-No. 6 U
4 HP	66-514-73	66-514-76
6 HP	66-516-73	66-516-76
8 HP	66-518-73	66-518-76



EMC Gasket (Stainless Steel)

Height	Part-No.
3 U	81-062-03
6 U	81-062-06

Front Panel Screws

- Front panel width up to 8 HP = 2 screws

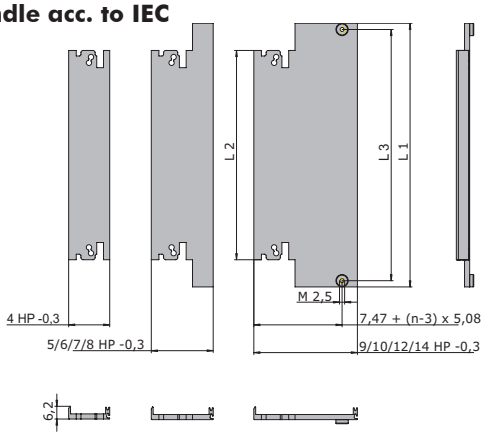
Description	Part-No.
Torx screw, M2.5 x 11.3, size T8	5443-08
Rounded head screw, cross recessed M2.5 x 12.7	61-287

Use Elma's font panel service for machining and screen printing of your panels!

2.7.6.2 EMC Front Panels for IEC Plug-In Units with Cutout for Ejector Handle acc. to IEC

EMC Front Panels Aluminium with EMC Gasket

- Excellent EMC shielding
- Immune to snagging
- EMC-gasket slid onto the extrusion
- **Scope of delivery:**
  - EMC front panel, incl. pressed-in bushes M2.5 (size ≥ 10 HP)
- EMC-gasket see below
- Handle has to be ordered separately, see below
- Front panel screw (size ≥10 HP), see below





Front Anodised, Rear Conductive (2 cutouts)

- With 2 cutouts (bottom + top)

Width	Part-No. 3 U	Part-No. 6 U	Part-No. 9 U
4 HP	66-514-23	66-514-26	66-514-29
5 HP	66-515-23	66-515-26	-
6 HP	66-516-23	66-516-26	66-516-29
8 HP	66-518-23	66-518-26	66-518-29
10 HP	66-520-23	66-520-26	66-520-29
12 HP	66-522-23	66-522-26	-
14 HP	66-534-23	66-534-26	-

Front Anodised, Rear Conductive (1 cutout)

- With 1 cutout (bottom)
- Incl. pressed-in centring pin and bush M2.5 (top)
- Incl. cutout for mounting of card holder 61-156 (top) with screw 5322-08 (see 2.2.2.7)

Width	Part-No. 3 U
4 HP	66-514-43
5 HP	66-515-43
6 HP	66-516-43
8 HP	66-518-43
10 HP	66-520-43
12 HP	66-522-43
14 HP	66-534-43

Dimensions

Height	L1 mm	L1 inch	L2 mm	L2 inch	L3 mm	L3 inch
3 U	128.55	5.06	102.05	4.01	122.50	4.82
6 U	261.90	10.31	235.40	9.27	255.85	10.07
9 U	395.25	15.56	368.75	14.51	389.20	15.32



EMC-Gasket (Stainless Steel)

Unit	Part-No. 3 U	Part-No. 6 U	Part-No. 9 U
1 pc.	81-062-03	81-062-06	81-062-09

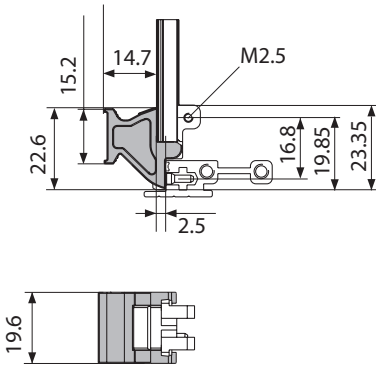
Front Panel Screw

- For EMC front panels size ≥ 9 HP = 2 additional screws are needed

Description	Part-No.
Cross recessed rounded head screws M2.5 x 12.7	61-287
Torx screws M2.5 x 11.3, size T8	5443-08

2.7.6.3 Ergonomic Ejector Handles acc. to IEC

- Simple assembly of plug-in units
- Allows trouble-free extraction of electronic units with multi-pole connectors
- Main features in one part: card holder, ejector handle and centring pin
- Reset spring for safe insertion
- One version for top and bottom only
- Handle is injection moulded, glass-reinforced plastic, UL94 V-0
- Card holder is zinc die-cast, nickel plated
- Reset spring is stainless steel
- **Scope of delivery:**
  - Ejector handle
  - Assembly material (cross recessed screws M2.5 for fixing of card holder/printed board/front panel)
- Front panel with special cutouts have to be ordered separately



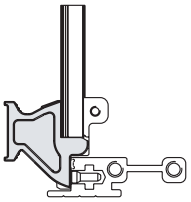


2.7.6.3 Ejector Handle acc. to IEC

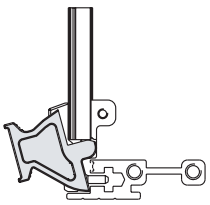
Description	Part-No.
Ejector handle black	81-233
Ejector handle grey	81-234

Extraction process:

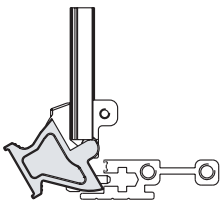
Rest position



Extraction



End position

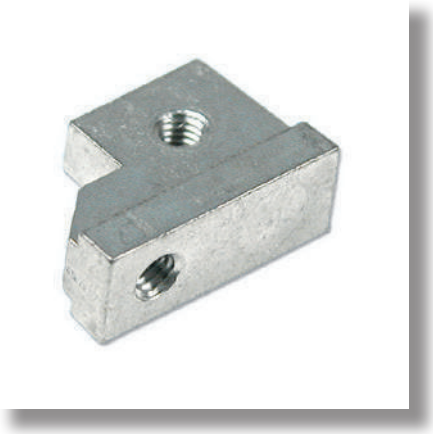


Label

Description	Part-No.
1 sheet A4 of 220 labels	81-031

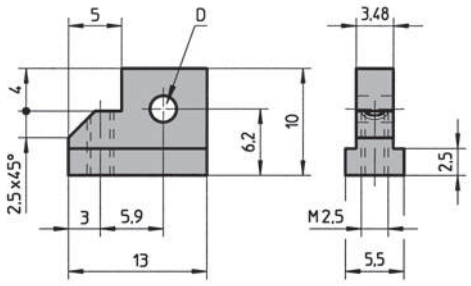
2.7.6.4 Card Holder acc. to IEC Standard

- By using the zinc die-cast card holder, flat front panels and EMC front panels acc. to IEC can be connected to a PC card to form a plug-in unit
- The card can be mounted both in the standard position and offset 1 HP (5.08 mm)
- **Scope of delivery:**
  - Card holder
- Assembly material see below



2.7.6.4 Card Holder without Swivel Stop

Description	Application	D	Part-No.
Card holder without swivel stop	Without injector / ejector handle	M2.5	61-156



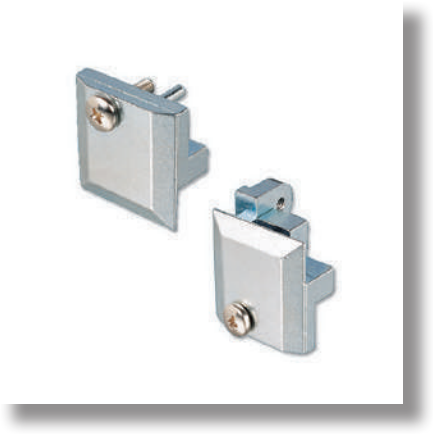


Assembly Material

Description	Application	Part-No.
Cross recessed countersunk screw M2.5 x 8	For card holder	5322-08
Torx countersunk screw M2.5 x 8, size T8	For card holder	5470-21
Slotted pan head screw M2.5 x 6	For printed board	5571-06
Torx cylinder head screw M2.5 x 6, size T8	For printed board	5470-04

2.7.6.5 Card Holder/End Piece without ESD Pin

- **Scope of delivery:**
  - End piece card holder (zinc die-cast, nickel plated)
  - Assembly material
    (screws M2.5 for fixing of front panel/card holder/printed board)



2.7.6.5 Card Holder/End Piece *without* ESD Pin

Description	Part-No.
Top	81-018-01
Bottom	81-019-01



2.7.7 Plug-In Units acc. to IEEE

2.7.7.1 EMC Front Panels Aluminium with EMC Gasket acc. IEEE

- Excellent EMC shielding
- Immune to snagging
- EMC-gasket slid onto the extrusion
- **Scope of delivery:**
  - EMC front panel, incl. press-in bushes M2.5 (size ≥ 10 HP)
- EMC-gasket see below
- Handle has to be ordered separately, see 2.7.7.5
- Front panel screw (size ≥10 HP), see below



2.7.7.1 Front Anodised, Side Conductive (2 cutouts)

- With 2 cutouts (bottom + top)

Width	Part-No. 3 U	Part-No. 6 U
4 HP	66-514-23	66-514-26
5 HP	66-515-23	66-515-26
6 HP	66-516-23	66-516-26
7 HP	66-517-23	66-517-26
8 HP	66-518-23	66-518-26
9 HP	66-519-23	66-519-26
10 HP	66-520-23	66-520-26
12 HP	66-522-23	66-522-26
14 HP	66-534-23	66-534-26

2.7.7.2 Front Anodised, Rear Conductive (1 cutout)

- With 1 cutout (bottom)
- Incl. pressed-in centring pin and bush M2.5 (top)
- Incl. cutout for mounting of card holder 61-156 (top) with screw 5322-08 (see 2.7.6.2)

Width	Part-No. 3 U
4 HP	66-514-43
5 HP	66-515-43
6 HP	66-516-43
8 HP	66-518-43
10 HP	66-520-43
12 HP	66-522-43
14 HP	66-534-43



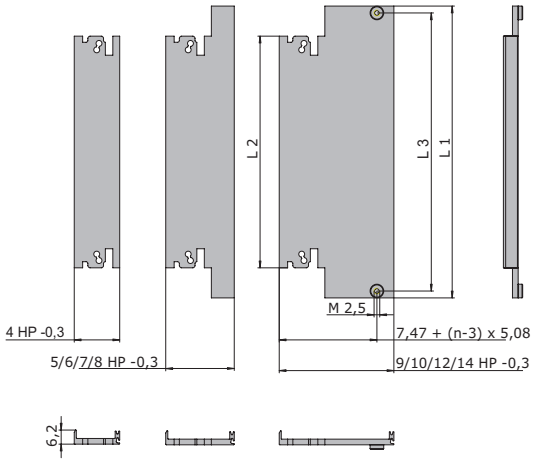
2.7.7.3 EMC-Gasket (Stainless Steel)

Unit	Part-No. 3 U	Part-No. 6 U
1 pc.	81-062-03	81-062-06

Front Panel Screw

- For EMC front panels size ≥ 9 HP = 2 additional screws are needed

Description	Part-No.
Cross recessed rounded head screws M2.5 x 12.7	61-287
Torx screws M2.5 x 11.3, size T8	5443-08



Dimensions

Height	L1 mm	L1 inch	L2 mm	L2 inch	L3 mm	L3 inch
3 U	128.55	5.06	102.05	4.01	122.50	4.82
6 U	261.90	10.31	235.40	9.27	255.85	10.07



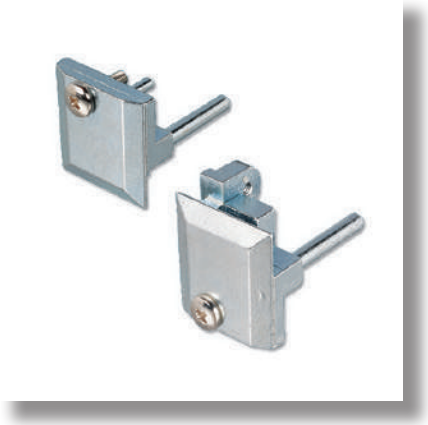
2.7.7.5 Injector/Ejector Handles acc. to IEEE

Type			Mounting	ESD Pin	Colour	Part-No
Ergonomic			Bottom	With ESD-pin	Black	81-076
Ergonomic			Top	With ESD-pin	Black	81-075
Ergonomic			Bottom	Without ESD-pin	Black	81-076-01
Ergonomic			Top	Without ESD-pin	Black	81-075-01
Ergonomic	Hot Swap		Bottom	With ESD-pin	Black	81-096
Ergonomic	Hot Swap		Top	With ESD-pin	Black	81-095
Ergonomic	Hot Swap		Bottom	Without ESD-pin	Black	81-096-01
Ergonomic	Hot Swap		Top	Without ESD-pin	Black	81-095-01
Ergonomic	Hot Swap	Offset	Bottom	With ESD-pin	Black	81-185
Ergonomic	Hot Swap	Offset	Top	With ESD-pin	Black	81-184
Classic			Bottom	With ESD-pin	Black	81-261
Classic			Top	With ESD-pin	Black	81-260
Classic		Offset	Bottom	With ESD-pin	Black	81-161
Classic		Offset	Top	With ESD-pin	Black	81-160
Classic	Hot Swap		Bottom	With ESD-pin	Black	81-256
Classic	Hot Swap		Top	With ESD-pin	Black	81-255
Classic	Hot Swap	Offset	Bottom	With ESD-pin	Black	81-156
Classic	Hot Swap	Offset	Top	With ESD-pin	Black	81-155
Telecom	Hot Swap		Bottom	With ESD-pin	Black	81-206
Telecom	Hot Swap		Top	With ESD-pin	Black	81-205
Telecom	Hot Swap		Bottom	Without ESD-pin	Black	81-206-01
Telecom	Hot Swap		Top	Without ESD-pin	Black	81-205-01
Telecom	Hot Swap	Offset	Bottom	With ESD-pin	Black	81-189
Telecom	Hot Swap	Offset	Top	With ESD-pin	Black	81-188
Telecom long	Hot Swap		Bottom	With ESD-pin	Black	81-215
Telecom long	Hot Swap		Top	With ESD-pin	Black	81-214
Telecom long	Hot Swap	Offset	Bottom	With ESD-pin	Black	81-116
Telecom long	Hot Swap	Offset	Top	With ESD-pin	Black	81-117
Microswitch						81-088-1 (10 pcs.)

For more information refer to chapter C | "Handles"

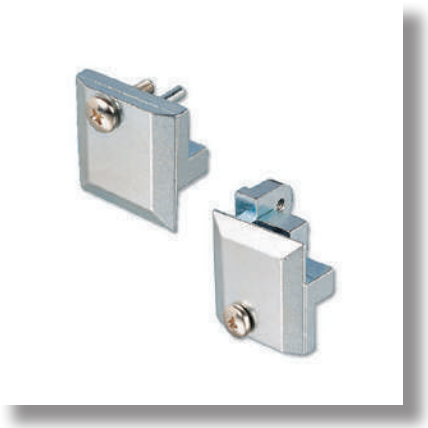
2.7.7.6 Card Holder and Coding Pins acc. to IEEE

- **Scope of delivery:**
  - End piece card holder (zinc die-cast, nickel plated)
  - Assembly material
    (screws M2.5 for fixing of front panel/card holder/printed board)



Card Holder/End Piece *with* ESD Pin

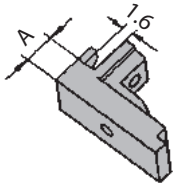
Description	Part-No.
Top	81-018
Bottom	81-019



Card Holder/End Piece *without* ESD Pin

Description	Part-No.
Top	81-018-01
Bottom	81-019-01





Middle Part

- Usable for all front panels
- For positioning and fixing of 6 U and 9 U cards, card thickness 1.6 mm
- Material: Plastic UL94 V-0

Description	A		Part-No.
	mm	inch	
Aluminium 2.5 mm	2.5	0.10	61-960

Assembly Material

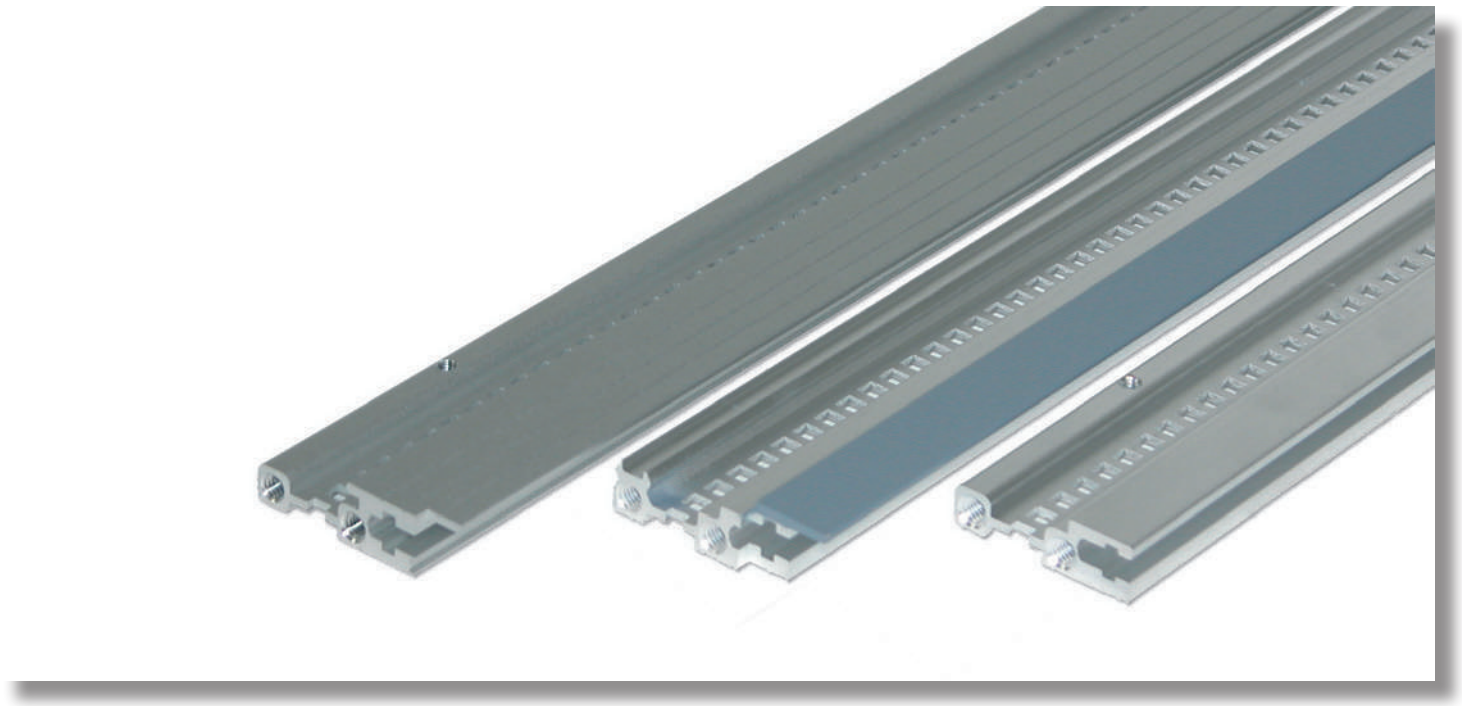
Description	Part-No. 100 pcs.
PT-countersunk screw 2.5 x 6	5534-06



Coding Pins

- Acc. to IEC 60297-3-103
- Plastic, UL94 V-0
- Can be rotated in 4 positions

Description	Part-No.
Grey	81-054-02
Dark red	81-054-06
Black	81-054-04

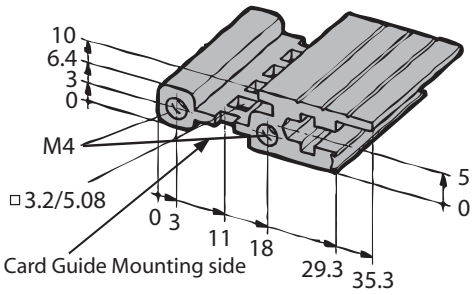


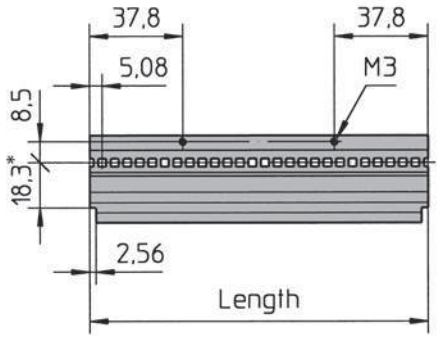
2.8 Extrusions

2.8.1 Front Extrusions

2.8.1.1 Front Extrusion 66-111, IEC

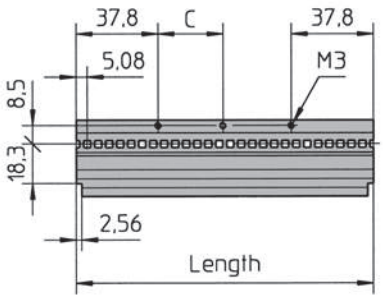
- For sub racks and cases front
- **Scope of delivery:**
  - 1 front extrusion without assembly material





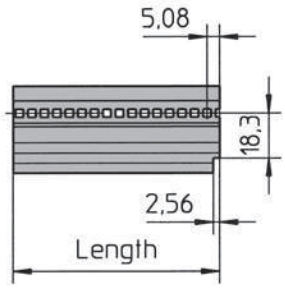
Standard Version

Length for HP	mm	inch	Part-No. clear anodised	black anodised	clear passivated	raw
21	111.8	4.40	66-111-26	-	-	-
28	147.3	5.80	66-111-25	-	-	-
32	167.6	6.80	66-111-62	-	-	-
42	218.4	8.60	66-111-60	-	66-111-75	-
63	325.1	12.80	66-111-61	-	66-111-76	-
81	416.6	16.40	66-111-22	-	66-111-77	-
84	431.8	17.00	66-111-23	66-111-56	66-111-78	-
	1350.0	53.15	-	-	-	66-111-19



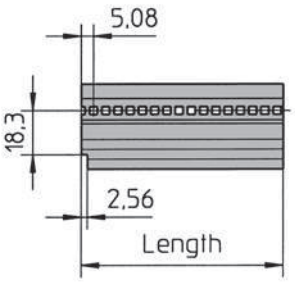
EMC Version

Length for HP	mm	inch	Holes n x C	Part-No. clear passivated
42	218.4	8.60	2 x 71.42	66-111-50
63	325.1	12.80	3 x 83.17	66-111-51
81	416.6	16.40	4 x 85.24	66-111-52
84	431.8	17.00	4 x 89.05	66-111-53



Height Divider Right

Length for HP	mm	inch	Part-No. anodised
8.5	43.18	1.70	66-111-71
12.5	63.82	2.54	66-111-72

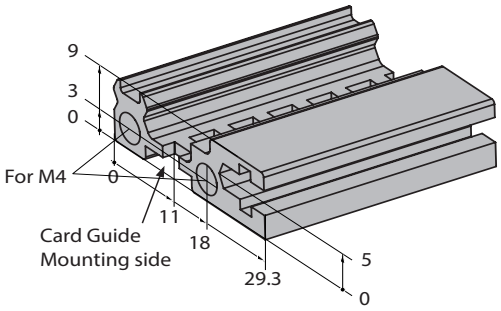


Height Divider Left

Length for HP	mm	inch	Part-No. anodised
8.5	43.18	1.70	66-111-81
12.5	63.50	2.50	66-111-82

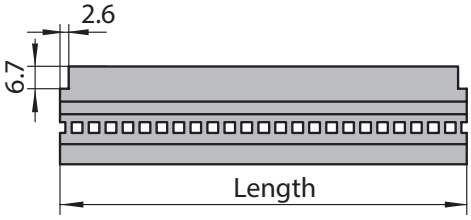
2.8.1.2 Front Extrusion 66-282, IEC

- For Stylebox 15 Smart
- **Scope of delivery:**
  - 1 front extrusion without assembly material



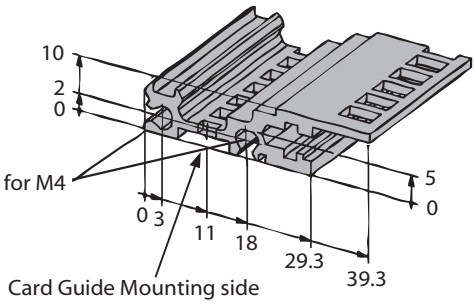
2.8.1.2 Front Extrusion 66-282, IEC

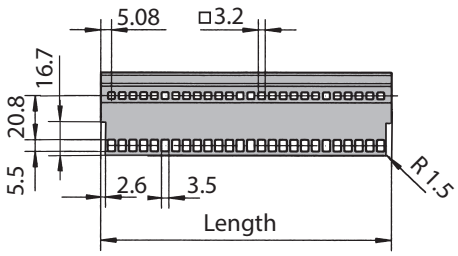
Length for HP	mm	inch	Part-No. clear passivated
42	218.4	8.60	66-282-26
63	325.1	12.80	66-282-27
84	431.8	17.00	66-282-28
	1350	53.15	66-282-19



2.8.1.3 Front Extrusion 66-281 , IEEE

- For Stylebox 15 standard according to IEEE
- **Scope of delivery:**
  - 1 extrusion without assembly material, powder-coated





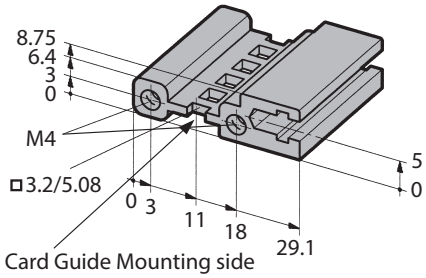
Standard Version

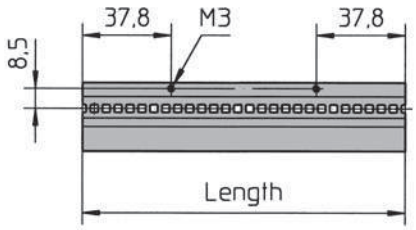
Length			Part-No.
for HP	mm	inch	
84	431.8	17.00	66-281-54
63	325.1	12.80	66-281-61
42	218.4	8.60	66-281-60

2.8.2 Internal Extrusions

2.8.2.1 Internal Extrusion 66-193 for Insulated Backplane Mounting

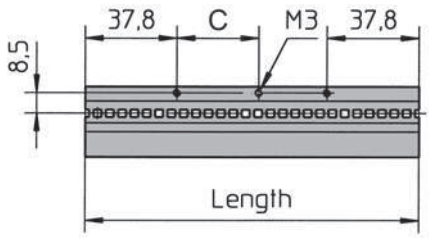
- For mounting backplanes in sub racks
- insulating strip see 2.8.2.6
- **Scope of delivery:**
  - 1 extrusion without assembly material





Standard Version

Length			Part-No.	
for HP	mm	inch	clear passivated	raw
32	167.6	6.60	66-193-26	-
42	218.4	8.60	66-193-20	-
63	325.1	12.80	66-193-21	-
81	416.6	16.40	66-193-22	-
84	431.8	17.00	66-193-23	-
	1350.0	53.14	-	66-193-19

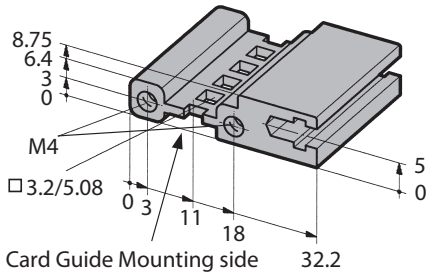


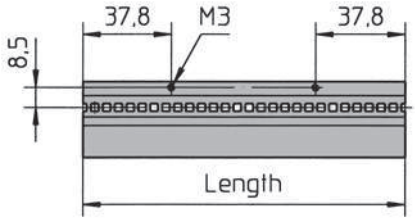
EMC Version

Length			Holes	Part-No.
for HP	mm	inch	n x C	clear passivated
84	431.8	17.00	2 x 178.1	66-193-63

2.8.2.2 Internal Extrusion 66-194 for Conductive Backplane Mounting

- For mounting backplanes without an insulating strip
- **Scope of delivery:**
  - 1 extrusion without assembly material



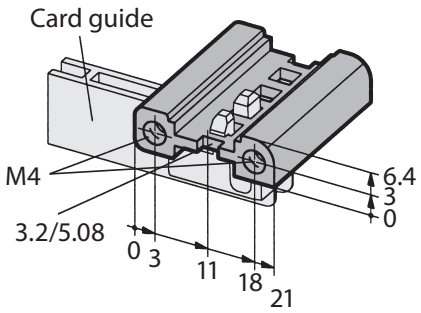


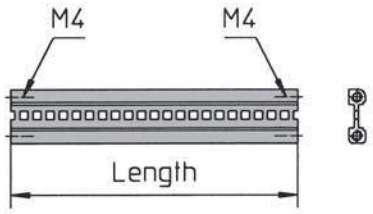
Standard Version

Length			Part-No.	
for HP	mm	inch	**clear passivated**	**raw**
84	431.8	17.00	66-194-23	-
	1350.0	53.14	-	66-194-19

2.8.2.3 Internal Extrusion 66-138 for Card Guides

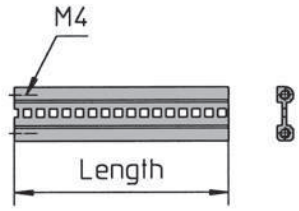
- For mounting card guides
- Tapped strip not required
- **Scope of delivery:**
  - 1 extrusion without assembly material





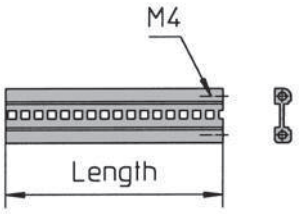
Standard Version

Length			Part-No.	
for HP	mm	inch	**clear passivated**	**raw**
21	111.8	4.40	66-138-28	-
28	147.3	5.70	66-138-25	-
42	218.4	8.60	66-138-26	-
63	325.1	12.79	66-138-27	-
81	416.6	16.40	66-138-22	-
84	431.8	17.00	66-138-23	-
	1350.0	53.14	-	66-138-19



Height Divider Left

Length for HP	mm	inch	Part-No. clear passivated
4.5	22.86	0.90	66-138-70

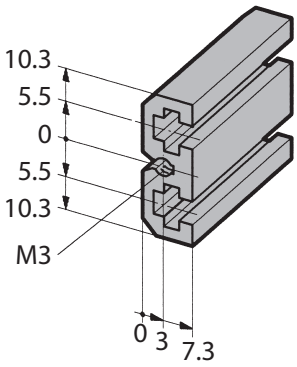


Height Divider Right

Length for HP	mm	inch	Part-No. clear passivated
4.5	22.86	0.90	66-138-80

2.8.2.4 Double Extrusion 66-192 for Insulated Backplane Mounting

- For mounting backplanes, matches 66-193, 66-288
- For use with insulating strips
- Insulating strip see 2.8.2.6
- Assembly material with adapter: 63-175
- **Scope of delivery:**
  - 1 extrusion without assembly material

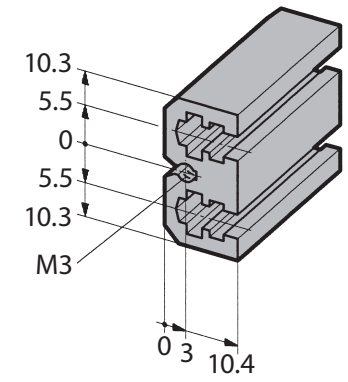


Length for HP	mm	inch	Part-No. clear passivated	raw
84	431.8	17.00	66-192-24	-
	1350.0	53.14	-	66-192-14

Length for HP	mm	inch	Part-No. clear passivated
42	213.4	8.40	66-192-20
63	320.0	12.59	66-192-21
81	411.5	16.20	66-192-22
84	426.7	16.79	66-192-23

2.8.2.5 Double Extrusion 66-195 for Conductive Backplane Mounting

- For mounting backplanes without insulating strips
- Matches 66-194, 66-289, 66-290
- Assembly material with adapter: 63-175
- **Scope of delivery:**
  - 1 extrusion without assembly material

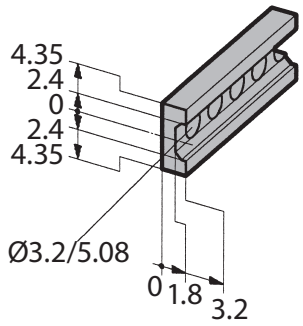


Length for HP	mm	inch	Part-No. clear passivated
84	431.8	17.00	66-195-24

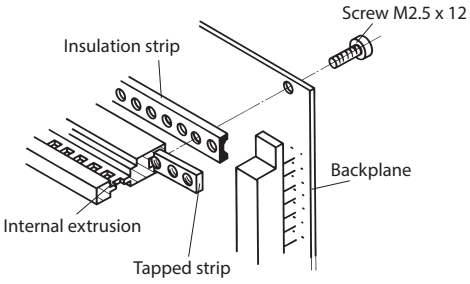
Length for HP	mm	inch	Part-No. clear passivated
84	426.7	16.77	66-195-23

2.8.2.6 Insulating Strip 66-901

- Plastic grey
- Use with extrusions 66-112, 66-192, 66-193, 66-288



Length for HP	mm	inch	Part-No.
42	216.44	8.52	66-901-20
63	323.12	12.72	66-901-21
81	414.56	16.32	66-901-22
84	429.80	16.92	66-901-23

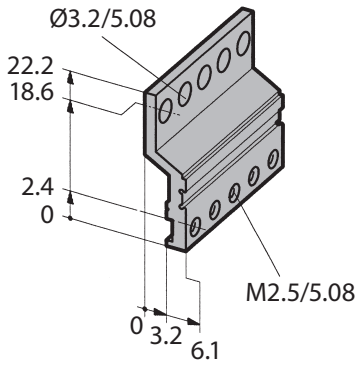


Mounting with Insulation Strips

Description	Part-No.
Screw to insulation extrusion	5325-12

2.8.2.7 Edge Connector Extrusion 66-147

- Supplementary edge connector extrusion for DIN 41612 (IEC 60603-2)
- Matches 66-112, 66-192, 66-193
- **Scope of delivery:**
  - 1 extrusion without assembly material



Length			Part-No.	
for HP	mm	inch	**clear passivated**	**raw**
8	40.6	1.59	66-147-40	-
18	91.4	3.59	66-147-41	-
28	142.2	5.60	66-147-42	-
42	213.4	8.40	66-147-63	-
63	320.0	12.60	66-147-65	-
81	411.5	16.20	66-147-22	-
84	426.7	16.80	66-147-52	-
	1350.0	53.14	-	66-147-19



3 U x 84 HP x special depth

- Instrumentation case



4 U x 84 HP x 305 mm

- Horizontal mounting of double eurocards
- Fan with front entrance
- Floppy disk drive



4 U x 84 HP x 395 mm

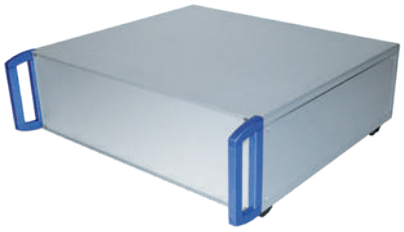
- Recessed mounting of eurocards and modules



Source: Interscience, Netherlands

Notes

3: Stylebox 15 e-motion



3.1 Stylebox 15 Overview **B | 3_3**

3.2 Stylebox 15 e-motion **B | 3_8**

3.2.1 Width B | 3_9

3.2.2 Height Bezels B | 3_9

3.2.3 Depth B | 3_10

3.2.4 Top Covers B | 3_10

3.2.5 Bottom Covers B | 3_11

3.2.6 Side Panels B | 3_12

3.2.7 Portable Desktop Handles B | 3_12

3.2.8 Tower Feet B | 3_13

3.2.9 Drawings Stylebox 15 e-motion B | 3_15



3.3 Adaptation Kits **B | 3_17**

3.3.1 Adaptation Kits a B | 3_17

3.3.2 Adaptation Kits b B | 3_18

3.3.3 Adaptation Kits c B | 3_18

3.3.4 Adaptation Kits d B | 3_19

3.3.5 Adaptation Kits e B | 3_19

3.3.6 Adaptation Kits f B | 3_20

3.3.7 Edge Connector Extrusion B | 3_20



3.4 Assembly Accessories **B | 3_21**

3.4.1 Front Sub Division Vertical for 6 U System or 6 U Assembly B | 3_21

3.4.2 EMC Front Sub Divisions Vertical Small B | 3_22

3.4.3 Horizontal Card Mounting Kits for Double Eurocards (6 U) B | 3_22

3.4.4 EMC Horizontal Card Mounting Kit for Double Eurocards (6 U) B | 3_24

3.4.5 EMC Front Sub Division B | 3_25

3.4.6 Mounting Chassis B | 3_27

3.4.7 EMC Shielding B | 3_30







3.5 General Accessories **B | 3_33**

3.5.1 Card Guides IEC B | 3_33

3.5.2 Card Guides acc. to IEEE B | 3_35

3.6 Front Panels **B | 3_38**

3.6.1 Flat Front Panels B | 3_38

3.6.2 EMC Flat Front Panels B | 3_39

3.6.3 Fan Front Panels B | 3_42

3.6.4 Hinged Front Panels B | 3_44

3.6.5 Heat Sink Front Panels B | 3_46

3.6.6 Plug-In Units acc. to IEC B | 3_48

3.6.7 EMC Plug-In Units acc. to IEC B | 3_51

3.6.8 Plug-In Units acc. to IEEE B | 3_55

3.7 Extrusions **B | 3_59**

3.7.1 Front Extrusions B | 3_59

3.7.2 Internal Extrusions B | 3_63

3.7.3 Insulating Strips 66-901 B | 3_66

3: Stylebox 15 e-motion



3.1 Stylebox 15 Overview

- The Elma Stylebox 15 case system consists of four longitudinal sections and two side panels as loadbearing frame and casing
- The top and bottom covers are provided with spring catches, which engage in special slots on the longitudinal sections. They are also screwed at the side to increase the torsional rigidity of the case
- The front of the case can be fitted as required with cover panels, front handles or 19" fixing brackets. This permits subsequent conversion from a desktop case to a 19" module unit and vice-versa
- The mounting dimensions at front and rear comply with IEC 60297
- The side panels are passivated. The supporting surfaces of the longitudal sections and top/bottom plates are clear passivated. This provides a large contact area for long-term EMI/RFI protection
- The top design and the variety of sizes and models, together with the full range of Elma accessories, are ideal solutions for a wide range of applications, including measuring units, controllers, computer systems, etc.

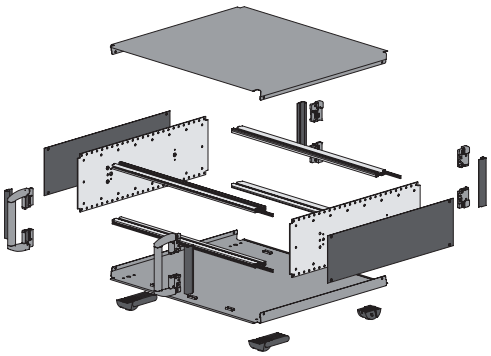
Sturdy, flexible and portable

Technical features
- Superior EMC-shielding options available
- Easy conversion from desktop to 19" rack mount case
- Dimensions to IEC 60297
- Simple assembly
- Easy access
- Elegant design

Options
- Numerous accessories
- Internal mounting chassis
- Horizontal and vertical insertion of eurocards
- Cooling

Applications
- Measurement and test instruments
- Lab and field service instruments
- Controls
- Computers

Colours
- Stylebox 15 e-motion
  - White (RAL 9016) and silver berluran
- Other colours available upon request

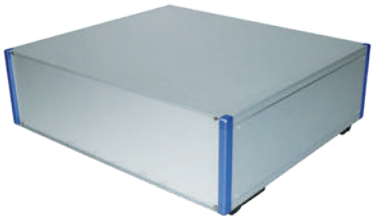


Stylebox 15 e-motion

- Extrusions and inner sides aluminium
- Covers of galvanised steel
- Basic EMC-shielding as standard

Types and Sizes

Desktop Case without Handles



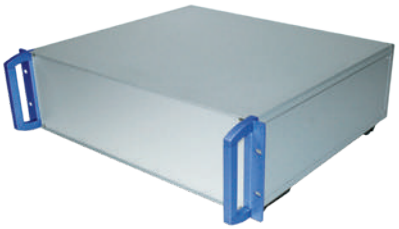
Desktop Case with Front Handles



Portable Desktop Case

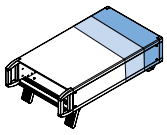
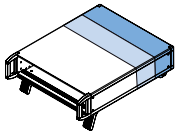
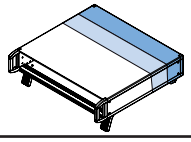
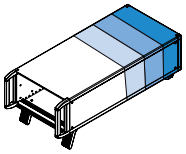
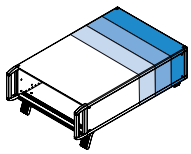
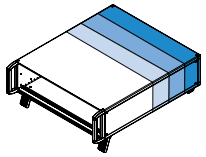
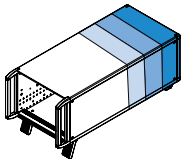
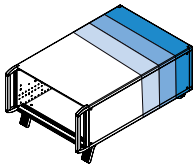
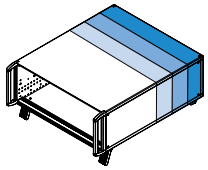
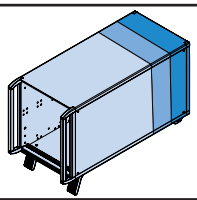
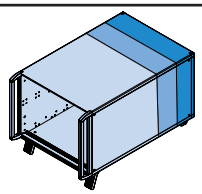
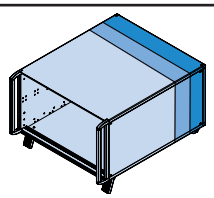
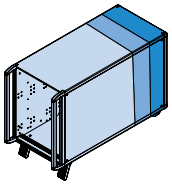
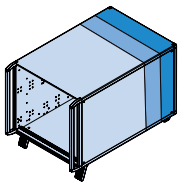
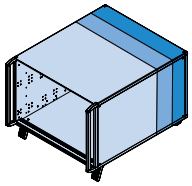


19" Case with Front Handles



19" Case without Front Handles



Width Height	42 HP e-motion	63 HP e-motion	84 HP e-motion
2 U			
3 U			
4 U			
6 U			
7 U			

Depth ☐ 245 mm 9.64" ☐ 305 mm 12.00" ☐ 395 mm 15.55" ■ 500 mm 19.68"

EMC

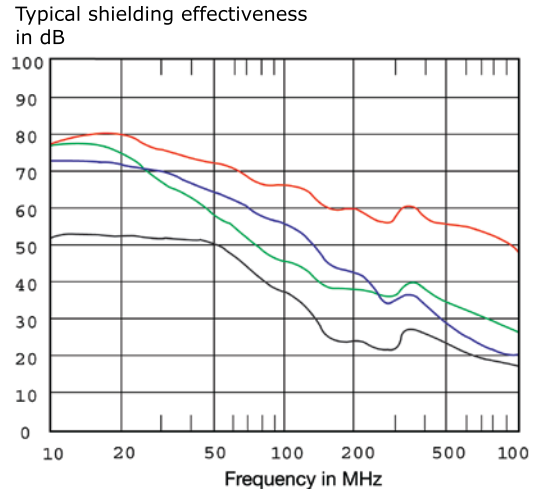
"Electromagnetic comptability is the ability of a system to operate in the intended environment without causing or suffering unacceptable degradation of performance due to unintentinal electromagnetic radiation or response."
The EMC characterstics of a system therefore consist of an appropriate immunity from interference (noise immunity) and a limited emission of interference (noise emission).

Elma's EMC concept describes three levels of electromagnetic shielding performance (Performance Level). The attenuation levels will simplify the selection of sub racks for the user.
Test setup: The first measurement E1 is without the enclosure. The next measurement E2 is made with the transmitting antenna installed inside the enclosure. The difference between the received signal without and with the enclosure represents the shielding effectiveness in dB.

Performance Level	30 - 230 MHz	230 - 1000 MHz	1000 - 2000 MHz
1 / Elma: Basic level	20 dB	10 dB	0 dB
2 / Elma: Advanced level	40 dB	30 dB	20 dB
3 / Elma: Superior level	60 dB	50 dB	40 dB

The standard configuration will provide you with a basic (Stylebox 15 Standard and e-motion) or an advanced EMC level (Stylebox 15 Smart). If you require an advanced or superior EMC level for your system, you need to order **additional EMC parts**. Throughout the catalogue we have put all EMC parts **in a yellow table**.

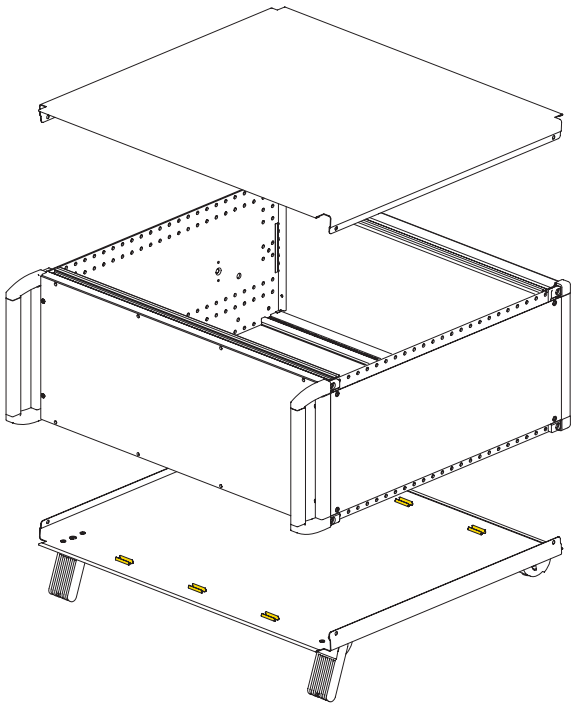
Typical Attenuation



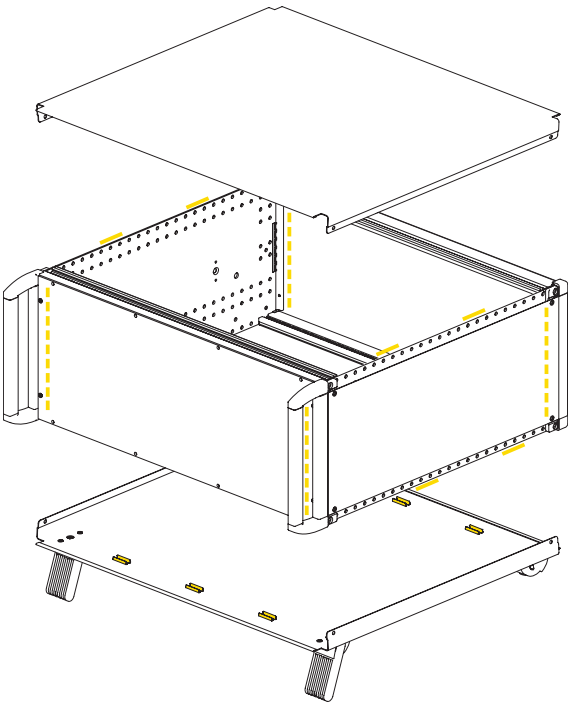
EMC basic level	Case size 4 U-x-42 HP-x-245 mm (9.64") with standard front panels (cover panels perforated and unperforated)
EMC basic level	Case size 4 U-x-84 HP-x-395 mm (15.55") with standard front panels (cover panels perforated and unperforated)
Advanced EMC level	Case size 4 U-x-84 HP-x-395 mm (15.55") with EMC front panels and gasket set for advanced EMC level (cover panels perforated and unperforated)
Superior EMC level	Case size 4 U-x-84 HP-x-395 mm (15.55") with EMC front panels and gasket set for superior EMC level (cover panels perforated and unperforated)

EMC Layout & Configuration Options

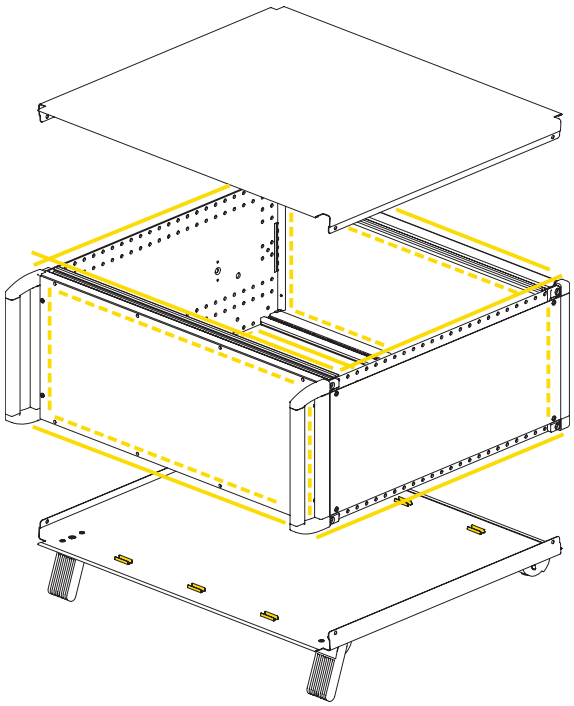
Basic Level
Stylebox 15 e-motion
Size 4 U x 84 HP x 395 mm
with standard front panels
(cover plates perforated or unperforated)



Advanced Level
Stylebox 15 e-motion
Size 4 U x 84 HP x 395 mm
with EMC front panels and gasket kit
(cover plates perforated or unperforated)



Superior Level
Stylebox 15 e-motion
Size 4 U x 84 HP x 395 mm
with EMC front panels and gasket kit
(cover plates perforated or unperforated)



3: Stylebox 15 e-motion

Configuration



Stylebox 15 e-motion

Frame

- **Width 1.2.1** — 42 HP / 63 HP / 84 HP
- **Height 1.2.2** — 2 U / 3 U / 4 U / 6 U / 7 U; Without / with handles; Portable desktop; 19” with or without front handles
- **Depth 1.2.3** — 245 mm / 305 mm / 395 mm / 500 mm

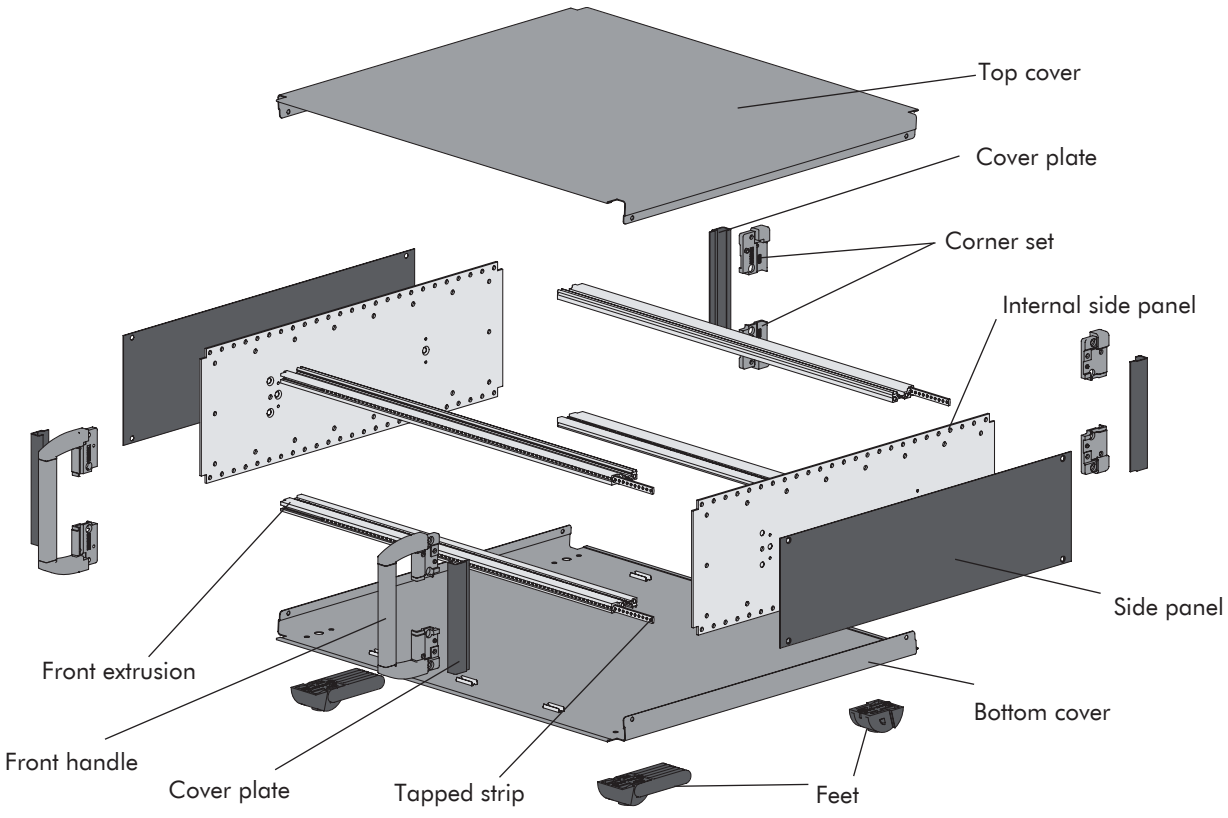
Covers

- **Top Cover 1.2.4** — Solid / perforated; Width: 42 HP / 63 HP / 84 HP
- **Bottom Cover 1.2.5** — Solid / perforated; Width: 42 HP / 63 HP / 84 HP
- **Feet**
- **Side Panels 1.2.6** — Height: 2 U / 3 U / 4 U / 6 U / 7 U; Solid / solid for portable desktop; Depth: 245 mm / 305 mm / 395 mm / 500 mm
- **Portable Desktop Handle 1.2.7**
- **Tower Feet 1.2.8**
- **Adapation Kits 1.3**
- **Assembly Accessories 1.4**
- **General Accessories 1.5**
- **Front Panels 1.6**
- **Extrusions 1.7**



3.2 Stylebox 15 e-motion

- Extrusions and inner sides aluminium
- Covers of galvanised steel
- Advanced EMC-shielding as standard
- Identical front and rear for insertion of boards, modules, etc.
- Dimensions to IEC 60297
- Top design
- Simple assembly
- Sturdy
- Conductive contact surfaces
- Visible surfaces are powder-coated
- Colour: white (RAL 9016) and silver berluran



3.2.1 Width

- For Stylebox 15 e-motion
- Extrusions: Aluminium, conductive
- **Scope of delivery:**
  - 4 front/rear extrusions
  - 4 tapped strips M 2.5
  - 1 set of 16 screws (Torx M4 x 10, T20)



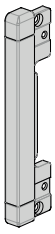
1.2.1 Width

Description	42 HP	63 HP	84 HP
IEC Application	15S035	15S036	15S037

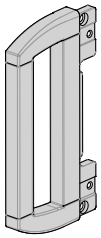
3.2.2 Height Bezels

- For Stylebox 15 e-motion
- No additional coverplate has to be ordered when using 19" bracket version
- Die cast parts and extrusions: Aluminium powder coated or wet painted, contact area conductive
- **Scope of delivery:**
  - 1 height bezel
- 4 sets have to be ordered (2 for front and 2 for rear side)

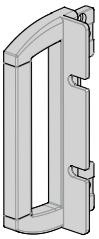




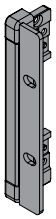
Bracket



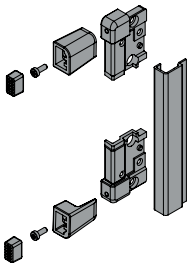
Front handle



19" bracket
with front handle



19" bracket



Rear feet corner set
plus coverplate

3.2.2 Height Bezels

Description	Colour	2 U	3 U	4 U	6 U
Bracket	white	15-242-70	15-243-70	15-244-70	15-246-70
	silver	15-242-80	15-243-80	15-244-80	15-246-80
for design front plate	white	15-242-01-70	15-243-01-70	15-244-01-70	15-246-01-70
	silver	15-242-01-80	15-243-01-80	15-244-01-80	15-246-01-80
Front handle	white	15-222-70	15-223-70	15-224-70	15-226-70
	silver	15-222-80	15-223-80	15-224-80	15-226-80
for design front plate	white	15-222-01-70	15-223-01-70	15-224-01-70	15-226-01-70
	silver	15-222-01-80	15-223-01-80	15-224-01-80	15-226-01-80

3.2.2 Height Bezels (continued)

19″ bracket	white silver	15-232-70 15-232-80	15-233-70 15-233-80	15-234-70 15-234-80	15-236-70 15-236-80
for design front plate	white silver	15-232-01-70 15-232-01-80	15-233-01-70 15-233-01-80	15-234-01-70 15-234-01-80	15-236-01-70 15-236-01-80
19″ bracket	white silver	15-182-70 15-182-80	15-183-70 15-183-80	15-184-70 15-184-80	15-186-70 15-186-80
for design front plate	white	15-212-70	15-213-70	15-214-70	15-216-70
Rear feet corner set	black	15S090	15S090	15S090	15S090

3.2.3 Depth

- For Stylebox 15 e-motion
- 2.0 mm Aluminium clear passivated
- **Scope of delivery:**
  - 1 Internal side panel
- 2 pieces have to be ordered (for left and right side)

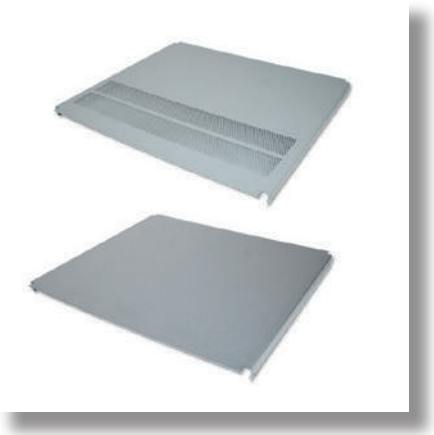


3.2.3 Depth

For Height	245 mm 9.64″	305 mm 12.00″	395 mm 15.55″	500 mm 19.68″
2 U	15-520	15-522	15-524	-
3 U	15-530	15-532	15-534	15-536
4 U left	15-540	15-542	15-544	15-546
4 U right	15-541	15-543	15-545	15-547
6 U	-	15-562	15-564	15-566
7 U	-	15-572	15-574	15-576

3.2.4 Top Covers

- For Stylebox 15 e-motion
- Symmetrical construction: Perforation can be used at front or rear
- 0.75 mm sheet steel powder coated or wet painted, contact area conductive
- **Scope of delivery:**
  - 1 top cover

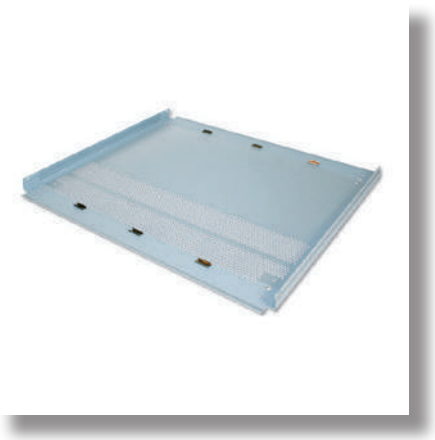


3.2.4 Top Covers

Description	Width	Depth			
		245 mm 9.64″	305 mm 12.00″	395 mm 15.55″	500 mm 19.68″
Solid, white	42 HP	15B201-70	15B202-70	15B203-70	15B204-70
Solid, silver		15B201-80	15B202-80	15B202-80	15B202-80
Perforated, white		15B201-71	15B202-71	15B203-71	15B204-71
Perforated, silver		15B201-81	15B202-81	15B203-81	15B204-81
Solid, white	63 HP	15B206-70	15B207-70	15B208-70	15B209-70
Solid, silver		15B206-80	15B207-80	15B208-80	15B209-80
Perforated, white		15B206-71	15B207-71	15B208-71	15B209-71
Perforated, silver		15B206-81	15B207-81	15B208-81	15B209-81
Solid, white	84 HP	15B210-70	15B212-70	15B213-70	15B214-70
Solid, silver		15B210-80	15B212-80	15B213-80	15B214-80
Perforated, white		15B210-71	15B212-71	15B213-71	15B214-71
Perforated, silver		15B210-81	15B212-81	15B213-81	15B214-81

3.2.5 Bottom Covers

- For Stylebox 15 e-motion
- Symmetrical construction: Perforation can be used at front or rear
- 0.75 mm sheet steel powder coated or wet painted, contact area conductive
- **Scope of delivery:**
  - 1 Bottom cover without mounted feed
- Feet for bottom cover panel see 3.2.5.2



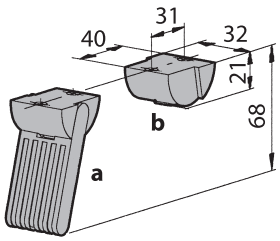
3.2.5.1 Bottom Covers

Description	Width	Depth			
		245 mm 9.64"	305 mm 12.00"	395 mm 15.55"	500 mm 19.68"
Solid, white	42 HP	15B301-70	15B302-70	15B303-70	15B304-70
Solid, silver		15B301-80	15B302-80	15B303-80	15B304-80
Perforated, white		15B301-71	15B302-71	15B303-71	15B304-71
Perforated, silver		15B301-81	15B302-81	15B303-81	15B304-81
Solid, white	63 HP	15B306-70	15B307-70	15B308-70	15B309-70
Solid, silver		15B306-80	15B307-80	15B308-80	15B309-80
Perforated, white		15B306-71	15B307-71	15B308-71	15B309-71
Perforated, silver		15B306-81	15B307-81	15B308-81	15B309-81
Solid, white	84 HP	15B310-70	15B312-70	15B313-70	15B314-70
Solid, silver		15B310-80	15B312-80	15B313-80	15B314-80
Perforated, white		15B310-71	15B312-71	15B313-71	15B314-71
Perforated, silver		15B310-81	15B312-81	15B313-81	15B314-81

3.2.5.2 Case Feet



3.2.5.2 Case Feet Type 15



- With and without tilt feet
- Glass-fiber reinforced plastic, UL94 V-0
- Including screws 3.5 x 8
- Up to 30 kg carring capacity per set
- **Scope of delivery:**
  - 2 + 2 case feet, incl. rubber inserts NBR
  - 8 Torx countersunk PT-screws 3.5 x 8, size T10

Description	Colour	Part-No.
Case feet 2 x **a** + 2 x **b**	Light grey (RAL 7035)	63K524
Case feet 2 x **a** + 2 x **b**	Black (RAL 9005)	63K526
Case feet 2 x **a** + 2 x **b**	Dark grey (special)	63K525

3.2.6 Side Panels

- For Stylebox 15 e-motion
- Outer side, visible surface
- 0.75 mm sheet steel powder coated or wet painted
- **Scope of delivery:**
  - 1 side panel
- 2 pieces have to be ordered (for left and right side)
- Assembly material see below



3.2.6 Side Panels

Description	Depth		Height				
	mm	inch	2 U	3 U	4 U	6 U	7 U
Solid, white	245	9.64	15B601-70	15B606-70	15B610-70	-	-
Solid, silver			15B601-80	15B606-80	15B610-80	-	-
Solid, white for portable desktop			15B657-70	15B661-70	15B665-70	-	-
Solid, silver for portable desktop			15B657-80	15B661-80	15B665-80	-	-
Solid, white	305	12.00	15B602-70	15B607-70	15B612-70	15B622-70	15B627-70
Solid, silver			15B602-80	15B607-80	15B612-80	15B622-80	15B627-80
Solid, white for portable desktop			15B658-70	15B662-70	15B667-70	-	-
Solid, silver for portable desktop			15B658-80	15B662-80	15B667-80	-	-
Solid, white	395	15.55	15B603-70	15B608-70	15B613-70	15B623-70	15B628-70
Solid, silver			15B603-80	15B608-80	15B613-80	15B623-80	15B628-80
Solid, white for portable desktop			15B659-70	15B663-70	15B668-70	-	-
Solid, silver for portable desktop			15B659-80	15B663-80	15B668-80	-	-
Solid, white	500	19.68	-	15B609-70	15B614-70	15B624-70	15B629-70
Solid, silver			-	15B609-80	15B614-80	15B624-80	15B629-80
Solid, white for portable desktop			-	15B664-70	15B669-70	-	-
Solid, silver for portable desktop			-	15B664-80	15B669-80	-	-

Assembly Material

- For 1 side panel

Description	Part-No
4 Torx countersunk screws M3 x 6, T10	63K800

3.2.7 Portable Desktop Handles

- For Stylebox 15 e-motion
- **Scope of delivery:**
  - 2 adapters
  - 2 side parts, black
  - 1 handle extrusion, soft feel
  - Assembly material, Torx



3.2.7 Portable Desktop Handles

Height	42 HP	63 HP	84 HP
2 HP	15S050	15S051	15S052
3/4 HP	15S053	15S054	15S055

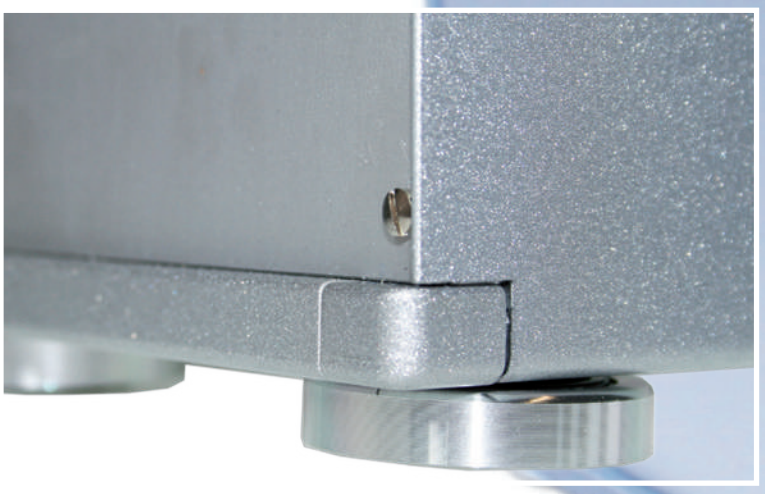
3.2.8 Tower Feet

- For Stylebox 15 e-motion
- Use of Stylebox 15 e-motion as a tower
- Feet mounted direct onto side panel
- Plastic and aluminium
- **Scope of delivery:**
  - 4 round feet, Ø 40 mm
  - 4 round head screws with integrated washer M3 x 8, Torx T10



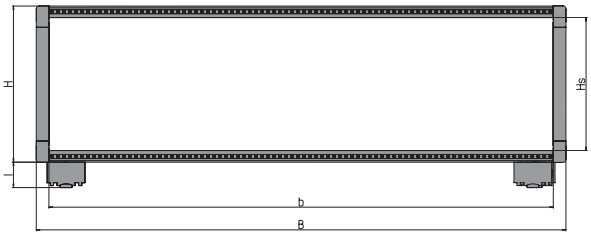
3.2.8 Tower Feet

Description	Part-No.
Set of tower feet	63-880

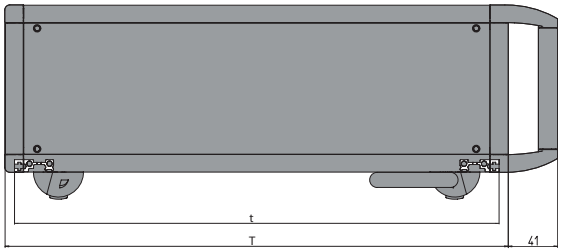


3.2.9 Drawings Stylebox 15 e-motion

Front view



Side view



Heights

U	H		Hs	
	mm	inch	mm	inch
2 U	88.05	3.46	68.05	2.67
3 U	132.50	5.21	112.50	4.42
4 U	176.95	6.96	156.95	6.17
6 U	265.85	10.46	245.85	9.67
7 U	310.3	12.21	290.30	11.43

Widths

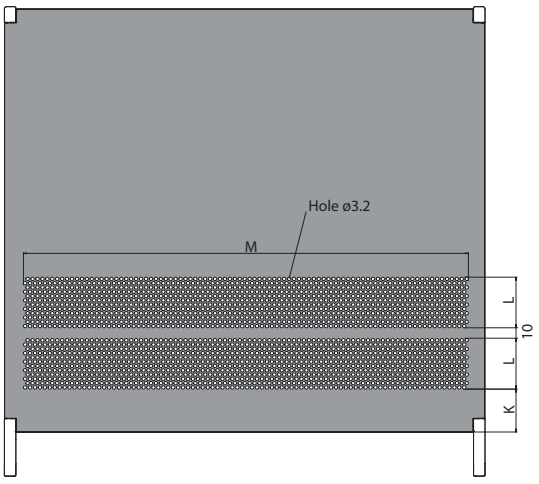
HP	B		b	
	mm	inch	mm	inch
42 HP	235.2	9.25	213.4	8.40
63 HP	341.9	13.46	320.1	12.60
84 HP	448.6	17.66	426.8	16.80

Depths

T		t	
mm	inch	mm	inch
245	9.64	232.6	9.15
305	12.00	292.6	11.51
395	15.55	382.6	15.06
500	19.68	487.6	19.19

Feet / Type	l	
	mm	inch
e-motion	21.5	0.89

Top view



Air Flow Stylebox 15 e-motion

mm

HP	Depth	M		K	L
	mm	mm	mm^2	mm	mm
42 HP	245/305/395/500	208	8680	40	47.2
63 HP	245/305/395/500	323	13510	40	47.2
84 HP	245/305/395/500	415	17370	40	47.2

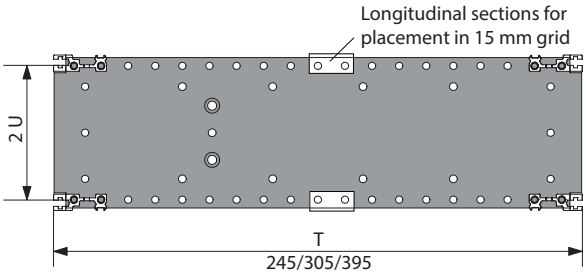
inch

HP	Depth	M		K	L
	inch	inch	sq. inch	inch	inch
42 HP	9.64/12.00/15.55/19.68	8.18	13.46	1.57	1.85
63 HP	9.64/12.00/15.55/19.68	12.71	20.94	1.57	1.85
84 HP	9.64/12.00/15.55/19.68	16.33	26.92	1.57	1.85

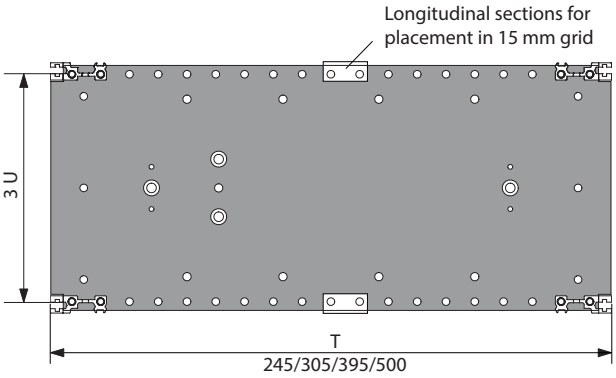
Our ability to adapt existing components to your application, make Elma your preferred solution partner.

Drawings Side Panels

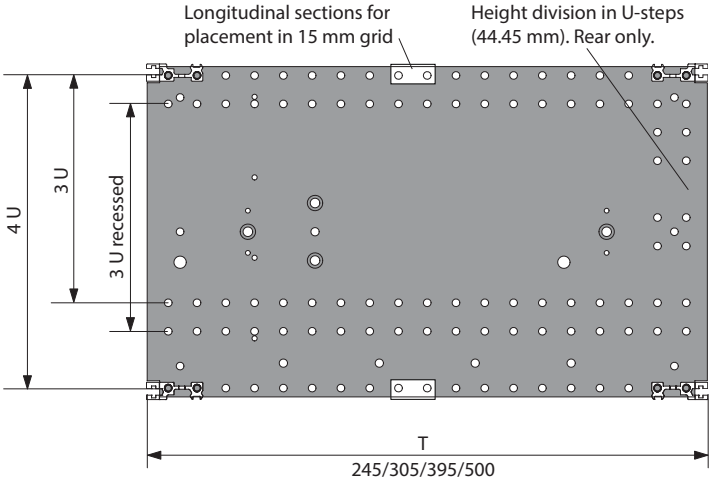
2 U



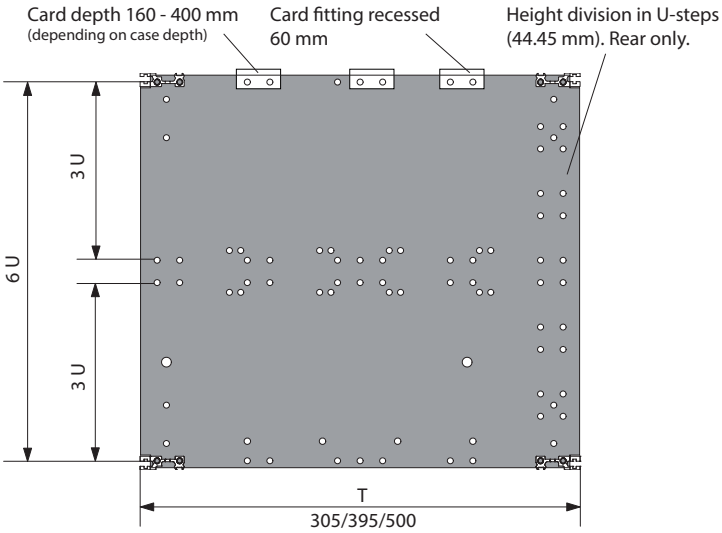
3 U



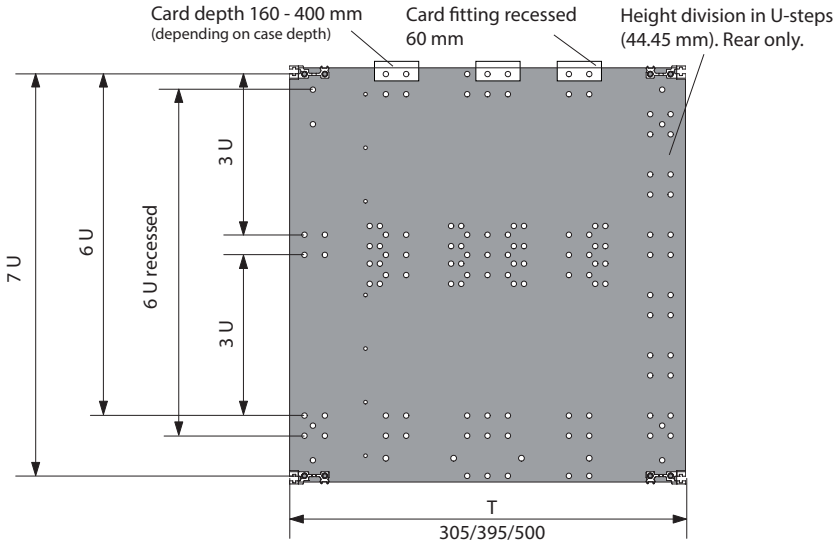
4 U

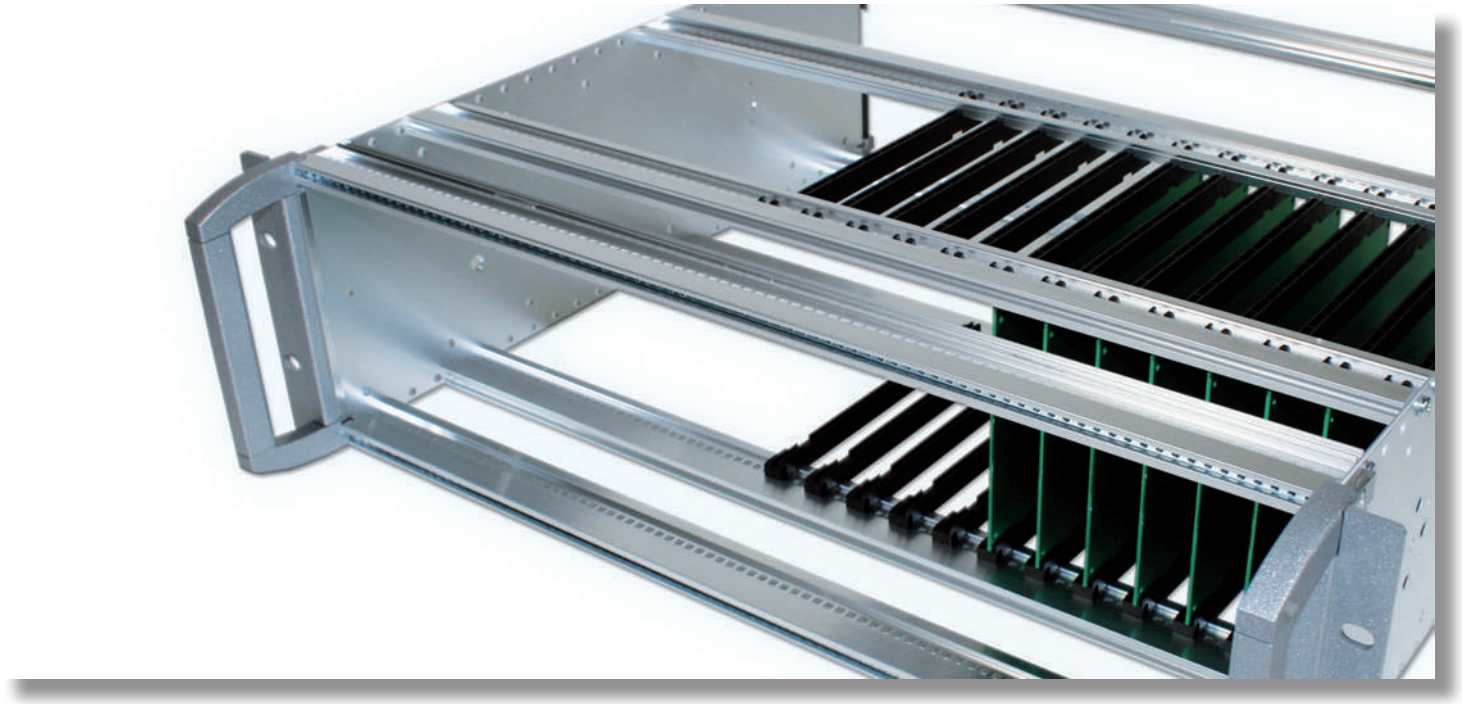


6 U



7 U





3.3 Adaptation Kits

- Adaptation kits are used to subdivide the Stylebox 15 both in its depths and heights
- The adaptation kits for the flush or recess mounted circuit boards or cassettes include the necessary internal extrusions and assembly materials
- Scope of delivery is shown in blue in the following illustrations

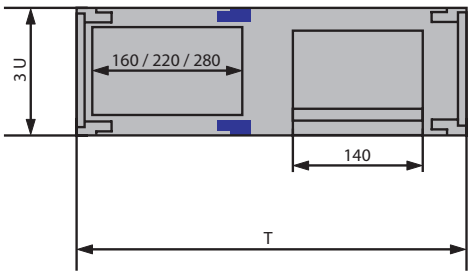
Note:

Information for Adaptation Kits a - e:

15-xxx- [x] for mounting:
6 = Extrusion 66-193, for insulated backplane mounting
7 = Extrusion 66-194, for conductive backplane mounting

3.3.1 Adaptation Kits a

- **Range of Application:**
  - Single eurocard depth 160 – 280 mm
  - Motherboard
  - Modules, cassettes, plug-in units
  - Set for horizontal mounting of single, double triple eurocards, depth 160 – 280mm
  - Crossflow ventilation with 3 U fan module
  - Drive mechanism receptacles $3^1/_2$"/$5^1/_4$"



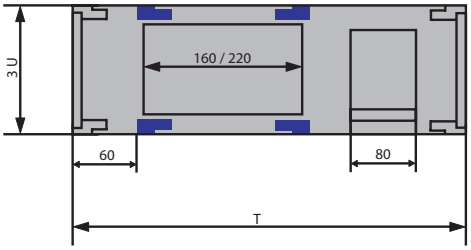
3.3.1 Adaptation Kits a

- **Scope of delivery:**
  - 2 internal extrusions
  - 2 insulating strips (-6 only)
  - 2 tapped strips M2.5
  - 1 set assembly material, Torx

Description	42 HP	63 HP	84 HP
Flush front-mounting of single eurocards	15K041-6	15K031-6	15K011-6
	15K041-7	15K031-7	15K011-7

3.3.2 Adaptation Kits b

- **Range of Application:**
  - Recessed single eurocards, depth 160 – 220 mm
  - Without individual front panels
  - Motherboard



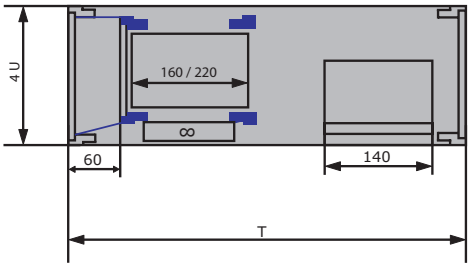
3.3.2 Adaptation Kits b

- **Scope of delivery:**
  - 4 internal extrusions
  - 2 insulating strips (-6 only)
  - 2 tapped strips M2.5
  - 1 set assembly material, Torx

Description	42 HP	63 HP	84 HP
Recessed mounting of single eurocards without front panels	15K042-6	15K032-6	15K012-6
	15K042-7	15K032-7	15K012-7

3.3.3 Adaptation Kits c

- Reduction Kit $^{1}/_{3}$ U + $^{2}/_{3}$ U for 60 mm recessed mounting
- **Range of Application:**
  - Recessed mounting of single eurocards, depth 160 – 220 mm
  - With or without individual front panels
  - Max. fan height 26 mm
  - Motherboard
  - Modules, cassettes, plug-in units
  - Drive mechanism receptacles $5^{1}/_{4}$"



3.3.3.1 Adaptation Kits c

- **Scope of delivery:**
  - 2 internal extrusions
  - 2 front extrusions 66-111 (IEC) or 66-677 (IEEE)
  - 2 insulating strips (-6 only)
  - 1 auxiliary cover top
  - 1 auxiliary cover bottom
  - 4 tapped strips M2.5
  - 1 set assembly material, Torx

Description	HP	Part-No.	
		IEC	IEEE
Adaptation kit reduction, solid, without fan panel	84 HP	15K050-6	15K060-6
		15K050-7	15K060-7
Adaptation kit reduction, perforated*, without fan panel		15K051-6	15K061-6
		15K051-7	15K061-7
Adaptation kit reduction, perforated*, with fan panel		15K052-6	15K062-6
		15K052-7	15K062-7

*only bottom part ($^{2}/_{3}$ U) is perforated

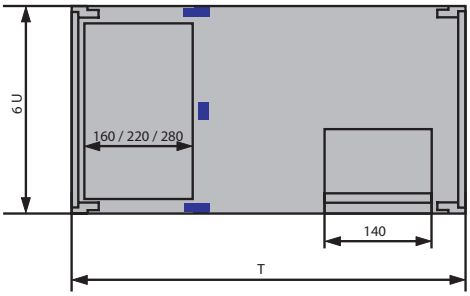
3.3.3.2 Additional Fan Plate

- For easy access and maintenance of the fans
- **Scope of delivery:**
  - 1 fan plate
  - 8 milled edge screws M3 x 5, Torx T10

Description	Part-No.
Additional fan plate incl. 1 set assembly material	12K737

3.3.4 Adaptation Kits d

- **Range of Application:**
  - Double eurocards, depth 160 – 280 mm
  - Motherboard
  - Modules, cassettes, plug-in units
  - Drive mechanism receptacles $3^1/_2$" / $5^1/_4$"



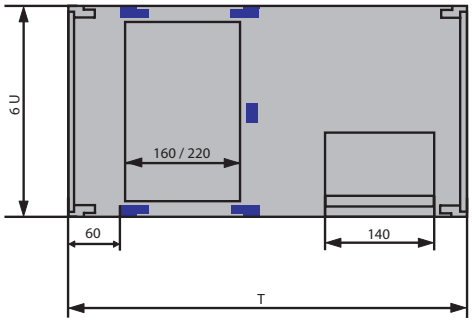
3.3.4 Adaptation Kits d

- **Scope of delivery:**
  - 2 internal extrusions
  - 1 centre extrusion
  - 4 insulating strips
  - 4 tapped strips M2.5
  - 2 sets assembly material, Torx

Description	42 HP	63 HP	84 HP
Flush front-mounting of double eurocards	15K044-6	15K034-6	15K014-6

3.3.5 Adaptation Kits e

- **Range of Application:**
  - Recessed mounting of double eurocards, depth 160 – 220 mm
  - Without individual front panels
  - Motherboard



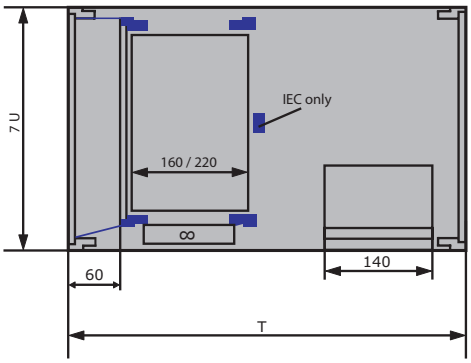
3.3.5 Adaptation Kits e

- **Scope of delivery:**
  - 4 internal extrusions
  - 1 centre extrusion
  - 4 insulating strips
  - 4 tapped strips
  - 2 set assembly material, Torx

Description	42 HP	63 HP	84 HP
Recessed mounting of double eurocards without front panels	15K045-6	15K035-6	15K015-6

3.3.6 Adaptation Kits f

- Reduction Kit $^1/_3$ U + $^2/_3$ U for 60 mm recessed mounting
- **Range of Application:**
  - Recessed mounting of double eurocards, depth 160 – 220 mm
  - With or without individual front panels
  - Max. fan height 26 mm
  - Motherboard
  - Modules, cassettes, plug-in units
  - Drive mechanism receptacles $5^1/_4$"



3.3.6.1 Adaptation Kits c

- **Scope of delivery:**
  - 2 internal extrusions
  - 2 front extrusions 66-111 (IEC) or 66-677 (IEEE)
  - 2 insulating strips (-6 and IEEE only, if -6 and IEC 4 strips)
  - 1 centre extrusion (IEC only)
  - 1 auxiliary cover top
  - 1 auxiliary cover bottom
  - 4 tapped strips M2.5 (6 pcs. for IEC)
  - 1 set assembly material, Torx

Description	HP	Part-No.	
		IEC	IEEE
Adaptation kit reduction, solid, without fan panel	84 HP	15K053-6	15K060-6
		15K053-7	15K060-7
Adaptation kit reduction, perforated*, without fan panel		15K054-6	15K061-6
		15K054-7	15K061-7
Adaptation kit reduction, perforated*, with fan panel		15K055-6	15K062-6
		15K055-7	15K062-7

*only bottom part ($^2/_3$ U) is perforated

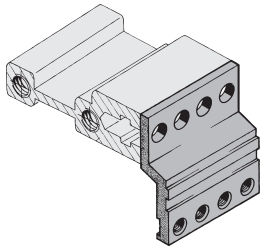
3.3.6.2 Additional Fan Plate

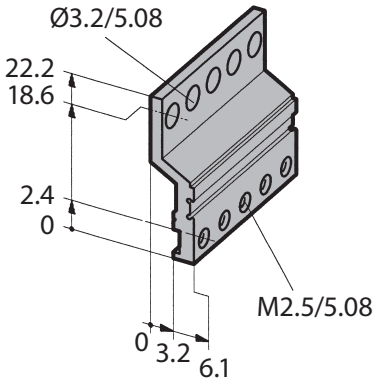
- For easy access and maintenance of the fans
- **Scope of delivery:**
  - 1 fan plate
  - 8 milled edge screws M3 x 5, Torx T10

Description	Part-No.
Additional fan plate incl. 1 set assembly material	12K737

3.3.7 Edge Connector Extrusion

- For use with extrusions for backplanes 66-193
- **Scope of delivery:**
  - 1 aluminium extrusion, clear passivated (conductive)



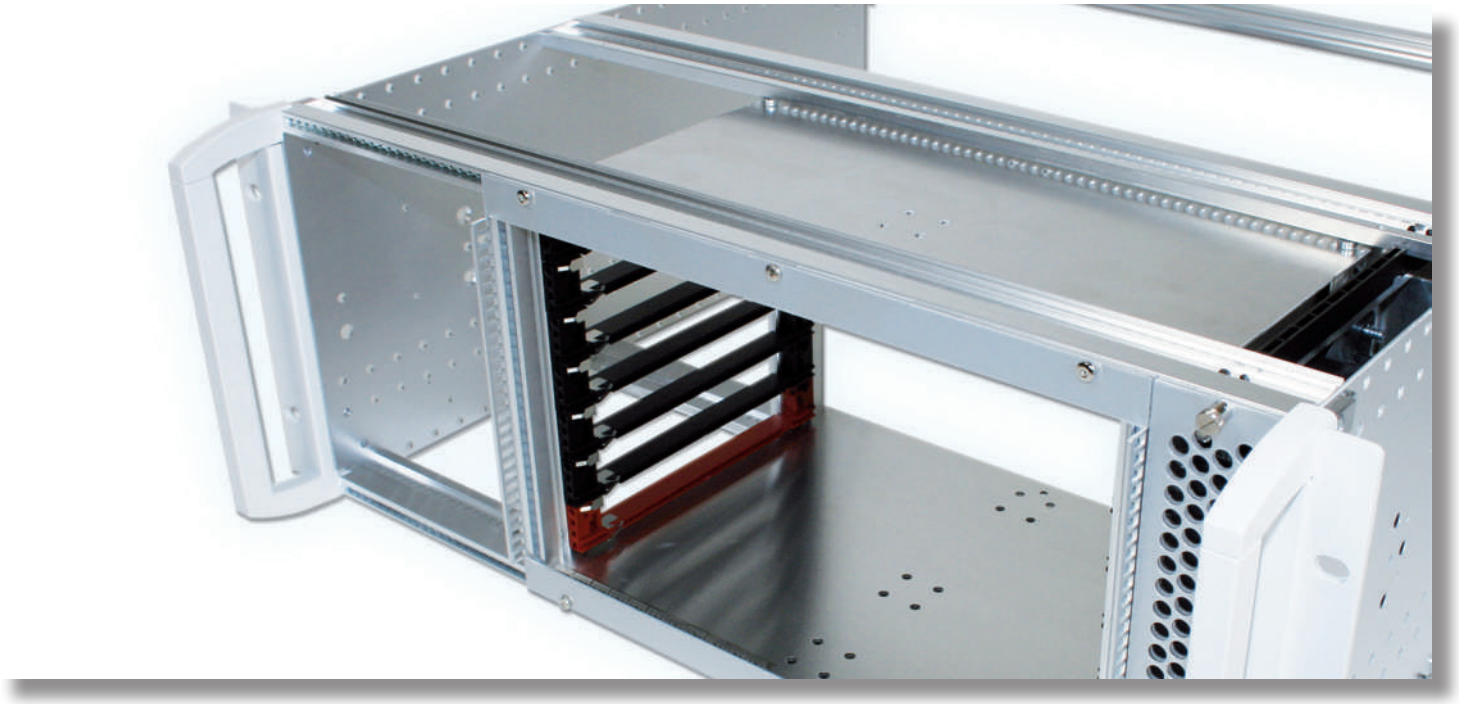


3.3.7 Edge Connector Extrusion

Length			Part-No.	
for HP	mm	inch	clear passivated	raw
8	40.6	1.59	66-147-40	
18	91.4	3.59	66-147-41	
28	142.2	5.60	66-147-42	
42	213.4	8.40	66-147-63	
63	320.0	12.60	66-147-65	
81	411.5	16.20	66-147-22	
84	426.7	16.80	66-147-52	
	1350.0	53.14		66-147-19

Assembly Material

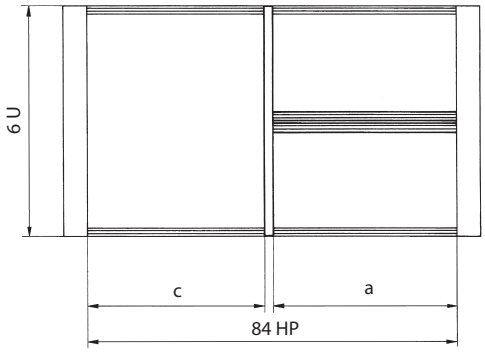
Description	Part-No.
Assembly material M2.5 (for 2 supplementary extrusions)	63-214



3.4 Assembly Accessories

3.4.1 Front Sub Division Vertical for 6 U System or 6 U Assembly

- **Scope of delivery:**
  - 1 divider extrusion front
  - 1 divider extrusion rear
  - 2 front extrusions
  - 2 internal extrusions
  - Assembly material
    (16 cylinderhead screws M4 x 10, Torx T20
    (4 cylinderhead screws M3 x 12, Torx T10)
- Tapped strips for front extrusions see below





3.4.1 Front Sub Division Vertical for 6 U System or 6 U Assembly

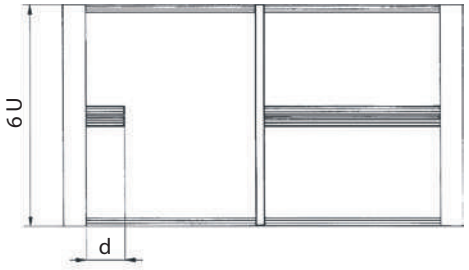
Nominal width 6 U (c)	Nominal width 2 x 3 U (a)	Part-No. IEC60297	Part-No. IEEE1101.10
50 HP	32 HP	12K959-2	12K959-3
40 HP	42 HP	12K949-2	12K949-3

Tapped Strips for Front Extrusions

Scope of delivery	Description	Part-No.
1 pc. tapped strip	M2,5 32 HP = 162.56 mm	61-463
1 pc. tapped strip	M2,5 42 HP = 213.36 mm	61-464

3.4.2 EMC Front Sub Divisions Vertical Small

- For dividing 6 U-systems
- Direct mounting onto the height extrusion and side panel
- For width of 4 HP and 8 HP
- Other sizes available upon request
- **Scope of delivery:**
  - 2 divider extrusions front
  - 2 divider extrusions rear
  - 2 tapped strips M2.5
  - 8 cylinder head screws M4 x 10
  - 4 slotted countersunk screws M4 x 10
  - 2 set screws for fixing of tapped strips M2.5 x 8
  - 2 card guides 160mm (4 pcs. for 8 HP version)



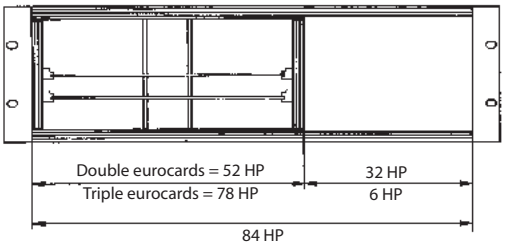


3.4.2 EMC Front Sub Divisions Vertical Small

Description	Part-No. d = 4 HP	Part-No. d = 8 HP
Front sub division vertical small IEEE	80-504-11	80-508-11
Front sub division vertical small IEC	80-204-11	80-208-11

3.4.3 Horizontal Card Mounting Kits for Double Eurocards (6 U)

- For double eurocards (6 U)
- Independent of card depth
- The horizontal card mounting kit can be fitted recessed within the Stylebox 15 by using two additional extrusions
- **Scope of delivery:**
  - 4 distance plates (2 front / 2 rear)
  - 4 length extrusions (2 front / 2 rear)
  - 1 centre extrusion
  - 6 tapped strips M2.5
  - 1 set assembly material
- Top and bottom cover plate when no overall fan front panel (1.4.3.2) is used
- Top and bottom cover plate has to be ordered separately
- Fan front panels for horizontal mounting kits see 1.4.3.2
- Card guides see 1.5.1
- Front panels see 1.6





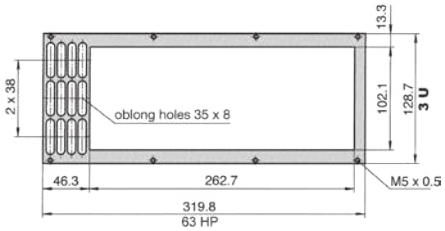
3.4.3.1 Horizontal Card Mounting Kits

Mounting height	Usable height	Backplane	Cover plate top*	Cover plate bottom*
3 U	20 HP	14K971-60	21N602-90	21N602-90
4 U	28 HP	14K981-60	21N602-90	21N603-90
6 U	48 HP	14K991-60	21N606-90	21N607-90

* Assembly material for cover plate see 1.4.3.2

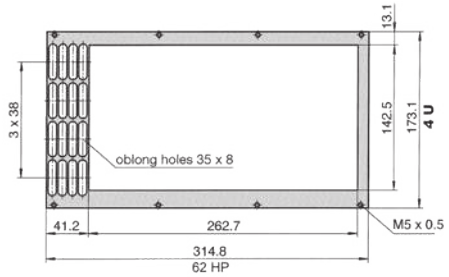
3.4.3.2 Fan Front Panels for Horizontal Mounting Kits

- For horizontal mounting of double eurocards
- Aluminium 2.5 mm, clear anodised (non-conductive)
- **Scope of delivery:**
  - 1 perforated fan front panel
- Front panel screw see below
- On-off switch see below

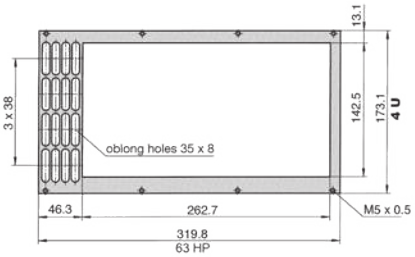


3.4.3.2 Fan Front Panels for Horizontal Mounting Kits

	Height	Width	Air passage		Part-No.
			mm²	sq. in.	
Without switch opening	3 U	63 HP	3195	4.95	21N363-07
With switch opening	3 U	63 HP	2662	4.12	21N363-02



	Height	Width	Air passage		Part-No.
			mm²	sq. in.	
Without switch opening	4 U	62 HP	4260	6.60	21N462-01
With switch opening	4 U	62 HP	3727	5.77	21N462-02



	Height	Width	Air passage		Part-No.
			mm²	sq. in.	
Without switch opening	4 U	63 HP	4260	6.60	21N463-07
With switch opening	4 U	63 HP	3727	5.77	21N463-02

Front Panel Screws

- Set of 10 screws
- With treaded or press-fit bush
- 8 screws are necessary per front panel

Description	Part-No. 10 pcs.
Recessed round head screw, M2.5 x 11.3 with threaded bush M5 x0.5	63-129
Recessed round head screw, M2.5 x 11.3 with press-fit bush Ø3.7	63-444



On-Off Switches

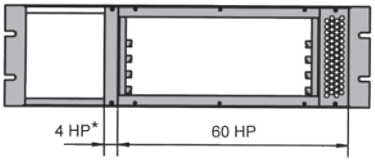
- Black body, plastic
- 2 pole (only on-off switches)
- 250V, 16A
- Quick-connect terminal 6.3 x 0.8 mm
- Cut-out for 69-410-05: 13 x 20 mm (0.51" x 0.78")
- Cut-out for others: 12.3 x 27.2 mm (0.48 "x1.07")

Description	Part-No.
On-off switch, indicator light green	69-410-04
On-off switch, indicator light green (for fan front panel 3 U)	69-410-05
On-off switch, without signal light	69-410-09
Single pole switch with momentary function	69-410-10

3.4.4 EMC Horizontal Card Mounting Kit for Double Eurocards (6 U)

- For 160 mm card depth
- For backplane mounting with insulating strips
- **Scope of delivery:**
  - 1 connector plate
  - 2 +14 card guides
  - 2 cover plates
  - 2 endplates
  - 2 front extrusions
  - 2 internal extrusions
  - 4 insulating strips
  - 1 fan tray incl. fan
  - 4 tapped strips M2.5
  - 1 set of assembly material
  - 1 set of EMC gaskets
  - 14 ESD Clips and 14 ESD springs (IEEE Version only)

! Fan module has to be on the right side of the horizontal card mounting kit



*This space is necessary for the air flow.
Assemble blind panel or monitoring module

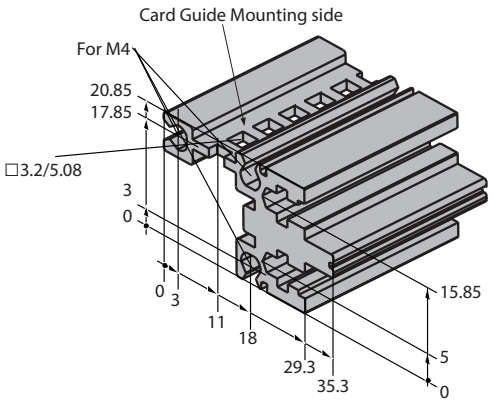


3.4.4 EMC Horizontal Card Mounting Kit for Double Eurocards (6 U)

U	Nominal Height	Part-No.	
		IEEE	IEC
4	28 HP	14K987-60	14K986-60

3.4.5 EMC Front Sub Division

3.4.5.1 EMC Front Sub Division Horizontal IEC for Card Guides



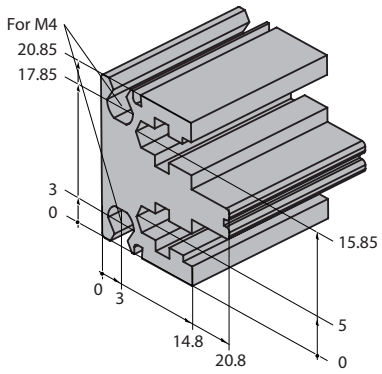
- For sub division of front or rear
- Card guides can be applied
- Superior EMC-level
- Only one special extrusion needed
- Easy and quick assembly
- Cost effective solution
- Delivered in kit form
- Usable width: 84 HP
- Other sizes available on request
- **Scope of delivery:**
  - 1 front double extrusion IEC-Special clear passivated
  - 2 tapped strips M2.5
  - 4 Torx cylinder head screws M4 x 10 (T20)
- For HF spring see below
- For EMC contact strips see below



3.4.5.1 EMC Front Sub Division Horizontal IEC

Description	Part-No.
EMC front sub division horizontal IEC for card guides	63K837-24

3.4.5.2 EMC Front Sub Division Horizontal IEC



- For sub division of front or rear
- Without possibility of using card guides
- Superior EMC-level
- Only one special extrusion needed
- Easy and quick assembly
- Cost effective solution
- Delivered in kit form
- Usable width: 84 HP
- Other sizes available on request
- **Scope of delivery:**
  - 1 front double extrusion IEC-Special clear passivated
  - 2 tapped strips M2.5
  - 4 Torx cylinder head screws M4 x 10 (T20)
- For HF spring see below
- For EMC contact strips see below

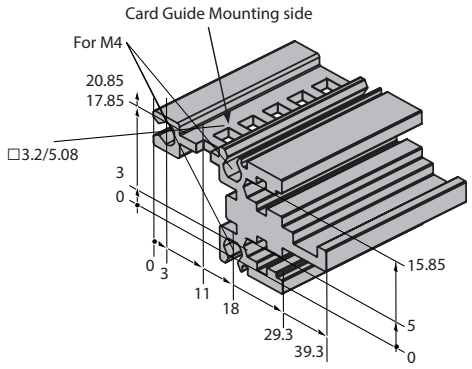


3.4.5.2 EMC Front Sub Division Horizontal IEC

Description	Part-No.
EMC front sub division horizontal IEC	63K837-22

3.4.5.3 EMC Front Sub Division Horizontal IEEE for card guides

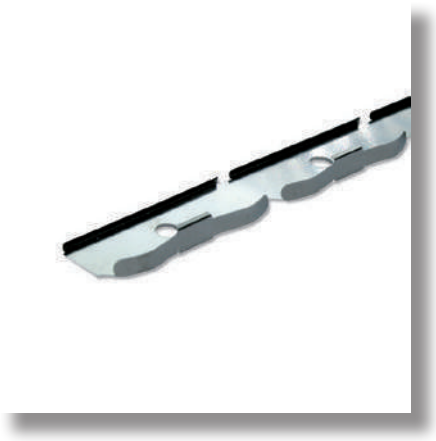
- Superior EMC-level
- Only one special extrusion needed
- Card guides can be applied
- Easy and quick assembly
- Cost effective solution
- Usable width: 84 HP
- Other sizes available on request
- **Scope of delivery:**
  - 1 front double extrusion IEEE-Special clear passivated
  - 2 tapped strips M2.5
  - 4 Torx cylinder head screws M4 x 10 (T20)
- For HF spring see below
- For EMC contact strips see below





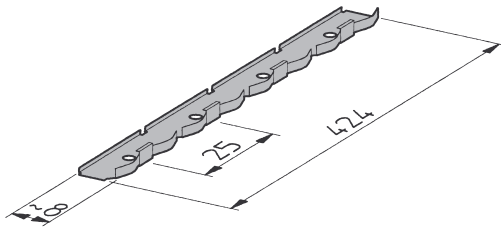
3.4.5.3 EMC Front Sub Division Horizontal IEEE

Description	Part-No.
EMC front sub division horizontal IEEE	63K837-23



HF Spring

- Stainless steel
- Snapped-in on the extrusion
- **Scope of delivery:**
  - 2 HF spring 84 HP

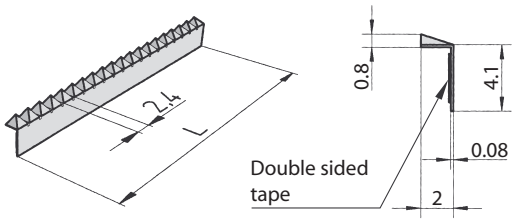


Description	Part-No.
1 set of 2 HF spring 84 HP	7739-14-4



EMC Contact Strip

- BeCu galvanized
- For front panels, fixing on extrusion
- Self-adhesive
- **Scope of delivery:**
  - 2 EMC contact strips



For HP	Length		Part-No.
	mm	inch	
84	424.2	16.70	63-836-70

3.4.6 Mounting Chassis

3.4.6.1 Mounting Chassis Full Depth of Stylebox 15 e-motion

- For mounting non-standard modules and components
- Mounting chassis is fixed directly on the side panels
- Aluminium 2.0 mm, raw
- **Scope of delivery:**
  - 1 mounting chassis
- Assembly material see below
- Mounting chassis depth < 230 mm can be mounted with 4 screws (> 230 mm with 6 screws)



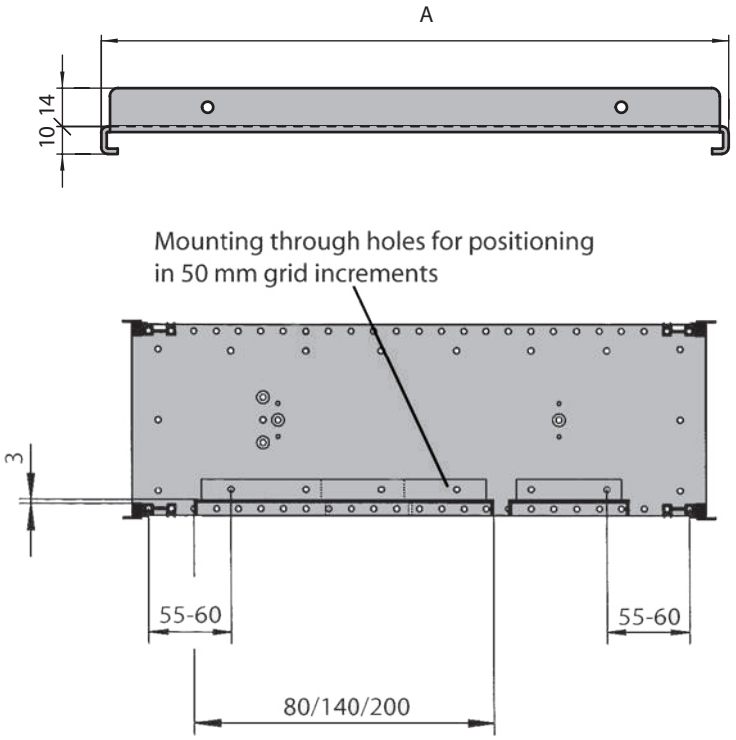
3.4.6.1 Mounting Chassis Full Depth of Stylebox 15 Standard and e-motion

Case Depth		Chassis Depth A		Part-No.		
mm	inch	mm	inch	**42 HP**	**63 HP**	**84 HP**
245	9.64	168	6.61	14M028	14M029	14M030
305	12.00	228	8.97	14M031	14M032	14M033
395	15.55	318	12.52	-	14M034	14M035
500	19.68	428	16.65	-	-	14M036

Assembly Material

- For one mounting chassis
- **Scope of delivery:**
  - 4 Torx cylinder head screw M4 x 6, size T20
  - 4 earthing nut M4

Description	Part-No.
Assembly material for mounting chassis with Torx-Screws	63K861





3.4.6.2 Mounting Chassis Small for Mounting of Power Supplies, etc.

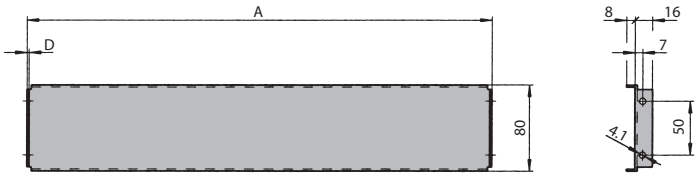
Chassis depth 80 mm

Case Width	A		D		Part-No.
	mm	inch	mm	inch	
84 HP	431.5	16.98	2	0.08	14-832

Assembly Material

- For one mounting chassis
- **Scope of delivery:**
  - 4 Torx cylinder head screw M4 x 6, size T20
  - 4 earthing nut M4

Description	Part-No.
Assembly material for mounting chassis with Torx-Screws	63K861



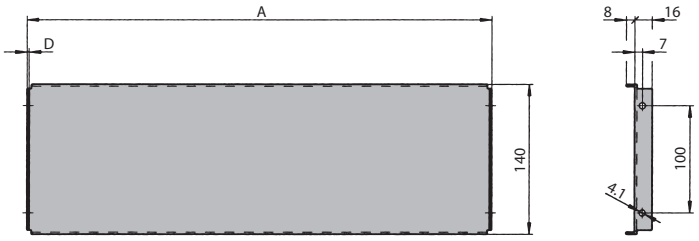
Chassis depth 140 mm

Case Width	A		D		Part-No.
	mm	inch	mm	inch	
42 HP	218.2	8.59	1.5	0.06	14-833
63 HP	324.9	12.79	1.5	0.06	14-834
84 HP	431.5	16.98	2.0	0.08	14-836

Assembly Material

- For one mounting chassis
- **Scope of delivery:**
  - 4 Torx cylinder head screw M4 x 6, size T20
  - 4 earthing nut M4

Description	Part-No.
Assembly material for mounting chassis with Torx-Screws	63K861



3.4.6.3 Mounting Chassis for Horizontal Mounting of Eurocards

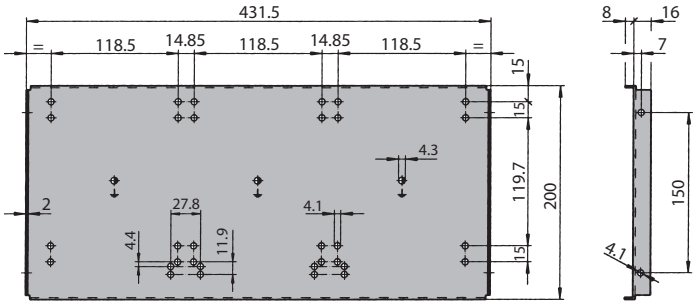
- Chassis depth 200 mm
- The hole pattern allows single, double and triple eurocards to be mounted

Case Width	Part-No.
84 HP	14-840

Assembly Material

- For one mounting chassis
- **Scope of delivery:**
  - 4 Torx cylinder head screw M4 x 6, size T20
  - 4 earthing nut M4

Description	Part-No.
Assembly material for mounting chassis with Torx-Screws	63K861



Mounting Set for One Eurocard

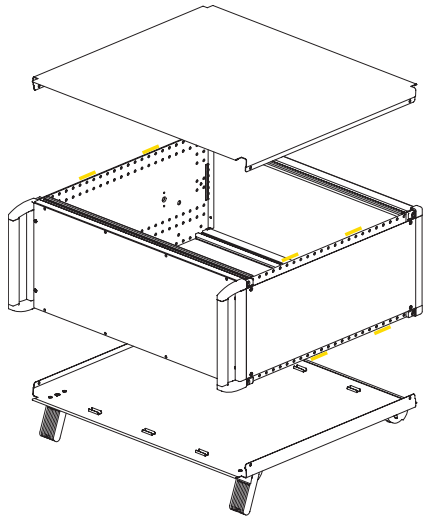
- **Scope of delivery:**
  - 2 Front extrusions
  - 2 Internal extrusions
  - Card guides (2 - 6 pcs.)
  - 2 Tapped strips
  - Assembly Material

Extrusion Length		Part-No.
4.5 HP	IEC	80-204-11
8.5 HP	IEC	80-208-11
12.5 HP	IEC	80-212-11
4.5 HP	IEEE	80-504-11
8.5 HP	IEEE	80-508-11

3.4.7 EMC Shielding

3.4.7.1 Gaskets for Advanced EMC level (Stylebox 15 e-motion)

- Vertical gaskets for cover plates (partial)
- To achive an advanced EMC level with Stylebox 15 e-motion
- No additional gaskets for width necessary
- Drawing shows the position of the gaskets

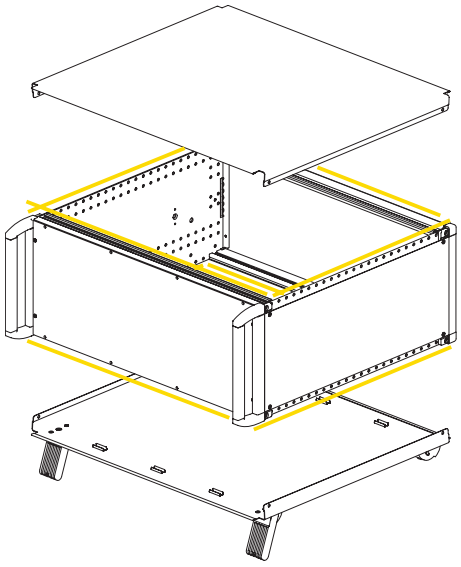


Depth Gaskets for Covers

Case Depth		Scope of Delivery	Part-No.
mm	inch		
245	9.64	4 self-adhesive HF gaskets L = 30 mm	63-836-07
305	12.00	4 self-adhesive HF gaskets L = 30 mm	63-836-07
395	15.55	8 self-adhesive HF gaskets L = 30 mm	63-836-08
500	19.68	12 self-adhesive HF gaskets L = 30 mm	63-836-09

3.4.7.2 Gaskets for Superior EMC level (Stylebox 15 e-motion)

- Vertical and horizontal gaskets for cover plates (overall)
- To achive superior EMC level with Stylebox 15 e-motion
- Order 1 set each for width and depth
- Drawing shows the position of the gaskets



Width Gaskets for Covers

Width	Scope of Delivery	Part-No.
42 HP	4 self-adhesive HF gaskets L = 216.5 mm	63-836-20
63 HP	4 self-adhesive HF gaskets L = 323 mm	63-836-21
84 HP	4 self-adhesive HF gaskets L = 430 mm	63-836-23

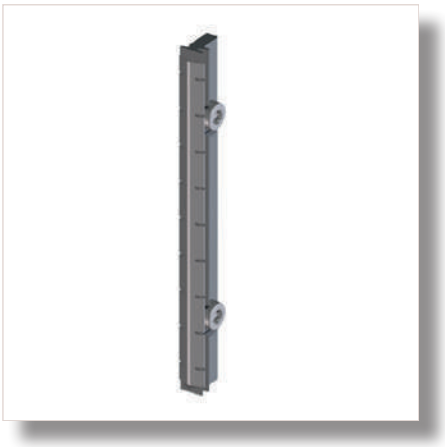
Depth Gaskets for Covers

Depth		Scope of Delivery	Part-No.
mm	inch		
245	9.64	4 self-adhesive HF gaskets L = 195 mm	63-836-10
305	12.00	4 self-adhesive HF gaskets L = 255 mm	63-836-11
395	15.55	4 self-adhesive HF gaskets L = 345 mm	63K836-04
500	19.68	4 self-adhesive HF gaskets L = 445 mm	63K836-05

3.4.7.3 Design front panel

- For front panels, pushing on side panel
- Aluminium, clear passivated
- For additional increase of EMC to advanced level

- **Scope of delivery**
  - 2 EMC front extrusion
  - 2 EMC springs 81-062-xx
  - Assembly material (2 screws Torx T8, adhesive foil)



3.4.7.3 EMC Extrusions Front

System Height	Part-No.
2 U	63-824-62
3 U	63-824-63
4 U	63-824-64
6 U	63-824-66
7 U	63-824-67

3.4.7.6 EMC Contact Strips (Advanced EMC-level)

- For front panels, fixing on extrusion
- Self-adhesive
- **Scope of delivery**
  - 2 contact strips



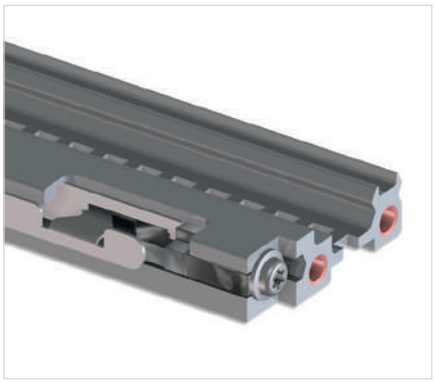
3.4.7.6 EMC Contact Strips

For HP	Length	Part-No.
42	212.1 mm	63-836-67
63	318.1 mm	63-836-68
84	424.2 mm	63-836-70



3.6.2.5 EMC design front panel

- Aluminium 2.5 mm (conductive)
- Closes the front and rear side of the chassis with big shielding effect
- Contact between flat front panel and chassis is made with an EMC gasket



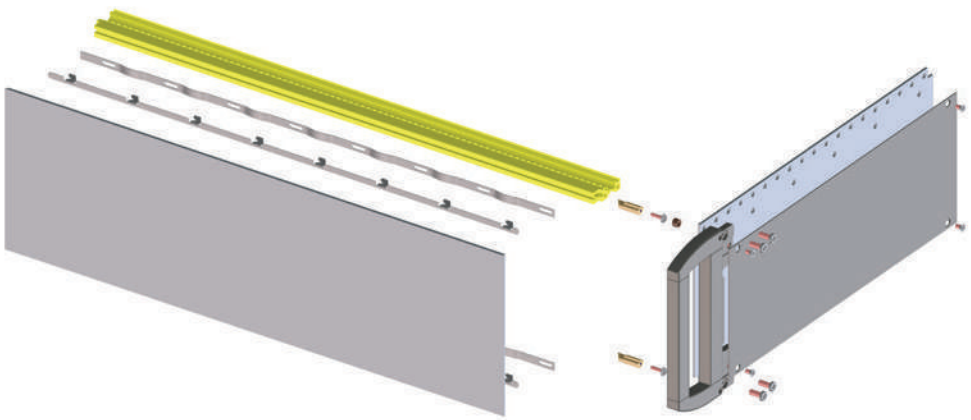
3.6.2.5 EMC design front panel

Scope of delivery:

- 1 EMC design front panel
- 2 Plate slider
- 2 Holder
- 2 Locking device
- 2 Filister head screw M2.5 x 40

Width	Part-No. 2 HE	Part-No. 3 HE	Part-No. 4 HE	Part-No. 6 HE	Part-No. 7 HE
42 TE	24B242	24B342	24B442	24B642	24B742
63 TE	24B263	24B363	24B463	24B663	24B763
84 TE	24B284	24B384	24B484	24B684	24B784

Configuration closing device

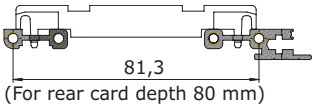




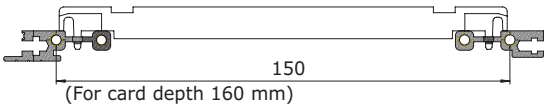
3.5 General Accessories

3.5.1 Card Guides IEC

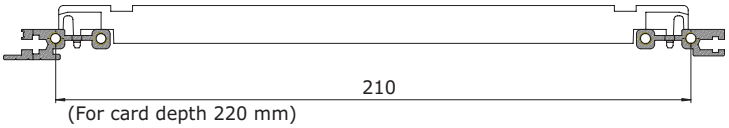
- For positive location of PCBs and plug-in units conforming to the dimensions of card depths of 80 mm, 160 mm, 220 mm and 280 mm
- The card guides are non-flammable, made from a high quality plastic material reinforced with fibreglass
- Including ESD provisions



(For rear card depth 80 mm)



(For card depth 160 mm)



(For card depth 220 mm)



3.5.1.1 Card Guides 1-Slot, IEC

- **Scope of delivery:**
  - Card guide black plastic UL94 V-0
- ESD Clip see below (not usable for card depth 80 mm)

Card Thickness		Card Depth		Part-No. 1 pc.
mm	inch	mm	inch	
1.6	0.06	80	3.15	61-019
		160	6.30	61-044
		220	8.66	61-039
		280	11.02	61-017
2.0	0.08	160	6.30	61-087
		220	8.66	61-039
		280	11.02	61-017



ESD Clips

- Connecting PCB with case
- Stainless steel

Description	Part-No. 1 pc.
ESD clip front bottom/rear top	61-419-01
ESD clip front top/rear bottom	61-419-02



3.5.1.2 Card Guide 7-Slot in 4 HP Steps , IEC

- For reduced assembly time of multiple slot applications
- For use with single, double and triple eurocards with a depth of 160 mm
- For card thickness: 1.6 mm / 0.06”
- Black plastic, UL94 V-0
- ESD Clip not usable

Card Thickness		Card Depth		Part-No. 1 pc.
mm	inch	mm	inch	
1.6	0.06	160	6.30	61-076



3.5.1.3 Aluminium Card Guide 1-Slot, 3 Parts, IEC

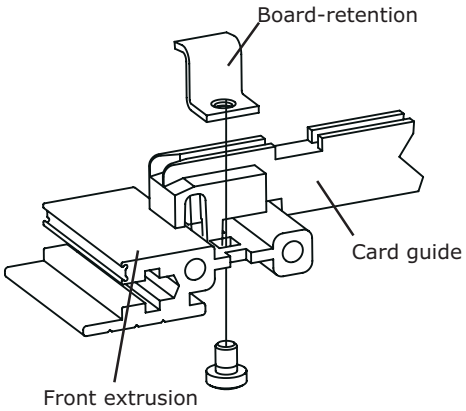
- Extrusion: Aluminium
- End feet: plastic, UL94 V-0
- For card thickness: 1.6 mm / 0.06"
- Card guide extrusion, aluminium, clear anodised
- ESD clip not usable

Extrusion

Card Depth		Length		Part-No. Aluminium
mm	inch	mm	inch	
160	6.30	112.5	4.43	66-122-20
220	8.66	172.5	6.79	66-122-21
280	11.02	232.5	9.15	66-122-22
340	13.38	292.5	11.51	66-122-23
400	15.74	352.5	13.87	66-122-24
-	-	1350	53.15	66-122-14

End Feet

Description	Part-No. 1 Pair
End feet plastic, UL94 V-0	61-069

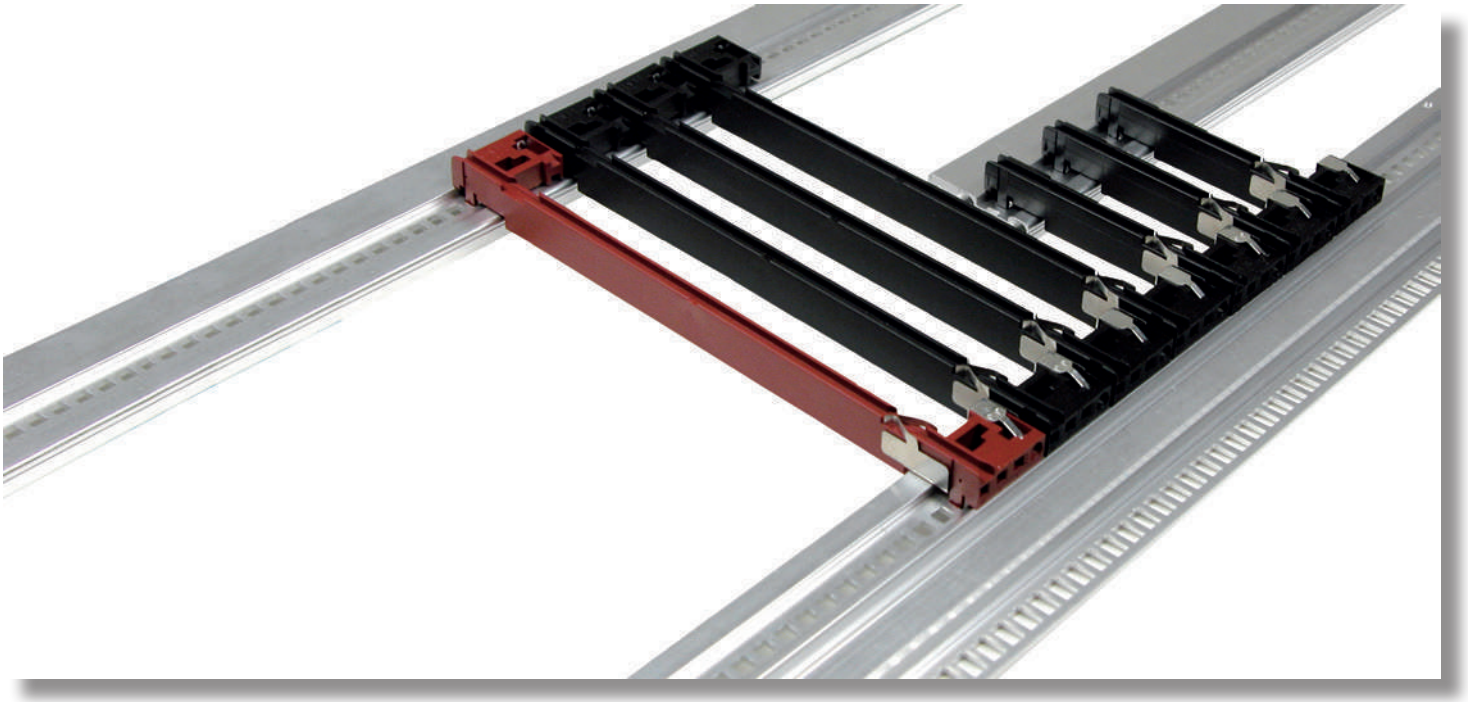


3.5.1.4 Card Guide Board-Retention Bar

Description	Part-No. 20 pcs.
Board-retention bar, zinc-plated steel	61-291

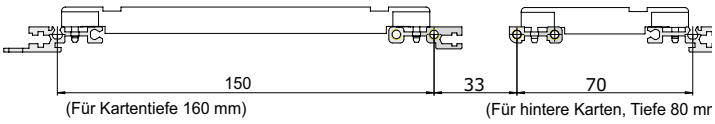
Assembly Material

Description	Part-No. 1 pc.
Cross recessed round head screw M3 x 4 (100 pcs.)	5331-04
Torx cylinder head screw M3 x 4, size T10 (1 pc.)	5470-01



3.5.2 Card Guides acc. to IEEE

- For positive location of PCBs and plug-in units conforming to the dimensions of card depths 80 mm, 160 mm, 220 mm, 280 mm and 340 mm
- The card guides are non-flammable, made from a highquality plastic material reinforced with fibreglass
- With ESD provisions
- With keying and alignment pin possibilities





3.5.2.1 Card Guides 1-Slot, IEEE

- Card thickness 1.6 mm / 0.06" and 2.0 mm / 0.08"
- Plastic UL94 V-0

Card Depth mm	Card Depth inch	Colour	Part-No. 1 Pair
80	3.15	black	61-949-01

Card Depth mm	Card Depth inch	Colour	Part-No. 1 pc.
160	6.30	black	61-950-01
160	6.30	red	61-950-03

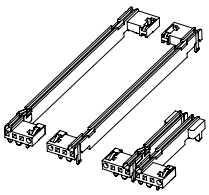


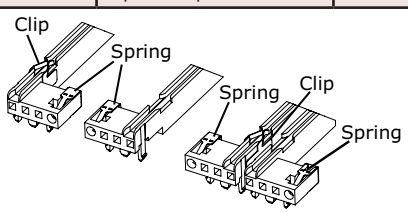
3.5.2.2 Card Guides 1-Slot, incl. mounted ESD-Components, IEEE

- Bottom: 1 ESD clip and 1 ESD spring
- Top: 1 ESD spring
- Black plastic UL94 V-0

Card Depth mm	Card Depth inch	Description	Part-No. 5 Pairs
80	3.15	1 pair top/bottom	61-949-02

Card Depth mm	Card Depth inch	Description	Part-No. 1 pc.
160	6.30	1 piece bottom	61-950-02
160	6.30	1 piece top	61-950-04







3.5.2.3 Aluminium Card Guides 1-Slot, 3 Parts, IEEE

- Extrusion: Aluminium
- End feet: Plastic UL94 V-0
- For card thickness 1.6 mm / 0.06" and 2.0 mm / 0.08"

Extrusion

Card Depth		Part-No. 1 pc.
mm	inch	
160	6.30	66-452-20
220	8.66	66-452-25
280	11.02	66-452-30
340	13.38	66-452-35

End Feet

Colour	Part-No. 1 Pair
Black	61-955-01
Red	61-955-03

End Feet Offset

Colour	Part-No. 1 Pair
Pearlwhite	61-961-01



3.5.2.4 Aluminium Card Guides 1-Slot, 3 Parts, IEEE

- Extrusion: Aluminium
- End feet: Plastic UL94 V-0
- For card thickness 2.4 mm / 0.094"

Extrusion

Card Depth		Part-No. 1 pc.
mm	inch	
160	6.30	66-453-20
220	8.66	66-453-25
280	11.02	66-453-30
340	13.38	66-453-35

End Feet

Colour	Part-No. 1 Pair
Black	61-956-01



3.5.2.5 ESD Clips

- Connecting printed board with case
- Stainless steel

Description	Part-No. 1 pc.
ESD clip front bottom/rear top	61-419-01
ESD clip front top/rear bottom	61-419-02



3.5.2.6 ESD Spring

- Connecting ESD pin with case
- BeCu galvanised
- Note: Notch inward-looking

Description	Part-No. 1 pc.
ESD spring	61-420



3.5.2.7 Coding Pins

- Acc. to IEC 60297-3-103
- Plastic, UL94 V-0
- Can be rotated in 4 positions

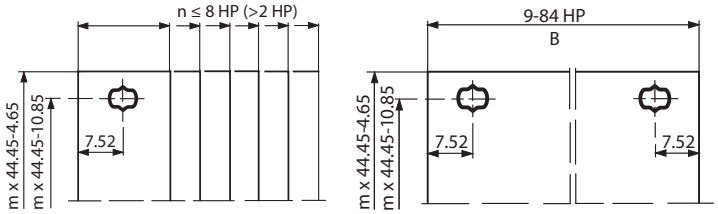
Description	Part-No. 1 pc.
Grey	81-054-02
Dark red	81-054-06
Black	81-054-04



3.6 Front Panels

3.6.1 Flat Front Panels

- For sub racks and enclosures, solid
- Aluminium 2.5 mm, clear anodised (non-conductive)
- **Scope of delivery:**
  - Flat front panel
- Front panel screws, see below
- 1 HP and 2 HP are divider extrusions (not flat panels)



3.6.1 Flat Front Panels for Sub Racks and Enclosures, Solid

Width	B		Height			Part-No.		
	mm	inch	1 U 39.8 mm	ca. 1 U* 42.15 mm	2 U 84.2 mm	3 U 128.7 mm	4 U 173.1 mm	6 U 262.0 mm
1 HP	5.0	0.19	—	—	—	66-115-21	—	66-115-25
2 HP	10.0	0.39	—	—	—	66-107-44	66-107-45	66-107-47
3 HP	15.2	0.59	—	—	—	21N303	21N403	21N603
4 HP	20.1	0.79	—	—	—	21N304	21N404	21N604
5 HP	25.2	0.99	—	—	—	21N305	21N405	21N605
6 HP	30.3	1.19	—	—	—	21N306	21N406	21N606
7 HP	35.3	1.38	—	—	—	21N307	21N407	21N607
8 HP	40.4	1.59	—	—	—	21N308	21N408	21N608
10 HP	50.6	1.99	—	—	—	21N310	21N410	21N610
11 HP	55.7	2.19	—	—	—	21N311	—	—
12 HP	60.7	2.38	—	—	—	21N312	21N412	21N612
14 HP	70.9	2.79	—	—	—	21N314	21N414	21N614
16 HP	81.1	3.19	—	—	—	21N316	21N416	21N616
20 HP	101.4	3.59	—	—	—	21N320	21N420	21N620
21 HP	106.5	4.19	—	—	—	21N321	21N421	21N621
28 HP	142.0	5.59	—	—	—	21N328	—	21N628
32 HP	162.3	6.38	—	—	—	21N332	21N432	—
42 HP	213.1	8.38	—	—	21N242	21N342	21N442	21N642
52 HP	263.9	10.38	—	—	—	21N352	21N452	21N652
63 HP	319.8	12.59	—	—	21N263	21N363	21N463	21N663
81 HP	411.3	16.19	—	—	21N281	21N381	21N481	21N681
84 HP	426.5	16.79	21N184	21N084*	21N284	21N384	21N484	21N684

* Coverplates for 1 U fan opening

Front Panel Screws

- Set of 10 screws, with screw retainer

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3, size T8 with plastic screw retainer	63K159
Milled edge screws recessed M2.5 x 11.3 with plastic screw retainer	63-159

3.6.2 EMC Flat Front Panels

3.6.2.1 EMC Filler Panels with EMC Gasket

- High stability (U-profile)
- Extruded aluminium
- Pressed-in centring pin and bushes M2.5
- Front side clear anodised, rear side conductive
- **Scope of delivery:**
  - EMC front panel incl. pressed-in centering pin and bushes M2.5
- EMC-gasket see below
- Front panel screw see below



3.6.2.1 EMC Front Panels

Width	Part-No. 3 U	Part-No. 4 U	Part-No. 6 U
4 HP	66-514-73	66-514-74	66-514-76
5 HP	66-515-73		66-515-76
6 HP	66-516-73	66-516-74	66-516-76
8 HP	66-518-73	66-518-74	66-518-76
9 HP	66-519-73		66-519-76
10 HP	66-520-73		66-520-76
12 HP	66-522-73	66-522-74	66-522-76
14 HP	66-534-73		66-534-76

EMC Gasket (Stainless Steel)

Height	Part-No. 1 pc.	Part-No. 1 pcs.
3 U	81-062-03	81-062-03
4 U	81-062-04	81-062-04
6 U	81-062-06	81-062-06

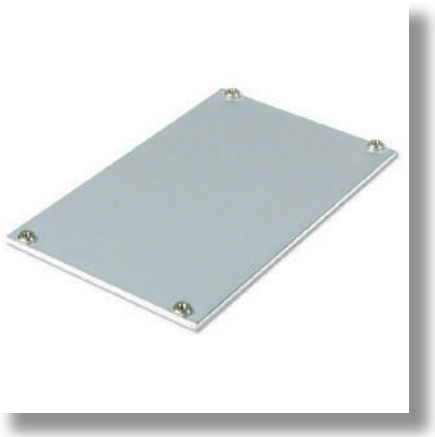
Front Panel Screws

- Front panel width up to 9 HP = 2 screws; ≥ 10 HP = 4 screws

Description	Part-No. 1 pc.
Torx screw, M2.5 x 11.3, size T8	5443-08
Round head screw, cross recessed M2.5 x 12.7	61-287

3.6.2.2 EMC Filler Panels without EMC-Gasket

- Front panel standard, solid
- Front clear anodised
- Rear conductive
- Basic level EMC
- **Scope of delivery:**
  - 1 front panel incl. press-fit bushes M2.5 (pressed-in)
- Front panel screws, see below
- Spacer see next page



3.6.2.2 EMC Filler Panels without Gasket

Width	Part-No. 3 U	Part-No. 4 U	Part-No. 6 U
4 HP	21B304		
10 HP	21B310		
12 HP	21B312		
16 HP	21B316	21B416	
21 HP	21B321	21B421	21B621
42 HP	21B342	21B442	21B642
63 HP	21B363	21B463	
84 HP	21B384	21B484	21B684

Front Panel Screws

- Front panel width up to 9 HP = 2 screws; ≥ 10 HP = 4 screws

Description	Part-No. 1 pc.
Torx screw, M2.5 x 11.3, size T8	5443-08
Round head screw, cross recessed M2.5 x 12.7	61-287



Spacer for EMC Front Panels Flat

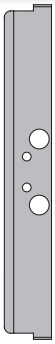
- EMC-Level: Advanced
- **Scope of delivery:**
  - 1 spacer incl. gasket
  - 2 Torx sheet metal screws 2.9 x 6.5; size T 10

Height	Part-No.
3 U	81K023
4 U	81K024
6 U	81K026
7 U	81K027

Optional Cross Recessed Screws for Spacer

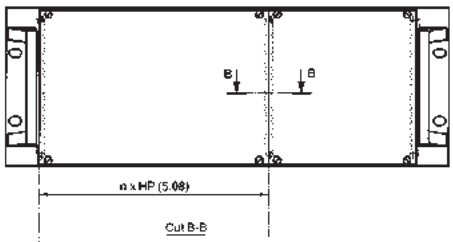
(2 Torx round head screws as standard included, 2 screws are needed)

Description	Part-No.
1 Torx round head screw 2.9 x 6.5 mm	5587-06

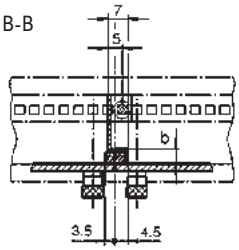


Holes in some cases needed for mounting telescopic rails



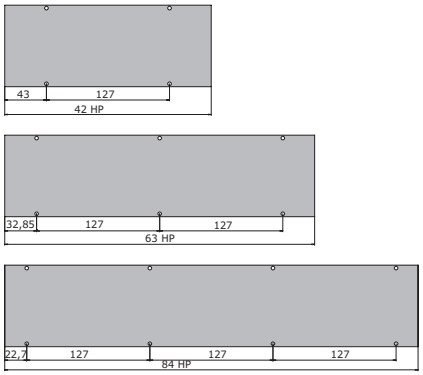


Cut B-B



3.6.2.3 EMC Flat Front Panels

- Aluminium 2.5 mm (conductive)
- Closes the front or rear of the sub rack with very high shielding effectiveness
- Contact between the flat front panel and the case is made via EMC gaskets



3.6.2.3 EMC Flat FrontPanelsAdvanced EMC Level

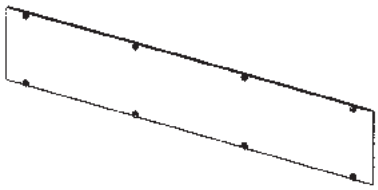
- **Scope of delivery:**
  - EMC flat front panel
  - Contact angle, incl. screws (4 + 6 U version only)
  - EMC gasket for contact angle (4 + 6 U version only)
- Front panel screws see below
  - Front panel width 42 HP = 4 screws
  - Front panel width 63 HP = 6 screws
  - Front panel width 84 HP = 8 screws

Width	Part-No. 1 U	Part-No. 2 U	Part-No. 3 U	Part-No. 4 U	Part-No. 6 U
42 HP		21C242	21C342		
63 HP		21C263	21C363	21C463	
84 HP	21C184	21C284	21C384	21C484	21C684

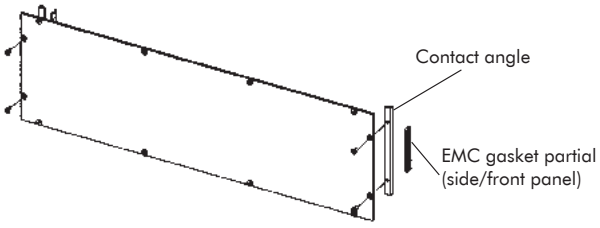
Front Panel Screws

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3, size T8, with press-fit bush	63K480
Screw recessed M2.5 x 11.3, with press-fit bush	63-444
Screw cross recessed M2.5 x 12.7, with press-fit bush	63-480

1 U - 3 U

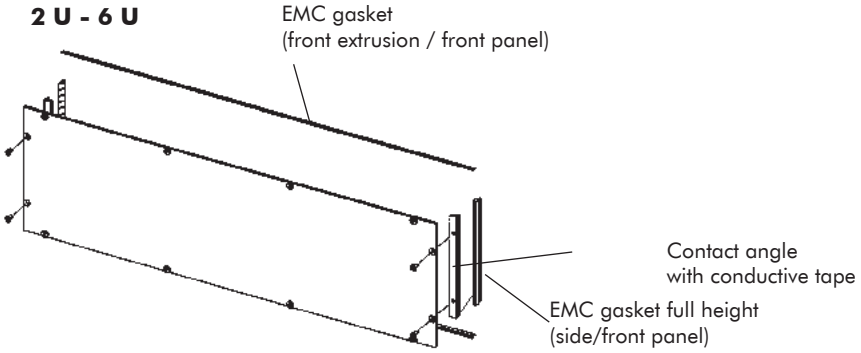


4 U - 6 U



3.6.2.3 EMC Flat Front Panels Superior EMC Level

- **Scope of delivery:**
  - EMC flat front panel
  - Contact angle, incl. screws
  - EMC gasket for contact angle
  - EMC gasket for front extrusion/front panel
- Front panel screws, see below
  - Front panel width 42 HP = 4 screws
  - Front panel width 63 HP = 6 screws
  - Front panel width 84 HP = 8 screws



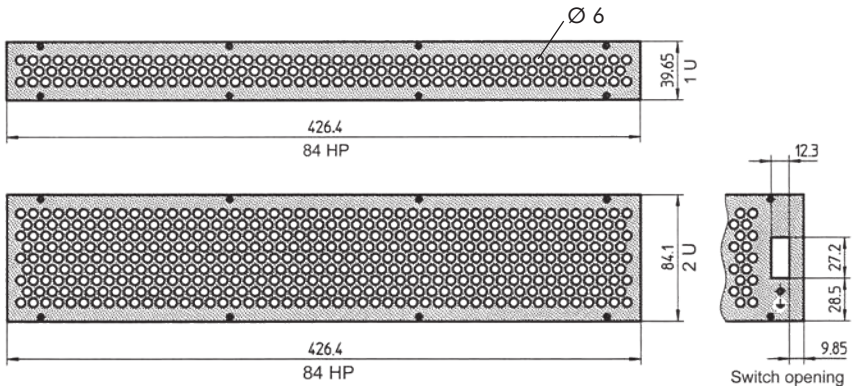
Width	Part-No. 2 U	Part-No. 3 U	Part-No. 4 U	Part-No. 6 U
42 HP	21D242	21D342		
63 HP	21D263	21D363	21D463	
84 HP	21D284	21D384	21D484	21D684

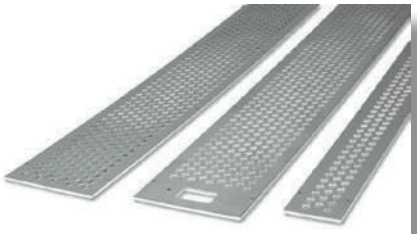
Front Panel Screws

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3, size T8, with press-fit bush	63K480
Screw recessed M2.5 x 11.3, with press-fit bush	63-444
Screw cross recessed M2.5 x 12.7, with press-fit bush	63-480

3.6.2.4 Perforated EMC Front Panels 84 HP

- Front anodised, rear conductive
- Advanced EMC level
- Width: 84 HP
- **Scope of delivery:**
  - Perforated flat front panel
- Front panel screws see below
- On-off switch see below





3.6.2.4 Perforated EMC Front Panels 84 HP

Height			Air Passage	Switch Opening	
				Part-No. with	Part-No. without
1 U	39.65 mm	1.56"	4'100 mm²	21C184-01	
2 U	84.1 mm	3.31"	12'300/11'700 mm²	21C284-01	21C284-02

Front Panel Screws

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3, size T8, with press-fit bush	63K480
Screws recessed M2.5 x 11.3, with press-fit bush	63-444
Screws cross recessed M2.5 x 12.7, with press-fit bush	63-480



On-Off Switches

- Black body, plastic
- 2 pole (only on-off switches)
- 250V, 16A
- Quick-connect terminal 6.3 x 0.8 mm
- Cut-out: 12.3 x 27.2 mm (0.48" x 1.07")

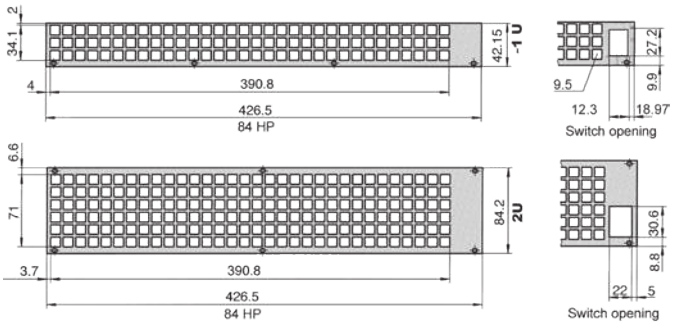
Description	Part-No.
On-off switch, indicator light green	69-410-04
On-off switch, without signal light	69-410-09
Single pole switch with momentary function	69-410-10



3.6.3 Fan Front Panels

3.6.3.1 Fan Front Panels 84 HP for Vertical Ventilation

- Fan front panels are flat, perforated and designed to ensure an optimum air flow rate
- Available with or without switch cut-out (switch opening 22 x 30.6 mm)
- Aluminium 2.5 mm, clear anodised (non-conductive)
- **Scope of delivery:**
  - 1 perforated fan front panel
- Front panel screws see below
- On-off switch see below





3.6.3.1 Fan Front Panels 84 HP for Vertical Ventilation

Description	Height	Air passage		Part-No.
		mm²	sq. inch	
Without switch opening	~ 1 U	8664	13.42	21N084-01
With switch opening	~ 1 U	8664	13.42	21N084-02
Without switch opening	2 U	17328	26.85	21N284-01
With switch opening	2 U	17328	26.85	21N284-02

Front Panel Screws

- Set of 10 screws
- With screw retainer
- Fan front panel ~1 U = 4 screws; 2 U= 6 screws

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3 , size T8, with plastic screw retainer	63K159
Milled edge screws recessed M2.5 x 11.3, with plastic screw retainer	63-159



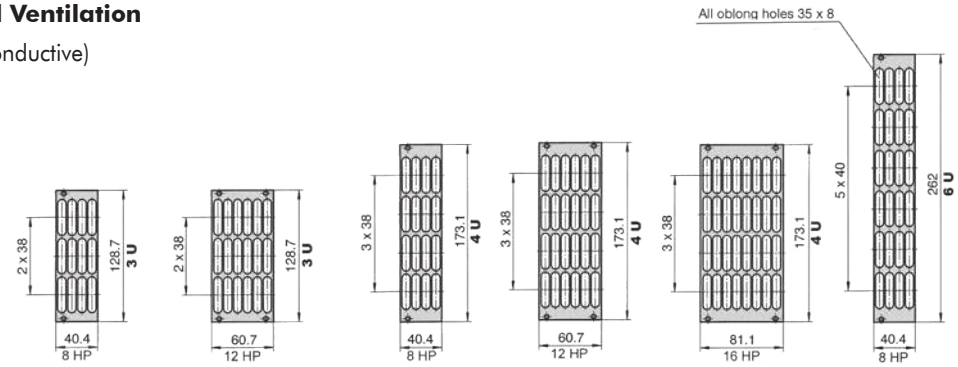
On-Off Switches

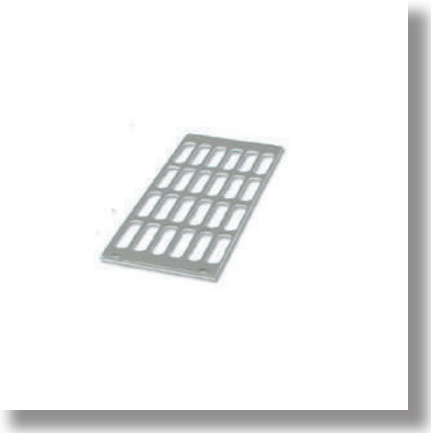
- Black body, plastic
- 2 pole (only on-off switches)
- 250V, 16A
- Quick-connect terminal 6.3 x 0.8 mm
- Cut-out for 4426-00: 22 x 30.6 mm (0.87" x 1.20")
  Cut-out others: 12.3 x 27.2 mm (0.48 x 1.07")

Description	Part-No.
On-off switch, indicator light transperant	7726-00
On-off switch, indicator light green	69-410-04
On-off switch, without signal light	69-410-09
Single pole switch with momentary function	69-410-10

3.6.3.2 Fan Front Panels for Horizontal Ventilation

- Aluminium 2.5 mm, clear anodised (non-conductive)
- **Scope of delivery:**
  - 1 perforated fan front panel
- Front panel screws see below





3.6.3.2 Fan Front Panels for Horizontal Ventilation

Height	Width	Air passage		Part-No.
		mm²	sq. inch	
3 U	8 HP	3195	4.95	21N308-01
	12 HP	4793	7.42	21N312-01
4 U	8 HP	4260	6.60	21N408-01
	12 HP	6390	9.90	21N412-01
	16 HP	8520	13.20	21N416-01
6 U	8 HP	6390	9.90	21N608-01
	12 HP	9586	14.85	21N612-01

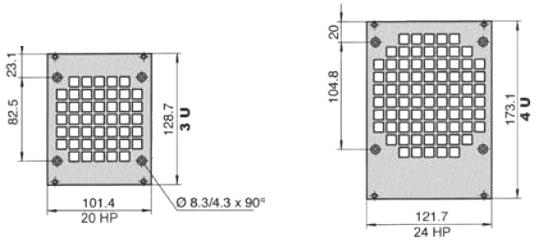
Front Panel Screws

- Set of 10 screws
- With screw retainer
- Fan front panel width up to 8 HP = 2 screws; ≥ 12 HP = 4 screws

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3 , size T8, with plastic screw retainer	63K159
Milled edge screws recessed M2.5 x 11.3, with plastic screw retainer	63-159

3.6.3.3 Fan Front Panels for Direct Fan Mounting

- Aluminium 2.5 mm, clear anodised (non-conductive)
- **Scope of delivery:**
  - 1 perforated fan front panel
- Front panel screws see below
- Assembly material for fan mounting has to be ordered separately





3.6.3.3 Fan Front Panels for Direct Fan Mounting

Description	Height	Width	Air passage		Part-No. 1 pc.
			mm²	sq. inch	
Without switch opening	3 U	20 HP	4051	6.27	21N320-04
	4 U	24 HP	7022	10.88	21N424-03

Front Panel Screws

- Set of 10 screws
- With screw retainer
- Per front panel 4 screws are needed

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3 , size T8, with plastic screw retainer	63K159
Milled edge screws recessed M2.5 x 11.3, with plastic screw retainer	63-159

Assembly Material for Fan Mounting

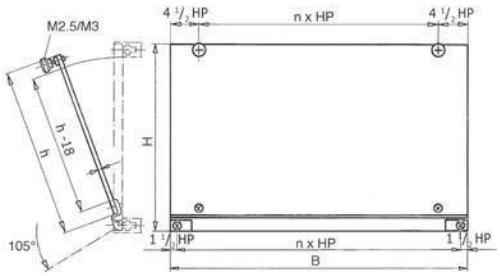
Description	Part-No. 1 pc.
Countersunk screw, recessed M4 x 10	5342-10
Hexagonal nut M4, 0.8D	5620-51



3.6.4 Hinged Front Panels

3.6.4.1 Top / Bottom-Hinged Front Panels

- Hinges are attached to the front extrusions of the sub rack or case
- Aluminium 2.5 mm, clear anodised (non-conductive)
- **Scope of delivery:**
  - Front panel
  - Hinge extrusion
  - Assembly material M2.5, incl. hinges





3.6.4.1 Top/Bottom-Hinged Front Panels

Width	Part-No. 3 U	Part-No. 4 U	Part-No. 6 U
63 HP	25N363-19	25N463-19	
84 HP	25N384-19	25N484-19	25N684-19

Dimensions

	Nominal Width		Width B	
HP	mm	inch	mm	inch
63 HP	320.04	12.60	319.8	12.59
84 HP	426.72	16.80	426.5	16.79

Nominal Height	Height H		Height h	
U	mm	inch	mm	inch
3 U	128.7	5.07	117	4.61
4 U	173.15	6.81	161.4	6.35
6 U	262.05	10.31	250.3	9.85

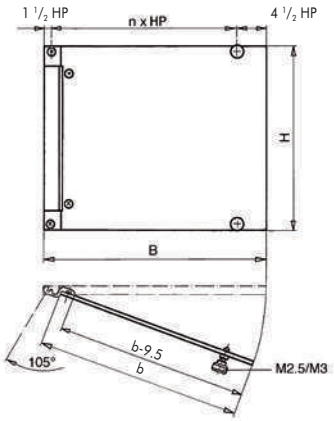
3.6.4.2 EMC Top / Bottom-Hinged Front Panels

- Width: 84 HP
- Offers optimum protection from electromagnetic interference
- Aluminium 2.5 mm, front anodised, rear conductive
- **Scope of delivery:**
  - EMC front panel
  - Hinge extrusions
  - Assembly material M2.5, incl. hinges
  - EMC gaskets



3.6.4.2 EMC Top / Bottom-Hinged Front Panels

EMC Level	Part-No. 3 U	Part-No. 4 U	Part-No. 6 U
Advanced	25C384-11	25C484-11	25C684-11
Superior	25D384-11	25D484-11	25D684-11



3.6.4.3 Side-Hinged Front Panels

- Aluminium 2.5 mm, clear anodised (non-conductive)
- **Scope of delivery:**
  - Front panel
  - Hinge extrusion
  - Assembly material M2.5, incl. hinges



3.6.4.3 Side-Hinged Front Panels

Width	Part-No. 3 U	Part-No. 4 U	Part-No. 6 U
42 HP	25N342-29		
63 HP	25N363-29		
84 HP	25N384-29	25N484-29	25N684-29

Dimensions

Nominal Width			Width B		Width b	
HP	mm	inch	mm	inch	mm	inch
42 HP	213.36	8.40	213.1	8.39	201	7.91
63 HP	320.04	12.60	319.8	12.59	307.7	12.11
84 HP	426.72	16.80	426.5	16.79	414.3	16.31

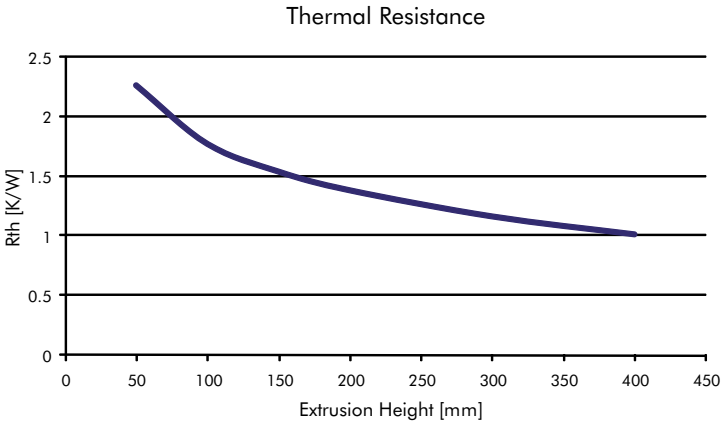
Nominal Height	Height H	
U	mm	inch
3 U	128.7	5.06
4 U	173.15	6.81
6 U	262.05	10.31

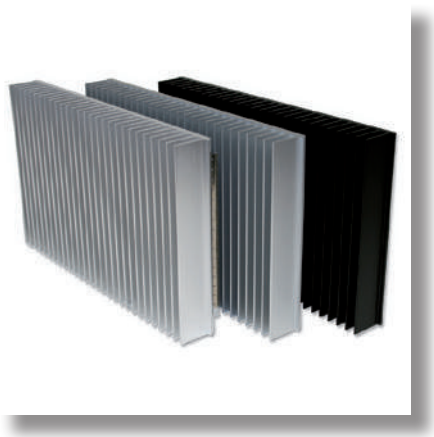
Use Elma's front panel service for machining and screen printing of your panels see Elmaset chapter F!



3.6.5 Heat Sink Front Panels

- For sub racks and enclosures
- Width 42 HP
- Cooling fins in pitch of 1½ HP
- Aluminium anodised or clear passivated
- EMC version with mounted brackets for slide in of EMC gaskets 81-062-xx
- Thermal resistance see diagram
- Customised versions on request
- **Scope of delivery:**
  - 1 heat sink front panel
- Assembly material see below
- EMC gasket see below





3.6.5 Heat Sink Front Panels

Description	Surface	Width	Height	Part-No.
Heat sink front panel	Clear anodised	42 HP	3 U	66-100-71
Heat sink front panel	Black anodised	42 HP	3 U	66-100-72
EMC heat sink front panel	Clear passivated	42 HP	3 U	21F342

Assembly Material

- Per heat sink front panel 6 screws are needed

Description	Part-No. 1 pc.
Torx cylinder head screw M2.5 x 10, size T8	5470-09
Cross recessed cylinder head screw M2.5 x 10	5325-10

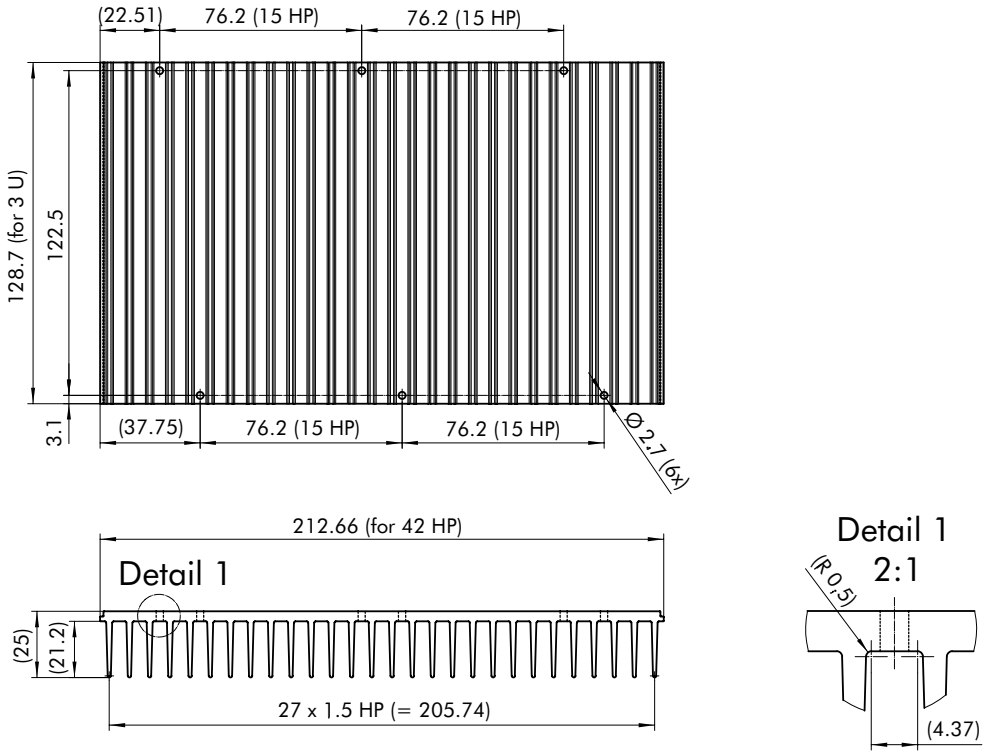


EMC Gasket

- Stainless steel

For Height	Length		Part-No. 1 pc.
	mm	inch	
3 U	101.6	4.00	81-062-03

Drawing Heat Sink Front Panel 66-100-71

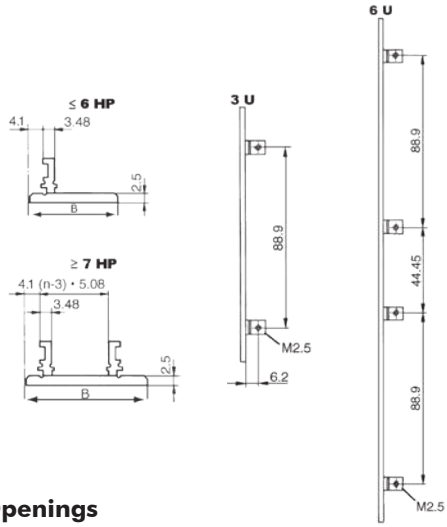




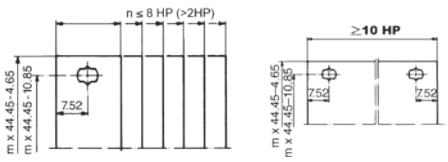
3.6.6 Plug-In Units acc. to IEC

3.6.6.1 Extruded Front Panels

- Aluminium 2.5 mm, clear anodised (non-conductive)
- PCB mounting lugs are formed on the rear face of the panel
- No PCB fixing screws on the front face of the panel, leaving more space for silk screening and mounting front panel components
- Suitable for all sub racks and cases
- Thickness of the mounting lugs (3.48 mm) allows PCBs to be mounted on either side of the lugs
- Drill marks at rear for handle-fixing holes
- **Scope of delivery:**
  - Extruded front panel, clear anodised
- Front panel screws see below







3.6.6.1 Extruded Front Panels, without Openings

Width	B		Part-No. 3 U	Part-No. 4 U	Part-No. 6 U
	mm	inch			
3 HP	15.0	0.59	26N303		26N603
4 HP	20.1	0.79	26N304	26N404	26N604
5 HP	25.2	0.99	26N305	26N405	26N605
6 HP	30.3	1.19	26N306	26N406	26N606
7 HP	35.3	1.38	26N307	26N407	26N607
8 HP	40.4	1.59	26N308	26N408	26N608
10 HP	50.6	1.99	26N310	26N410	26N610
12 HP	60.7	2.38	26N312	26N412	26N612
14 HP	70.9	2.79	26N314	26N414	26N614
16 HP	81.1	3.19	26N316	26N416	26N616
21 HP	106.5	4.19	26N321	26N421	

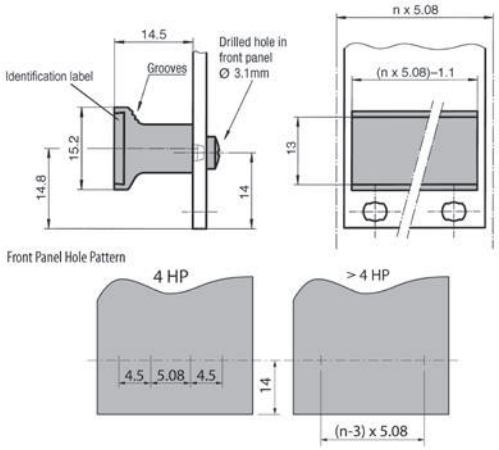
Front Panel Screws

- Set of 10 screws
- With screw retainer
- Front panel width up to 9 HP = 2 screws; ≥ 10 HP = 4 screws

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3 , size T8, with plastic screw retainer	63K159
Milled edge screws recessed M2.5 x 11.3, with plastic screw retainer	63-159

Rigid-Mounted Unit Handles with Identification Label

- Black, plastic UL94 V-0, label aluminium anodised
- **Scope of delivery:**
  - Rigid-mounted handle
  - Identification label
- Assembly material see below





Rigid-Mounted Handles with Identification Label

Width	Scope of Delivery	Part-No.
4 HP top*	5 pcs.	60-200-01
4 HP bottom*	5 pcs.	60-200-02
4 HP	10 pcs.	60-200-04
5 HP	10 pcs.	60-200-05
6 HP	10 pcs.	60-200-06
7 HP	10 pcs.	60-200-07
8 HP	10 pcs.	60-200-08
10 HP	10 pcs.	60-200-10
12 HP	10 pcs.	60-200-12
14 HP	1 pc.	60-200-14
21 HP	1 pc.	60-200-21

- Other sizes (up to 84 HP) are available upon request

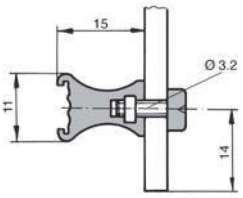
* (Flat front panel with card holder)

Assembly Material

Description	Part-No.
Recessed round head screw	61-276

Fluted Handles

- Extruded aluminium handles, shaped to facilitate withdrawal of plug-in units
- Two grooves in the front face will accept identification strips (0.5 x 9 mm)
- **Scope of delivery:**
  - Extruded handle, clear anodised
  - Assembly material



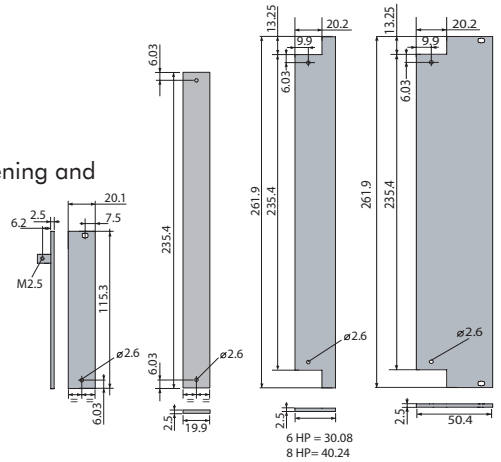


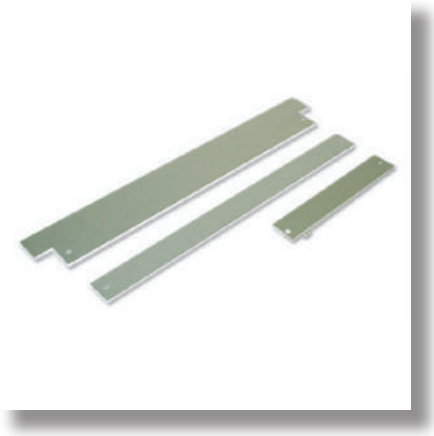
Fluted Handles for Front Panels to IEC

Front Panel	Width		Handle Length		Part-No.
Width HP	mm	inch	mm	inch	
3 HP	15.0	0.59	12.5	0.49	60-103
4 HP	20.1	0.79	17.6	0.69	60-104
5 HP	25.2	0.99	22.6	0.88	60-105
6 HP	30.3	1.19	27.7	1.09	60-106
7 HP	35.3	1.38	33.5	1.31	60-107
8 HP	40.4	1.59	37.9	1.49	60-108
10 HP	50.6	1.99	48.0	1.88	60-110
12 HP	60.8	2.39	58.2	2.29	60-112
14 HP	70.9	2.79	69.1	2.72	60-114
16 HP	81.1	3.19	78.5	3.09	60-116
20 HP	101.4	3.99	98.8	3.88	60-120
21 HP	106.5	4.18	104.6	4.11	60-121
27 HP	137.0	5.39	134.4	5.29	60-127
30 HP	152.2	5.99	149.6	5.88	60-130
40 HP	203.0	7.99	200.4	7.88	60-140
60 HP	304.6	11.99	302.0	11.88	60-160
84 HP	426.5	16.79	424.0	16.69	60-184

3.6.6.2 Front Panels with Cut-outs for IEC Ejector Handles

- Aluminium 2.5 mm, clear anodised (non-conductive)
- Upper PCB mounting lug is formed on the rear face of the panel (3 U-Version only)
- No PCB fixing screws on the front face of the panel, leaving more space for silk screening and mounting front panel components
- Suitable for all sub racks and cases
- 3 U front panels prepared for one handle
- 6 U front panels prepared for two handels
- **Scope of delivery:**
  - Front panel, clear anodised
- Front panel screws see below (for 3 U-Version only)
- IEC ejector handles, see below





3.6.6.2 Front Panels with Cut-outs for IEC Ejector Handles

Width	B		Part-No. 3 U	Part-No. 6 U
	mm	inch		
4 HP	20.0	0.79	26N304-51	21N604-51
6 HP	30.2	1.19		21N606-51
8 HP	40.3	1.59		21N608-51
10 HP	50.5	1.99		21N610-51

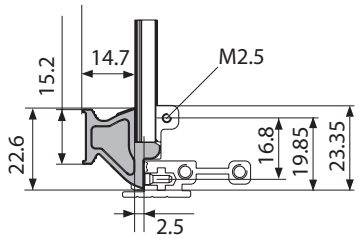
Front Panel Screws (for 3 U-Version only)

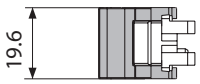
- Set of 10 screws
- With screw retainer
- Front panel 3 U = 1 screw

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3, size T8, with plastic screw retainer	63K159
Milled edge screws recessed M2.5 x 11.3, with plastic screw retainer	63-159

3.6.6.3 Ergonomic Ejector Handles acc. to IEC

- Simple assembly of plug-in units
- Allows trouble-free extraction of electronic units with multi-pole connectors
- Main features in one part: card holder, ejector handle and centering pin
- Reset spring for safe insertion
- One version for top and bottom only
- Handle is injection moulded, glass-reinforced plastic, UL94 V-0
- Card holder is zinc die-cast, nickel plated
- Reset spring is stainless steel
- **Scope of delivery:**
  - Ejector handle
  - Assembly material (cross recessed screws M2.5 for fixing of card holder/printed board/front panel)
- Front panel with special cut-outs have to be ordered separately





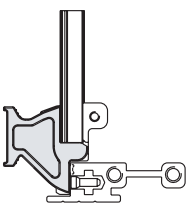


3.6.6.3 Ejector Handles acc. to IEC

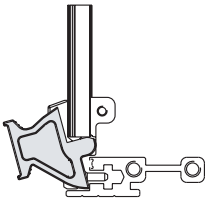
Description	Part-No. 10 pcs.	Part-No. 100 pcs.
Ejector handle black	81-233-1	81-233-2
Ejector handle grey	81-234-1	81-234-2

Extraction process:

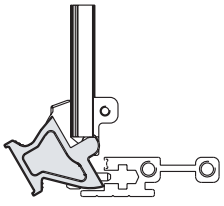
Rest position



Extraction



End position



Label

Description	Part-No.
1 sheet A4 of 220 labels	81-031



3.6.7 EMC Plug-In Units acc. to IEC

- Excellent EMC shielding
- Made of aluminium extrusions
- Rear side: conductive surface finish (clear passivated)
- Used in the assembly of plug-in units
- The EMC-gasket is integrated into the front panel profile to protect it from damage
- A pressfit centering pin guarantees optimum positioning of the panel as well as the right pressure between the contact strip and the next panel



3.6.7.1 EMC Filler Panels without Openings

- High stability
- Extruded aluminium
- Pressed-in centring pin and bushes M2.5
- Front side clear anodised, rear side conductive
- **Scope of delivery:**
  - EMC front panel, incl. pressed-in centering pin and bushes M2.5
- EMC-gasket see below
- Front panel screw see below
- Handles and card holders cannot be fitted with this type of front panel

Width	Part-No. 3 U	Part-No. 6 U
4 HP	66-514-73	66-514-76
6 HP	66-516-73	66-514-76
8 HP	66-518-73	66-518-76



EMC Gaskets (Stainless Steel)

Height	Part-No. 1 pc.
3 U	81-062-03
6 U	81-062-06

Front Panel Screws

- Front panel width up to 8 HP = 2 screws

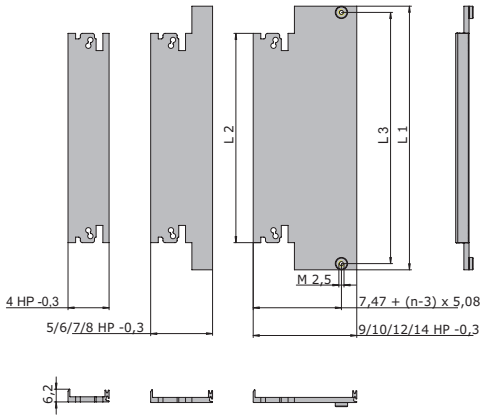
Description	Part-No. 1 pc.
Torx screw, M2.5 x 11.3, size T8	5443-08
Round head screw, cross recessed M2.5 x 12.7	61-287

Use Elma's font panel service for machining and screen printing of your panels!

3.6.7.2 EMC Front Panels for IEC Plug-In Units with Cut-out for Ejector Handles acc. to IEC

EMC Front Panels Aluminium with EMC Gasket

- Excellent EMC shielding
- Immune to snagging
- EMC-gasket slid onto the extrusion
- **Scope of delivery:**
  - EMC front panel, incl. pressed-in bushes M2.5 (size ≥ 10 HP)
- EMC-gasket see below
- Handle has to be ordered separately, see 1.6.7.3
- Front panel screw (size ≥10 HP), see below





Front Anodised, Rear Conductive (2 cutouts)

- With 2 cutouts (bottom + top)

Width	Part-No. 3 U	Part-No. 6 U	Part-No. 9 U
4 HP	66-514-23	66-514-26	66-514-29
5 HP	66-515-23	66-515-26	
6 HP	66-516-23	66-516-26	66-516-29
7 HP	66-517-23	66-517-26	
8 HP	66-518-23	66-518-26	66-518-29
9 HP	66-519-23	66-519-26	
10 HP	66-520-23	66-520-26	66-520-29
12 HP	66-522-23	66-522-26	66-522-29
14 HP	66-534-23	66-534-26	

Front Anodised, Rear Conductive (1 cutout)

- With 1 cutout (bottom)
- Incl. pressed-in centring pin and bush M2.5 (top)
- Incl. cutout for mounting of card holder 61-156 (top) with screw 5322-08 (see 1.6.7.4)

Width	Part-No. 3 U
4 HP	66-514-43
5 HP	66-515-43
6 HP	66-516-43
7 HP	66-517-43
8 HP	66-518-43
9 HP	66-519-43
10 HP	66-520-43
12 HP	66-522-43
14 HP	66-534-43

Front and Rear Side Raw

- With 2 cutouts (bottom + top)

Width	Part-No. 3 U	Part-No. 6 U
4 HP	66-514-63	66-514-66
6 HP	66-516-63	66-516-66
8 HP	66-518-63	66-518-66
10 HP	66-520-63	66-520-66
12 HP	66-522-63	66-522-66

Dimensions

Height	L1 mm	L1 inch	L2 mm	L2 inch	L3 mm	L3 inch
3 U	128.55	5.06	102.05	4.01	122.50	4.82
6 U	261.90	10.31	235.40	9.27	255.85	10.07
9 U	395.25	15.56	368.75	14.51	389.20	15.32



EMC-Gaskets (Stainless Steel)

Unit	Part-No. 3 U	Part-No. 6 U	Part-No. 9 U
1 pc.	81-062-03	81-062-06	81-062-09

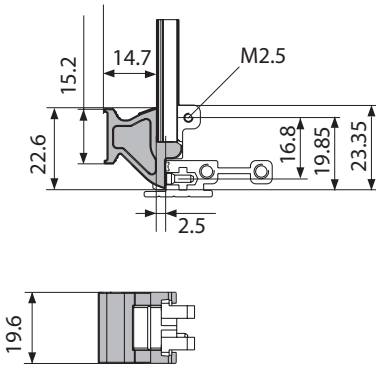
Front Panel Screws

- For EMC front panels size ≥ 10 HP = 2 additional screws are needed

Description	Part-No. 1 pc.
Cross recessed round head screw M2.5 x 12.7	61-287
Torx screw M2.5 x 11.3, size T8	5443-08

3.6.7.3 Ergonomic Ejector Handles acc. to IEC

- Simple assembly of plug-in units
- Allows trouble-free extraction of electronic units with multi-pole connectors
- Main features in one part: card holder, ejector handle and centering pin
- Reset spring for safe insertion
- One version for top and bottom only
- Handle is injection moulded, glass-reinforced plastic, UL94 V-0
- Card holder is zinc die-cast, nickel plated
- Reset spring is stainless steel
- **Scope of delivery:**
  - Ejector handle
  - Assembly material (cross recessed screws M2.5 for fixing of card holder/printed board/front panel)
- Front panel with special cut-outs have to be ordered separately

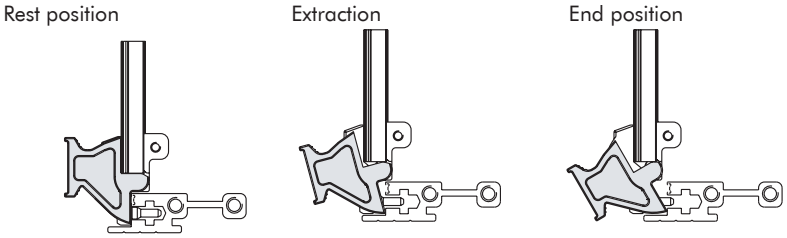




3.6.7.3 Ejector Handles acc. to IEC

Description	Part-No. 10 pcs.	Part-No. 100 pcs.
Ejector handle black	81-233-1	81-233-2
Ejector handle grey	81-234-1	81-234-2

Extraction process:

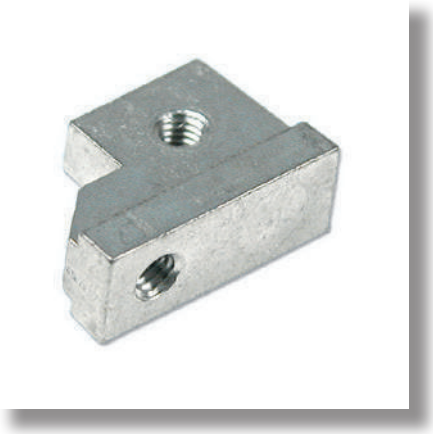


Label

Description	Part-No.
1 sheet A4 of 220 labels	81-031

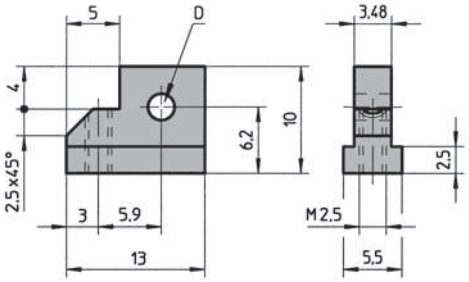
3.6.7.4 Card Holder acc. to IEC Standard

- By using the zinc die-cast card holder, flat front panels and EMC front panels acc. to IEC can be connected to a PC card to form a plug-in unit
- The card can be mounted both in the standard position and offset 1 HP (5.08 mm)
- **Scope of delivery:**
  - Card holder
- Assembly material see below



3.6.7.4 Card Holder without Swivel Stop

Description	Application	D	Part-No. 1 pc.
Card holder without swivel stop	Without injector / ejector handle	M2.5	61-156



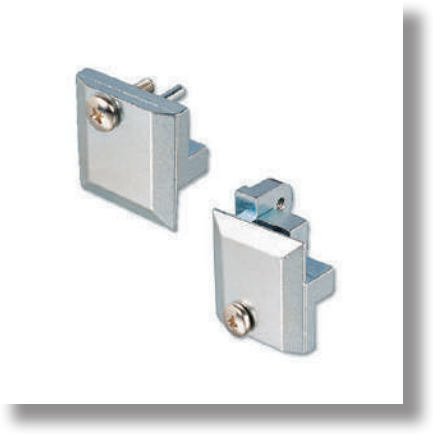


Assembly Material

Description	Application	Part-No. 1 pc.
Cross recessed countersunk screw M2.5 x 8	For card holder	5322-08
Torx countersunk screw M2.5 x 8, size T8	For card holder	5470-21
Slotted pan head screw M2.5 x 6	For printed board	5571-06
Torx cylinder head screw M2.5 x 6, size T8	For printed board	5470-04

3.6.7.5 Card Holders/End Pieces without ESD Pin

- **Scope of delivery:**
  - End piece card holder (zinc die-cast, nickel plated)
  - Assembly material
    (screws M2.5 for fixing of front panel/card holder/printed board)



3.6.7.5 Card Holders/End Pieces *without* ESD Pin

Description	Part-No. 1 pc.	Part-No. 100 pcs.
Top	81-018-01	81-018-01-2
Bottom	81-019-01	81-019-01-2



3.6.8 Plug-In Units acc. to IEEE

3.6.8.1 EMC Front Panels Aluminium with EMC Gasket acc. IEEE

- Excellent EMC shielding
- Immune to snagging
- EMC-gasket slid onto the extrusion
- **Scope of delivery:**
  - EMC front panel, incl. press-in bushes M2.5 (size ≥ 10 HP)
- EMC-gasket see below
- Handle has to be ordered separately, see 1.6.8.5
- Front panel screw (size ≥10 HP), see below



3.6.8.1 Front Anodised, Side Conductive (2 cutouts)

- With 2 cutouts (bottom + top)

Width	Part-No. 3 U	Part-No. 6 U
4 HP	66-514-23	66-514-26
5 HP	66-515-23	66-515-26
6 HP	66-516-23	66-516-26
7 HP	66-517-23	66-517-26
8 HP	66-518-23	66-518-26
9 HP	66-519-23	66-519-26
10 HP	66-520-23	66-520-26
12 HP	66-522-23	66-522-26
14 HP	66-534-23	66-534-26

3.6.8.2 Front Anodised, Rear Conductive (1 cutout)

- With 1 cutout (bottom)
- Incl. pressed-in centring pin and bush M2.5 (top)
- Incl. cutout for mounting of card holder 61-156 (top) with screw 5322-08 (see 2.7.6.2)

Width	Part-No. 3 U
4 HP	66-514-43
5 HP	66-515-43
6 HP	66-516-43
7 HP	66-517-43
8 HP	66-518-43
9 HP	66-519-43
10 HP	66-520-43
12 HP	66-522-43
14 HP	66-534-43



3.6.8.3 Front and Rear Side Raw

- With 2 cutouts (bottom + top)

Width	Part-No. 3 U	Part-No. 6 U
4 HP	66-514-63	66-514-66
6 HP	66-516-63	66-516-66
8 HP	66-518-63	66-518-66
10 HP	66-520-63	66-520-66
12 HP	66-522-63	66-522-66

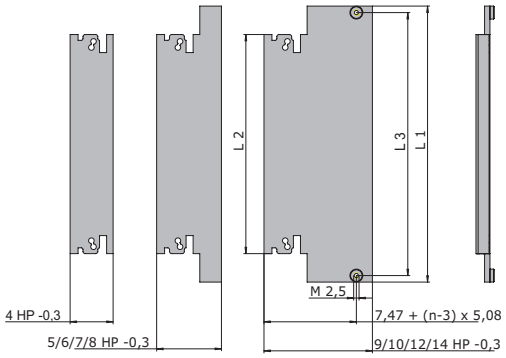
EMC-Gaskets (Stainless Steel)

Part-No. 3 U	Part-No. 6 U
81-062-03	81-062-06

Front Panel Screws

- For EMC front panels size ≥ 10 HP = 2 additional screws are needed

Description	Part-No. 1 pc.
Cross recessed round head screw M2.5 x 12.7	61-287
Torx screw M2.5 x 11.3, size T8	5443-08



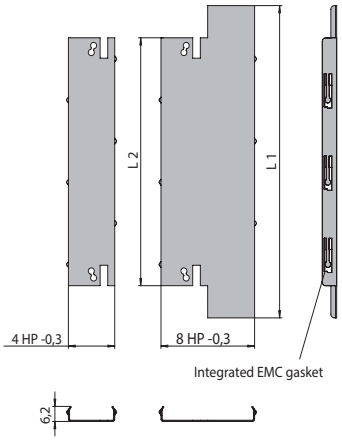
Dimensions



Height	L1 mm	L1 inch	L2 mm	L2 inch	L3 mm	L3 inch
3 U	128.55	5.06	102.05	4.01	122.50	4.82
6 U	261.90	10.31	235.40	9.27	255.85	10.07

1.6.8.4 EMC Front Panels Stainless Steel acc. IEEE

- Very good EMC shielding
- Economic solution
- EMC-spring integrated in front panel
- Stainless steel
- **Scope of delivery:**
  - EMC front panel
- Handle has to be ordered separately, see 1.6.8.5





3.6.8.4 Front and Rear Side Untreated, Stainless Steel

Width	Part-No. 3 U	Part-No. 6 U
4 HP	28-304	28-604
8 HP	28-308	28-608



3.6.8.5 Injector/Ejector Handles acc. to IEEE

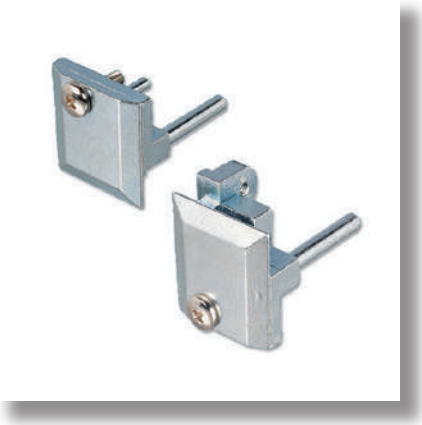
Type			Mounting	ESD Pin	Colour	Part-No 1 pc.	Part-No. 100 pcs.
Ergonomic			Bottom	With ESD-pin	Black	81-076	81-076-2
Ergonomic			Top	With ESD-pin	Black	81-075	81-075-2
Ergonomic			Bottom	Without ESD-pin	Black	81-076-01	81-076-01-2
Ergonomic			Top	Without ESD-pin	Black	81-075-01	81-075-01-2
Ergonomic	Hot Swap		Bottom	With ESD-pin	Black	81-096	81-096-2
Ergonomic	Hot Swap		Top	With ESD-pin	Black	81-095	81-095-2
Ergonomic	Hot Swap		Bottom	Without ESD-pin	Black	81-096-01	81-096-01-2
Ergonomic	Hot Swap		Top	Without ESD-pin	Black	81-095-01	81-095-01-2
Ergonomic	Hot Swap	Offset	Bottom	With ESD-pin	Black	81-185	81-185-2
Ergonomic	Hot Swap	Offset	Top	With ESD-pin	Black	81-184	81-184-2
Classic			Bottom	With ESD-pin	Black	81-261	81-261-2
Classic			Top	With ESD-pin	Black	81-260	81-260-2
Classic		Offset	Bottom	With ESD-pin	Black	81-161	81-161-2
Classic		Offset	Top	With ESD-pin	Black	81-160	81-160-2
Classic	Hot Swap		Bottom	With ESD-pin	Black	81-256	81-256-2
Classic	Hot Swap		Top	With ESD-pin	Black	81-255	81-255-2
Classic	Hot Swap	Offset	Bottom	With ESD-pin	Black	81-156	81-156-2
Classic	Hot Swap	Offset	Top	With ESD-pin	Black	81-155	81-155-2
Telecom	Hot Swap		Bottom	With ESD-pin	Black	81-206	81-206-2
Telecom	Hot Swap		Top	With ESD-pin	Black	81-205	81-205-2
Telecom	Hot Swap		Bottom	Without ESD-pin	Black	81-206-01	81-206-01-2
Telecom	Hot Swap		Top	Without ESD-pin	Black	81-205-01	81-205-01-2
Telecom	Hot Swap	Offset	Bottom	With ESD-pin	Black	81-189	81-189-2
Telecom	Hot Swap	Offset	Top	With ESD-pin	Black	81-188	81-188-2
Telecom long	Hot Swap		Bottom	With ESD-pin	Black	81-215	81-215-2
Telecom long	Hot Swap		Top	With ESD-pin	Black	81-214	81-214-2
Telecom long	Hot Swap	Offset	Bottom	With ESD-pin	Black	81-116	81-116-2
Telecom long	Hot Swap	Offset	Top	With ESD-pin	Black	81-117	81-117-2
Microswitch						81-088-1 (10 pcs.)	

For more information refer to Elmaset chapter C | "Handles"

3.6.8.6 Card Holders and Coding Pins acc. to IEEE

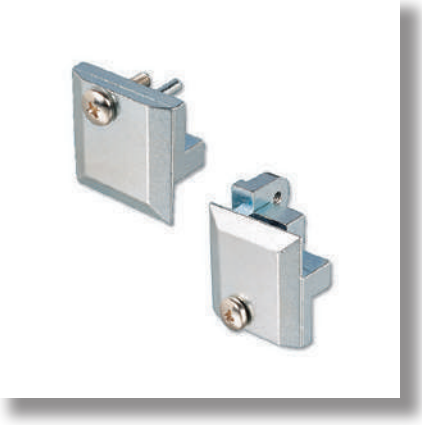
- **Scope of delivery:**
  - End piece card holder (zinc die-cast, nickel plated)
  - Assembly material

  (screws M2.5 for fixing of front panel/card holder/printed board)



Card Holders/End Pieces *with* ESD Pin

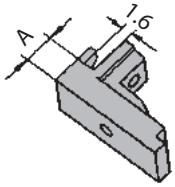
Description	Part-No. 1 pc.	Part-No. 100 pcs.
Top	81-018	81-018-2
Bottom	81-019	81-019-2



Card Holders/End Pieces *without* ESD Pin

Description	Part-No. 1 pc.	Part-No. 100 pcs.
Top	81-018-01	81-018-01-2
Bottom	81-019-01	81-019-01-2





Middle Parts

- Usable for all front panels
- For positioning and fixing of 6 U and 9 U cards, card thickness 1.6 mm
- Material: Plastic UL94 V-0

Description	A		Part-No. 1 pc.
	mm	inch	
Aluminium 2.5 mm	2.5	0.10	61-960
Stainless steel	4.5	0.18	61-963

Assembly Material

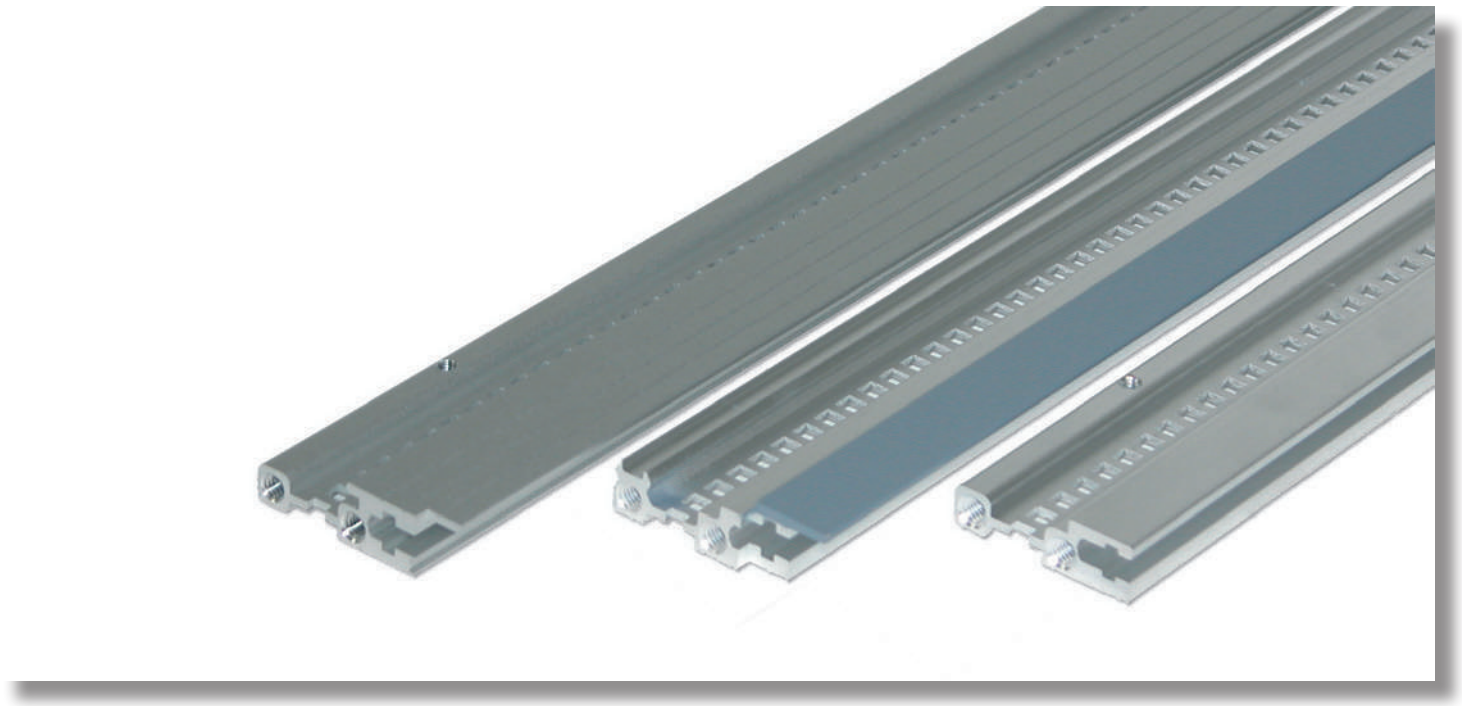
Description	Part-No. 1 pc.
PT-countersunk, 2.5 x 6	5534-06



Coding Pins

- Acc. to IEC 60297-3-103
- Plastic, UL94 V-0
- Can be rotated in 4 positions

Description	Part-No. 1 pc.
Grey	81-054-02
Dark red	81-054-06
Black	81-054-04

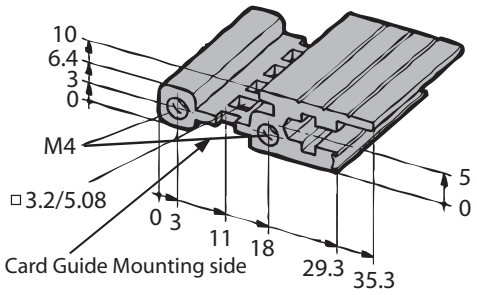


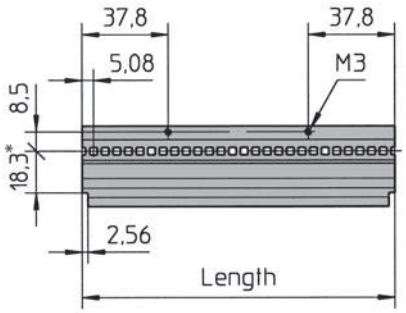
3.7 Extrusions

3.7.1 Front Extrusions

3.7.1.1 Front Extrusions 66-111, IEC

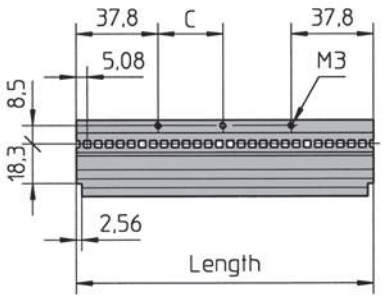
- For sub racks and cases front
- Accepts 2 x 6 mm tapped strips
- **Scope of delivery:**
  - 1 front extrusion without assembly material





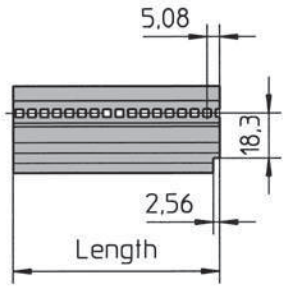
3.7.1.1 Standard Version

Length for HP	mm	inch	Part-No. clear anodised	clear passivated	raw
21	111.8	4.40	66-111-26	-	-
28	147.3	5.80	66-111-25	-	-
32	167.6	6.80	66-111-62	-	-
42	218.4	8.60	66-111-60	66-111-75	-
63	325.1	12.80	66-111-61	66-111-76	-
81	416.6	16.40	66-111-22	66-111-77	-
84	431.8	17.00	66-111-23	66-111-78	-
	1350.0	53.15	-	-	66-111-19



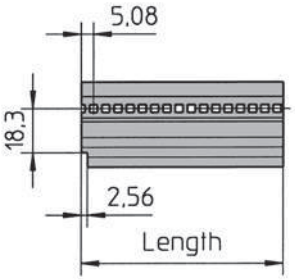
EMC Version

Length for HP	mm	inch	Holes n x C	Part-No. clear passivated
42	218.4	8.60	2 x 71.42	66-111-50
63	325.1	12.80	3 x 83.17	66-111-51
81	416.6	16.40	4 x 85.24	66-111-52
84	431.8	17.00	4 x 89.05	66-111-53



Height Divider Right, IEC

Length for HP	mm	inch	Part-No. anodised
4.5	22.86	0.90	66-111-70
8.5	43.18	1.70	66-111-71
12.5	63.82	2.54	66-111-72

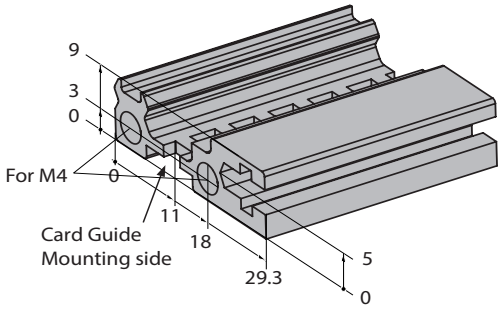


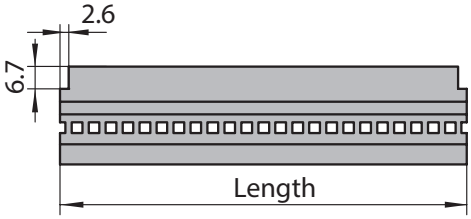
Height Divider Left, IEC

Length for HP	mm	inch	Part-No. anodised
4.5	22.86	0.90	66-111-80
8.5	43.18	1.70	66-111-81
12.5	63.50	2.50	66-111-82

3.7.1.2 Front Extrusions 66-282, IEC

- For Stylebox 15 Smart and e-motion
- **Scope of delivery:**
  - 1 front extrusion without assembly material



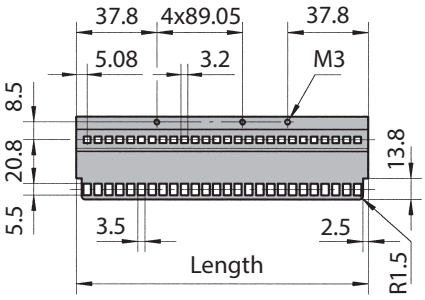


3.7.1.2 Front Extrusions 66-282, IEC

Length for HP	mm	inch	Part-No. clear passivated
42	218.4	8.60	66-282-26
63	325.1	12.80	66-282-27
84	431.8	17.00	66-282-28
	1350	53.15	66-282-19

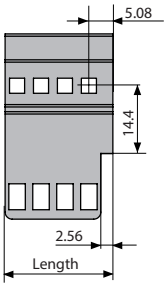
3.7.1.3 Front Extrusions 66-677, IEEE

- For Stylebox 15 Smart and e-motion
- Front separation extrusion according to IEEE standard
- Accepts 2 x 6 mm tapped strips
- **Scope of delivery:**
  - 1 front extrusion without assembly material



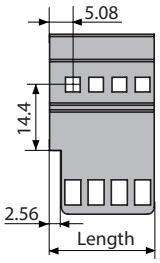
3.7.1.3 Version for Stylebox 15 Smart and e-motion acc. to IEEE

Length for HP	mm	inch	Part-No. clear passivated
84	431.8	17.00	66-677-33



Height Divider Right, IEEE

Length for HP	mm	inch	Part-No. clear passivated
4.5	22.86	0.90	66-677-70
8.5	43.18	1.70	66-677-71

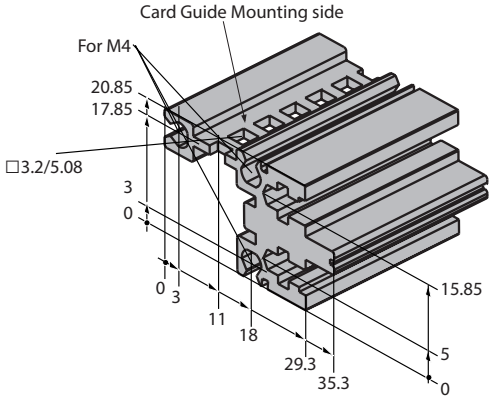


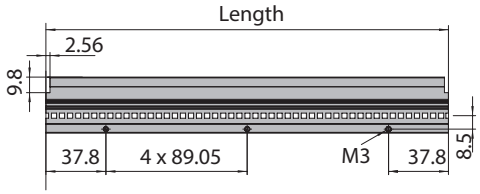
Height Divider Left, IEEE

Length for HP	mm	inch	Part-No. clear passivated
4.5	22.86	0.90	66-677-80
8.5	43.18	1.70	66-677-81

3.7.1.4 Horizontal Front Sub Division Extrusions 66-245, IEC

- Card guide can be applied
- Accept 2 x 6 mm tapped strips
- **Scope of delivery:**
  - 1 front double extrusion IEC-special without assembly material



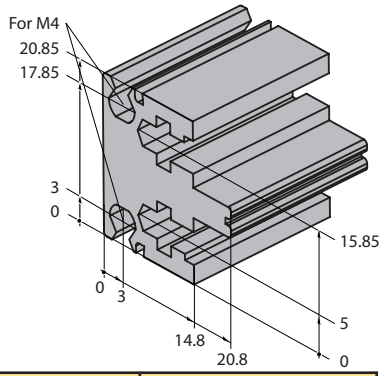


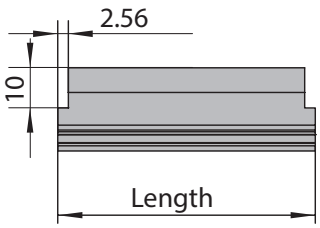
3.7.1.4 Standard Version

Length for HP	mm	inch	Part-No. clear passivated	raw
84	431.8	17.00	66-245-23	-
	1350.0	53.14	-	66-245-19

3.7.1.5 Horizontal Front Sub Division Extrusion 66-243, IEC

- Card guide cannot be applied
- Accept 2 x 6 mm tapped strips
- **Scope of delivery:**
  - 1 front double extrusion IEC-special without assembly material



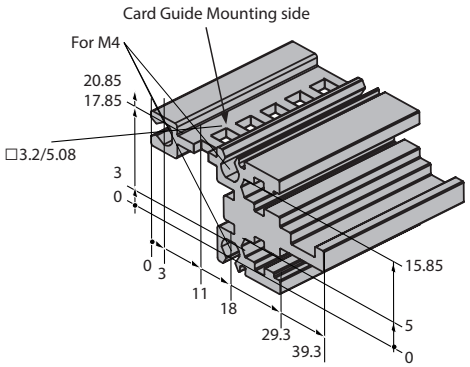


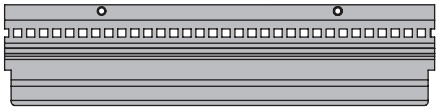
3.7.1.5 Standard Version

Length for HP	mm	inch	Part-No. clear passivated
84	431.8	17.00	66-243-23

3.7.1.6 Horizontal Front Sub Division Extrusions 66-240, IEEE

- Card guide can be applied
- Accept 2 x 6 mm tapped strips
- **Scope of delivery:**
  - 1 front double extrusion IEEE-special without assembly material





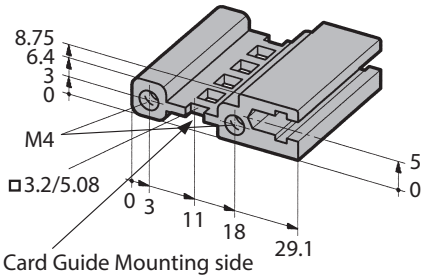
3.7.1.6 Standard Version

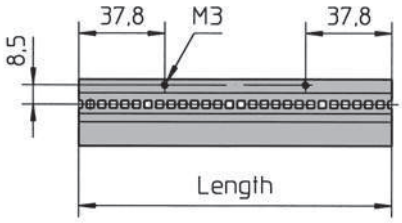
Length for HP	mm	inch	Part-No. clear passivated	raw
84	431.8	17.00	66-240-153	-
	1350.0	53.14	-	66-240-19

3.7.2 Internal Extrusions

3.7.2.1 Internal Extrusions 66-193 insulated Backplane Mounting

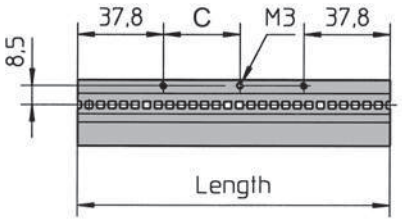
- For mounting back 1.7.3
- **Scope of delivery:**
  - 1 extrusion without assembly material





3.7.2.1 Standard Version

Length			Part-No.	
for HP	mm	inch	**clear passivated**	**raw**
32	167.6	6.60	66-193-26	-
42	218.4	8.60	66-193-20	-
63	325.1	12.80	66-193-21	-
81	416.6	16.40	66-193-22	-
84	431.8	17.00	66-193-23	-
	1350.0	53.14	-	66-193-19

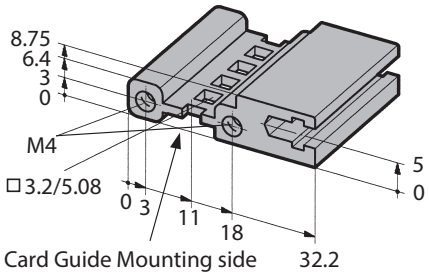


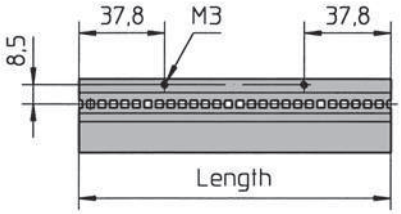
EMC Version

Length			Holes	Part-No.
for HP	mm	inch	**n x C**	**clear passivated**
42	218.4	8.60	2 x 71.42	66-193-60
63	325.1	12.80	2 x 124.76	66-193-61
81	416.6	16.40	2 x 170.48	66-193-62
84	431.8	17.00	4 x 89.05	66-193-29
84	431.8	17.00	2 x 178.1	66-193-63

3.7.2.2 Internal Extrusions 66-194 for conductive Backplane Mounting

- For mounting backplanes without an insulating strip
- **Scope of delivery:**
  - 1 extrusion without assembly material



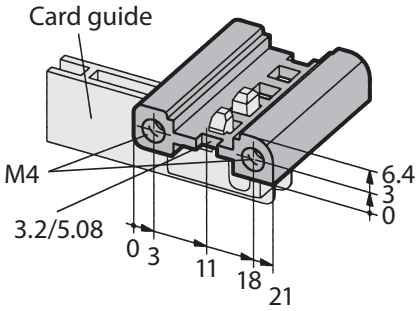


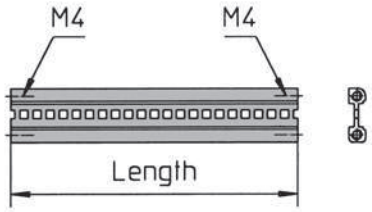
3.7.2.2 Standard Version

Length			Part-No.	
for HP	mm	inch	clear passivated	raw
42	218.4	8.60	66-194-20	-
63	325.1	12.80	66-194-21	-
84	431.8	17.00	66-194-23	-
	1350.0	53.14	-	66-194-19

3.7.2.3 Internal Extrusions 66-138 for Card Guides

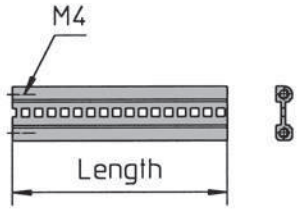
- For mounting card guides
- For rear I/O applications
- Tapped strip not required
- **Scope of delivery:**
  - 1 extrusion without assembly material





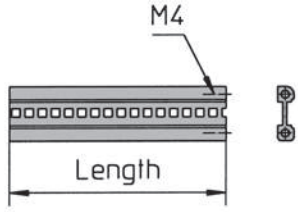
3.7.2.3 Standard Version

Length			Part-No.	
for HP	mm	inch	clear passivated	raw
21	111.8	4.40	66-138-28	-
28	147.3	5.70	66-138-25	-
32	167.6	6.59	66-138-29	-
42	218.4	8.60	66-138-26	-
63	325.1	12.79	66-138-27	-
81	416.6	16.40	66-138-22	-
84	431.8	17.00	66-138-23	-
	1350.0	53.14	-	66-138-19



Height Divider Left

Length			Part-No.
for HP	mm	inch	clear passivated
4.5	22.86	0.90	66-138-70
8.5	43.18	1.70	66-138-71
12.5	63.50	2.50	66-138-72
16.5	83.82	3.30	66-138-73

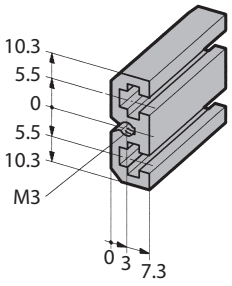


Height Divider Right

Length			Part-No.
for HP	mm	inch	clear passivated
4.5	22.86	0.90	66-138-80
8.5	43.18	1.70	66-138-81
12.5	63.50	2.50	66-138-82
16.5	83.82	3.30	66-138-83

3.7.2.4 Double Extrusions 66-192 for insulated Backplane Mounting

- For mounting backplanes, matches 66-193, 66-288
- For use with insulating strips
- Insulating strip see 2.8.2.6
- Assembly material with adapter: 63-175
- **Scope of delivery:**
  - 1 extrusion without assembly material



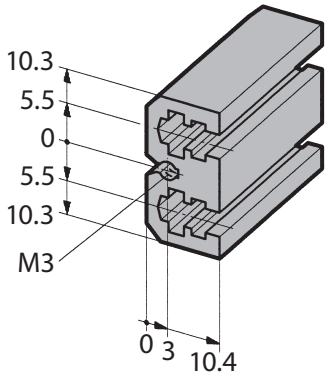
Length			Part-No.	
for HP	mm	inch	**clear passivated**	**raw**
84	431.8	17.00	66-192-24	-
	1350.0	53.14	-	66-192-14

Length			Part-No.
for HP	mm	inch	**clear passivated**
42	213.4	8.40	66-192-20
63	320.0	12.59	66-192-21
81	411.5	16.20	66-192-22
84	426.7	16.79	66-192-23

Assembly material with adapter: 63-175 (63K175 with Torx)

3.7.2.5 Double Extrusions 66-195 for conductive Backplane Mounting

- For mounting backplanes without insulating strips
- Matches 66-194, 66-289, 66-290
- Assembly material with adapter: 63-175
- **Scope of delivery:**
  - 1 extrusion without assembly material



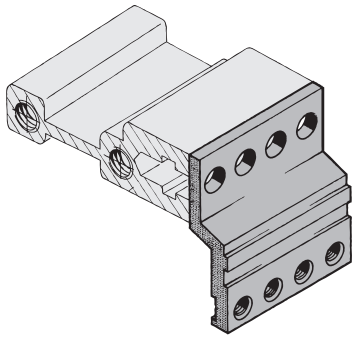
Length			Part-No.
for HP	mm	inch	**clear passivated**
84	431.8	17.00	66-195-24

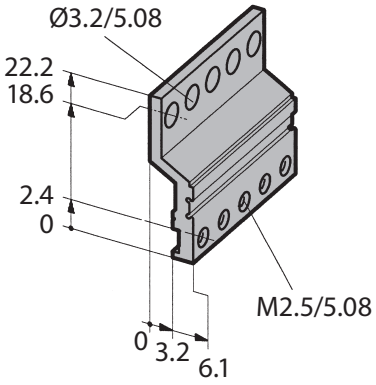
Length			Part-No.
for HP	mm	inch	**clear passivated**
81	411.5	16.20	66-195-22
84	426.7	16.77	66-195-23

Assembly material with adapter: 63-175 (63K175 with Torx)

3.7.2.6 Edge Connector Extrusions 66-147

- Supplementary edge connector extrusion for DIN 41612 (IEC 60603-2)
- Matches 66-112, 66-192, 66-193
- **Scope of delivery:**
  - 1 extrusion without assembly material

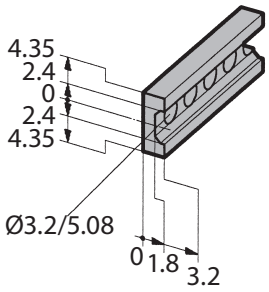




Length			Part-No.	
for HP	mm	inch	clear passivated	raw
8	40.6	1.59	66-147-40	-
18	91.4	3.59	66-147-41	-
28	142.2	5.60	66-147-42	-
42	213.4	8.40	66-147-63	-
63	320.0	12.60	66-147-65	-
81	411.5	16.20	66-147-22	-
84	426.7	16.80	66-147-52	-
	1350.0	53.14	-	66-147-19

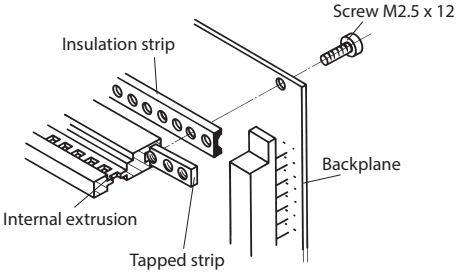
3.7.3 Insulating Strips 66-901

- Plastic grey
- In use with extrusions 66-112, 66-192, 66-193, 66-288
- **Scope of delivery:**
  - 1 insulating strip without assembly material



3.7.3.1 Insulating Strips 66-901

Length			Part-No.
for HP	mm	inch	
42	216.44	8.52	66-901-20
63	323.12	12.72	66-901-21
81	414.56	16.32	66-901-22
84	429.80	16.92	66-901-23



Mounting with Insulation Strips

Description	Part-No.
Cross recessed cylinderhead earthing screw M2.5 x 12	5325-12

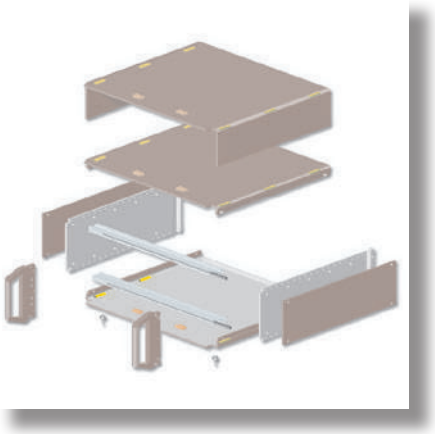


4: Stylebox 15 smart



4.1. Complete Stylebox 15 smart Kits	**B | 4_2**
4.1.1 Feet	B | 4_2
4.1.2 Foot / Cable Set (stone-grey)	B | 4_2
4.1.3 Earthing Set	B | 4_3

4.1 Complete Stylebox 15 Kits



4.1.1 Stylebox 15 Smart Kit

- **Scope of delivery:**
  - 2 height bezels (detail see 2.2.2)
  - 2 front extrusions (detail see 2.2.1)
  - 2 tapped strips M2.5 (detail see 2.2.1)
  - 1 top cover panel, solid, light grey (detail see 2.2.4)
  - 1 bottom cover panel, solid, light grey (detail see 2.2.5)
  - 2 internal side panels (detail see 2.2.3)
  - 2 external side panels, solid, light grey (detail see 2.2.6)
  - 1 set of 4 pieces plastic feet (detail see 2.2.5.2)
  - 1 set assembly material
  - 1 set of EMC gaskets (detail see 2.5.8.1)
- Rear panel have to be ordered separately, see 2.2.7

Description	Height	Width	Depth			
			155 mm 6.10"	245 mm 9.64"	305 mm 12.00"	395 mm 15.55"
Desktop without front handles	2 U	32 HP	15A01200-30	-	-	-
Desktop with front handles		42 HP		15A02212-30	15A02213-30	-
Desktop with front handles		63 HP		15A02222-30	15A02223-30	-
Desktop with front handles		84 HP		15A02242-30	15A02243-30	-
19" case with front handles		84 HP		15A03242-30	15A03243-30	-
Desktop with front handles	3 U	42 HP		15A02312-30	15A02313-30	-
Desktop with front handles		63 HP		15A02322-30	15A02323-30	15A02324-30
Desktop with front handles		84 HP		15A02342-30	15A02343-30	15A02344-30
19" case with front handles		84 HP		15A03342-30	15A03343-30	15A03344-30
Desktop with front handles	4 U	63 HP		-	15A02423-30	15A02424-30
Desktop with front handles		84 HP		-	15A02443-30	15A02444-30
19" case with front handles		84 HP		-	15A03443-30	15A03444-30

4.1.2 Rear Panel

- For Stylebox 15 Smart
- 2.5 mm Aluminium, front anodised, rear conductive
- **Scope of delivery:**
  - 1 rear panel
- Rear feet for portable desktop application see 2.2.9
- Rear panel drawing see 2.3.8
- Assembly material see below



4.2.1.1 Rear Panel

Description	Width	Height		
		2 U	3 U	4 U
Solid	32 HP	21A232	-	-
Solid	42 HP	21A242	21A342	-
Solid, portable desktop		-	-	-
Solid	63 HP	21A263	21A363	21A463
Solid, portable desktop		-	21A363-2	21A463-2
Solid	84 HP	21A284	21A384	21A484
Solid, portable desktop		-	21A384-2	21A484-2

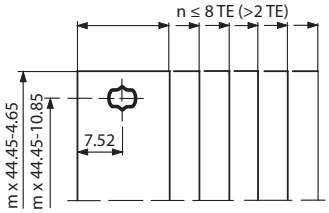
4.2.1.2 Assembly Material for Rear Panel

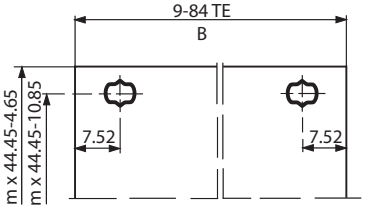
Description	Part-No.
Cross recessed pan shead screw M3x8	5330-08



4.1.3 Flat Front Panels

- For sub racks and enclosures, solid
- Aluminium 2.5 mm, clear anodised (non-conductive)
- **Scope of delivery:**
  - Flat front panel
- Front panel screws, see below
- 1 HP and 2 HP are divider extrusions (not flat panels)





4.1.3 Flat Front Panels for Sub Racks and Enclosures, Solid

Width	B		Height			Part-No.		
	mm	inch	1 U 39.8 mm	ca. 1 U* 42.15 mm	2 U 84.2 mm	3 U 128.7 mm	4 U 173.1 mm	6 U 262.0 mm
1 HP	5.0	0.19	—	—	—	66-115-21	—	66-115-25
2 HP	10.0	0.39	—	—	—	21N302	—	21N602
3 HP	15.2	0.59	—	—	—	21N303	21N403	21N603
4 HP	20.1	0.79	—	—	—	21N304	21N404	21N604
5 HP	25.2	0.99	—	—	—	21N305	21N405	21N605
6 HP	30.3	1.19	—	—	—	21N306	21N406	21N606
7 HP	35.3	1.38	—	—	—	21N307	21N407	21N607
8 HP	40.4	1.59	—	—	—	21N308	21N408	21N608
10 HP	50.6	1.99	—	—	—	21N310	21N410	21N610
11 HP	55.7	2.19	—	—	—	21N311	—	—
12 HP	60.7	2.38	—	—	—	21N312	21N412	21N612
14 HP	70.9	2.79	—	—	—	21N314	21N414	21N614
16 HP	81.1	3.19	—	—	—	21N316	21N416	21N616
20 HP	101.4	3.59	—	—	—	21N320	21N420	21N620
21 HP	106.5	4.19	—	—	—	21N321	21N421	21N621
28 HP	142.0	5.59	—	—	—	21N328	—	21N628
32 HP	162.3	6.38	—	—	21N232	21N332	21N432	—
42 HP	213.1	8.38	—	—	21N242	21N342	21N442	21N642
52 HP	263.9	10.38	—	—	—	21N352	21N452	21N652
63 HP	319.8	12.59	—	—	21N263	21N363	21N463	21N663
81 HP	411.3	16.19	—	—	21N281	21N381	21N481	21N681
84 HP	426.5	16.79	21N184	21N084*	21N284	21N384	21N484	21N684

* Coverplates for 1 U fan opening

Use Elma's front panel center for the processing, coloring, digital and anodized digital aluminium printing and installation of your operating unit.

Front Panel Screws

- Set of 10 screws, with screw retainer

Description	Part-No. 10 pcs.
Milled edge screws recessed M2.5 x 11.3 with plastic screw retainer	63-159



reddot award 2014
winner





5.1 Design Enclosure iD-Box 16 **B | 5_3**

5.1.1 iD-Box 16 - Size 1 B | 5_3

5.1.2 iD-Box 16 - Size 2 B | 5_4

5.1 Design Enclosure iD-Box 16



5.1.1 iD-Box 16 Size 1

Scope of delivery:

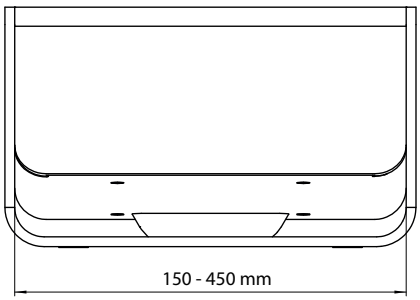
- 1 enclosure, powder coated
- 1 profile, powder coated
- 1 aluminium front panel with anodized digital printing
- 1 rear panel, powder coated
- 1 handle, powder coated
- 2 bezels, powder coated
- 1 feet, powder coated
- 2 earthing bolts
- 1 mounting plate

5.1.1 iD-Box 16 Size 1

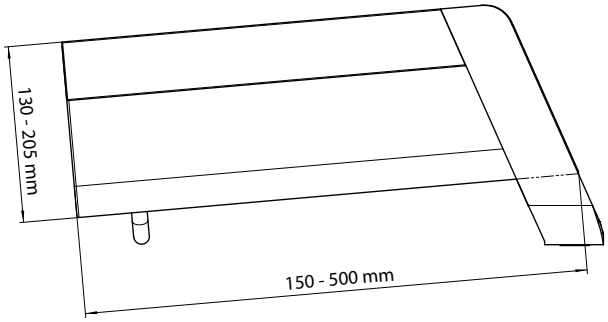
Size	Part-No.
1	16-10001*

*customized solutions are possible

Front view



Side view



Main features:

- Standard-independent system
- High design aestetics
- Ergonomic HMI-Interface with sloping front
- Adaptable sizes (height, width and depth)
- Individual colour combination
- Customer-specific design front panels and HMI-interface
- EMV-Level: Basic or Advanced
- Flexible mounting options of your electronics
- Thermal analysis on request

Possible customizations:

- Dimensions (height, width and depth)
- Colour combination
- Front and rear panel design
- Integration of the front panel components
- Mounting options of electronics
- EMV-Level: Advanced
- Components the front and rear panels

Technical characteristics:

- Dimensions height (mm): 130 - 205
- Dimensions width (mm): 150 - 450
- Dimensionen depth (mm): 150 - 500
- Degree of protection: IP40
- EMV-Level: Basic
- Aluminium front panel: anodized natural, cut edges raw

Typical applications:

- Test and measurement technology
- Sensor technology
- Medical equipment
- Mobile test and measurement
- Testing and calibrating devices
- Optical and mechanical measuring systems

5.1 Design Enclosure iD-Box 16



5.1.2 iD-Box 16 Size 2

Scope of delivery:

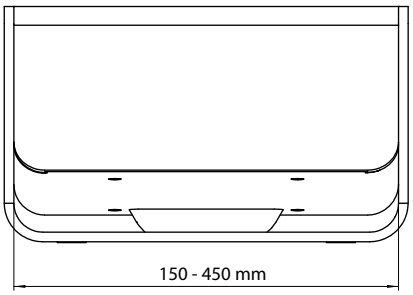
- 1 enclosure, powder coated
- 1 profile, powder coated
- 1 aluminium front panel with anodized digital printing
- 1 rear panel, powder coated
- 1 handle, powder coated
- 2 bezels, powder coated
- 1 feet, powder coated
- 2 earthing bolts
- 1 mounting plate

5.1.2 iD-Box 16 Size 2

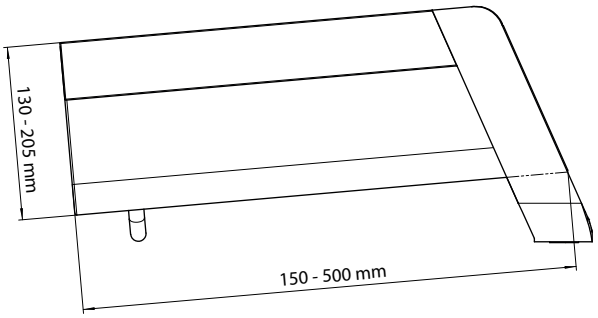
Size	Part-No.
2	16-10002

*customized solutions are possible

Front view



Side view



Main features:

- Standard-independent system
- High design aestetics
- Ergonomic HMI-Interface with sloping front
- Adaptable sizes (height, width and depth)
- Individual colour combination
- Customer-specific design front panels and HMI-interface
- EMV-Level: Basic or Advanced
- Flexible mounting options of your electronics
- Thermal analysis on request

Possible customizations:

- Dimensions (height, width and depth)
- Colour combination
- Front and rear panel design
- Integration of the front panel components
- Mounting options of electronics
- EMV-Level: Advanced
- Components the front and rear panels

Technical characteristics:

- Dimensions height (mm): 80 - 130
- Dimensions width (mm): 100 - 450
- Dimensionen depth (mm): 120 - 300
- Degree of protection: IP40
- EMV-Level: Basic
- Aluminium front panel: anodized natural, cut edges raw

Typical applications:

- Test and measurement technology
- Sensor technology
- Medical equipment
- Mobile test and measurement
- Testing and calibrating devices
- Optical and mechanical measuring systems

6: Classicbox 32



6.1 Classicbox 32 Overview B | 6_3



6.2 Basic Case B | 6_4

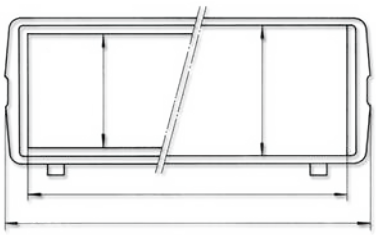


6.3 Assembly Accessories **B | 6_5**

6.3.1 Front Panel B | 6_5

6.3.2 Mounting Chassis B | 6_6

6.3.3 EMC Chassis Kit B | 6_6



6.4.3 Handle **B | 6_8**

6.3.5 Feet B | 6_9

6.3.7 Foot / Cable Set (stone-grey) B | 6_9

6.3.8 Earthing Set B | 6_10

6.4 Dimensions of Classicbox 32 B | 6_11

6.4.1 Basic Case Dimensions B | 6_11



6.1 Classicbox 32 Overview

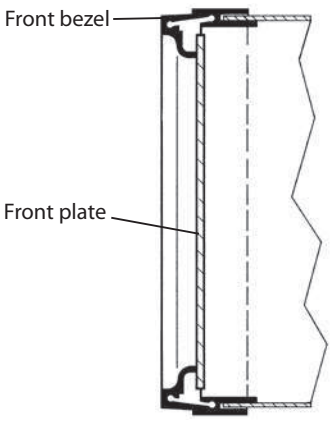
- The method of construction together with the comprehensive range of accessories allows a wide variety of possible combinations
- This all-aluminium case is easily assembled from just a few parts and, when in service, offers quick and total access to the interior for maintenance purposes
- The bezels, top and bottom covers are non-loadbearing all internal parts being mounted on the depth extrusion

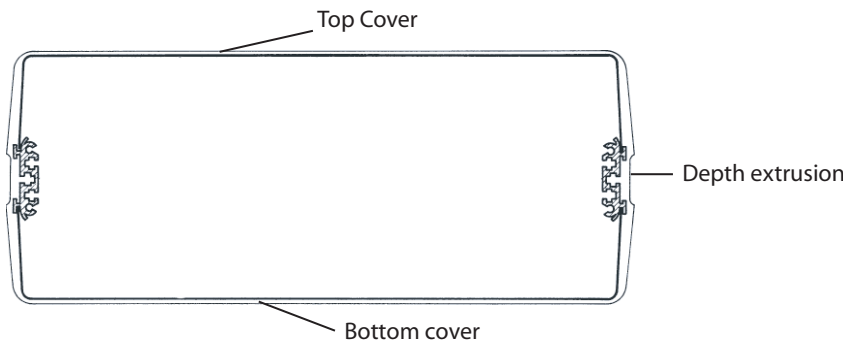
Bezel
- The bezels are fixed to the depth extrusion by means of 2 screws from the side
- The bezel conceals all the fixing screws in the front plate (no visible screws from the front)

Top and bottom cover plates
- Solid top and bottom cover plates made from powdered aluminium (ventilation slits available on request)
- The bottom plates are supplied with four black feet attached

Colour
- The aluminium cover plates have a powder coated surface and are available in silver (RAL 9006) as standard
- Front and rear bezels as well as depth extrusions are powder-coated in charcoal (RAL 7016)
- You find our most common colours in chapter 6.4, but we can deliver your customised Classicbox 32 in any other colour.

Application
- For applications where easy handling, shape and colour are decisive factors
- By taking advantage of the available accessories, non-standard components can be mounted in addition to standardized parts







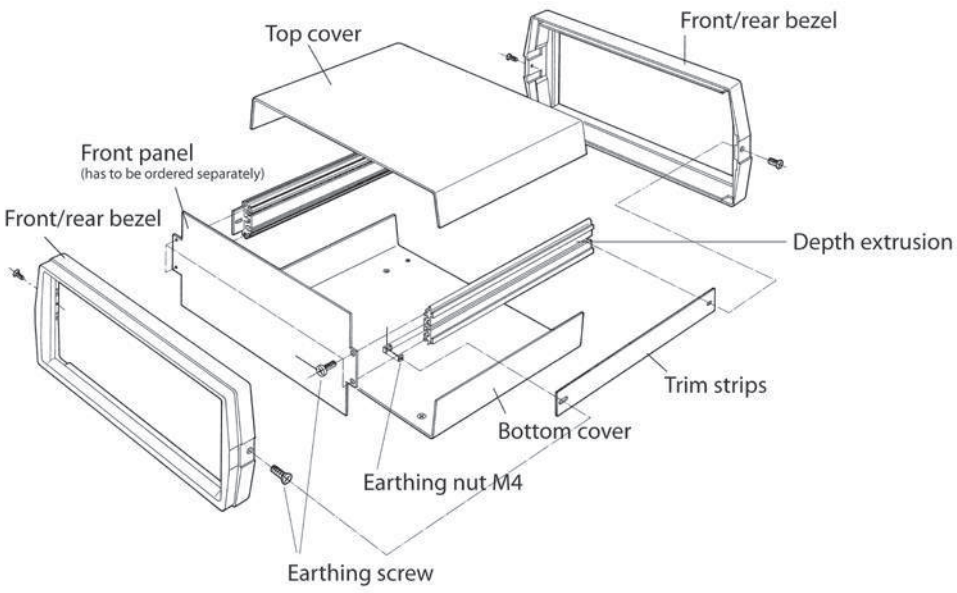
6.2 Basic Case

- **Scope of delivery:**
  - 2 depth extrusions
  - 2 trim strips
  - 1 bottom cover incl. black feet
  - 1 top cover
  - 2 front bezels
  - Assembly material
- Note: Front panel is not included with the basic model. See 3.3.1



6.2 Basic Case

Height	Depth		Width		
	mm	inch	42 HP	63 HP	84 HP
2 U	260	10.23	32-72212-10		
	340	13.38	32-72213-10		
3 U	260	10.23	32-72312-10		
	340	13.38		32-72323-10	
4 U	340	13.38		32-72423-10	
	340	13.38			32-72443-10





6.3 Assembly Accessories

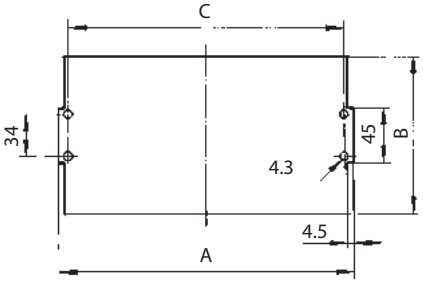
6.3.1 Front Panel

- This panel is mounted directly onto the ends of the depth sections for good case stability
- Front panels can be removed after removal of the bezel
- A full-width panel can be mounted at the front or rear of the case
- Accepts controls, indicators, connectors, etc.
- Aluminium 3 mm, anodised
- **Scope of delivery:**
  - 1 front panel
  - 4 cross recessed cylinder screws M4 x 10



6.3.1 Front Panel

Height	Width		
	42 HP	63 HP	84 HP
2 U	32-25210-00		
3 U	32-25310-00	32-25320-00	
4 U		32-25420-00	32-25440-00



Width		42 HP		63 HP		84 HP
Height		2 U	3 U	3 U	4 U	4 U
A	mm	241.44	241.44	348.12	348.12	454.80
	inch	9.50	9.50	13.70	13.70	17.90
B	mm	84.55	129.00	129.00	173.45	173.45
	inch	3.32	5.07	5.07	6.83	6.83
C	mm	232.44	232.44	339.12	339.12	445.80
	inch	9.15	9.15	13.35	13.35	17.55

6.3.2 Mounting Chassis

- Formed from 2 mm (0.07") sheet aluminium in various sizes to match the height and width of case used
- The chassisis mounted directly onto the depth extrusions
- **Scope of delivery:**
  - 1 Mounting chassis (aluminium raw)
  - Fixing material





6.3.2 Mounting Chassis

Height	Depth		Width		
	mm	inch	42 HP	63 HP	84 HP
2 U / 3 U	180	7.08	32-23312-00		
	240	9.44	32-23313-00	32-23323-00	
	300	11.81		32-23324-00	
4 U	240	9.44		32-23623-00	32-23643-00
	300	11.81		32-23624-00	32-23644-00

6.3.3 EMC Chassis Kit

"Electromagnetic comptability is the ability of a system to operate in the intended environment without causing or suffering unacceptable degradation of performance due to unintentinal electromagnetic radiation or response." The EMC characterstics of a system therefore consist of an appropriate immunity from interference (noise immunity) and a limited emission of interference (noise emission).

Elma's EMC concept describes three levels of electromagnetic shielding performance (Performance Level). The attenuation levels will simplify the selection of sub racks for the user. Test setup: The first measurement E1 is without the enclosure. The next measurement E2 is made with the transmitting antenna installed inside the enclosure. The difference between the received signal without and with the enclosure represents the shielding effectiveness in dB.

Performance Level	30 - 230 MHz	230 - 1000 MHz	1000 - 2000 MHz
1 / Elma: Basic level	20 dB	10 dB	0 dB
2 / Elma: Advanced level	40 dB	30 dB	20 dB
3 / Elma: Superior level	60 dB	50 dB	40 dB

Throughout the catalogue we have put these EMC parts **in a yellow table**.

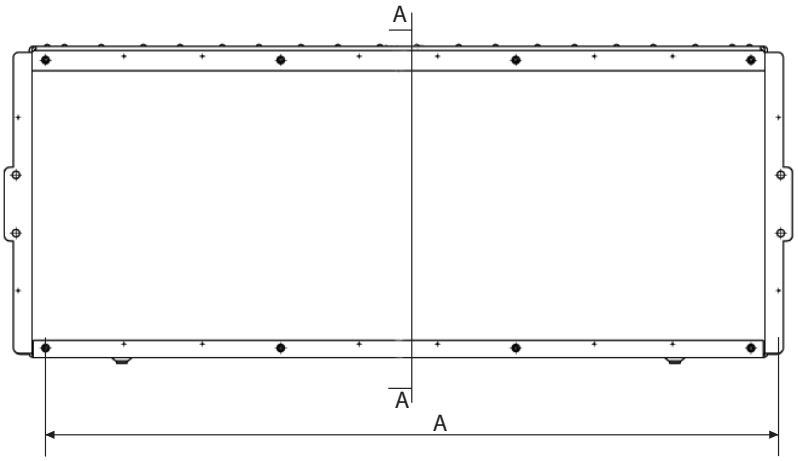
6.3.3 EMC Chassis Kit

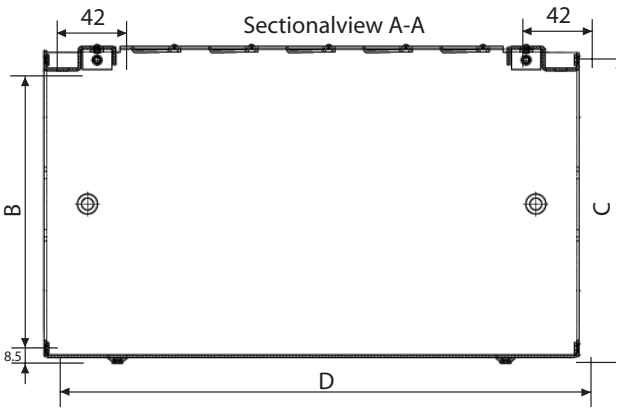
- For EMC Advanced level
- **Scope of delivery:**
  - 1 aluminium chassis, conductive
  - 2 front-/rear panels (front anodised, rear conductive)
  - Assembly material



6.3.3 EMC Chassis Kit

Height	Depth		Width		
	mm	inch	42 HP	63 HP	84 HP
2 U	260	10.23	32-722-12		
	340	13.38	32-722-13		
3 U	260	10.23	32-723-12		
	340	13.38		32-723-23	
4 U	340	13.38		32-724-23	
	340	13.38			32-724-43



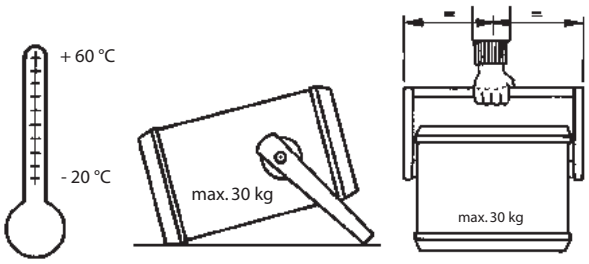


EMC Chassis Dimensions

Case size	A		B		C		D	
	mm	inch	mm	inch	mm	inch	mm	inch
2 U x 42 HP x 260 mm	214.1	8.43	68.4	2.69	89.6	3.53	232.2	9.14
2 U x 42 HP x 340 mm	214.1	8.43	68.4	2.69	89.6	3.53	312.2	12.29
3 U x 42 HP x 260 mm	214.1	8.43	112.8	4.44	134.1	5.28	232.2	9.14
3 U x 63 HP x 340 mm	320.8	12.63	112.8	4.44	134.1	5.28	312.2	12.29
4 U x 63 HP x 340 mm	320.8	12.63	157.3	6.19	178.5	7.03	312.2	12.29
4 U x 84 HP x 340 mm	457.5	18.00	157.3	6.19	178.5	7.03	312.2	12.29

6.3.4 Handle

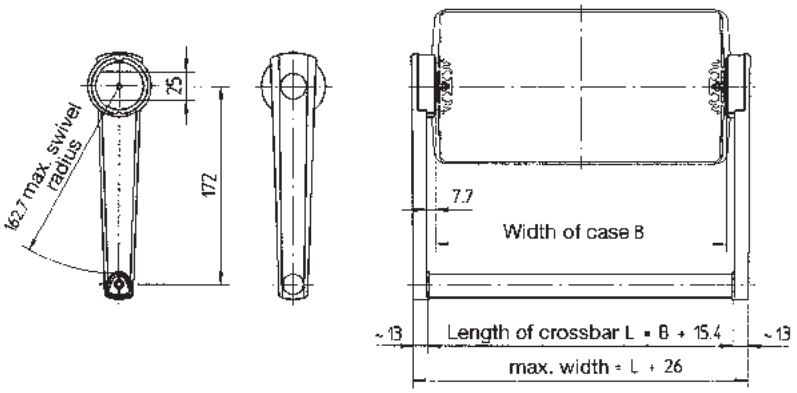
- The new carry handle is easy to mount, lightweight but robust
- The handle has a press button mechanism which locks in increments of 30°
- The fully assembled side arms are made from glass fibre reinforced and impact modified Polyamide (UL94 HB)
- Safe carrying is ensured with the aluminium cross bar coated with black non-slip varnish
- Portable units up to 4 U high
- **Scope of delivery:**
  - 2 side arms assembled
  - 1 cross bar
  - Assembly material
  - Assembly instruction
- Note: the assembly instructions contains a drilling template for marking the fixing holes





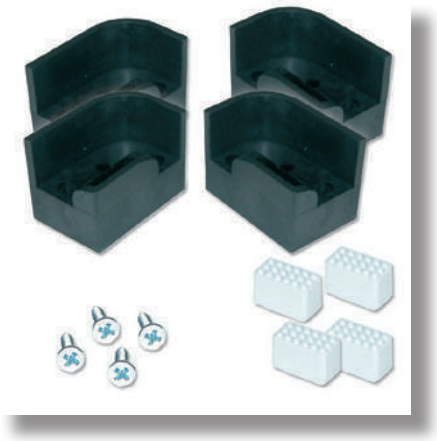
6.3.5 Handle

Width	L		B		Part-No
	mm	inch	mm	inch	
42 HP	266.44	10.49	251.04	9.88	32-590-61
63 HP	373.12	14.69	357.72	14.08	32-590-62
84 HP	479.80	18.89	464.40	18.28	32-590-64



6.3.6 Feet

- The feet are made of reinforced polyamide and are screwed onto the corners of the rear bezel. This does not reduce the inside dimensions of the bezel
- Rubber inserts pressed into the feet ensure that they do not slip
- The feet protrude approximately 10 mm from the bezel
- The main purpose of the feet is to prevent damage to the rear bezel when the case is lifted and set down using the case handle
- For use on front and rear bezel, protrude approx. 10 mm / 0.4”
- **Scope of delivery:**
  - 2 feet right
  - 2 feet left
  - 4 earthing screws M3
  - 1 adhesive tape
  - 4 rubber inserts
  - Assembly instructions



6.3.6 Feet

Case Height	Black
3 U / 4 U	32-530

6.3.7 Foot / Cable Set (stone-grey)

- The cable cramp foot is made of stone-grey (Elma special grey) aluminium section and is designed to be screwed to the rear bezel
- Caps of black NBR rubber prevent the case from slipping on smooth surfaces
- Inside dimensions are not reduced as a result
- The mains cable is wound onto the cable cramp
- The cable cramp foot is used with all portable units. It protects the rear bezel and other possible components (plugs, etc.) from damage when the case is set down
- Mains and signal cable are easily wound onto the cramp
- **Scope of delivery:**
  - 2 foot / cable cramps
  - 4 feet caps
  - Assembly material
- The drilling template needed to position the holes has to be ordered separately

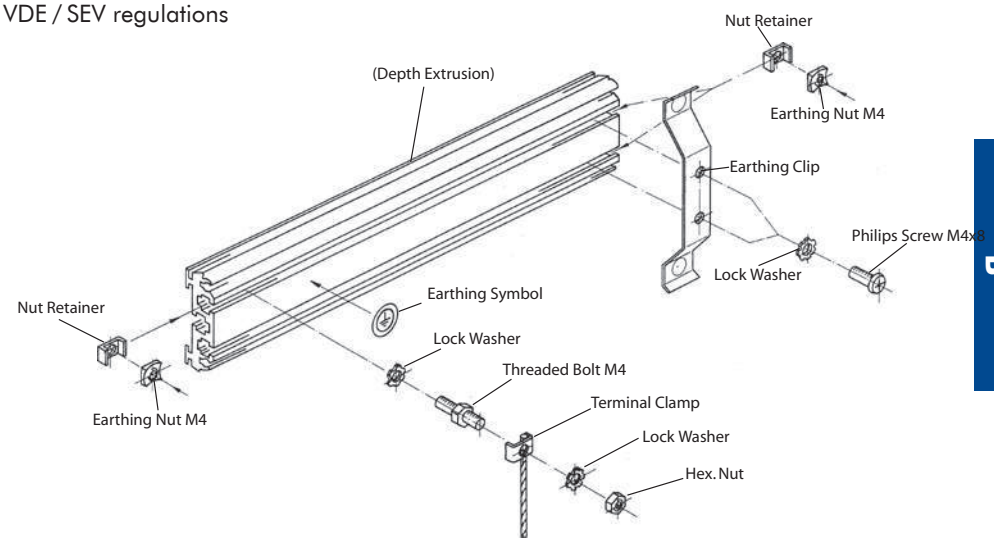


6.3.7 Foot / Cable Set (stone-grey)

Description	3 U	4 U
Foot / cable set (incl. fixing material)	32-518-17	32-518-18
Drilling template for foot / cable cramp	61-540	61-541

6.3.8 Earthing Set

- The earthing set consists of an earthing terminal and earthing clips to ensure electrical conduction between the component parts of the case
- The set enables the case to be earthed to VDE / SEV regulations
- **Scope of delivery:**
  - 4 cross recessed screws M4x8
  - 1 hexagonal nut M4
  - 5 nut retainers
  - 2 earthing clips
  - 5 earthing nuts M4
  - 1 threaded bolt M4
  - 1 terminal clamp
  - 1 earthing symbol
  - 6 lock washers



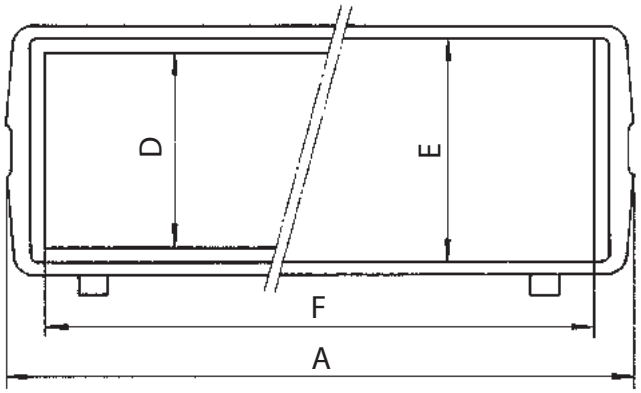


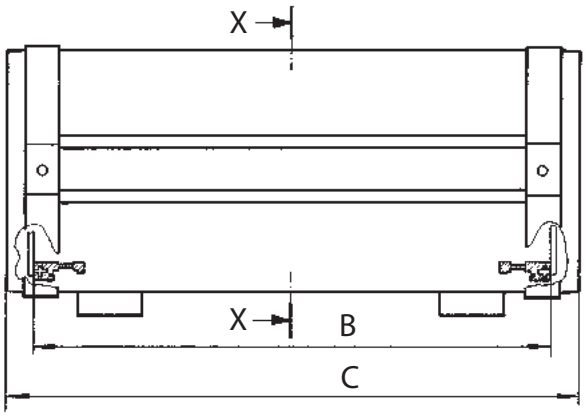
6.3.8 Earthing Set

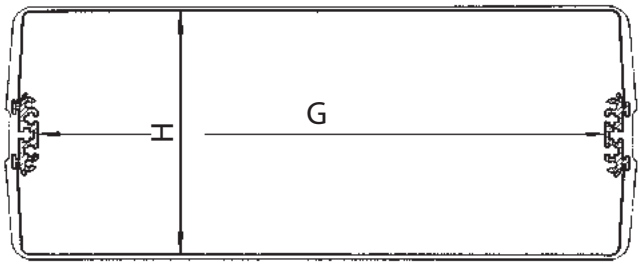
Description	Part-No.
Earthing set	32-521

6.4 Dimensions of Classicbox 32

6.4.1 Basic Case Dimensions







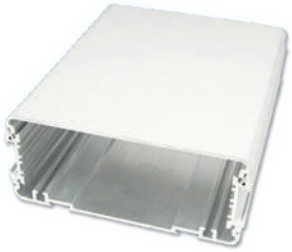
3.4.1 Basic Case Dimensions

U	HP	Overall Width A		Overall Depth C		Max. usable Depth B		Accept. Dimensions D		E		F		Internal Width G		Internal Height H	
		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
2	42	260	10.23	260	10.23	229	9.01	68.4	2.69	85	3.34	214	8.42	222.44	8.75	94.25	3.71
				340	13.38	309	12.16										
3	42	260	10.23	260	10.23	229	9.01	112.9	4.44	129.5	5.09	214	8.42	222.44	8.75	138.70	5.46
3	63	366	14.40	340	13.38	309	12.16	157.3	6.19	173.9	6.84	320.6	12.62	329.12	12.95	138.70	5.46
4	63	366	14.40	340	13.38	309	12.16	157.3	6.19	173.9	6.84	320.6	12.62	329.12	12.95	183.15	7.21
4	84	473	18.62	340	13.38	309	12.16	157.3	6.19	173.9	6.84	427.3	16.82	435.80	17.15	183.15	7.21

Notes

7: Guardbox 33









7.1 Guardbox 33 Overview **B | 7_3**

7.1.1 Complete Guardbox 33 Kit's B | 7_7

7.2 Basic Case **B | 7_9**

7.2.1 Basic Case Light Grey B | 7_9

7.2.2 Basic Case Black B | 7_9

7.2.3 Basic Case Pebble Grey B | 7_9

7.3 Bezel **B | 7_10**

7.4 Front / Rear Panel **B | 7_10**

7.4.1 Front / Rear Panel B | 7_10

7.4.2 Replacement Seals IP65 B | 7_11

7.4.3 Replacement Seals IP54/EMC B | 7_11



7.5 Accessories **B | 7_12**

7.5.1 Assembly Material B | 7_12

7.5.2 Assembly Instructions B | 7_12

7.5.3 Supplementary EMC Gasket Set B | 7_13

7.5.4 Handles B | 7_14

7.5.5 Bracket for Mounting in Consoles B | 7_16

7.5.6 Sliding Blocks for Handle Slots and Feet Slots B | 7_17

7.5.7 Single-Eurocard Mounting Sets B | 7_18

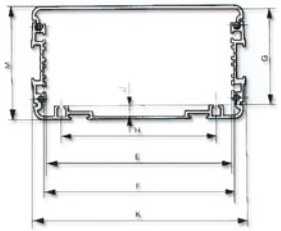
7.5.8 Card Guides B | 7_20

7.5.9 Mounting Set for Plug-In Units (Single Eurocards) B | 7_21

7.5.10 Card Stop Set B | 7_23

7.5.11 Mounting Plates B | 7_24

7.5.12 Earthing Terminal B | 7_24



7.6 Dimensions / Technical Information **B | 7_25**

7.6.1 Cross Sections of Extrusions B | 7_25

7.6.2 Line Drawings B | 7_25

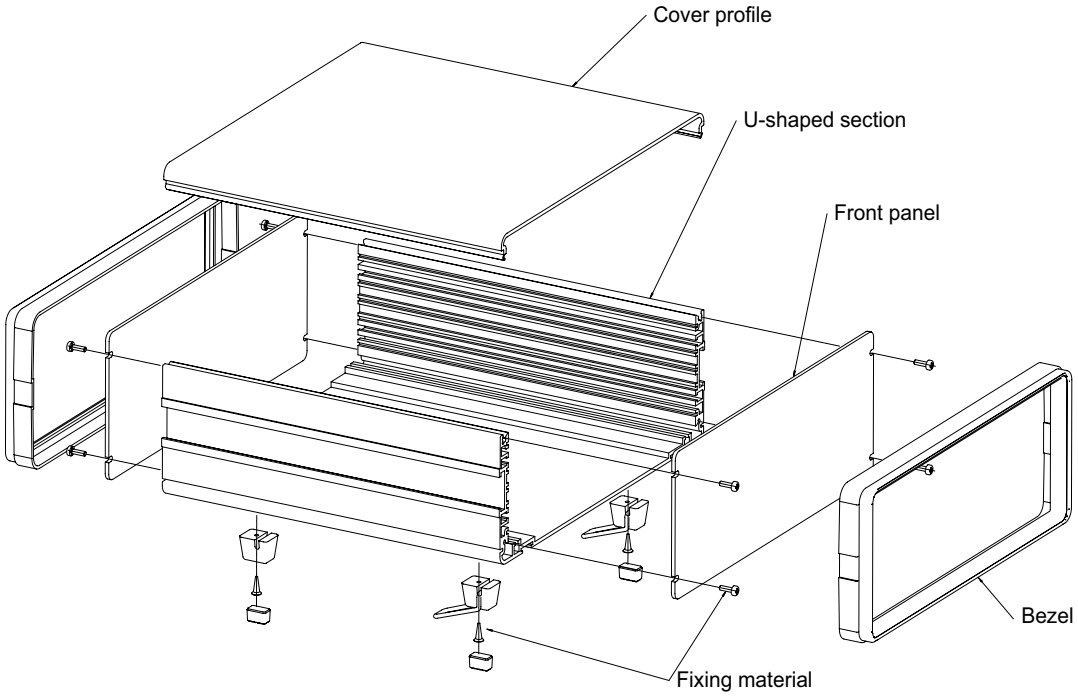
7.6.3 IP Protection Classes B | 7_26

7.6.4 Climatic and Mechanical Tests B | 7_27



7.1 Guardbox 33 Overview

- The Elma Guardbox 33 is manufactured from 2 aluminium sections only
- A U-shaped section forms the bottom with integrated sides and provides superior strength
- The extruded cover is held in place by the screws used for front/rear panel mounting
- The main features of this vibration-proof case are its rugged construction, ease of assembly and serviceability as well as its modern design
- The four screws used to assemble the Guardbox 33, and the fastenings for the feet and handle, are not visible
- The position of the feet is infinitely variable, allowing the case to be tilted to any angle within certain limits
- The aluminium design provides a high level of interference attenuation
- This compact case is available with or without ventilation slots in the base and front/rear panels
- Protection to IP30 is assured with ventilation slots, IP40 without ventilation slots
- A special sealing set allows the Guardbox 33 to be adapted to conform to protection class IP65
- This compact case is ideally used for test and measurement instruments, drive modules as well as for controls where rugged construction, design, colour and ease of serviceability are important
- The Guardbox 33 can easily accept single and double Eurocards as well as non-standard board sizes or other components





Sturdy, flexible and portable

Suitable for
- Mounting grooves
- Mounting panels
- Single eurocard
- Double eurocard (direct arrangement with case size 2, 3 and 5)

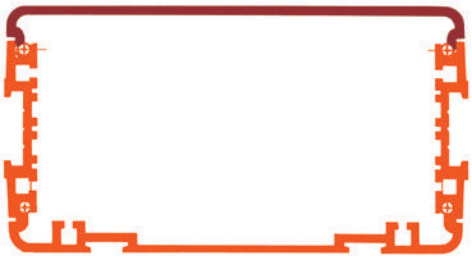
Application examples
- Measurement, control and test instrumentation
- Laboratory and maintenance equipment
- Equipment on train, trams, etc.

Versions
- EMC as standard
- IP65
- IP54 and EMC combined

Description
- Sturdy
- Handy
- Ease of service access
- Tilt-up feet
- No visible screws
- Optional carrying handle

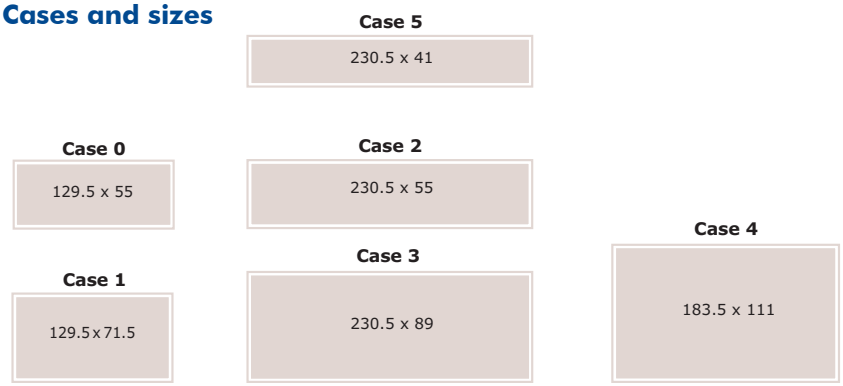
Thermal Solutions
- Bottom with or without air perforation
- Front/rear panel with or without air perforation

Colours
- Colours bottom and cover: light grey (RAL 7035), black (RAL 9005), pebble grey (RAL 7032), other colours acc. to colour list upon request (MOQ: 10 pcs., no stock)
- Colours bezel: light grey (RAL 7035), black (RAL 9011), stone grey (RAL 7030)



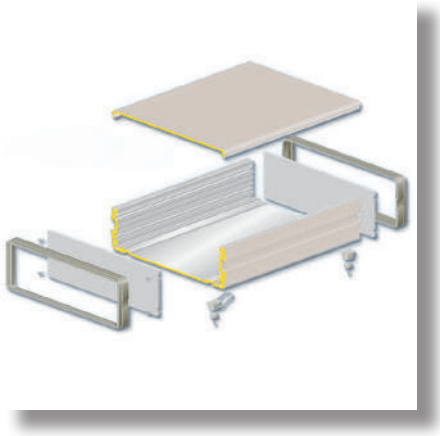
The basic case consists of two aluminium extrusions and guarantees optimal and professional packaging of your boards or components.

Cases and sizes

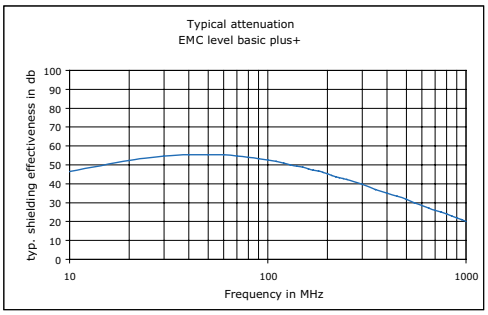


The Guardbox 33 series comes in 3 different widths and overall 6 different sizes to meet many different requirements.

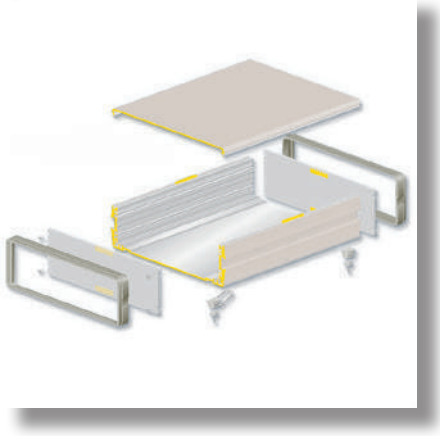
Guardbox 33 Standard



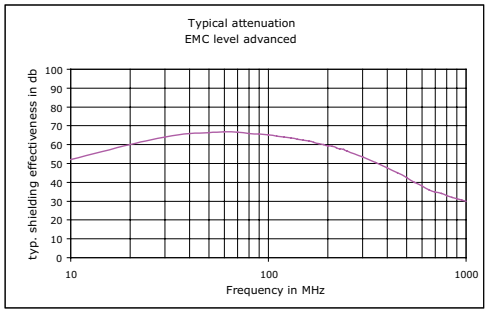
- EMC level basic plus+
- Top and bottom extrusions as well as front panels have conductive connections
- This provides effective EMC protection



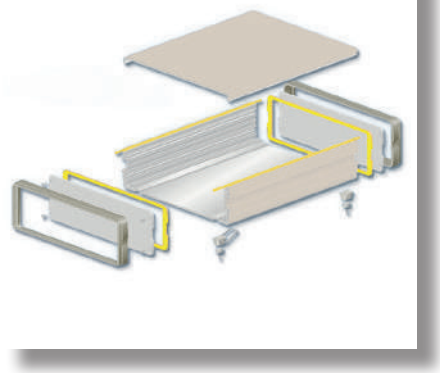
Guardbox 33 EMC



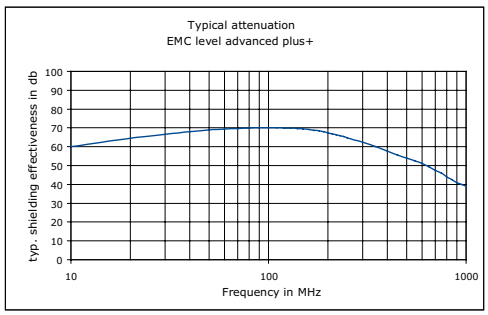
- EMC level advanced
- Standard housing and additional EMC Gasket set
- The EMC case for demanding applications!



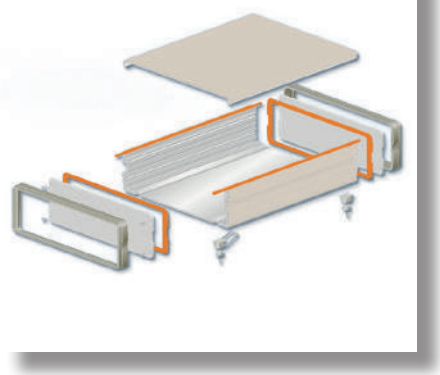
Guardbox 33 IP54 and EMC



- EMC level advanced plus+
- Standard housing and additional IP54/EMC set
- The EMC case for the most demanding applications!
- This version protects your electronics ainst splashes and dust



Guardbox 33 IP65



- This version protects your electronics against dust and water jets from a nozzle in all directions

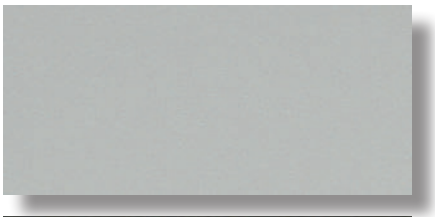
Colours

Powder Coating

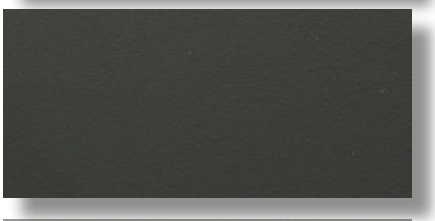
Powder coating is a method of applying coatings to surfaces without using solvents. The coating is applied as a free flowing powder and heated to cause it to flow and adhere to the surface. The powder may be a thermoplastic or a thermoset polymer. It is normally used to create a hard finish on metals. Powder coating is mainly used for coating of metals, such as "white goods", aluminium extrusions and automobiles. The polymer used by Elma is polyester-epoxy.

The most common way of applying the powder coating is to spray the powder using an electrostatic gun. The gun imparts an electric charge on the powder, which is then sprayed to the object which is grounded. The object is then heated, and the powder melts to form a hard coating.

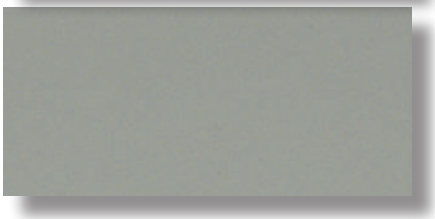
Colour samples (Standard-colours):



- Light grey, RAL 7035, structure, silky lustre

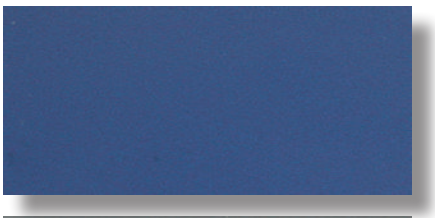


- Jet black, RAL 9005, structure, silky lustre



- Pebble grey, RAL 7032

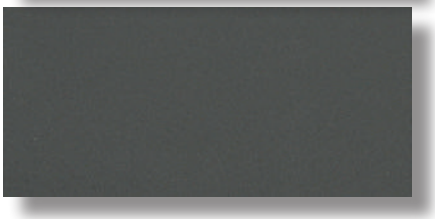
Other colours (options):



- Elma blue, Pantone 280C, structure, silky lustre



- Blue grey, NCS 5010-R 90B, structure, silky lustre



- Anthrazit, PES5803 E713 85A10, structure, silky lustre

Wet Painting

In a general, lacquer is a clear or coloured coating, that dries by solvent evaporation only which produces a hard, durable finish, that can be polished to a very high gloss, and gives the illusion of depth.



- Silver/Berluran Pantone 043.094.190, smooth

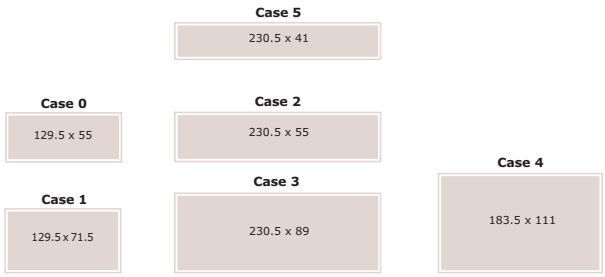
Note: other colours available upon request

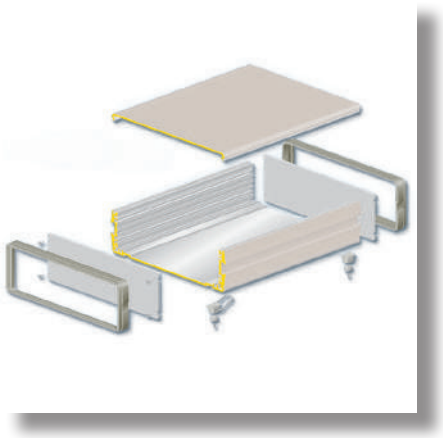
7.1.1 Complete Guardbox 33 Kit's

You find the most used complete kit's below.

With the new order structure (see "Configuration" on next page) you have however the possibility of configure your individual housing in different steps. Use this offer or contact us for further information or any other help.

Cases and sizes





7.1.1 Guardbox 33 Kit EMC Basic

- Scope of delivery:
  - 1 basic case without perforation (detail see 4.2)
  - 2 bezels (detail see 4.3)
  - 2 front / rear panels without perforation (detail see 4.4)
  - 1 set assembly material (detail see 4.5.1)

Case Size	Colour	Depth			
		120 mm 4.72"	180 mm 7.08"	240 mm 9.44"	300 mm 11.81"
0	black	33E012-25	33E018-25	33E024-25	-
0	light grey	33E012-45	33E018-45	33E024-45	-
1	black	33E112-25	33E118-25	33E124-25	-
1	light grey	33E112-45	33E118-45	33E124-45	-
2	black	-	-	33E224-25	33E230-25
2	light grey	-	-	33E224-45	33E230-45
3	black	-	-	33E324-25	33E330-25
3	light grey	-	-	33E324-45	33E330-45
4	black	-	33E418-25	33E424-25	33E430-25
4	light grey	-	33E418-45	33E424-45	33E430-45
5	black	-	33E518-25	33E524-25	-
5	light grey	-	33E518-45	33E524-45	-

Configuration

- The flexible way of setting your Guardbox 33 up:

Basic Case:
- Type
- Depth
- With/without perforation



Colour



4.2.1 Light Grey | **4.2.3 Pebble Grey** | **4.2.2 Black**

4.3 Bezel
(order 2 bezels per case)



4.4 Front-/Rear Panel

Solid
(order 2 panels per case)

With Perforation
(order 2 panels per case)

IP65 incl. gasket
(order 1 set per case)

IP54 / EMC
(order 1 set per case)

4.5.1 Assembly Material:
- Colour
- Case size

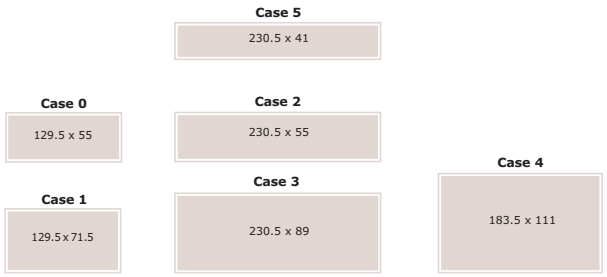


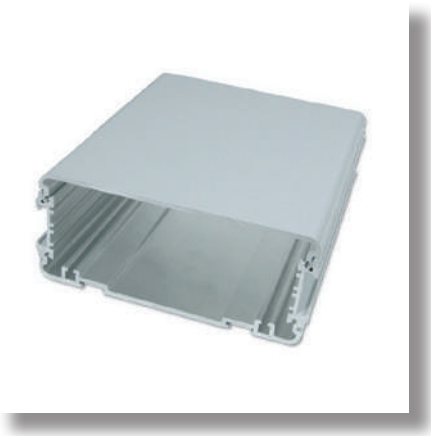
Options
- 4.5.2 Assembly instructions
- 4.5.3 EMC level advanced
- 4.5.4 Carrying handle
- 4.5.5 Case mount
- 4.5.6 Bracket
- 4.5.7 Sliding blocks
- 4.5.8 Eurocard mounting sets
- 4.5.9 Card guides
- 4.5.10 Plug-in Units
- 4.5.11 Card stop
- 4.5.12 Mounting plates
- 4.5.13 Earthing terminal

7.2 Basic Case

- Extruded aluminium
- Powder coated
- With or without air perforation slots in bottom
- **Scope of delivery:**
  - 1 U-shaped bottom
  - 1 cover

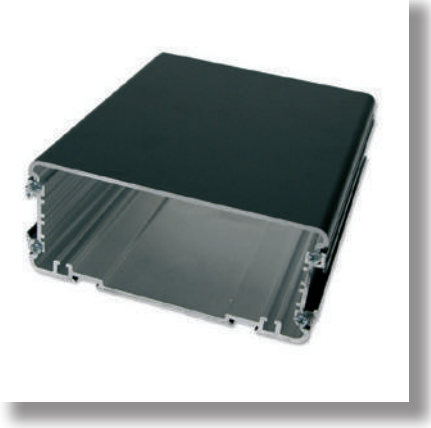
Cases and sizes





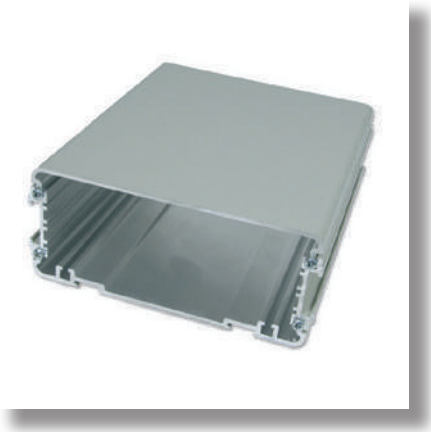
7.2.1 Basic Case Light Grey

Case Size	Without Air Perforation				With Air Perforation	
Depth mm	120	180	240	300	240	300
Depth inch	4.72	7.08	9.44	11.81	9.44	11.81
0	33E717	33E721	33E725	-	-	-
1	33E705	33E709	33E713	-	-	-
2	-	-	33E733	33E737	33E734	33E738
3	-	-	33E757	33E761	33E758	33E762
4	-	33E777	33E781	33E785	33E782	33E786
5	-	33E741	33E744	-	-	-



7.2.2 Basic Case Black

Case Size	Without Air Perforation				With Air Perforation	
Depth mm	120	180	240	300	240	300
Depth inch	4.72	7.08	9.44	11.81	9.44	11.81
0	33E717-06	33E721-06	33E725-06	-	-	-
1	33E705-06	33E709-06	33E713-06	-	-	-
2	-	-	33E733-06	33E737-06	33E734-06	33E738-06
3	-	-	33E757-06	33E761-06	33E758-06	33E762-06
4	-	33E777-06	33E781-06	33E785-06	33E782-06	33E786-06
5	-	33E741-06	33E744-06	-	-	-



7.2.3 Basic Case Pebble Grey

Case Size	Without Air Perforation				With Air Perforation	
Depth mm	120	180	240	300	240	300
Depth inch	4.72	7.08	9.44	11.81	9.44	11.81
0	33E717-00	33E721-00	33E725-00	-	-	-
1	33E705-00	33E709-00	33E713-00	-	-	-
2	-	-	33E733-00	33E737-00	33E734-00	33E738-00
3	-	-	33E757-00	33E761-00	33E758-00	33E762-00
4	-	33E777-00	33E781-00	33E785-00	33E782-00	33E786-00
5	-	33E741-00	33E744-00	-	-	-

Note: Throughout the catalogue we put all EMC parts in a yellow table

7.3 Bezel

- Guards the complete case
- Moulded highquality plastic, UL94 V-0
- **Scope of delivery:**
  - 1 plastic bezel
- Note: For 1 Guardbox two bezels have to be ordered



7.3 Bezel

Case Size	Light grey	Black	Stone grey
0	33-000-03	33-000-06	33-000
1	33-001-03	33-001-06	33-001
2	33-002-03	33-002-06	33-002
3	33-003-03	33-003-06	33-003
4	33-004-03	33-004-06	33-004
5	33-005-03	33-005-06	33-005

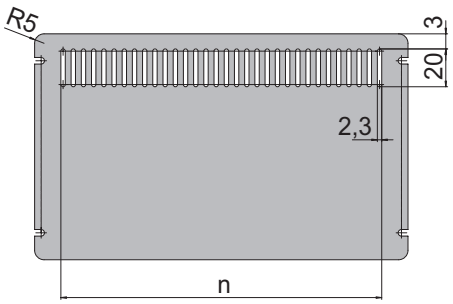
7.4 Front / Rear Panel

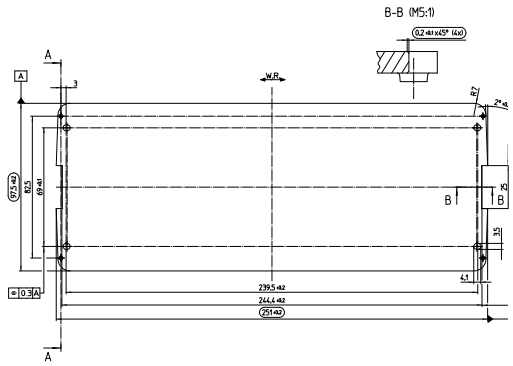
- The 2.5 mm (0.9") front panels of anodised aluminium serve both as front and rear panels
- They are screwed to the front end of the case profiles to give the snap-on bezel the required stability
- The panels are available with or without perforations
- IP54 / EMC and IP65: A special seal matching the Guardbox 33 ensures reliable sealing of the box
- **Scope of delivery:**
  - 1 Front- / Rear panel with or without perforation (Note: for one Guardbox 33 two panels have to be ordered)
  - IP65 and IP54 / EMC set: 1 Front- and 1 rear panel, 2 self-adhesive seals, sealing hose, washers
- Replacement seals IP65 see 4.4.2 / IP54 / EMC see 4.4.3
- Torque of mounting screws to ensure IP protection: 0.70Nm - 0.75Nm



7.4.1 Front / Rear Panel

Case Size	Without Perforation	With Perforation	IP65 Set incl. Gasket	IP54 / EMC Set incl. Gasket
EMC level	basic advanced (4.5.3)	basic (4.5.3)	-	advanced plus
0	33E400-50	33E400-51	33-520	33E520
1	33E401-50		33-521	33E521
2	33E402-50	33E402-51	33-522	33E522
3	33E403-50	33E403-51	33-523	33E523
4	33E404-50	33E404-51	33-524	33E524
5	33E405-50		33-525	33E525





Case Size	A		B		C		D		n	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
0	142.3	5.60	63.5	2.50	137.0	5.39	35	1.37	126.5	4.98
1	142.3	5.60	80	3.14	137.0	5.39	51.5	2.02		
2	243.3	9.57	63.5	2.50	238.4	9.38	35	1.37	212.9	8.38
3	244.4	9.62	97.5	3.83	238.4	9.38	69	2.71	212.9	8.38
4	197.5	7.77	119.5	4.70	190.6	7.50	91	3.58	169.7	6.68
5	243.3	9.57	49.5	1.94	238.4	9.38	21	0.82		

7.4.2 Replacement Seals IP65

- As spare part
- Foamed plastic PVC grey, UL94 V-0
- Self-adhesive seals

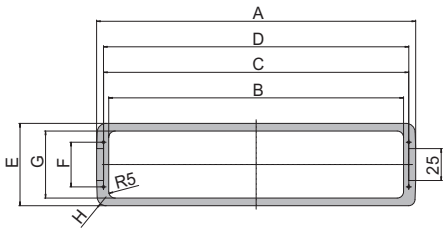


7.4.2 Replacement Seals IP65

Case Size	Part-No.
0	33-510
1	33-511
2	33-512
3	33-513
4	33-514

7.4.3 Replacement Seals IP54/EMC

- As spare part
- Foamed plastic conductive PET-PU black, UL94 V-0
- Self-adhesive seals

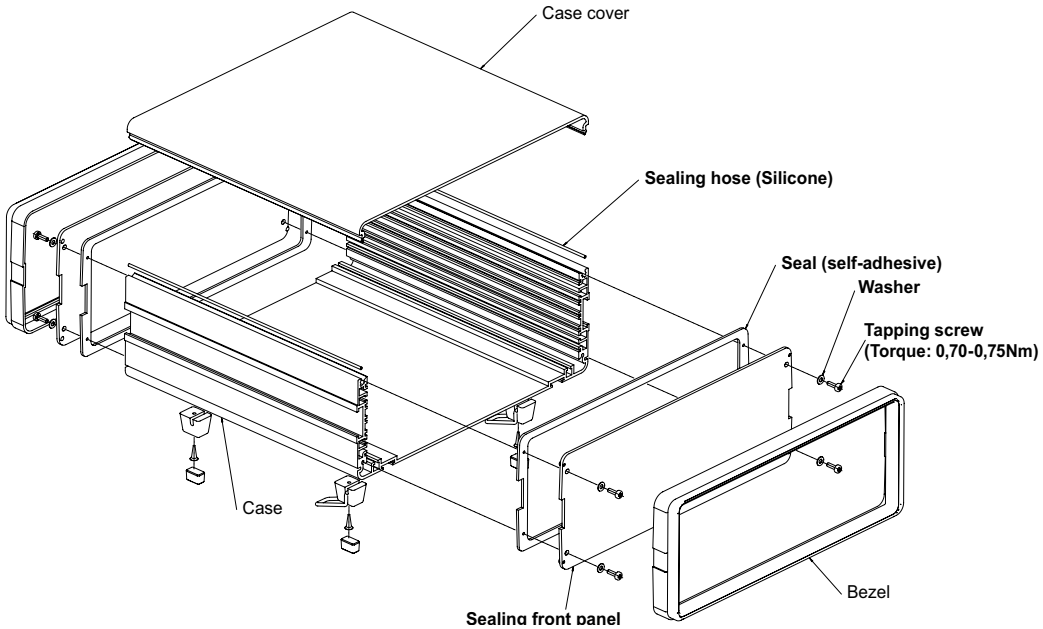


4.4.3 Replacement Seals IP54/EMC

Case Size	Part-No.
0	33E510
1	33E511
2	33E512
3	33E513
4	33E514
5	33E515

Case	A		B		C		D		E		F		G		H	
Type	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
0	149	5.86	130	5.11	137	5.39	138	5.43	64.5	2.53	35	1.37	52.5	2.06	R6.5	0.25
1	149	5.86	130	5.11	137	5.39	138	5.43	81	3.18	51.5	2.02	69	2.71	R6.5	0.25
2	250	9.84	231	9.09	239	9.40	239	9.40	64.5	2.53	35	1.37	52.5	2.06	R7	0.27
3	251	9.88	231	9.09	239	9.40	240	9.44	98	3.85	69	2.71	86	3.38	R7	0.27
4	204	8.03	184	7.24	191	7.51	193	7.59	120.5	4.74	91	3.58	108.5	4.27	R7.5	0.29
5	249.5	9.82	231	9.09	239	9.40	239	9.40	50	1.96	21	0.82	38	1.49	R7	0.27

Guardbox 33 with IP54 / EMC Set or IP65 Set



7.5 Accessories

7.5.1 Assembly Material

- One set with all necessary materials for mounting one Guardbox 33
- **Scope of delivery:**
  - 4 feet (2 tilted) incl. screws, UL94 V-0
  - 4 tapping screws to assemble the case
  - Assembly material for internal extension (10 screws M3 x 8, 10 screw nuts M3, 10 nut holders)

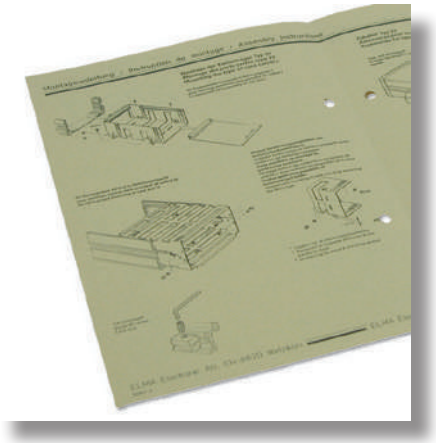


7.5.1 Assembly Material

Case Size	Light Grey	Black	Stone Grey
0 - 4	33-640	33-620	33-621
5	33-641	33-624	33-622

7.5.2 Assembly Instructions

- For a fast and secure assembly of the Guardbox 33
- **Scope of delivery:**
  - Detailed assembly instruction (1 Page)



7.5.2 Assembly Instructions

Description	Part-No.
Version: EMC only	33E100
Version: For Standard, IP65 and IP54/EMC	33-200

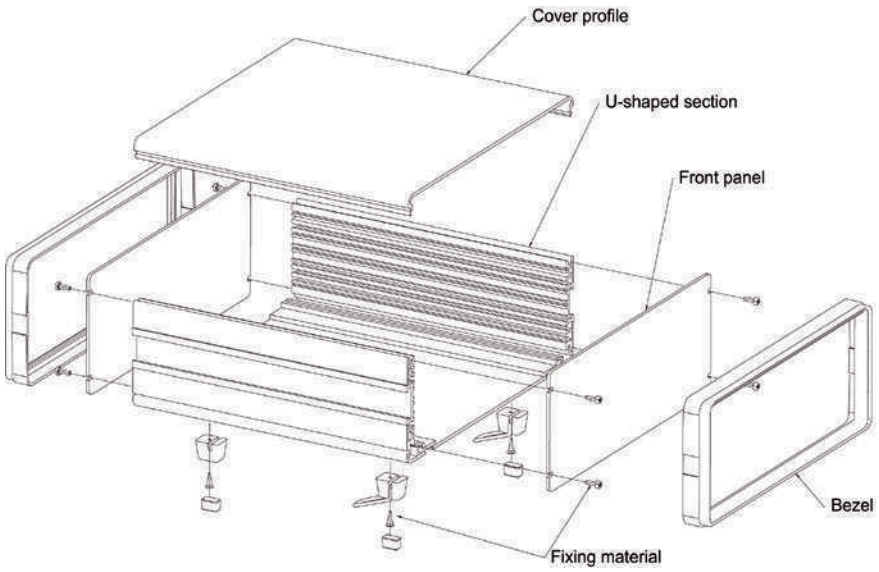
7.5.3 Supplementary EMC Gasket Set

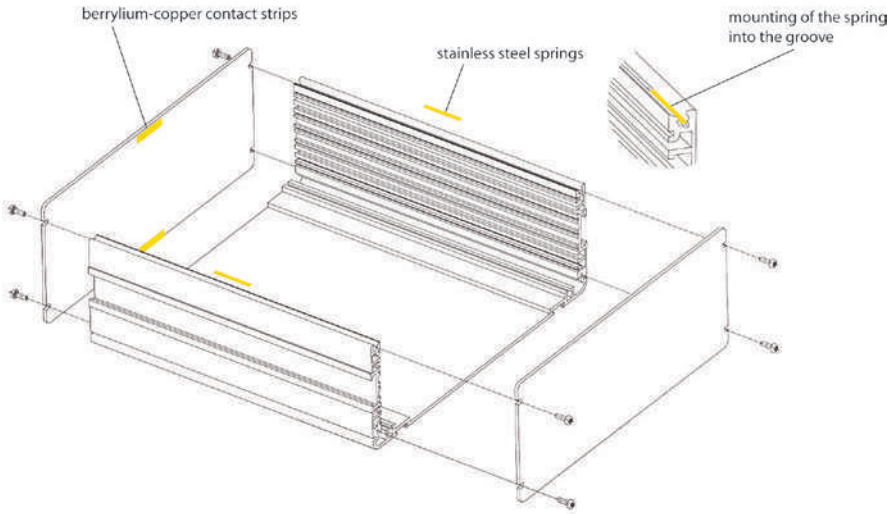
- For EMC level advanced when using no perforations
- For EMC level basic when using perforations
- Increased EMC level by approximate 10 dB
- **Scope of delivery:**
  - 4 berrylium-copper contact strips
  - 2 stainless steel springs



7.5.3 Supplementary EMC Gasket Set

Case Size	Description	Part-No.
0 - 5	Increased by approx. 10 dB	33-642



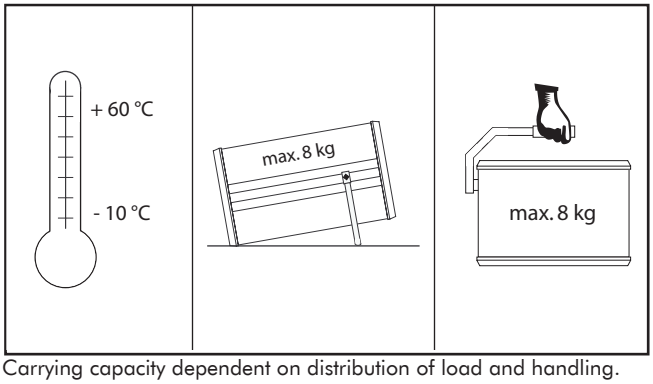




7.5.4 Handles

7.5.4.1 Carrying Handle

- Zinc die-cast, powder-coated
- Handle piece: Black polyurethane, UL94 V-0
- The handle is inserted into the side groove on the case and can be fixed in any position
- The handle is looking at 90°, while the carrying position has a slight detent only
- Following the case size, there are handles available in two different widths
- **Scope of delivery:**
  - Pre-assembled handle with assembly material

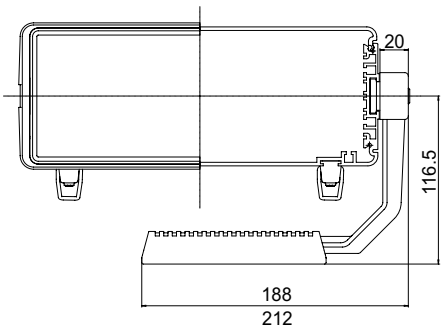


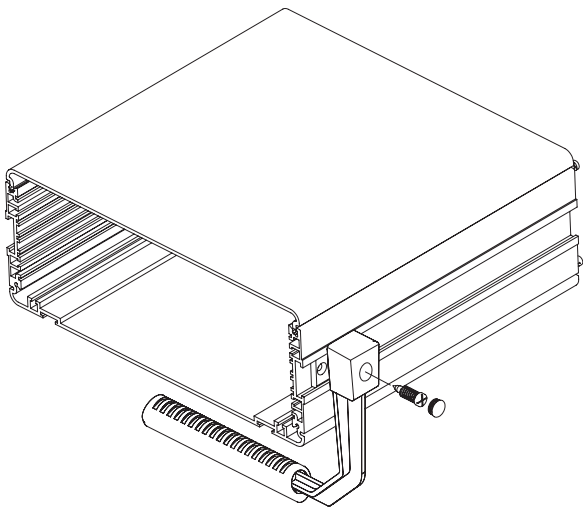
Carrying capacity dependent on distribution of load and handling. Decreases with dynamic stress



7.5.4 Carrying Handle

Colour	Part-No. 212 mm (8.34") for case size 2 + 3	Part-No. 188 mm (7.40") for case size 4
Light grey	33-635	33-636
Black	33-645	33-646
Pebble grey	33-630	33-631



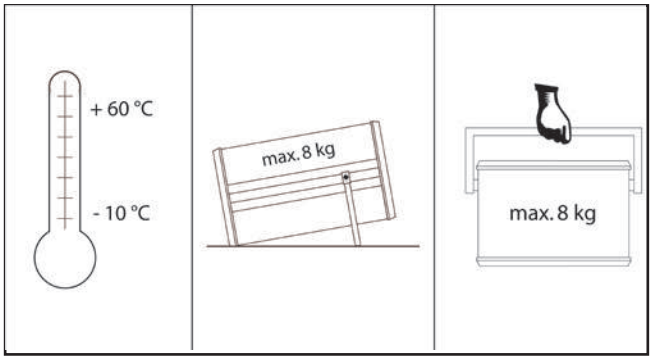




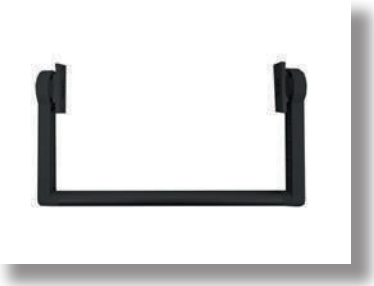


7.5.4.2 Bow Handle

- for Guardbox 33, sizes 1–4
- Side parts made of plastic black or grey
- Handle extrusion in aluminium, anodized black or clear
- The handle can be attached at any position on the lateral groove
- The handle latches every 30 °
- **Scope of delivery:**
  - 1 pre-assembled handle with assembly material



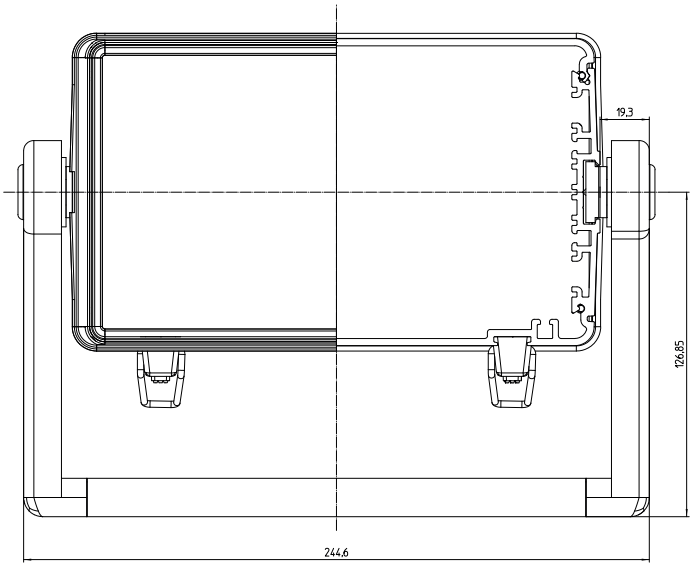
Carrying capacity dependent on distribution of load and handling.
Decreases with dynamic stress





7.5.4.2 Bow Handle

Description	Black Part-No.	Grey Part-No.
Bow handle for Guardbox 33, sizes 0 + 1	33-647	33-651
Bow handle for Guardbox 33, sizes 2 + 3	33-648	33-652
Bow handle for Guardbox 33, size 4	33-649	33-653





7.5.5 Bracket for Mounting in Consoles

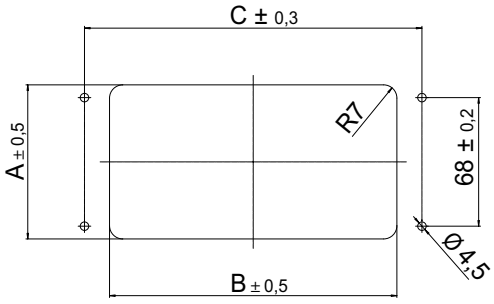
- 3 mm (0.11") sheet aluminium mounting bracket
- Inserted into the slots on the sides of the Guardbox 33 and positioned using two M4 x 6 mm set screws
- Using the mounting brackets, the compact case can be mounted in consoles, etc.
- **Scope of delivery:**
  - 2 mounting brackets
  - 4 screws M4 x 6



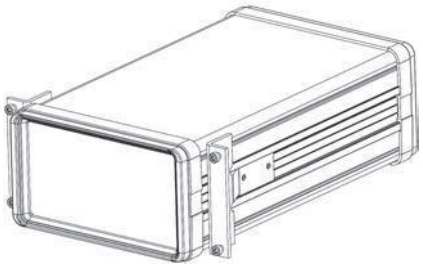
7.5.6 Bracket for Mounting in Consoles

Description	Part-No.
For case sizes 0 - 4	33-650

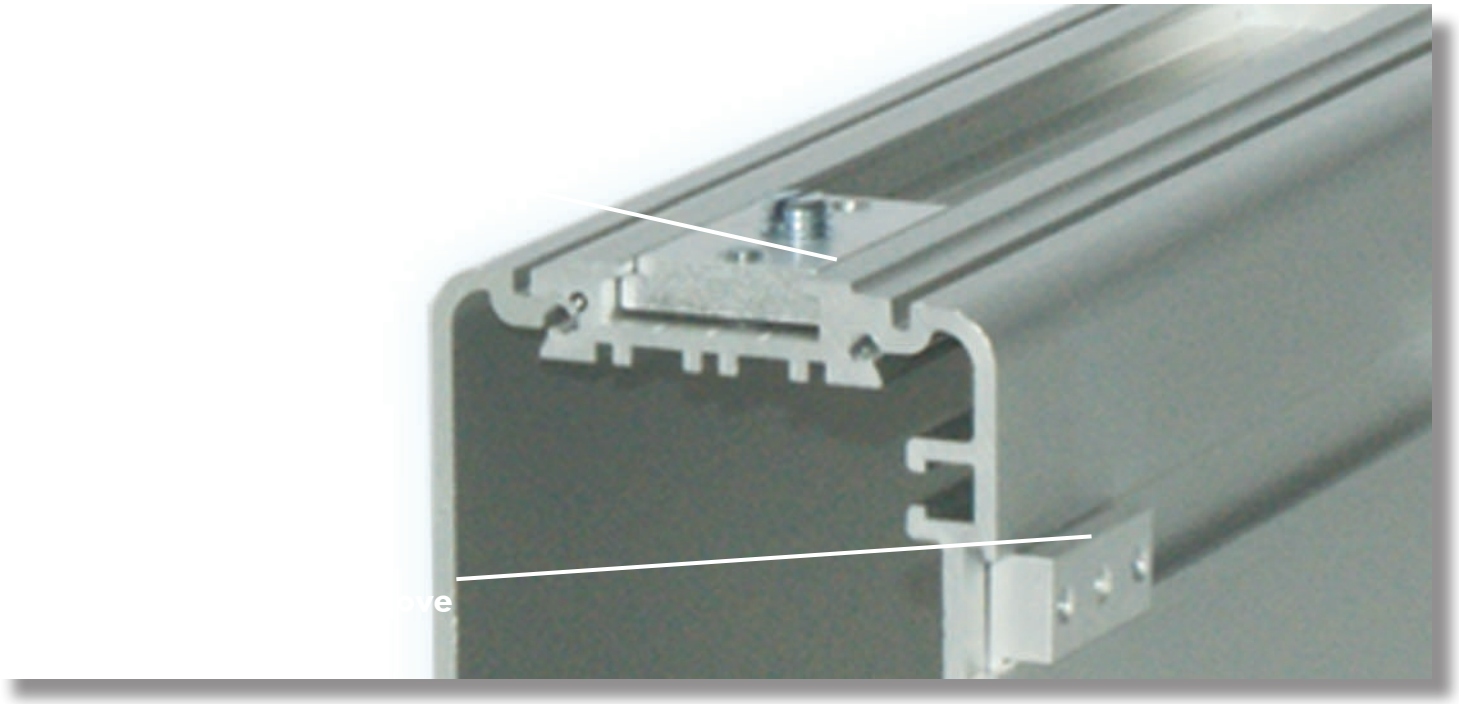
Cut-out drawing:



Mounting position of brackets:

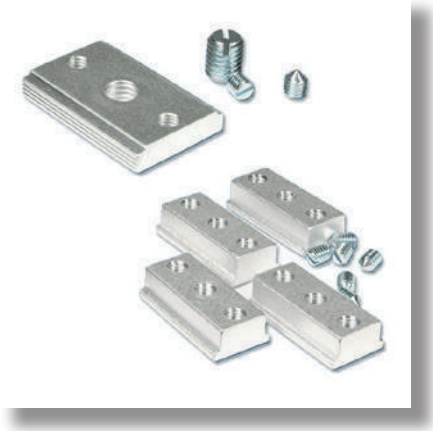


Case Size	A		B		C	
	mm	inch	mm	inch	mm	inch
0	65	2.55	152	5.98	178.5	7.02
1	81.5	3.20	152	5.98	178.5	7.02
2	65	2.55	253	9.96	279.5	11.00
3	99	3.89	254	10.00	280.5	11.02
4	121	4.76	207	8.14	233.5	9.19



7.5.6 Sliding Blocks for Handle Slots and Feet Slots

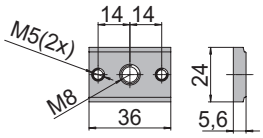
- The sliding blocks (extruded aluminium) provide an optional means of attachment for the Guardbox 33
- The blocks are inserted in the handle slot on the side of the case or in place of the feet
- **Scope of delivery:**
  - Sliding blocks incl. screws



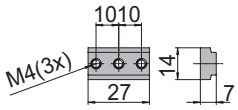
7.5.6 Sliding Blocks for Handle and Feet Slots

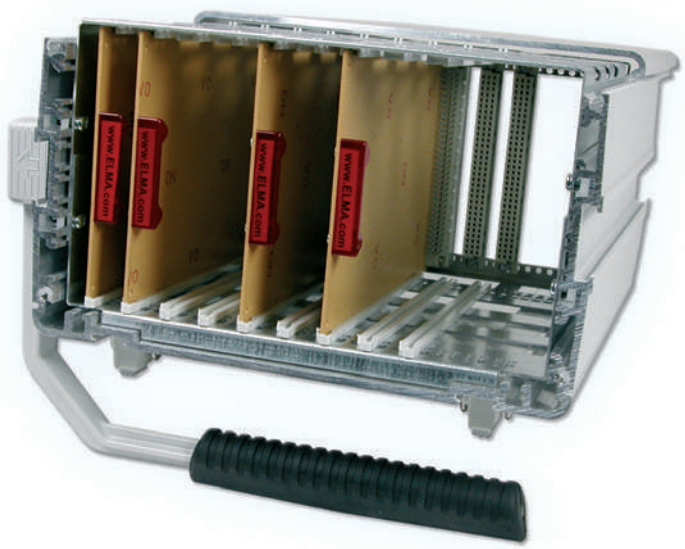
Case Size	Description	Scope of Delivery	Part-No.
0 - 4	Handle groove	1 pc.	33-665
0 - 5	Foot groove	4 pcs.	33-666

Handle groove slot nut



Foot groove slot nut

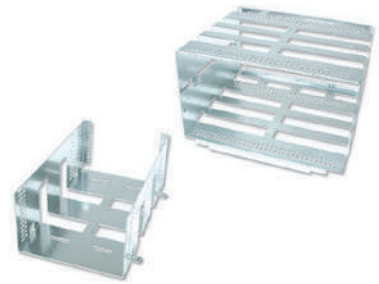






7.5.7 Single-Eurocard Mounting Sets

- Card carrier of 1 mm (0.03") galvanised sheet steel for mounting in case sizes 0 - 4
- Card guides are the same as used in Elma Type 23 cassettes
- For 100 x 160 mm (3.93 x 6.29") eurocards with plug-in connectors acc. to IEC 60603-2
- Other use is: for vertical mounting of cards in case size 4 (fastening lugs have to be removed)
- **Scope of delivery:**
  - 1 card carrier
- Assembly material included in set see 4.5.1
- Please note: A mounting plate (see 4.5.12) has to be ordered if cards are to be mounted horizontally in case sizes 2, 3 and 4

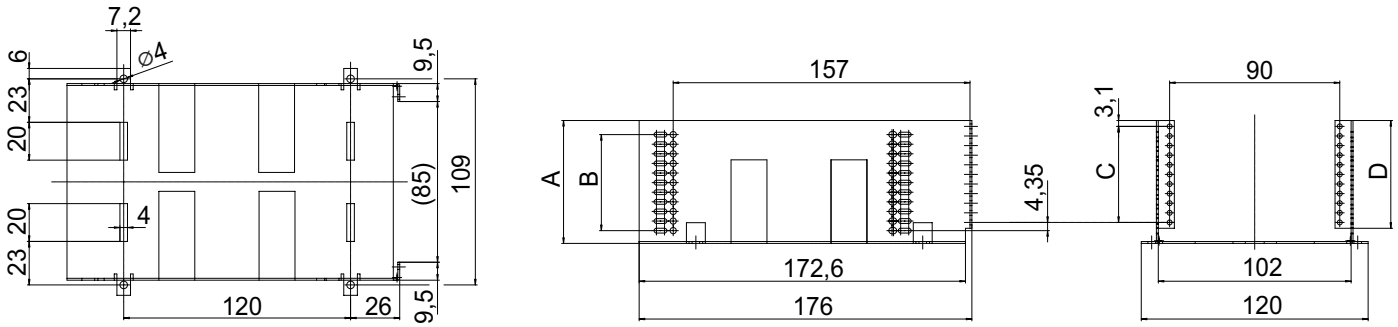


7.5.7 Single-Eurocard Mounting Sets

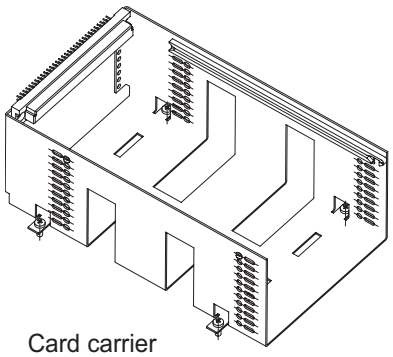
Case Size	Mounting of Cards	Part-No.
1, 3 and 4	horizontally	33-205

Other versions available on request.

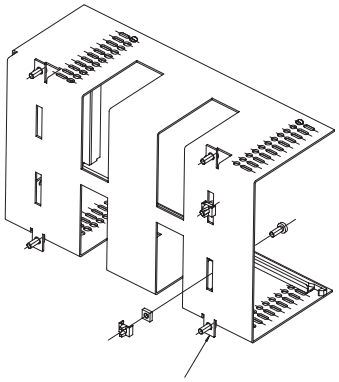
Line drawing, cards mounted horizontally



Case Size	A		B		C		D	
	mm	inch	mm	inch	mm	inch	mm	inch
0 + 2	49.76	1.95	7 x 5.08	0.20	7 x 5.08	0.20	41.76	1.64
1, 3, 4	65	2.55	10 x 5.08	0.20	10 x 5.08	0.20	57	2.24



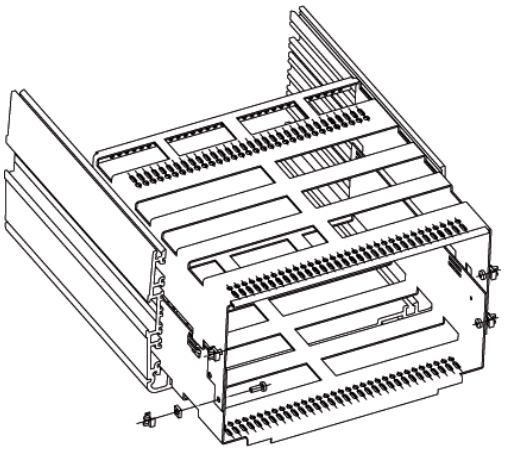
Card carrier

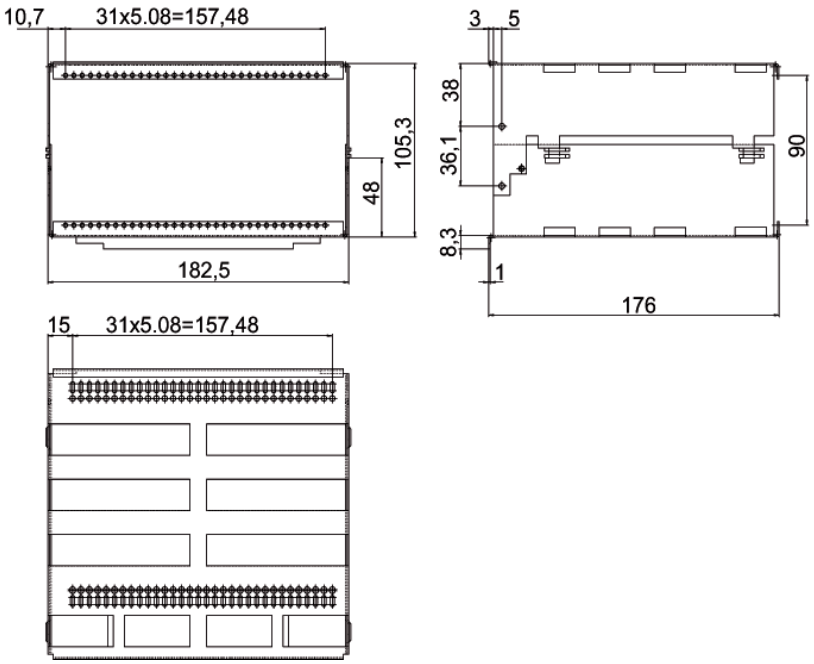


Fastening lugs
Cards mounted vertically

Note: For vertical mounting of cards in case size 4, fastening lugs have to be removed

Line drawing, case size 4, card mounted vertically





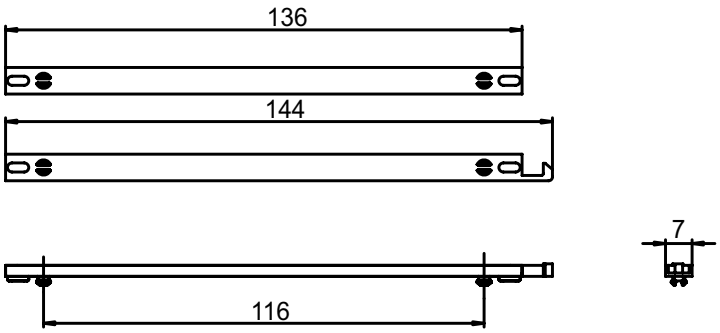
7.5.8 Card Guides

- In each pair, one card guide is fitted with a card locking mechanism
- Light Grey UL94 V-0
- **Scope of delivery:**
  - 1 pair of card guides
- Card handles see 4.5.9.1



7.5.9 Card guides

Card Depth	Part-No. 1 Pair
160 mm (6.29")	61-034



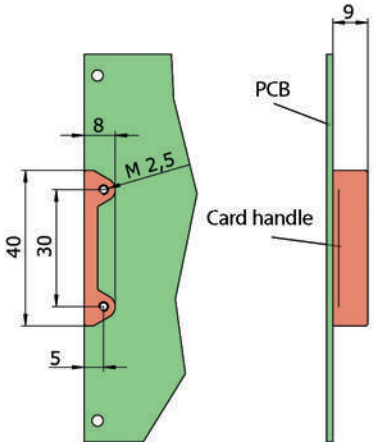


7.5.9.1 Card Handles

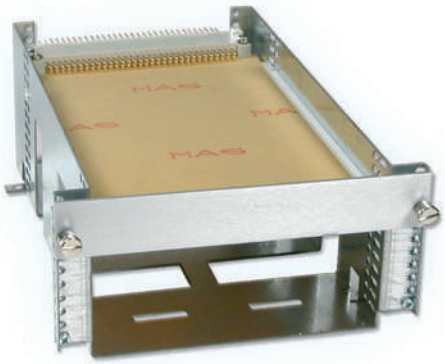
- Coloured, transparent handles which will accept labels and facilitate the handling and identification of PCBs
- **Scope of delivery:**
  - 1 card handle
- Two screws M2.5 x 5 are needed per handle and have to be ordered separately

Description	Colour	Part-No.
Card handle	clear	1091-51
	red	1091-54
Cylindrical screw M2.5 x 5		5571-05
Torx cylinder head screw M2.5 x 5, size T8		5470-07

- Other colours (blue, yellow, green, orange) upon request

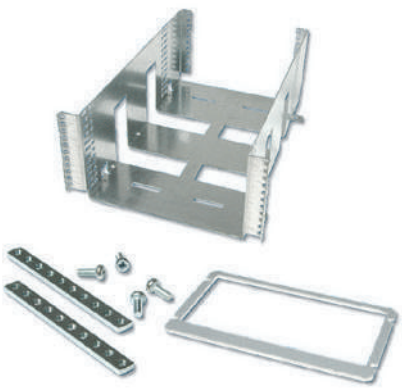






7.5.9 Mounting Set for Plug-In Units (Single Eurocards)

- Galvanised sheet steel plug-in sub-unit allowing 3U plug-in units (eurocards 100 x 160 mm with IEC 60603-2 connectors and flat or extruded front panels) to be mounted horizontally in the Guardbox 33
- The usable height is 12 HP
- The case front panel with the 129.2 x 61 mm (5.08 x 2.40") opening is made from 2.5 mm (0.07") thick anodised sheet aluminium
- **Scope of delivery:**
  - 1 plug-in card carrier sub-unit
  - 1 front panel with opening for case size 1
  - Assembly material for sub-unit
- Sub-unit for case size 3 and 4 see 4.5.10.1
- Card guides see 4.5.9



7.5.10 Mounting Set for Plug-In Units (single eurocard)

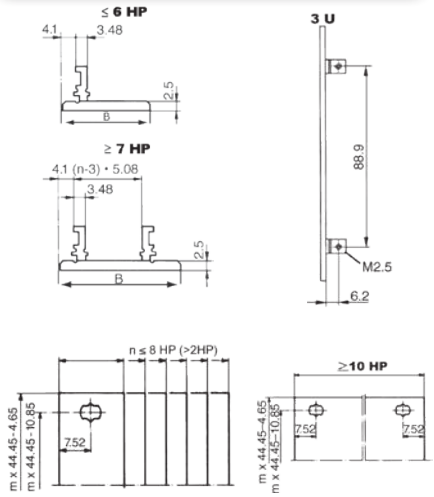
Description	Part-No.
Complete sub-unit for case 1	33-207

7.5.10.1 Sub-unit for case size 3 and 4

- The sub-unit can also be used for case size 3 and 4. The case front panel can be manufactured with openings to your own specifications
- An appropriate mounting plate (see 4.5.12) is required to mount the sub-unit. The mounting plate has to be ordered separately
- For front panels for single eurocards see 4.5.10.2

Description	Part-No.
Plug-in card carrier sub-unit	33-206
Assembly material for plug-in unit	33-616





4.5.10.2 Extruded Front Panels

- Aluminium 2.5 mm, clear anodised (non-conductive)
- PCB mounting lugs are formed on the rear face of the panel
- No PCB fixing screws on the front face of the panel, leaving more space for silk screening and mounting front panel components
- Suitable for all sub racks and cases
- Thickness of the mounting lugs (3.48 mm) allows PCBs to be mounted on either side of the lugs
- At rear drill marks for handle-fixing holes
- **Scope of delivery:**
  - Extruded front panel, clear anodised
- Front panel screws see below

Width	B		Part-No. 3 U
	mm	inch	
3 HP	15.0	0.59	26N303
4 HP	20.1	0.79	26N304
5 HP	25.2	0.99	26N305
6 HP	30.3	1.19	26N306
7 HP	35.3	1.38	26N307
8 HP	40.4	1.59	26N308
10 HP	50.6	1.99	26N310
12 HP	60.7	2.38	26N312

Front Panel Screws

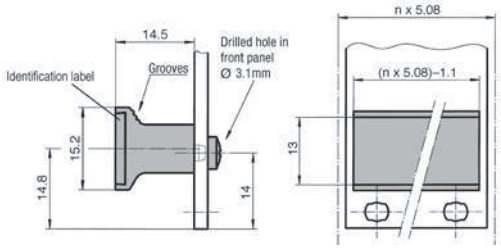
- Set of 10 screws
- With screw retainer
- Front panel width up to 9 HP = 2 screws; ≥ 10 HP = 4 screws

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3, size T8, with plastic screw retainer	63K159
Milled edge screws recessed M2.5 x 11.3, with plastic screw retainer	63-159



4.5.10.3 Rigid-Mounted Handle with Identification Label

- Black, plastic UL94 V-0, label aluminium anodised
- **Scope of delivery:**
  - Rigid-mounted handle
  - Identification label
- Assembly material see below



Width	Scope of Delivery	Part-No.
4 HP	10 pcs.	60-200-04
5 HP	10 pcs.	60-200-05
6 HP	10 pcs.	60-200-06
7 HP	10 pcs.	60-200-07
8 HP	10 pcs.	60-200-08
10 HP	10 pcs.	60-200-10
12 HP	10 pcs.	60-200-12

- Other sizes (up to 84 HP) are available upon request

Assembly Material

Description	Part-No.
Cross recessed rounded head screw	61-276

Other front panels and handles see chapter C "Front Panels, Handles and Plug-In Units"



4.5.10 Card Stop Set

- Card stoppers are used for card fixation when direct horizontal insertion of double euro-cards (case size 2, 3 and 5) or other inserted cards is required
- **Scope of delivery:**
  - 4 extruded card stoppers
  - 4 hexagon socket set screws
  - 1 hexagon socket key



4.5.11 Card Stop Set

Case Size	Part-No.
0 - 5	33-618

4.5.11 Mounting Plates

- Made of 2 mm (0.07") thick sheet aluminium
- Dimensions correspond to the respective case size
- The position of the slots allows various mounting arrangements
- The mounting plate is screwed to the grooved case profile
- **Scope of delivery:**
  - Mounting plate, blank aluminium
- Assembly material included with in set see 3.5.1



4.5.12 Mounting Plates

Case Size	Part-No. 180 mm 7.08 inch	Part-No. 240 mm 9.44 inch	Part-No. 300 mm 11.81 inch
0 + 1	33-313	33-314	-
2, 3, 5	-	33-324	33-325
4	-	33-344	-

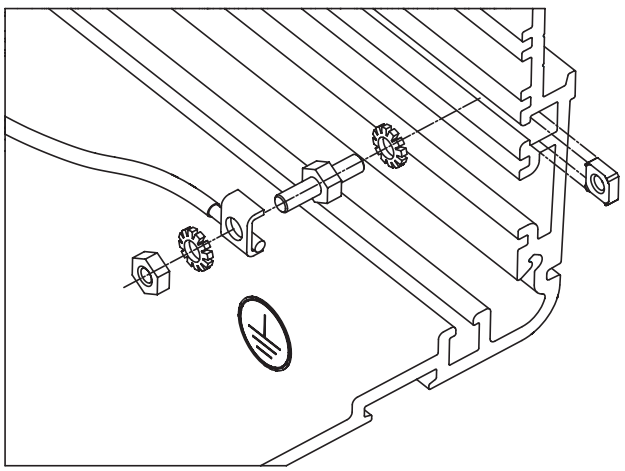
4.5.12 Earthing Terminal

- The earthing terminal facilitates grounding of the Guardbox 33 in accordance with EN / VDE / SEV standard
- **Scope of delivery:**
  - 1 earthing nut M3.5
  - 1 threaded bolt M3.5
  - 1 clamping yoke
  - 2 serrated washers
  - 1 nut M3.5
  - 1 earthing symbol



4.5.13 Earthing Terminal

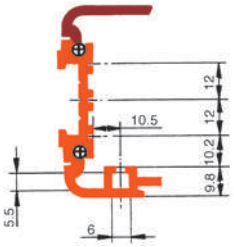
Case Size	Description	Part-No.
0 - 5	Earthing terminal	33-619



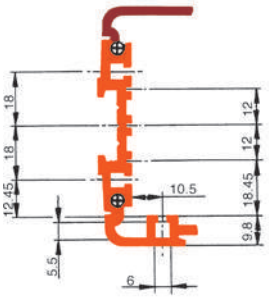
4.6 Dimensions / Technical Information

4.6.1 Cross Sections of Extrusions

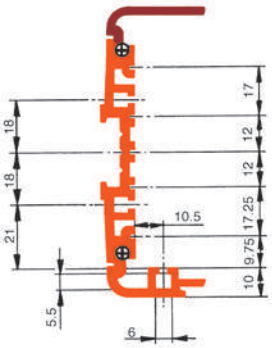
Case size 0 and 2



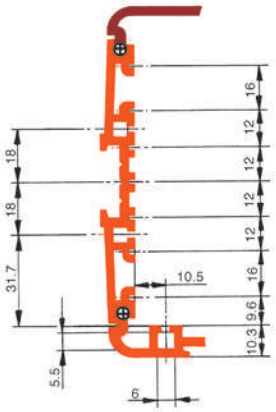
Case size 1



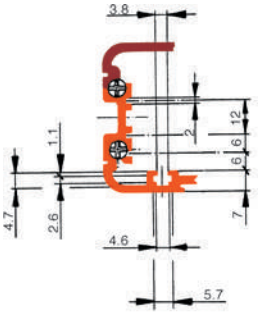
Case size 3



Case size 4

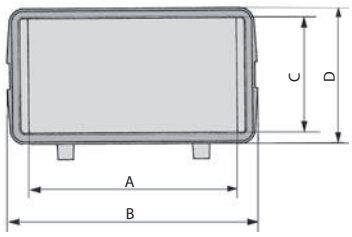


Case size 5

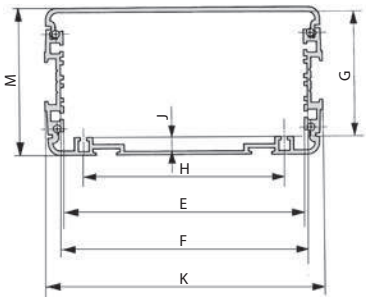


4.6.2 Line Drawings

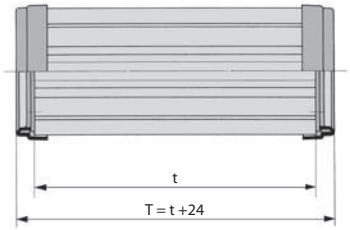
Front View



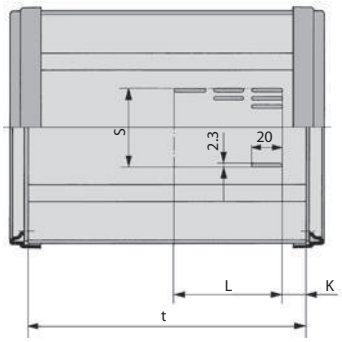
Internal Dimensions



Side View



Bottom Air Perforation



Type		A	B	C	D	E	F Intern. Width	F Board Width	G	H	J	K	M±0.5	S	L if t=240 9.44"	L if t=300 11.81"	t=120 4.72"	t=180 7.08"	t=240 9.44"	t=300 11.81"
0	mm	129.5	155.5	55	69	130	134	133	51.7	109	7.5	151	64					✓	✓	
	inch	5.10	6.12	2.16	2.71	5.12	5.27	5.23	2.03	4.29	0.29	5.94	2.52							
1	mm	129.5	155.5	71.5	85.5	130	134	133	68.4	109	7.5	151	80.5				✓	✓	✓	
	inch	5.10	6.12	2.81	3.37	5.12	5.27	5.23	2.69	4.29	0.29	5.94	3.17							
2	mm	230.5	256.5	55	69	231	235	233.35	51.7	210	7.5	252	64	148.1	45	45			✓	✓
	inch	9.07	10.10	2.16	2.71	9.09	9.25	9.18	2.03	8.26	0.29	9.92	2.52	5.83	1.77	1.77				
3	mm	230.5	257.5	89	103	231	235	233.35	85.5	210	7.5	253	98	148.1	45	70			✓	✓
	inch	9.07	10.14	3.50	4.05	9.09	9.25	9.18	3.36	8.26	0.29	9.96	3.86	5.83	1.77	2.75				
4	mm	183.5	210.5	111	125	184	188	186.6	106.9	163	7.5	206	120	104.9	70	70		✓	✓	✓
	inch	7..22	8.29	4.37	4.92	7.24	7.40	7.34	4.21	6.41	0.29	8.11	4.72	4.13	2.75	2.75				
5	mm	230.5	256.5	41	56	231	235	233.35	43	210	4.7	249.5	50					✓	✓	
	inch	9.07	10.10	1.61	2.20	9.09	9.25	9.18	1.69	8.26	0.18	9.82	1.97							

4.6.3 IP Protection Classes

- Protection against contact and foreign bodies
- Protection against water
- Acc. to IEC 60529

Evaluation of classification

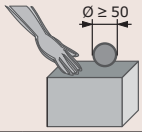
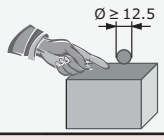
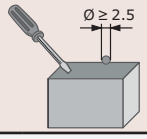
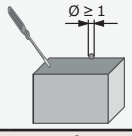
- The test results according to the standard do not entirely exclude leaks and an individual test is therefore recommended in critical cases (with the actual equipment layout)
- The protection class for cabinets and enclosures is specified by IP (International Protection) and two indices

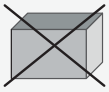
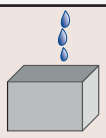
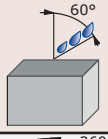
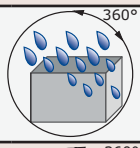
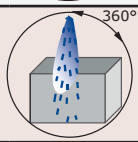
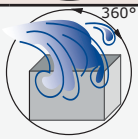
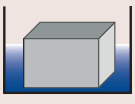
Example IP 55

Protection against penetration by water jets from all directions

Complete protection against contact with internal parts and against dust deposition

3.6.3 IP Protection Classes

First Index	Contact Protection	Foreign-Body Protection
0 	No special protection	
1 	Against large areas of body	Large foreign bodies Ø ≥ 50 mm (1.97")
2 	Against fingers or objects of similar size	Medium-sized foreign bodies Ø ≥ 12.5 mm (0.49")
3 	Against tools, wires, etc. with a thickness of ≥ 2.5 mm	Granular foreign bodies Ø ≥ 2.5 mm (0.10")
4 	Against tools, wires, etc. with thickness ≥ 1.0 mm	Granular foreign bodies Ø ≥ 1.0 mm (0.04")
5 	Complete protection	Dust-protected; dust deposits are permitted, but their volume must not affect the function of the unit
6 	Complete protection	Dust-proof

Second Index	Water Protection
0 	No special protection
1 	Against water dripping vertically
2 	Against water dripping at an angle (up to 15° from the vertical)
3 	Against spray water (any direction up to 60° from the vertical)
4 	Against spray water from all directions
5 	Against water jets from a nozzle in all directions
6 	Against inundation
7 	Against immersion
8 	Against submersion

4.6.4 Climatic and Mechanical Tests

The Guardbox 33 fulfils the following test according to:

- Vibration EN 50155 (EN 61373)
- Shock EN 60068-2-27
- IP Protection IEC 60529
- Salt Spray Test DIN 50021

The functionality of the box was ensured during all tests







Detail information to climatic and mechanical tests:

- **Vibration** EN 50155 (EN 61373, Cat. 1, Class B)
  Eff. Acceleration: 7.9m/s², Duration: 5h/Axis
  Frequency: 5Hz to 150Hz
  Axis of stimulation: X, Y, Z

- **Shock** EN 60068-2-27
  Shockform: Halfsinus Acceleration: 150m/s² Duration: 11ms
  Number of Shocks: 3 per Axle Total: 18 Shocks

- **IP Protection IEC 60529**
  IP65: Guardbox 33 with IP65 sealing kit
  IP54: Guardbox 33 with IP54/EMC sealing kit

- **Salt Spray Test** DIN 50021
  Salt concentration: 5g/l Duration: 96h Temperature: +35°C



Source: Ellisys, Switzerland

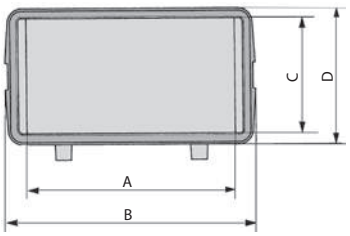
8: Guardbox 33 easy



8: Guardbox 33 easy







8.1 Guardbox 33 easy Overview **B | 8_2**

8.1.1 Complete Guardbox 33 easy Kit's B | 8_2

8.2 Bow Handles **B | 8_5**

8.2.1 Sliding Blocks for Handle Slots and Feet Slots B | 8_6

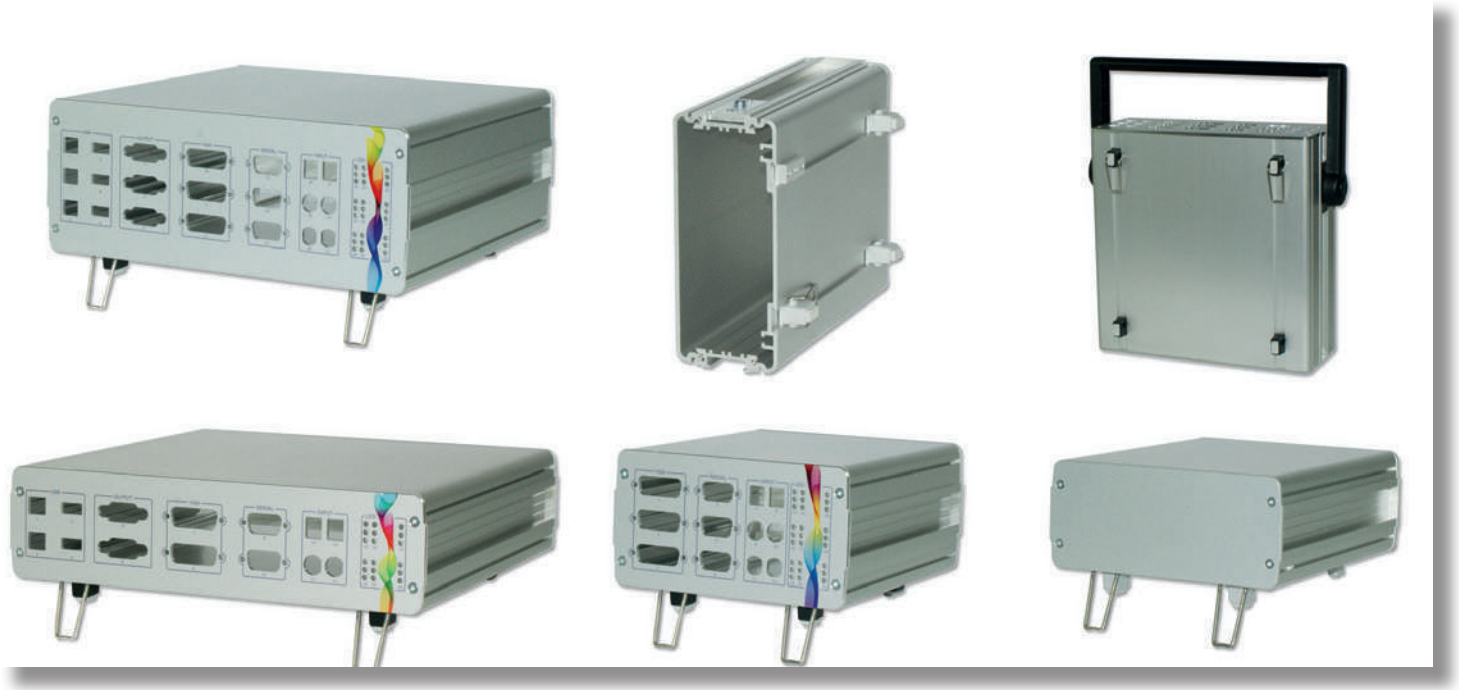
8.2.2 Card Stop Set B | 8_7

8.2.3 Earthing terminals B | 8_8

8.3 Dimensions / Technical Information **B | 8_9**

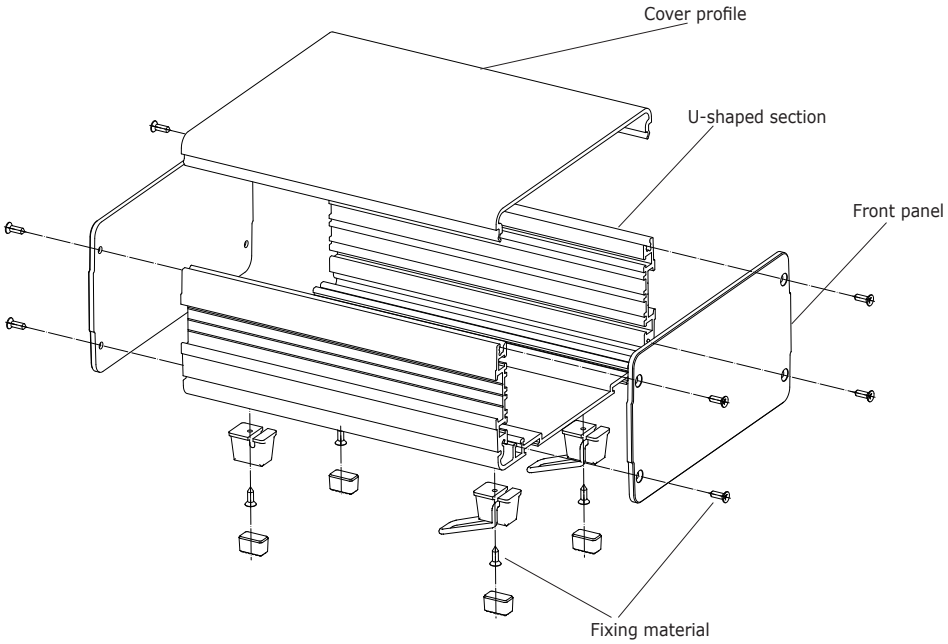
8.3.1 Cross Section of Extrusions B | 8_9

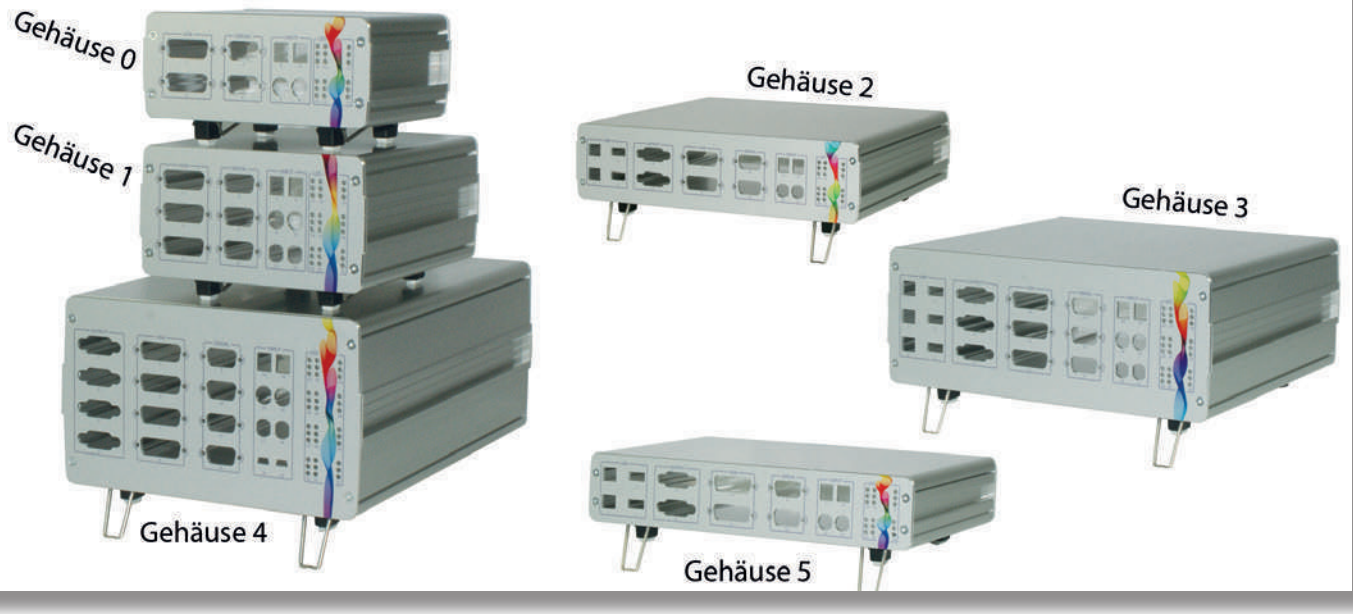
8.3.2 Line Drawings B | 8_9



8.1 Guardbox 33 Easy Overview

- The Elma Guardbox 33 Easy is manufactured from 2 aluminium sections only
- A U-shaped section forms the bottom with integrated sides and provides superior strength
- The extruded cover is held in place by the screws used for front/rear panel mounting
- The main features of this vibration-proof case are its rugged construction, ease of assembly and serviceability as well as its modern design
- This compact case is ideally used for test and measurement instruments, drive modules as well as for controls where rugged construction, design, colour and ease of serviceability are important
- The Guardbox 33 Easy can easily accept single and double Eurocards as well as non-standard board sizes or other components

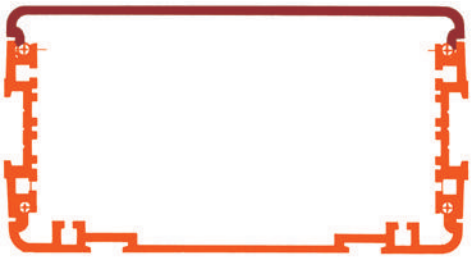




Sturdy, flexible and portable

Suitable for
- Mounting grooves
- Mounting panels
- Single eurocard
- Double eurocard (direct arrangement with case size 2, 3 and 5)

Application examples
- Measurement, control and test instrumentation
- Laboratory and maintenance equipment
- Equipment on train, trams, etc.



The basic case consists of two aluminium extrusions and guarantees optimal and professional packaging of your boards or components.

Description
- Sturdy
- Handy
- Ease of service access
- Tilt-up feet
- Optional carrying handle

Surface
- Enclosure and front / rear panels are fully anodized

Cases and sizes

Case 5
230.5 x 41

Case 0
129.5 x 55

Case 2
230.5 x 55

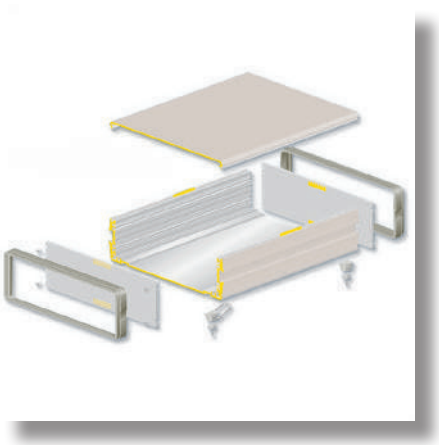
Case 4
183.5 x 111

Case 1
129.5 x 71.5

Case 3
230.5 x 89

The Guardbox 33 Easy series comes in 3 different widths and overall 6 different sizes to meet many different requirements.

8.1.1 Complete Guardbox 33 Easy Kit's

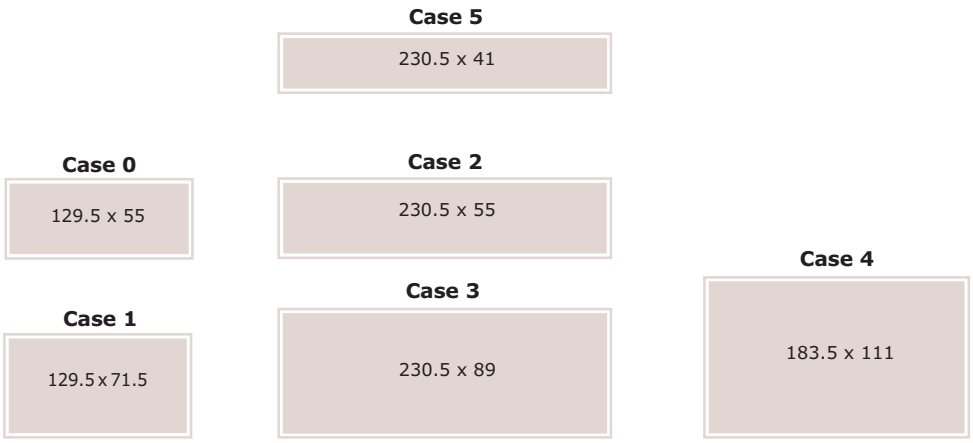


8.1.1 Guardbox 33 Easy Set

- Scope of delivery:
  - 1 basic case anodized
  - 2 front / rear panels clear anodized
  - 1 set with 4 feets (2 rocking, UL94V-0) incl. screws

Case size	Surface	Depth			
		120 mm 4.72"	180 mm 7.08"	240 mm 9.44"	300 mm 11.81"
0	clear anodized	33-012-55	33-018-55	33-024-55	-
1	clear anodized	33-112-55	33-118-55	33-124-55	-
2	clear anodized	-	-	33-224-55	33-230-55
3	clear anodized	-	-	33-324-55	33-330-55
4	clear anodized	-	33-418-55	33-424-55	33-430-55
5	clear anodized	-	33-518-55	33-524-55	-

Cases and sizes

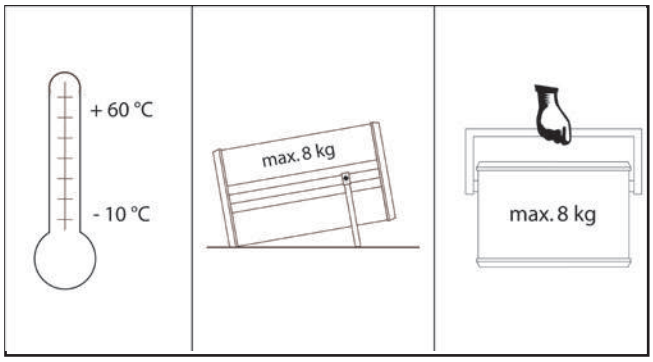




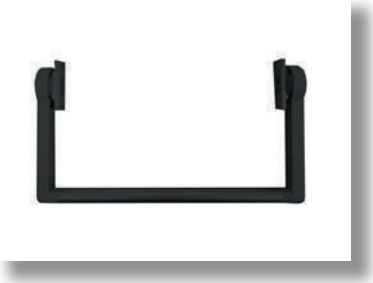


8.2 Bow Handles

- for Guardbox 33, sizes 1–4
- Side parts made of plastic black or grey
- Handle extrusion in aluminium, anodized black or clear
- The handle can be attached at any position on the lateral groove
- The handle latches every 30 °
- **Scope of delivery:**
  - 1 pre-assembled handle with assembly material



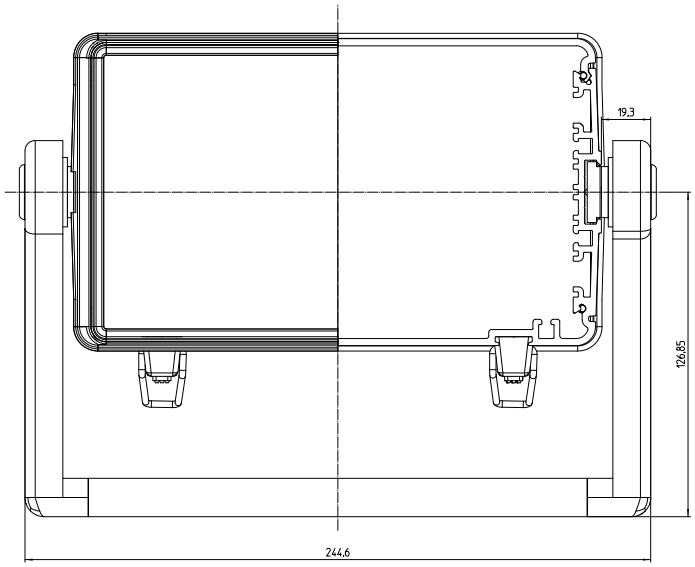
Carrying capacity dependent on distribution of load and handling.
Decreases with dynamic stress

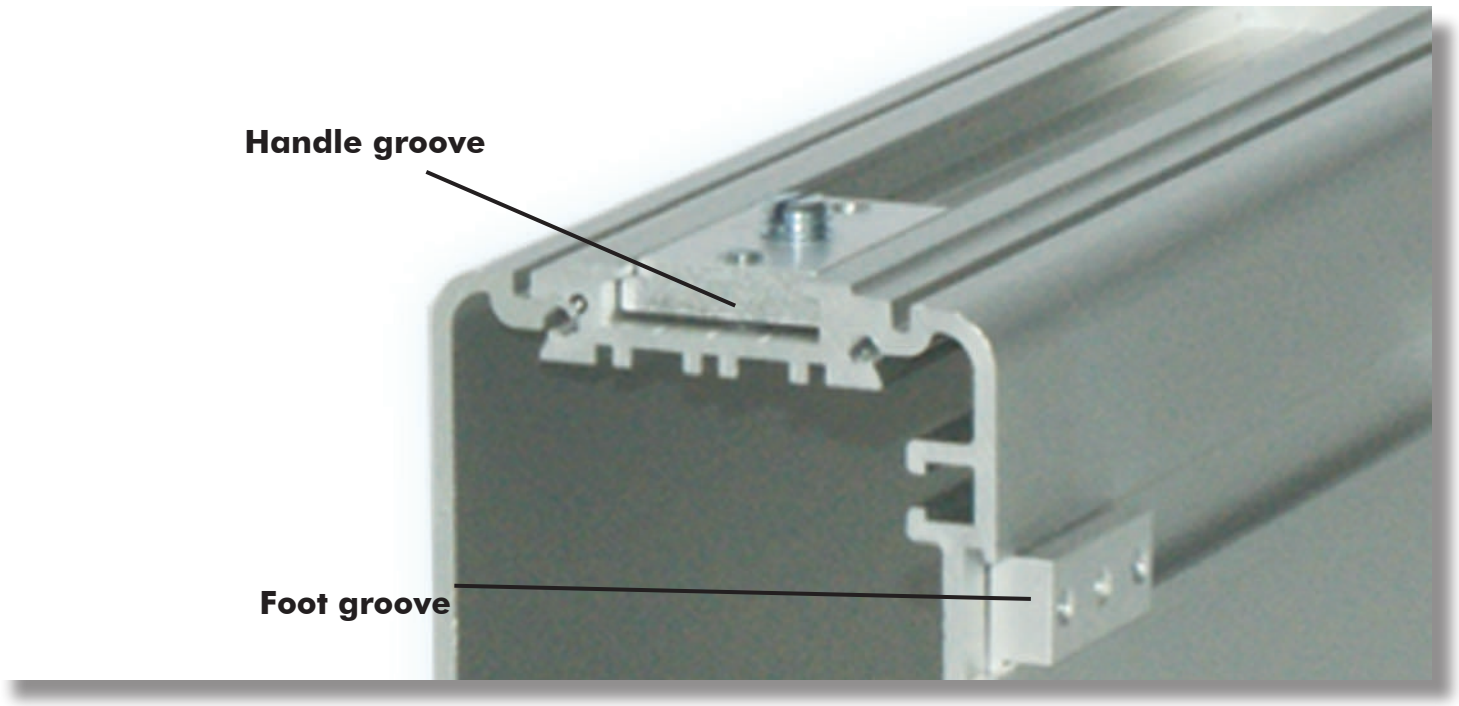




8.2 Bow Handles

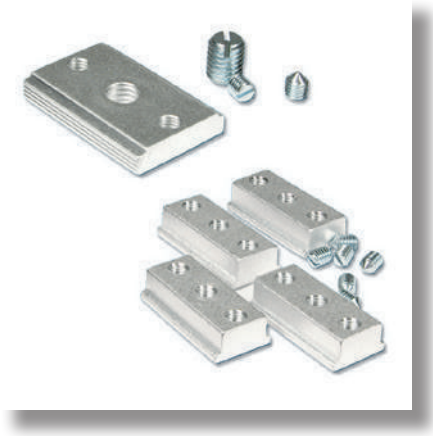
Description	Black Part-No.	Grey Part-No.
Bow handle for Guardbox 33, sizes 0 + 1	33-647	33-651
Bow handle for Guardbox 33, sizes 2 + 3	33-648	33-652
Bow handle for Guardbox 33, size 4	33-649	33-653





8.2.1 Sliding Blocks for Handle Slots and Feet Slots

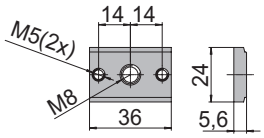
- The sliding blocks (extruded aluminium) provide an optional means of attachment for the Guardbox 33
- The blocks are inserted in the handle slot on the side of the case or in place of the feet
- **Scope of delivery:**
  - Sliding blocks incl. screws



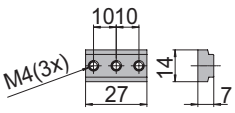
4.2.2 Sliding Blocks for Handle and Feet Slots

Case Size	Description	Scope of Delivery	Part-No.
0 - 4	Handle groove	1 Stk.	33-665
0 - 5	Foot groove	4 Stk.	33-666

Handle groove slot nut



Foot groove slot nut





8.2.2 Card Stop Set

- Card stoppers are used for card fixation when direct horizontal inserting of double eurocards (case size 2, 3 and 5) or other inserted cards is required
- **Scope of delivery:**
  - 4 extruded card stoppers
  - 4 hexagon socket set screws
  - 1 hexagon socket key



4.2.3 Card Stop Set

Case Size	Part-No.
0 - 5	33-618

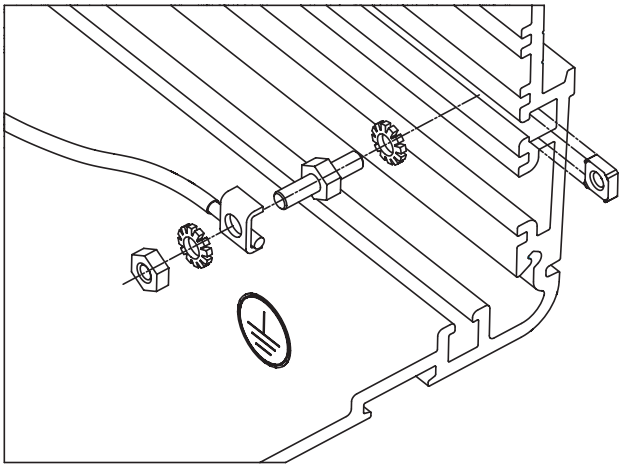
8.2.3 Earthing Terminal

- The earthing terminal facilitates grounding of the Guardbox 33 Easy in accordance with EN / VDE / SEV standard
- **Scope of delivery:**
  - 1 earthing nut M3.5
  - 1 threaded bolt M3.5
  - 1 clamping yoke
  - 2 serrated washers
  - 1 nut M3.5
  - 1 earthing symbol



4.2.4 Earthing Terminal

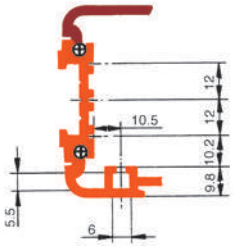
Case Size	Description	Part-No.
0 - 5	Earthing terminal	33-619



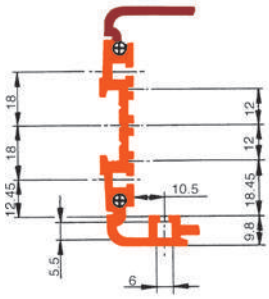
8.3 Dimensions / Technical Information

8.3.1 Cross Sections of Extrusions

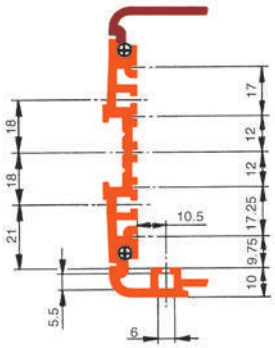
Case size 0 and 2



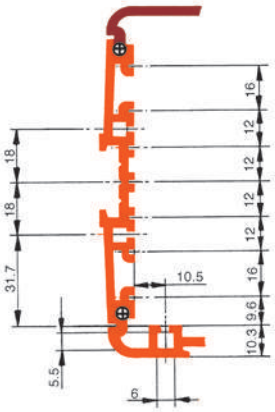
Case size 1



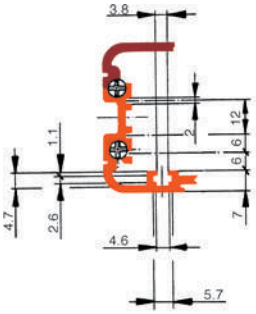
Case size 3



Case size 4

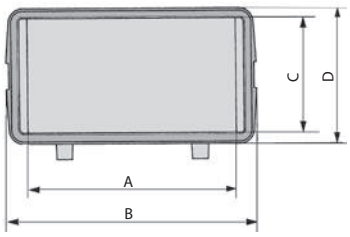


Case size 5

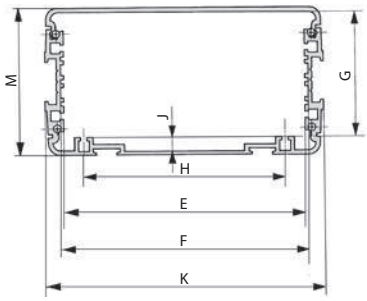


8.3.2 Line Drawings

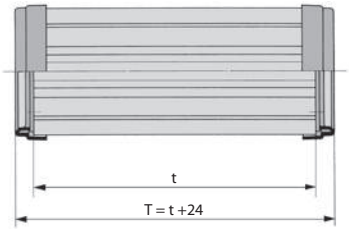
Front View



Internal Dimensions



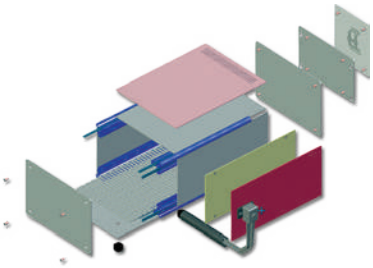
Side View



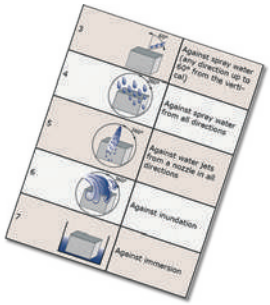
Type		A	B	C	D	E	F Intern. Width	F Board Width	G	H	J	K	M±0.5	t=120 4.72"	t=180 7.08"	t=240 9.44"	t=300 11.81"
0	mm	129.5	155.5	55	69	130	134	133	51.7	109	7.5	151	64		✓	✓	
	inch	5.10	6.12	2.16	2.71	5.12	5.27	5.23	2.03	4.29	0.29	5.94	2.52				
1	mm	129.5	155.5	71.5	85.5	130	134	133	68.4	109	7.5	151	80.5	✓	✓	✓	
	inch	5.10	6.12	2.81	3.37	5.12	5.27	5.23	2.69	4.29	0.29	5.94	3.17				
2	mm	230.5	256.5	55	69	231	235	233.35	51.7	210	7.5	252	64			✓	✓
	inch	9.07	10.10	2.16	2.71	9.09	9.25	9.18	2.03	8.26	0.29	9.92	2.52				
3	mm	230.5	257.5	89	103	231	235	233.35	85.5	210	7.5	253	98			✓	✓
	inch	9.07	10.14	3.50	4.05	9.09	9.25	9.18	3.36	8.26	0.29	9.96	3.86				
4	mm	183.5	210.5	111	125	184	188	186.6	106.9	163	7.5	206	120		✓	✓	✓
	inch	7..22	8.29	4.37	4.92	7.24	7.40	7.34	4.21	6.41	0.29	8.11	4.72				
5	mm	230.5	256.5	41	56	231	235	233.35	43	210	4.7	249.5	50		✓	✓	
	inch	9.07	10.10	1.61	2.20	9.09	9.25	9.18	1.69	8.26	0.18	9.82	1.97				

9: Varietybox 35









9.1 Varietybox 35 Overview **B | 9_2**

9.1.1 Construction and Features B | 9_2

9.1.2 Multifunctional Corner Extrusion B | 9_4

9.2 Configuration Basic Box **B | 9_7**

9.2.1 Corner Extrusions B | 9_7

9.2.2 Extrusion Plates B | 9_8

9.2.3 Front / Rear Termination Plates B | 9_12

9.3 Accessories **B | 9_14**

9.3.1 Bumpon (Self adhesive Feet) B | 9_14

9.3.2 Sealing Gasket B | 9_14

9.3.3 Mounting Plates B | 9_15

9.3.4 Card Stop B | 9_15

9.3.5 EMC Gasket B | 9_16

9.3.6 Earthing Terminal B | 9_16

9.3.7 Assembly Material B | 9_17

9.3.8 U-Handle Aluminium B | 9_17

9.3.9 Spacers B | 9_18

9.3.10 Mounting Plates B | 9_19

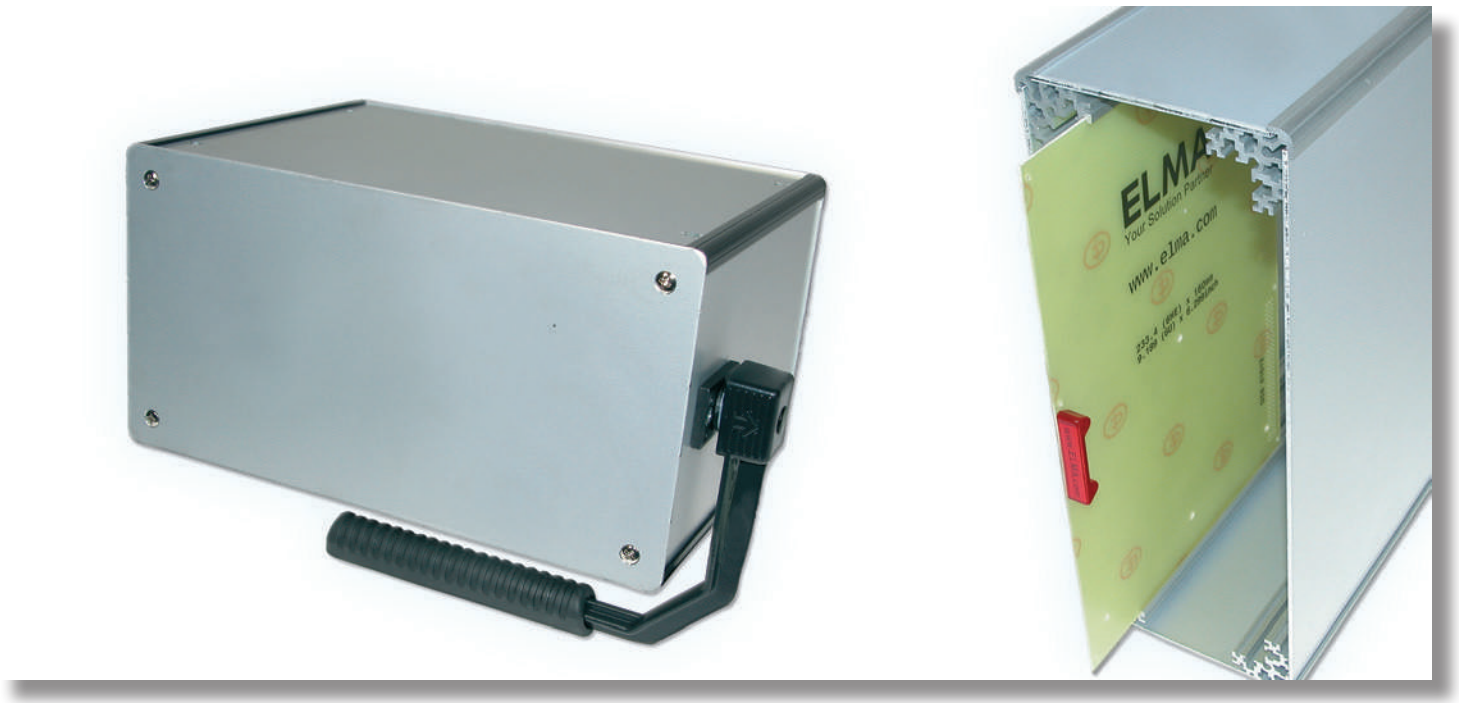
9.3.11 Hexagonal Spacers M3 Thread B | 9_19

9.3.12 Covering Caps B | 9_19

9.3.13 Mounting Bracket B | 9_20

9.4 Technical Information **B | 9_21**

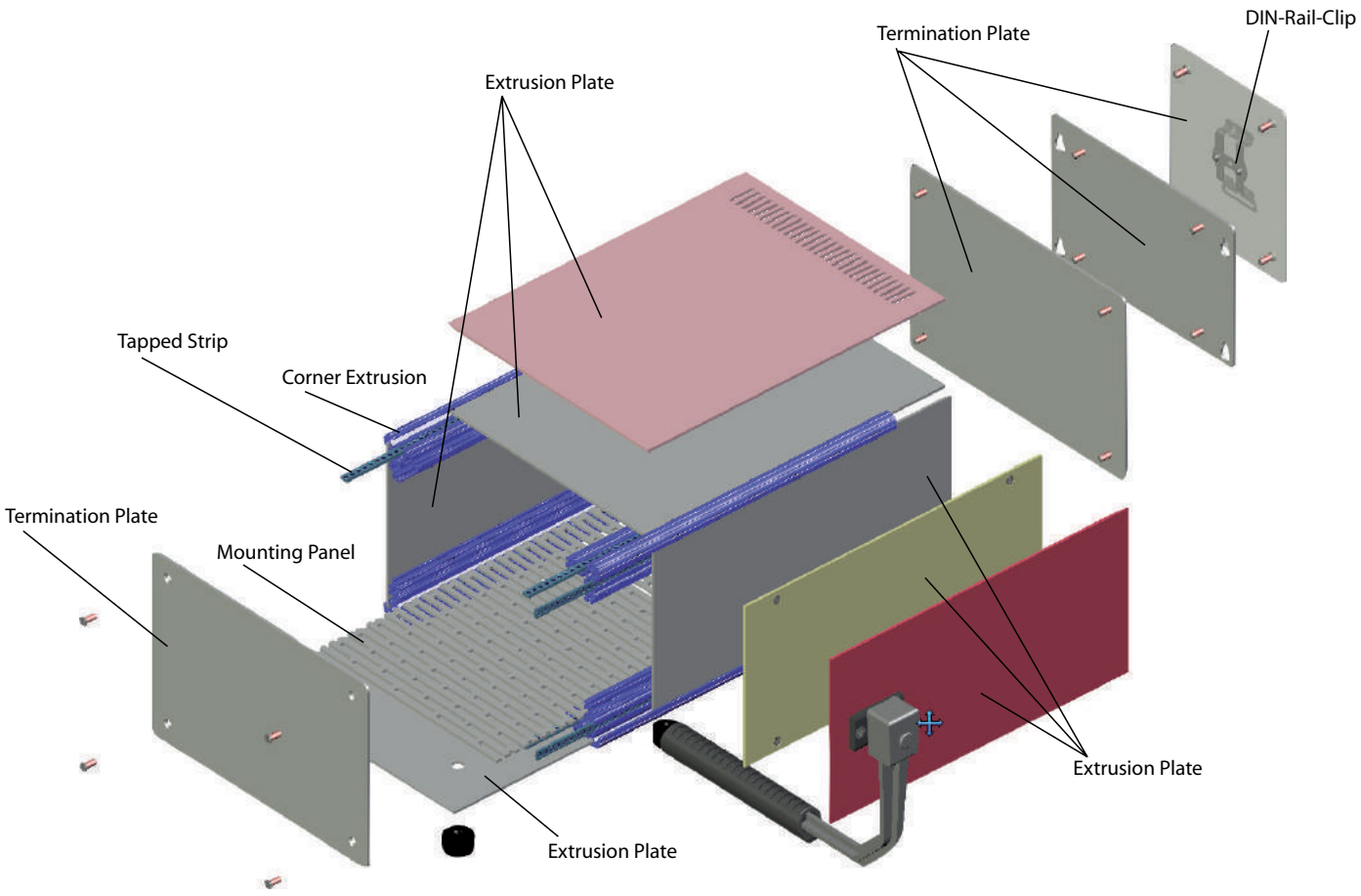
9.4.1 IP Protection Classes B | 9_21



9.1 Varietybox 35 Overview

9.1.1 Construction and Features

- The Varietybox 35 is constructed from 4 equal corner extrusions and 6 flat plates
- Multifunctional corner extrusion made from aluminium
- Flat plates made from aluminium sheet metal 2.0 mm
- Fast assembly (1-2 minutes)
- Very cost effective solution
- Easy to modify
- Protection to IP30 is assured with ventilation slots, IP40 without ventilation slots
- EMC level basic can be achieved when using clear passivated corner extrusions
- Hard and wear resistant solution with standard anodised corner extrusions



9: Varietybox 35



Very flexible and portable

- Desktop enclosures
- DIN-Rail enclosures
- Wall-mounted enclosures
- Flat enclosures
- Multi-purpose enclosures
- Hand-held boxes
- 19" rack-mount enclosures (modified standard)

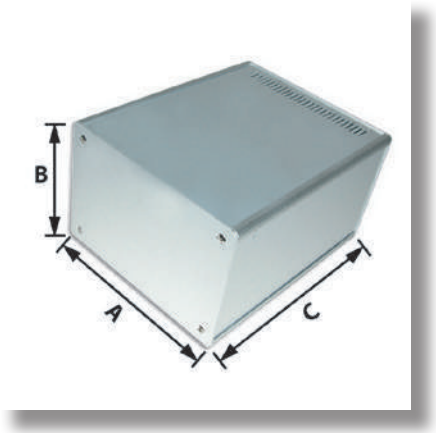
Application examples

- Measurement equipment
- Control instruments
- Test equipment
- Maintenance unit

Colours

- Our ability to adapt existing components to your application, makes Elma your preferred solution partner
- You find our most common colours in section F, but we can deliver your customised Varietybox 35 in any other colour

Standard outer-dimensions



A			B			C	
mm	inch		mm	inch		mm	inch
74	2.91		74	2.91		64	2.52
104	4.09		104	4.09		94	3.70
125	4.92		125	4.92			
134	5.27	X	134	5.27	X	124	4.88
194	7.63		194	7.63		184	7.24
254	10.0					244	9.60
258.35	10.17		258.35	10.17			
314	12.36		314	12.36		304	11.96

Other dimensions available upon request

9.1.2 Multifunctional Corner Extrusion



- Functions symmetrical
- Can be mounted twisted
- Dimension: approximately 30 mm
- Outer radius 5 mm
- Material: Aluminium
- Different colours (anodised or painted)
- Conductive or wear resistant



- Take-up of sheet metal 1.5 mm or 2.0 mm
- Mounting through insertion
- Use of flat sheet metal
- Use of different materials possible
- Different surfaces, colours



- Insertion of tapped strip 6x2 mm, M3 or M2.5
- Insertion of square nut M3
- Possibility of screw down extrusion plates
- For better EMC-contacting
- For better stability
- For accessibility with removable extrusion plates



- Groove for insertion of a sealing gasket
- For secure EMC-contacting
- For higher IP-Protection
- For firmer securing of non-screwed extrusion plates



- Insertion of tapped strip 6x2 mm, M3 or M2.5
- Insertion of square nut M3
- For direct mounting of components within the Varietybox 35
- For assembling a mounting plate
- For mounting of a card stopper

9: Varietybox 35



- Groove for direct insertion of PCB's
- Sufficient space for double sided PCB's
- Simple insertion until the card stopper

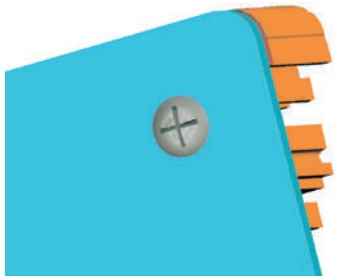


- Groove for direct sliding of a mounting panel or a PCB
- Sufficient place for feet as well as for press-in nuts, screw heads, etc.



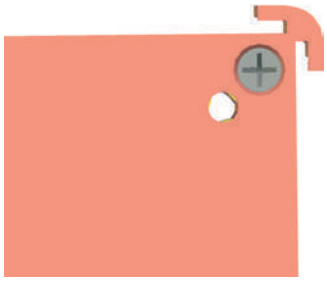
- Mounting of an earthing terminal M3.5
- Secure connections to the ground





- Hole for direct mounting of front and rear panel
- Mounting with 4 screws M4
- Use of flat sheet metal
- Use of different materials possible
- Various surfaces colours
- Front-/Rear panel can be used as a side panel (by relating the whole box by 90°)





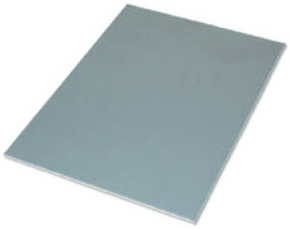
- Hole for direct mounting of an intermediate plate
- For additional stability
- For integration of further features

Configuration



Corner Extrusions
9.2.1

- Different lengths
- Different versions



Extrusions Plates
9.2.2

- With or without mounting holes
- With or without air perforation
- With or without holes for mounting feet
- With or without holes for handle



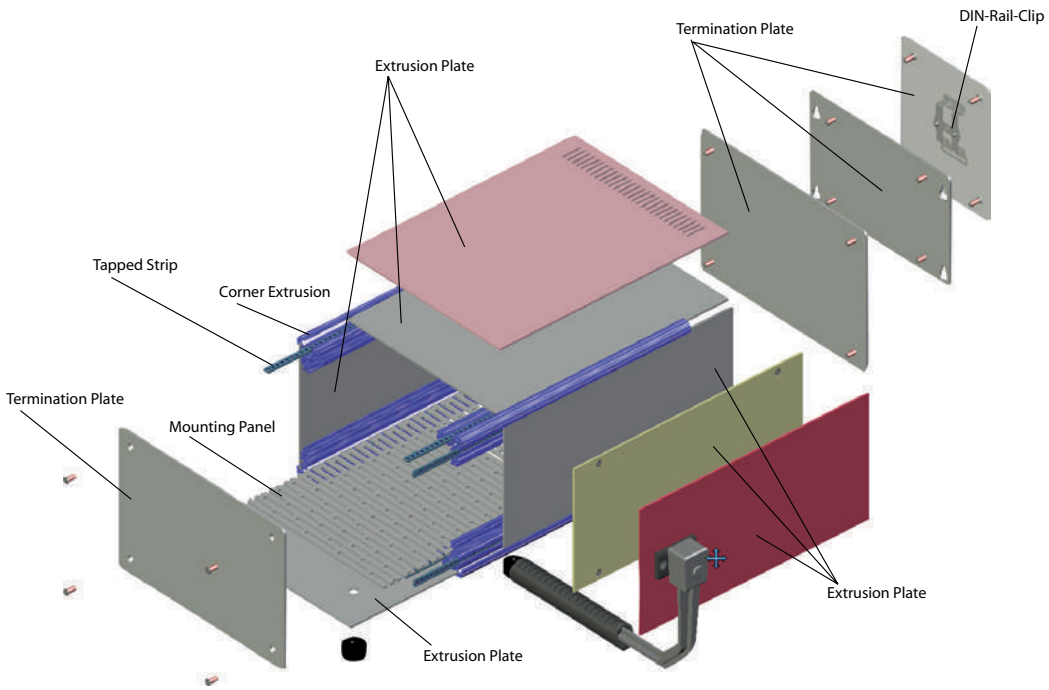
Front / Rear Terminations Plates
9.2.3

- Standard
- For Eurocard mounting
- For DIN-Rail Snap-on mounting
- For wall-mounting



Accessories
9.3

- Bumpon (self adhesive feet)
- Sealing gasket
- Mounting plates
- Card Stop
- EMC gasket
- Earthing terminal
- Assembly material
- U-handle
- Spacers





9.2 Configuration Basic Box

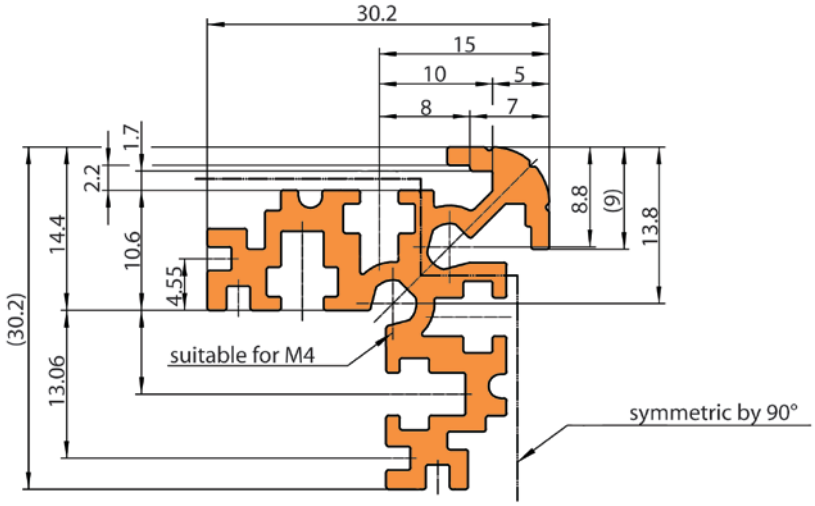
9.2.1 Corner Extrusions

- Extruded aluminium
- Versions: clear anodised / black anodised / clear passivated (conductive)
- 7 different lengths
- Other sizes, colours and surface treatments available upon request
- **Scope of delivery:**
  - 1 corner extrusion
- Note: for one Varietybox 35 you have to order 4 corner extrusions



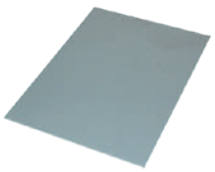
9.2.1 Corner Extrusions

Length		Part-No.	Part-No.	Part-No.	Part-No.
mm	inch	clear anodised	black anodised	clear passivated	raw
60	2.36	66-244-060-1	66-244-060-2	66-244-060-3	-
90	3.54	66-244-090-1	66-244-090-2	66-244-090-3	-
120	4.72	66-244-120-1	66-244-120-2	66-244-120-3	-
180	7.08	66-244-180-1	66-244-180-2	66-244-180-3	-
240	9.44	66-244-240-1	66-244-240-2	66-244-240-3	-
300	11.81	66-244-300-1	66-244-300-2	66-244-300-3	-
1350	53.15	66-244-1350-1	66-244-1350-2	66-244-1350-3	66-244-100

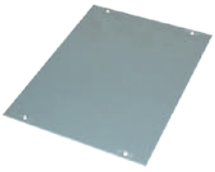


9.2.2 Extrusion Plates

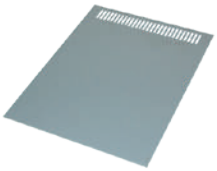
- Without holes can be slipped into the extrusion
- With or without air perforation
- With or without holes for mounting feet
- With holes for screwing for more stability and for direct access
- Material: aluminium 2.0 mm, front clear anodised, rear conductive
- Other sizes, colours and surface treatments available upon request
- **Scope of delivery:**
  - 1 extrusion plate
- Note: for one Varietybox 35 you have to order 4 extrusion plates



9.2.2.1
Without holes



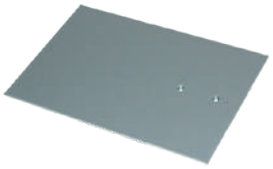
9.2.2.2
With mounting holes



9.2.2.3
With air perforation



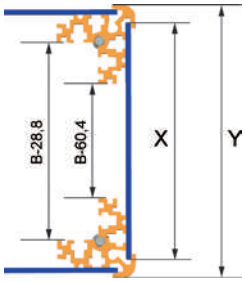
9.2.2.4
With holes for feet



9.2.2.5
With holes for handle

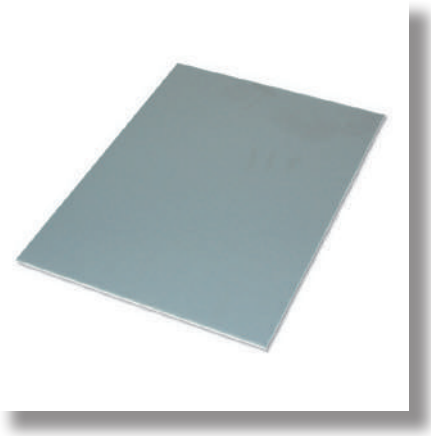
Conversion help

If extrusion plate size (X) is			then use termination plate size (Y)	
mm	inch		mm	inch
60	2.36	→	74	2.91
90	3.54		104	4.09
120	4.72		134	5.27
180	7.08		194	7.63
240	9.44		254	10.0
300	11.81		314	12.36



9.2.2.1 Extrusion Plates without Holes

- For direct insertion into the corner extrusions
- **Scope of delivery:**
  - 1 extrusion plate
- Sealing gasket for firmer securing of non-screwed extrusion plates see 9.3.2



9.2.2.1 Extrusion Plates without Holes

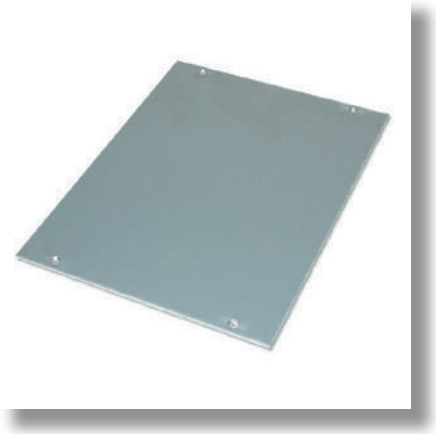
Dimensions		Part-No.
mm	inch	
60 x 60	2.36 x 2.36	35-20001
60 x 90	2.36 x 3.54	35-20002
60 x 120	2.36 x 4.72	35-20003
60 x 180	2.36 x 7.08	35-20004
60 x 240	2.36 x 9.44	35-20005
90 x 90	3.54 x 3.54	35-20036
90 x 120	3.54 x 4.72	35-20006
90 x 180	3.54 x 7.08	35-20007
90 x 240	3.54 x 9.44	35-20008
120 x 120	4.72 x 4.72	35-20009
120 x 180	4.72 x 7.08	35-20010
120 x 240	4.72 x 9.44	35-20012
120 x 300	4.72 x 11.81	35-20041
180 x 180	7.08 x 7.08	35-20013
180 x 240	7.08 x 9.44	35-20014
180 x 300	7.08 x 11.81	35-20042
240 x 240	9.44 x 9.44	35-20016
240 x 300	9.44 x 11.81	35-20037
300 x 300	11.81 x 11.81	35-20038

For mounting of Single or Double Eurocards
• Suitable termination plates see 9.2.3.2 and 9.2.3.3

Dimensions		Part-No.
mm	inch	
111.00 x 180	4.37 x 7.08	35-20011
244.35 x 180	9.62 x 7.08	35-20015

9.2.2.2 Extrusion Plates with Mounting Holes

- For more stability
- Removable for maintenance and accessibility
- **Scope of delivery:**
  - 1 extrusion plate
- Assembly material see below



9.2.2.2 Extrusion Plates with Holes

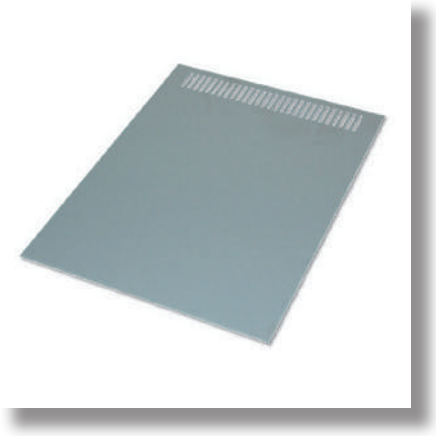
For dimensions		Eff. dimensions		Part-No.
mm	inch	mm	inch	
120 x 120	4.72 x 4.72	117.5 x 120	4.62 x 4.72	35-20017
120 x 180	4.72 x 7.08	117.5 x 180	4.62 x 7.08	35-20018
120 x 240	4.72 x 9.44	117.5 x 240	4.62 x 9.44	35-20019
180 x 120	7.08 x 4.72	177.5 x 120	6.98 x 4.72	35-20020
180 x 180	7.08 x 7.08	177.5 x 180	6.98 x 7.08	35-20021
180 x 240	7.08 x 9.44	177.5 x 240	6.98 x 9.44	35-20022
240 x 120	9.44 x 4.72	237.5 x 120	9.35 x 4.72	35-20023
240 x 180	9.44 x 7.08	237.5 x 180	9.35 x 7.08	35-20024
240 x 240	9.44 x 9.44	237.5 x 240	9.35 x 9.44	35-20025

Assembly Material

Description	For length / eff. length	Part-No.
Cross recessed countersunk screw M3 x 6		5332-06
Torx countersunk screw M3 x 6, size T10		5470-22
Tapped strip 2 x 6 mm, M3	120 mm / 106.2 mm	61-457
Tapped strip 2 x 6 mm, M3	180 mm / 212.9 mm	61-428
Tapped strip 2 x 6 mm, M3	240 mm / 212.9 mm	61-454
Square nut M3		5621-40
Plastic glider		61-015
Set screw for fixing of tapped strips M3 x 6		5413-06

9.2.2.3 Extrusion Plates with Air Perforation

- For thermal optimisation
- IP30 is assured with ventilation slots
- **Scope of delivery:**
  - 1 extrusion plate
- Sealing gasket for firmer securing of non-screwed extrusion plates see 9.3.2



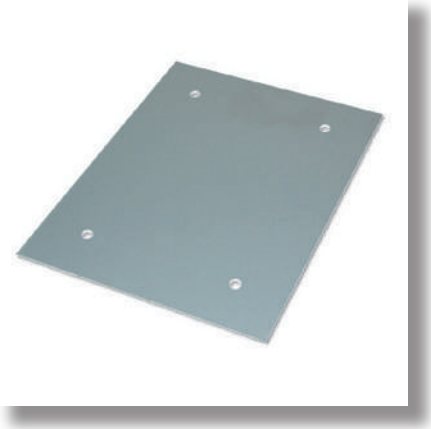
9.2.2.3 Extrusion Plates with Air Perforation

Dimensions		Part-No.
mm	inch	
120 x 300	4.72 x 11.81	35-20044
180 x 240	7.08 x 9.44	35-20026
180 x 300	7.08 x 11.81	35-20046
240 x 180	9.44 x 7.08	35-20027
240 x 240	9.44 x 9.44	35-20028
300 x 300	11.81 x 11.81	35-20045

9.2.2.4 Extrusion Plates with Holes for Feet

- For mounting of case feet, see below
- **Scope of delivery:**
  - 1 extrusion plate





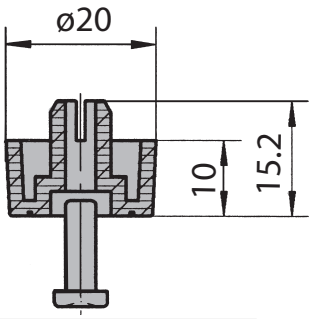
9.2.2.4 Extrusion Plates with Holes for Feet

Dimensions		Part-No.
mm	inch	
180 x 240	7.08 x 9.44	35-20029
180 x 300	7.08 x 11.81	35-20043
240 x 240	9.44 x 9.44	35-20030
240 x 300	9.44 x 11.81	35-20039
300 x 300	11.81 x 11.81	35-20040



Case Feet

- Black plastic, UL94 V-0
- Easy and fast mounting
- Mounting without tools
- **Scope of delivery:**
  - Set of 4 pieces plastic feet
  - Incl. push rivet

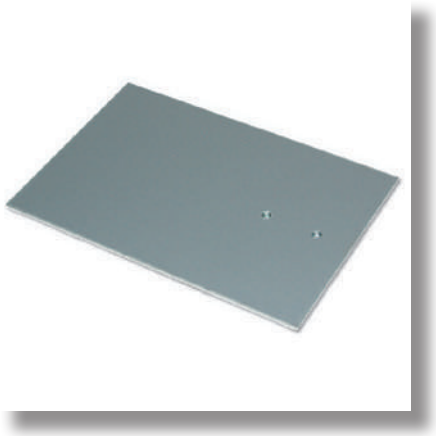


Description	Part-No.
Set of case feet, black (RAL 9005)	63-528
Set of case feet, light grey (RAL 7035)	63-529

Our ability to adapt existing components to your application, make Elma your preferred solution partner.

9.2.2.5 Extrusion Plates with Holes for Handle

- For mounting a handle onto Varietybox 35
- **Scope of delivery:**
  - 1 extrusion plate
- Carrying handle see below
- Screws to mount carrying handle see below

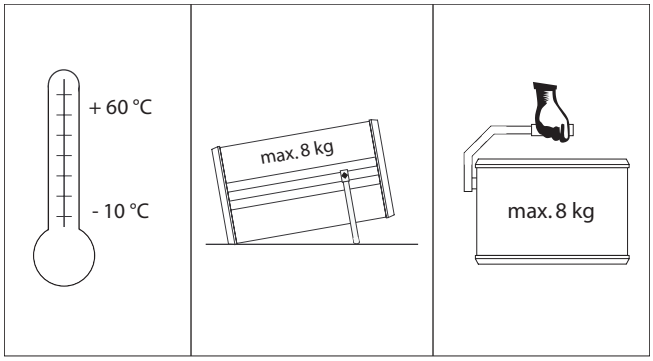


9.2.2.5 Extrusion Plates with Holes for Handle

Dimensions		Part-No.
mm	inch	
90 x 180	3.54 x 7.08	35-20031
90 x 240	3.54 x 9.44	35-20032
120 x 180	4.72 x 7.08	35-20033
120 x 240	4.72 x 9.44	35-20034
180 x 240	7.08 x 9.44	35-20035

Carrying Handle

- Zinc die-cast powder-coated
- Handle piece: Black polyurethane, UL 94V-0
- The handle is looking at 90°, while the carrying position has a slight detent only
- Following the case size, there are handles available in two different widths
- **Scope of delivery:**
  - Pre-assembled handle with assembly material



Carrying capacity dependent on distribution of load and handling. Decreases with dynamic stress



Carrying Handle

Colour	Part-No. 212 mm (8.34")	Part-No. 188 mm (7.40")
Black	33-645	33-646



Assembly Material for Handle

- 2 screws per 1 handle

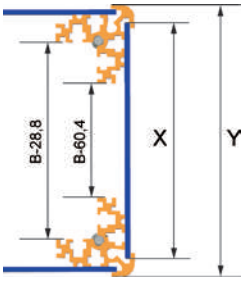
Description	Part-No.
Cross recessed countersunk screw M4 x 10	5342-10
Torx countersunk screw M4 x 10, size T20	5470-26

9.2.3 Front / Rear Termination Plates

- Aluminium sheet metal 2.0 mm
- Front clear anodised, rear conductive
- Other sizes, colours and surface treatments available upon request
- **Scope of delivery:**
  - 1 front / rear termination plate
- Note: for one Varietybox 35 you have to order 2 termination plates (1 front / 1 rear)

Conversion help

If extrusion plate size (X) is			then use termination plate size (Y)	
mm	inch		mm	inch
60	2.36	→	74	2.91
90	3.54		104	4.09
120	4.72		134	5.27
180	7.08		194	7.63
240	9.44		254	10.0
300	11.81		314	12.36



9.2.3.1 Termination Plates Standard

- Standard termination of Varietybox 35
- **Scope of delivery:**
  - 1 termination plate
- Per termination plate 4 screws are needed, see 9.2.3.5



9.2.3.1 Termination Plates Standard

Dimensions		Part-No.
mm	inch	
74 x 74	2.91 x 2.91	35-10001
74 x 104	2.91 x 4.09	35-10002
74 x 134	2.91 x 5.27	35-10003
74 x 194	2.91 x 7.63	35-10004
74 x 254	2.91 x 10.00	35-10005
104 x 104	4.09 x 4.09	35-10006
104 x 134	4.09 x 5.27	35-10007
104 x 194	4.09 x 7.63	35-10008
104 x 254	4.09 x 10.0	35-10009
134 x 134	5.27 x 5.27	35-10010
134 x 194	5.27 x 7.63	35-10011
134 x 254	5.27 x 10.0	35-10012
134 x 314	5.27 x 12.36	35-10022
194 x 194	7.63 x 7.63	35-10024
194 x 254	7.63 x 10.0	35-10013
194 x 314	7.63 x 12.39	35-10023
254 x 254	10.00 x 10.00	35-10019
254 x 314	10.00 x 12.36	35-10020
314 x 314	12.36 x 12.36	35-10021

9.2.3.2 Termination Plates for Eurocard Mounting

- Direct sliding of Single or Double Eurocard within Varietybox 35
- Suitable termination plates for DIN-Rail mounting 9.2.3.3
- **Scope of delivery:**
  - 1 termination plate
- Per termination plate 4 screws are needed, see 9.2.3.5



9.2.3.2 Termination Plates for Eurocard Mounting

Dimensions		Description	Part-No.
mm	inch		
125.00 x 104	4.92 x 4.09	for Single Eurocard	35-10014
258.35 x 104	10.17 x 4.09	for Double Eurocard	35-10016

9.2.3.3 Termination Plates for DIN-Rail Snap-on Mounting

- Incl. riveted steel DIN-clip
- Suitable for top hat rails 35 mm, acc. to IEC 60715 or EN 50022
- Suitable front termination plates see 9.2.3.2
- **Scope of delivery:**
  - 1 termination plate
- Per termination plate 4 screws are needed, see 9.2.3.5



9.2.3.3 Termination Plates for DIN-Rail Snap-on Mounting

Dimensions		Description	Part-No.
mm	inch		
125.00 x 104	4.92 x 4.09	DIN-Rail mounting	35-10015
258.35 x 104	10.17 x 4.09	DIN-Rail mounting	35-10017

9.2.3.4 Termination Plate for Wall Mounting

- For direct wall mounting of Varietybox 35
- Suitable front termination plates see 9.2.3.1
- **Scope of delivery:**
  - 1 termination plate
- Per termination plate 4 screws are needed, see 9.2.3.5



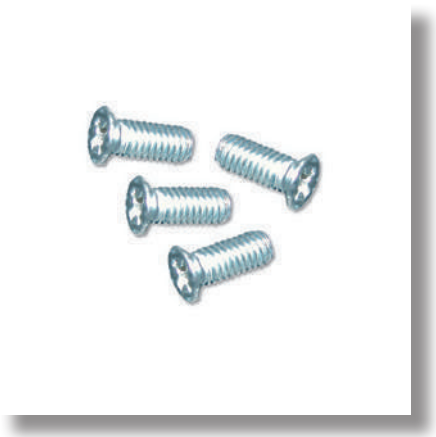
9.2.3.4 Termination Plate for Wall Mounting

Dimensions			Part-No.
mm	inch		
104 x 164	4.09 x 6.45	for 104 x 134	35-10018

Other dimensions and arrangements available upon request

9.2.3.5 Screws for Mounting Termination Plates

- Small head
- Per termination plate 4 screws are needed (8 screws per Varietybox 35)



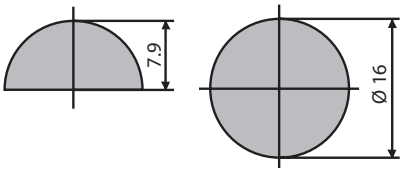
9.2.3.5 Screws for Mounting Termination Plates

Description	Part-No.
Torx countersunk screw M4x10, size T10	5441-54
Torx countersunk screw M4x10, size T10, black	5441-57



9.3 Accessories

9.3.1 Bumpon (Self adhesive Feet)



- Self adhesive bumpon
- Black polyurethane, UL94 HB
- **Scope of delivery:**
  - 1 bumpon



9.3.1 Bumpon (Self adhesive Feet)

Description	Part-No.
Set of 4 plastic bumpon	7650-52

9.3.2 Sealing Gasket

- For EMC-sealing from extrusion to extrusion plates
- For higher IP-protection (upon request, still in engineering process)
- Firmer securing of non-screwed extrusion plates
- Conductive sealing
- **Scope of delivery:**
  - 1 sealing gasket (conductive or non-conductive)

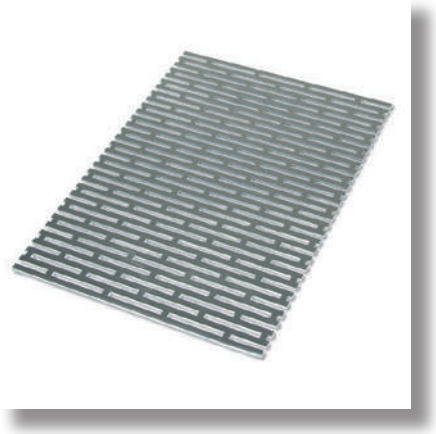


9.3.2 Sealing Gasket

Description	Part-No.
Sealing gasket conductive, length 700 mm	33E025
Sealing gasket non-conductive, length 1000 mm	33-025

9.3.3 Mounting Plates

- Made of 2 mm (0.07") thick sheet aluminium
- Dimensions correspond to the respective mounting plate dimensions
- The position of the slots allows various mounting arrangements
- The mounting plate is screwed to corner extrusion via M3 nut and screw in 4 places
- **Scope of delivery:**
  - 1 mounting plate, blank aluminium
- Assembly material see 9.3.7



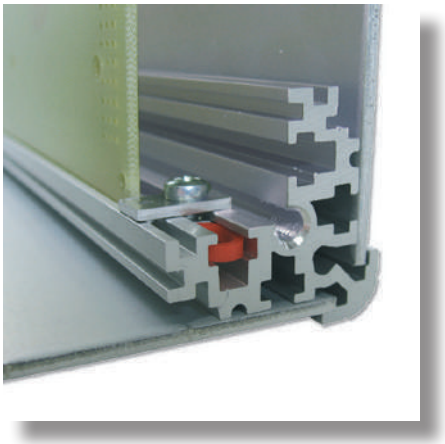
9.3.3 Mounting Plates

For termination Plate Width		Mounting Plate Dimension		Part-No.
mm	inch	mm	inch	
194	7.63	160 x 116.5	6.30 x 4.72	35-30004
254	10.0	220 x 116.5	8.66 x 4.72	35-30007
254	10.0	220 x 176.5	8.66 x 7.08	35-30008
314	12.36	280 x 296.5	11.02 x 11.67	35-30012
314	12.36	280 x 116.5	11.02 x 4.72	35-30014

Other sizes available on request.

9.3.4 Card Stop

- Card stoppers are used for card or mounting plate fixation when directly inserted
- **Scope of delivery:**
  - 1 card stopper aluminium
  - 1 cross recessed screw M3 x 6
  - 1 square nut M3
  - 2 plastic gliders



9.3.4 Card Stop

Description	Part-No.
Straight version	35-00001
Angled version	35-00002

9.3.5 EMC Gasket

- For EMC level advanced
- Increased EMC level by approximate 10 dB
- Self-adhesive
- Mounting direct onto the front / rear termination plate
- **Scope of delivery:**
  - 1 berrylium-copper contact strip



9.3.5 EMC Gasket

Description	Part-No.
EMC-Gasket, L = 29 mm	7739-31

9.3.6 Earthing Terminal

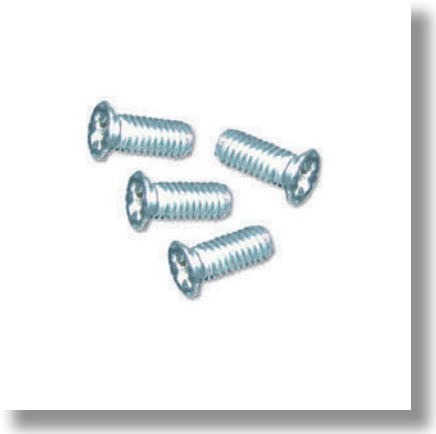
- The earthing terminal facilitates grounding of the Varietybox 35 in accordance with VDE/SEV standard
- **Scope of delivery:**
  - 1 earthing nut M3.5
  - 1 threaded bolt M3.5
  - 1 clamping yoke
  - 2 serrated washers
  - 1 nut M3.5
  - 1 earthing symbol



9.3.6 Earthing Terminal

Description	Part-No.
Earthing terminal	33-619

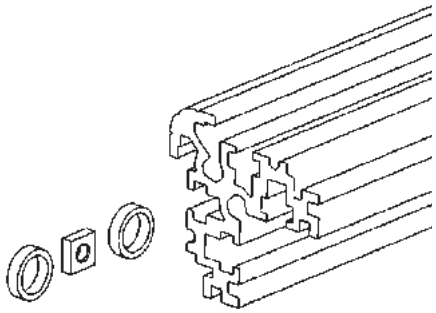
9.3.7 Assembly Material



9.3.7 Assembly Material

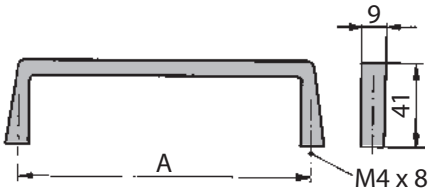
Description	For Length / eff. Length	Part-No.
Cross recessed countersunk screw M4 x 10		5441-51
Cross recessed countersunk screw M3 x 6		5332-06
Torx countersunk screw M3 x 6, size T10		5470-22
Raised cross recessed screw M3 x 6		5330-06
Torx cylinder head screw M3 x 6, size T10		5470-02
Tapped strip 2 x 6 mm, M2.5	120 mm / 106.2 mm	61-459
Tapped strip 2 x 6 mm, M3	240 mm / 212.9 mm	61-454
Square nut M3		5621-40
Plastic glider		61-015
Set screw for fixing of tapped strips M3 x 6		5413-06

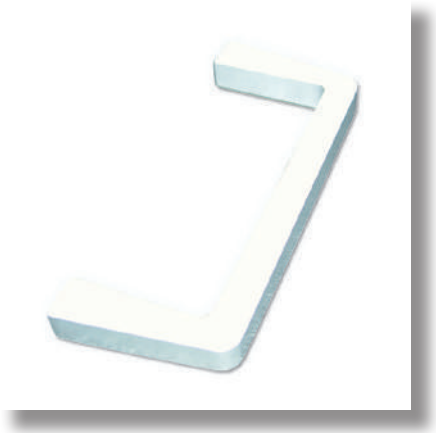
Mounting position of plastic gliders and square nut:



9.3.8 U-Handle Aluminium

- Anodised aluminium extrusion
- Width: 9 mm
- **Scope of delivery:**
  - 1 aluminium handle
- Per handle 2 screws are needed, see 9.3.8.1
- Holes for mounting U-handle not included in termination plates (upon request)





9.3.8 U-handle aluminium

A mm	A inch	Part-No. clear anodised	Part-No. black anodised
44.5	1.75	60-527	60-527-6
88.9	3.5	60-528	60-528-6
133.4	5.25	60-529	60-529-6
177.8	7.00	60-530	60-530-6
222.3	8.75	60-531	60-531-6

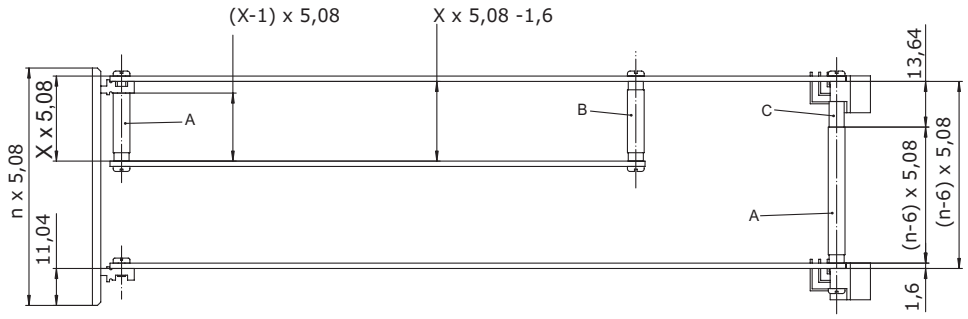
9.3.8.1 Screws

Material	Pcs.	Part-No.
Special philips cylindrical earthing screw M4 x 10	1000	61-260

9.3.9 Spacers

- Four-sided, nickel-plated brass spacers with M2.5 internal threads at both ends
- Using these spacers, additional PCBs may be mounted at a horizontal pitch of 5.08 mm
- Mounting plate is 1.5 mm galvanized steel with mounting holes corresponding to PCBs conforming to IEC 60297

Example of use:



n * 5.08 = theoretical width of front panel
x * 5.08 = distance of printed PCBs
n = multiple of the 5.08 pitch of the selected front panel
x = selected multiple of the 5.08 pitch for the distance of printed PCBs



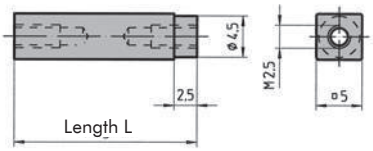
9.3.9.1 Spacers Series A

- Use between PCB mounting lugs and PCBs
- Gives 5.08 mm pitch

Length L		Part-No.
mm	inch	
10.16	0.40	61-300
15.24	0.60	61-301
20.32	0.80	61-302

Other lengths available on request.

Series A

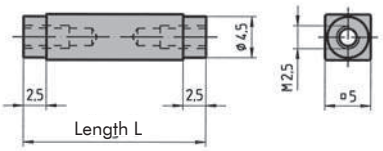


9.3.9.2 Spacers Series B

- Use between two PCBs
- Gives 5.08 mm pitch

Length L		Part-No.
mm	inch	
13.64	0.53	61-320
18.72	0.73	61-321
23.80	0.93	61-322

Series B

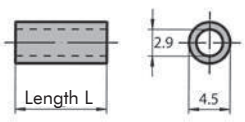


9.3.9.3 Spacers Series C

- Use between a PCB with connector and a second PCB

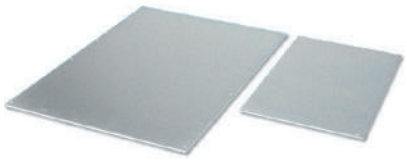
Length L		Part-No.
mm	inch	
7.64	0.30	61-340

Series C



9.3.10 Mounting Plates

- Dimensions identical to eurocard dimensions
- 1.5 mm galvanized sheet steel
- **Scope of delivery:**
  - 1 mounting plate
- Assembly material, see 9.3.10.1



9.3.10 Mounting Plates

Height	Dimensions	Part-No.
3 U	100 x 160 mm (3.93" x 6.29")	61-350
6 U	233.35 x 160 mm (9.18" x 6.29")	61-351

9.3.10.1 Assembly Material

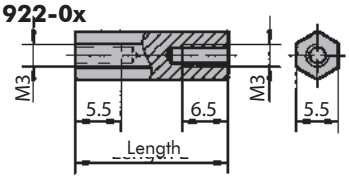
Description	Part-No. 100 pcs.
Screws recessed M2.5 x 5	5571-05

9.3.11 Hexagonal Spacers M3 Thread

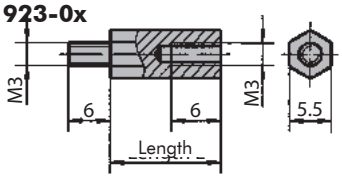
- Galvanized steel
- Ideal for use as supports or spacers
- **Scope of delivery:**
  - 1 spacer



1922-0x



1923-0x



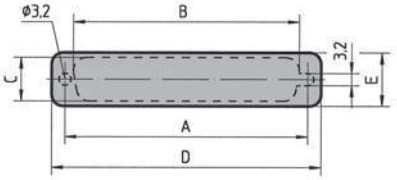
9.3.11 Hexagonal Spacers, M3 Thread

Length L mm	Length L inch	Part-No. 1 pc.
10	0.39	1922-01
15	0.59	1922-02
30	1.18	1922-05
40	1.57	1922-07

Length L mm	Length L inch	Part-No.
8.5	0.33	1923-01
13.5	0.53	1923-02

9.3.12 Covering Caps

- The caps, fit openings for D-Sub connectors and can be fitted without special tools
- Material: ABS grey UL94 HB
- **Scope of delivery:**
  - Plastic covering caps





9.3.12 Covering Caps

Opening		A mm	B mm	C mm	D mm	E mm	Part-No.
DB9	9-pole	25.0	20.5	11.4	32.0	14.0	61-920
DB15	15-pole	33.3	28.8	11.4	40.3	14.0	61-921
DB25	25-pole	47.0	42.5	11.4	54.0	14.0	61-922
DB37	37-pole	63.5	59.1	11.4	70.5	14.0	61-923

9.3.13 Mounting Bracket

- Assembly of a separation
- Separations are manufactured as required by the customer
- Sheet steel
- **Scope of delivery:**
  - 1 mounting bracket
- Assembly material, see 9.3.13.1



9.3.13 Mounting Bracket

Description	Part-No.
Mounting brackets	61-416

9.3.13.1 Assembly Material

Description	Part-No.
Rounded head screws cross recessed M3 x 6	5335-06
Rounded head screws Torx M3 x 6, size T10	5473-01

9.4 Technical Information

9.4.1 IP Protection Classes

- Protection against contact and foreign bodies
- Protection against water
- Acc. to IEC 60529

Evaluation of classification

- The test results according to the standard do not entirely exclude leaks and an individual test is therefore recommended in critical cases (with the actual equipment layout)
- The protection class for cabinets and enclosures is specified by IP (International Protection) and two indices

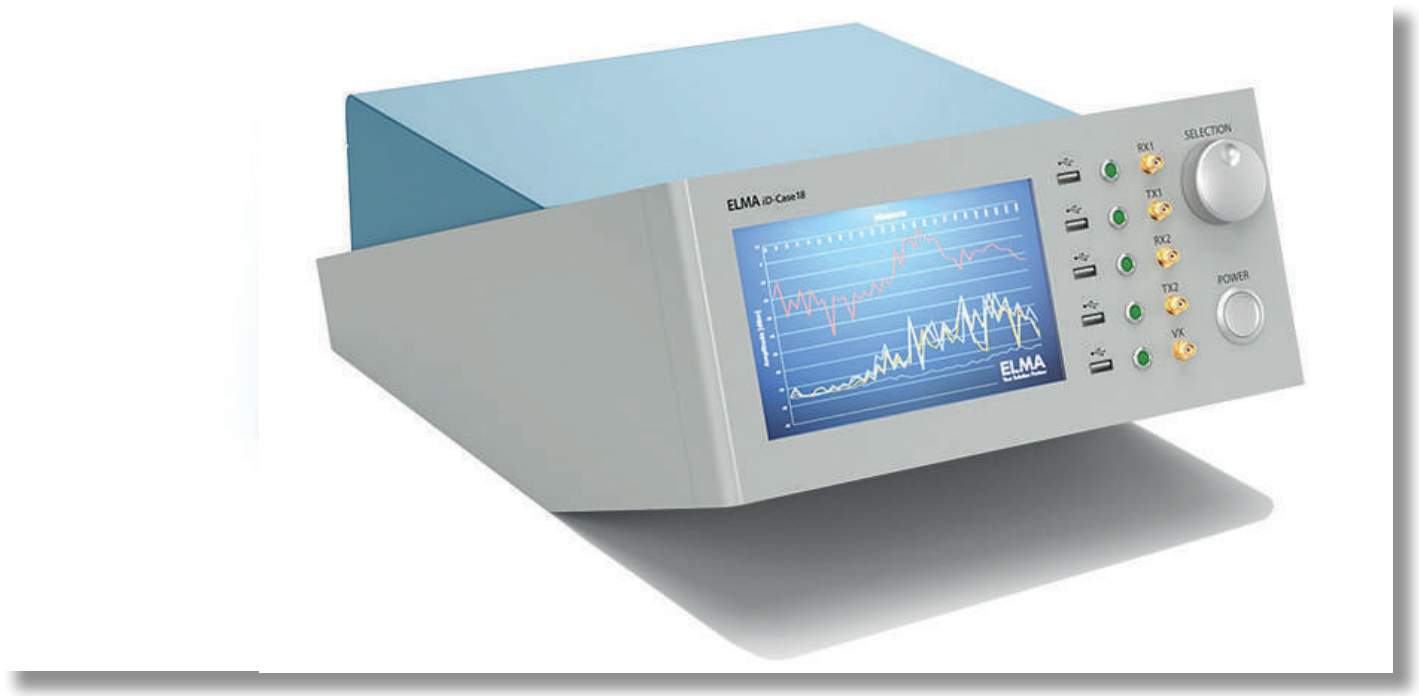
Example IP 55

Protection against penetration by water jets from all directions

Complete protection against contact with internal parts and against dust deposition

First Index	Contact Protection	Foreign-Body Protection
0	No special protection	
1	Against large areas of body	Large foreign bodies Ø ≥ 50 mm (1.97")
2	Against fingers or objects of similar size	Medium-sized foreign bodies Ø ≥ 12.5 mm (0.49")
3	Against tools, wires, etc. with a thickness of ≥ 2.5 mm	Granular foreign bodies Ø ≥ 2.5 mm (0.10")
4	Against tools, wires, etc. with thickness ≥ 1.0 mm	Granular foreign bodies Ø ≥ 1.0 mm (0.04")
5	Complete protection	Dust-protected; dust deposits are permitted, but their volume must not affect the function of the unit
6	Complete protection	Dust-proof

Second Index	Water Protection
0	No special protection
1	Against water dripping vertically
2	Against water dripping at an angle (up to 15° from the vertical)
3	Against spray water (any direction up to 60° from the vertical)
4	Against spray water from all directions
5	Against water jets from a nozzle in all directions
6	Against inundation
7	Against immersion
8	Against submersion



Gehäuseplattform mit vielfältigen Möglichkeiten

Mit dem IC-Case hebt sich jedes technische Gerät von der Masse ab. Dank leicht demontierbarem Deckel ist der Zugang zu Elektronik leicht und minimiert damit den Montageaufwand auf ein Minimum. Die vier Grössen des ID-Case bieten sehr viel Freiraum für kundenspezifische Gestaltung. Dank den klappbaren Füssen kann die Front entweder Senkrecht oder in einem 20° Winkel bedient werden. So kann das Gerät stehend wie auch sitzend optimal bedient werden.

Nutzen Sie die vielfältigen Möglichkeiten Ihr individuelles Gehäuse zusammen zu stellen.

Grössen

Sie wählen die passende Gehäusegrösse (HxBxT):

- Grösse XS: 75 x 173 x 253mm
- Grösse S: 90 x 208 x 288mm
- Grösse M: 110 x 258 x 360mm
- Grösse L: 140 x 308 x 450mm



Farbe

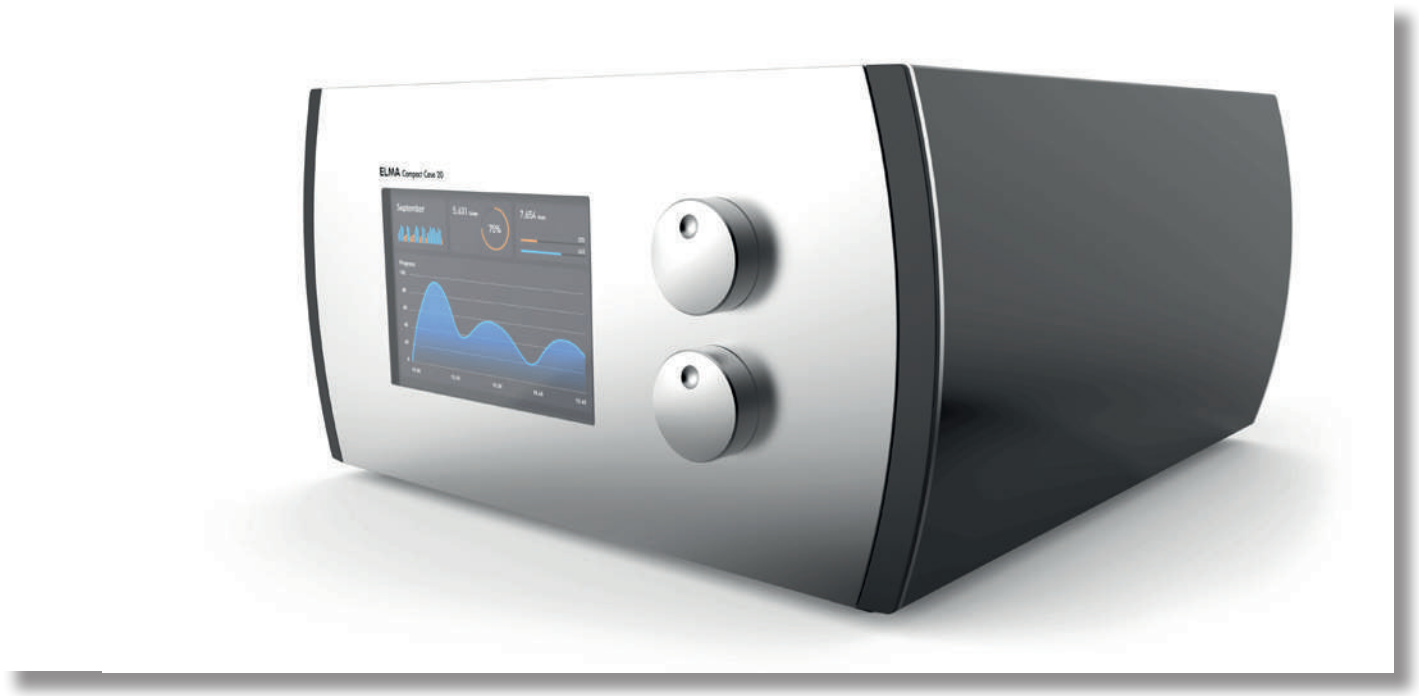
Sie wählen die Farbkombination für:

- Bodenwanne
- Deckel
- Rückplatte
- Front / Bügel

Zusatzoptionen

Sie entscheiden, welche Teile bedruckt und welche zusätzlichen Komponenten auf der Frontplatte integriert werden:•

- Displays
- Schalter / Encoder
- LED's
- Druck: Beschriftung, Logo, Fotorealistische Drucke



Designgehäuse

Das Auge arbeitet mit – eine ansprechende Optik im Umfeld macht das Arbeiten schöner und damit effizienter. Das gilt auch für Gehäuse und Komponenten. Wo immer Sie präzise Elektronik einsetzen: Das kompakte Designgehäuse Compact Case 20 von Elma Electronic verpackt diese perfekt.

Ausführung

Das Gehäuse ist in 3 Versionen erhältlich.

Standard:

- Seitenwandprofile: Aluminium, schwarz eloxiert, Schnittkanten roh
- Boden- / Deckblech: farblos eloxiertes Aluminium, 2mm, Schnittkanten roh
- Rückplatte: farblos eloxiertes Aluminium, 2mm, Schnittkanten roh



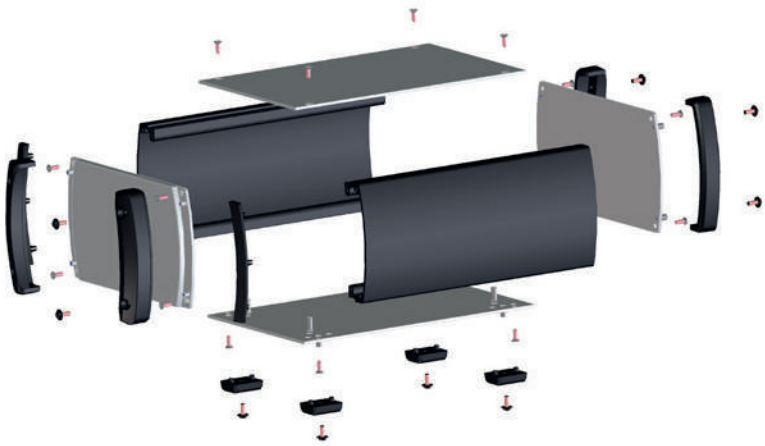
11: Compact Case 20

Höhere Anforderung

- inklusive Kunststoffabdeckungen aus PC / ABS* in RAL 9005 für die Frontplatte

Hohe Belastung

- inklusive Rugged-Abdeckungen in Elastomere, NBR 80 Shore in RAL 9005 für Front- / Rückplatte



Grösse

Wählen Sie aus 4 verschiedenen Grössen aus:

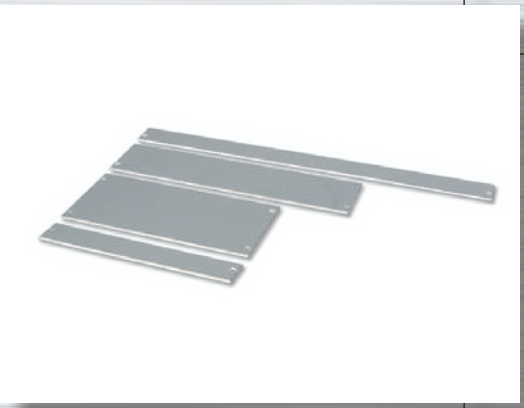
Grösse	Masse (BxH)	Masse Tiefe	Standard	Kunststoff-abdeckung schwarz	ugged Abdeckung schwarz
XS	130 x 60mm	150 bis 300mm (10mm Schritte)	CC20 schwarz / silber XS 150mm lang	CC20 schwarz / silber XS 150mm lang	CC20 schwarz / silber XS 150mm lang
			20C-100-150	20C-101-150	20C-102-150
S	170 x 90mm	150 bis 300mm (10mm Schritte)	CC20 schwarz / silber S 200mm lang	CC20 schwarz / silber S 200mm lang	CC20 schwarz / silber S 200mm lang
			20C-200-200	20C-201-200	20C-202-200
M	240 x 120mm	150 bis 300mm (10mm Schritte)	CC20 schwarz / silber M 250mm lang	CC20 schwarz / silber M 250mm lang	CC20 schwarz / silber M 250mm lang
			20C-300-250	20C-301-250	20C-302-250
L	300 x 150mm	150 bis 300mm (10mm Schritte)	CC20 schwarz / silber L 300mm lang	CC20 schwarz / silber L 300mm lang	CC20 schwarz / silber L 300mm lang
			20C-400-300	20C-401-300	20C-402-300



Farbe

Farben Sie erhalten Ihr Compact Case 20 in Aluminium, silbern mit schwarz eloxierten Seitenwandprofilen.

Front Panels, Handles and Plug-in Units



1. Front Panels for Sub Racks and Enclosures

- Flat front panels
- EMC flat front panels
- Fan front panels
- Hinged front panels



2. Front Panels for Plug-In Units

- IEC plug-in units
- IEEE plug-in units
- ATCA plug-in units
- PMC Mezzanine front panels
- FMC Mezzanine front panels



3. Handles

- Fixed handles
- Injector-/ejector handles

4. Cassettes and Modules

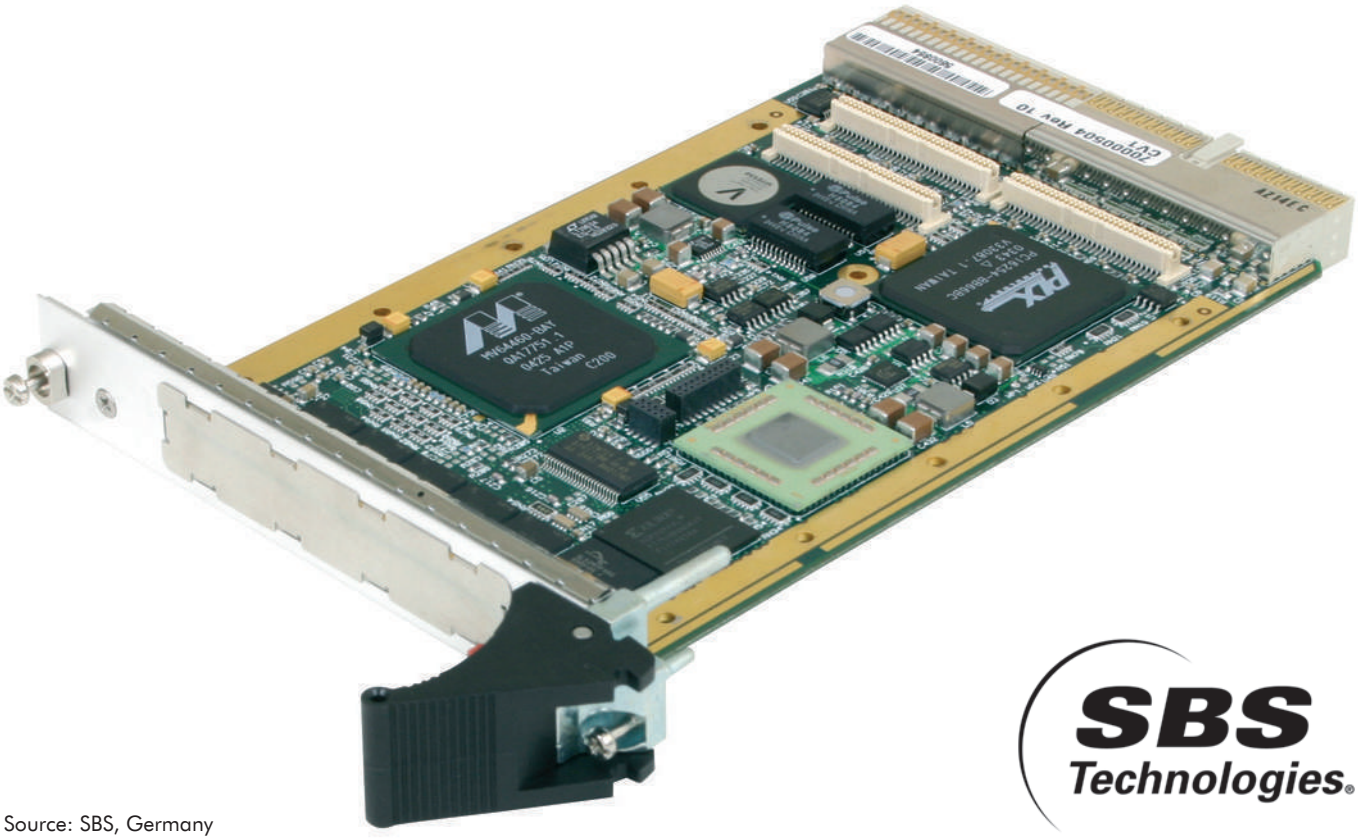
- For several eurocards
- For one eurocard and bulky components



5. Ventilation 84 HP

- Fan Modules Vertical
- Fan Modules Horizontal
- Fan and Fan Speed Control





Source: SBS, Germany

1: Front Panels for Sub Racks and Enclosures









1.1 Flat Front Panels **C | 1_2**

1.1.1 Front Panel Screws C | 1_2

1.2 EMC Flat Front Panels **C | 1_3**

1.2.1 EMC Filler Panel with EMC Gasket C | 1_4

1.2.2 EMC Filler Panel without EMC Gasket C | 1_4

1.2.3 EMC Flat Front Panels C | 1_5

1.2.4 Superior EMC Level C | 1_6

1.2.5 Perforated EMC Front Panel 84 HP C | 1_6

1.3 Fan Front Panels **C | 1_7**

1.3.1 Fan Front Panel 84 HP for Vertical Ventilation C | 1_7

1.3.2 Fan Front Panel for Horizontal Ventilation C | 1_8

1.3.3 Fan Front Panels for Direct Fan Mounting C | 1_8

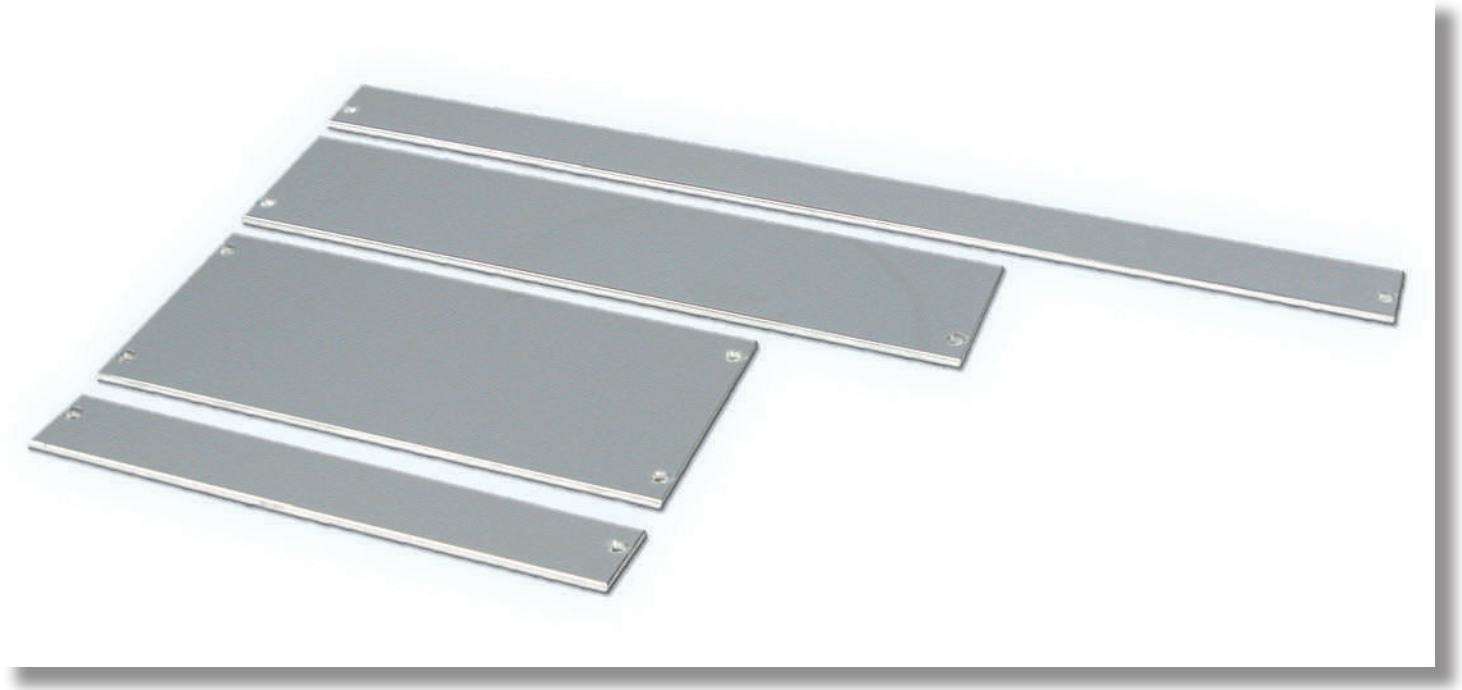
1.4 Hinged Front Panels **C | 1_9**

1.4.1 Top / Bottom-Hinged Front Panel C | 1_9

1.4.2 EMC Top / Bottom-Hinged Front Panel C | 1_10

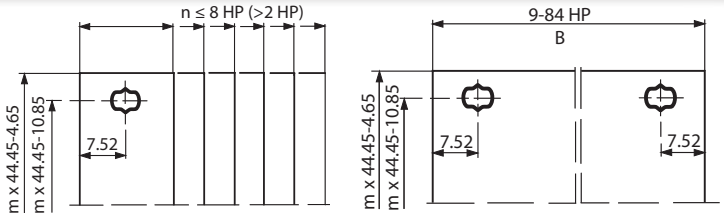
1.4.3 Side-Hinged Front Panel C | 1_10

1.4.4 Accessories C | 1_11



1.1 Flat Front Panels

- For sub racks and enclosures, solid
- Aluminium 2.5 mm, clear anodised (non-conductive)
- **Scope of delivery:**
  - Flat front panel
- Front panel screws, see below
- 2 HP version: screw retainer can not be fitted



1.1 Flat Front Panels for Sub Racks and Enclosures, Solid

Width	B		Height			Part-No.				
	mm	inch	1 U 39.8mm	ca. 1 U* 42.15mm	2 U 84.2mm	3 U 128.7mm	4 U 173.1mm	6 U 262.0mm	7 U 306.5mm	9 U 395.4mm
2 HP[1]	10.0	0.39	—	—	—	21N302	—	21N602	—	—
3 HP	15.2	0.59	—	—	—	21N303	21N403	21N603	—	—
4 HP	20.1	0.79	—	—	—	21N304	21N404	21N604	—	21N904
5 HP	25.2	0.99	—	—	—	21N305	21N405	21N605	—	—
6 HP	30.3	1.19	—	—	—	21N306	21N406	21N606	—	—
7 HP	35.3	1.38	—	—	—	21N307	21N407	21N607	—	—
8 HP	40.4	1.59	—	—	—	21N308	21N408	21N608	—	—
10 HP	50.6	1.99	—	—	—	21N310	21N410	21N610	—	—
11 HP	55.7	2.19	—	—	—	21N311	—	—	—	—
12 HP	60.7	2.38	—	—	—	21N312	21N412	21N612	—	—
14 HP	70.9	2.79	—	—	—	21N314	21N414	21N614	—	—
16 HP	81.1	3.19	—	—	—	21N316	21N416	21N616	—	—
20 HP	101.4	3.59	—	—	—	21N320	21N420	21N620	—	—
21 HP	106.5	4.19	—	—	—	21N321	—	21N621	—	—
28 HP	142.0	5.59	—	—	—	21N328	—	21N628	—	—
32 HP	162.3	6.38	—	—	—	21N332	21N432	—	—	—
42 HP	213.1	8.38	—	—	21N242	21N342	21N442	21N642	—	—
52 HP	263.9	10.38	—	—	—	21N352	21N452	21N652	—	—
63 HP	319.8	12.59	—	—	21N263	21N363	21N463	21N663	—	—
81 HP	411.3	16.19	—	—	21N281	21N381	21N481	21N681	—	—
84 HP	426.5	16.79	21N184	21N084*	21N284	21N384	21N484	21N684	21N784	21N984

* Coverplates for 1 U fan opening

1.1.1 Front Panel Screws

- Set of 10 screws, with screw retainer

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3, size T8 with plastic screw retainer	63K159
Rounded head screws recessed M2.5 x 11.3 with plastic screw retainer	63-159



1.2 EMC Flat Front Panels

"Electromagnetic comptability is the ability of a system to operate in the intended environment without causing or suffering unacceptable degradation of performance due to unintentinal electromagnetic radiation or response." The EMC characterstics of a system therefore consist of an appropriate immunity from interference (noise immunity) and a limited emission of interference (noise emission).

Elma's EMC concept describes three levels of electromagnetic shielding performance (Performance Level). The attenuation levels will simplify the selection of sub racks for the user. Test setup: The first measurement E1 is without the enclosure. The next measurement E2 is made with the transmitting antenna installed inside the enclosure. The difference between the received signal without and with the enclosure represents the shielding effectiveness in dB.

Performance Level	30-230 MHz	230-1000 MHz	1000-2000 MHz
1 / Elma: basic level	20 dB	10 dB	0 dB
2 / Elma: advanced level	40 dB	30 dB	20 dB
3 / Elma: superior level	60 dB	50 dB	40 dB

Note: Throughout the catalogue we put all EMC parts in a yellow table.

1.2.1 EMC Filler Panel with EMC Gasket

- High stability (U-profile)
- Extruded aluminium
- Pressed-in centring pin and bushes M2.5
- Front side clear anodised, rear side conductive
- **Scope of delivery:**
  - EMC front panel incl. pressed-in centering pin and bushes M2.5
- EMC-gasket see below
- Front panel screw see below



1.2.1 EMC Front Panel

Width	Part-No. 3 U	Part-No. 4 U	Part-No. 6 U
4 HP	66-514-73	66-514-74	66-514-76
5 HP	66-515-73	-	66-515-76
6 HP	66-516-73	66-516-74	66-516-76
8 HP	66-518-73	66-518-74	66-518-76
9 HP	66-519-73	-	66-519-76
10 HP	66-520-73	-	66-520-76
12 HP	66-522-73	-	66-522-76
14 HP	66-534-73	-	66-534-76

1.2.1.1 EMC Gasket (Stainless Steel)

Height	Part-No.
3 U	81-062-03
4 U	81-062-04
6 U	81-062-06

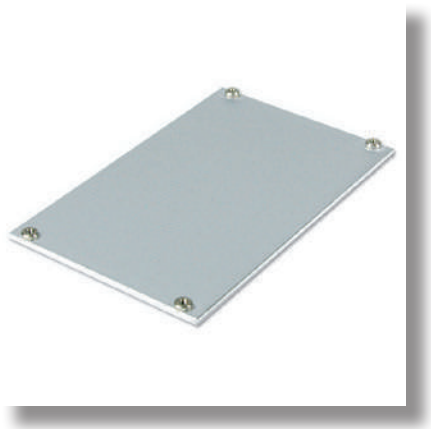
1.2.1.2 Front Panel Screws

- Front panel width up to 8 HP = 2 screws; ≥ 9 HP = 4 screws

Description	Part-No.
Torx screw, M2.5 x 11.3, size T8	5443-08
Rounded head screw, cross recessed M2.5 x 12.7	61-287

1.2.2 EMC Filler Panel without EMC Gasket

- Front panel standard, solid
- Front clear anodised
- Rear conductive
- Basic level EMC
- **Scope of delivery:**
  - 1 front panel incl. press-fit bushes M2.5 (pressed-in)
- Front panel screws, see below
- Spacer see 1.2.2.2



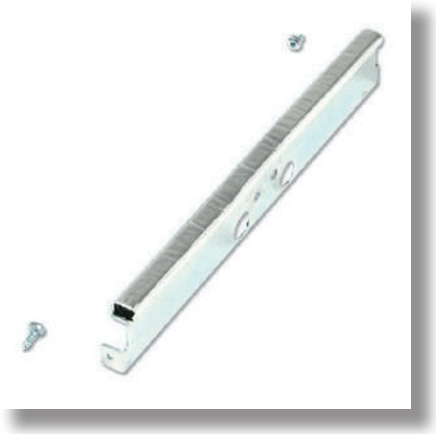
1.2.2 EMC Filler Panel without Gasket

Width	Part-No. 3 U	Part-No. 4 U	Part-No. 6 U
4 HP	21B304	-	-
10 HP	21B310	-	-
12 HP	21B312	-	-
16 HP	21B316	21B416	-
21 HP	21B321	21B421	-
42 HP	21B342	21B442	21B642
63 HP	21B363	21B463	-
84 HP	21B384	21B484	21B684

1.2.2.1 Front Panel Screws

- Front panel width up to 9 HP = 2 screws; ≥ 10 HP = 4 screws

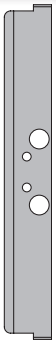
Description	Part-No.
Torx screw, M2.5 x 11.3, size T8	5443-08
Rounded head screw, cross recessed M2.5 x 12.7	61-287



1.2.2.2 Spacer for EMC Front Panel Flat

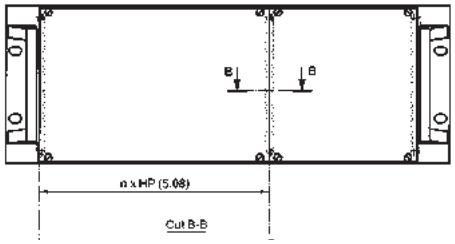
- EMC-Level: Advanced
- **Scope of delivery:**
  - 1 spacer incl. gasket
  - 2 Torx sheet metal screws 2.9 x 6.5; size T 10

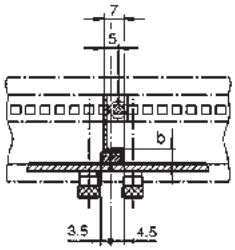
Height	Part-No.
3 U	81K023
4 U	81K024
7 U	81K027



Holes in some cases needed for mounting telescopic rails

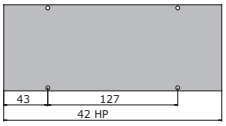


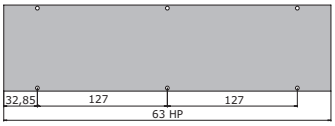


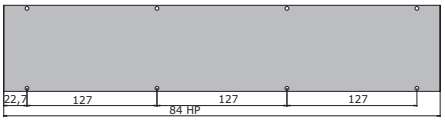


1.2.3 EMC Flat Front Panels

- Aluminium 2.5 mm (conductive)
- Closes the front or rear of the sub rack with very high shielding effectiveness
- Contact between the flat front panel and the case is made via EMC gaskets







1.2.3 Advanced EMC Level

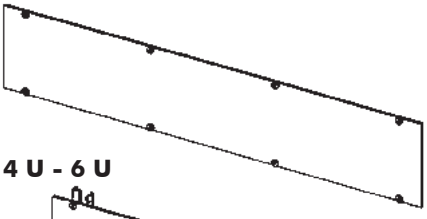
- **Scope of delivery:**
  - EMC flat front panel
  - Contact angle, incl. screws (4 + 6 U version only)
  - EMC gasket for contact angle (4 + 6 U version only)
- Front panel screws see below
  - Front panel width 42 HP = 4 screws
  - Front panel width 63 HP = 6 screws
  - Front panel width 84 HP = 8 screws

Width	Part-No. 1 U	Part-No. 2 U	Part-No. 3 U	Part-No. 4 U	Part-No. 6 U
42 HP	-	-	21C342	-	-
63 HP	-	21C263	21C363	21C463	-
84 HP	21C184	21C284	21C384	21C484	21C684

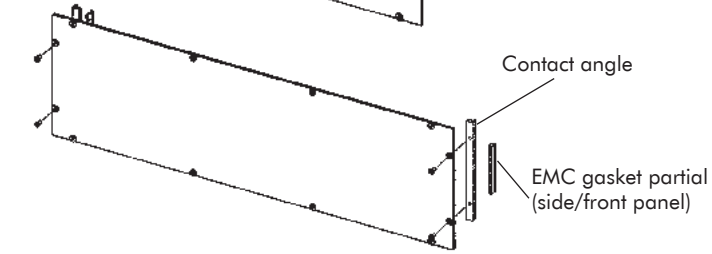
1.2.3.1 Front Panel Screws

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3, size T8, with press-fit bush	63K480
Screw recessed M2.5 x 11.3, with press-fit bush	63-444
Screw cross recessed M2.5 x 12.7, with press-fit bush	63-480

1 U - 3 U

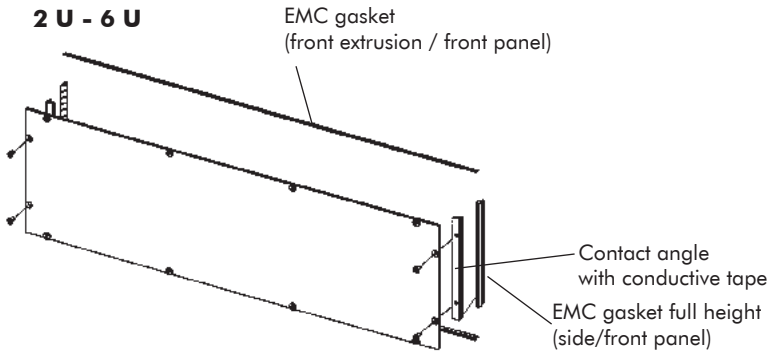


4 U - 6 U



1.2.4 Superior EMC Level

- **Scope of delivery:**
  - EMC flat front panel
  - Contact angle, incl. screws
  - EMC gasket for contact angle
  - EMC gasket for front extrusion/front panel
- Front panel screws, see below
  - Front panel width 42 HP = 4 screws
  - Front panel width 63 HP = 6 screws
  - Front panel width 84 HP = 8 screws



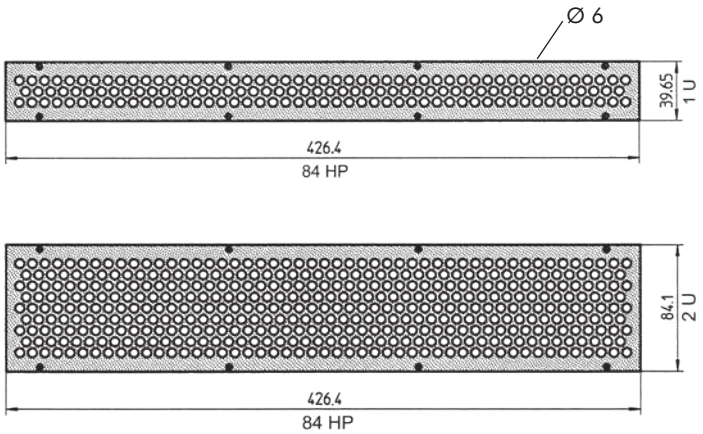
Width	Part-No. 2 U	Part-No. 3 U	Part-No. 4 U	Part-No. 6 U
84 HP	21D284	21D384	21D484	21D684

1.2.4.1 Front Panel Screws

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3, size T8, with press-fit bush	63K480
Screw recessed M2.5 x 11.3, with press-fit bush	63-444
Screw cross recessed M2.5 x 12.7, with press-fit bush	63-480

1.2.5 Perforated EMC Front Panel 84 HP

- Front anodised, rear conductive
- Advanced EMC level
- Width: 84 HP
- **Scope of delivery:**
  - Perforated flat front panel
- Front panel screws see below
- On-off switch see below





1.2.5 Perforated EMC Front Panel 84 HP

Height			Air Passage	Switch Opening Part-No. without
1 U	39.65 mm	1.56"	4'100 mm²	21C184-01
2 U	84.1 mm	3.31"	12'300/11'700 mm²	21C284-01

1.2.5.1 Front Panel Screws

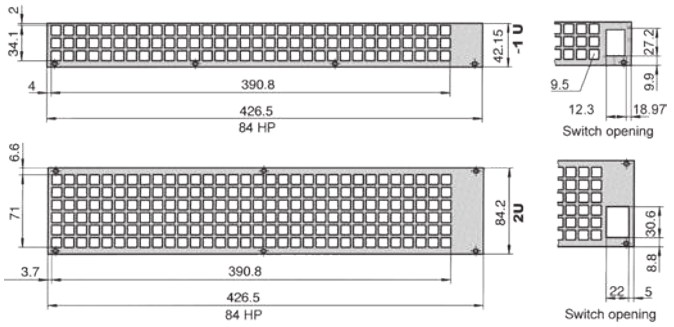
Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3, size T8, with press-fit bush	63K480
Screws recessed M2.5 x 11.3, with press-fit bush	63-444
Screws cross recessed M2.5 x 12.7, with press-fit bush	63-480



1.3 Fan Front Panels

1.3.1 Fan Front Panel 84 HP for Vertical Ventilation

- Fan front panels are flat, perforated and designed to ensure an optimum air flow rate
- Available with or without switch cut-out (switch opening 1 U = 12.3 x 27.2 mm / 2 U = 22 x 30.6 mm)
- Aluminium 2.5 mm, clear anodised (non-conductive)
- **Scope of delivery:**
  - 1 perforated fan front panel
- Front panel screws see below
- On-off switch see below





1.3.1 Fan Front Panel 84 HP for Vertical Ventilation

Description	Height	Air passage		Part-No.
		mm²	sq. inch	
Without switch opening	~ 1 U	8664	13.42	21N084-01
With switch opening	~ 1 U	8664	13.42	21N084-02
Without switch opening	2 U	17328	26.85	21N284-01
With switch opening	2 U	17328	26.85	21N284-02

1.3.1.1 Front Panel Screws

- Set of 10 screws
- With screw retainer
- Fan front panel ~1 U = 4 screws; 2 U= 6 screws

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3 , size T8, with plastic screw retainer	63K159
Rounded head screws recessed M2.5 x 11.3, with plastic screw retainer	63-159



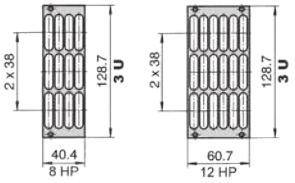
1.3.1.2 On-Off Switch

- Black body, plastic
- 2 pole
- 250V, 16A
- Quick-connect terminal 6.3 x 0.8 mm
- Cut-out for 4426-00: 22 x 30.6 mm (0.87" x 1.20")
  Cut-out others: 12.3 x 27.2 mm (0.48 x 1.07")

Description	Part-No.
On-off switch, indicator light green	69-410-04
On-off switch, without signal light	69-410-09

1.3.2 Fan Front Panel for Horizontal Ventilation

- Aluminium 2.5 mm, clear anodised (non-conductive)
- **Scope of delivery:**
  - 1 perforated fan front panel
- Front panel screws see below





1.3.2 Fan Front Panel for Horizontal Ventilation

Height	Width	Air passage		Part-No.
		mm²	sq. inch	
3 U	8 HP	3195	4.95	21N308-01
	12 HP	4793	7.42	21N312-01

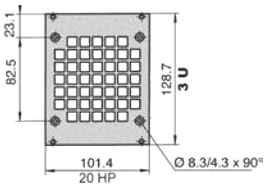
1.3.2.1 Front Panel Screws

- Set of 10 screws
- With screw retainer
- Fan front panel width up to 8 HP = 2 screws; ≥ 12 HP = 4 screws

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3 , size T8, with plastic screw retainer	63K159
Rounded head screws recessed M2.5 x 11.3, with plastic screw retainer	63-159

1.3.3 Fan Front Panels for Direct Fan Mounting

- Aluminium 2.5 mm, clear anodised (non-conductive)
- **Scope of delivery:**
  - 1 perforated fan front panel
- Front panel screws see below
- Assembly material for fan mounting has to be ordered separately





1.3.3 Fan Front Panels for Direct Fan Mounting

Description	Height	Width	Air passage		Part-No. 10 pcs.
			mm²	sq. inch	
Without switch opening	3 U	20 HP	4051	6.27	21N320-04

1.3.3.1 Front Panel Screws

- Set of 10 screws
- With screw retainer
- Per front panel 4 screws are needed

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3 , size T8, with plastic screw retainer	63K159
Rounded head screws recessed M2.5 x 11.3, with plastic screw retainer	63-159

1.3.3.2 Assembly Material for Fan Mounting

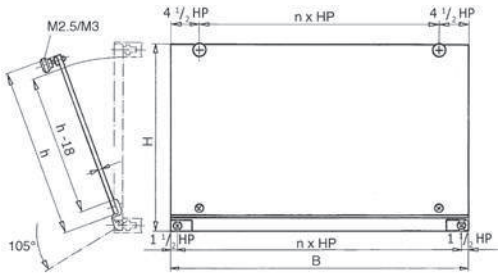
Description	Part-No.
Countersunk screw, recessed M4 x 10	5342-10
Hexagonal nut M4, 0.8D	5620-51
Countersunk self-tapping screw cross.recessed, 13 mm	5441-55



1.4 Hinged Front Panels

1.4.1 Top / Bottom-Hinged Front Panel

- Hinges are attached to the front extrusions of the sub rack or case
- Aluminium 2.5 mm, clear anodised (non-conductive)
- **Scope of delivery:**
  - Front panel
  - Hinge extrusion
  - Assembly material M2.5, incl. hinges





1.4.1 Top/Bottom-Hinged Front Panel

Width	Part-No. 3 U	Part-No. 4 U	Part-No. 6 U
84 HP	25N384-19	25N484-19	25N684-19

Dimensions

Nominal Width			Width B	
HP	mm	inch	mm	inch
84 HP	426.72	16.80	426.5	16.79

Nominal Height	Height H		Height h	
U	mm	inch	mm	inch
3 U	128.7	5.07	117	4.61
4 U	173.15	6.81	161.4	6.35
6 U	262.05	10.31	250.3	9.85

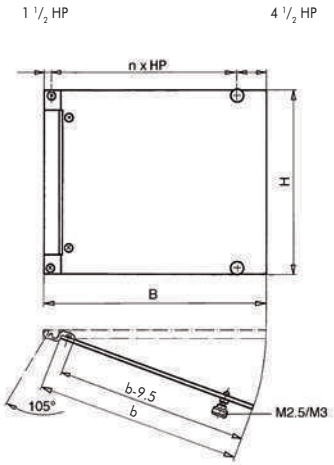
1.4.2 EMC Top / Bottom-Hinged Front Panel

- Width: 84 HP
- Offers optimum protection from electromagnetic interference
- Aluminium 2.5 mm, front anodised, rear conductive
- **Scope of delivery:**
  - EMC front panel
  - Hinge extrusions
  - Assembly material M2.5, incl. hinges
  - EMC gaskets



1.4.2 EMC Top / Bottom-Hinged Front Panel

EMC Level	Part-No. 3 U	Part-No. 6 U
Advanced	25C384-11	-
Superior	-	25D684-11



1.4.3 Side-Hinged Front Panel

- Aluminium 2.5 mm, clear anodised (non-conductive)
- **Scope of delivery:**
  - Front panel
  - Hinge extrusion
  - Assembly material M2.5, incl. hinges



1.4.3 Side-Hinged Front Panel

Width	Part-No. 3 U	Part-No. 6 U
84 HP	25N384-29	25N684-29

Other widhts and heights available on request

Dimensions

Nominal Width			Width B		Width b	
HP	mm	inch	mm	inch	mm	inch
84 HP	426.72	16.80	426.5	16.79	414.3	16.31

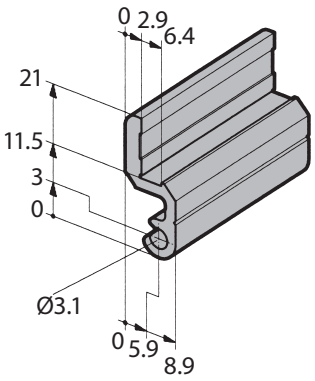
Nominal Height	Height H	
U	mm	inch
3 U	128.7	5.06
6 U	262.05	10.31

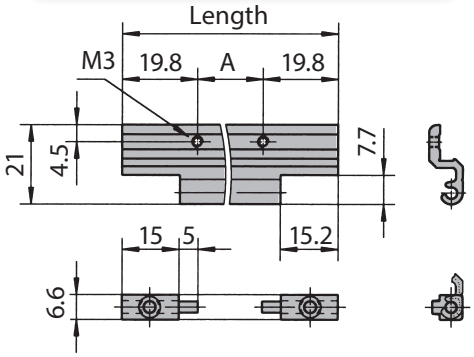
Use Elma's front panel service for machining and screen printing of your panels!

1.4.4 Accessories

- To build up customised hinged front panels





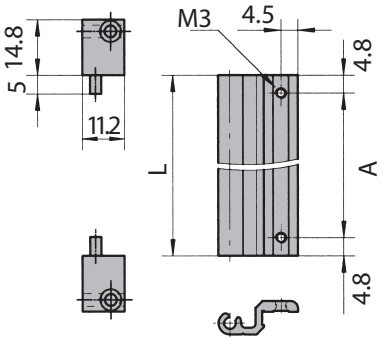


1.4.4.1 Hinge Extrusions for Top/Bottom-Hinged Front Panels

Width	**A** mm	**A** inch	**L** mm	**L** inch	**Part-No.**
42 HP	172.9	6.80	212.5	8.36	66-230-27
63 HP	279.5	11.00	319.1	12.56	66-230-28
84 HP	386.2	15.20	425.8	16.76	66-230-26

1.4.4.2 Assembly Material incl. Hinge Parts for Top/Bottom-Hinged Front Panels

Description	**Part-No.**
Incl. screws, tapped strips, nuts in thread M2.5	81-124

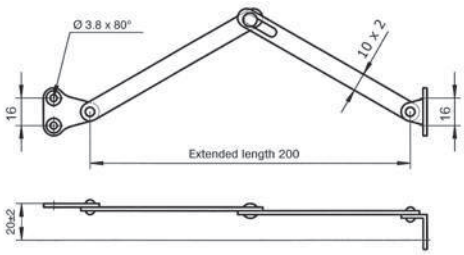


1.4.4.3 Hinge Extrusions for Side-Hinged Front Panels

Height	**A** mm	**A** inch	**L** mm	**L** inch	**Part-No.**
3 U	89.1	3.50	98.7	3.88	66-230-33
4 U	133.6	5.26	143.2	5.63	66-230-34
6 U	222.5	8.76	232.1	9.13	66-230-36
7 U	266.9	10.50	276.5	10.88	66-230-37

1.4.4.4 Assembly Material incl. Hinge Parts for Side-Hinged Front Panels

Description	**Part-No.**
Incl. screws, tapped strips, nuts in thread M2.5	81-125



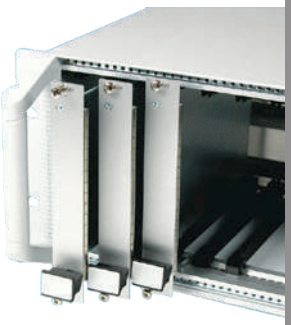
1.4.4.5 Panel Stay

- **Scope of delivery:**
  - 2 pcs. panel stay
  - Assembly material

Description	**Part-No.**
Set of panel stay complete	63-242

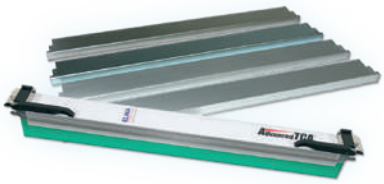
2: Front Panels for Plug-In Units











2.1 Plug-In Units acc. to IEC **C | 2_3**

2.1.1 Extruded Front Panel C | 2_3

2.1.2 Front Panel with Cutout for IEC Ejector Handle C | 2_5

2.2 EMC Plug-In Units acc. to IEC **C | 2_6**

2.2.1 EMC Filler Panel without Openings C | 2_6

2.2.2 EMC Front Panels for IEC Plug-In Units with Cutout for Ejector Handle acc. to IEC C | 2_7

2.3 Plug-In Units acc. to IEEE **C | 2_10**

2.3.1 EMC Front Panels Aluminium with EMC Gasket acc. IEEE C | 2_10

2.3.2 Injector/Ejector Handles acc. to IEEE C | 2_12

2.3.3 Card Holder and Coding Pins acc. to IEEE C | 2_13

2.4 Plug-In Units acc. to VPX **C | 2_14**

2.5 Plug-In Units "Ergonomic" acc. to AdvancedTCA **C | 2_15**

2.5.1 EMC ATCA Front Panels "Ergonomic" C | 2_15

2.5.2 EMC Front Panel 8 U x 6 HP Aluminium C | 2_16

2.5.3 ATCA Ergonomic Handle C | 2_16

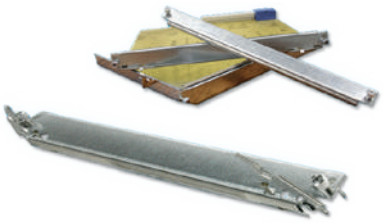
2.5.4 Microswitch for Injector/Ejector Handle C | 2_16

2.5.5 EMC-Gasket C | 2_16

2.5.6 Cutouts for ATCA Ergonomic Handle without Switching Nose C | 2_17

2.5.7 Cutouts for ATCA Ergonomic Handle with Switching Nose C | 2_17

2: Front Panels for Plug-In Units



2.6 Plug-In Units "Classic" acc. to AdvancedTCA **C | 2_18**

2.6.1 Plug-In Units "Classic" C | 2_18

2.6.2 Filler Panel C | 2_18

2.6.3 Handle Set acc. to ATCA C | 2_19

2.6.4 Captive Screw M3 and Latch Spring Clip C | 2_19

2.6.5 EMC-Gasket C | 2_19

2.6.6 Microswitch for Injector/Ejector Handle C | 2_19



2.7 PMC Mezzanine Front Panels **C | 2_21**



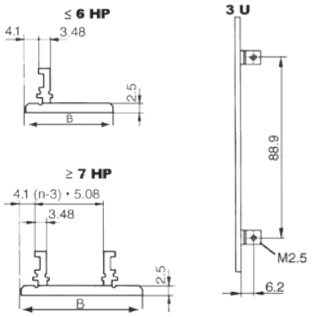
2.8 FMC Mezzanine Front Panels **C | 2_22**



2.1 Plug-In Units acc. to IEC

2.1.1 Extruded Front Panel

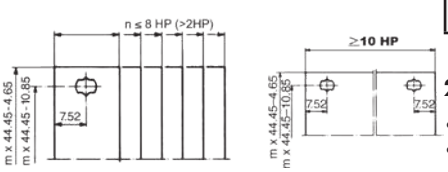
- Aluminium 2.5 mm, clear anodised (non-conductive)
- PCB mounting lugs are formed on the rear face of the panel
- No PCB fixing screws on the front face of the panel, leaving more space for silk screening and mounting front panel components
- Suitable for all sub racks and cases
- Thickness of the mounting lugs (3.48 mm) allows PCBs to be mounted on either side of the lugs
- Drill marks at rear for handle-fixing holes
- **Scope of delivery:**
  - Extruded front panel, clear anodised
- Front panel screws see below





2.1.1 Extruded Front Panels, without Openings

Width	B		Part-No. 3 U	Part-No. 6 U
	mm	inch		
3 HP	15.0	0.59	26N303	26N603
4 HP	20.1	0.79	26N304	26N604
5 HP	25.2	0.99	26N305	26N605
6 HP	30.3	1.19	26N306	26N606
7 HP	35.3	1.38	26N307	26N607
8 HP	40.4	1.59	26N308	26N608
10 HP	50.6	1.99	26N310	26N610
12 HP	60.7	2.38	26N312	26N612
14 HP	70.9	2.79	26N314	26N614
16 HP	81.1	3.19	26N316	26N616
21 HP	106.5	4.19	26N321	-



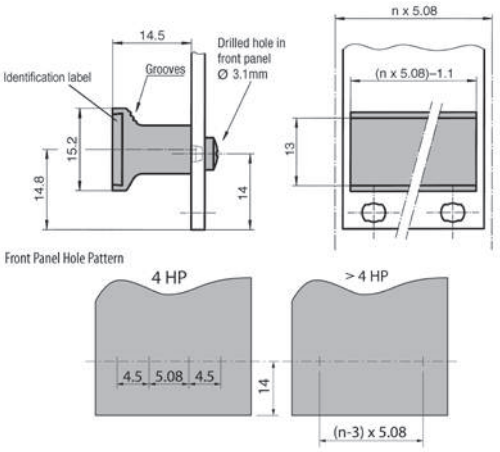
2.1.1.1 Front Panel Screws

- Set of 10 screws
- With screw retainer
- Front panel width up to 9 HP = 2 screws; ≥ 10 HP = 4 screws

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3 , size T8, with plastic screw retainer	63K159
Rounded head screws recessed M2.5 x 11.3, with plastic screw retainer	63-159

2.1.1.2 Rigid-Mounted Unit Handles with Identification Label

- Black, plastic UL94 V-0, label aluminium anodised
- **Scope of delivery:**
  - Rigid-mounted handle
  - Identification label
- Assembly material see below





2.1.1.2 Rigid-Mounted Handle with Identification Label

Width	Scope of Delivery	Part-No.
4 HP	10 pcs.	60-200-04
5 HP	10 pcs.	60-200-05
6 HP	10 pcs.	60-200-06
7 HP	10 pcs.	60-200-07
8 HP	10 pcs.	60-200-08
10 HP	10 pcs.	60-200-10
12 HP	10 pcs.	60-200-12
14 HP	1 pc.	60-200-14

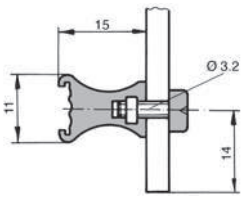
- Other sizes (up to 84 HP) are available upon request

Assembly Material

Description	Part-No.
Cross recessed rounded head screw	61-276

2.1.1.3 Fluted Handles

- Extruded aluminium handles, shaped to facilitate withdrawal of plug-in units
- Two grooves in the front face will accept identification strips (0.5 x 9 mm)
- **Scope of delivery:**
  - Extruded handle, clear anodised
  - Assembly material



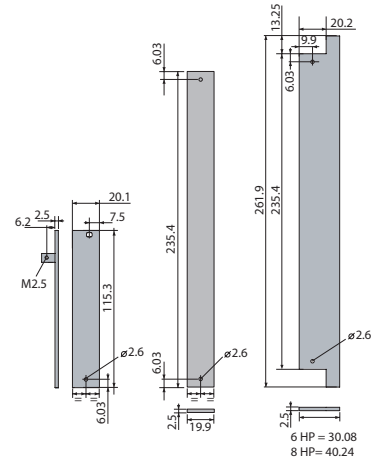


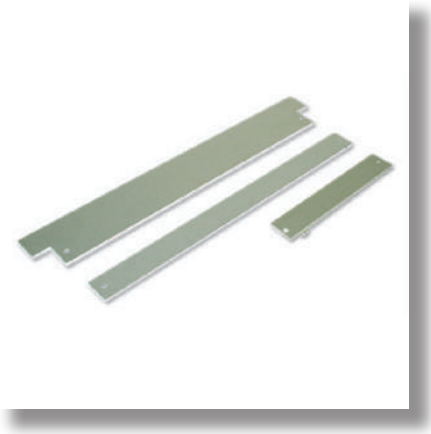
2.1.1.3 Fluted Handles for Front Panels to IEC

Front Panel Width HP	Width mm	Width inch	Handle Length mm	Handle Length inch	Part-No.
3 HP	15.0	0.59	12.5	0.49	60-103
4 HP	20.1	0.79	17.6	0.69	60-104
5 HP	25.2	0.99	22.6	0.88	60-105
6 HP	30.3	1.19	27.7	1.09	60-106
7 HP	35.3	1.38	33.5	1.31	60-107
8 HP	40.4	1.59	37.9	1.49	60-108
10 HP	50.6	1.99	48.0	1.88	60-110
12 HP	60.8	2.39	58.2	2.29	60-112
14 HP	70.9	2.79	69.1	2.72	60-114
16 HP	81.1	3.19	78.5	3.09	60-116
21 HP	106.5	4.18	104.6	4.11	60-121
30 HP	152.2	5.99	149.6	5.88	60-130
40 HP	203.0	7.99	200.4	7.88	60-140
60 HP	304.6	11.99	302.0	11.88	60-160
84 HP	426.5	16.79	424.0	16.69	60-184

2.1.2 Front Panel with Cutout for IEC Ejector Handle

- Aluminium 2.5 mm, clear anodised (non-conductive)
- PCB mounting lugs are formed on the rear face of the panel (only 3 U-Version)
- No PCB fixing screws on the front face of the panel, leaving more space for silk screening and mounting front panel components
- Suitable for all sub racks and cases
- 3 U front panels prepared for one handle
- 6 U front panels prepared for two handels
- **Scope of delivery:**
  - Front panel, clear anodised
- Front panel screws see 2.1.2.1 (for 3 U-Version only)
- IEC ejector handles, see 2.1.2.2





2.1.2 Front Panel with Cutout for IEC Ejector Handle

Width	B		Part-No. 3 U	Part-No. 6 U
	mm	inch		
4 HP	20.0	0.79	26N304-51	21N604-51
6 HP	30.2	1.19		21N606-51
8 HP	40.3	1.59		21N608-51

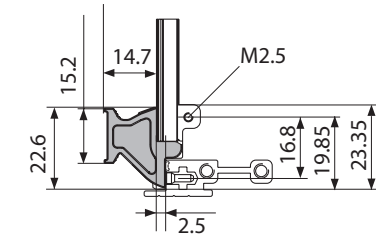
2.1.2.1 Front Panel Screws (for 3 U-Version only)

- Set of 10 screws
- With screw retainer
- Front panel 3 U = 1 screw

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3, size T8, with plastic screw retainer	63K159
Rounded head screws recessed M2.5 x 11.3, with plastic screw retainer	63-159

2.1.2.2 Ergonomic Ejector Handles acc. to IEC

- Simple assembly of plug-in units
- Allows trouble-free extraction of electronic units with multi-pole connectors
- Main features in one part: card holder, ejector handle and centring pin
- Reset spring for safe insertion
- One version for top and bottom only
- Handle is injection moulded, glass-reinforced plastic, UL94 V-0
- Card holder is zinc die-cast, nickel plated
- Reset spring is stainless steel
- **Scope of delivery:**
  - Ejector handle
  - Assembly material (cross recessed screws M2.5 for fixing of card holder/printed board/front panel)
- Front panel with special cutouts have to be ordered separately



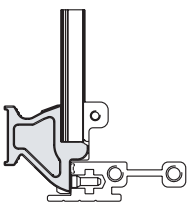


2.1.2.2 Ejector Handle acc. to IEC

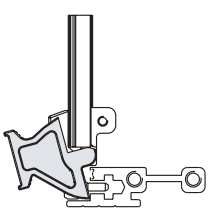
Description	Part-No.
Ejector handle black	81-233
Ejector handle grey	81-234

Extraction process:

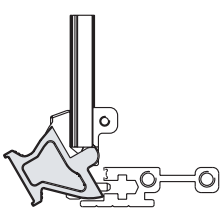
Rest position



Extraction

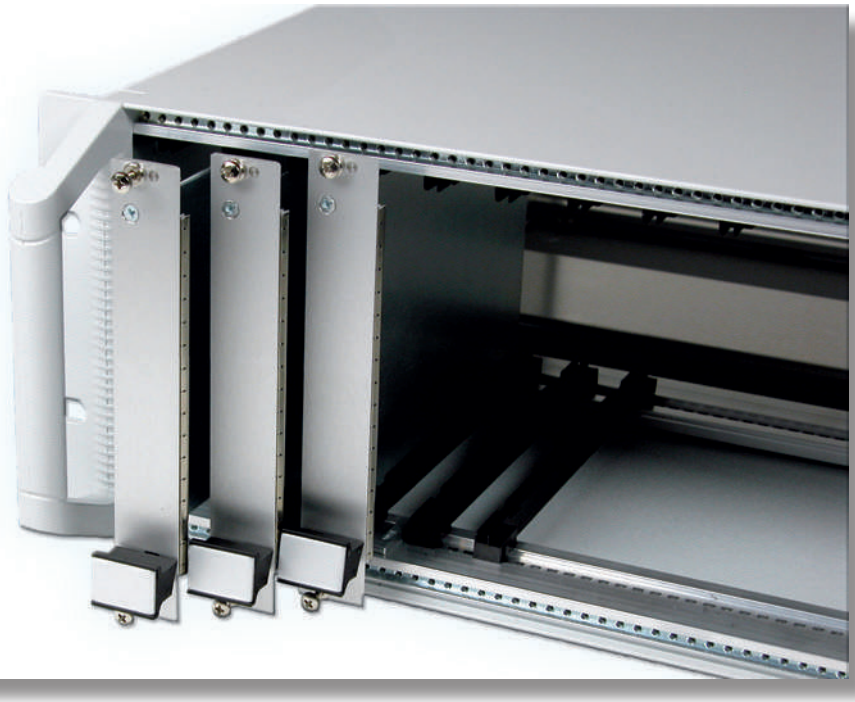


End position



Label

Description	Part-No.
1 sheet A4 of 220 labels	81-031



2.2 EMC Plug-In Units acc. to IEC

2.2.1 EMC Filler Panel without Openings

- Excellent EMC shielding
- Made of aluminium extrusions
- Rear side: conductive surface finish (clear passivated)
- Used in the assembly of plug-in units
- The EMC-gasket is integrated into the front panel profile to protect it from damage
- A pressfit centering pin guarantees optimum positioning of the panel as well as the right pressure between the contact strip and the next panel



2.2.1 EMC Filler Panel without Openings

- High stability
- Extruded aluminium
- Pressed-in centring pin and bushes M2.5
- Front side clear anodised, rear side conductive
- **Scope of delivery:**
  - EMC front panel, incl. pressed-in centering pin and bushes M2.5
- EMC-gasket see below
- Front panel screw see below
- Handles and card holders cannot be fitted with this type of front panel

Width	Part-No. 3 U	Part-No. 6 U
4 HP	66-514-73	66-514-76
6 HP	66-516-73	66-516-76
8 HP	66-518-73	66-518-76



2.2.1.1 EMC Gasket (Stainless Steel)

Height	Part-No.
3 U	81-062-03
6 U	81-062-06

2.2.1.2 Front Panel Screws

- Front panel width up to 8 HP = 2 screws

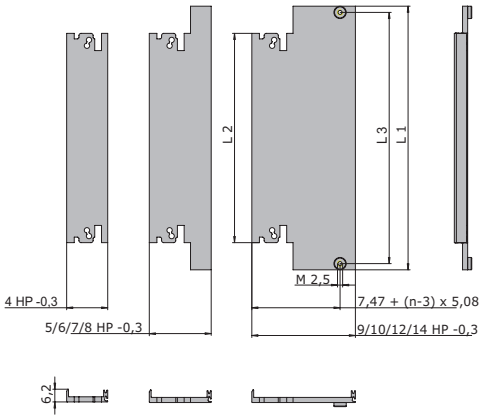
Description	Part-No.
Torx screw, M2.5 x 11.3, size T8	5443-08
Rounded head screw, cross recessed M2.5 x 12.7	61-287

Use Elma's front panel service for machining and screen printing of your panels!

2.2.2 EMC Front Panels for IEC Plug-In Units with Cutout for Ejector Handle acc. to IEC

EMC Front Panels Aluminium with EMC Gasket

- Excellent EMC shielding
- Immune to snagging
- EMC-gasket slid onto the extrusion
- **Scope of delivery:**
  - EMC front panel, incl. pressed-in bushes M2.5 (size ≥ 9 HP)
- EMC-gasket see 2.2.2.4
- Handle has to be ordered separately, see 2.2.2.6
- Front panel screw (size ≥10 HP), see 2.2.2.5





2.2.2.1 Front Anodised, Rear Conductive (2 cutouts)

- With 2 cutouts (bottom + top)

Width	Part-No. 3 U	Part-No. 6 U	Part-No. 9 U
4 HP	66-514-23	66-514-26	66-514-29
5 HP	66-515-23	66-515-26	-
6 HP	66-516-23	66-516-26	66-516-29
7 HP	66-517-23	66-517-26	-
8 HP	66-518-23	66-518-26	66-518-29
9 HP	66-519-23	66-519-26	-
10 HP	66-520-23	66-520-26	66-520-29
12 HP	66-522-23	66-522-26	-
14 HP	66-534-23	66-534-26	-

2.2.2.2 Front Anodised, Rear Conductive (1 cutout)

- With 1 cutout (bottom)
- Incl. pressed-in centring pin and bush M2.5 (top)
- Incl. cutout for mounting of card holder 61-156 (top) with screw 5322-08 (see 2.2.2.7)

Width	Part-No. 3 U
4 HP	66-514-43
5 HP	66-515-43
6 HP	66-516-43
8 HP	66-518-43
10 HP	66-520-43
12 HP	66-522-43
14 HP	66-534-43

Dimensions

Height	L1 mm	L1 inch	L2 mm	L2 inch	L3 mm	L3 inch
3 U	128.55	5.06	102.05	4.01	122.50	4.82
6 U	261.90	10.31	235.40	9.27	255.85	10.07
9 U	395.25	15.56	368.75	14.51	389.20	15.32



2.2.2.4 EMC-Gasket (Stainless Steel)

Unit	Part-No. 3 U	Part-No. 6 U	Part-No. 9 U
1 pc.	81-062-03	81-062-06	81-062-09

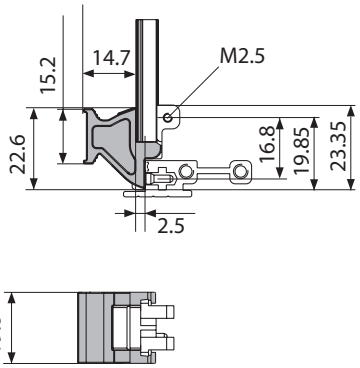
2.2.2.5 Front Panel Screw

- For EMC front panels size ≥ 9 HP = 2 additional screws are needed

Description	Part-No.
Cross recessed rounded head screws M2.5 x 12.7	61-287
Torx screws M2.5 x 11.3, size T8	5443-08

2.2.2.6 Ergonomic Ejector Handles acc. to IEC

- Simple assembly of plug-in units
- Allows trouble-free extraction of electronic units with multi-pole connectors
- Main features in one part: card holder, ejector handle and centring pin
- Reset spring for safe insertion
- One version for top and bottom only
- Handle is injection moulded, glass-reinforced plastic, UL94 V-0
- Card holder is zinc die-cast, nickel plated
- Reset spring is stainless steel
- **Scope of delivery:**
  - Ejector handle
  - Assembly material (cross recessed screws M2.5 for fixing of card holder/printed board/front panel)
- Front panel with special cutouts have to be ordered separately



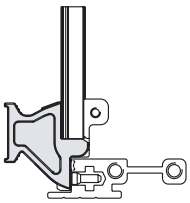


2.2.2.6 Ejector Handle acc. to IEC

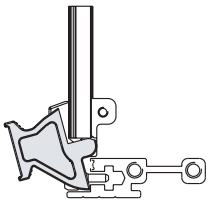
Description	Part-No.
Ejector handle black	81-233
Ejector handle grey	81-234

Extraction process:

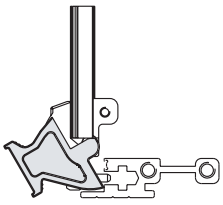
Rest position



Extraction



End position

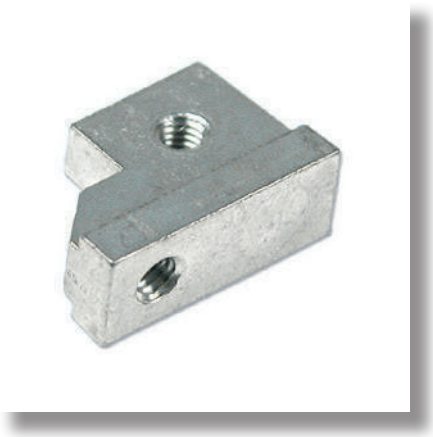


Label

Description	Part-No.
1 sheet A4 of 220 labels	81-031

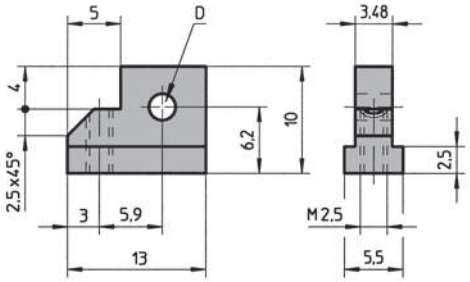
2.2.2.7 Card Holder acc. to IEC Standard

- By using the zinc die-cast card holder, flat front panels and EMC front panels acc. to IEC can be connected to a PC card to form a plug-in unit
- The card can be mounted both in the standard position and offset 1 HP (5.08 mm)
- **Scope of delivery:**
  - Card holder
- Assembly material see below



2.2.2.7 Card Holder without Swivel Stop

Description	Application	D	Part-No.
Card holder without swivel stop	Without injector / ejector handle	M2.5	61-156





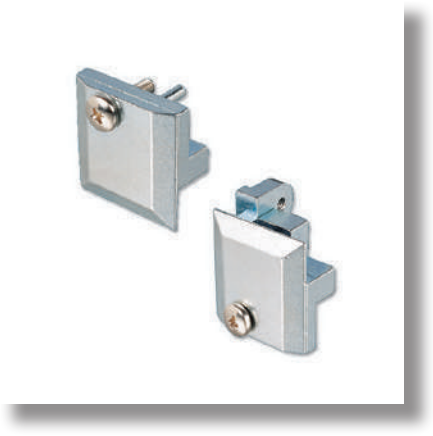
Assembly Material

Description	Application	Part-No.
Cross recessed countersunk screw M2.5 x 8	For card holder	5322-08
Torx countersunk screw M2.5 x 8, size T8	For card holder	5470-21
Slotted pan head screw M2.5 x 6	For printed board	5571-06
Torx cylinder head screw M2.5 x 6, size T8	For printed board	5470-04

2.2.2.8 Card Holder/End Piece without ESD Pin

- **Scope of delivery:**
  - End piece card holder (zinc die-cast, nickel plated)
  - Assembly material

  (screws M2.5 for fixing of front panel/card holder/printed board)



Card Holder/End Piece *without* ESD Pin

Description	Part-No.
Top	81-018-01
Bottom	81-019-01



2.3 Plug-In Units acc. to IEEE

2.3.1 EMC Front Panels Aluminium with EMC Gasket acc. IEEE

- Excellent EMC shielding
- Immune to snagging
- EMC-gasket slid onto the extrusion
- **Scope of delivery:**
  - EMC front panel, incl. press-in bushes M2.5 (size ≥ 10 HP)
- EMC-gasket see 2.3.1.1
- Handle has to be ordered separately, see 2.3.5
- Front panel screw (size ≥10 HP), see 2.3.1.2



2.3.1.1 Front Anodised, Rear Conductive (2 cutouts)

- With 2 cutouts (bottom + top)

Width	Part-No. 3 U	Part-No. 6 U
4 HP	66-514-23	66-514-26
5 HP	66-515-23	66-515-26
6 HP	66-516-23	66-516-26
7 HP	66-517-23	66-517-26
8 HP	66-518-23	66-518-26
9 HP	66-519-23	66-519-26
10 HP	66-520-23	66-520-26
12 HP	66-522-23	66-522-26
14 HP	66-534-23	66-534-26

2.3.1.2 Front Anodised, Rear Conductive (1 cutout)

- With 1 cutout (bottom)
- Incl. pressed-in centring pin and bush M2.5 (top)
- Incl. cutout for mounting of card holder 61-156 (top) with screw 5322-08

Width	Part-No. 3 U
4 HP	66-514-43
5 HP	66-515-43
6 HP	66-516-43
8 HP	66-518-43
10 HP	66-520-43
12 HP	66-522-43
14 HP	66-534-43



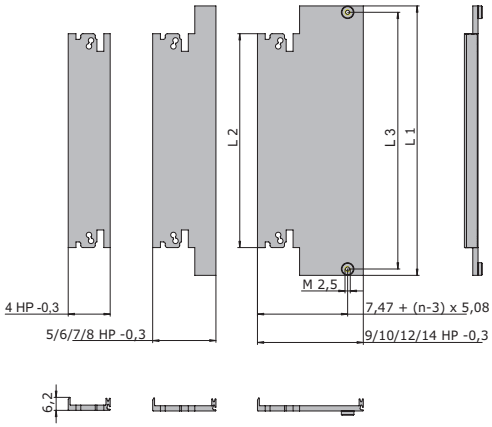
EMC-Gasket (Stainless Steel)

Unit	Part-No. 3 U	Part-No. 6 U
1 pc.	81-062-03	81-062-06

Front Panel Screw

- For EMC front panels size ≥ 9 HP = 2 additional screws are needed

Description	Part-No.
Cross recessed rounded head screws M2.5 x 12.7	61-287
Torx screws M2.5 x 11.3, size T8	5443-08



Dimensions

Height	L1 mm	L1 inch	L2 mm	L2 inch	L3 mm	L3 inch
3 U	128.55	5.06	102.05	4.01	122.50	4.82
6 U	261.90	10.31	235.40	9.27	255.85	10.07



2.3.2 Injector/Ejector Handles acc. to IEEE

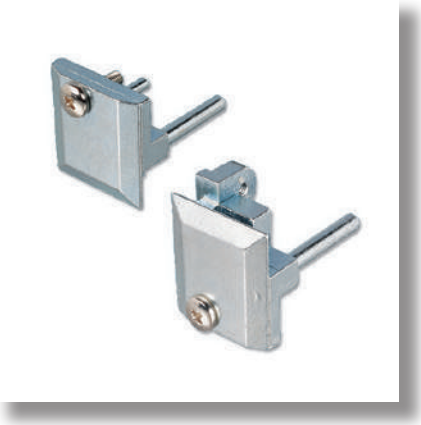
Type			Mounting	ESD Pin	Colour	Part-No.
Ergonomic			Bottom	With ESD-pin	Black	81-076
Ergonomic			Top	With ESD-pin	Black	81-075
Ergonomic			Bottom	Without ESD-pin	Black	81-076-01
Ergonomic			Top	Without ESD-pin	Black	81-075-01
Ergonomic	Hot Swap		Bottom	With ESD-pin	Black	81-096
Ergonomic	Hot Swap		Top	With ESD-pin	Black	81-095
Ergonomic	Hot Swap		Bottom	Without ESD-pin	Black	81-096-01
Ergonomic	Hot Swap		Top	Without ESD-pin	Black	81-095-01
Ergonomic	Hot Swap	Offset	Bottom	With ESD-pin	Black	81-185
Ergonomic	Hot Swap	Offset	Top	With ESD-pin	Black	81-184
Classic			Bottom	With ESD-pin	Black	81-261
Classic			Top	With ESD-pin	Black	81-260
Classic		Offset	Bottom	With ESD-pin	Black	81-161
Classic		Offset	Top	With ESD-pin	Black	81-160
Classic	Hot Swap		Bottom	With ESD-pin	Black	81-256
Classic	Hot Swap		Top	With ESD-pin	Black	81-255
Classic	Hot Swap	Offset	Bottom	With ESD-pin	Black	81-156
Classic	Hot Swap	Offset	Top	With ESD-pin	Black	81-155
Telecom	Hot Swap		Bottom	With ESD-pin	Black	81-206
Telecom	Hot Swap		Top	With ESD-pin	Black	81-205
Telecom	Hot Swap		Bottom	Without ESD-pin	Black	81-206-01
Telecom	Hot Swap		Top	Without ESD-pin	Black	81-205-01
Telecom	Hot Swap	Offset	Bottom	With ESD-pin	Black	81-189
Telecom	Hot Swap	Offset	Top	With ESD-pin	Black	81-188
Telecom long	Hot Swap		Bottom	With ESD-pin	Black	81-215
Telecom long	Hot Swap		Top	With ESD-pin	Black	81-214
Telecom long	Hot Swap	Offset	Bottom	With ESD-pin	Black	81-116
Telecom long	Hot Swap	Offset	Top	With ESD-pin	Black	81-117
Microswitch						81-088-1 (10 pcs.)

For more information refer to chapter 3 "Handles".

2.3.3 Card Holder and Coding Pins acc. to IEEE

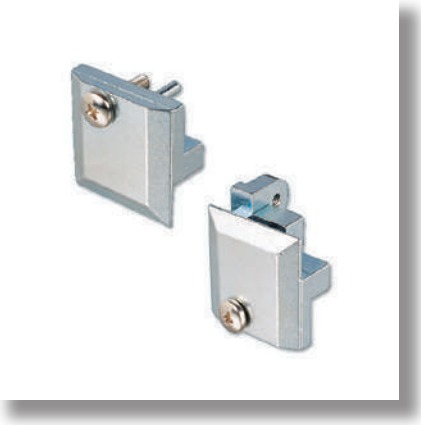
- **Scope of delivery:**
  - End piece card holder (zinc die-cast, nickel plated)
  - Assembly material

  (screws M2.5 for fixing of front panel/card holder/printed board)



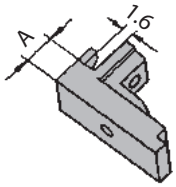
2.3.3.1 Card Holder/End Piece *with* ESD Pin

Description	Part-No.
Top	81-018
Bottom	81-019



2.3.3.2 Card Holder/End Piece *without* ESD Pin

Description	Part-No.
Top	81-018-01
Bottom	81-019-01





2.3.3.3 Middle Part

- Usable for all front panels
- For positioning and fixing of 6 U and 9 U cards, card thickness 1.6 mm
- Material: Plastic UL94 V-0

Description	A		Part-No.
	mm	inch	
Aluminium 2.5 mm	2.5	0.10	61-960

Assembly Material

Description	Part-No.
PT-countersunk, 2.5 x 6	5534-06



2.3.3.4 Coding Pins

- Acc. to IEC 60297-3-103
- Plastic, UL94 V-0
- Can be rotated in 4 positions

Description	Part-No.
Grey	81-054-02
Dark red	81-054-06
Black	81-054-04

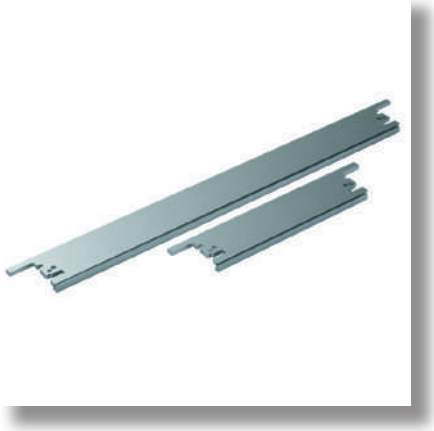


2.4 Plug-In Units acc. to VPX

2.4.1 EMC Front Panels Aluminium acc. VPX

- Excellent EMC shielding
- EMC gasket can be inserted on the profile
- In accordance with VPX specifications
- Aluminum extrusion, anodized front, side and rear: conductive
- Front panels with 2 cut-outs (bottom + top); 66-515-43-VPX only 1 cut-out (bottom)

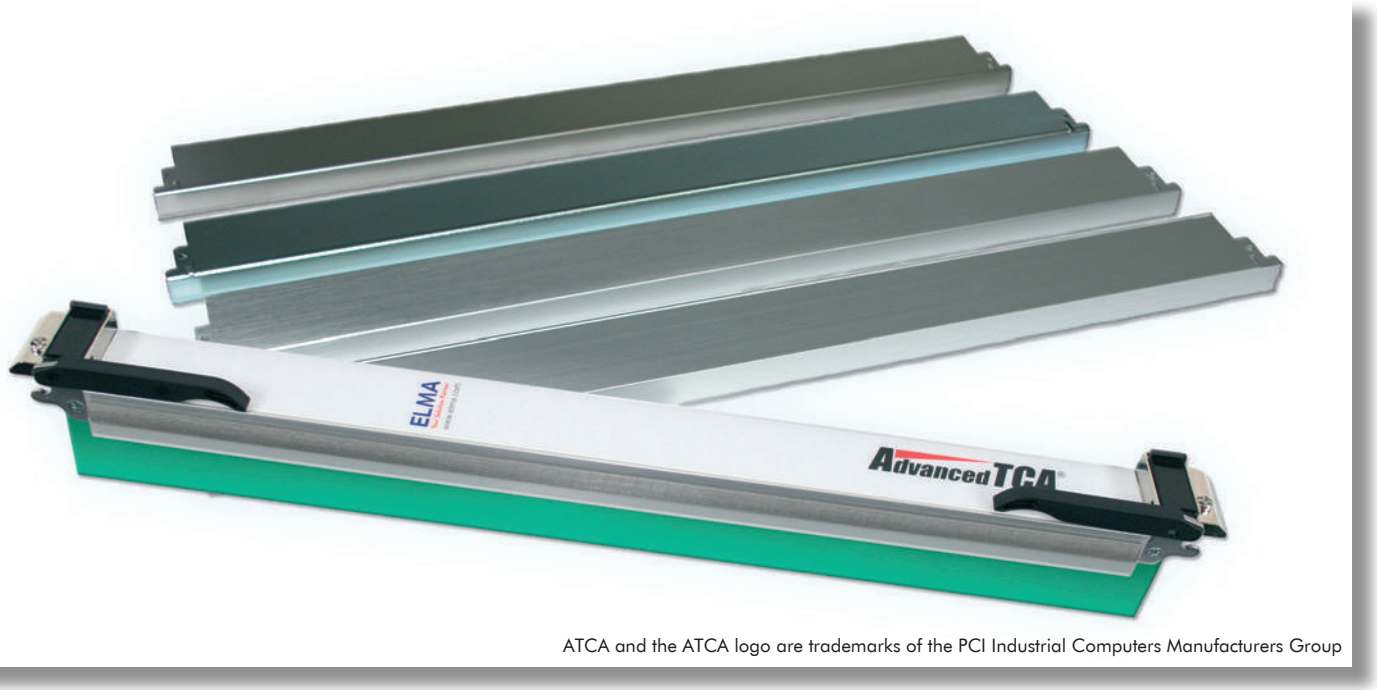
- **Scope of delivery:**
  - 1 EMC front panel, aluminum
  - 66-515-43-VPX additionally 1 card holder and assembly material
  - EMC gasket and injector handles must be ordered separately
  - For more injector handles, see Elmaset, Chapter C_3



Description	Part-No. 3 U	Part-No. 3 U, 1 cut-out	Part-No. 6 U
VPX profile front panel, 5 HP	66-515-23-VPX	66-515-43-VPX	66-515-26-VPX
EMC gasket (stainless steel)	81-062-03	81-062-03	81-062-06
Ergonomic injector handle bottom	81-096	81-096	81-096
Ergonomic injector handle top	81-095	-	81-095
Telecom injector handle bottom	81-206	81-206	81-206
Telecom injector handle top	81-205	-	81-205
10 pcs. Microswitch for injector handle	81-088-1	81-088-1	81-088-1

Contact us for the mechanical processing and imprinting of your VPX front panels.

Use Elma's front panel center for the processing, coloring, digital and anodized digital aluminium printing and installation of your operating unit.



ATCA and the ATCA logo are trademarks of the PCI Industrial Computers Manufacturers Group

AdvancedTCA

- AdvancedTCA, the PICMG 3.0 family, is a new series of PICMG specifications, targeted to requirements for the next generation of carrier grade communications equipment. This series of specifications incorporates the latest trends in high speed interconnect technologies, next generation processors and improved reliablility, manageability and serviceability.
- AdvancedTCA has several key features including Gigabit/Terabit per second bandwidth across each shelf, 150 - 200 W per board and 3 kilowatts per chasis power. It accomodates larger (8 U x 280 mm) boards and a 1.2 mm pitch which allows larger/taller components and more space on each board. Over 100 companies participated in developing the ATCA specification

2.5 Plug-In Units "Ergonomic" acc. to AdvancedTCA

2.5.1 EMC ATCA Front Panels "Ergonomic"

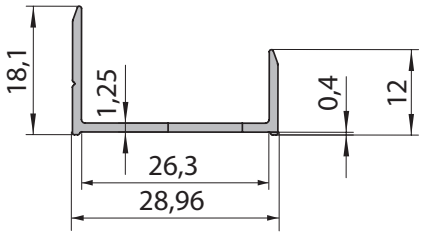
- 8 U x 6 HP
- Conform to the PICMC 3.0 specification
- For boards with thicknesses of 1.6 mm to 2.4 mm
- Made for the ATCA Ergonomic handle family



2.5.1 EMC Front Panel 8 U x 6 HP Aluminium for Overlays

- Extruded aluminium
- Clear passivated
- **Scope of delivery:**
  - EMC front panel

Description	Part-No.
EMC front panel with pinhole for microswitch activation	66-535-38



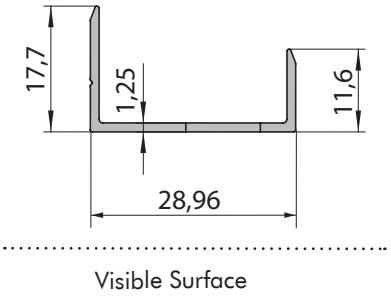
2.5.2 EMC Front Panel 8 U x 6 HP Aluminium



2.5.2 EMC Front Panel 8 U x 6 HP Aluminium

- Extruded aluminium
- Surfaces: visible part : Clear anodised
  rest: Clear passivated
- **Scope of delivery:**
  - EMC front panel

Description	Part-No.
EMC front panel	66-536-28
EMC front panel with pinhole for microswitch activation	66-536-38



2.5.3 ATCA Ergonomic Handle



2.5.3 ATCA Ergonomic Handle

- Pre-assembled
- Easy assembling onto front panel and PCB
- **Scope of delivery:**
  - Handles pre assembled
  - Screws front panel assembly loose packed
  - Screws PCB mounting loose packed

Description	Part-No.
Top handle	81-300-00
Bottom handle	81-301-00
Bottom handle with pin for microswitch activation	81-301-01

2.5.4 Microswitch for Injector/Ejector Handle



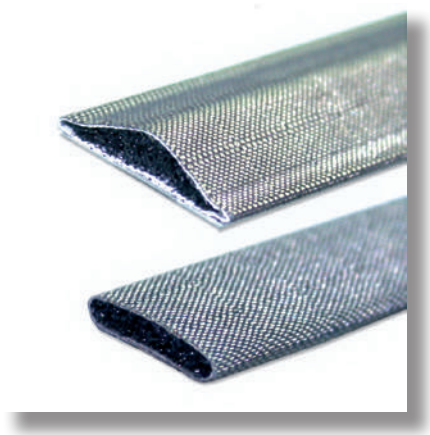
2.4.4 Microswitch for Injector/Ejector Handle

- Technical data and function see 3.5.3.1

Description	Part-No. 10 pcs.
Microswitch with pre-assembled wire cable length (25 mm)	81-088-1

Assembly material for mounting of Microswitch onto front panel acc. to ATCA, 2 pcs. 5686-05 have to be ordered separately

2.5.5 EMC-Gasket



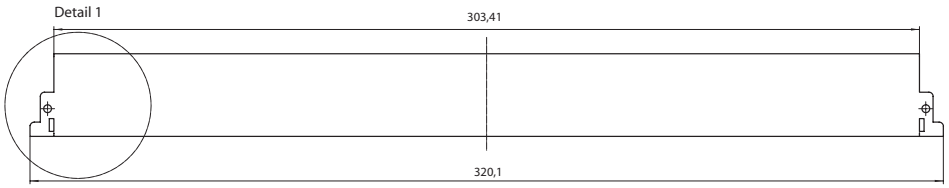
2.4.5 EMC-Gasket

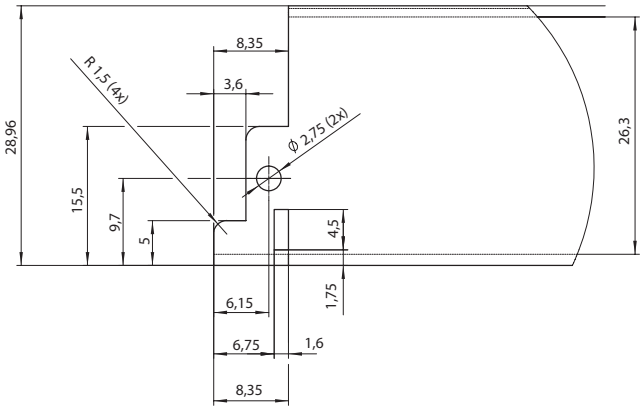
- Polyurethan foam core
- Conductive fabric (Cu + nickel plated)

Description	Part-No.
EMC-gasket triangular. 2.3 x 10 mm, L = 300 mm	7821-300
EMC-gasket triangular. 2.3 x 10 mm, L = 2000 mm	7821-2000

2.5.6 Cutouts for ATCA Ergonomic Handle without Switching Nose

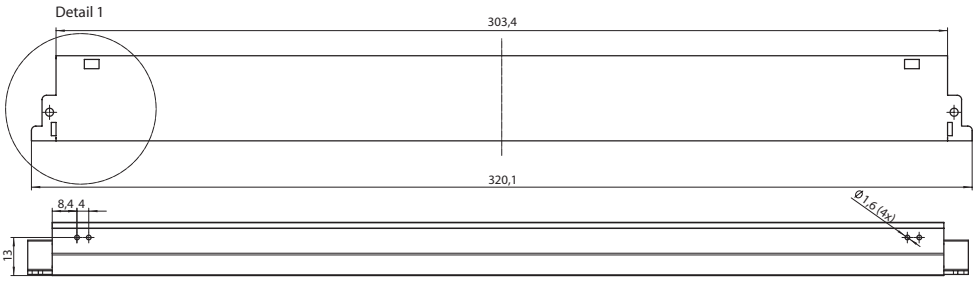
- Microswitch 81-088 assembled to handle
- Microswitch activation through interlock (sliding button) on handle

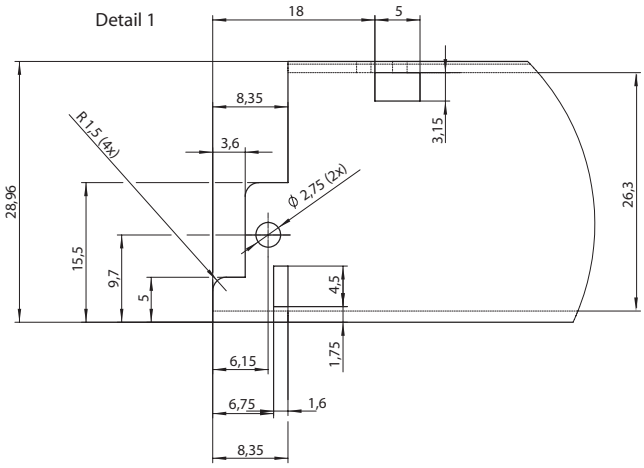


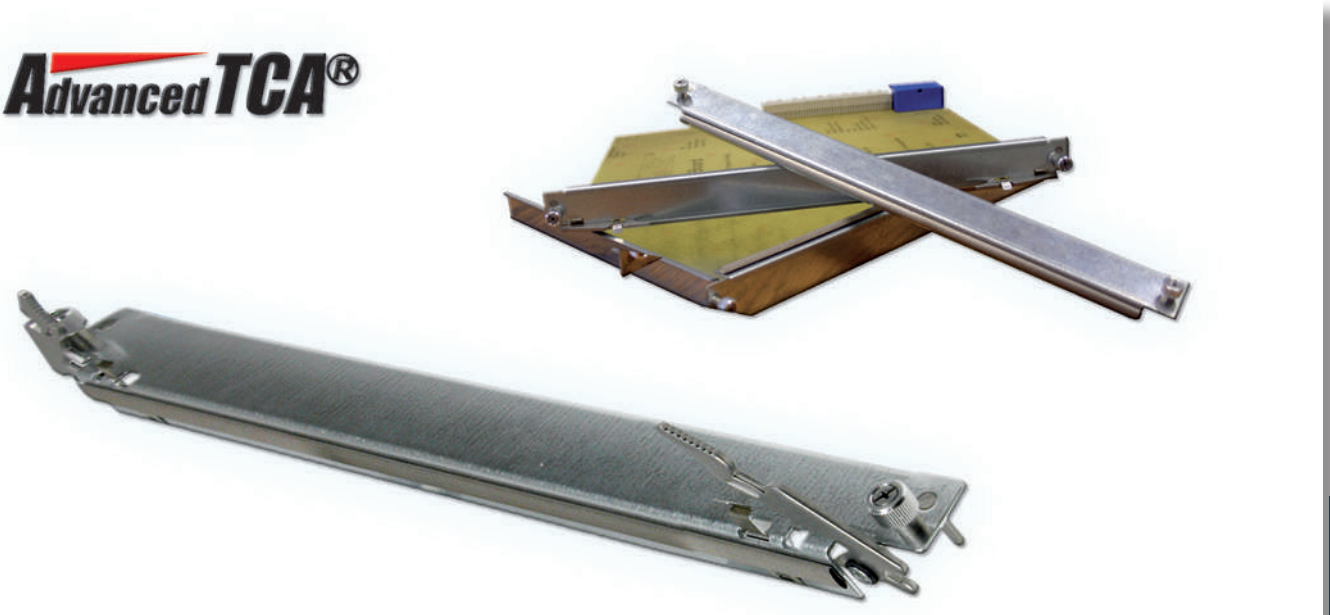


2.5.7 Cutouts for ATCA Ergonomic Handle with Switching Nose

- Microswitch 81-088 assembled to front panel
- Microswitch activation through switching pin on lever handle







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2.6 Plug-In Units "Classic" acc. to AdvancedTCA

2.6.1 Plug-In Units "Classic"

- 8 U x 6 HP with handles
- Conform to the PICMC 3.0 specification
- For boards with thicknesses of 1.6 mm to 2.4 mm



2.6.1 Front Panel 8 U x 6 HP with Handles acc. to ATCA

- **Scope of delivery:**
  - Galvanised steel front panel incl. captive screws M3
  - EMC gasket
  - Handle set

Description	Part-No.
Steel front panel with handle	12T100

2.6.2 Filler Panel



2.6.2.1 Filler Panel 8 U x 6 HP acc. to ATCA

- **Scope of delivery:**
  - Steel filler panel, incl. captive screws M3
  - EMC gasket

Description	Part-No.
Filler panel steel, incl. captive screws M3	12T102

2.6.2.2 Filler Panels with Baffle

- **Scope of delivery:**
  - Steel filler panel, incl. captive screws M3
  - EMC gasket
  - Incl. Baffles

Description	Part-No.
Filler front panel with baffles 8 U x 6 HP x 270 mm	12T120
Filler RTM panel with baffles 8 U x 6 HP x 72.5 mm	12T121

2.6.3 Handle Set acc. to ATCA



2.6.3 Handle Set acc. to ATCA

- **Scope of delivery:**
  - 2 steel handles
  - 2 shoulder screws M2.5, Torx size T10
  - 4 + 4 washers
  - 2 latch spring clips

Description	Part-No.
2 handles	12T130

2.6.4 Captive Screw M3 and Latch Spring Clip



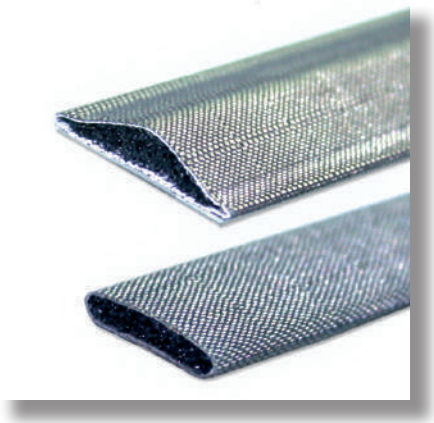
2.6.4.1 Captive Screw M3

Description	Part-No.
Screw M3 captive	12T133

2.6.4.2 Latch Spring Clip

Description	Part-No.
Latch spring	12T132

2.6.5 EMC-Gasket



2.6.5 EMC-Gasket

- Polyurethan foam core
- Conductive fabric (cu+Niplated)

Description	Part-No.
EMC-gasket triangular. 2.3 x 10 mm, L = 300 mm	7821-300
EMC-gasket triangular. 2.3 x 10 mm, L = 2000 mm	7821-2000

2.6.6 Microswitch for Injector/Ejector Handle



2.6.6 Microswitch for Injector/Ejector Handle

Technical data and function see 3.5.3.1

Description	Part-No. 10 pcs.
Microswitch with pre-assembled wire cable length (25 mm)	81-088-1

AdvancedTCA

AdvancedTCA (ATCA) stands for Advanced Telecom Computer Architecture.
ATCA is the first open industry specification for carrier grade equipment incorporating high speed switched fabric technology. ATCA systems are capable of switching and processing 2.5 terabits per second in a single shelf.

What Size are the Boards?

After lengthy deliberations, sophisticated thermal simulations, and a lot of customer feedback, PICMG 3 boards are 8 U (322.25 mm) high and 280 mm deep. This size was carefully arrived at after considering cooling, front panel space, backplane size, and rear panel I/O requirements. Boards are spaced at a 1.2" (6 HP) pitch. The wider pitch accommodates taller components like next generation CPU's with integral heat sinks, off-the-shelf memory modules, and high power DC-DC converters. The wider pitch also improves cooling as more air volume can be circulated over a card.

Elma's ATCA Products and Services

Capabilities
- Simulation
- NEBS certification
- Customisation
- 3D solid modeling
- Manufacturing
- Integration

Systems
- 2 U, 3 U, 4 U, 5 U, 12 U & 13 U
- Redundant 48VDC input (AC input options available)
- Optimised via thermal simulation studies
- IPM sentry shelf management options

Backplanes
- 2, 4, 5, 14 & 16 slots
- Dual star, mesh or replicated mesh
- Compliant to PICMG 3.0
- Optimised via signal integrity studies

Accessories
- Front panels
- Handles
- Shelf managers

Please find further information on www.elma.com

AdvancedMC

AdvancedMC (AMC) brings hot swap and ATCA like features to a new generation of mezzanine modules.
While AMC was developed to be compatible with the ATCA architecture, AMC modules will be used in conjunction with other platform architectures. As its predecessors have shown, good mezzanine cards will be used wherever they can fit, which will encompass a very wide range of carrier form factors and applications.

AdvancedMC Products

To build up AMC Carriers and mezzanine modules mechanics in different versions are needed: Covers, Front Panels, Handles, EMC-Gaskets, Card-Guides, Filler Panels, Air Baffles and Micro Switches.
Elma is still working on those products.

Please find further information on www.elma.com

Customisation is the standard at Elma. With an extensive offering of modular products as a foundation, Elma is able to leverage existing solutions and proven design concepts to meet any custom application.

uTCA

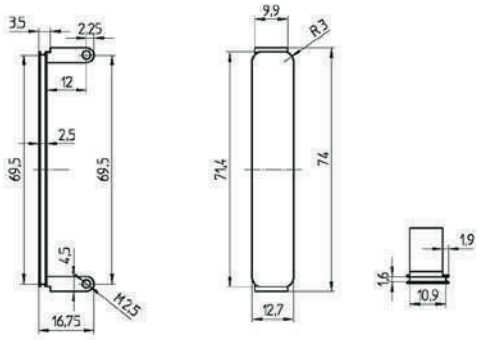
MicroTCA defines a system architecture that uses AdvancedMC mezzanine cards plugged directly into a backplane architecture to produce smaller form factor systems.

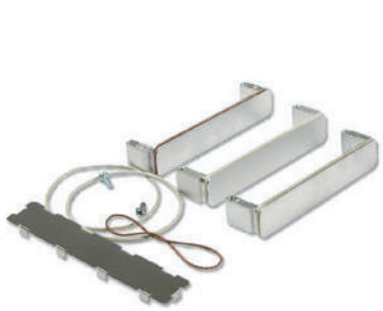
Please find further information on **www.elma.com**



2.7 PMC Mezzanine Front Panels

- Acc. to IEEE 1386
- Used on VME-, Future, CPCI- or MultibusII-Boards when additional interfaces are needed
- On a double euro board (6 U / 4 HP) maximum two PCI mezzanine cards can be placed
- Two designs are available: Zinc die-cast or aluminium extrusion
- Mezzanine filler panel: To cover the unused Mezzanine cut outs. The filler panels are simply clipped into the cut outs.
- The EMC-gaskets can be inserted into the groove of the front panels
- **Scope of delivery:**
  - 1 Mezzanine front panel
  - 1 Gasket
  - 2 screws M2.5 x 6 mm





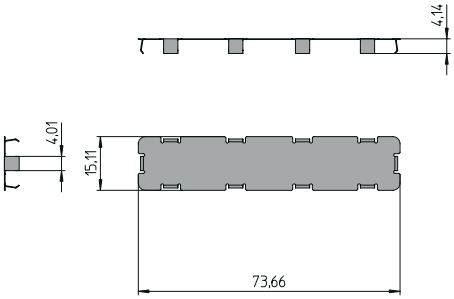
2.7 PMC Mezzanine Front Panels

Description	Material	Part-No.
Mezzanine front panel incl. EMC-gasket	Zinc die-cast, chrome-plated	21M171
Mezzanine front panel incl. EMC-gasket	Aluminium extrusion, clear anodised	21M271

Accessories

Description	Material	Part-No.
EMC-gasket (for zinc die-cast version)	Berilium copper	21M571
EMC-gasket (for aluminium profile version)	Elastomer mix with metal portion	21M570
Mezzanine filler panel	Stainless steel	21M600
Screws cross recessed M2.5 x 6 mm	Steel zinc plated blue	5325-06
Torx cylinder head screw M2.5 x 6, size T8	Stainless	5470-04

Mezzanine Filler Panel

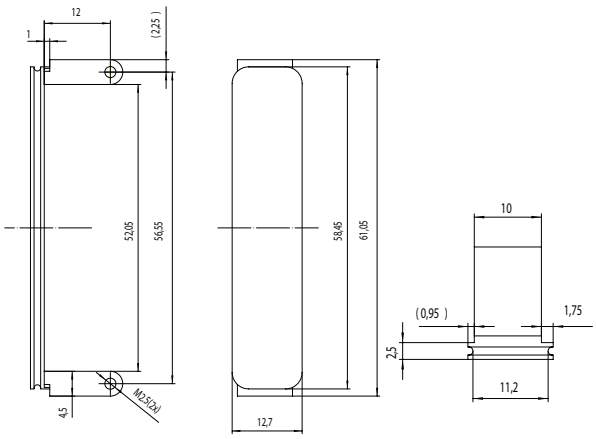




2.8 FMC Mezzanine Front Panels

FPGA Mezzanine Card or FMC (Vita 57.1) describes a specification of I/O mezzanine modules in conjunction with FPGA or another device with configurable I/O capability. The low-profile design allows use on any industry standard slot card with form factors such as VME, VPX, CompactPCI, AdvancedTCA, MicroTCA, PCI, PXI, and many others. The compact size is very highly adaptable to many configuration requirements and complements existing mezzanine technologies such as PMC.

- Front panel in accordance with VITA 57.1 for FPGA Mezzanine Card (FMC)
- Material: aluminum
- The EMC gasket is inserted into the groove on the front panel
- **Scope of delivery:**
  - 1 Mezzanine FMC front panel, aluminum, anodized front, rest: conductive
  - 1 EMC gasket (elastomer)
  - 4 cylinder screws with cross recess M2.5 × 6 mm
  - 21M2080-2 additionally: 2 standoffs 10mm, 4 screws



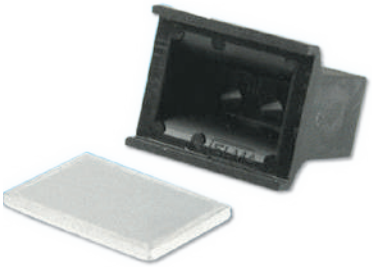


2.8 FMC Mezzanine Front Panels

Description	Part-No.
1 FMC Mezzanine front panel incl. EMC-gasket	21M280-1
1 FMC Mezzanine front panel incl. EMC-gasket and 2 standoffs 10mm	21M280-2

3: Handles











3.1 Fluted Handles C | 3_2

3.2 Rigid-Mounted Unit Handles C | 3_3

3.3 Ejector Handles acc. to IEC C | 3_4

3.4 Injector/Ejector Handles acc. to IEEE C | 3_6

3.4.1 Ergonomic IEEE Standard Injector/Ejector Handle C | 3_6

3.4.2 Ergonomic IEEE Hot-Swap Injector/Ejector Handle C | 3_7

3.4.3 Classic IEEE Standard and Hot-Swap Injector/Ejector Handle C | 3_8

3.4.4 Telecom Hot-Swap Injector/Ejector Handle C | 3_9

3.4.5 Telecom Long Hot-Swap Injector/Ejector Handle C | 3_10

3.4.6 Cutouts and Function C | 3_11

3.4.7 Microswitch Technical Data and Function C | 3_12

3.4.8 Card Holder and Coding Pins acc. to IEEE C | 3_14

3.5 Injector/Ejector Handles acc. to AdvancedTCA C | 3_15

3.5.1 ATCA Ergonomic Injector / Ejector Handle C | 3_15

3.5.2 ATCA Classic Handle C | 3_16

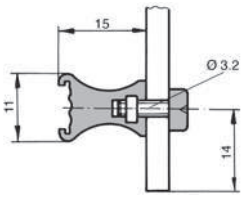
3.5.3 Microswitch Technical Data and Function C | 3_16

3.5.4 Fixing material C | 3_18



3.1 Fluted Handles

- Extruded aluminium handles, shaped to facilitate withdrawal of plug-in units
- Two grooves in the front face will accept identification strips (0.5 x 9 mm)
- **Scope of delivery:**
  - Extruded handle, clear anodised
  - Assembly material





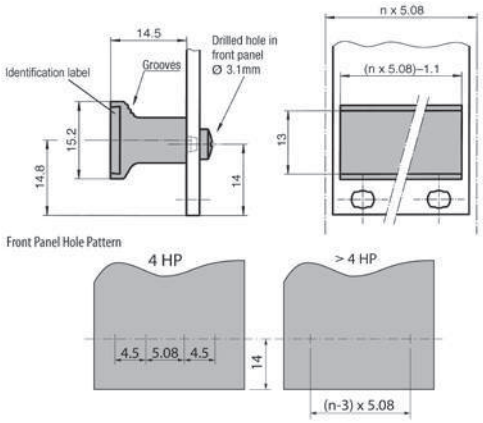
3.1 Fluted Handles for Front Panels to IEC

Front Panel	Width		Handle Length		Part-No.
Width HP	mm	inch	mm	inch	
3 HP	15.0	0.59	12.5	0.49	60-103
4 HP	20.1	0.79	17.6	0.69	60-104
5 HP	25.2	0.99	22.6	0.88	60-105
6 HP	30.3	1.19	27.7	1.09	60-106
7 HP	35.3	1.38	33.5	1.31	60-107
8 HP	40.4	1.59	37.9	1.49	60-108
10 HP	50.6	1.99	48.0	1.88	60-110
12 HP	60.8	2.39	58.2	2.29	60-112
14 HP	70.9	2.79	69.1	2.72	60-114
16 HP	81.1	3.19	78.5	3.09	60-116
21 HP	106.5	4.18	104.6	4.11	60-121
30 HP	152.2	5.99	149.6	5.88	60-130
40 HP	203.0	7.99	200.4	7.88	60-140
60 HP	304.6	11.99	302.0	11.88	60-160
84 HP	426.5	16.79	424.0	16.69	60-184



3.2 Rigid-Mounted Unit Handles

- Shape/finish and mounting position which correspond to those of the injector/ejector handles
- 4 HP to 12 HP injection-moulded in black glass reinforced Nylon (UL94 V-0)
- 14 HP to 84 HP are extruded in black Noryl (UL94 V-0)
- Aluminium identification labels are inserted into a slot in the handle
- Handles are fixed to the front panels using self-tapping, self-centering screws
- Handles for 4 HP have positioning nipples, allowing them to be fixed with one screw, without turning
- Width greater than 4 HP, at least two screws must be used for fixing
- Grooves on the handle always point towards the middle of the unit
- **Scope of delivery:**
  - Rigid-mounted handle
  - Identification label
- Assembly material see below





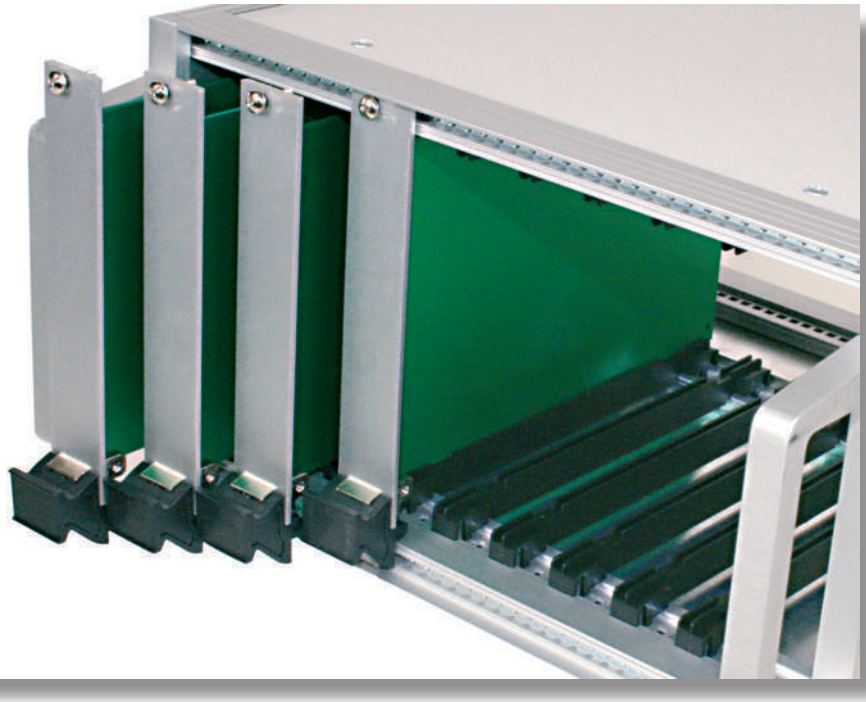
3.2 Rigid-Mounted Handle with Identification Label

Width	Scope of Delivery	Part-No.
4 HP	10 pcs.	60-200-04
5 HP	10 pcs.	60-200-05
6 HP	10 pcs.	60-200-06
7 HP	10 pcs.	60-200-07
8 HP	10 pcs.	60-200-08
10 HP	10 pcs.	60-200-10
12 HP	10 pcs.	60-200-12
14 HP	1 pc.	60-200-14

- Other sizes (up to 84 HP) are available upon request

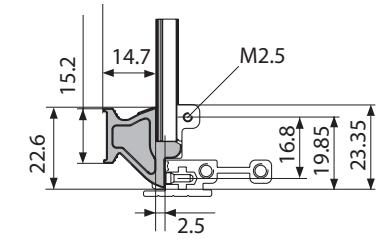
Assembly Material

Description	Part-No.
Cross recessed rounded head screw	61-276



3.3 Ejector Handles acc. to IEC

- Simple assembly of plug-in units
- Allows trouble-free extraction of electronic units with multi-pole connectors
- Main features in one part: card holder, ejector handle and centring pin
- Reset spring for safe insertion
- One version for top and bottom only
- Handle is injection moulded, glass-reinforced plastic, UL94 V-0
- Card holder is zinc die-cast, nickel plated
- Reset spring is stainless steel
- **Scope of delivery:**
  - Ejector handle
  - Assembly material (cross recessed screws M2.5 for fixing of card holder/printed board/front panel)
- Front panel with special cutouts have to be ordered separately

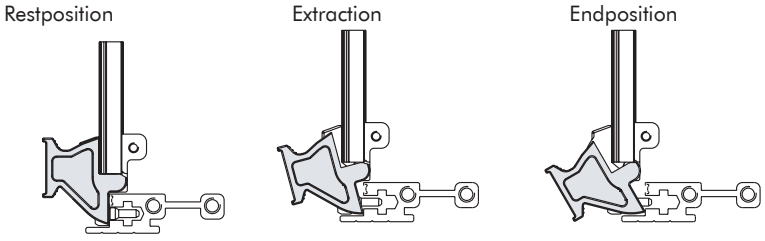




3.3 Ejector Handle acc. to IEC

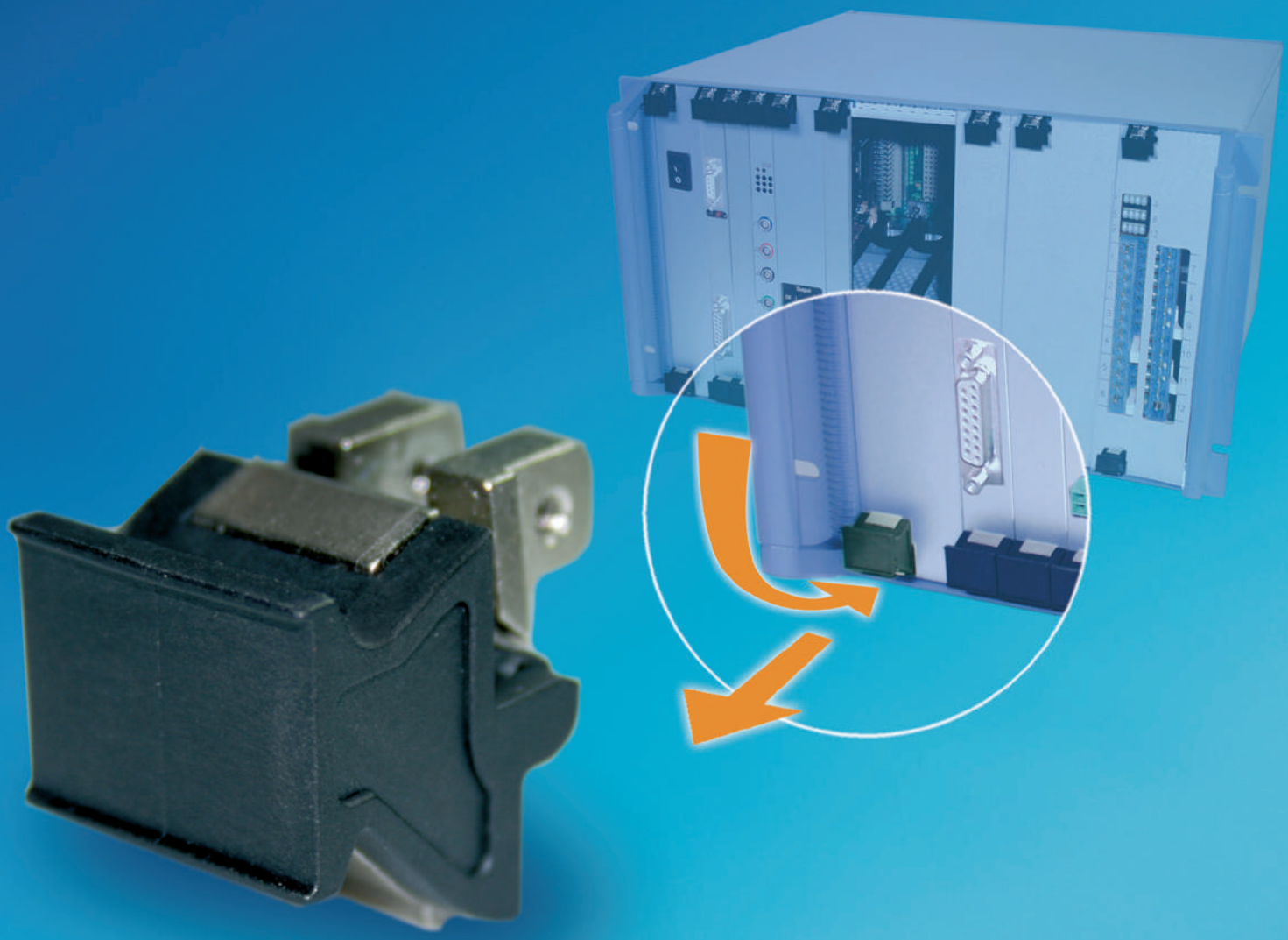
Description	Part-No.
Ejector handle black	81-233
Ejector handle grey	81-234

Extraction process:



Label

Description	Part-No.
1 sheet A4 of 220 labels	81-031



Simplify Your Operations

Straightforward and shorter, error free assembly

Elma's New IEC Ergonomic Handle

- Shorter assembly time of plug-in units
- Fewer individual parts
- Ejector function with optimised pressure point
- Reset spring for defined rest postion
- All functions integrated in only 3 parts
- Use of simple standard front panels

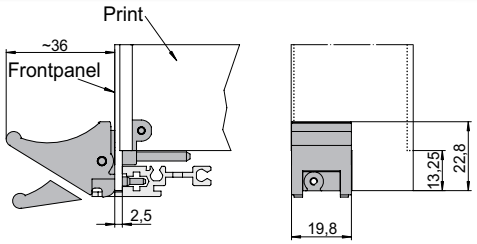
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Your Solution Partner



3.4 Injector/Ejector Handles acc. to IEEE

3.4.1 Ergonomic IEEE Standard Injector/Ejector Handle



- Without latching (standard)
- **Scope of delivery:**
  - Handle black (plastic, UL94 V-0)
  - Card holder (nickel plated)
  - Reset spring (stainless steel)
  - Assembly material (screws M2.5 for fixing of card holder/printed board/front panel)
- Maximal recommended force per handle 550 N
- Grey handles available on request



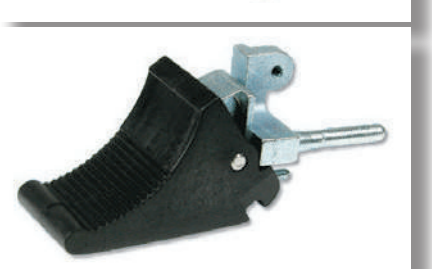
Injector/Ejector Handle Top *with* ESD Pin

Description	Part-No.
Black	81-075



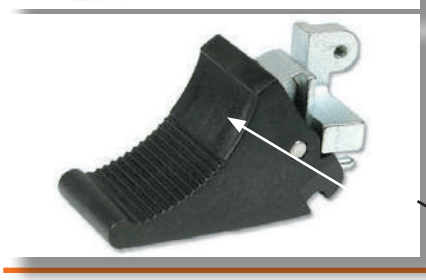
Injector/Ejector Handle Top *without* ESD Pin

Description	Part-No.
Black	81-075-01



Injector/Ejector Handle Bottom *with* ESD Pin

Description	Part-No.
Black	81-076



Injector/Ejector Handle Bottom *without* ESD Pin

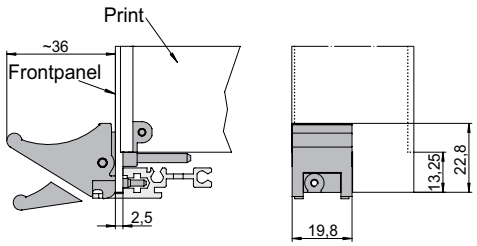
Description	Part-No.
Black	81-076-01

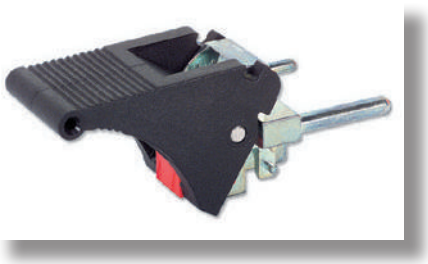
Label 18.5 x 10 mm

1 sheet A4 with 280 labels	81-030

3.4.2 Ergonomic IEEE Hot-Swap Injector/Ejector Handle

- With latching (hot-swap)
- **Scope of delivery:**
  - Handle black, button red (plastic, UL94 V-0)
  - Card holder (nickel plated
  - Reset spring (stainless steel)
  - Assembly material (screws M2.5 for fixing of card holder/printed board)
- Maximal recommended force per handle 550 N
- Grey handles available on request
- Offset version:
  - Offset by 2.54 mm (1/2 HP) to the right
  - Thus giving more space on the solder side of the PCB

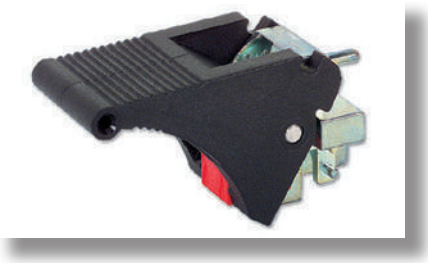




Top Handle *with* ESD Pin

Description	Part-No.
Black	81-095
Black offset	81-184

Optional screws for fixing front panels: M2.5,: 61-295



Top Handle *without* ESD pin

Description	Part-No.
Black	81-095-01

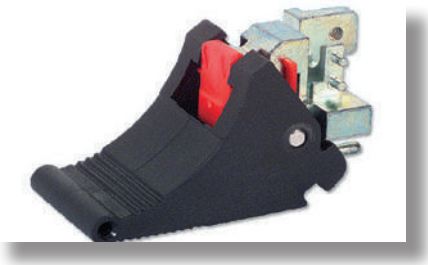
Optional screws for fixing front panels: M2.5,: 61-295



Bottom Handle *with* ESD Pin

Description	Part-No.
Black	81-096
Black offset	81-185

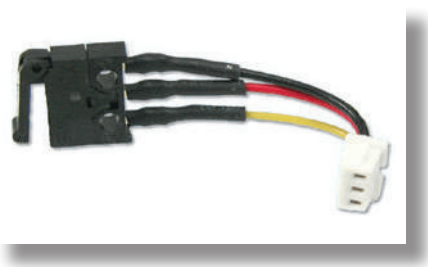
Optional screws for fixing front panels: M2.5,: 61-295



Bottom Handle *without* ESD Pin

Description	Part-No.
Black	81-096-01

Optional screws for fixing front panels: M2.5,: 61-295



Microswitch for Injector/Ejector Handle

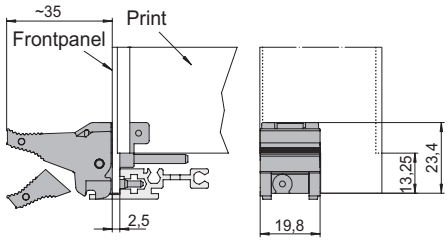
- Technical data and function see 3.4.7

Description	Part-No. 10 pcs.
Microswitch with pre-assembled wire cable length (25 mm)	81-088-1

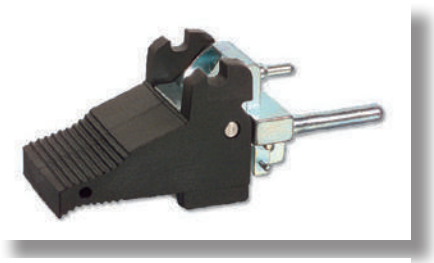
Label 18.5 x 10 mm

1 sheet A4 with 280 labels	81-030

3.4.3 Classic IEEE Standard and Hot-Swap Injector/Ejector Handle



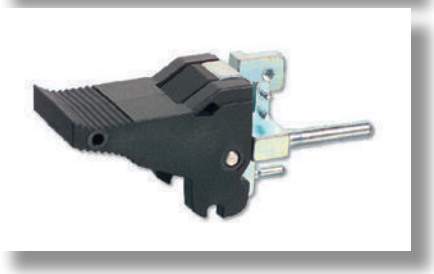
- Without latching (standard)
- **Scope of delivery:**
  - Handle black, without button (plastic, UL94 V-0)
  - Card holder (nickel plated)
  - Reset spring (stainless steel)
  - Assembly material (screws M2.5 for fixing of card holder/printed board)
- Maximal recommended force per handle 550 N
- Offset version:
  - Offset by 2.54 mm (1/2 HP) to the right
  - Thus giving more space on the solder side of the PCB



Top Handle *with* ESD Pin

Description	Part-No.
Black	81-260
Black offset	81-160

Optional screws for fixing front panels: M2.5,: 61-295

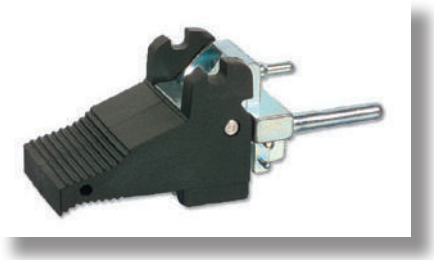


Bottom Handle with ESD Pin

Description	Part-No.
Black	81-261
Black offset	81-161

Optional screws for fixing front panels: M2.5,: 61-295

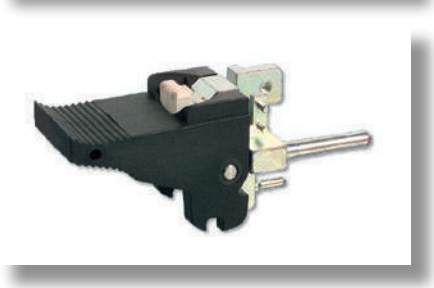
- With latching (hot-swap)
- **Scope of delivery:**
  - Handle black, button light grey (plastic, UL94 V-0)
  - Card holder (zinc die-cast, galvanized)
  - Assembly material (screws M2.5 for fixing of card holder/printed board)
- Offset version:
  - Offset by 2.54 mm (1/2 HP) to the right
  - Thus giving more space on the solder side of the PCB



Top Handle *with* ESD Pin

Description	Part-No.
Black	81-255
Black offset	81-155

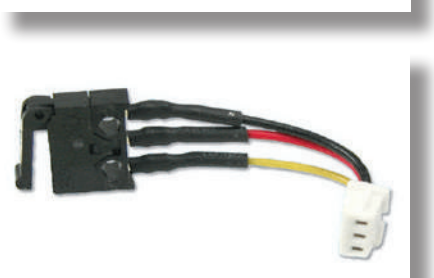
Optional screws for fixing front panels: M2.5, : 61-295



Bottom Handle *with* ESD Pin

Description	Part-No.
Black	81-256
Black offset	81-156

Optional screws for fixing front panels: M2.5, : 61-295



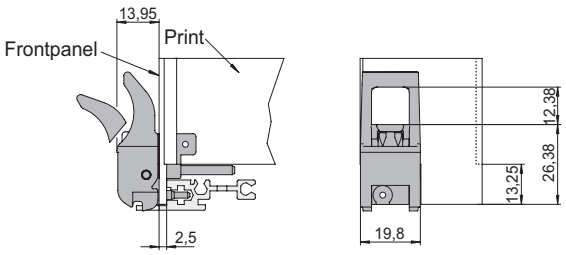
Microswitch for Injector/Ejector Handle

- Technical data and function see 3.4.7

Description	Part-No. 10 pcs.
Microswitch with pre-assembled wire cable length (25 mm)	81-088-1

3.4.4 Telecom Hot-Swap Injector/Ejector Handle

- With latching (hot-swap)
- **Scope of delivery:**
  - Handle black, button red (plastic, UL94 HB)
  - Card holder (zinc die-cast, galvanized)
  - Assembly material (screws M2.5 for fixing of card holder/printed board)
- Maximal recommended force per handle 550 N
- Grey handles available on request
- Offset version:
  - Offset by 2.54 mm (1/2 HP) to the right
  - Thus giving more space on the solder side of the PCB





Top Handle *with* ESD Pin

Description	Part-No.
Black	81-205
Black offset	81-188

Optional screws for fixing front panels: M2.5,: 61-295



Top Handle *without* ESD Pin

Description	Part-No.
Black	81-205-01

Optional screws for fixing front panels: M2.5,: 61-295



Bottom Handle *with* ESD Pin

Description	Part-No.
Black	81-206
Black offset	81-189

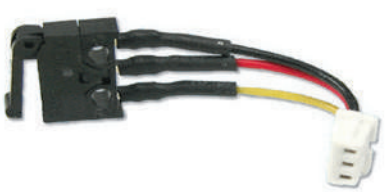
Optional screws for fixing front panels: M2.5, : 61-295



Bottom Handle *without* ESD Pin

Description	Part-No.
Black	81-206-01

Optional screws for fixing front panels: M2.5,: 61-295



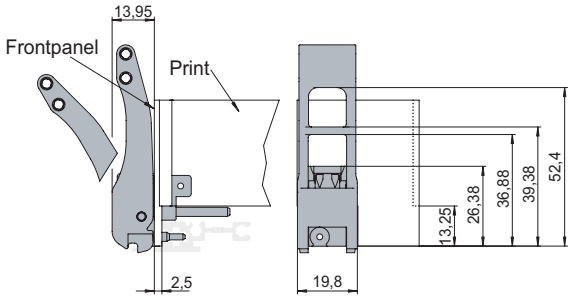
Microswitch for Injector/Ejector Handle

- Technical data and function see 3.4.7

Description	Part-No. 10 pcs.
Microswitch with pre-assembled wire cable length (25 mm)	81-088-1

3.4.5 Telecom Long Hot-Swap Injector/Ejector Handle

- With latching (hot-swap)
- **Scope of delivery:**
  - Handle black, button red (plastic, UL94 HB)
  - Card holder (zinc die-cast, galvanized)
  - Assembly material (screws M2.5 for fixing of card holder/printed board)
- Maximal recommended force per handle 550 N
- Grey handles available on request
- Offset version:
  - Offset by 2.54 mm (1/2 HP) to the right
  - Thus giving more space on the solder side of the PCB





Top Handle *with* ESD Pin

Description	Part-No.
Black	81-214
Black offset	81-117

Optional screws for fixing front panels: M2.5,: 61-295



Bottom Handle *with* ESD pin

Description	Part-No.
Black	81-215
Black offset	81-116

Optional screws for fixing front panels: M2.5,: 61-295

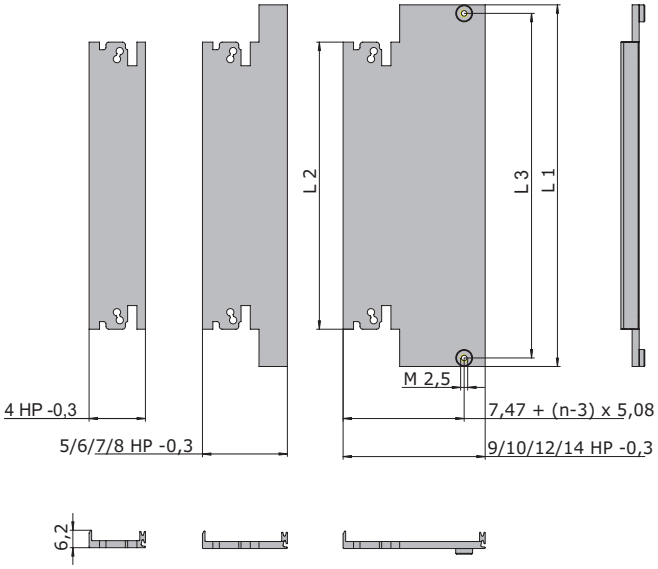


Microswitch for Injector/Ejector Handle

- Technical data and function see 3.4.7

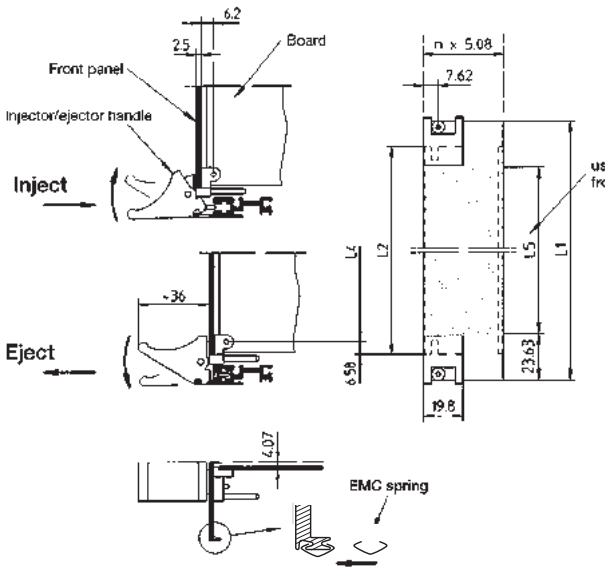
Description	Part-No. 10 pcs.
Microswitch with pre-assembled wire cable length (25 mm)	81-088-1

3.4.6 Cutouts and Function

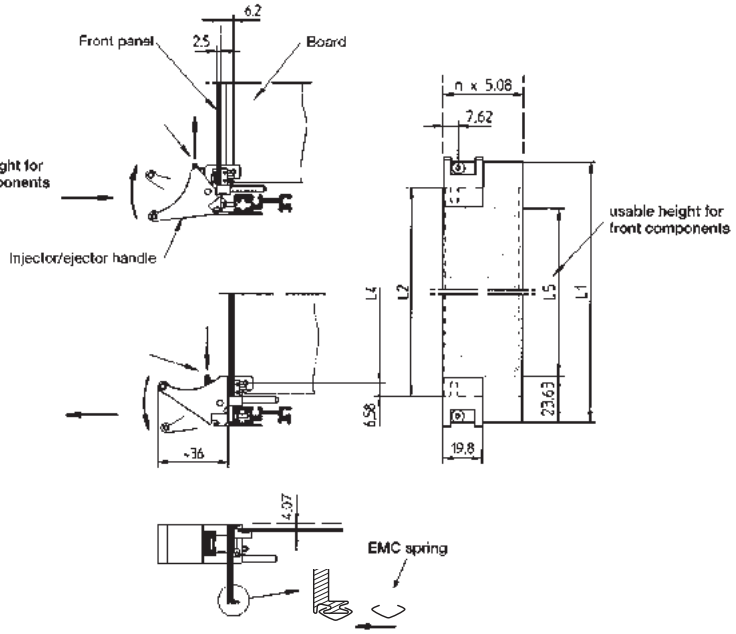


C

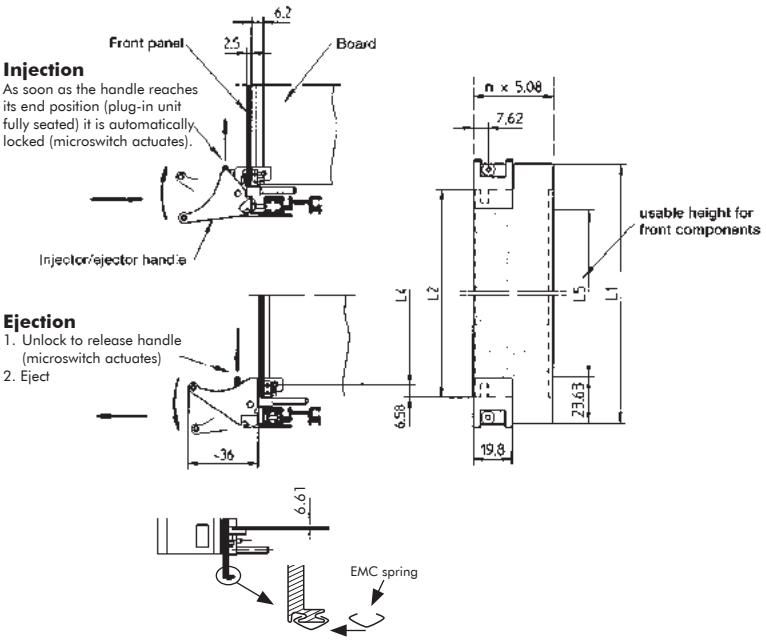
Injector/Ejector Handle
Without Locking Feature (Function)



Injector/Ejector Handle
With Locking Feature (Function)



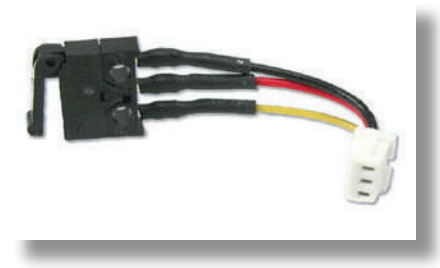
Injector/Ejector Offset Handle
With Locking Feature (Function)



Dimensions

Height	**L1** mm	**L1** inch	**L2** mm	**L2** inch	**L3** mm	**L3** inch	**L4** mm	**L4** inch	**L5** mm	**L5** inch
3 U	128.55	5.06	102.05	4.01	122.50	4.82	88.90	3.50	81.30	3.20
6 U	261.90	10.31	235.40	9.27	255.85	10.07	222.25	8.75	214.65	8.45
9 U	395.25	15.56	368.75	14.51	389.20	15.32	355.60	14.00	348.00	13.70

3.4.7 Microswitch Technical Data and Function

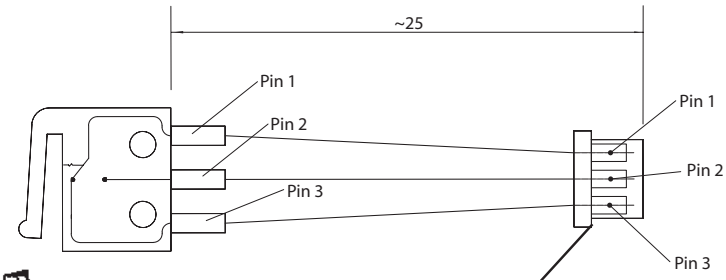


Microswitch for Injector/Ejector Handle

Description	**Part-No.** **10 pcs.**
Microswitch with pre-assembled wire cable length (25 mm)	81-088-1

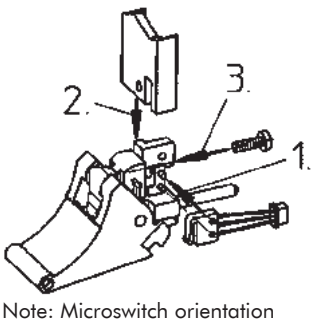
Technical data

Life circuit:	30 V DC, 5 - 50 mA	30'000 cycles
	60 V DC, 5 mA	30'000 cycles
	60 V DC, 500 mA	15'000 cycles
Temperature:	-25°C to +70°C	
Humidity:	RH 85% max.	
Vibration:	10 Hz to 55 Hz, 18 g	
Shock:	30 g, 11 msec	



Molex Plug
Part-No. 51021-0300

Mates with: (Molex P/N)
51047-0300
53048-0310
53047-0310
53261-0390
53398-0390



Note: Microswitch orientation

Switch function:
- Switch open: Connection between Pin 1 and Pin 3
- Switch closed: Connection between Pin 1 and Pin 2

Mounting sequence:
1. Push microswitch onto the handle
2. Insert the front panel into the handle
3. Screw-on

Hot-Swap Safely at the Touch of a Button

Modern backplanes are equipped with high pin density connectors. In order to manage the occurring high connecting forces, up to 500 N (100lbs.) for a 6U plug-in unit, a new insertion/extraction handle was designed and standardized in IEEE 1101.10.

The standards for CompactPCI Hot Swap and VME64x show new features added to the IEEE handle. To meet these different demands, Elma has developed two handles.

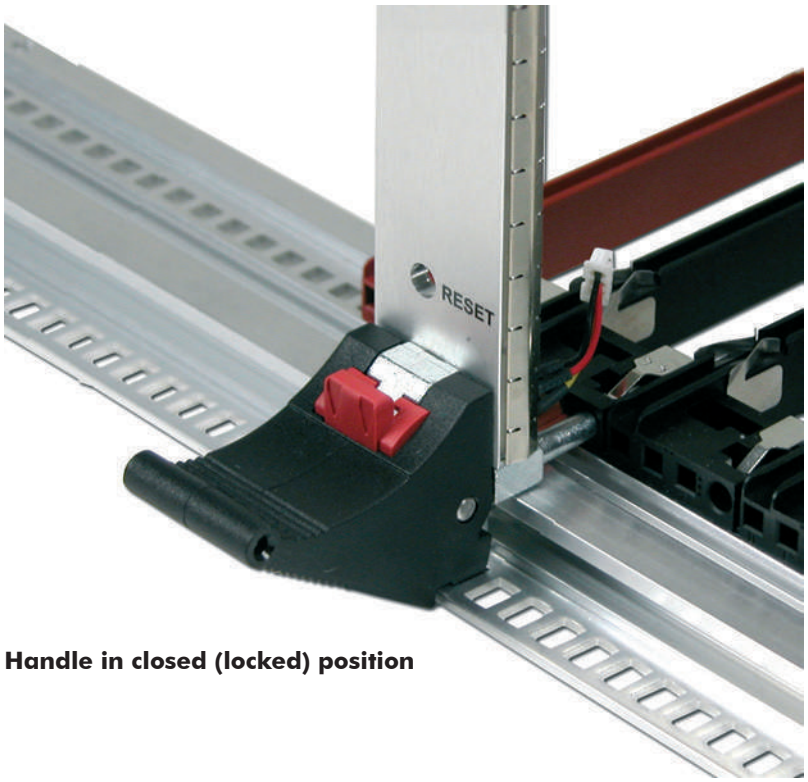
To confirm with IEEE 1101.10 and CompactPCI without Hot Swap or other applications where high insertion/extraction forces have to be managed, Elma developed a handle with an optimised ratio of leverage that impairs minimum vertical forces to the rack. Thus preventing the front extrusions from buckling which can cause malfunction of the handle. In addition the Elma handle has a positioning pin. This pin, anchored in the tapped strip, precisely aligns each board within its slot, eliminating lateral forces to adjacent boards (this guarantees the functionality of the EMC gaskets and reinforces the front extrusions). A matter of course are the coding (up to 4096 possibilities) and the ESD pin for electrostatic discharge of the front panel (via an ESD clip in the card guide) as defined in the IEEE standard.

The CompactPCI Hot Swap specification asks for a switch incorporated in the handle assembly. And the VME64x specifications requires a handle with a build in locking feature. Elma has added these features to the above mentioned handle. Thus offering the user two almost identical handles for different requirements. Unique and user friendly is the locking feature:

To remove the plug-in unit first the handle has to be unlocked by pushing down the red button on the handle. The red button also activates at the same time the switch (open). The red button remains depressed. Now the plug-in unit can be removed by pushing the handle outwards. If the red button was pushed in error, push the handle inwards. When the plug-in unit is fully seated, the red button jumps up automatically thus locking the handle and activating the switch (closed).

To separate the two operations (unlocking and extraction) means security and guarantees that the handle meets completely the Hot Swap specification. According to the specification the switch has to change the state as the handle is unlocked but before any movement of the board begins. On insertion the switch should change state after the board is fully seated (physical connection is done). This locking happens automatically with the Elma handle. Only when the plug-in unit is fully and correctly inserted, will the handle be locked and the switch actuated (closed).

The Hot Swap specification highly recommends a protective cover for Hot Swap boards. The cover from Elma can be mounted without screws. It is inserted between printed board and front panel. Then the double-sided adhesive tape is pressed on the printed board through the pins of the connector. No time or money is wasted fitting screws and in addition the cover can be fixed on all 6 U-, 160 mm and 80 mm boards even on those where holes for a protective cover are missing.

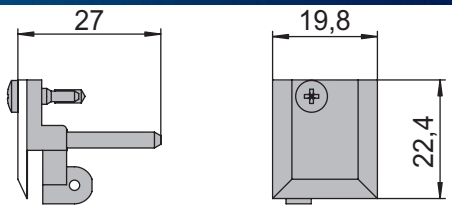


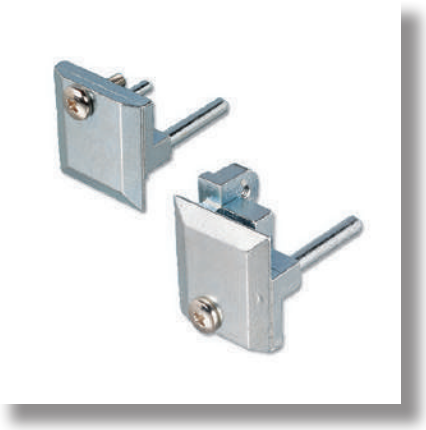
Handle in closed (locked) position

3.4.8 Card Holder and Coding Pins acc. to IEEE

- **Scope of delivery:**
  - End piece card holder (zinc die-cast, nickel plated)
  - Assembly material

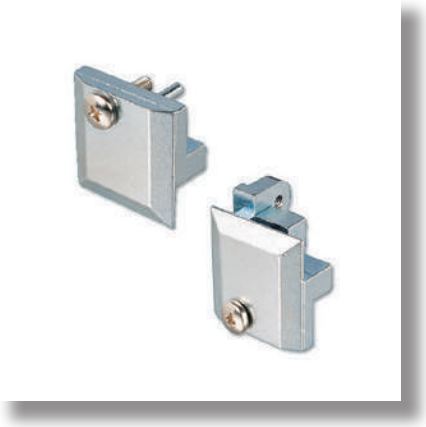
  (screws M2.5 for fixing of front panel/card holder/printed board)





3.4.8.1 Card Holder/End Piece *with* ESD Pin

Description	Part-No.
Top	81-018
Bottom	81-019



3.4.8.2 Card Holder/End Piece *without* ESD Pin

Description	Part-No.
Top	81-018-01
Bottom	81-019-01



3.4.8.3 Coding Pins

- Acc. to IEC 60297-3-103
- Plastic, UL94 V-0
- Can be rotated in 4 positions

Description	Part-No.
Grey	81-054-02
Dark red	81-054-06
Black	81-054-04



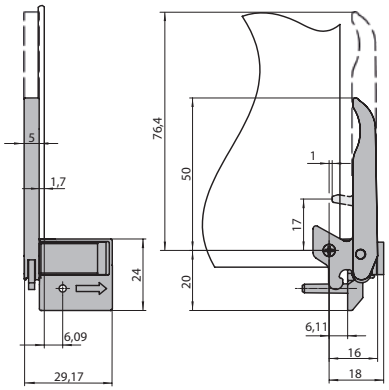


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3.5 Injector/Ejector Handles acc. to AdvancedTCA

3.5.1 ATCA Ergonomic Injector / Ejector Handle

- Pre-assembled
- Self-locking screws for front panel and board mounting (Tuflok)
- Plastic parts black (UL94 V-0)
- Base part including alignment pin (zinc die-cast, nickel plated)
- Other versions available on request
- **Scope of delivery:**
  - Handle pre-assembled
  - Retaining scre mounting (loose packed)
  - Screw for board mounting (loose packed)





3.5.1.1 Ergonomic Handle, Microswitch to be assembled on Handle

Description	Part-No.
Front top, rear bottom	81-300-00
Front bottom, rear top	81-301-00



3.5.1.2 Ergonomic Handle, Microswitch to be assembled on Front Panel or Board

- Switching pin on lever handle

Description	Part-No.
Front bottom, rear top	81-301-01

3.5.2 ATCA Classic Handle

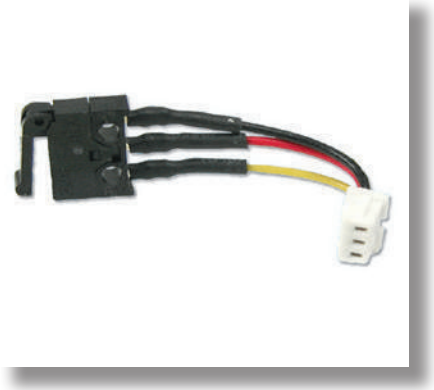


3.5.2 ATCA Classic Handle

- Easy operation
- Material: stainless steel
- With latching (hot-swap)
- For self installation
- **Scope of delivery:**
  - 2 steel handles
  - 2 shoulder screws M2.5, Torx size T10
  - 4 + 4 washers
  - 2 latch spring clips
  - Assembly instruction

Description	Part-No.
2 handles	12T130

3.5.3 Microswitch Technical Data and Function



3.5.3.1 Microswitch for Injector/Ejector Handle

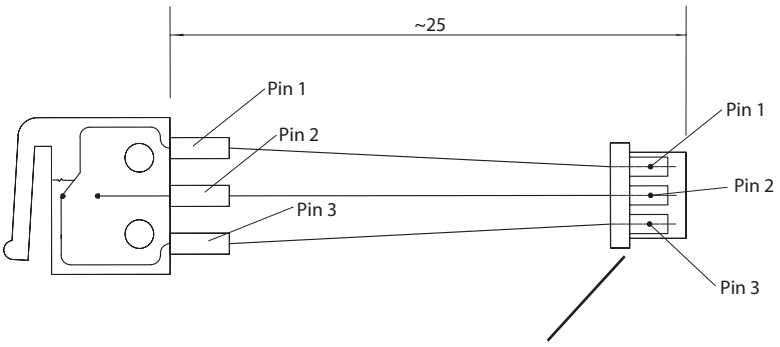
Description	Part-No. 10 pcs.
Microswitch with pre-assembled wire cable length (25 mm)	81-088-1

Technical data

Life circuit:	30 V DC, 5 - 50 mA	30'000 cycles
	60 V DC, 5 mA	30'000 cycles
	60 V DC, 500 mA	15'000 cycles
Temperature:	-25°C to +70°C	
Humidity:	RH 85% max.	
Vibration:	10 Hz to 55 Hz, 18 g	
Shock:	30 g, 11 msec	

Switch function:

- Switch open: Connection between Pin 1 and Pin 3
- Switch closed: Connection between Pin 1 and Pin 2



Molex Plug
Part-No. 51021-0300

Mates with: (Molex P/N)
51047-0300
53048-0310
53047-0310
53261-0390
53398-0390

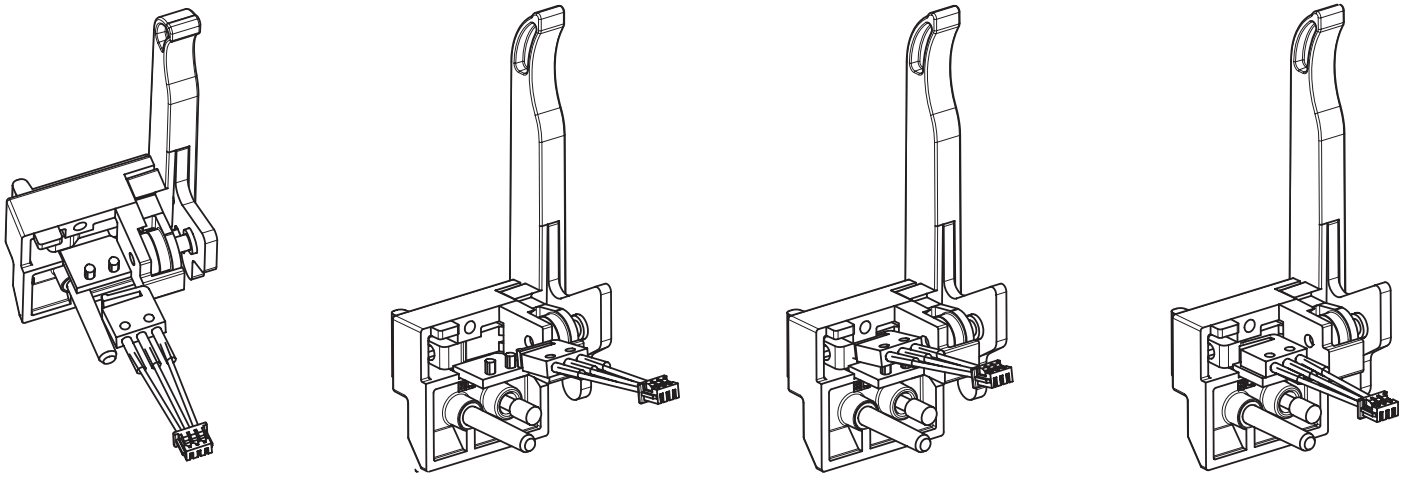
3.5.3.1.1 Mounting Microswitch to ATCA Ergonomic Handle:

- Possible without tools

1. Handle stays in the locked (closed) position

2. Check the microswitch orientation according the drawing below

3. Push microswitch onto the handle

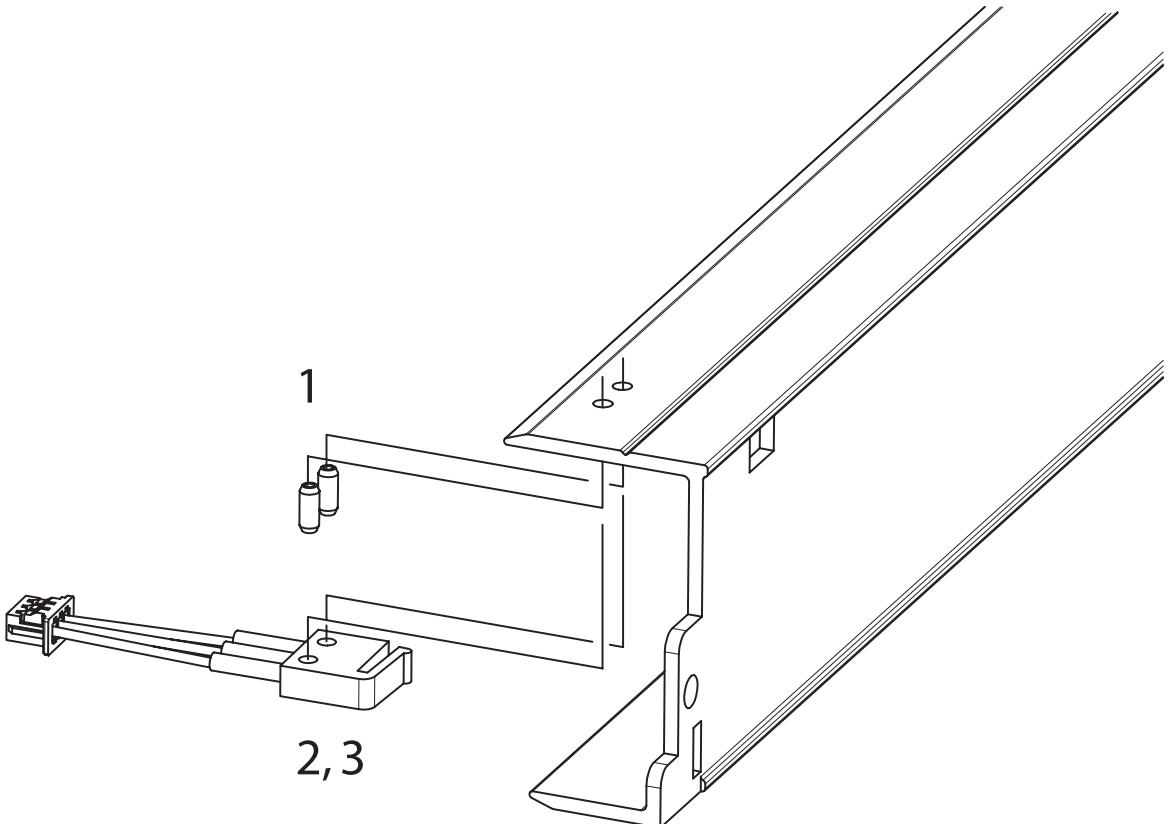


3.5.3.1.2 Mounting Microswitch to Front Panel:

1. Press studs (Elma part number: 5686-05) into the panel

2. Check the microswitch orientation according the drawing below

3. Push microswitch onto the studs



3.5.4 Fixing material



3.5.4.1 Rounded Head Screw M2.5 x 5 mm

- For front panel mounting
- Self securing (Tuflok)
- Steel, nickel plated
- Philips #1

Description	Part-No.
Rounded head screw M2.5 x 5 mm	5306-11



3.5.4.2 Rounded Head Screw M3 x 12.7 mm

- Captive screw for mounting handle to rack
- Steel, nickel plated
- Freedrive, Philips #2

Description	Part-No.
Rounded head screw M3 x 12.7 mm	61-296



3.5.4.3 Speziel Screw M2.5 x 8.3 mm

- Screw for mounting PCB to ATCA Ergonomic handle
- Self securing (Tuflok)
- Steel, gavanised, clear passivated
- Philips #1

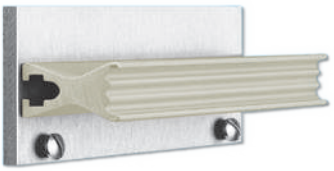
Description	Part-No.
Rounded head screw M2.5 x 8.3 mm	5441-38

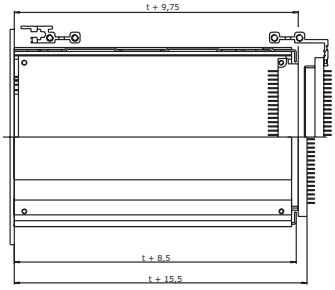
4: Cassettes and Modules











4.1 Cassette A **C | 4_2**

4.1.1 Cassette A, for Several Eurocards C | 4_3

4.1.2 Card Guides C | 4_4

4.1.3 Rear Panel C | 4_4

4.2 Module B **C | 4_5**

4.2.1 Module B, for One Eurocard and Bulky Components C | 4_5

4.3 Module C **C | 4_6**

4.3.1 Module C, for One Eurocard and Bulky Components C | 4_6

4.4 Accessories for Cassettes and Modules **C | 4_7**

4.4.1 Card Guides C | 4_7

4.4.2 Fluted Handles C | 4_7

4.4.3 Side Wall Extrusion C | 4_7

4.4.4 Depth Extrusion C | 4_7

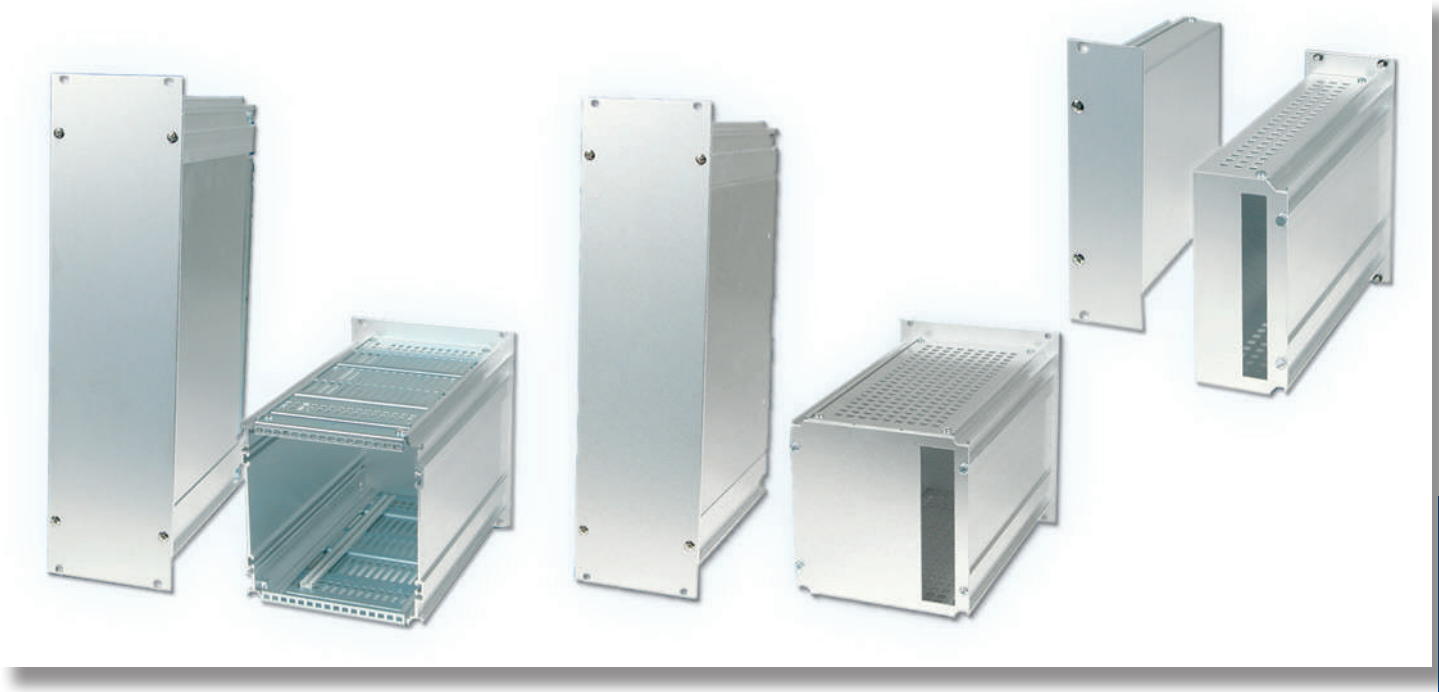
4.5 Line Drawings **C | 4_8**

4.5.1 3 U Cassettes and Modules C | 4_8

4.5.2 6 U Cassettes and Modules C | 4_9

4.5.3 Rear Panel C | 4_9

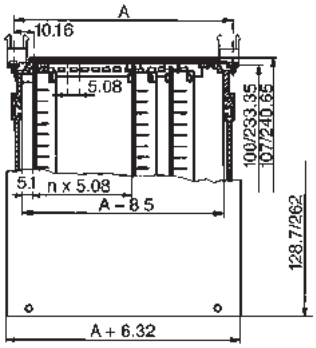
4.5.4 Fixing Methods C | 4_10



- Designed to accept single or double eurocards
- Depths 160 mm (6.29”) or 220 mm (8.66”)
- Aligned for connectors conforming to IEC 60603-2
- External dimensions meet the requirements for attachment to sub racks as specified in IEC 60297
- Plug-in units
- PCB firmly attached to the side extrusions

4.1 Cassette A

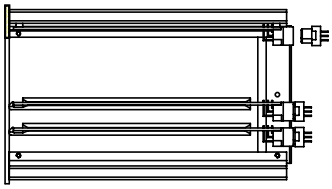
- Accepts several PCBs on horizontal pitch of 1 HP (5.08 mm, 0.20")
- IEC60603-2 connectors can be mounted internally at rear
- Connectors can be interwired to form a functional plug-in unit
- Suitable for use with all sub racks, adaptation kits for mounting eurocards and eurocard mounting sets
- Several eurocards 100 x 160 mm (3.93" x 6.29") or 100 x 220 mm (3.93" x 8.66") can be fitted
- Several double eurocards 233.35 x 160 mm (9.18" x 6.29") or 233.35 x 220 mm (9.18" x 8.66") can be fitted
- Possibility to mount 100 x 160 mm (3.93" x 6.29") PCBs recessed inside a 100 x 220 mm (3.93" x 8.66") cassette with insertion from front or rear (see wiring example)
- Edge connectors used for interwiring are attached to connector mounting angles at the rear of the cassette
- Card guides are used to locate the cassette in the sub rack
- Right and left side extrusions with grooves for sliding in a PCB
- Installation of further PCB’s by assembly of card guides in the perforated bottom/top covers
- **Scope of delivery:**
  - Front panel
  - Side extrusions
  - Top/bottom covers
  - Mounting angle
  - Extension piece
  - Assembly material
  - Rear panel (6 U version only)
  - Side covers (6 U version only)
- Front panel screws, see 4.1.1
- Handles, see 4.4.2



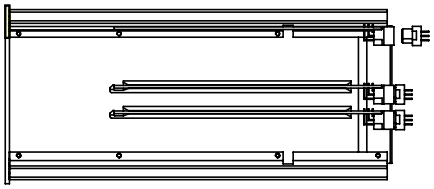
Dimensions Cassette A

Width	**A** mm	**A** inch
14 HP	64.60	2.54
21 HP	100.16	3.94
28 HP	135.72	5.34
42 HP	206.84	8.14

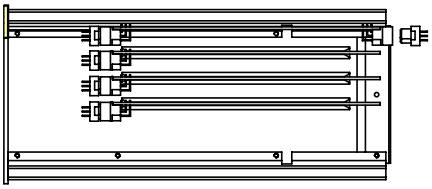
Mounting Possibilities



Card Depth 160/220 mm



Card Depth 160 mm Recessed



Card Depth 160 mm Rear Insertion*

* When 160 mm cards are inserted from the rear of a 220 mm cassette, a rear panel is required (see 4.1.5)

4.1.1 Cassette A, for Several Eurocards



4.1.1 Cassette A, for Several Eurocards

Depth	**Width**	**3 U**	**6 U**
160 mm 6.29"	14 HP	23A302	-
	21 HP	23A312	-
	28 HP	23A322	-
	42 HP	23A332	-
220 mm 8.66"	14 HP	-	23A603
	-	-	-

Front Panel Screws

- Set of 10 screws, M2.5 x 11.3
- With screw retainer
- Per cassette A 4 screws are needed

Description	**Part-No. 10 pcs.**
Torx screws, size T8, with plastic screw retainer	63K159
Rounded head screws recessed, with plastic screw retainer	63-159

For more front panel screws refer to chapter E

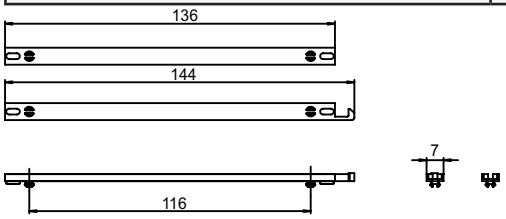
4.1.2 Card Guides



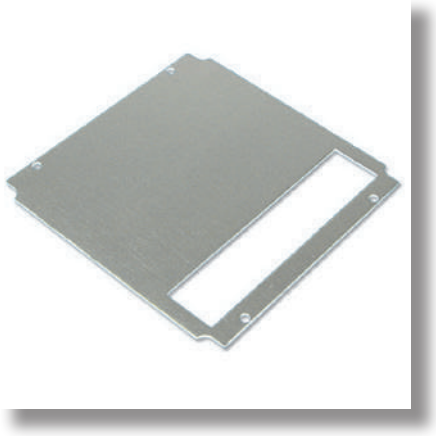
4.1.2 Card Guides

- For mounting PCBs in cassettes
- Assembly in the perforated bottom/top covers
- Light grey UL94 V-0

Description	Card Depth	Part-No. 1 Pair
Card guides in cassettes	160/220 mm (6.29"/8.66")	61-034



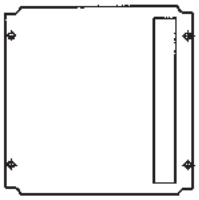
4.1.3 Rear Panel



4.1.3 Rear Panel

- For mounting from rear for 160 mm (6.29") cards in cassettes 220 mm (8.66")

Connector Body Style, acc. IEC60603-2	Height	14 HP	21 HP	28 HP
B, C, D	for 3 U	-	23-386-1	23-387-1
E, F, H	for 3 U	23-385-2	23-386-2	-

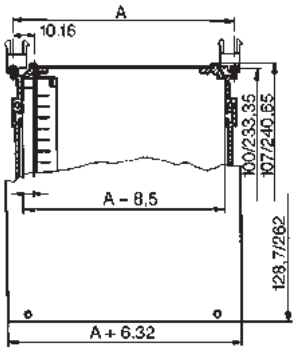


Please note:

For front panels, handles and front panel screws must be ordered separately. Card guides for use inside cassettes, card guides to locate cassettes, edge connector mounting pieces and special screws for mounting connectors need to be ordered separately.

4.2 Module B

- Accepts one PCB and various non-standard and bulky components which can be mounted using the grooves formed in the side extrusions
- By interwiring the components, the module can be used as functional plug-in unit
- Suitable for use with all sub racks, adaptation kits for mounting eurocards and euro-card mounting sets
- Accepts a eurocard 100 x 160 mm (3.93" x 6.29") or 100 x 220 mm (3.93" x 8.66") and double eurocards 233.35 x 160 mm (9.18" x 6.29") or 233.35 x 220 mm (9.18" x 8.66") fastened to the side extrusions and leaving room for non-standard and bulky components
- Card guides are used to locate the module in the sub rack
- **Scope of delivery:**
  - Front panel
  - Side extrusions
  - Top/bottom covers
  - Rear panel
  - Assembly material
  - Side covers (6 U versions only)
- Front panel screws, see 4.2.1
- Handles see 4.4.2



Dimensions Module B

Width	**A** mm	**A** inch
14 HP	64.60	2.54
21 HP	100.16	3.94
28 HP	135.72	5.34

4.2.1 Module B, for One Eurocard and Bulky Components



4.2.1 Module B, for One Eurocard and Bulky Components

Depth	**Width**	**Connector Body Style acc. IEC 60603-2**	**3 U**	**6 U**
160 mm 6.29"	21 HP	B, C, D	23B312-1	23B612-1
		E, F, H	23B312-2	-
220 mm 8.66"	14 HP	E, F, H	23B303-2	23B603-2
	21 HP	E, F, H	23B313-2	23B613-2

Front Panel Screws

- Set of 10 screws, M2.5 x 11.3
- With screw retainer
- Per module B 4 screws are needed

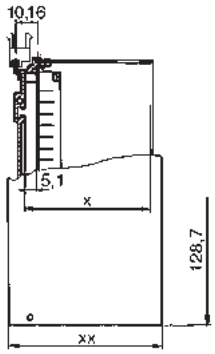
Description	**Part-No. 10 pcs.**
Torx screws, size T8, incl. plastic screw retainer	63K159
Rounded head screws recessed, incl. plastic screw retainer	63-159

For more front panel screws refer to chapter 7

Please note: Handles for front panels, front panel screws and card guides to locate the module need to be ordered separately.

4.3 Module C

- These narrow modules can be used for the shielding and mechanical protection of single PCBs or as small functional plug-in units
- Suitable for use with all sub racks and eurocard mounting sets
- The C-type module accepts one eurocard 100 x 160 mm (3.93" x 6.29") or 100 x 220 mm (3.93" x 8.66") with edge connector to IEC60603-2, types B, C, D
- The closed module provides good shielding and also mechanical protection for sensitive components
- Card guides are used to slide the module into the sub rack
- **Scope of delivery:**
  - Front panel
  - Side extrusion
  - Cover
  - Assembly material
- Front panel screws, see 4.3.1
- Handles see 4.4.2



Dimensions Module C

Width	**x** mm	**x** inch	**xx** mm	**xx** inch
7 HP	24.48	0.96	35.36	1.39
10 HP	39.72	1.56	50.60	1.99
14 HP	60.04	2.36	70.92	2.79

C

4.3.1 Module C, for One Eurocard and Bulky Components



4.3.1 Module C, for One Eurocard and Bulky Components

Depth	**Width**	**Cover**	**3 U**
160 mm 6.29"	7 HP	solid	23C307-10
	10 HP	solid	23C310-10
		perforated	23C310-11
	14 HP	solid	23C314-10
		perforated	23C314-11
220 mm 8.66"	7 HP	solid	23C307-30
		perforated	23C307-31

Front Panel Screws

- Set of 10 screws, M2.5 x 11.3
- With screw retainer
- Module C width 7 HP = 2 screws; ≥ 10 HP = 4 screws

Description	**Part-No. 10 pcs.**
Torx screws, size T8	63K159
Rounded head screws recessed	63-159

For more front panel screws refer to chapter E

Please note: Handles for front panels, front panel screws and card guides to locate the module need to be ordered separately.

4.4 Accessories for Cassettes and Modules

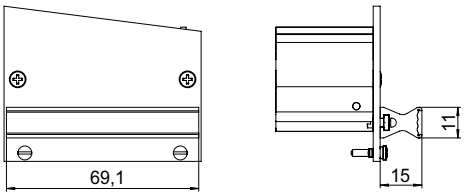
4.4.1 Card Guides



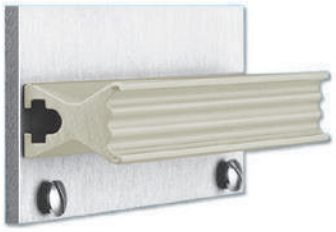
4.4.1 Card Guides

- Used to locate the module in the sub rack
- Black plastic UL94 V-0

Card Depth mm	Card Depth inch	Part-No.
160	6.29	61-044
220	8.66	61-039

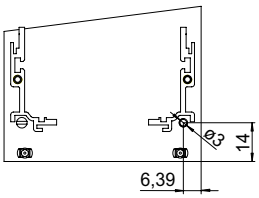


4.4.2 Fluted Handles



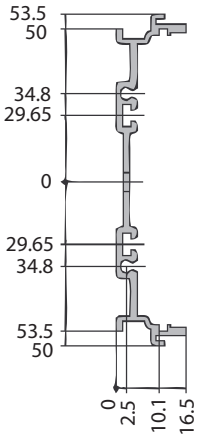
4.4.2 Fluted Handles

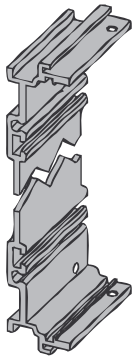
- Extruded aluminium handles, shaped to facilitate withdrawal of plug-in units
- Two grooves in the front face will accept identification strips (0.5 x 9 mm)
- **Scope of delivery:**
  - Extruded handle, clear anodised
  - Assembly material



7 HP	10 HP	14 HP
23-060	23-061	23-062

4.4.3 Side Wall Extrusion



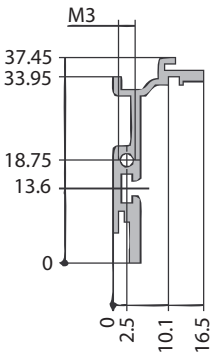


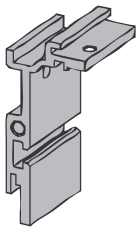
4.4.3 Side Wall Extrusion

- To build up customised solutions
- For 3 U type 23 cassettes and modules
- **Scope of delivery:**
  - 1 side wall extrusion
- Assembly material has to be ordered separately

Length mm	Length inch	Part-No. Clear Passivation	Part-No. Raw
165.7	6.52	66-106-20	—
225.7	8.87	66-106-21	—
1350.0	53.14	—	66-106-14

4.4.4 Depth Extrusion





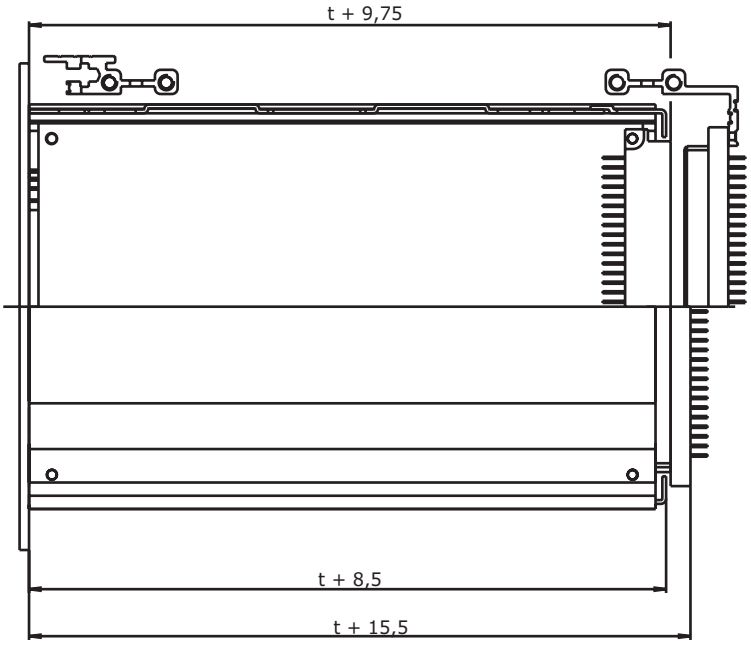
4.4.4 Depth Extrusion

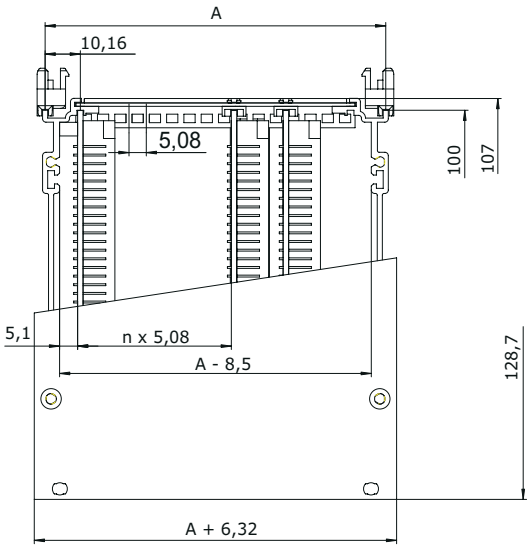
- To build up customised solutions
- For 6 U cassettes and modules type 23
- **Scope of delivery:**
  - 1 depth extrusion
- Assembly material has to be ordered separately

Length mm	Length inch	Part-No. Clear Passivation	Part-No. Raw
165.7	6.52	66-188-20	—
225.7	8.87	66-188-22	—
1350.0	53.14	—	66-188-14

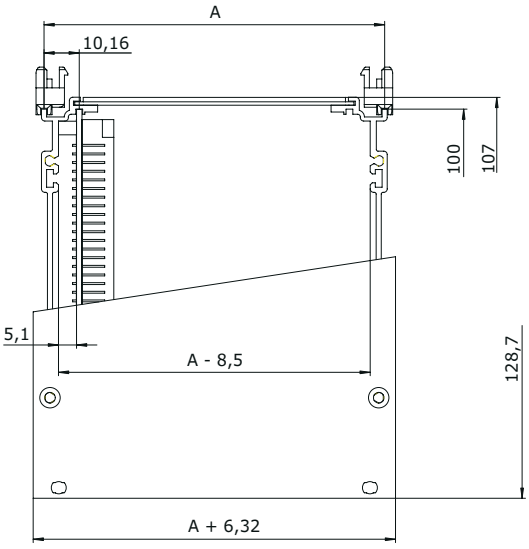
4.5 Line Drawings

4.5.1 3 U Cassettes and Modules

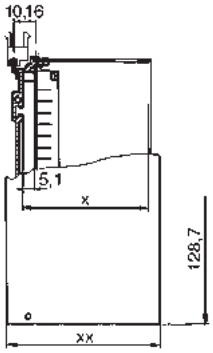




Cassette A



Module B



Module C

Cassette A and Module B

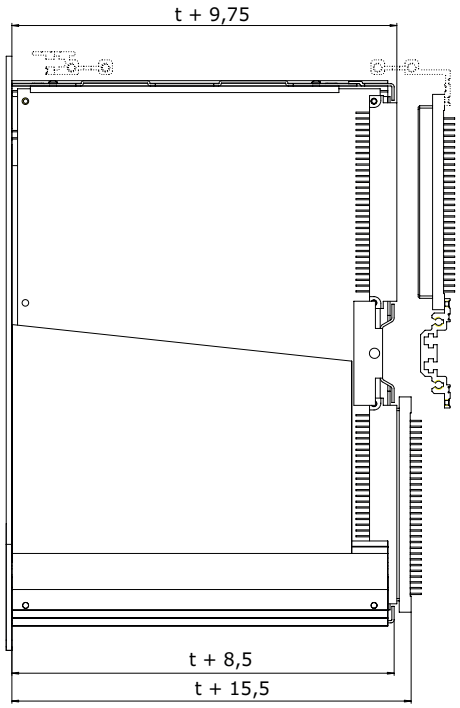
Width	**A** mm	**A** inch
14 HP	64.60	2.54
21 HP	100.16	3.94
28 HP	135.72	5.34
42 HP	206.84	8.14

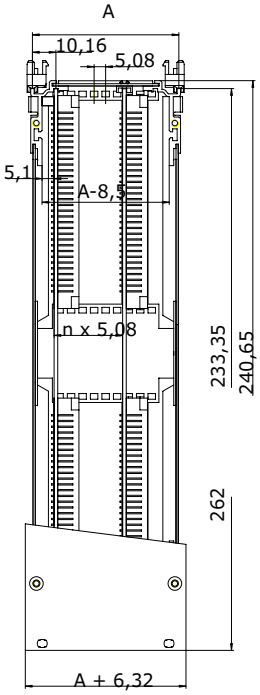
Module C

Width	**x** mm	**x** inch	**xx** mm	**xx** inch
7 HP	24.48	0.96	35.36	1.39
10 HP	39.72	1.56	50.60	1.99
14 HP	60.04	2.36	70.92	2.79

t = card depth = 160/220 mm (6.29"/8.66")

4.5.2 6 U Cassettes and Modules

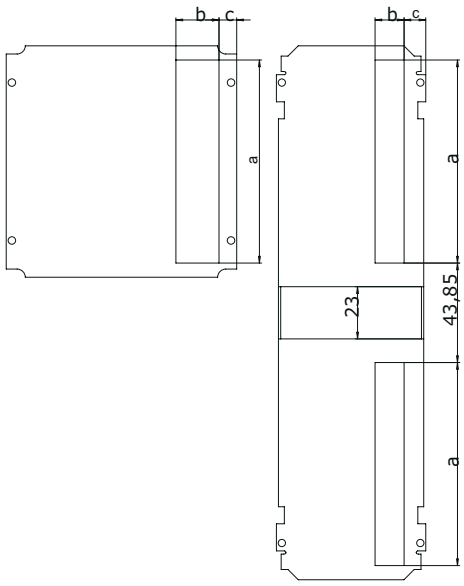




Width	**A** mm	**A** inch
14 HP	64.60	2.53
21 HP	100.16	3.94
28 HP	135.72	5.34
42 HP	206.84	8.14

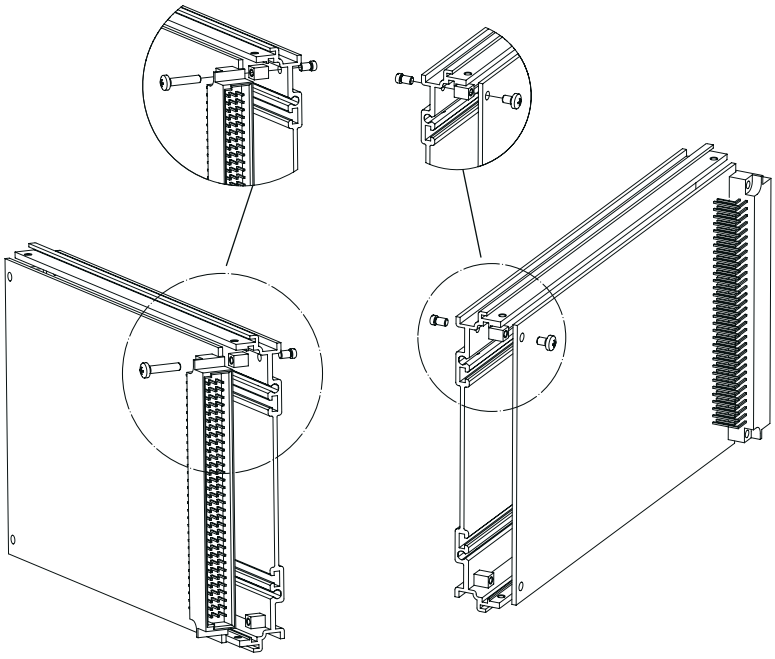
t = Card Depth = 160/220 mm (6.29"/8.66")

4.5.3 Rear Panel



	Height	**IEC60603-2 Connectors**			
		B, C, D mm	**B, C, D** inch	**E, F, H** mm	**E, F, H** inch
a	3 U	89.5	3.52	89.5	3.52
	6 U	89.5	3.52	89.5	3.52
b	3 U	12.0	0.47	19.0	0.74
	6 U	12.8	0.50	19.1	0.75
c	3 U	9.65	0.38	7.80	0.30
	6 U	9.55	0.37	7.75	0.30

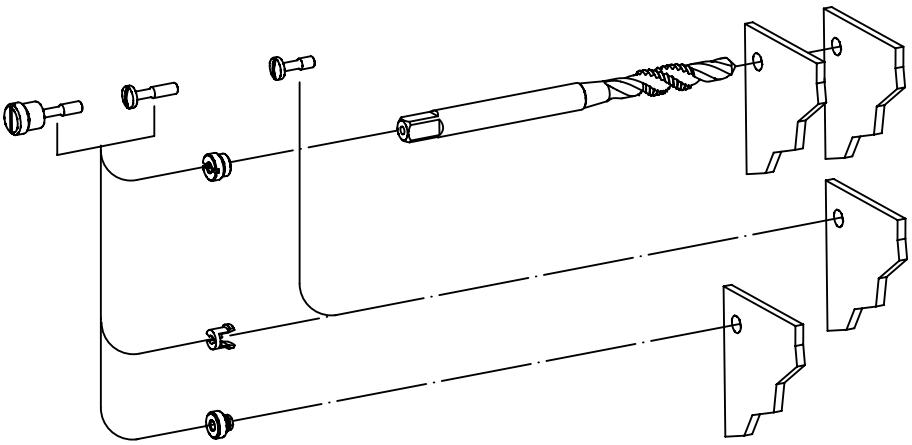
4.5.4 Fixing Methods



Rear Fastening **Front Fastening**

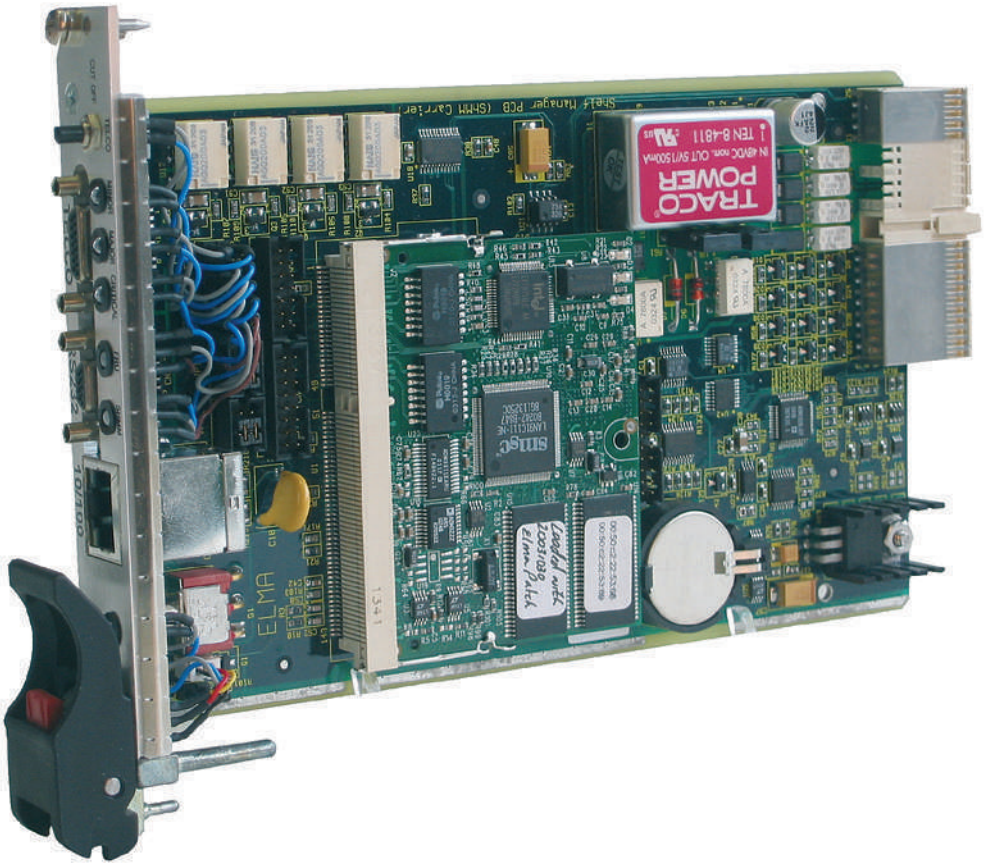
The PCB can be fastened to the front or rear of the side extrusions

Fixing of Front Panel Screws



- Fixing screw only
- Screw with threaded bush
- Screw with retainer
- Screw with press-fit bush (M2.5 only)

If threaded bushes are used, the fixing holes must be drilled out and tapped, M5 x 0.5.
Elma will perform this task on request.
No reworking is necessary when press-fit bushes are used.



Source: Elma Group



MicroTCA 5U shelf

- Application: Telecommunications and enterprise computer network equipment
- Full redundancy provided by two MCHs (MicroTCA Carrier Hubs), two cooling units and two power modules for –48 V/–60 V
- 12 AMC Single modules, Compact-size and Full-size
- All pluggable components are hot-swappable and controlled via IPMI

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Your Solution Partner

5: Ventilation







5.1 Fan Module 84 HP **C | 5_2**

5.1.1 Fan Module Vertical 84 HP C | 5_2

5.1.2 Fan Module Horizontal 84 HP C | 5_3

5.1.3 Line Drawing and Technical Information C | 5_3

5.2 Accessories for Ventilation **C | 5_4**

5.2.1 Fan C | 5_4

5.2.4 Fan Speed Control C | 5_6

5.3 General Accessories for Ventilation **C | 5_7**

5.3.1 Fan Mounting Panels C | 5_7

5.3.2 Fan Front Panels C | 5_9

5.3.3 Air Baffle Cover C | 5_11



5.1 Fan Module 84 HP

- The fan module is designed for vertical ventilation of a sub rack or desktop case.
- Modules for depths of 160 mm and 220 mm have 3 fans.
- These are arranged in an optimum configuration to ensure cooling of the printed PCBs over the entire width of the rack.
- Fan modules with 84 HP front panels (with on/off switch) are for mounting in withdrawable units and desktop cases acc. to DIN 41494, part 5, being run in and out on card guides.
- An AMP socket is used fot the mains connection

5.1.1 Fan Module Vertical 84 HP

- 230V/50Hz (115 V on request)
- **Scope of delivery:**
  - 1 fan module 84 HP
- Front panel screws see below



5.1.1.1 Assembled, Ready for Connection

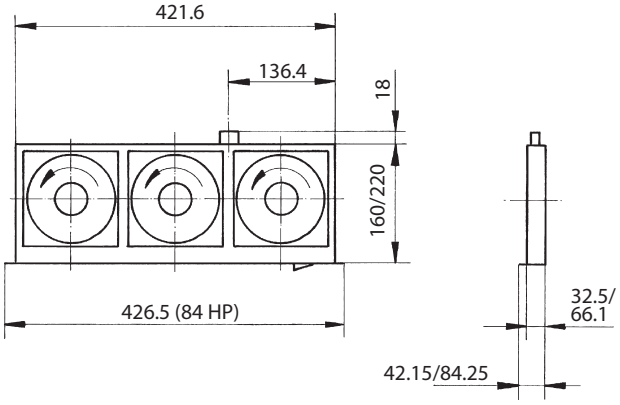
Height	Fan Type	Card Depth		Part-No.
		mm	inch	
1 U	69-430-20	160	6.29	27-110-02

5.1.1.2 Front Panel Screws

- For mounting fan module in housing
- Set of 10 screws
- With screw retainer

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3 , size T8, with plastic screw retainer	63K159
Rounded head screws recessed M2.5 x 11.3, with plastic screw retainer	63-159

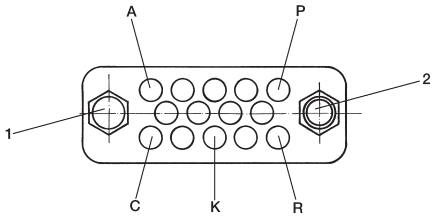
5.1.2 Line Drawing and Technical Information



Power Supply

AMP connector, "M" series, 14 pole (pin)

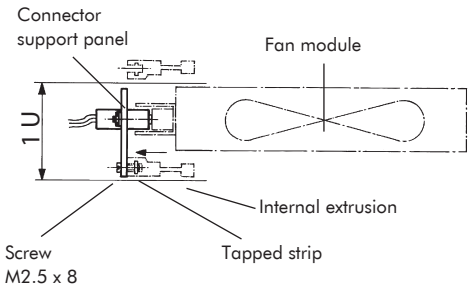
Standard in fan modules 84 HP

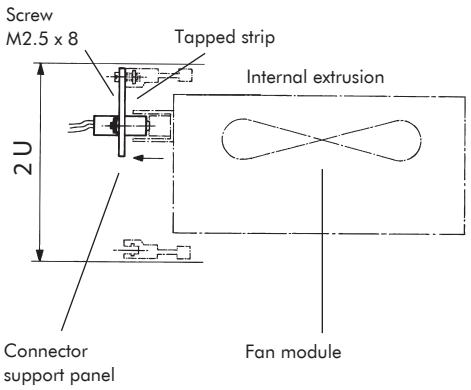


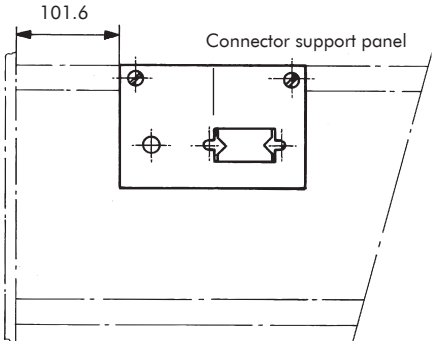
1	coding socket
2	coding pin
A-N	-blue
C-Na	-blue
K-PE	-green / yellow
P-L	-brown
R-La	-brown

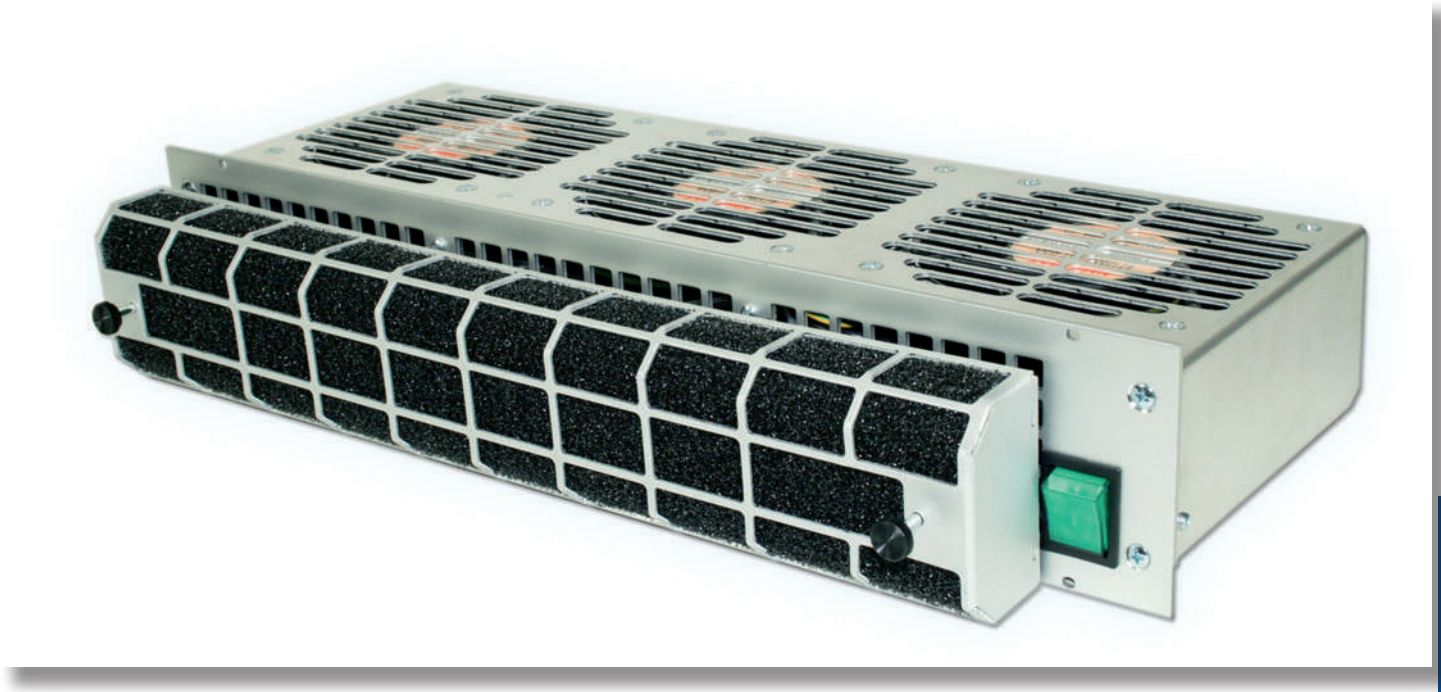
The fan module is inserted in the case or rack on card guides.

The AMP connector on the inserted fan module makes contact with the socket mounted on the rear extrusion.









5.2 Accessories for Ventilation

5.2.1 Fan



5.2.1.1 Fan 12V DC

- Brushless
- Sealed ball bearings
- Polarity and electronic locked rotor protection (autorestart)
- Air exhaust in over struts (can be mounted directly on a perforated front panel)
- Connector 2.8 x 0.5 (except fan with speed sensor)
- Fan case and wheel plastic UL94 V-0
- Operating temperature –20 °C to +70 °C
- CE, UL, CSA, VDE standard
- Life expectancy L10 = 70 000 hours at 40°C
- Special configuration with speed sensor

VDC	Voltage range VDC	Power consumption W**	Current consumption mA**	Rotational speed min^{-1}	Noise dB (A)**	max. stat. pressure mm H_2O	Flow rate m^3/h	Dimensions A		B		C		Part-No.
								mm	inch	mm	inch	mm	inch	
12	6.0-13.8	6.80	570	2400	39	5.0	153	119.0	4.68	105.0	4.13	25.0	0.98	69-430-26
12	6.0-13.8	3.80	315	3200	41	4.8	93	92.0	3.62	82.5	3.24	25.0	0.98	69-430-32*

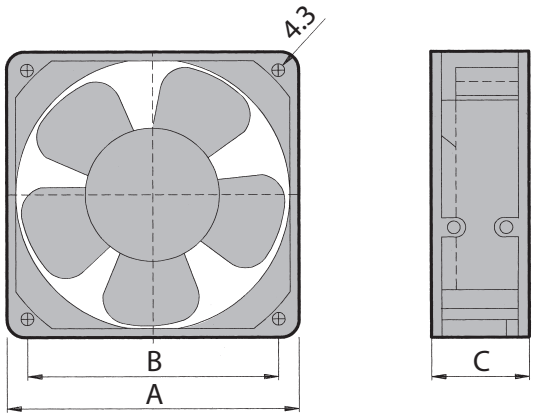
* with speed sensor
** with free exhaust

5.2.1.2 Fan 230V/115V AC

- Split-pole motor
- Sealed ball bearings
- Impedance protection resp. integrated thermal switch
- Connector 2.8 x 0.5
- Air exhaust in over struts (can be mounted directly on a perforated front panel)
- Fan case: aluminium
- Fan wheel: plastic UL94 V-0
- Operating temperature –40°C to +70°C
- CE, UL, CSA, VDE standard
- Life expectancy L10 = 50 000 hours at 40°C

VAC	Freq. Hz	Power consumption W**	Current consumption mA**	Rotational speed min^{-1}	Noise dB (A)**	max. stat. pressure mm H_20	Flow rate m^3/h	Dimensions A		B		C		Part-No.
								mm	inch	mm	inch	mm	inch	
230	50/60	14.0/11.0	100/90	2300/2700	34/38	4.25/4.25	108/120	119.0	4.68	105.0	4.13	25.0	0.98	69-430-20
230	50/60	15.0/14.0	120/100	2600/2900	37/41	9.0/7.3	162/192	119.0	4.68	105.0	4.13	38.0	1.51	1925-79

** with free exhaust



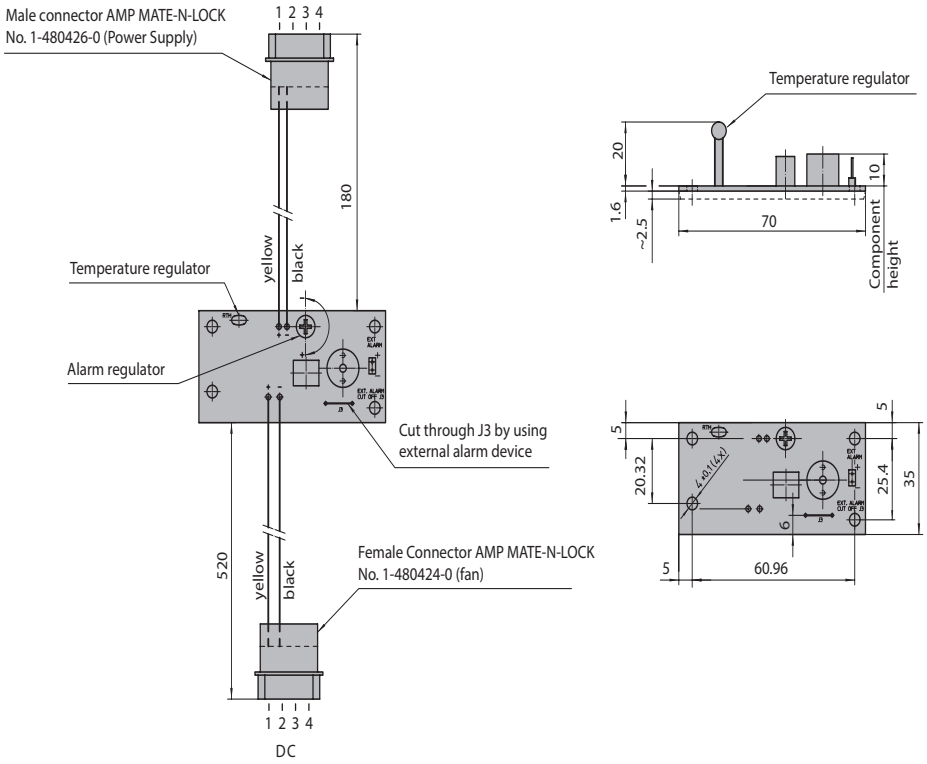
5.2.4 Fan Speed Control

- Temperature regulator with acoustic alarm signal
- Simple conversion to external optical signal
- Range of regulation
  - Fan regulating range: min. speed up to 34 °C
max. speed at 48°C
  - Alarm regulating range: adjustable between 45°C and 54°C
- Voltage 12 V/DC, voltage range 10-14 VDC
- Temperature regulator current consumption 50 mA
- Max. current consumption 0,6 A
- Operating temperature 0°C to 65°C
- Storage temperature –20°C to +80°C



5.6.3 Fan Speed Control

Description	Part-No.
Fan speed control (incl. wiring)	7731-02





5.3 General Accessories for Ventilation

5.3.1 Fan Mounting Panels

- The fan-mounting panel are designed for easy fitting of axial-flow fans for vertical and cross-flow ventilation of 160 mm deep cards in cases and modules.
- The panels are fixed to the horizontal extrusion using 6/4 screws (M3x10)
- Aluminium 1.5 mm, raw
- **Scope of delivery:**
  - 1 fan mounting panel
- Assembly material see below

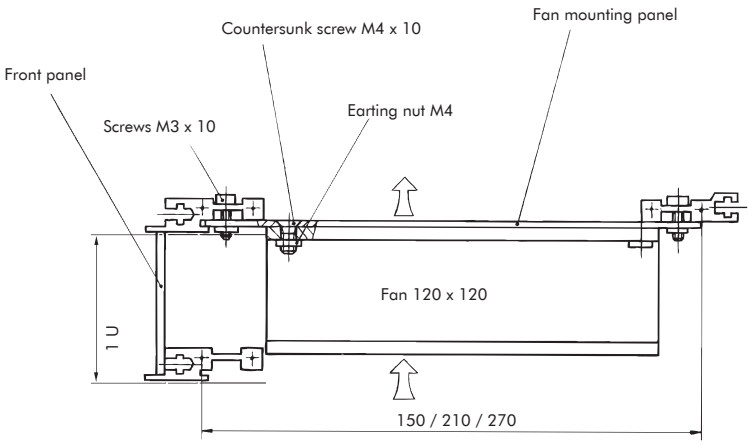


5.3.1.1 Fan Mounting Panels for Vertical Ventilation

Case Width	No. of Fans	Fan Size		Mounting Panel Size		Part-No.
		mm	inch	mm	inch	
42 - 84 HP	1	120x120	4.8x4.8	149x150	5.86x5.90	27-048
84 HP (card depth 160 mm)	3	120x120	4.8x4.8	148x430.8	5.82x16.96	27-043

Assembly Material

Description	Part-No.
Cross recessed milled edge screw M3 x 10	5330-10
Cross recessed countersunk screw M4 x 10	5342-10
Earthing nut M4	61-095



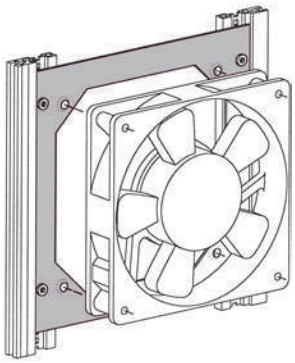


5.3.1.2 Fan Mounting Panels for Cross-flow Ventilation (Horizonal Mounting Kits)

Mounting Height	No. of Fans	Fan Size		Mounting Panel Size		Part-No.
		mm	inch	mm	inch	
3 U	1	90x90	3.6x3.6	105.5 x 149	4.15 x 5.86	27-049
4 U	1	120x120	4.8x4.8	150 x 149	5.90 x 5.86	27-048

Assembly Material

Description	Part-No.
Cross recessed milled edge screw M3 x 10	5330-10
Cross recessed countersunk screw M4 x 10	5342-10
Earthing nut M4	61-095

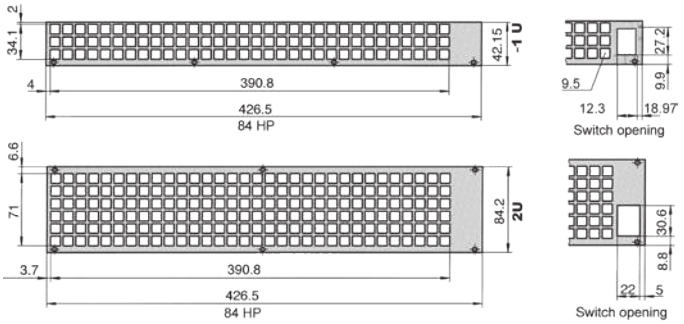




5.3.2 Fan Front Panels

5.3.2.1 Fan Front Panel 84 HP for Vertical Ventilation

- Fan front panels are flat, perforated and designed to ensure an optimum air flow rate
- Available with or without switch cut-out (switch opening 1 U = 12.3 x 27.2 mm / 2 U = 22 x 30.6 mm)
- Aluminium 2.5 mm, clear anodised (non-conductive)
- **Scope of delivery:**
  - 1 perforated fan front panel
- Front panel screws see below
- On-off switch see below





5.3.2.1 Fan Front Panel 84 HP for Vertical Ventilation

Description	Height	Air passage		Part-No.
		mm²	sq. inch	
Without switch opening	~ 1 U	8664	13.42	21N084-01
With switch opening	~ 1 U	8664	13.42	21N084-02
Without switch opening	2 U	17328	26.85	21N284-01
With switch opening	2 U	17328	26.85	21N284-02

Front Panel Screws

- Set of 10 screws
- With screw retainer
- Fan front panel ~1 U = 4 screws; 2 U= 6 screws

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3 , size T8, with plastic screw retainer	63K159
Rounded head screws recessed M2.5 x 11.3, with plastic screw retainer	63-159



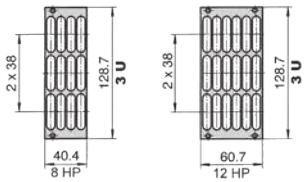
On-Off Switch

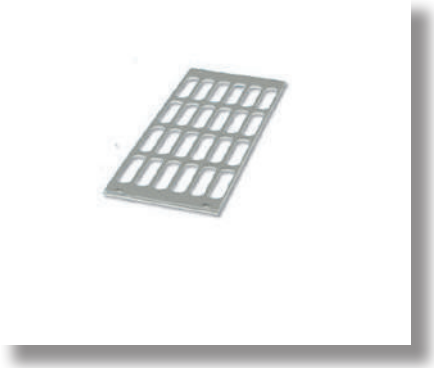
- Black body, plastic
- 2 pole
- 250V, 16A
- Quick-connect terminal 6.3 x 0.8 mm
- Cut-out for 4426-00: 22 x 30.6 mm (0.87" x 1.20")
  Cut-out others: 12.3 x 27.2 mm (0.48 x 1.07")

Description	Part-No.
On-off switch, indicator light green	69-410-04
On-off switch, without signal light	69-410-09

5.3.2.2 Fan Front Panel for Horizontal Ventilation

- Aluminium 2.5 mm, clear anodised (non-conductive)
- **Scope of delivery:**
  - 1 perforated fan front panel
- Front panel screws see below





5.3.2.2 Fan Front Panel for Horizontal Ventilation

Height	Width	Air passage		Part-No.
		mm^2	sq. inch	
3 U	8 HP	3195	4.95	21N308-01
	12 HP	4793	7.42	21N312-01

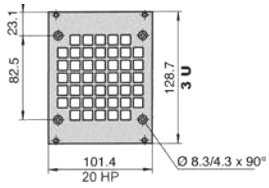
Front Panel Screws

- Set of 10 screws
- With screw retainer
- Fan front panel width up to 8 HP = 2 screws; ≥ 12 HP = 4 screws

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3 , size T8, with plastic screw retainer	63K159
Rounded head screws recessed M2.5 x 11.3, with plastic screw retainer	63-159

5.3.2.3 Fan Front Panels for Direct Fan Mounting

- Aluminium 2.5 mm, clear anodised (non-conductive)
- **Scope of delivery:**
  - 1 perforated fan front panel
- Front panel screws see below
- Assembly material for fan mounting see below





5.3.2.3 Fan Front Panels for Direct Fan Mounting

Description	Height	Width	Air passage		Part-No. 10 pcs.
			mm^2	sq. inch	
Without switch opening	3 U	20 HP	4051	6.27	21N320-04

Front Panel Screws

- Set of 10 screws
- With screw retainer
- Per front panel 4 screws are needed

Description	Part-No. 10 pcs.
Torx screws M2.5 x 11.3 , size T8, with plastic screw retainer	63K159
Rounded head screws recessed M2.5 x 11.3, with plastic screw retainer	63-159

Assembly Material for Fan Mounting

Description	Part-No.
Countersunk screw, recessed M4 x 10	5342-10
Hexagonal nut M4, 0.8D	5620-51
Countersunk self-tapping screw cross.recessed, 13 mm	5441-55

5.3.3 Air Baffle Cover

- When 84 HP fan modules are used, an air baffle cover can be fitted to regulate the cooling air flow and ensure maximum dissipation of the heat generated by the electronic devices.
- The air baffle cover is fixed to the internal extrusions by means of 4 screws.
- The air supplied to the printed PCBs (160 and 220 mm deep) above the baffle plate is regulated by opening or closing the vanes.
- To optimise the cooling air flow, a cover panel can be fitted to the back of the fan assembly. This will prevent internal air circulation.



5.3.3 Air Baffle Cover

- **Scope of delivery:**
  - 1 air baffle cover
- Assembly material see below

Description	Card Depth		Part-No.
	mm	inch	
Air baffle cover	160	6.29	27-290
Air baffle cover	220	8.66	27-291

5.3.3.1 Assembly Material

Description	Part-No.
Torx cylinder head earthing screw M3 x 6, size T10	5443-04
Cross recessed milled edge earthing screw M3 x 6	61-283



MicroTCA 5U shelf

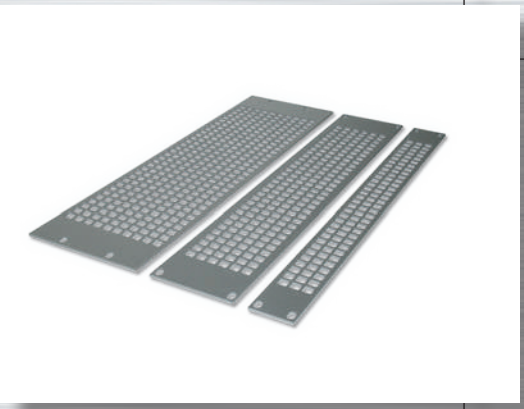
- Application: Telecommunications and enterprise computer network equipment
- Full redundancy provided by two MCHs (MicroTCA Carrier Hubs), two cooling units and two power modules for –48 V/–60 V
- 12 AMC Single modules, Compact-size and Full-size
- All pluggable components are hot-swappable and controlled via IPMI

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19" Accessories



1. 19" Front Panels

Solid and perforated front panels with the overall length of 19" in different surface treatments and heights up to 12 U.



2. Telescopic Rails

Despite their rugged construction, these are amongst the slimmest telescopic rails available on the market. Load capacity up to 90 kg/pair



3. 19" Ventilations

The fan modules are designed for vertical and horizontal ventilation of a 19" rack and cabinets.

4. Keyboards

High-quality compact keyboard trays 1 U in a very rugged metal housing with an ergonomic design.



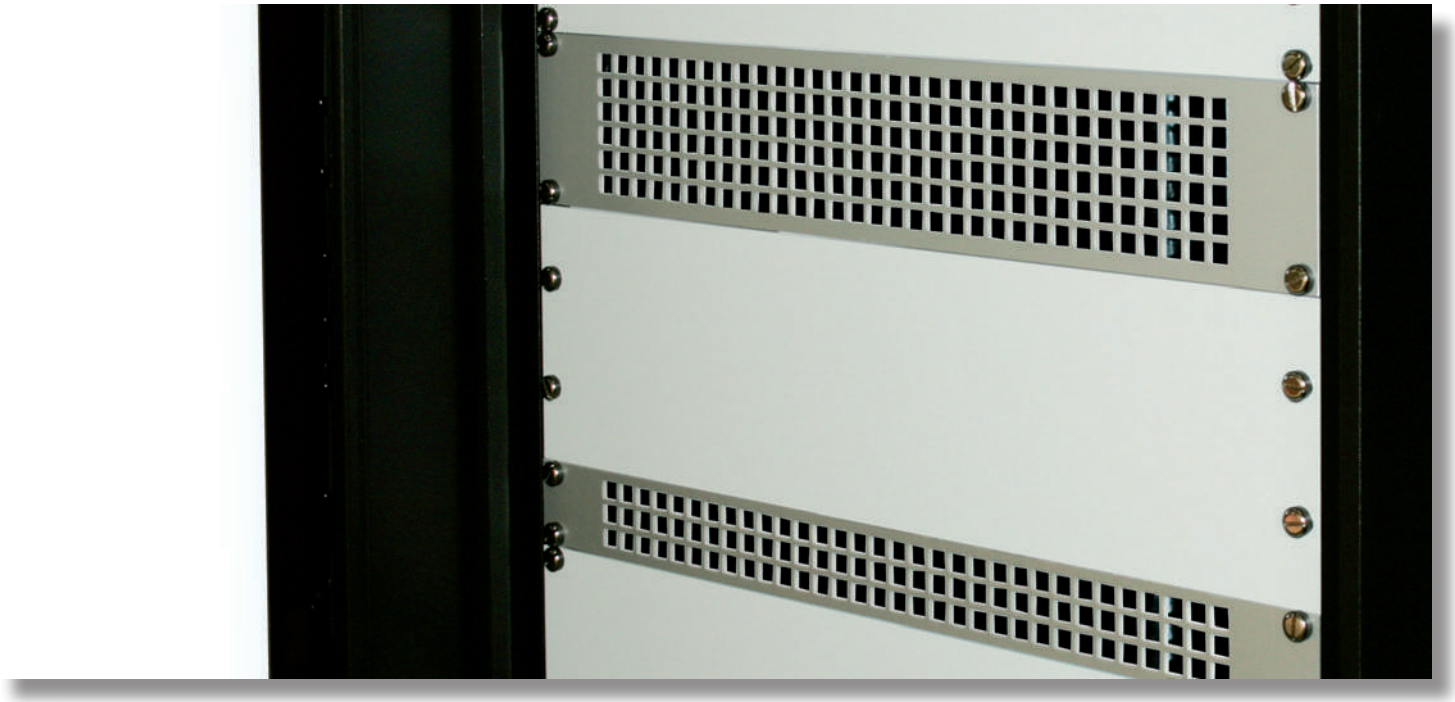








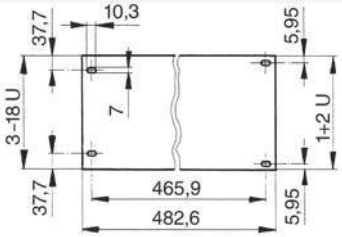
1: 19" Front Panels	**D |4**
1.1 Front Panels 19"	D |4
1.1.1 Front / Rear Panels 19", solid, anodised	D |4
1.1.2 Front / Rear Panels 19", solid, powdercoated	D |4
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4.3.1 Earthing Set	D | 17
4.3.3 Assembly Material	D | 17



1.1 Front Panels 19"

1.1.1 Front/Rear Panels 19", Solid, Anodised



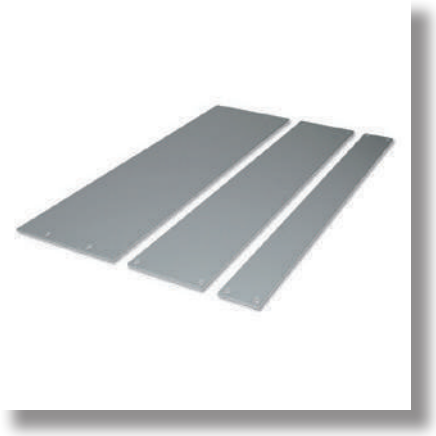


1.1.1 Front/Rear Panels 19", Solid, Anodised

- Aluminium 3 mm
- **Scope of delivery:**
  - 1 front panel
- Assembly material see 1.1.4

Height			**Part-No.**
for	mm	inch	**clear anodised**
1 U	43.6	1.71	20-101
2 U	88.1	3.46	20-102
3 U	132.5	5.21	20-103
4 U	177.0	6.96	20-104
5 U	221.5	8.72	20-105
6 U	266.0	10.47	20-106
7 U	310.5	12.22	20-107
8 U	355.0	13.97	20-108
9 U	399.0	15.70	20-109
10 U	443.5	17.46	20-110
12 U	532.5	20.96	20-112

1.1.2 Front/Rear Panels 19", Solid, Powder Coated



1.1.2 Front/Rear Panels 19", Powder Coated

- Aluminium 3 mm
- Rear conductive
- **Scope of delivery:**
  - 1 front panel
- Assembly material see 1.1.4

Height			**Part-No.**
for	mm	inch	**Light-grey RAL 7035**
1 U	43.6	1.71	20-101-30
2 U	88.1	3.46	20-102-30
3 U	132.5	5.21	20-103-30
4 U	177.0	6.96	20-104-30
6 U	266.0	10.47	20-106-30

Other colours and heights available upon request

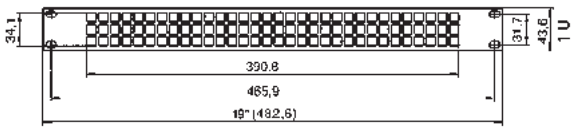
1.1.3 Fan Front Panels 19"

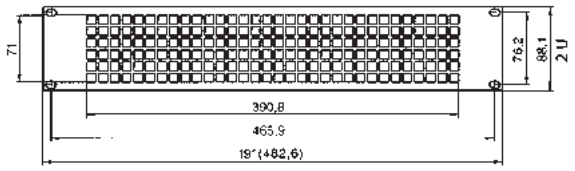
- Aluminium 3 mm
- Clear anodised
- **Scope of delivery:**
  - 1 front panel
- Assembly material see below

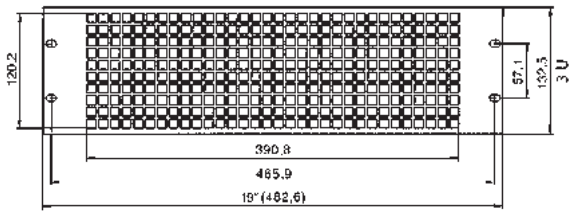


1.1.3 Fan Front Panels 19"

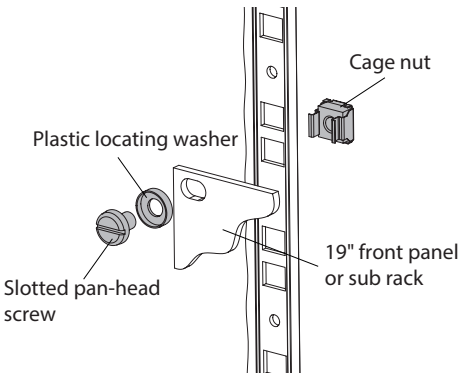
Height for	mm	inch	Air passage mm²	sq. in.	Part-No. clear anodised
1 U	43.6	1.71	8643	13.39	20-101-01
2 U	88.1	3.46	17286	26.79	20-102-01
3 U	132.5	5.21	28811	44.65	20-103-01







1.1.4 Assembly Material



1.1.4 Assembly Material

- For mounting front panels in cabinets

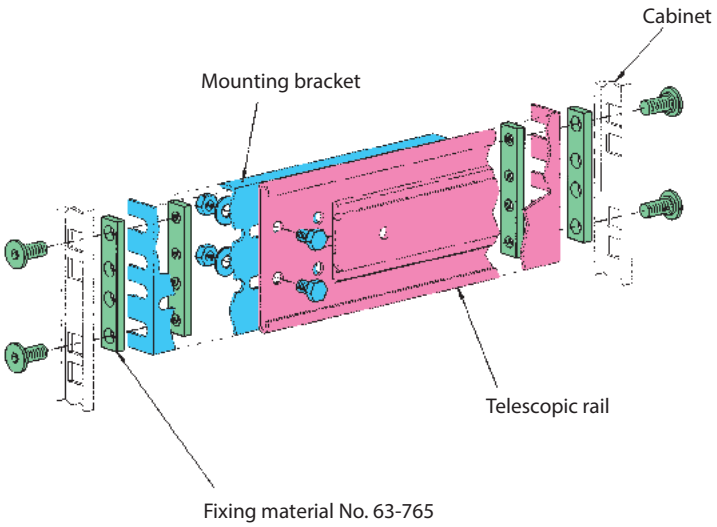
Description	Part-No.
Slotted pan-head screw M6 x 8	5561-08
Slotted pan-head screw M6 x 12	5561-12
Plastic locating washer	61-007
Cage nut M6	5625-06



2.1 Telescopic Rails 60 kg

Despite their rugged construction, these are among the slimmest telescopic rails avaiable on the market.
All types can be locked in the extended position and are fitted with a quick release latch. The load carrying capacity of one pair is 60 kg.

- Extremely slim, overall width only 6 mm
- New type of corrosion-protected surface with high sliding properties
- No additional lubrication necessary
- Little frictional resistance with heavy loads
- Selfunlocking plug-in function
- Load capacity up to 60 kg/132 lb (US) / pair
- Ease of assembly
- No milling of front vertical extrusion necessary



2.1.1 Telescopic Rails 60 kg, Set

- Telescopic rails, suitable for all heights
- **Scope of delivery:**
  - 2 telescopic rails
  - Mounting brackets
  - Assembly materal for mounting into cabinet and on module



2.1.1 Telescopic Rails, Set (Load Capacity up to 60 kg/Pair)

Max. withdraw	Usable depth min.	Usable depth max.	Part-No.
511.2 mm	463 mm	681.8 mm	65-051
596.4 mm	564.6 mm	783.4 mm	65-052
719.6 mm	666.2 mm	885.0 mm	65-053

Rugged telescopic rail 90 kg available on request.

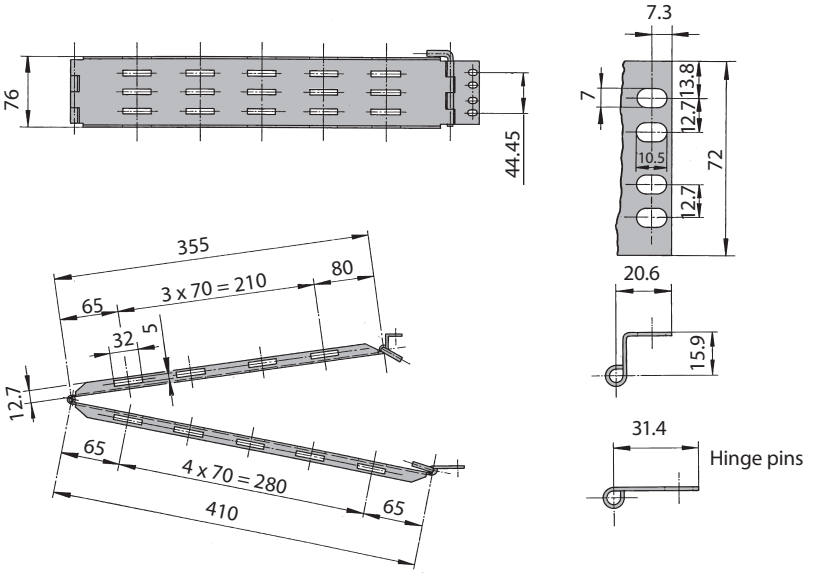
2.2 Cable Carrier

- The cable carrier can be easily installed and detached by removing the hinge bolt
- The cable carrier is mounted on the rear vertical section
- **Scope of delivery:**
  - 1 cable carrier



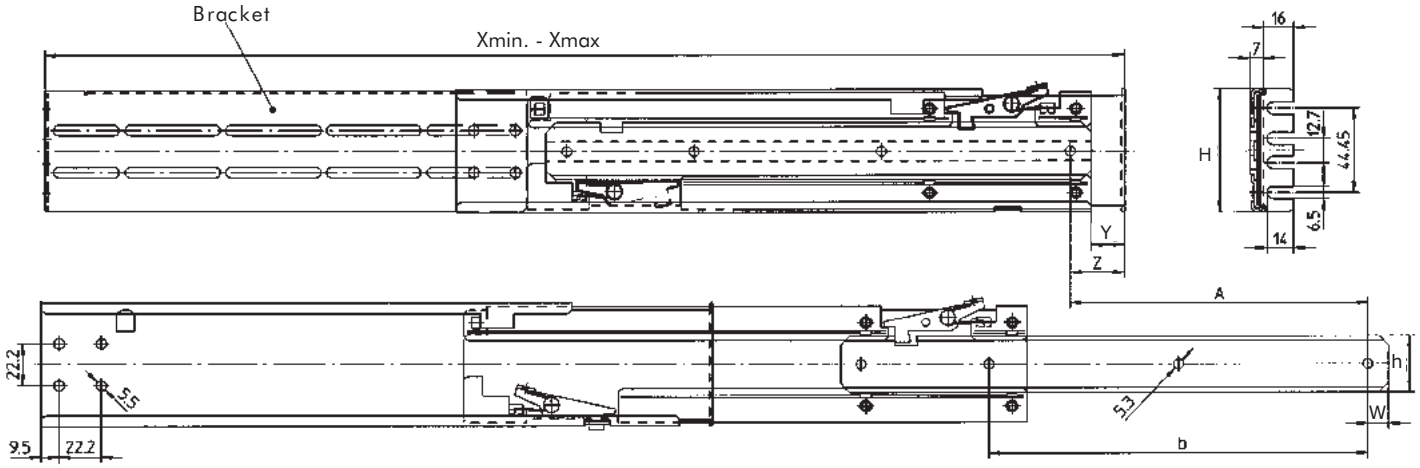
3.3 Cable Carrier

Description	Part-No.
Cable carrier	65-028-00



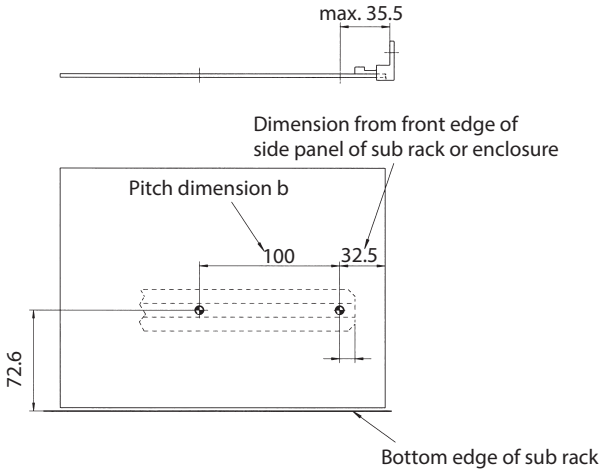
2.3 Line Drawings

- Showing a 60 kg rail



Dimensions

Size	Type	b	h	H	A	Z	Y	W	X min.	X max.
Size 3	65-051	3 x 100	30	65	511.2	32.2	17.5	11	463	681.8
Size 5	65-052	4 x 100	30	65	596.4	31.8	17.5	11	564.6	783.4
Size 7	65-053	5 x 100	30	65	719.6	28.4	11	11	666.2	885





D

3.1 Fan Modules 19"

- The fan modules are designed for vertical ventilation of 19" cabinets.
- Modules for depths of 160 mm and 220 mm have 3 fans
- These are arranged in an optimum configuration to ensure cooling of the PCBs over the entire width of the rack
- Fan modules with 19" front panels are designed for use in 19" racks and cabinets
- They can be run in and out on supporting rails
- The modules have a 3-pole appliance inlet for connection to the mains

3.1.1 Fan Modules Vertical 19"

- 230V/50Hz (115 V on request)
- **Scope of delivery:**
  - 1 fan module 19"
- Assembly material for mounting fan module in cabinet see below



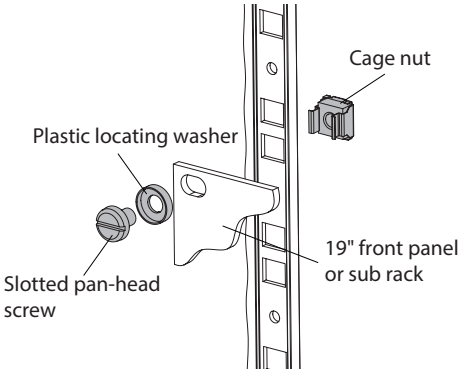
3.1.1.1 Assembled, Ready for Connection

Height	Fan Type (Details see 4.2.5.2)	Card Depth		Part-No.
		mm	inch	
1 U	69-430-20	160	6.29	27-100-02
		220	8.66	27-101-02

3.1.1.2 Assembly Material

- For mounting fan modules in cabinets

Description	Part-No.
Slotted pan-head screw M6 x 8	5561-08
Slotted pan-head screw M6 x 12	5561-12
Plastic locating washer	61-007
Cage nut M6	5625-06



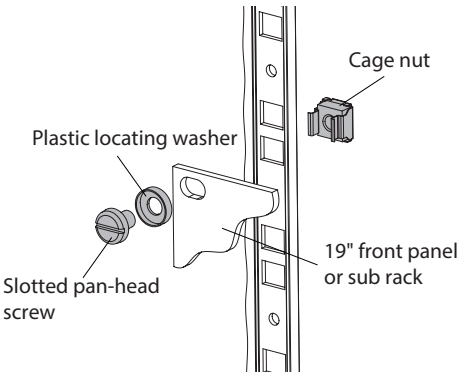
3.1.2 Fan Modules Horizontal 19"

- 230 V/50 Hz (115 V on request)
- **Scope of delivery:**
  - 1 fan module
- Assembly material for mounting fan module in cabinet see below



3.1.2.1 Assembled Ready for Connection

Height	Fan Type (Details see 4.2.5.2)	Card Depth		Part-No.
		mm	inch	
2 U	1925-79	160	6.29	27-250-02
		220	8.66	27-251-02

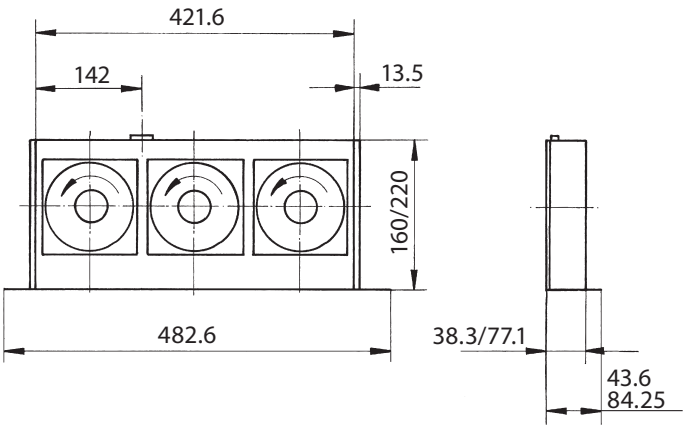


3.1.2.2 Assembly Material

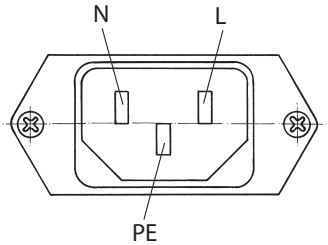
- For mounting fan modules in cabinets

Description	Part-No.
Slotted pan-head screw M6 x 8	5561-08
Slotted pan-head screw M6 x 12	5561-12
Plastic locating washer	61-007
Cage nut M6	5625-06

3.1.3 Line Drawing and Technical Information



Power Supply
AMP connector, "M" series, 14 pole (pin)
Standard in fan modules 84 HP



N -blue
L -brown
PE -green / yellow

1 AMP connector series M can be assembled additionally



3.2 Accessories for Ventilation

3.2.1 Handles for Fan Modules 19"

- **Scope of delivery:**
  - 1 handle
- Per Handle 2 screws are needed, see below



3.2.1 Handles for Fan Modules 19"

- **Scope of delivery:**
  - 1 handle

For Height	Description	Part-No.
1 U	U-handle diecast zinc	60-541
2 U	U-handle aluminium	60-527

Assembly Material

Description	Part-No.
Cross recessed cylinderhead earthing screw M4 x 10	61-260
Torx roundhead earthing screw M4 x 10, size T20	5443-01
Cross recessed countersunk screw M4 x 10	5342-10
Torx countersunk screw M4 x 10, size T20	5470-26

3.2.2 Front Filter Set

- The front filter is fastened to the front panel of the fan body or the fan frontpanel 2 U / 84 HP using two captive screws
- The filter mat can be re-used after washing in water with a temperature of up to approx. 40°C
- Replacement filter mats can be ordered as spare parts



3.2.2 Front Filter Set

- **Scope of delivery:**
  - 1 filter cradle, aluminium, clear anodised
  - 1 filter mat, polyester
  - 1 filter mat support, steel galvanised
  - 1 set of assembly material

Description	Part-No.
Front filter set for 19" fan module	27-281

3.2.3 Fans



3.2.3.1 Fans 12V DC

- Brushless
- Sealed ball bearings
- Polarity and electronic locked rotor protection (autorestart)
- Air exhaust in over struts
  (can be mounted directly on a perforated front panel)
- Connector 2.8 x 0.5 (except fan with speed sensor)
- Fan case and wheel plastic UL94 V-0
- Operating temperature –20 °C to +70 °C
- CE, UL, CSA, VDE standard
- Life expectancy L_{10} = 70 000 hours at 40 °C
- Special configuration with speed sensor

VDC	Voltage range VDC	Power consumption W**	Current consumption mA**	Rotational speed min^{-1}	Noise dB (A)**	max. stat. pressure mm H_2O	Flow rate m^3/h	Dimensions A mm	A inch	B mm	B inch	C mm	C inch	Part-No.
12	6.0-13.8	6.80	570	2400	39	5.0	153	119.0	4.68	105.0	4.13	25.0	0.98	69-430-26
12	6.0-13.8	3.80	315	3200	41	4.8	93	92.0	3.62	82.5	3.24	25.0	0.98	69-430-32*

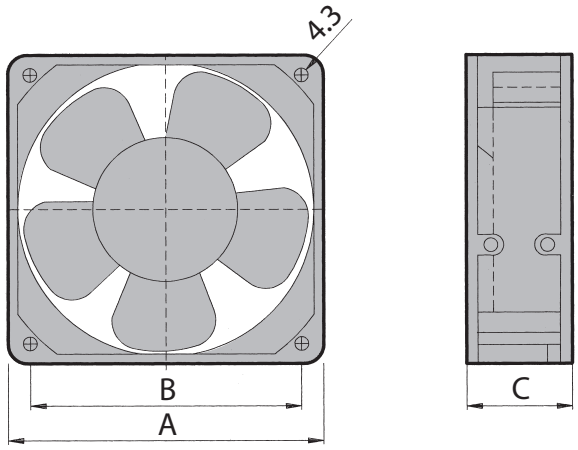
* with speed sensor
** with free exhaust

3.2.3.2 Fans 230V/115V AC

- Split-pole motor
- Sealed ball bearings
- Impedance protection resp. integrated thermal switch
- Connector 2.8 x 0.5
- Air exhaust in over struts (can be mounted directly on a perforated front panel)
- Fan case: aluminium
- Fan wheel: plastic UL94 V-0
- Operating temperature –40 °C to +70 °C
- CE, UL, CSA, VDE standard
- Life expectancy L_{10} = 50 000 hours at 40 °C

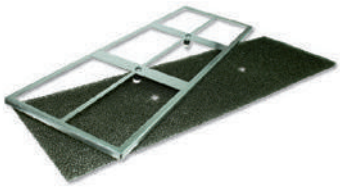
VAC	Freq. Hz	Power consumption W**	Current consumption mA**	Rotational speed min^{-1}	Noise dB (A)**	max. stat. pressure mm H_2O	Flow rate m^3/h	Dimensions A mm	A inch	B mm	B inch	C mm	C inch	Part-No.
230	50/60	14.0/11.0	100/90	2300/2700	34/38	4.25/4.25	108/120	119.0	4.68	105.0	4.13	25.0	0.98	69-430-20
230	50/60	15.0/14.0	120/100	2600/2900	37/41	9.0/7.3	162/192	119.0	4.68	105.0	4.13	38.0	1.51	1925-79

** with free exhaust



3.2.4 Filter Set on Pressure Side of Fan Body

- The filter set is fastened to the pressure side of the fan body by means of two quick-release fasteners
- The filter mat can be regenerated by washing in water at approx. 40°C
- The filter set can only be used wiht 2 U / 19" fan modules
- Replacement filter mat can be ordered as spare part (packet with 10 filter mats)



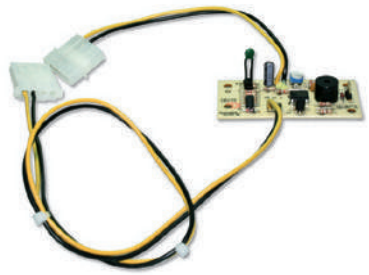
3.2.4 Filter Set on Pressure Side of Fan Body

- **Scope of delivery:**
  - 1 filter catch, steel
  - 1 filter mat, polyester
  - 2 fastening elements

Description	Part-No.
Filter for fan module 19" / 2 U	27-280

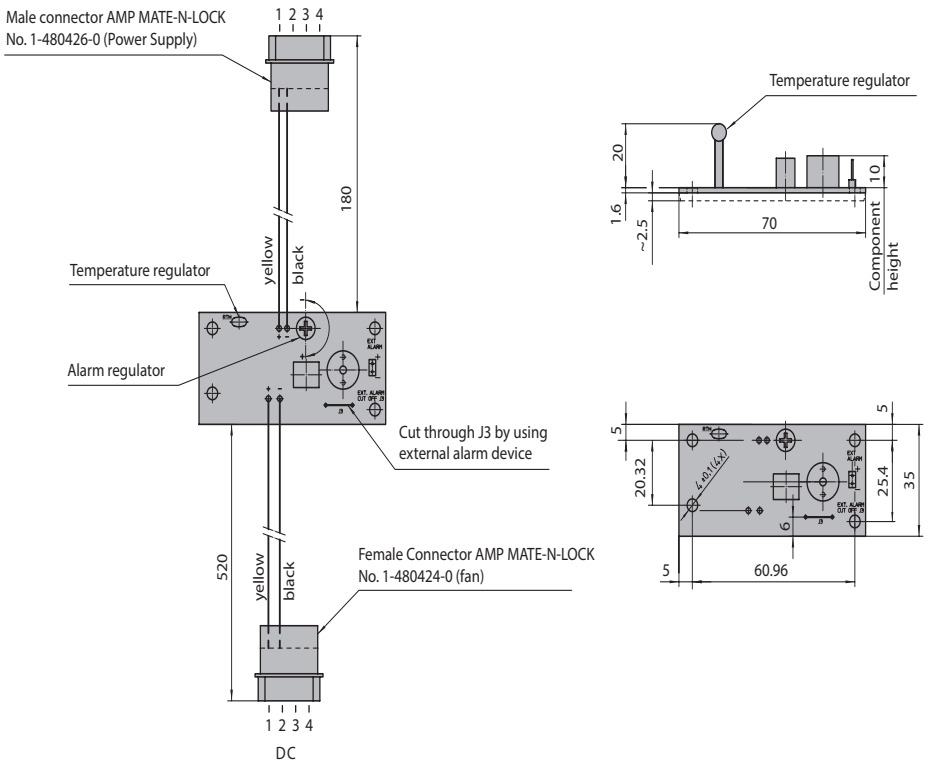
3.2.5 Fan Speed Control

- Temperature regulator with acoustic alarm signal
- Simple conversion to external optical signal
- Range of regulation
  - fan regulating range: min. speed up to 34 °C
max. speed at 48 °C
  - Alarm regulating range: adjustable between 45 °C and 54 °C
- Voltage 12 V/DC, voltage range 10-14 VDC
- Temperature regulator current consumption 50 mA
- Max. current consumption 0,6 A
- Operating temperature 0 °C to 65 °C
- Storage temperature –20 °C to +80 °C



3.2.5 Fan Speed Control

Description	Part-No.
Fan speed control (incl. wiring)	7731-02





4.1 Keyboard Trays 1 U Overview

- High-quality compact keyboard for all applications
- Very rugged metal housing
- Single mechanical keys with gold contacts
- Designed for continuous use – more than 50 Mio. key presses
- Simple rack mount
- Additional versions with touchpad
- Country specific keyboard
- Ergonomic design
- Usable with standard drivers of the operating systems

4.1.1 Technical Data

Enclosure:

Dimensions (WxHxD):	19" x 1U x 300 mm	
Material :	Galvanised sheet metal enclosure	
Weight:	approx. 5 kg	
Colours:	Front panel:	• clear anodised • light grey (RAL 7035) • black (RAL 9005)
	Keyboard housing:	• light grey (RAL 7035) • black (RAL 9005)

Power supply:

Voltage supply:	• + 5 VDC (PS/2, USB) • ± 15 VDC (RS232)	
Current input:	typ. 35 mA (USB: max. 100mA)	

General

Storage temperature:	-20 °C until 60 °C	
Operating temperature:	0°C until 50 °C	
Humidity:	max. 95 % HR (not condensing)	
Touchpad:	Resolution:	1000 dpi
	Lifetime (Overlay):	> 10 Mio. strokes
Cable length:	max. 3.0 m (Touchpad 1.4m)	

4.2 Keyboard Tray 19“, 1U

- **Scope of delivery:**
  - 1 ready for connection keyboard tray
  - 1 adaptor PS/2 → DIN (AT) (Touchpad-Version only)
  - 1 adaptor PS/2 → RS232 (Touchpad-Version only)

4.2.2 Keyboard Trays 19", 1 U with Touchpad (RS232, PS/2)



4.2.2 Keyboard Trays 19", 1 U with Touchpad (RS232, PS/2)

Country Version	Front Panel Colour	Keyboard Housing Colour	Part-No.
Germany (DE)	Clear Anodised	Light Grey RAL 7035	70-190-05E3
	Light Grey RAL 7035	Light Grey RAL 7035	70-190-0533
Switzerland (CH)	Light Grey RAL 7035	Light Grey RAL 7035	70-190-0633
US-English (US)	Clear Anodised	Light Grey RAL 7035	70-190-10E3
	Light Grey RAL 7035	Light Grey RAL 7035	70-190-1033

4.2.3 Keyboard Trays 19", 1 U with Touchpad (USB)

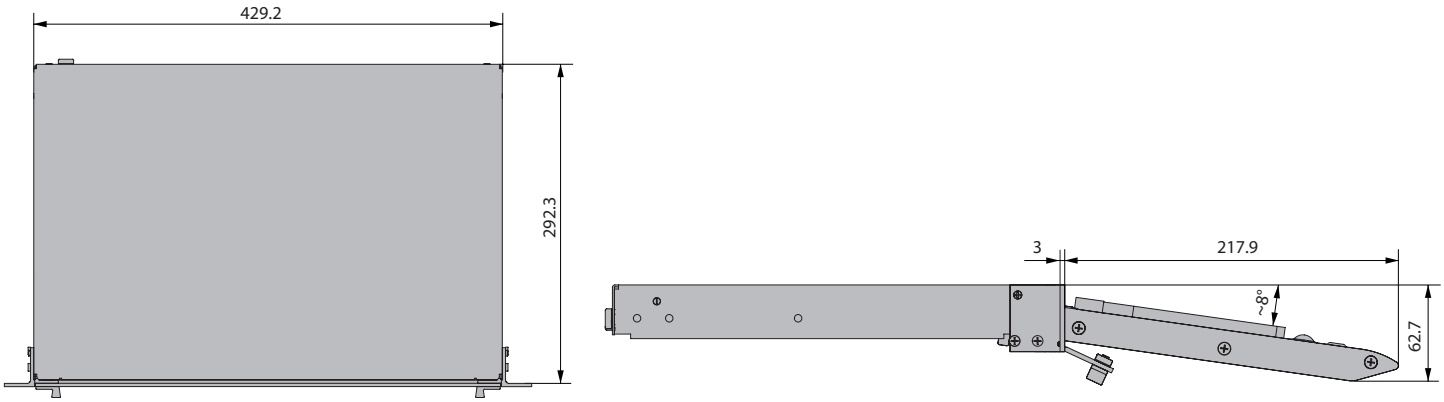


4.2.3 Keyboard Trays 19", 1 U with Touchpad (USB)

Country Version	Front Panel Colour	Keyboard Housing Colour	Part-No.
Germany (DE)	Clear Anodised	Light Grey RAL 7035	70-191-05E3
	Light Grey RAL 7035	Light Grey RAL 7035	70-191-0533
Switzerland (CH)	Clear Anodised	Light Grey RAL 7035	70-191-06E3
	Light Grey RAL 7035	Light Grey RAL 7035	70-191-0633
US-English (US)	Clear Anodised	Light Grey RAL 7035	70-191-10E3
	Light Grey RAL 7035	Light Grey RAL 7035	70-191-1033

Other country versions or colours available on request

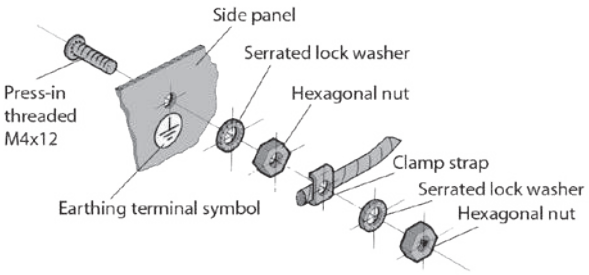
Line Drawing



4.3 Accessories

4.3.1 Earthing Set

- Enables cases to be earthed in conformance with EN / VDE / SEV
- **Scope of delivery:**
  - 1 press-in threaded bolt M4
  - 2 serrated lock washers
  - 2 hexagonal nuts M4
  - 1 terminal clamp
  - 1 earthing symbol



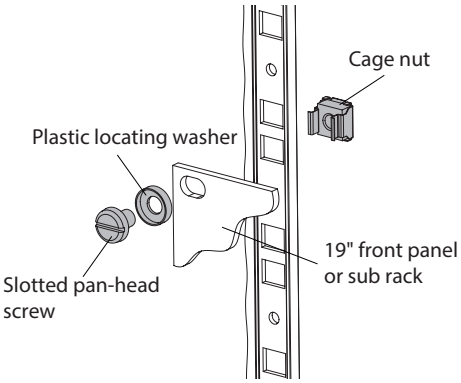


4.3.1 Earthing Set

Description	Part-No.
Earthing set according to EN VDE / SEV	63-174

4.3.2 Assembly Material

- To insert in the square holes in the 19" mounts



4.3.2 Assembly Material

Description	Part-No.
Slotted pan-head screw M6x8	5561-08
Slotted pan-head screw M6x12	5561-12
Plastic locating washer (M6)	61-007
Caged nut M6	5625-06

General Accessories



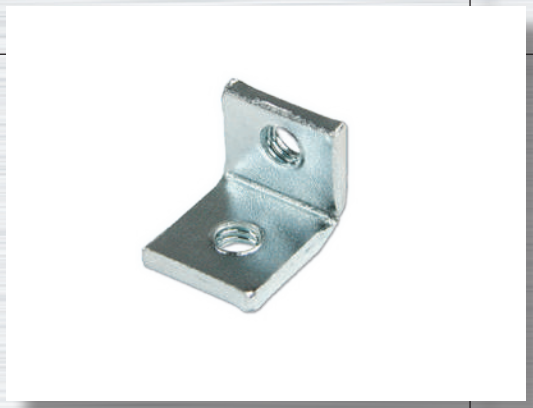
1. Card Guides

- acc. to IEC Standard
- acc. to IEC Rugged Screw mount
- acc. to IEEE Standard
- acc. to IEEE Rugged Screw mount
- acc. to uTCA



2. Assembly Material

- Screws
- Nuts
- Washers
- Tapped Strips



3. PCB Accessories

- Card Locks and Card Handles
- Card Holders
- Middle Parts and Protective Covers
- Spacers and Mounting Plates
- Covering Caps and Mounting Brackets

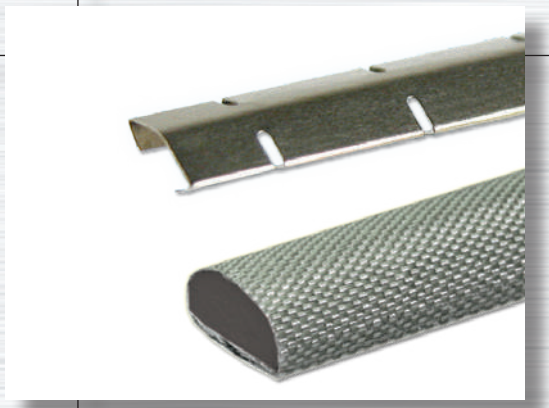


4. Handles / Feet

- From Universal Carrying Handles to Small Component Handles
- From Easy Self-adhesive Bumpon to Tilting Case Feet

5. EMC / HF Gaskets

- Stainless steel
- BeCu galvanised
- Polyurethane foam core with conductive fabric
- Neopren core with aluminium shield



6. Extrusions

- Front Extrusions
- Internal, Center and Edge Connector Extrusions
- Height and Height Divider Extrusions
- Depth Extrusions
- Different Extrusions



1: Card Guides







1.1 Card Guides Standard acc. to IEC **E | 1_3**

1.1.1 Card Guides 1-Slot E | 1_3

1.1.2 Card Guides 7-Slot in 4 HP Steps E | 1_4

1.1.3 Card Guides 1-Slot, 3 Parts E | 1_4

1.1.4 Card Guide Board-Retention Bar E | 1_4

1.2 Rugged Screw mount Card Guides acc. to IEC **E | 1_5**

1.2.1 Standard Mounting E | 1_6

1.2.2 Optional Mounting E | 1_6

1.2.3 ESD Clips E | 1_6

1.3 Card Guides Standard acc. to IEEE **E | 1_7**

1.3.1 Card Guides 1-Slot E | 1_7

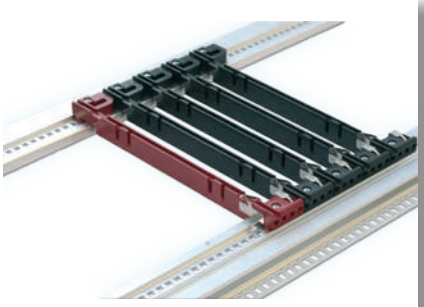
1.3.2 Card Guides 1-Slot, incl. mounted ESD-Components E | 1_8

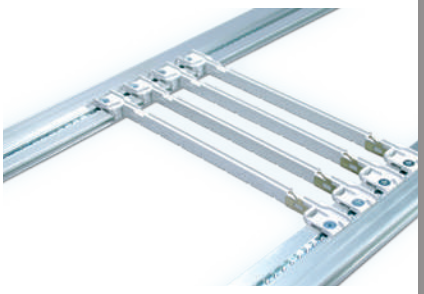
1.3.3. Aluminium Card Guides 1-Slot, 3 Parts E | 1_8

1.3.4 ESD Clips E | 1_9

1.3.5 ESD Spring E | 1_9

1.3.6 Coding Pins E | 1_9





1.4 Rugged Screw-mount Card Guides acc. to IEEE **E | 1_10**

1.4.1 Standard Mounting E | 1_10

1.4.2 Optional Mounting E | 1_11

1.4.3 ESD Clips E | 1_11

1.4.4 ESD Spring E | 1_11

1.4.5 Coding Pins E | 1_11

1.5 uTCA Components **E | 1_12**

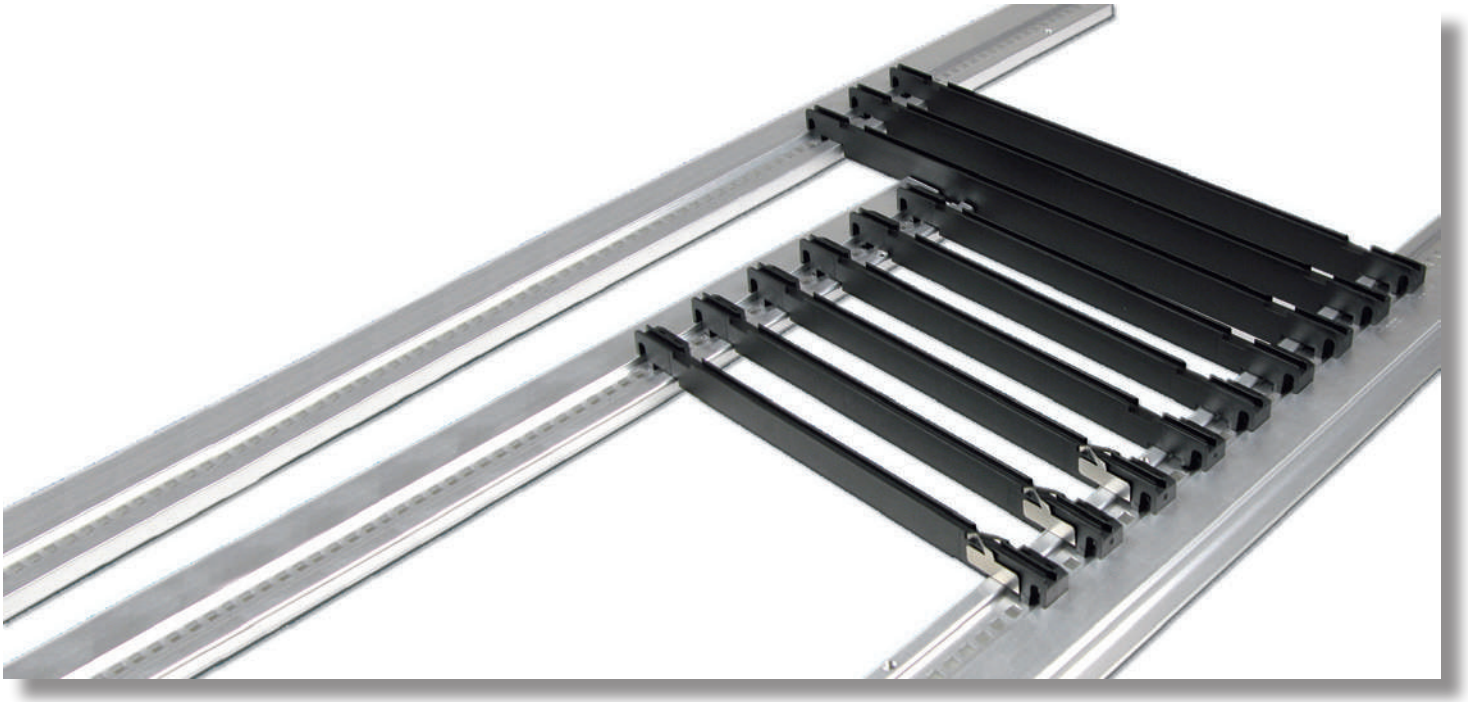
1.5.1 uTCA Extrusion E | 1_12

1.5.2 uTCA Card Guide E | 1_13

1.5.3 uTCA ESD Clip E | 1_13

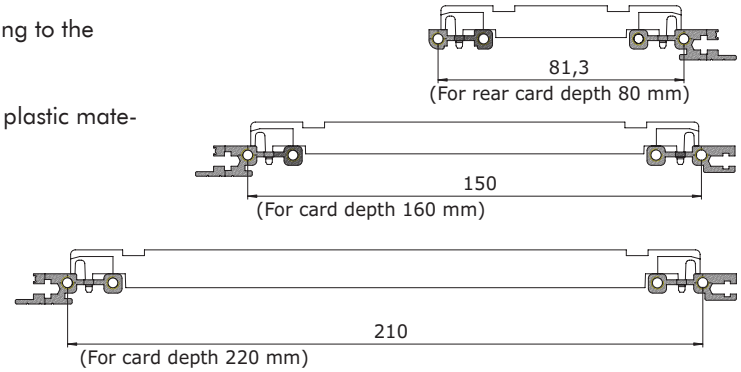
1.5.4 Tapped Strips M3 E | 1_13

1.5.5 Countersunk Screw M3 x 6 mm E | 1_14



1.1 Card Guides Standard acc. to IEC

- For positive location of circuit boards and plug-in units conforming to the dimensions of card depths 80 mm, 160 mm, 220 mm and 280 mm
- The card guides are non-flammable, made from a high quality plastic material reinforced with fibreglass (UL94 V-0)
- Including ESD provisions



1.1.1 Card Guides 1-Slot



1.1.1 Card Guides 1-Slot

- **Scope of delivery:**
  - Card guide black plastic UL94 V-0
- ESD Clip see below (not usable for card depth 80 mm)

Card Thickness		Card Depth		Part-No.
mm	inch	mm	inch	
1.6	0.06	80	3.15	61-019
		160	6.30	61-044
		220	8.66	61-039
		280	11.02	61-017
2.0	0.08	160	6.30	61-087
		220	8.66	61-039
		280	11.02	61-169



ESD Clips

- Connecting PCB with case

Description	Part-No.
ESD clip front bottom/rear top	61-419-01
ESD clip front top/rear bottom	61-419-02

1.1.2 Card Guides 7-Slot in 4 HP Steps



1.1.2 Card Guides 7-Slot in 4 HP Steps

- For reduced assembly time of multiple slot applications
- For use with single, double and triple eurocards with a depth of 160 mm
- For card thickness: 1.6 mm / 0.06"
- Black plastic, UL94 V-0
- ESD Clip not usable

Card Thickness		Card Depth		Part-No.
mm	inch	mm	inch	
1.6	0.06	160	6.30	61-076

1.1.3 Card Guides 1-Slot, 3 Parts



1.1.3 Card Guides 1-Slot, 3 Parts

- Extrusion: Aluminium / Plastic ABS, (UL 94 V-O)
- End feet: plastic, UL94 HB
- For card thickness: 1.6 mm / 0.06"
- Card guide extrusion, single, clear anodised or plastic grey
- ESD clip not usable

Extrusion

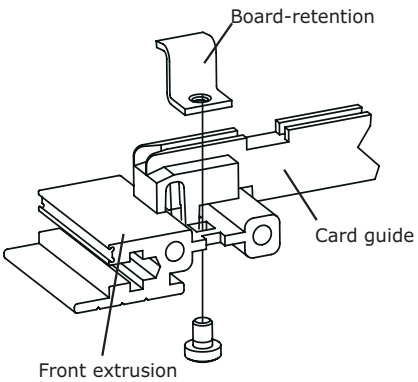
Card Depth		Length		Part-No. Plastic	Part-No. Aluminium
mm	inch	mm	inch		
160	6.30	112.5	4.43	61-051	66-122-20
220	8.66	172.5	6.79	61-052	66-122-21
280	11.02	232.5	9.15	61-053*	66-122-22
340	13.38	292.5	11.51	61-054*	66-122-23
400	15.74	352.5	13.87	61-055*	66-122-24
-	-	1350	53.15	61-059	66-122-14

End Feet

Description	Part-No. 1 Pair
End feet plastic, UL94 HB	61-069

* Card guides must be supported in the middle by an additional extrusion (66-138)

1.1.4 Card Guide Board-Retention Bar

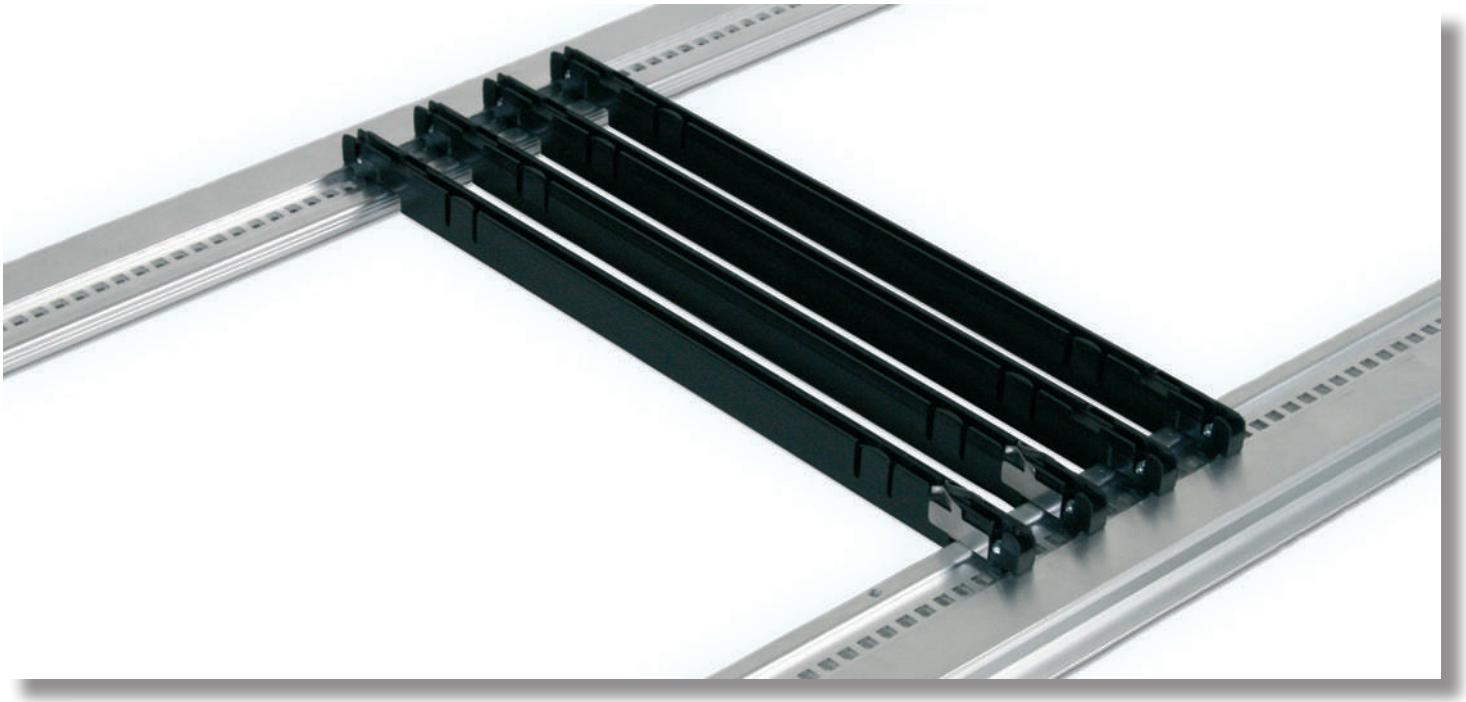


1.1.4 Card Guide Board-Retention Bar

Description	Part-No. 20 pcs.
Board-retention bar, zinc-plated steel	61-291

Assembly Material

Description	Part-No.
Cross recessed round head screw M3 x 4	5331-04
Torx cylinder head screw M3 x 4, size T10	5470-01



1.2 Rugged Screw mount Card Guides acc. to IEC

- Simple assembly comparable to anchoring
- Very high retention force
- Shock and vibration proof
- For positive location of circuit boards and plug-in units
- For card thickness 1.6 mm / 0.06" and 2.0 mm/0.08" with anti-vibration feature
- The card guides are nonflammable, made from a high-quality plastic material reinforced with fibreglass (UL94 V-0)
- With ESD provision
- Stainless steel PT-screw, Torque: 0,36 Nm



1.2 Rugged Screw mount Card Guides acc. to IEC

- **Scope of delivery:**
  - Card guide, plastic UL94 V-0
- Security screw see 1.2.1 (at least one must be used)
- Optional mounting see 1.2.2
- ESD clip see 1.2.3

Card Depth		Colour	Part-No.
mm	inch		
160	6.30	black	61-975
220	8.66	black	61-976

1.2.1 Standard Mounting



1.2.1 Standard Mounting

- With Stainless Steel Security Screw (from Top)

Description	Part-No.
Cross recessed pan head screw, Inox	5588-08

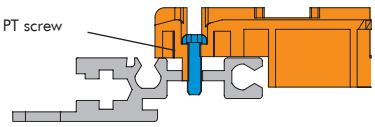
Note: For highest security 2 screws/card guide are necessary.



1. Insert Card Guide



2. Shift Card Guide



3. Protection by Screwing

1.2.2 Optional Mounting



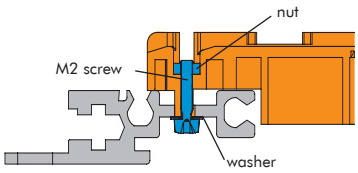
1.2.2 Optional Mounting

- With M2 screw, washer and nut (from Bottom)

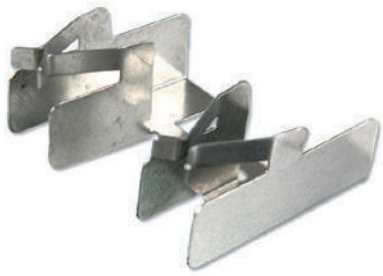
Description	Part-No. 1 set (1 each)	Part-No.
Cross recessed pan head screw M2, Inox	63-485	5304-13
Hexagonal nut M2 Inox		5620-12
Serrated lock washer		5708-12

Note: For highest security 2 sets/card guide are necessary.





1.2.3 ESD Clips

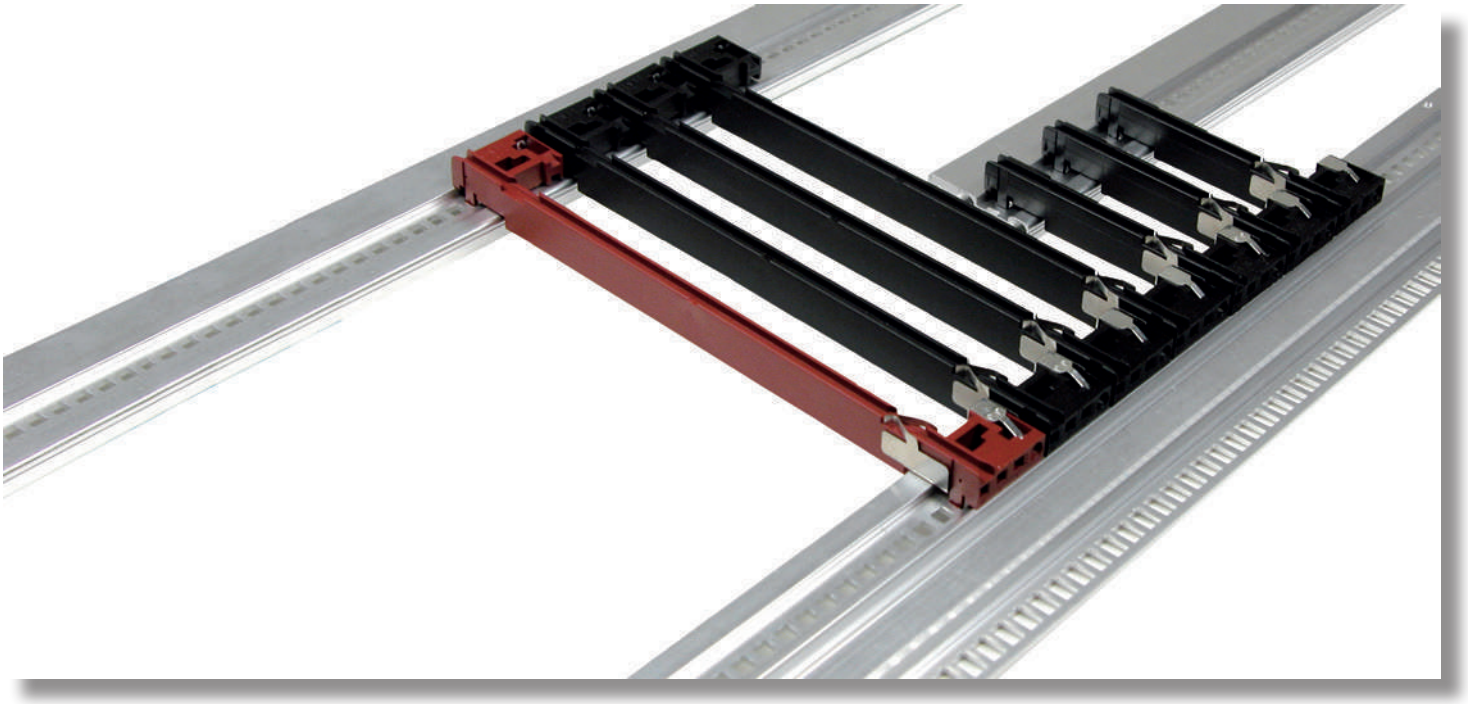


1.2.3 ESD Clips

- Connecting PCB with case

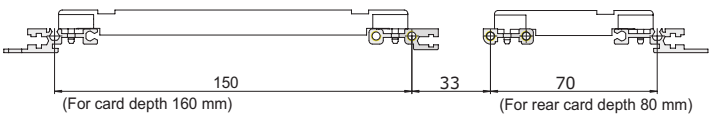
Description	Part-No.
ESD clip front bottom/rear top	61-419-01
ESD clip front top/rear bottom	61-419-02

Our ability to adapt existing components to your application, makes Elma your prefered solution partner.



1.3 Card Guides Standard acc. to IEEE

- For positive location of PCBs and plug-in units conforming to the dimensions of card depths 80 mm, 160 mm, 220 mm, 280 mm and 340 mm
- The card guides are nonflammable, made from a high quality plastic material reinforced with fibreglass (UL94 V-0)
- With ESD provisions
- With keying and alignment pin possibilities



1.3.1 Card Guides 1-Slot

- Card thickness 1.6 mm / 0.06" and 2.0 mm / 0.08"
- Plastic UL94 V-0



1.3.1 Card Guides 1-Slot

Card Depth mm	Card Depth inch	Colour	Part-No. 1 Pair
80	3.15	black	61-949-01

Card Depth mm	Card Depth inch	Colour	Part-No.
160	6.30	black	61-950-01
160	6.30	red	61-950-03

1.3.2 Card Guides 1-Slot, incl. mounted ESD-Components

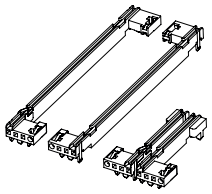
- Bottom: 1 ESD clip and 1 ESD spring
- Top: 1 ESD spring
- Black plastic UL94 V-0

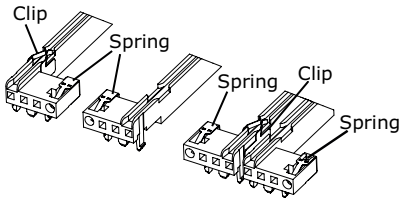


1.3.2 Card Guides 1-Slot, incl. mounted ESD-Components

Card Depth		Description	Part-No. 1 Pair
mm	inch		
80	3.15	1 pair top/bottom	61-949-02

Card Depth		Description	Part-No.
mm	inch		
160	6.30	1 piece bottom	61-950-02
160	6.30	1 piece top	61-950-04





1.3.3. Aluminium Card Guides 1-Slot, 3 Parts



1.3.3.1 Aluminium Card Guides 1-Slot, 3 Parts, 1.6 mm

- Extrusion: Aluminium
- End feet: Plastic UL94 V-0
- For card thickness 1.6 mm / 0.06" and 2.0 mm / 0.08"

Extrusion

Card Depth		Part-No.
mm	inch	
160	6.30	66-452-20
220	8.66	66-452-25
280	11.02	66-452-30
340	13.38	66-452-35

End Feet

Colour	Part-No. 1 Pair
Black	61-955-01
Red	61-955-03

End Feet Offset

Colour	Part-No. 1 Pair
Pearlwhite	61-961-01



1.3.3.2 Aluminium Card Guides 1-Slot, 3 Parts, 2.4 mm

- Extrusion: Aluminium
- End feet: Plastic UL94 V-0
- For card thickness 2.4 mm / 0.094"

Extrusion

Card Depth		Part-No.
mm	inch	
160	6.30	66-453-20
220	8.66	66-453-25
280	11.02	66-453-30
340	13.38	66-453-35

End Feet

Colour	Part-No. 1 Pair
Black	61-956-01

1.3.4 ESD Clips

- Connecting printed board with case



1.3.4 ESD Clips

Description	Part-No.
ESD clip front bottom/rear top	61-419-01
ESD clip front top/rear bottom	61-419-02

1.3.5 ESD Spring

- Connecting ESD pin with case
- Note: Notch inward-looking



1.3.5 ESD Spring

Description	Part-No.
ESD spring	61-420

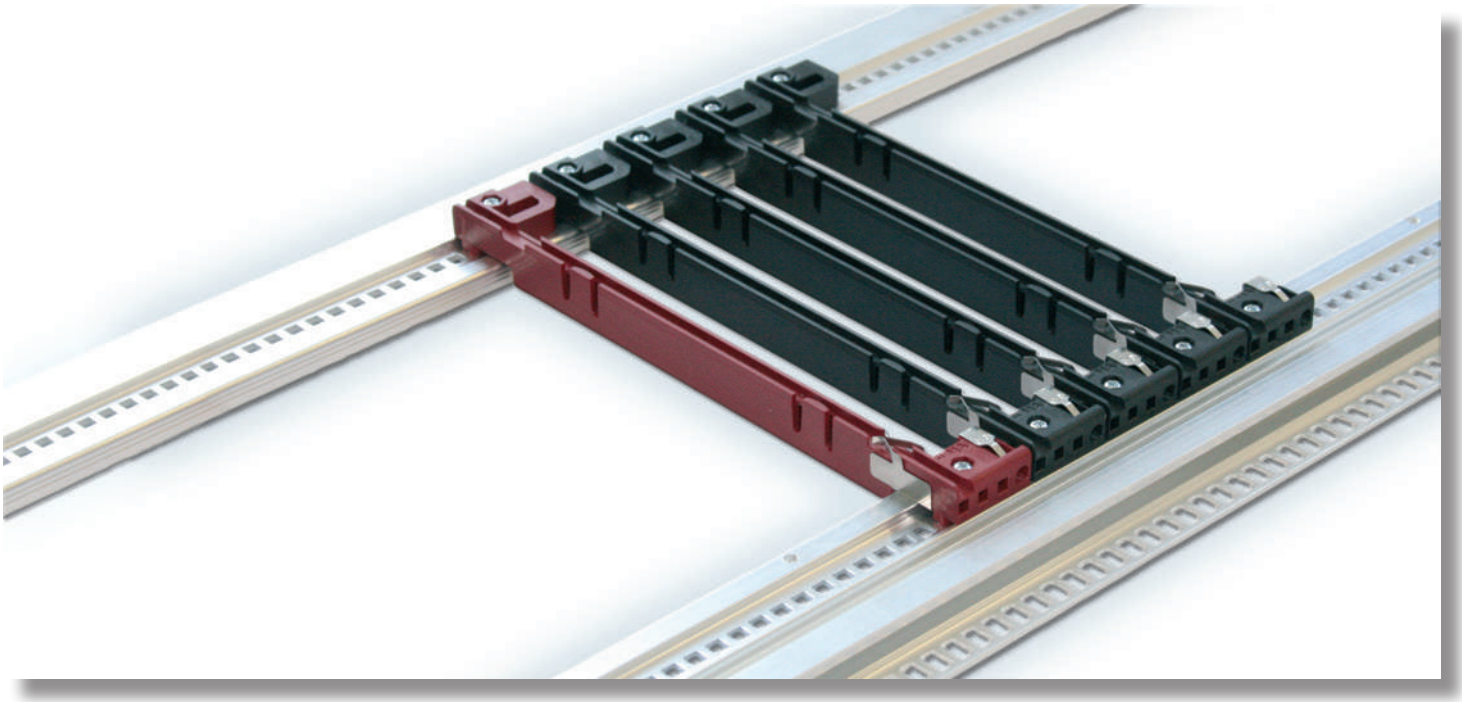
1.3.6 Coding Pins

- Acc. to IEC 60297-3-103
- Plastic, UL94 V-0
- Can be rotated in 4 positions



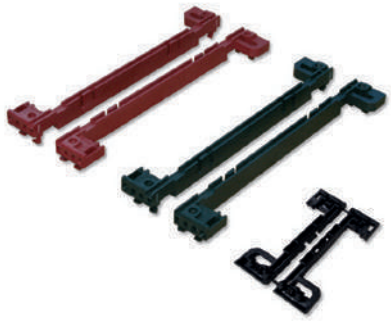
1.3.6 Coding Pins

Colour	Part-No.
Grey	81-054-02
Dark red	81-054-06
Black	81-054-04



1.4 Rugged Screw-mount Card Guides acc. to IEEE

- Simple assembly comparable to anchoring
- Very high retention force
- Shock and vibration proof
- For positive location of circuit boards and plug-in units
- For card thickness 1.6 mm / 0.06" and 2.0 mm/0.08" with anti-vibration feature
- The card guides are nonflammable, made from a high quality plastic material reinforced with fibreglass (UL94 V-0)
- With ESD provision
- With keying and alignment pin possibilities
- Stainless steel PT-screw, Torque: 0,36 Nm



1.4 Rugged Screw-mount Card Guides acc. to IEEE

- **Scope of delivery:**
  - Card guide, plastic UL94 V-0
  - Security screw see 1.4.1 (at least one must be used)
  - Optional mounting see 1.4.2
  - ESD clip, ESD spring and coding pin see 1.4.3 - 1.4.5

Card Depth mm	Card Depth inch	Colour	Part-No. 1 Pair
80	3.15	black	61-971-01
160	6.30	black	61-970-01
160	6.30	red	61-970-03
160	6.30	pearlwhite / offset	61-972

1.4.1 Standard Mounting

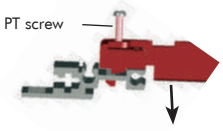
- With Stainless Steel Security Screw (from Top)



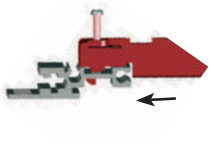
1.4.1 Standard Mounting

Description	Part-No.
Cross recessed pan head PT-screw 2.2x12, Inox	5535-12

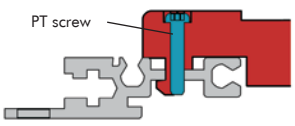
Note: For highest security 2 screws/card guide, 4 screws/pair are necessary.



1. Insert Card Guide



2. Shift Card Guide



3. Protection by Screwing

1.4.2 Optional Mounting

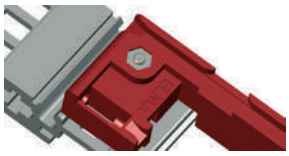
- With M2 screw, washer and nut (from Bottom)

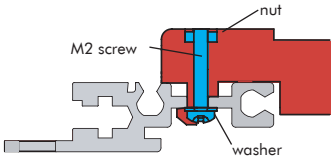


1.4.2 Optional Mounting

Description	Part-No. 1 set (1 each)	Part-No.
Cross recessed pan head screw M2x12, Inox	63-484	5304-13
Hexagonal nut M2 Inox		5620-12
Serrated lock washer		5708-12

Note: For highest security 2 sets/card guide, 4 sets/pair are necessary.





1.4.3 ESD Clips

- Connecting printed board with case



1.4.3 ESD Clips

Description	Part-No.
ESD clip front bottom/rear top	61-419-01
ESD clip front top/rear bottom	61-419-02

1.4.4 ESD Spring

- Connecting ESD pin with case
- Note: Notch inward-looking

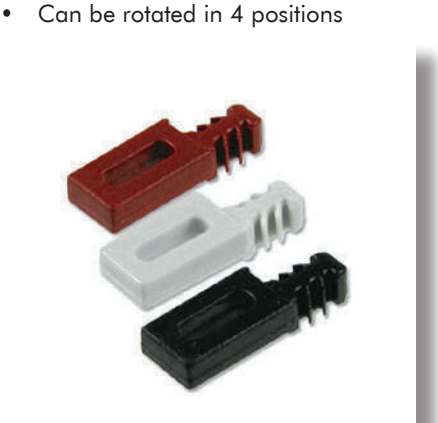


1.4.4 ESD Spring

Description	Part-No.
ESD spring	61-420

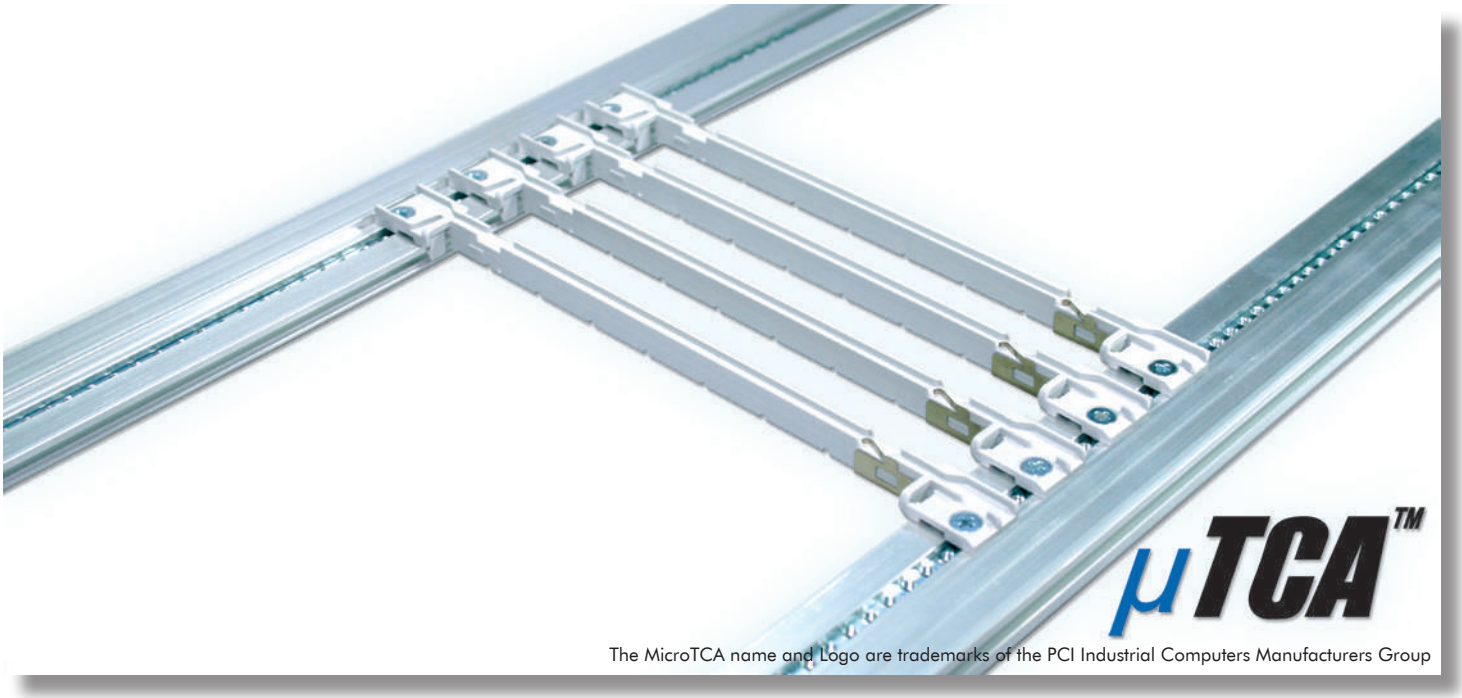
1.4.5 Coding Pins

- Acc. to IEC60297-3-103
- Plastic, UL94 V-0
- Can be rotated in 4 positions



1.4.5 Coding Pins

Description	Part-No.
Grey	81-054-02
Dark red	81-054-06
Black	81-054-04



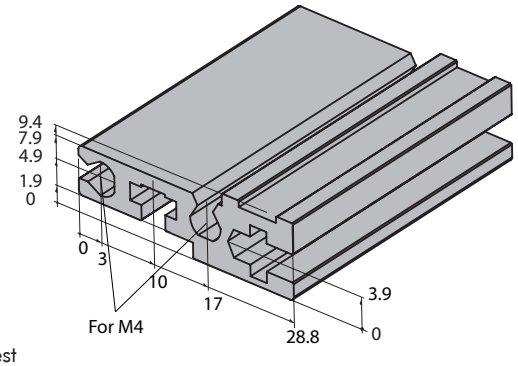
The MicroTCA name and Logo are trademarks of the PCI Industrial Computers Manufacturers Group

uTCA

- The PICMG® Micro Telecommunications Computing Architecture (MicroTCA™) specification defines the requirements for a system that uses PICMG Advanced Mezzanine Cards (AdvancedMCs) directly on a Backplane. This specification, MicroTCA.0, defines the general mechanical, electrical, thermal, and management properties of a MicroTCA Shelf necessary to support AMC.0 compliant Modules.
- MicroTCA has a primary purpose of serving as a platform for telecommunications and enterprise computer network equipment. Its secondary goal is to function as a platform for other demanding marketplaces, such as Customer Premises Equipment (CPE).
- MicroTCA is complementary to the PICMG3.0 Advances Telecommunications Computing Architecture (AdvandedTCA or PICMG3). Where AdvancedTCA is optimised for very high capacity, high performance applications, MicroTCA is designed to address cost sensitive and physically smaller applications with lower capacity, performance, and perhaps less stringent availability requirements. MicroTCA preserves many of the important philosophies of AdvancedTCA, inculding basic interconnect topologies and management structure

1.5 uTCA Components

- Made to build uTCA card cages
- Comform to the PICMG specification MTCA.0 R1.0
- Prepared to meet EMC requirements





1.5.1 uTCA Extrusion

- Aluminium clear passivated
- Special length or surface treatments on request

Description	Part-No.
uTCA Extrusion L=443.32 mm	66-242-443
uTCA Extrusion L=428.08 mm	66-242-428

1.5.2 uTCA Card Guide

- Fits on extrusion 66-242-X
- Top and bottom use of card guide
- Plastic, grey, UL94 V-0
- ESD clip can be assembled at front and rear



1.5.2 uTCA Card Guide

Description	Part-No.
uTCA Card guide	61-193-00

1.5.3 uTCA ESD Clip

- Fits on uTCA card guide 61-193-00
- Stainless steel

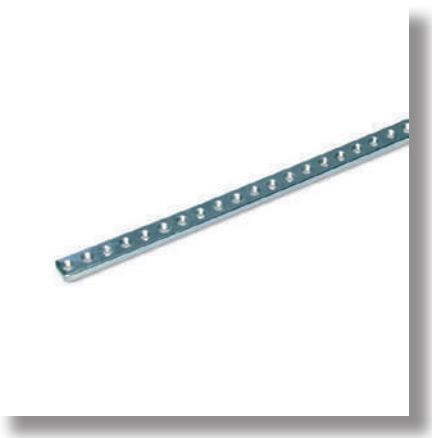


1.5.3 uTCA ESD Clip

Description	Part-No.
uTCA ESD clip	61-194

1.5.4 Tapped Strips M3

- 2 x 6 mm M3
- Fit into uTCA extrusion 66-242-XX
- Steel, glavanised, passivated



1.5.4 Tapped Strips M3

Description	Part-No.
Tapped strips 2 x 6 mm M3, L= 443.02 mm	61-242-443
Tapped strips 2 x 6 mm M3, L= 427.78 mm	61-242-428

1.5.5 Countersunk Screw M3 x 6 mm

- Cross recessed, Philips #1
- Steel, galvanised, passivated



1.5.5 Countersunk Screw M3 x 6 mm

Description	Part-No.
Countersunk screw M3 x 6 mm	5332-06

2: Assembly Material

















2.1 Front Panel Screws M2.5 E | 2_3

2.2 Miscellaneous Screws E | 2_5

2.3 Earthing Screws E | 2_7

2.4 Self-Tapping Screws E | 2_8

2.5 PT Screws E | 2_8

2.6 Sheet Metal Screws E | 2_8

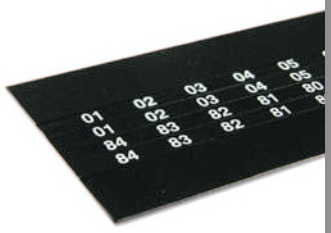
2.7 Threaded Bolts E | 2_8

2.8 Set Screws E | 2_8











2.9 Nuts and Lock Nuts E | 2_9

2.10 Washers E | 2_10

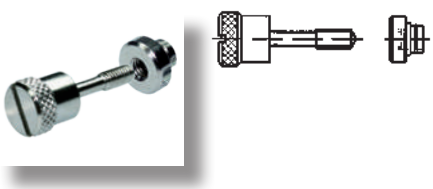
2.11 Tapped Strips E | 2_11

2.12 Label Strips E | 2_12

2.13 Insulation E | 2_13

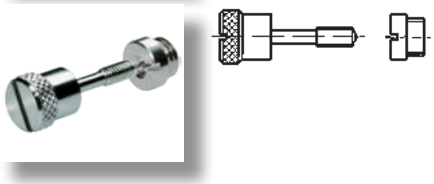


2.1 Front Panel Screws M2.5



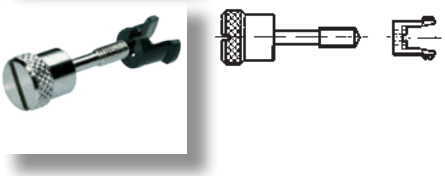
2.1.1 Milled Edge Screw Slotted, Head Ø 7, Press-Fit Bush

Description	Material	Part-No. 10 pcs.
M2.5 x 11.3	Steel, nickel-plated	63-443



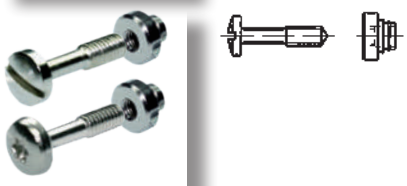
2.1.2 Milled Edge Screw Slotted, Head Ø 7, Threaded Bush

Description	Material	Part-No. 10 pcs.
M2.5 x 11.3; M2.5/M5 x 0.5	Steel/brass, nickel-plated	63-130



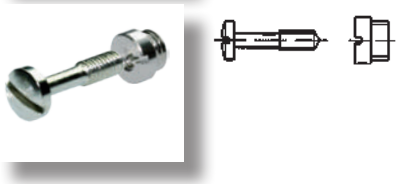
2.1.3 Milled Edge Screw Slotted, Head Ø 7, Retainer

Description	Material	Part-No. 10 pcs.
M2.5 x 11.3	Steel, nickel-plated / plastic	63-157



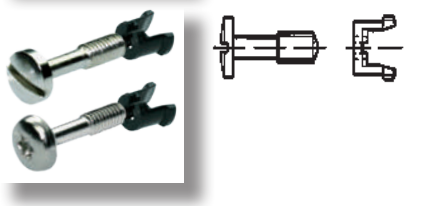
2.1.4 Round Head Screw, Head Ø 5 (Torx Ø 6), Press-Fit Bush

Description	Material	Part-No. 10 pcs.
Slotted, M2.5 x 11.3	Steel, nickel-plated	63-444
Torx, M2.5 x 11.3, size T8	Steel, nickel-plated	63K480



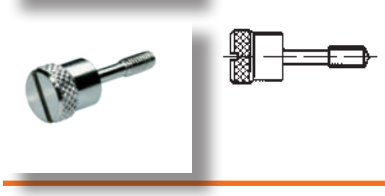
2.1.5 Round Head Screw Slotted, Head Ø 5, Threaded Bush

Description	Material	Part-No. 10 pcs.
M2.5 x 11.3; M2.5/M5 x 0.5	Steel/brass, nickel-plated	63-129



2.1.6 Round Head Screw, Head Ø 5 (Torx Ø 6), Retainer

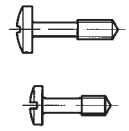
Description	Material	Part-No. 10 pcs.
Slotted M2.5 x 11.3	Steel, nickel-plated / plastic	63-159
Torx, M2.5 x 11.3, size T8	Steel, nickel-plated / plastic	63K159



2.1.7 Milled Edge Screw Slotted, Head Ø 7

Description	Material	Part-No.
M2.5 x 11.3	Steel, nickel-plated	61-267
M2.5 x 11.3	Steel, nickel-plated, black	61-267-01

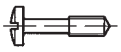




2.1.8 Round Head Screw Slotted, Head Ø 5

Description	Material	Part-No.
M2.5 x 9	Steel, nickel-plated	61-252
M2.5 x 11.3	Steel, nickel-plated	61-256





2.1.9 Round Head Screw, Head Ø 6

Description	Material	Part-No.
Philips M2.5 x 12.7	Steel, nickel-plated	61-287
Philips M2.5 x 12.7	Steel, nickel-plated, black	61-294
Torx M2.5 x 11.3, size T8	Steel, nickel-plated	5443-08
Freedrive M2.5 x 11.3	Steel, nickel-plated	61-295
Freedrive M2.5 x 11.3	Steel, nickel-plated, black	61-295-01





2.1.10 Press-Fit Bush, Drilling Ø $3.7^{+0.11}_{0}$

Description	Material	Part-No.
M2.5 Mat.≥ 2.5 mm	Steel, nickel-plated	61-201
M2.5 Mat.≥ 2.5 mm	Steel, nickel-plated, black	61-207
M2.5 Mat.≥ 1 mm	Steel, nickel-plated	61-225
M2.5 Mat.≥ 1 mm	Steel, nickel-plated, black	61-223





2.1.11 Threaded Bush

Description	Material	Part-No.
M2.5/M5 x 0.5	Brass, nickel-plated	61-200





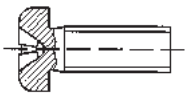
2.1.12 Screw Retainer

Description	Material	Part-No.
M2.5 + M3	Plastic	61-008



2.2 Miscellaneous Screws

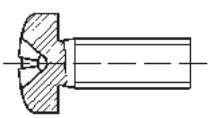




2.2.1 Philips Cylindrical Screw, ~DIN 84A

Description	Material	Part-No.
M2.5 x 4	Steel, zinc-plated	5325-04
M2.5 x 4, Torx T8	Stainless steel	5470-07
M2.5 x 5, Torx T8	Stainless steel	5470-07
M2.5 x 6	Steel, zinc-plated	5325-06
M2.5 x 6, Torx T8	Stainless steel	5470-04
M2.5 x 8	Steel, zinc-plated	5325-08
M2.5 x 8, Torx T8	Stainless steel	5470-10
M2.5 x 10	Steel, zinc-plated	5325-10
M2.5 x 10, Torx T8	Stainless steel	5470-09
M2.5 x 12	Steel, zinc-plated	5325-12
M2.5 x 12, Torx T8	Rostfreier Stahl	5470-12
M3 x 4, Torx T10	Steel, zinc-plated	5470-01
M3 x 6, Torx T10	Steel, zinc-plated	5470-02
M3 x 8	Steel, zinc-plated	5338-08
M3 x 8, Torx T10	Steel, zinc-plated	5470-03
M3 x 12	Steel, zinc-plated	5330-12
M3 x 12, Torx T10	Steel, zinc-plated	5470-05
M4 x 8	Steel, zinc-plated	5348-08
M4 x 8 , Torx T10	Steel, zinc-plated	5470-06
M4 x 12	Steel, zinc-plated	5348-12

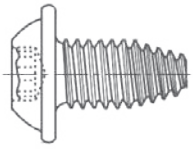




2.2.2 Philips Round Head Screw, DIN 7985A

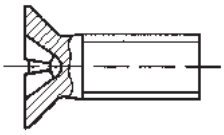
Description	Material	Part-No.
M3 x 4	Steel, zinc-plated	5331-04
M3 x 6	Steel, zinc-plated	5330-06
M3 x 8	Steel, zinc-plated	5330-08
M3 x 10	Steel, zinc-plated	5330-10
M4 x 6	Steel, zinc-plated	5340-06
M4 x 8	Steel, zinc-plated	5340-08
M6 x 8	Steel, zinc-plated	5360-08





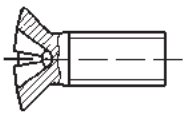
2.2.3 SHEETtracs® Screw

Description	Material	Part-No.
3 x 6, Torx T10	Steel, zinc-plated	5477-01

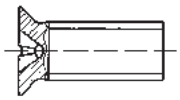
2.2.4 Philips Countersunk Screw, DIN 965A

Description	Material	Part-No.
M2.5 x 4	Steel, zinc-plated	5322-04
M2.5 x 4, Torx T8	Stainless steel	5470-25
M2.5 x 6	Steel, zinc-plated	5322-06
M2.5 x 6, Torx T8	Stainless steel	5470-20
M2.5 x 8	Steel, zinc-plated	5322-08
M2.5 x 8, Torx T8	Stainless steel	5470-21
M2.5 x 16, Torx T8	Stainless steel	5470-30
M3 x 6	Steel, zinc-plated	5332-06
M3 x 6, Torx T10	Steel, zinc-plated	5470-22
M3 x 8	Steel, zinc-plated	5332-08
M3 x 8, Torx T10	Steel, zinc-plated	5470-28
M3 x 10	Steel, zinc-plated	5332-10
M3 x 10, Torx T10	Steel, zinc-plated	5470-23
M4 x 6, Torx T20	Steel, zinc-plated	5470-27
M4 x 8, Torx T20	Steel, zinc-plated	5470-29
M4 x 10	Steel, zinc-plated	5342-08
M4 x 10, Torx T20	Steel, zinc-plated	5470-26
M4 x 10	Steel, zinc-plated	5342-10

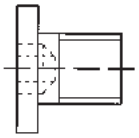
2.2.5 Philips Countersunk Round Head Screw, DIN 966A

Description	Material	Part-No.
M3 x 6	Steel, nickel-plated	5333-06
M3 x 8	Steel, nickel-plated	5333-08

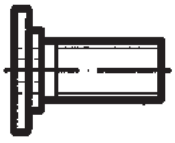
2.2.6 Philips Countersunk Screw with Small Head Ø 6

Description	Material	Part-No.
M4 x 5	Steel, zinc-plated	5441-50
M4 x 5	Steel, zinc-plated, black	5441-53
M4 x 5, Torx T10	Steel, zinc-plated	5441-58
M4 x 5, Torx T10	Steel, zinc-plated, black	5441-59
M4 x 10	Steel, zinc-plated	5441-51
M4 x 10	Steel, zinc-plated, black	5441-52
M4 x 10, Torx T10	Steel, zinc-plated	5441-54
M4 x 10, Torx T10	Steel, zinc-plated, black	5441-57

2.2.7 Cylindrical Allen Screw with Extremely Low Head

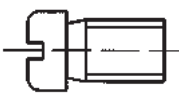
Description	Material	Part-No.
M5 x 6	Steel, zinc-plated	5441-22

2.2.8 Special Low-Head Allen Screw with Collar

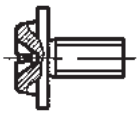
- Ø 8.2 x 1.3 for 19" perforation in cabinets

Description	Material	Part-No.
M6 x 15	Steel, zinc-plated	5441-15

2.2.9 Slotted Cylindrical Screw with Small Head Ø 3.2 / Ø 3.8 (M3)

Description	Material	Part-No.
M2.5 x 4	Steel, zinc-plated	5526-04
M3 x 6	Steel, zinc-plated	5536-06

2.2.10 Philips Round Head Screw with Integrated Washer

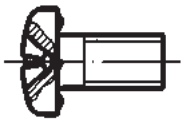
Description	Material	Part-No.
M2.5 x 10, Torx 8	Steel, zinc-plated	5473-04
M3 x 4, Torx T10	Steel, zinc-plated	5473-02
M3 x 6	Steel, zinc-plated	5335-06
M3 x 6, Torx T10	Steel, zinc-plated	5473-01
M3 x 8, Torx T10	Steel, zinc-plated	5473-05
M4 x 12, Torx T20	Stainless steel	5473-03
M4 x 16, Torx T20	Steel, zinc-plated	5473-06
M5 x 16, Torx T25	Steel, zinc-plated	5473-07




2.2.11 Philips Round Head Screw with Integrated Washer, Tuflock-Coated

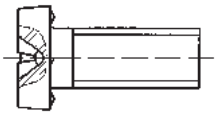
Description	Material	Part-No.
M2.5 x 10	Steel, zinc-plated	5336-10

2.3 Earthing Screws

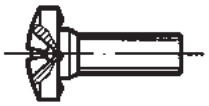
2.3.1 Special Philips Round Head Earthing Screw

Description	Material	Part-No.
M3 x 6	Steel, zinc-plated	61-283
M3 x 6	Steel, zinc-plated, black	61-293

2.3.2 Special Philips Cylindrical Earthing Screw

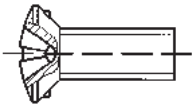
Description	Material	Part-No.
M3 x 6, Torx T10	Steel, zinc-plated	5443-04
M4 x 6		61-279
M4 x 6, Torx T20	Steel, zinc-plated	5443-06
M4 x 10	Steel, zinc-plated	61-260
M4 x 10, Torx T20	Steel, zinc-plated	5443-01
M4 x 16, Torx T20	Steel, zinc-plated	5443-07

2.3.3 Special Philips Round Head Earthing Screw

- With collar Ø 3.2 x 0.9 for front panels

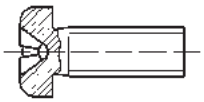
Description	Material	Part-No.
M2.5 x 8	Steel, nickel-plated	61-286
M2.5 x 8, Torx T8	Steel, nickel-plated	61-298

2.3.4 Philips Countersunk Round Head Earthing Screw

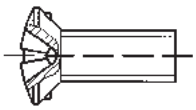
Description	Material	Part-No.
M3 x 8	Steel, zinc-plated	61-270
M3 x 8	Steel, zinc-plated, black	61-292
M4 x 12	Steel, zinc-plated	63-271

2.4 Self-Tapping Screws

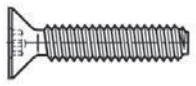
2.4.1 Self-Tapping Philips Round Head Screw

Description	Material	Part-No.
M3 x 5	Steel, zinc-plated	5338-05
M4 x 6, Torx T20	Steel, zinc-plated	5471-01
M4 x 8, Torx T20	Steel, zinc-plated	5471-02

2.4.2 Self-Tapping Philips Countersunk Earthing Screw

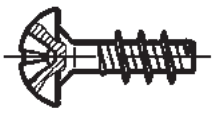
Description	Material	Part-No.
M3 x 8.8	Steel, zinc-plated	61-272

2.4.3 Self-Tapping Countersunk Screw

Description	Material	Part-No.
M4 x 12, Torx T20	Steel, zinc-plated	5472-01

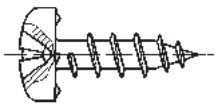
2.5 PT Screws

2.5.1 Philips PT Round Head Screw

Description	Material	Part-No.
Ø 2.2 x 8	Steel, zinc-plated	5535-13
Ø 2.2 x 12	Steel, zinc-plated	5535-12
Ø 2.5 x 8	Steel, zinc-plated	5588-08
Ø 3 x 8	Steel, zinc-plated	61-276

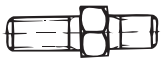
2.6 Sheet Metal Screws

2.6.1 Special Philips Round Head Sheet Metal Earthing Screw

Description	Material	Part-No.
Ø 2.9 x 6.5, Torx T10	Steel, zinc-plated	5443-09
Ø 2.9 x 9.5	Steel, zinc-plated	5441-33
Ø 4.8 x 9.5, Torx T25	Steel, zinc-plated	5575-40

2.7 Threaded Bolts

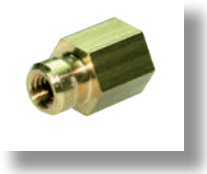
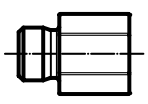
2.7.1 Threaded Earthing Bolt

Description	Material	Part-No.
M4 x 9/6	Steel, zinc-plated	61-096




2.7.2 Press-in Threaded Stud for Earth Connector

Description	Material	Part-No.
M3 x 8	Steel, zinc-plated	5815-32
M4 x 8	Steel, zinc-plated	5815-41
M4 x 10	Steel, zinc-plated	5815-42
M4 x 12	Steel, zinc-plated	5815-43

2.7.3 ESD Snap-faster Hook-up

Description	Material	Part-No.
M3 / 4.5 mm, L= 9.5 mm	Brass	61-001

2.8 Set Screws




2.8.1 Set Screws for Fixing of Tapped Strips

Description	Material	Part-No.
M2.5 x 8	Steel, zinc-plated	5412-08
M3 x 6	Steel, zinc-plated	5413-06

2.9 Nuts and Lock Nuts



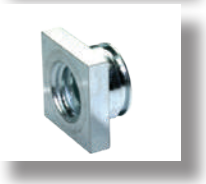
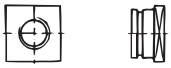

2.9.1 Hexagonal Nut

Description	Material	Part-No.
M2 x 0.8d	Stainless steel	5620-12
M2.5 x 0.8d	Steel, zinc-plated	5620-31
M3 x 0.5d	Steel, zinc-plated	5620-40
M3 x 0.8d	Steel, zinc-plated	5620-41
M4 x 0.5d	Steel, zinc-plated	5620-50
M4 x 0.8d	Steel, zinc-plated	5620-51
M5 x 0.8d	Steel, zinc-plated	5620-61
M6 x 0.8d	Steel, zinc-plated	5620-71




2.9.2 Hexagonal Lock Nut

Description	Material	Part-No.
M2.5	Steel, zinc-plated	5627-00
M5	Steel, zinc-plated	5627-02

2.9.3 Inset Nut

Description	Material	Part-No.
M6	Steel, zinc-plated	1925-65




2.9.4 Retainer For Inset Nut

Description	Material	Part-No.
M6	POM	61-030



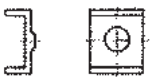

2.9.5 Square Nut

Description	Material	Part-No.
M2.5 SW5.5	Steel, zinc-plated	61-249
M3 SW5.5	Steel, zinc-plated	5621-40
M4 SW7	Steel, zinc-plated	5621-50




2.9.6 Square Earthing Nut

Description	Material	Part-No.
M4 SW7	Steel, tempered	61-095

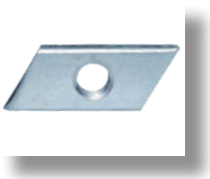
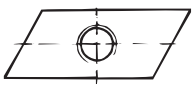
2.9.7 Holder For Square Nut

Description	Material	Part-No.
SW7	POM	61-073




2.9.6 Nut Positioning Ring for Nut in Profile Slot

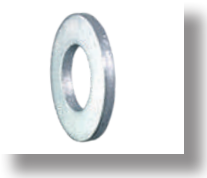
Description	Material	Part-No.
M3 (8.2 / 6.2)	PE	61-015
M4 (8.2 / 6.2)	PE	61-016

2.9.6 Oblique Nut

Description	Material	Part-No.
M6	Steel, zinc-plated	61-839

2.10 Washers





2.10.1 Washer

Description	Material	Part-No.
Ø 2.8 / 7.0 (M2.5)	Steel, zinc-plated	5630-01
Ø 3.2 / 7.0 (M3)	Steel, zinc-plated	5630-02
Ø 4.3 / 9.0 (M4)	Steel, zinc-plated	5630-03
Ø 4.3 / 12.0 (M4)	Steel, zinc-plated	5630-06





2.10.2 Lock Washer

Description	Material	Part-No.
Ø 3.2 (M3)	Spring steel, black	5706-04
Ø 4.3 (M4)	Spring steel, black	5706-06



2.10.3 Plastic Washer

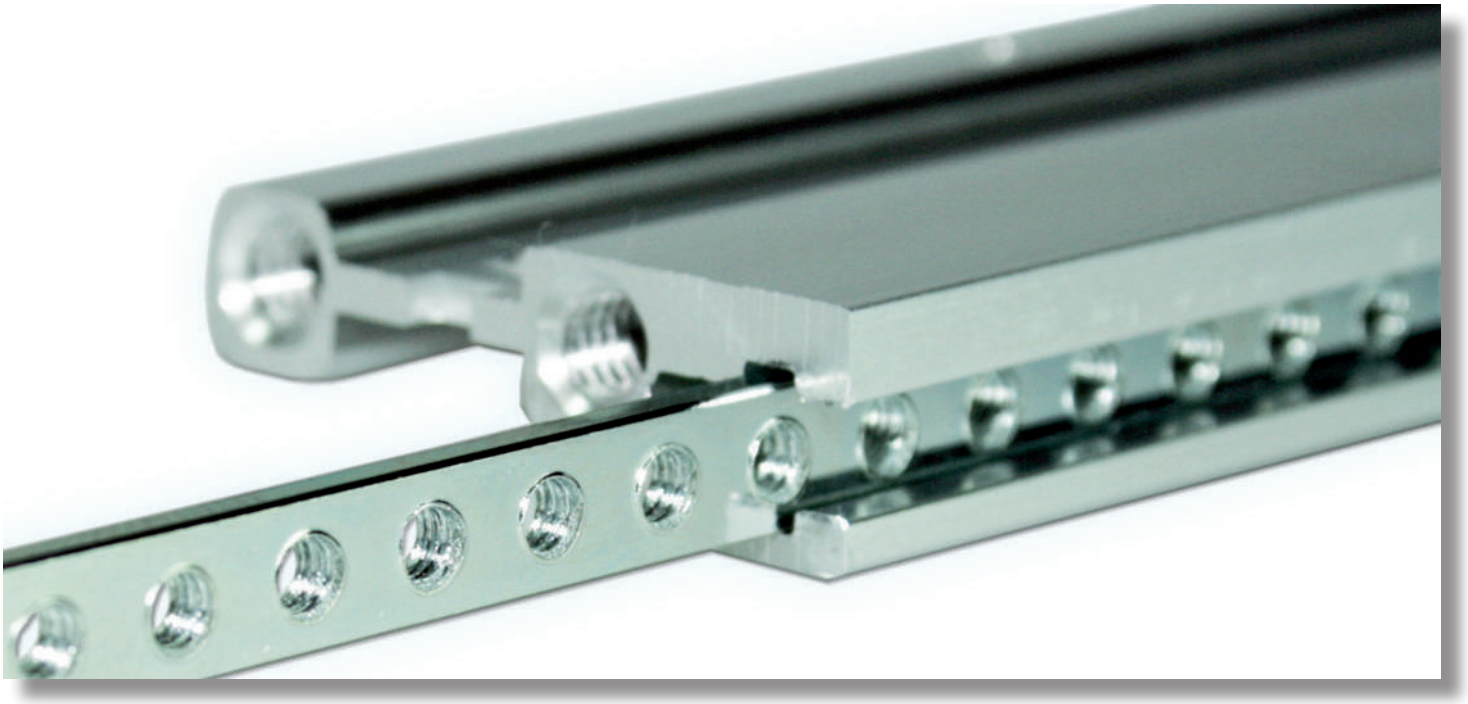
Description	Material	Part-No.
M6	POM, black	61-007





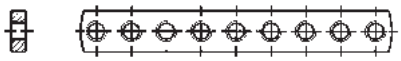
2.10.5 Washers for Unibox 14

Description	Material	Part-No.
Washer for Unibox 14	Aluminium, raw	61-427



2.11 Tapped Strips

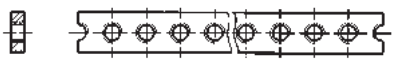




2.11.1 Tapped Strips M2.5

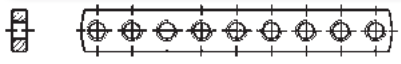
- 2 x 6 mm M2.5
- Steel, galvanised, passivated

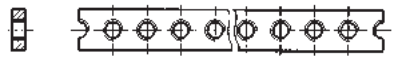
Description	Material	Part-No.
M2.5 4 HP	Steel, zinc-plated	61-483
M2.5 8 HP	Steel, zinc-plated	61-475
M2.5 10 HP	Steel, zinc-plated	61-436
M2.5 15 HP	Steel, zinc-plated	61-476
M2.5 18 HP	Steel, zinc-plated	61-477
M2.5 21 HP	Steel, zinc-plated	61-459
M2.5 27 HP	Steel, zinc-plated	61-486
M2.5 28 HP	Steel, zinc-plated	61-458
M2.5 32 HP	Steel, zinc-plated	61-463
M2.5 40 HP	Steel, zinc-plated	61-465
M2.5 42 HP	Steel, zinc-plated	61-464
M2.5 47 HP	Steel, zinc-plated	61-461
M2.5 60 HP	Steel, zinc-plated	61-466
M2.5 63 HP	Steel, zinc-plated	61-469
M2.5 81 HP	Steel, zinc-plated	61-467
M2.5 84 HP	Steel, zinc-plated	61-468
M2.5 2200 mm	Steel, zinc-plated	61-532



Description	Material	Part-No.
M2.5 43 HP	Steel, zinc-plated	61-588
M2.5 64 HP	Steel, zinc-plated	61-587
M2.5 85 HP	Steel, zinc-plated	61-568





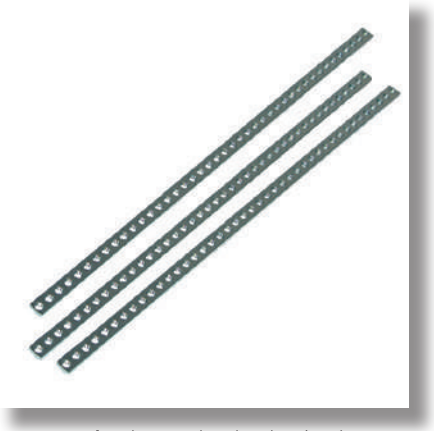


2.11.2 Tapped Strips M2.5 1.8 x 5 mm

- 1.8 x 5 mm, M2.5
- Steel, galvanised, passivated

Description	Material	Part-No.
M2.5 10 HP	Steel, zinc-plated	61-470
M2.5 18 HP	Steel, zinc-plated	61-478
M2.5 27 HP	Steel, zinc-plated	61-479
M2.5 42 HP	Steel, zinc-plated	61-471
M2.5 46 HP	Steel, zinc-plated	61-460
M2.5 63 HP	Steel, zinc-plated	61-472
M2.5 81 HP	Steel, zinc-plated	61-473
M2.5 84 HP	Steel, zinc-plated	61-474
M2.5 2200 mm	Steel, zinc-plated	61-534

Description	Material	Part-No.
M2.5 43 HP	Steel, zinc-plated	61-584
M2.5 64 HP	Steel, zinc-plated	61-585
M2.5 85 HP	Steel, zinc-plated	61-586





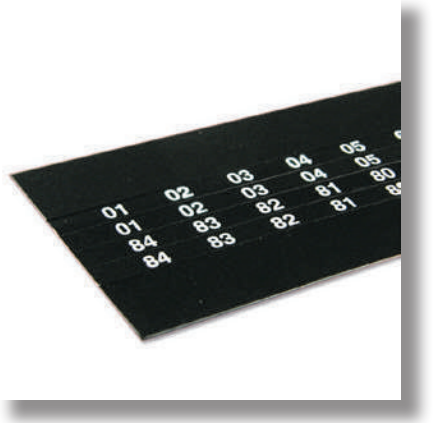
2.11.3 Tapped Strips M3

- 2 x 6 mm M3
- Steel, galvanised, passivated

Description	Material	Part-No.
M3 10 HP	Steel, zinc-plated	61-435
M3 28 HP	Steel, zinc-plated	61-456
M3 42 HP	Steel, zinc-plated	61-454
M3 63 HP	Steel, zinc-plated	61-455
M3 81 HP	Steel, zinc-plated	61-450
M3 84 HP	Steel, zinc-plated	61-453
M3 L = 427.78 mm	Steel, zinc-plated	61-242-443
M3 L = 443.02 mm	Steel, zinc-plated	61-242-428

2.12 Label Strips

- Numbering of HP-steps
- Mounting onto front extrusions
- Black plastic, PVC
- Numbering white
- Self-adhesive
- **Scope of delivery:**
  - 1 label strip, consisting of 4 single tapes



2.12.1 Label Strips

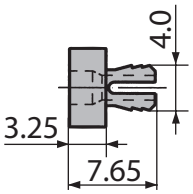
Numbering	Length		Scope of Delivery	Part-No.
	mm	inch		
01-42/42-01	218.1	8.58	2 pcs. each (up and down)	63-142
01-63/63-01	324.8	12.78	2 pcs. each (up and down)	63-143
01-81/81-01	416.4	16.39	2 pcs. each (up and down)	63-043
01-84/84-01	431.6	16.99	2 pcs. each (up and down)	63-046

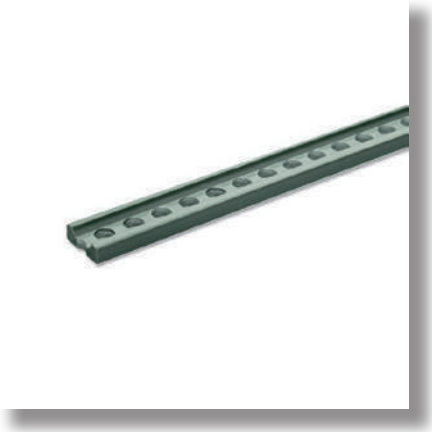
2.13 Insulation



2.13.1 Backplane Insulating Spacer

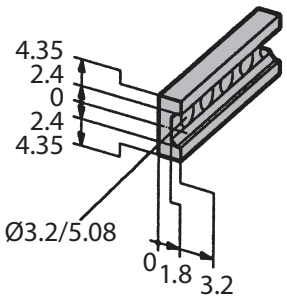
Description	Material	Part-No.
Ø 7 (M2.5)	POM	61-088

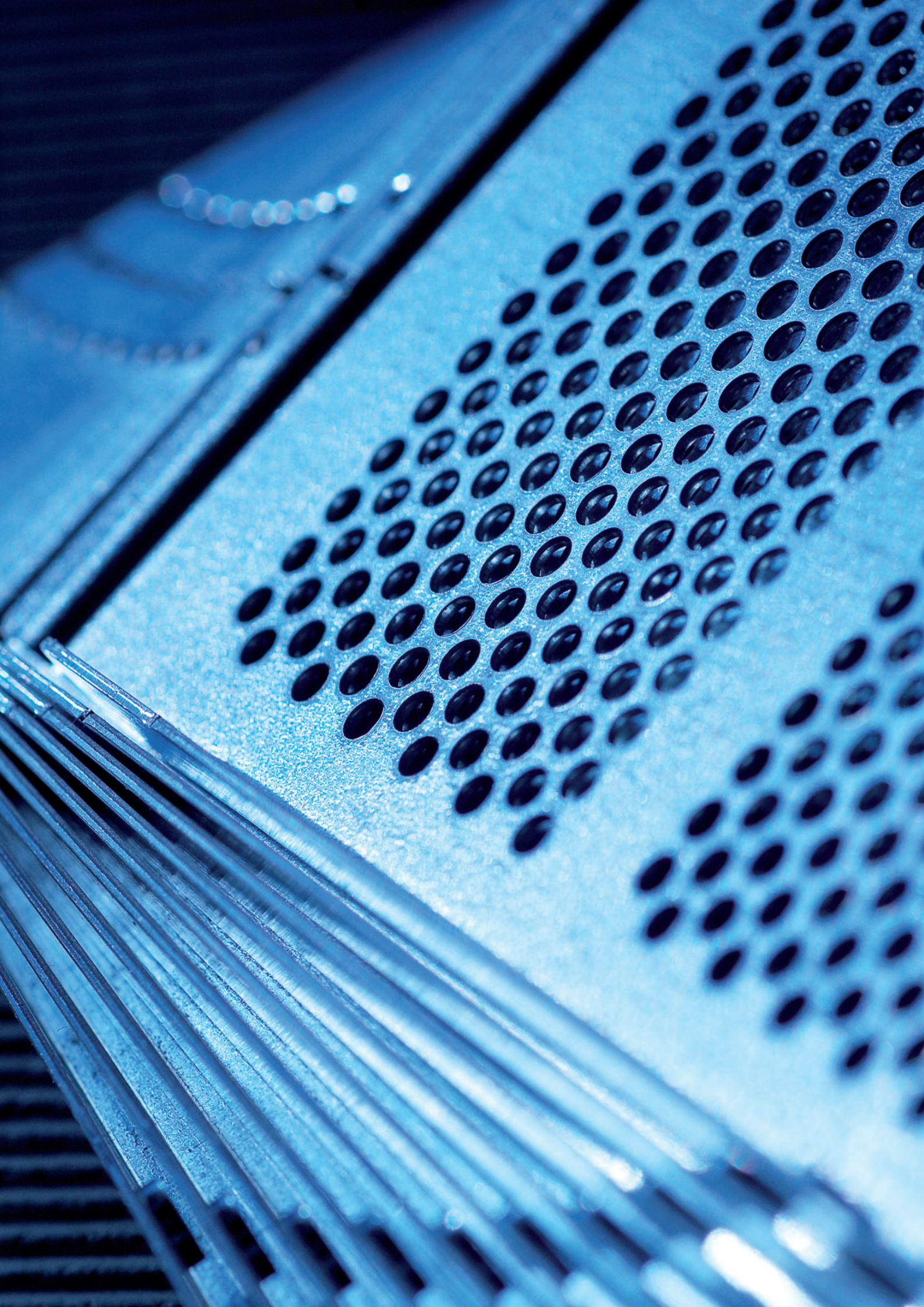




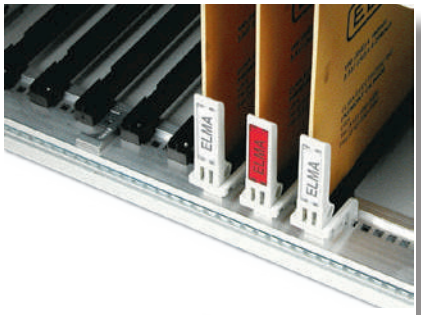
2.13.2 Insulating Strips

Description	Material	Part-No.
28 HP	ABS	66-901-25
42 HP	ABS	66-901-20
63 HP	ABS	66-901-21
81 HP	ABS	66-901-22
84 HP	ABS	66-901-23





3: PCB Accessories











3.1 Card Locks and Card Handles **E | 3_3**

3.1.1 Card Locks, Card Injector/Ejector Handles E | 3_3

3.1.2 Card Handles E | 3_4

3.2 Card Holders acc. to IEC Standard **E | 3_5**

3.2.1 Card Holders without Swivel Stop E | 3_5

3.2.2 Card Holders with Swivel Stop E | 3_5

3.2.3 Assembly Material E | 3_5

3.3 Middle Parts **E | 3_6**

3.4 Protective Covers for 6 U Printed Boards **E | 3_6**

3.5 Spacers and Mounting Plates **E | 3_7**

3.5.1 Spacers Series A E | 3_7

3.5.2 Spacers Series B E | 3_7

3.5.3 Spacers Series C E | 3_7

3.5.4 Mounting Plates E | 3_8



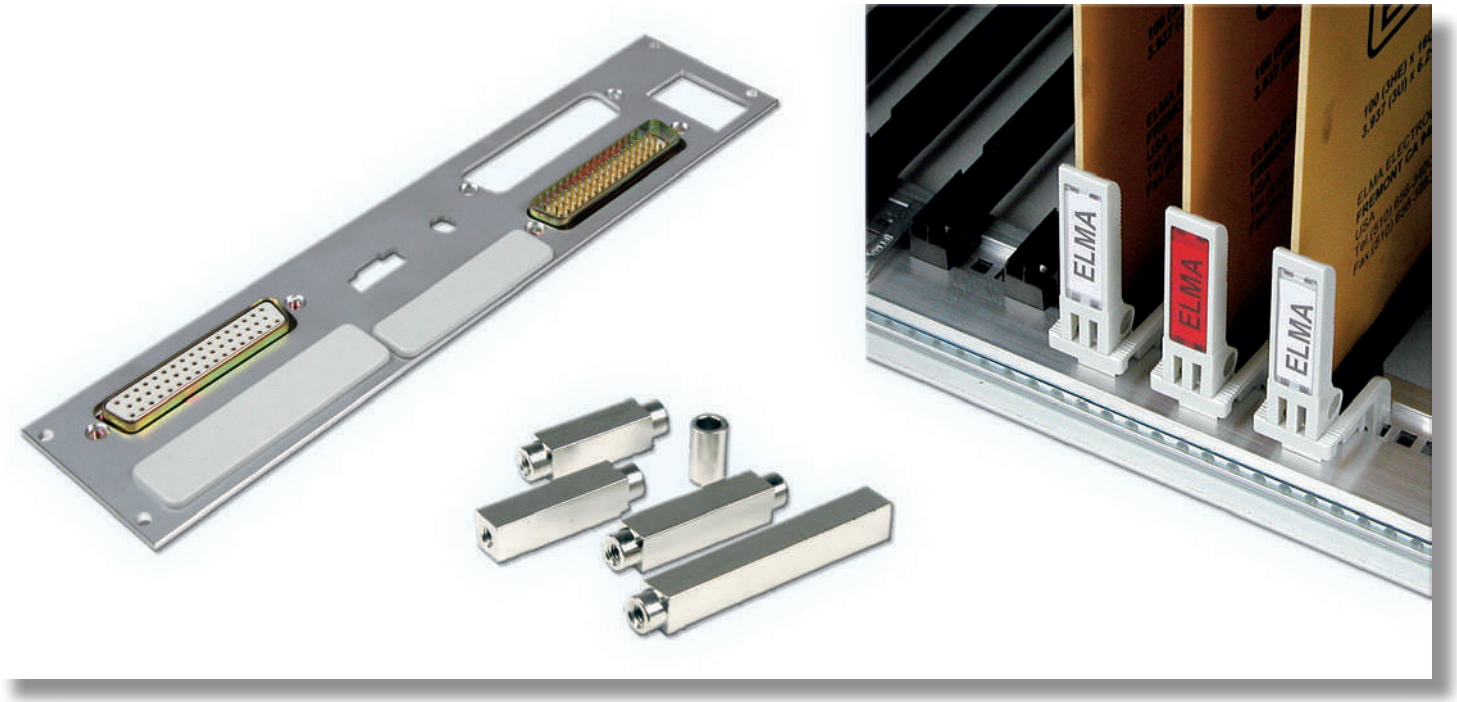




3.6 Hexagonal Spacers M3 Thread E | 3_8

3.7 Covering Caps E | 3_8

3.8 Mounting Brackets E | 3_9



3.1 Card Locks and Card Handles

- The card lock is easily mounted onto the upper or lower front profile
- When the PCB is pushed home, it is automatically locked into position
- The card eject mechanism can be attached to the top or bottom front edge of the PCB and is used in conjunction with the card lock
- The lever action ensures smooth and jerk-free card removal, especially useful when multi-pole connectors are being used
- Transparent windows in different colours and self-adhesive labels set into the front face of the eject mechanism make card identification easy
- The card lock and eject mechanism does not inhibit the use of front panels
- For recessed cards, a special card lock is available, suitable for use with profile 66-144
- **Scope of delivery:**
  - Card locks, eject mechanisms, windows and labels

3.1.1 Card Locks, Card Injector/Ejector Handles



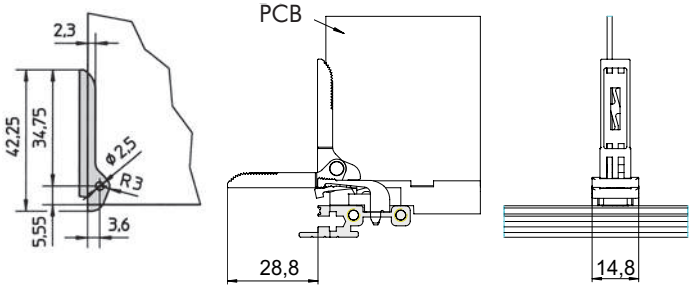


3.1.1 Card Locks, Card Injector/Ejector Handles

Description	Colour	Part-No.	
		1 pc.	10 pcs.
Card ejector handles		-	63-151
Card locks		61-126	-
Card locks to 66-144		61-144	-
Transparent window	Clear	-	63-155-1

3.1.1.1 Labels

Description	Part-No.
1 sheet A4 of 105	63-161



3.1.2 Card Handles

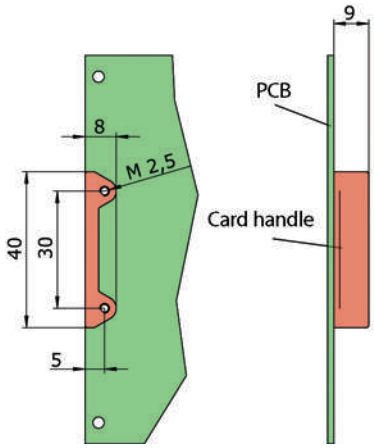


3.1.2 Card Handles

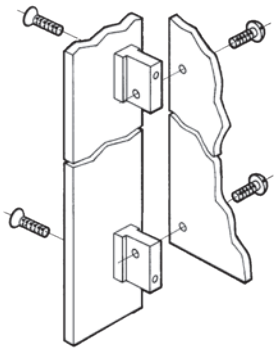
- Coloured, transparent handles which will accept labels facilitate the handling and identification of PCBs
- **Scope of delivery:**
  - 1 card handle
- Two screws M2.5 x 5 are needed per handle and have to be ordered separately

Description	Colour	Part-No.
Card handle	clear	1091-51
	red	1091-54
Cylindrical screw M2.5 x 5		5571-05
Torx cylinder head screw M2.5 x 5, size T8		5470-07

- Other colours (blue, yellow, green, orange) upon request



3.2 Card Holders acc. to IEC Standard



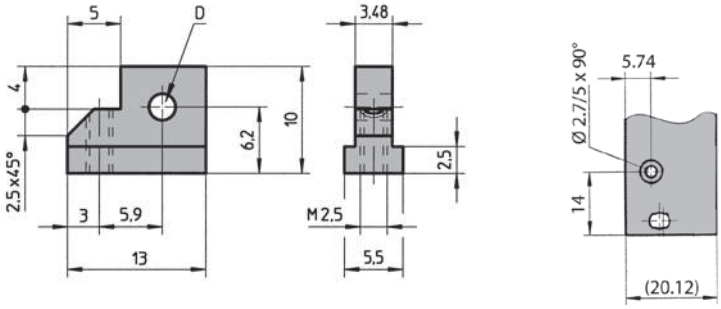
- By using the zinc die-cast card holder, flat front panels can be connected to a PC card to form a plug-in unit to IEC 60297
- The card can be mounted both in the standard position and offset 1 HP (5.08 mm)
- For better positioning of 6 U cards, there is a card holder centre piece made of nylon (see 3.3)
- The injector-/ejector handle can be used with the card holder
- **Scope of delivery:**
  - 1 card holder
- Assembly material see 3.2.3

3.2.1 Card Holders without Swivel Stop

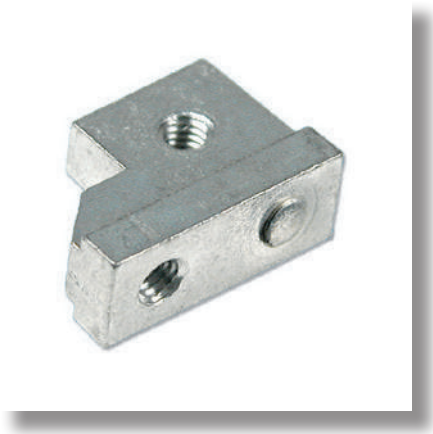


3.2.1 Card Holders without Swivel Stop

Description	Application	D	Part-No.
Card holder without swivel stop	Without injector/ejector handle	M2.5	61-156
Card holder without swivel stop	With injector/ejector handle	Ø 2.5	61-155

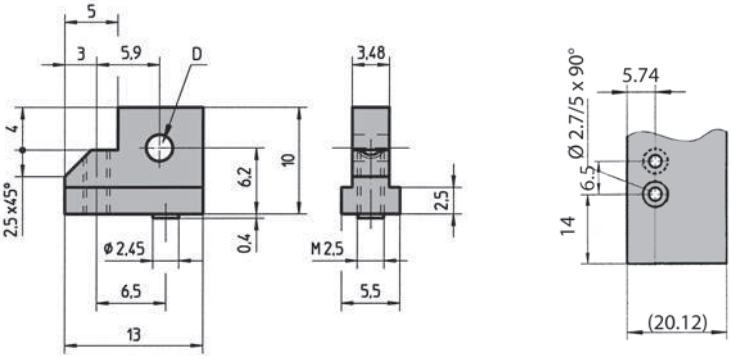


3.2.2 Card Holders with Swivel Stop



3.2.2 Card Holders with Swivel Stop

Description	Application	D	Part-No.
Card holder with swivel stop	Without injector/ejector handle	M2.5	61-156-01
Card holder with swivel stop	With injector/ejector handle	Ø 2.5	61-155-01



3.2.3 Assembly Material

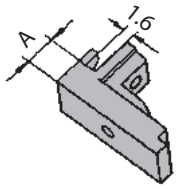


3.2.3 Assembly Material

Description	Application	Part-No.
Cross recessed countersunk screw M2.5 x 8	For card holder	5322-08
Torx countersunk screw M2.5 x 8, size T8	For card holder	5470-21
Slotted pan head screw M2.5 x 6	For printed board	5571-06
Torx cylinder head screw M2.5 x 6, size T8	For printed board	5470-04

3.3 Middle Parts

- Usable for all front panels
- For positioning and fixing of 6 U and 9 U cards
- Card thickness 1.6 mm
- Self-adhesive, can optionally be screwed onto front panel and printed board
- Material: Plastic black UL94 V-0
- **Scope of delivery:**
  - Plastic middle part
- Assembly material, see below





3.3 Middle Parts

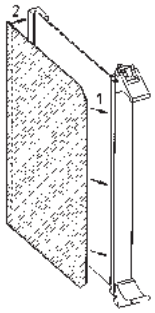
For Front Panels out of	A		Part-No.
	mm	inch	
Aluminium 2.5 mm	2.5	0.10	61-960

Assembly Material

Description	Part-No.
PT-countersunk, 2.5 x 6, cross recessed	5534-06

3.4 Protective Covers for 6 U Printed Boards

1. Slide protective cover between front panel and printed board
2. Press adhesive tape on protective cover through pins of connectors to attach onto printed board





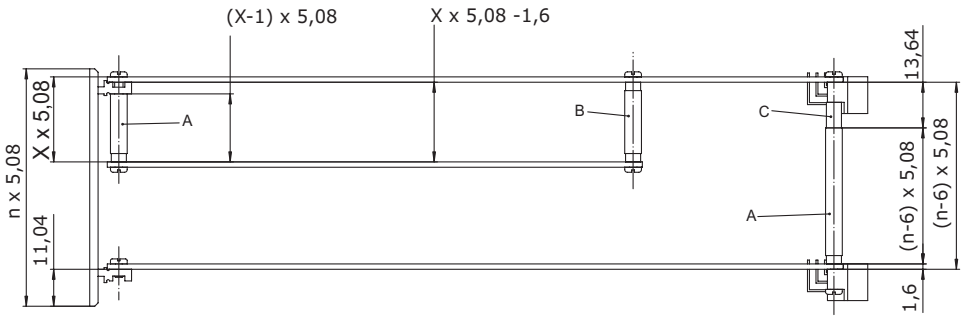
3.4 Protective Covers for 6 U Printed Board

- Material: Polyester film mat, thickness 0.2 mm, UL94 VTM-2
- Mechanical protection of soldering side

For Card Depth		Part-No.
mm	inch	
160	6.30	81-010-02

3.5 Spacers and Mounting Plates

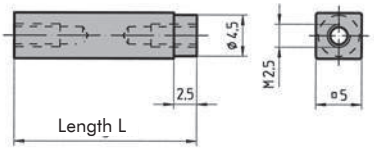
- Four-sided, nickel-plated brass spacers with M2.5 internal threads at both ends
- Using these spacers, additional PCBs may be mounted at a horizontal pitch of 5.08 mm
- Mounting plate is 1.5 mm galvanised steel with mounting holes corresponding to PCBs conforming to IEC 60297



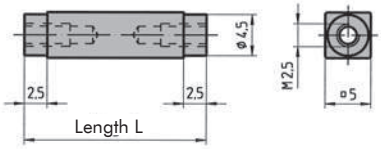
n * 5.08 = theoretical width of front panel
x * 5.08 = distance of printed PCBs
n = multiple of the 5.08 pitch of the selected front panel
x = selected multiple of the 5.08 pitch for the distance of printed PCBs



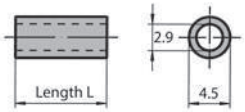
Series A



Series B



Series C



3.5.1 Spacers Series A

- Use between PCB mounting lugs and PCBs
- Gives 5.08 mm pitch

Length L		Part-No.
mm	inch	
10.16	0.40	61-300
15.24	0.60	61-301
20.32	0.80	61-302

Other lengths available on request

3.5.2 Spacers Series B

- Use between two PCBs
- Gives 5.08 mm pitch

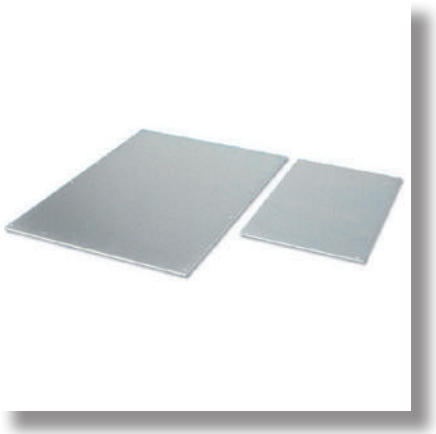
Length L		Part-No.
mm	inch	
13.64	0.53	61-320
18.72	0.73	61-321
23.80	0.93	61-322

3.5.3 Spacers Series C

- Use between a PCB with connector and a second PCB

Length L		Part-No.
mm	inch	
7.64	0.30	61-340

3.5.4 Mounting Plates



3.5.4 Mounting Plates

- Dimensions identical to eurocard dimensions
- 1.5 mm galvanized sheet steel
- **Scope of delivery:**
  - 1 mounting plate
- Assembly material, see below

Height	Dimensions	Part-No.
3 U	100 x 160 mm (3.93" x 6.29")	61-350
6 U	233.35 x 160 mm (9.18" x 6.29")	61-351

Assembly Material

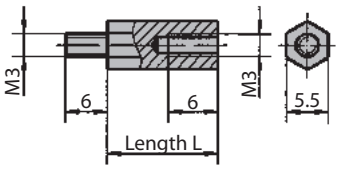
Description	Part-No.
Screws recessed M2.5 x 5	5571-05

3.6 Hexagonal Spacers M3 Thread

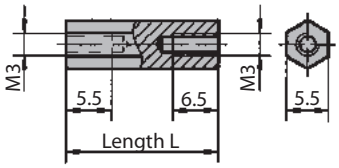
- Galvanized steel
- Ideal for use as supports or spacers
- **Scope of delivery:**
  - 1 spacer



1922-0x



1923-0x



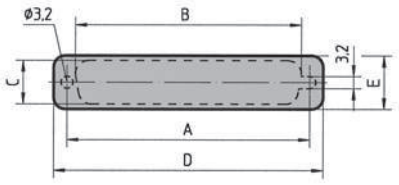
3.6 Hexagonal Spacers, M3 Thread

Length L mm	Length L inch	Part-No.
10	0.39	1922-01
15	0.59	1922-02
30	1.18	1922-05
40	1.57	1922-07

Length L mm	Length L inch	Part-No.
8.5	0.33	1923-01
13.5	0.53	1923-02

3.7 Covering Caps

- The caps, fit openings for D-Sub connectors and can be fitted without special tools
- Material: ABS grey UL94 HB
- **Scope of delivery:**
  - Plastic covering caps



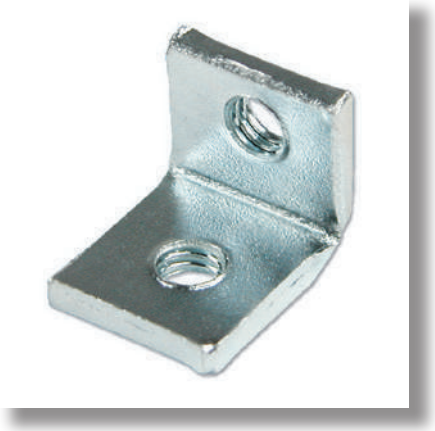


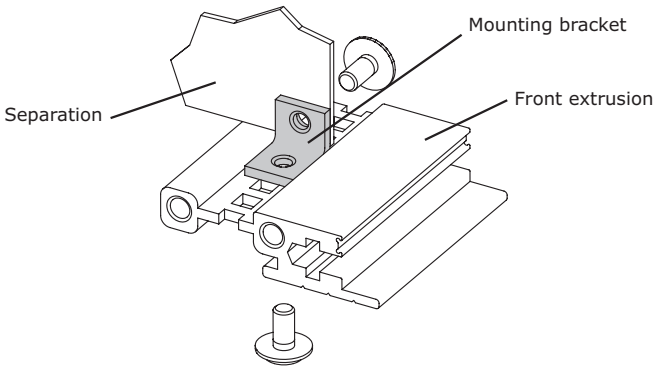
3.6 Covering Caps

Opening		A mm	B mm	C mm	D mm	E mm	Part-No.
DB9	9-poles	25.0	20.5	11.4	32.0	14.0	61-920
DB15	15-poles	33.3	28.8	11.4	40.3	14.0	61-921
DB25	25-poles	47.0	42.5	11.4	54.0	14.0	61-922
DB37	37-poles	63.5	59.1	11.4	70.5	14.0	61-923

3.8 Mounting Brackets

- Assembly of a separation
- Separations are manufactured as required by the customer
- Sheet steel
- **Scope of delivery:**
  - 1 mounting bracket
- Assembly material, see below



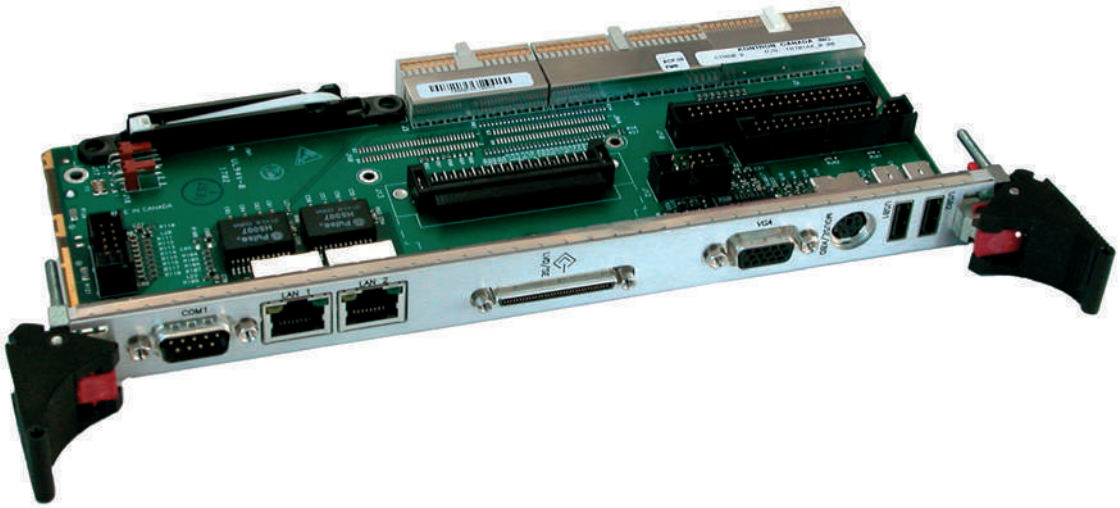


3.8 Mounting Brackets

Description	Part-No.
Mounting brackets	61-416

Assembly Material

Description	Part-No.
Round head screws cross recessed M3 x 6	5335-06
Round head screws Torx M3 x 6, size T10	5473-01



Source: Kontron, Germany



4: Handles / Feet



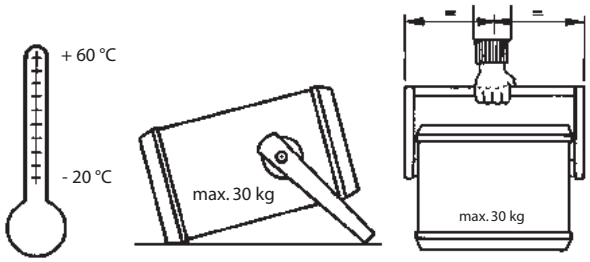


4.1 Handles	**E | 4_2**
4.1.1 Universal Carrying Handles	E | 4_2
4.1.2 U-Handles Aluminium, Anodised	E | 4_3
4.1.3 Die Cast Aluminium Handles	E | 4_3
4.1.4 Small Component U-Handle, Steel	E | 4_4
4.2 Feet	**E | 4_5**
4.2.1 Case Feet Type 15	E | 4_5
4.2.2 Case Feet Type 14	E | 4_5
4.2.4 Push in Feet	E | 4_6
4.2.6 Bumpon (Self adhesive Feet)	E | 4_6



4.1 Handles

4.1.1 Universal Carrying Handles



- For portable units up to 6 U
- Sturdy and light
- Easy assembly
- Carrying capacity up to 30 kg
- Lock in increments of 30°
- Operating temperature –20°C to +60°C
- Fixing material included
- **Scope of delivery:**
  - 2 side parts assembled
  - 2 raised cross recessed screws M4 x 16
  - 2 raised cross recessed screws M5 x 16
  - 2 press-in nuts M4
  - 4 caps
- Cross bar see 4.1.1.1



4.1.1 Universal Carrying Handles

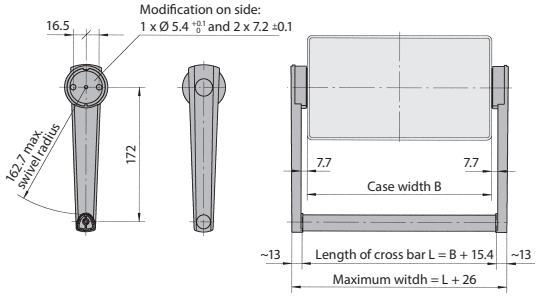
Description	Material	Colour	Part-No.
Side arm assembled	Glass fiber reinforced plastic	Black (Ral 9005)	61-160-60



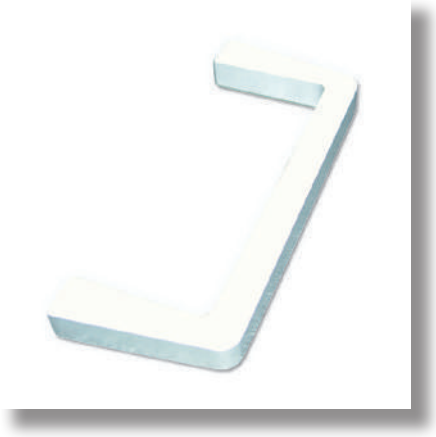
4.1.1.1 Cross Bars

- Aluminium, coated (softfeel)
- **Scope of delivery:**
  - 1 handle extrusion

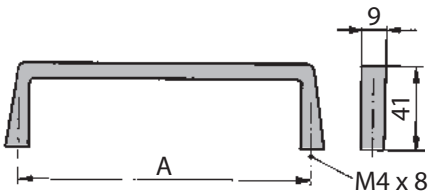
Description	Front	Length L	Part-No.
Handle extrusion	M5 x 15	266.4	66-308-20
	M5 x 15	373.1	66-308-21
	Ø 4.2 mm	1000	66-308-40



4.1.2 U-Handles Aluminium, Anodised



4.1.2 U-Handles Aluminium, Anodised



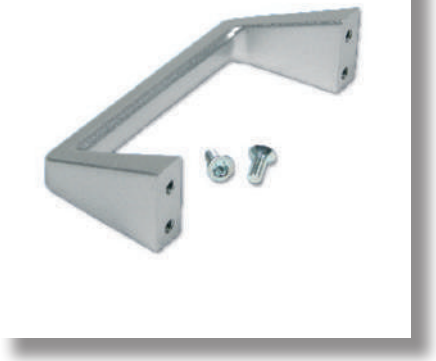
- Anodised aluminium extrusion
- Width: 9 mm
- **Scope of delivery:**
  - 1 aluminium handle
- Per handle 2 screws are needed, see below

For Case Height	A		Colour	Part-No.
	mm	inch		
2 U	44.5	1.75	Clear anodised	60-527
			Black anodised	60-527-6
3 U	88.9	3.50	Clear anodised	60-528
			Black anodised	60-528-6
4 U	133.4	5.25	Clear anodised	60-529
			Black anodised	60-529-6
5 U	177.8	7.00	Clear anodised	60-530
			Black anodised	60-530-6
6 U	222.3	8.75	Clear anodised	60-531
			Black anodised	60-531-6

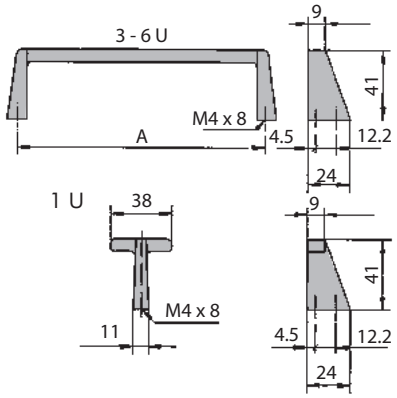
Assembly Material

Description	Part-No.
Cross recessed cylinderhead earthing screw M4 x 10	61-260
Torx cylinderhead earthing screw M4 x 10, size T20	5443-01
Cross recessed countersunk screw M4 x 10	5342-10
Torx countersunk screw M4 x 10, size T20	5470-26

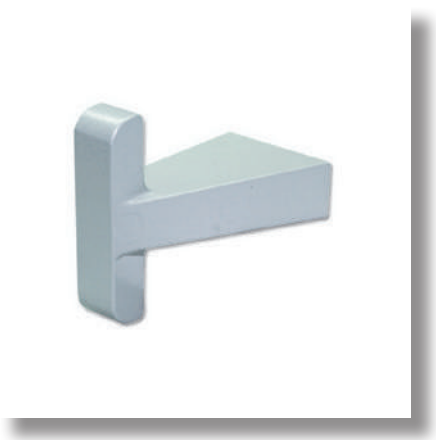
4.1.3 Die Cast Aluminium Handles



4.1.3 Die Cast Aluminium Handles



- Universal handle
- Wet painted white aluminium (RAL 9006)
- Material 1 U version: Die cast zinc
- **Scope of delivery:**
  - 1 die cast handle
- Per handle 2 screws are needed see below



For Case Height	A		Part-No.
	mm	inch	
1 U	-	-	60-541
3 U	88.9	3.50	60-553
4 U	133.4	5.25	60-554
6 U	222.3	8.75	60-556

Assembly Material

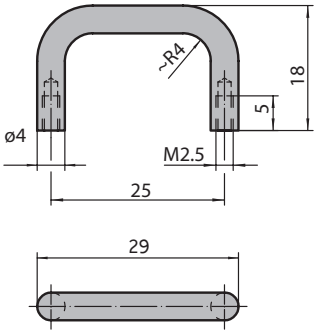
Description	Part-No.
Cross recessed cylinderhead earthing screw M4 x 10	61-260
Torx cylinderhead earthing screw M4 x 10, size T20	5443-01
Cross recessed countersunk screw M4 x 10	5342-10
Torx countersunk screw M4 x 10, size T20	5470-26

4.1.4 Small Component U-Handle, Steel



4.1.4 Small Component U-Handle, Steel

- For small components
- Steel powder coated black (RAL 9005)
- **Scope of delivery:**
  - 1 handle
- Per handle 2 screws are needed, see below



Description	Part-No.
U-handle steel, black	60-539

Assembly Material

Description	Part-No.
Cross recessed cylinderhead screw M2.5 x 6	5325-06
Torx cylinderhead screw M2.5 x 6	5470-04
Cross recessed countersunk screw M2.5 x 6	5322-06
Torx countersunk screw M2.5 x 6, size T8	5470-20

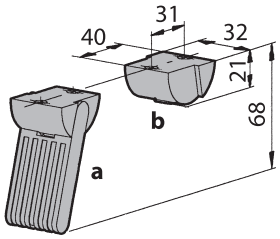


4.2 Feet

4.2.1 Case Feet Type 15



4.2.1 Case Feet Type 15

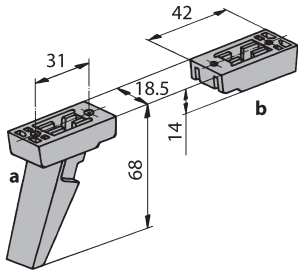


- With and without tilt feet
- Glass-fiber reinforced plastic, UL94 V-0
- Including screws 3.5 x 8
- Up to 30 kg carring capacity per set
- **Scope of delivery:**
  - 2 + 2 case feet, incl. rubber inserts NBR
  - 8 countersunk PT-screws 3.5 x 8

Description	Colour	Screw	Part-No.
Case feet 2 x **a** + 2 x **b**	Light grey (RAL 7035)	Cross recessed	63-524
		Torx	63K524
Case feet 2 x **a** + 2 x **b**	Black (RAL 9005)	Cross recessed	63-526
		Torx	63K526
Case feet 2 x **a** + 2 x **b**	Dark grey (special)	Cross recessed	63-525
		Torx	63K525

4.2.2 Case Feet Type 14





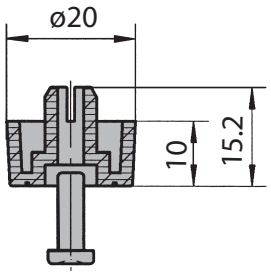
- With or without tilt feet
- Glass-fiber reinforced plastic, UL94 V-0
- Including screws 3.5 x 7
- Up to 30 kg carring capacity per set
- **Scope of delivery:**
  - 4 case feet
  - 8 cross recessed countersunk PT-screws 3.5 x 7
  - 4 rubber inserts NBR

Description	Colour	Part-No.
Case feet 4 x **b**	Light grey (RAL 7035)	63-019
Case feet 4 x **b**	Black (RAL 9005)	63-321
Case feet 2 x **a** + 2 x **b**	Light grey (RAL 7035)	63-018
Case feet 2 x **a** + 2 x **b**	Black (RAL 9005)	63-320

4.2.3 Push in Feet



- Plastic, UL94 V-0
- Easy and fast mounting without tools
- Drilling: Ø8 ± 0.1 mm
- Sheet metal: 1 to 2.5 mm
- • Set of 4 pieces plastic feet
  • Incl. push rivet



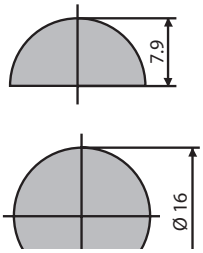
Description	Part-No.
Set of case feet light grey (RAL 7035)	63-529
Set of case feet black (RAL 9005)	63-528

4.2.4 Bumpon (Self adhesive Feet)



5.2.6 Bumpon (Self adhesive Feet)

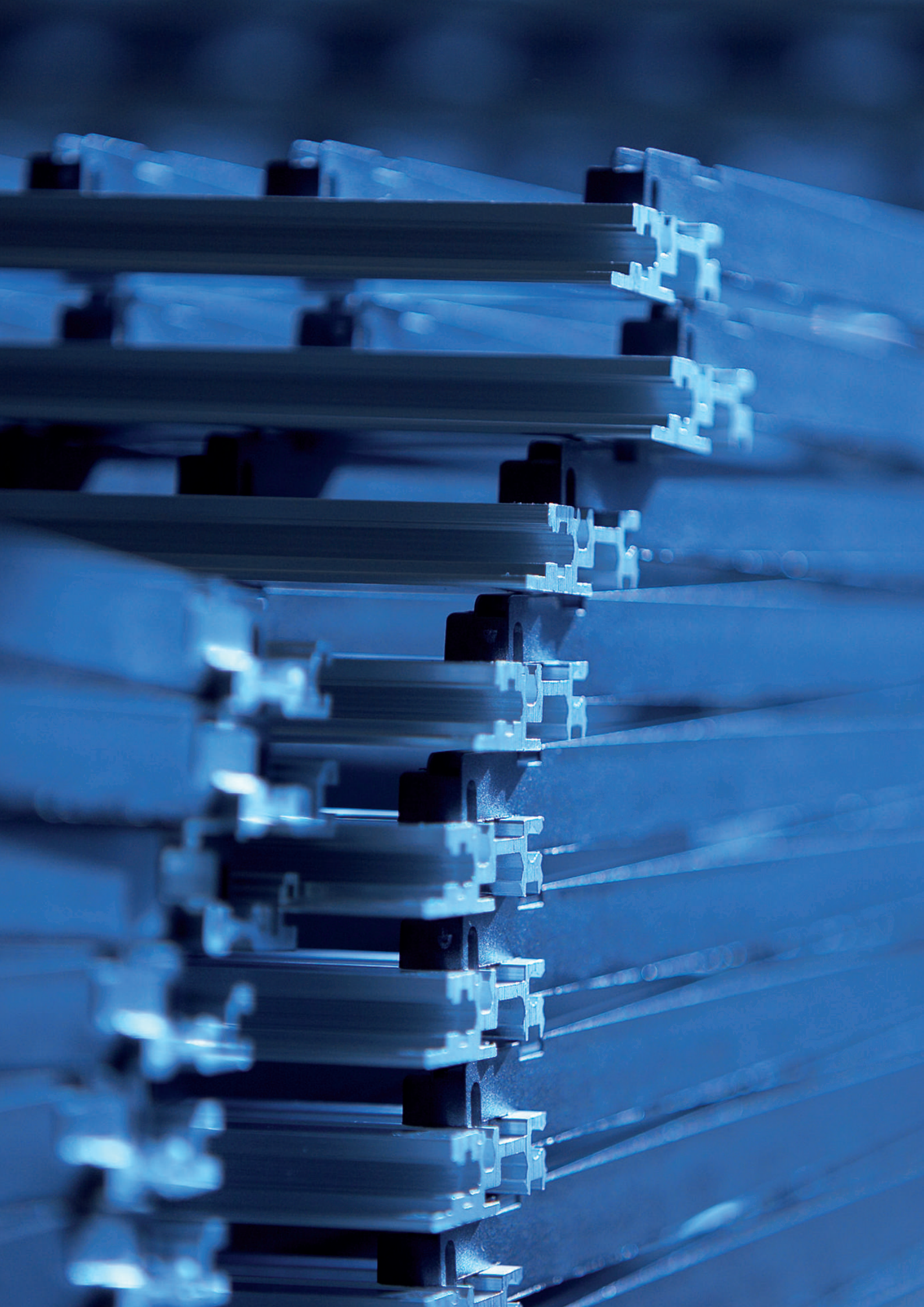
- Self adhesive bumpon
- Black polyurethane, UL94 HB
- **Scope of delivery:**
  • 1 bumpon



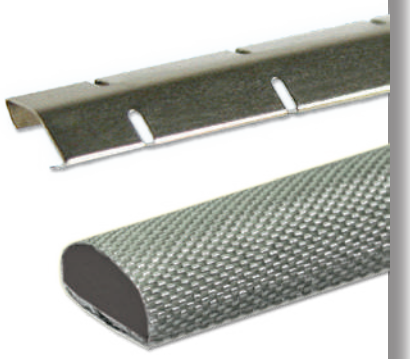
Description	Part-No.
1 plastic bumpon	7650-52

E

Notes



5: EMC / HF Gaskets



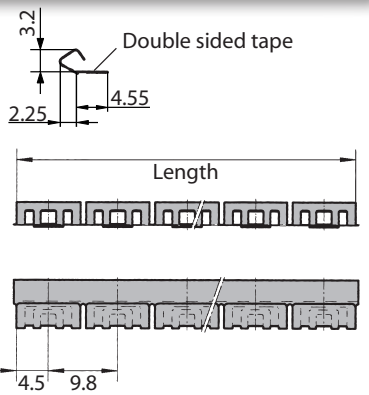
5.1 EMC / HF Gaskets	**E | 5_2**
5.1.1 EMC Contact Springs (A)	E | 5_2
5.1.2 EMC Contact Strips (A)	E | 5_2
5.1.3 HF Gaskets (A)	E | 5_3
5.1.4 EMC Gaskets (B) Stainless Steel	E | 5_3
5.1.5 EMC Gaskets (B) Foam Core	E | 5_3
5.1.6 EMC Contact Strips (B)	E | 5_4
5.1.7 HF Spring (C)	E | 5_4
5.1.8 EMC Contact Strips (C)	E | 5_4
5.1.9 EMC Contact Strips(D)	E | 5_4
5.1.10 HF Gasket	E | 5_5
5.1.11 Sealing Gasket	E | 5_5



5.1 EMC / HF Gaskets

5.1.1 EMC Contact Springs (A)





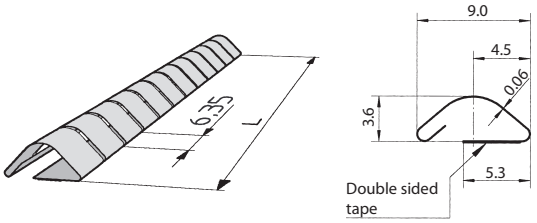
5.1.1 EMC Contact Springs (A)

- Stainless steel
- Side front panel to end side panel
- EMC divinding extrusion 66-266
- Self-adhesive

For Size	Length		Packing Units	Part-No.
	mm	inch		
2 U	58	2.32	2 pcs.	63-873-03
3 U	107	4.28	2 pcs.	63-873-01
6 U	2 x 107	2 x 4.28	4 pcs.	63-873-02
4 U	146.2	5385	2 pcs.	63-873-04
6 U	244.2	9.77	2 pcs.	63-873-05

5.1.2 EMC Contact Strips (A)





5.1.2 EMC Contact Strips (A)

- BeCu galvanised
- Side front panel to end side panel
- Self-adhesive

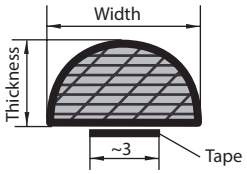
Division	For Size	Length		Packing Units	Part-No.
		mm	inch		
17	3 U	108	4.32	2 pcs.	63-836-53
24	4 U	152.4	6.00	2 pcs.	63-836-54
38	6 U	241.3	9.65	2 pcs.	63-836-56
45	7 U	285.8	11.42	1 pc.	61-800-07
66	10 U / 84 HP	419.1	16.76	1 pc.	61-800-10

5.1.3 HF Gaskets (A)



5.1.3.1 HF Gaskets (A)

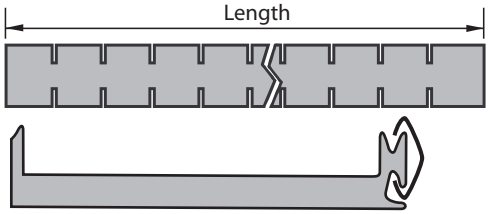
- D-shaped
- Polyurethane foam core
- Conductive fabric (Ni+Cu plated)
- Self-adhesive



Width		Thickness		Length		Packing Units	Part-No.
mm	inch	mm	inch	mm	inch		
6.35	0.25	3.56	0.14	142.5	5.6	1 pc.	7820-90
				245.0	9.65	1 pc.	7820-91
				88.0	3.46	1 pc.	7820-92

5.1.4 EMC Gaskets (B) Stainless Steel



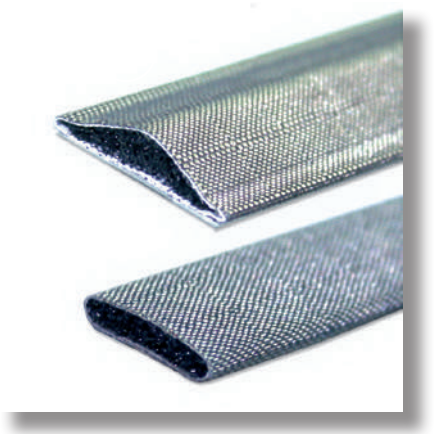


5.1.4 EMC Gasket (A and B)

- Stainless steel

For size	Length		Part-No.
	mm	inch	
2 U	57.15	2.25	81-062-02
3 U	101.6	4.00	81-062-03
4 U	146.05	5.75	81-062-04
6 U	234.95	9.25	81-062-06
7 U	279.4	11.00	81-062-07
8 U	323.85	12.75	81-062-08
9 U	368.3	14.50	81-062-09

5.1.5 EMC Gaskets (B) Foam Core

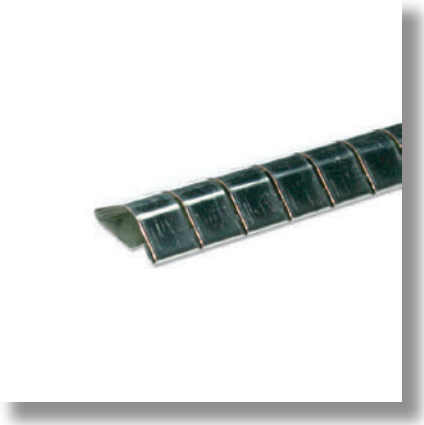


5.1.5 EMC-Gaskets (B)

- Polyurethane foam core
- Conductive fabric (Ni+Cu plated)
- Self-adhesive

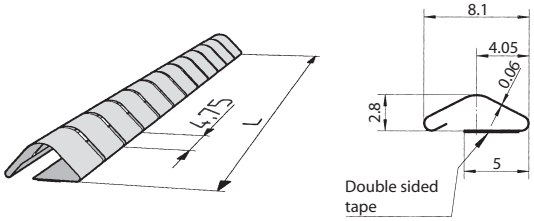
Description	Part-No.
EMC-gasket rectangular. 2.0 x 7 mm, L = 300 mm	7820-95
EMC-gasket triangular. 2.3 x 10 mm, L = 300 mm	7821-300
EMC-gasket triangular. 2.3 x 10 mm, L = 2000 mm	7821-2000

5.1.6 EMC Contact Strips (B)



5.1.6 EMC Contact Strips (B)

- BeCu galvanised
- For part front panels
- Self-adhesive



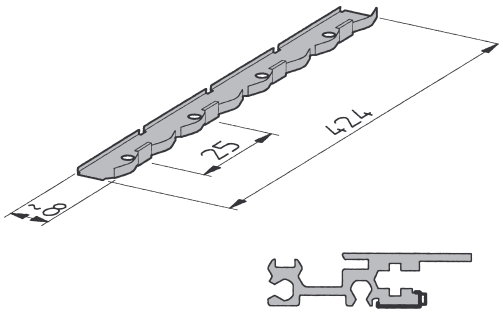
Division	For Size	Length		Packing Units	Part-No.
		mm	inch		
17	3 U	80.4	3.16	1 pc.	7738-13
45	6 U	213.4	8.40	1 pc.	7738-16

5.1.7 HF Spring (C)



5.1.7 HF Spring (C)

- Stainless steel
- Snapped-in on the extrusion
- **Scope of delivery:**
  - 2 pcs. HF spring 84 HP



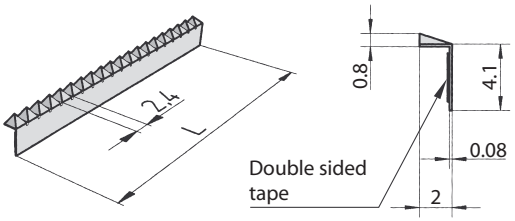
Description	Part-No.
1 set of 2 HF spring 84 HP	7739-14-4

5.1.8 EMC Contact Strips (C)



5.1.8 EMC Contact Strips (C)

- BeCu galvanised
- For front panels, fixing on extrusion
- Self-adhesive
- **Scope of delivery:**
  - 2 pcs. EMC contact strips



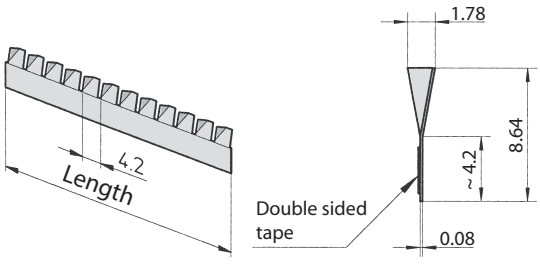
For HP	Length		Part-No.
	mm	inch	
42	212.1	8.35	63-836-67
63	318.1	12.52	63-836-68
84	424.2	16.70	63-836-70

5.1.9 EMC Contact Strips(D)

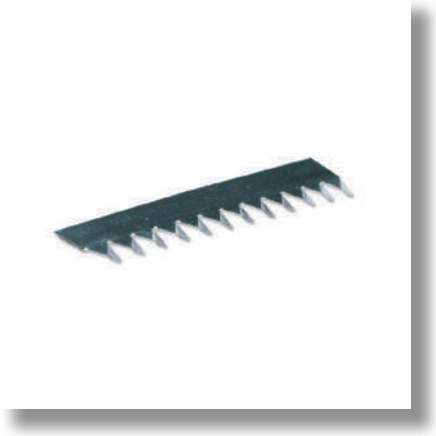


5.1.9 EMC Contact Strips (D)

- BeCu galvanised
- Self-adhesive

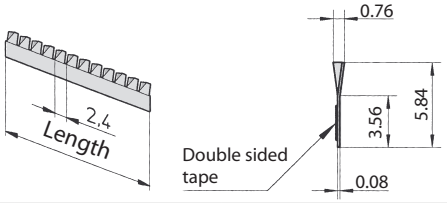


Division	For Size	Length		Packing Units	Part-No.
		mm	inch		
103	84 HP	431.55	16.99	1 pc.	7739-37



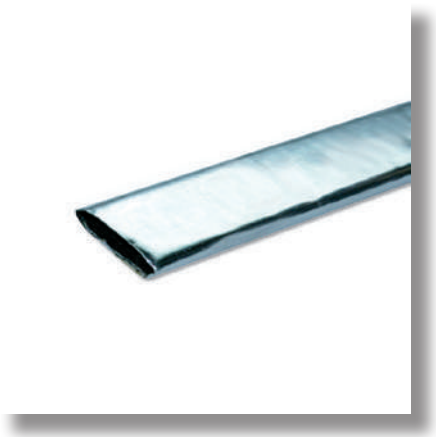
5.1.9.1 EMC Contact Strips

- For fixing on flat front panels
- Self-adhesive



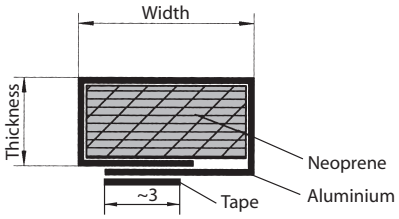
Division	For Size	Length		Packing Units	Part-No.
		mm	inch		
12	-	29	1.14	1 pc.	7739-31
178	84 HP	429.5	16.91	2 pc.	63-836-80

5.1.10 HF Gasket



5.1.10 HF Gasket

- Neoprene foam core
- Aluminium cover
- Self-adhesive

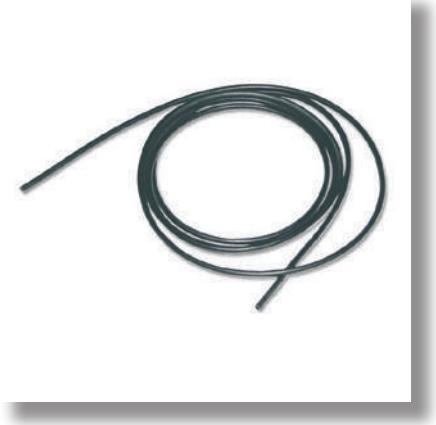


Width		Thickness		Length		Packing Units	Part-No.
mm	inch	mm	inch	mm	inch		
7	0.27	2	0.07	30	1.18	16 pcs.	63-836-30
				115	4.50	1 pc.	7820-27
				195	7.67	4 pcs.	63-836-10
				236	9.29	4 pcs.	63K836-15
				245	9.65	1 pc.	7820-22
				255	10.04	4 pcs.	63-836-11
				316	12.44	4 pcs.	63K836-16
				345	13.58	4 pcs.	63K836-04
				395	15.55	1 pc.	7820-26
				430	16.93	1 pc.	7820-21
				445	17.52	4 pcs.	63K836-05
		3	0.12	216.5	8.52	4 pcs.	63-836-20
				323	12.72	4 pcs.	63-836-21
				430	16.93	4 pcs.	63-836-23

5.1.11 Sealing Gasket

- For higher IP-protection and EMC shielding in one
- Conductive sealing
- **Scope of delivery:**
  - 1 sealing gasket (conductive)

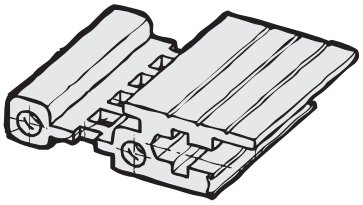


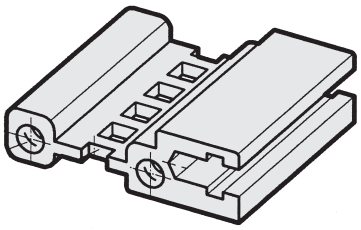


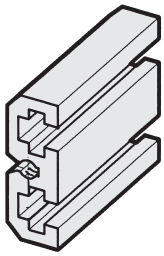
5.1.11 Sealing Gasket

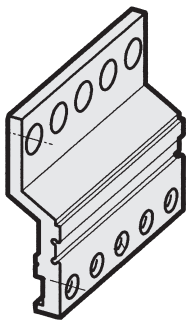
Description	Part-No.
Sealing gasket conductive, length 700 mm	33E025

6: Extrusions









6.1 Front Extrusions **E | 6_3**

6.1.1 Front Extrusion 66-111, IEC E | 6_3

6.1.2 Front Extrusion 66-112 E | 6_4

6.1.3 Front Extrusion 66-665, IEC E | 6_4

6.1.4 Horizontal Front Sub Division Extrusion 66-245, IEC E | 6_5

6.1.5 Horizontal Front Sub Division Extrusion 66-243, IEC E | 6_5

6.1.6 Front Extrusion 66-282, IEC E | 6_5

6.1.7 Front Extrusion 66-677, IEEE E | 6_6

6.1.8 Front Extrusion 66-678, IEEE E | 6_7

6.1.9 Front Extrusion 66-666, IEEE E | 6_7

6.1.10 Front Extrusion 66-281 , IEEE E | 6_7

6.1.11 Horizontal Front Sub Division Extrusion 66-240, IEEE E | 6_8

6.1.12 uTCA Extrusion 66-242, uTCA E | 6_8

6.2 Internal Extrusions **E | 6_9**

6.2.1 Internal Extrusion 66-193 for Insulated Backplane Mounting E | 6_9

6.2.2 Internal Extrusion 66-194 for Conductive Backplane Mounting E | 6_10

6.2.3 Standard Internal Extrusion 66-144 E | 6_10

6.2.4 Internal Extrusion 66-138 for Card Guides E | 6_11

6.2.5 Standard Internal Extrusion 66-140 E | 6_12

6.2.6 Standard Internal Extrusion 66-137 E | 6_12

6.3 Center Extrusions **E | 6_13**

6.3.1 Double Extrusion 66-192 for Insulated Backplane Mounting E | 6_13

6.3.2 Double Extrusion 66-195 for Conductive Backplane Mounting E | 6_13

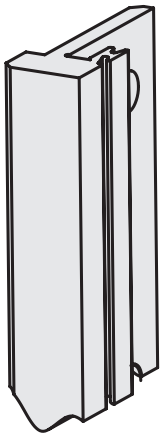
6.3.3 Central Extrusion 66-190 E | 6_14

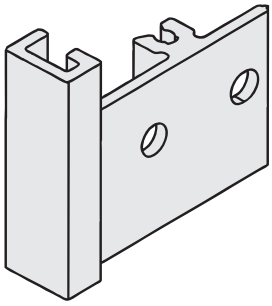
6.4 Edge Connector Extrusion and Insulating Strips **E | 6_15**

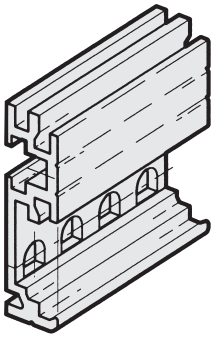
6.4.1 Edge Connector Extrusion 66-145 E | 6_15

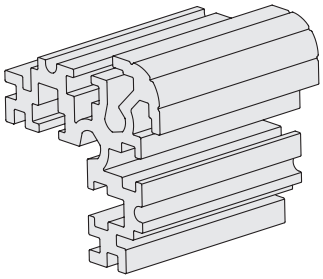
6.4.2 Edge Connector Extrusion 66-147 E | 6_16

6.4.3 Insulating Strips 66-901 E | 6_16









6.5 Height Extrusions **E | 6_17**

6.5.1 Height Extrusion 19" 66-175 E | 6_17

6.5.2 Height Extrusions 19" 66-275 E | 6_17

6.5.3 Height Extrusion 66-174 E | 6_18

6.5.4 Height Extrusions 66-274 E | 6_18

6.5.5 Height Extrusion 66-173 E | 6_19

6.5.6 Height Extrusion 19" 66-179 E | 6_19

6.6 Height Divider Extrusions **E | 6_20**

6.6.1 Height Divider Extrusion 66-115 E | 6_20

6.6.2 Height Divider Extrusion 66-107 E | 6_20

6.6.3 Height Divider Extrusion 66-266 E | 6_21

6.6.4 Height Divider Extrusion 66-116 E | 6_21

6.7 Depth Extrusions **E | 6_22**

6.7.1 Depth Extrusion 66-177 E | 6_22

6.7.2 Depth Divider Extrusion 66-176 E | 6_22

6.7.3 Depth Extrusion 66-188 E | 6_23

6.7.4 Side Wall Extrusion 66-106 E | 6_23

6.8 Miscellaneous Extrusions **E | 6_24**

6.8.1 Card Guide Extrusion 66-122 IEC E | 6_24

6.8.2 Card Guide Extrusion 66-452 IEEE E | 6_25

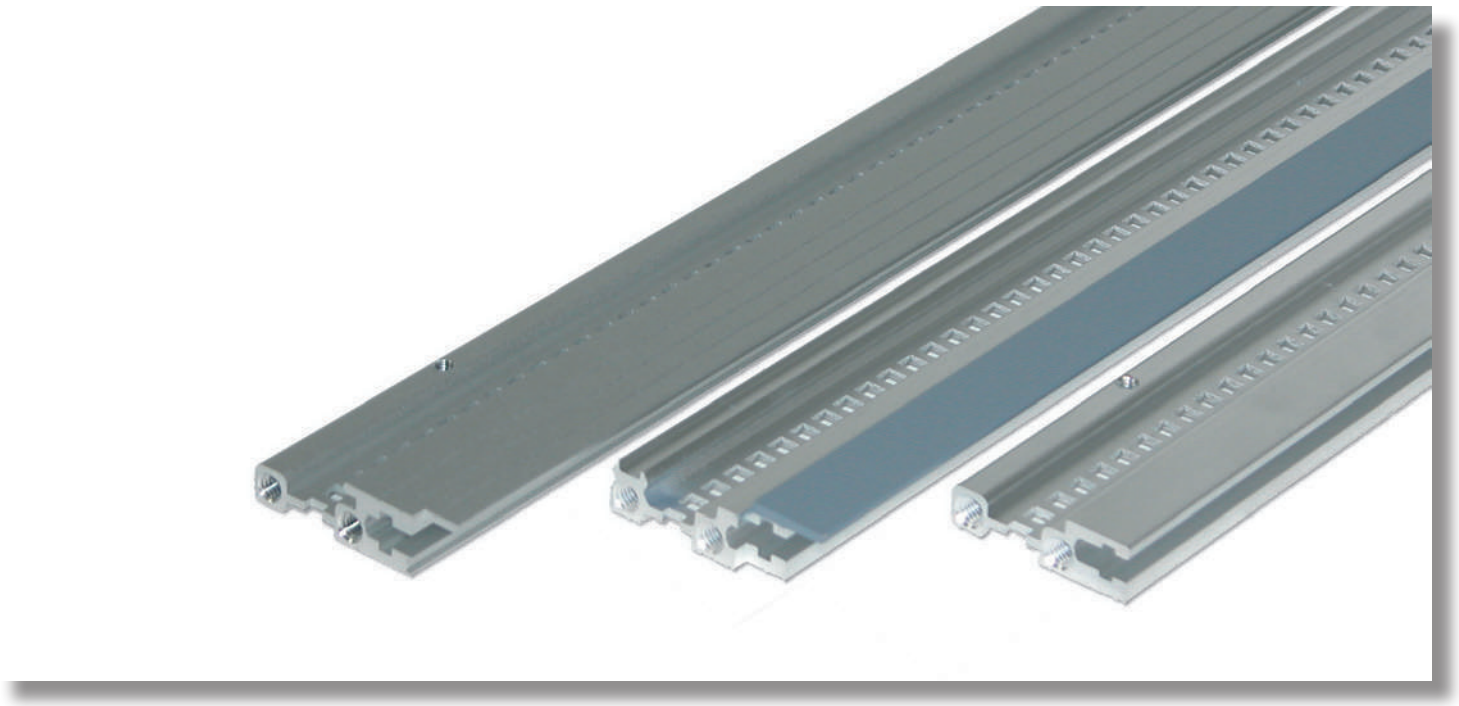
6.8.3 Card Guide Extrusion 66-453 IEEE E | 6_25

6.8.4 Hinge Extrusion 66-230 E | 6_26

6.8.5 Contact Bracket For EMC Front Panels E | 6_27

6.8.6 Front Panel Extrusion E | 6_28

6.8.7 Corner Extrusion 66-244 E | 6_29

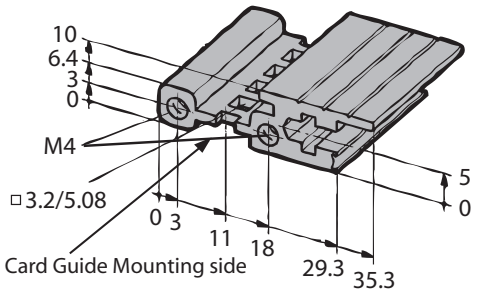


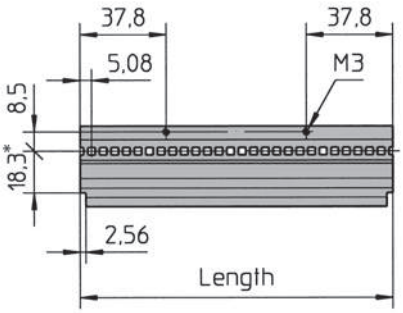
6.1 Front Extrusions

- Material: Aluminium unless otherwise specified

6.1.1 Front Extrusion 66-111, IEC

- For sub racks and cases front
- Accept 2 x 6 mm tapped strips
- **Scope of delivery:**
  - 1 front extrusion without assembly material

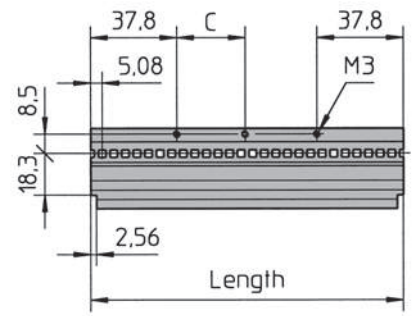




6.1.1.1 Standard Version

Length for HP	mm	inch	Part-No. clear anodised	clear passivated	raw
21	111.8	4.40	66-111-26	-	
28	147.3	5.80	66-111-25	-	-
32	167.6	6.80	66-111-62	-	-
42	218.4	8.60	66-111-60	66-111-75	-
42	218.4	8.60	-	66-111-160*	-
63	325.1	12.80	66-111-61	66-111-76	-
81	416.6	16.40	66-111-22	66-111-77	-
84	431.8	17.00	66-111-23	66-111-78	-
	1350.0	53.15		-	66-111-19

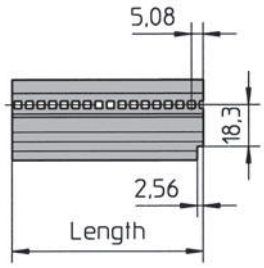
* for Systemkit 12K



6.1.1.2 EMC Version

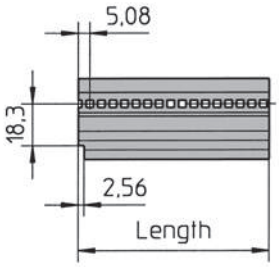
Length for HP	mm	inch	Holes n x C	Part-No. clear passivated
42	218.4	8.60	2 x 71.42	66-111-50
63	325.1	12.80	3 x 83.17	66-111-51
81	416.6	16.40	4 x 85.24	66-111-52
84	431.8	17.00	4 x 89.05	66-111-53
84	431.8	17.00	4 x 89.05	66-111-153*

* for Systemkit 12K



6.1.1.3 Height Divider Right, IEC

Length for HP	mm	inch	Part-No. anodised
8.5	43.18	1.70	66-111-71
12.5	63.50	2.50	66-111-72

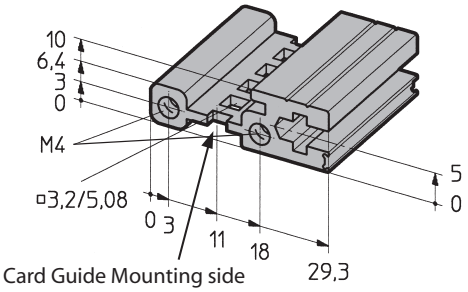


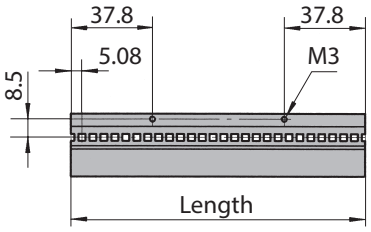
6.1.1.4 Height Divider Left, IEC

Length for HP	mm	inch	Part-No. anodised
8.5	43.18	1.70	66-111-81
12.5	63.50	2.50	66-111-82

6.1.2 Front Extrusion 66-112

- For sub racks and cases front, without protrusion
- Accept 2 x 6 mm tapped strips
- **Scope of delivery:**
  - 1 front extrusion without assembly material





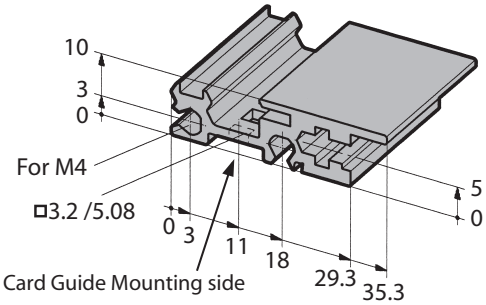
6.1.2.1 Standard Version

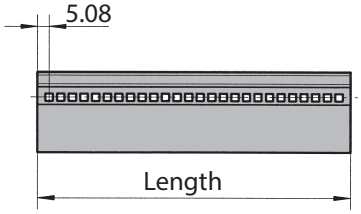
Length for HP	mm	inch	Part No. clear passivated	raw
21	111.8	4.40	66-112-26	-
28	147.3	5.80	66-112-25	-
32	167.6	6.80	66-112-47*	-
42	218.4	8.60	66-112-60	-
63	325.1	12.80	66-112-61	-
81	416.6	16.40	66-112-22	-
84	431.8	17.00	66-112-23	-
	1350.0	53.15	-	66-112-19

*=without M3

6.1.3 Front Extrusion 66-665, IEC

- For Magic-Kit 11 according to IEC/EN standard
- Accept 2 x 6 mm tapped strips
- **Scope of delivery:**
  - 1 front extrusion without assembly material



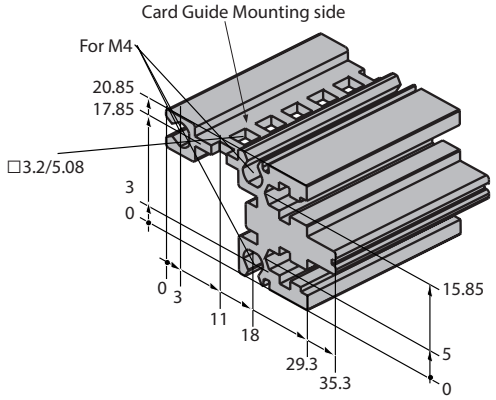


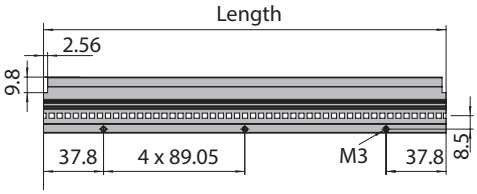
6.1.3.1 Standard Version

Length for HP	mm	inch	Part-No. clear passivated
84	431.8	17.00	66-665-53

6.1.4 Horizontal Front Sub Division Extrusion 66-245, IEC

- Card guide can be applied
- Accept 2 x 6 mm tapped strips
- **Scope of delivery:**
  - 1 front double extrusion IEC-special without assembly material



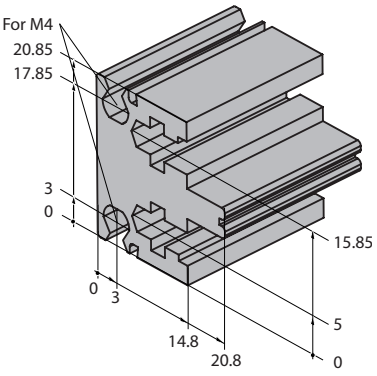


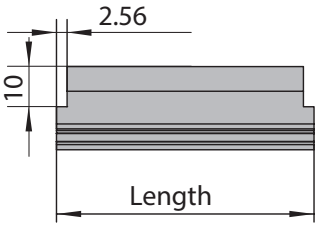
6.1.4.1 Standard Version

Length for HP	mm	inch	Part-No. clear passivated	raw
84	431.8	17.00	66-245-23	
	1350.0	53.14	-	66-245-19

6.1.5 Horizontal Front Sub Division Extrusion 66-243, IEC

- Card guide cannot be applied
- Accept 2 x 6 mm tapped strips
- **Scope of delivery:**
  - 1 front double extrusion IEC-special without assembly material



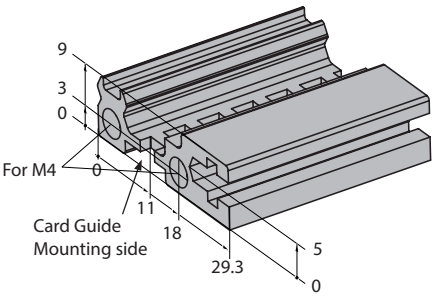


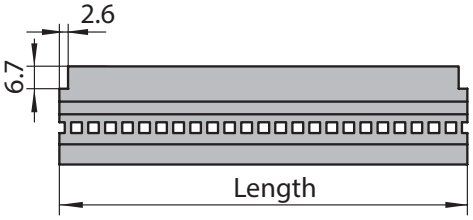
6.1.5.1 Standard Version

Length for HP	mm	inch	Part-No. clear passivated
84	431.8	17.00	66-243-23

6.1.6 Front Extrusion 66-282, IEC

- For Stylebox 15 Smart
- **Scope of delivery:**
  - 1 front extrusion without assembly material



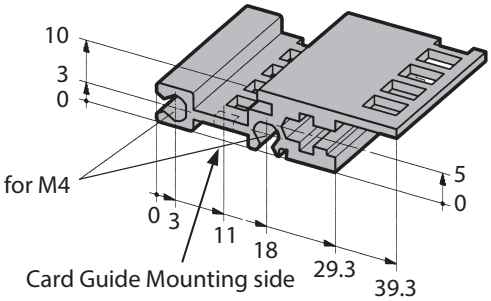


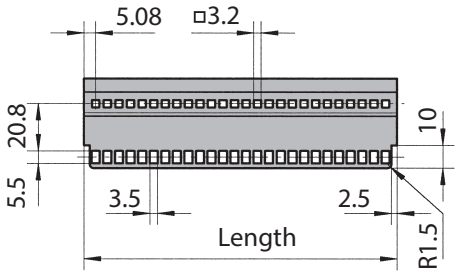
6.1.6 Front Extrusion 66-282, IEC

Length for HP	mm	inch	Part-No. clear passivated
42	218.4	8.60	66-282-26
63	325.1	12.80	66-282-27
84	431.8	17.00	66-282-28
	1350	53.15	66-282-19

6.1.7 Front Extrusion 66-677, IEEE

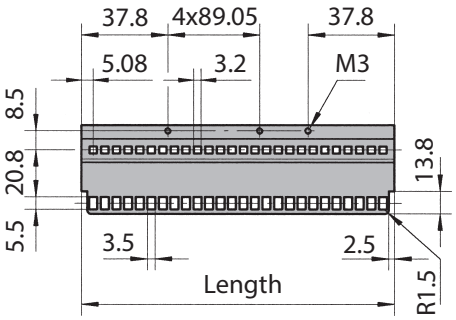
- Front separation extrusion according to IEEE standard
- Accept 2 x 6 mm tapped strips
- **Scope of delivery:**
  - 1 front extrusion without assembly material





6.1.7.1 Version for type 11 spirit according to IEEE standard

Length for HP	mm	inch	Part-No. clear passivated
84	431.8	17.00	66-677-23

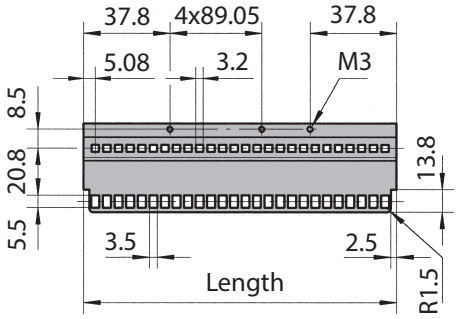


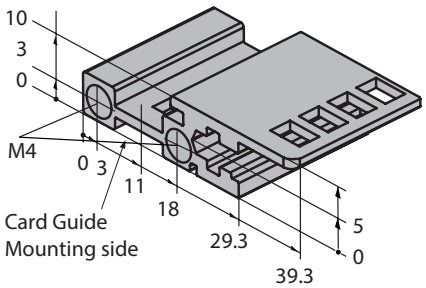
6.1.7.2 Version for Systemkit 12K and Stylebox 15 according to IEEE standard

Length for HP	mm	inch	Part-No. clear passivated
84	431.8	17.00	66-677-33

6.1.8 Front Extrusion 66-678, IEEE

- Front separation extrusion according to IEEE standard
- Accept 2 x 6 mm tapped strips
- **Scope of delivery:**
  - 1 front extrusion without assembly material



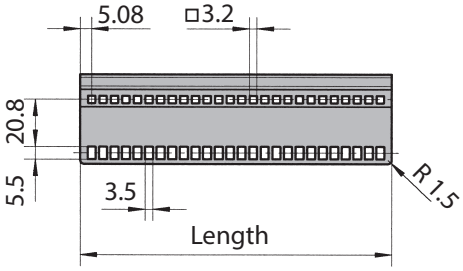


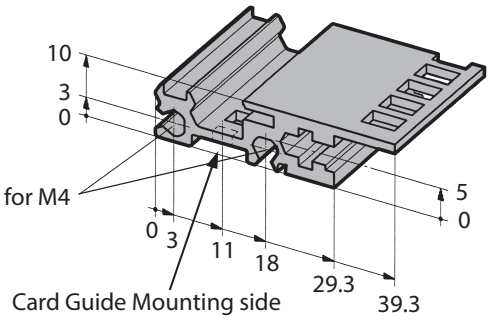
6.1.8.1 Version for Systemkit 12K according to IEEE standard

Length for HP	mm	inch	Part-No. clear passivated
84	431.8	17.00	66-678-23

6.1.9 Front Extrusion 66-666, IEEE

- For Spirit-Kit 11 according to IEEE standard
- Accept 2 x 6 mm tapped strips
- **Scope of delivery:**
  - 1 front extrusion without assembly material



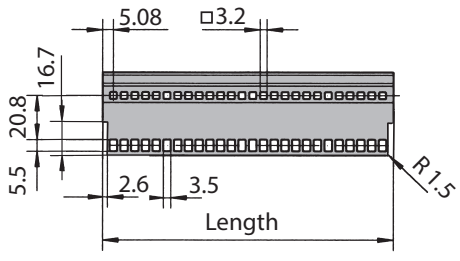


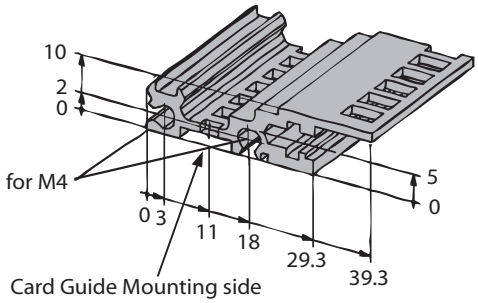
6.1.9.1 Standard Version

Length for HP	mm	inch	Part-No. clear passivated
84	431.8	17.00	66-666-53

6.1.10 Front Extrusion 66-281 , IEEE

- For Stylebox 15 standard according to IEEE
- Accept 2 x 6 mm tapped strips
- **Scope of delivery:**
  - 1 front extrusion without assembly material, powder-coated



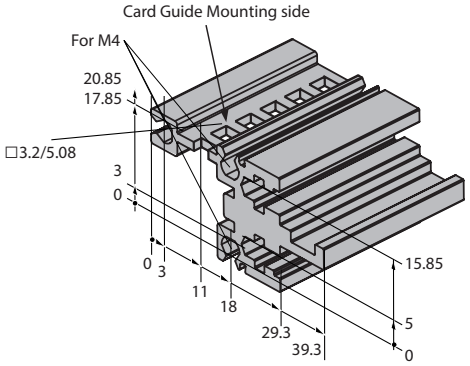


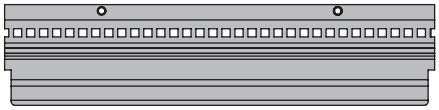
6.1.10.1 Standard Version

Length for HP	mm	inch	Part-No.
42	218.4	8.60	66-281-60
63	325.1	12.80	66-281-61
84	431.8	17.00	66-281-54

6.1.11 Horizontal Front Sub Division Extrusion 66-240, IEEE

- Card guide can be applied
- Accept 2 x 6 mm tapped strips
- **Scope of delivery:**
  - 1 front double extrusion IEEE-special without assembly material



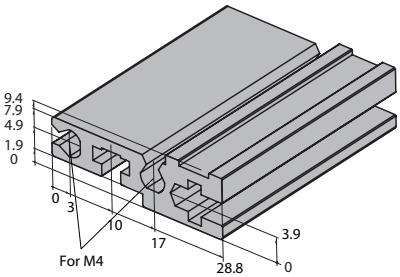


6.1.11.1 Standard Version

Length			Part-No.	
for HP	mm	inch	clear passivated	raw
84	431.8	17.00	66-240-153	-
	1350.0	53.14	-	66-240-19

6.1.12 uTCA Extrusion 66-242, uTCA

- Accept 2 x 6 mm tapped strips
- **Scope of delivery:**
  - 1 uTCA extrusion without assembly material



6.1.12.1 uTCA Extrusion

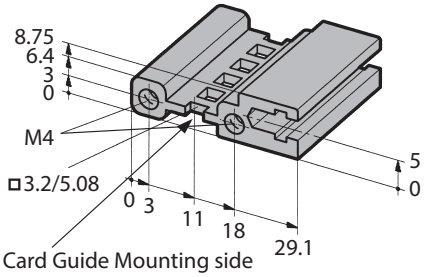
Description	Part-No.
uTCA Extrusion L=443.32 mm	66-242-443

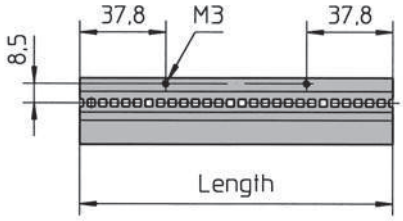


6.2 Internal Extrusions

6.2.1 Internal Extrusion 66-193 for Insulated Backplane Mounting

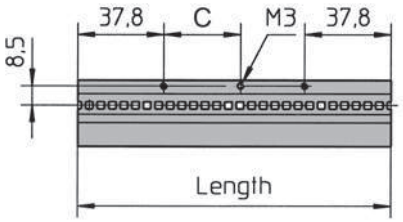
- For mounting backplanes in sub racks
- Insulating strip see 7.4.3
- Accept 1.8 x 5 mm tapped strips
- **Scope of delivery:**
  - 1 extrusion without assembly material





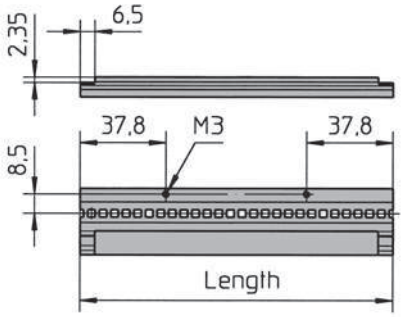
6.2.1.1 Standard Version

Length			Part-No.	
for HP	mm	inch	clear passivated	raw
32	167.6	6.60	66-193-26	-
42	218.4	8.60	66-193-20	-
63	325.1	12.80	66-193-21	-
81	416.6	16.40	66-193-22	-
84	431.8	17.00	66-193-23	-
	1350.0	53.14	-	66-193-19



6.2.1.2 EMC Version

Length			Holes	Part-No.
for HP	mm	inch	n x C	clear passivated
63	325.1	12.80	2 x 124.76	66-193-61
84	431.8	17.00	4 x 89.05	66-193-29
84	431.8	17.00	2 x 178.1	66-193-63

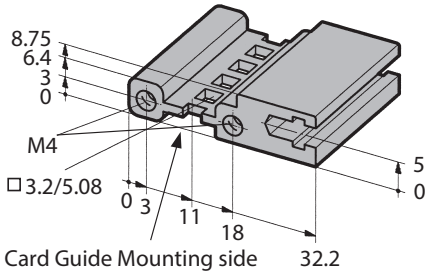


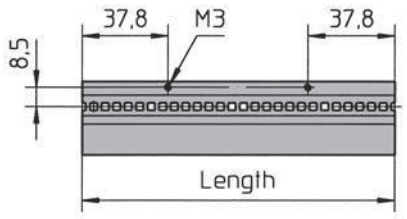
6.2.1.3 Version for Unibox 14

Length			Part-No.
for HP	mm	inch	clear passivated
81	416.6	16.40	66-193-24
84	431.8	17.00	66-193-25

6.2.2 Internal Extrusion 66-194 for Conductive Backplane Mounting

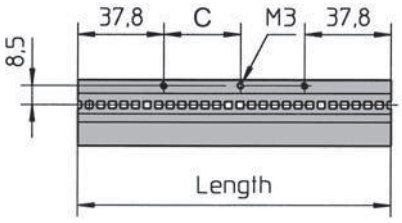
- For mounting backplanes without an insulating strip
- Accept 1.8 x 5 mm tapped strips
- **Scope of delivery:**
  - 1 extrusion without assembly material





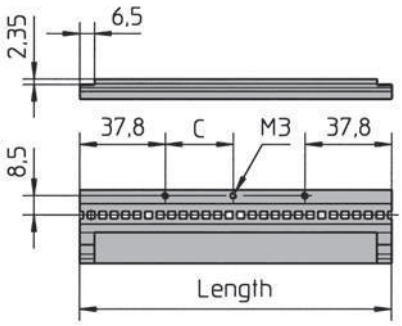
6.2.2.1 Standard Version

Length			Part-No.	
for HP	mm	inch	clear passivated	raw
42	218.4	8.60	66-194-20	-
63	325.1	12.80	66-194-21	-
84	431.8	17.00	66-194-23	-
	1350.0	53.14	-	66-194-19



6.2.2.2 EMC Version

Length			Holes	Part-No.
for HP	mm	inch	n x C	clear passivated
84	431.8	17.00	4 X 89.05	66-194-29



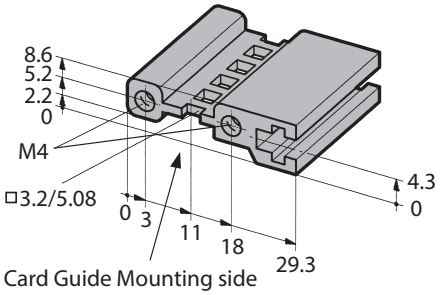
6.2.2.2 Version for Unibox 14

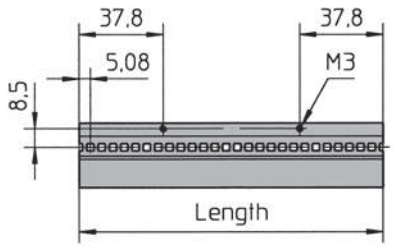
Length			Holes	Part-No.
for HP	mm	inch	n x C	clear passivated
81	416.6	16.40	2 x 170.48	66-194-24
84	431.8	17.00	2 x 178.1	66-194-25

E

6.2.3 Standard Internal Extrusion 66-144

- Standard extrusion for mounting supplementary edge connector extrusions in sub racks and cases
- Accept 2 x 6 mm tapped strips
- **Scope of delivery:**
  - 1 extrusion without assembly material



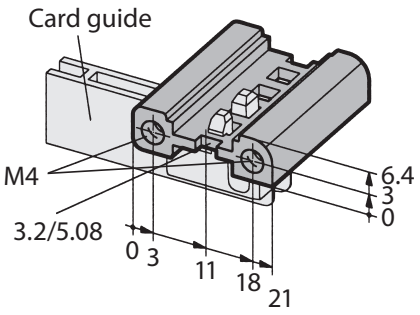


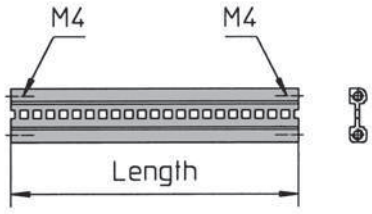
6.2.3.1 Standard Version

Length			Part-No.	
for HP	mm	inch	clear passivated	raw
42	218.4	8.60	66-144-60	-
63	325.1	12.80	66-144-61	-
81	416.6	16.40	66-144-22	-
84	431.8	17.00	66-144-23	-
	1350.0	53.14	-	66-144-19

6.2.4 Internal Extrusion 66-138 for Card Guides

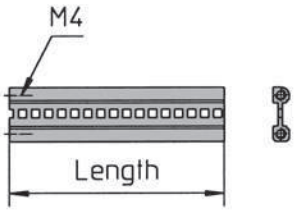
- For mounting card guides
- For rear I/O applications
- Tapped strip not required
- **Scope of delivery:**
  - 1 extrusion without assembly material





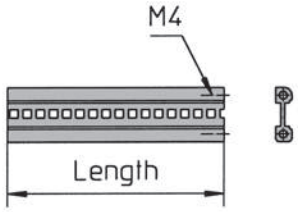
6.2.4.1 Standard Version

Length			Part-No.	
for HP	mm	inch	**clear passivated**	**raw**
21	111.8	4.40	66-138-28	-
28	147.3	5.70	66-138-25	-
42	218.4	8.60	66-138-26	-
63	325.1	12.79	66-138-27	-
81	416.6	16.40	66-138-22	-
84	431.8	17.00	66-138-23	-
	1350.0	53.14	-	66-138-19



6.2.4.2 Height Divider Left

Length			Part-No.
for HP	mm	inch	**clear passivated**
4.5	22.86	0.90	66-138-70

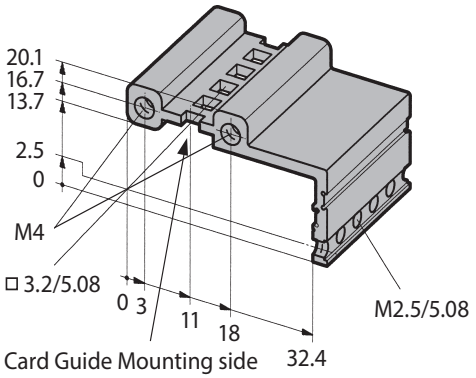


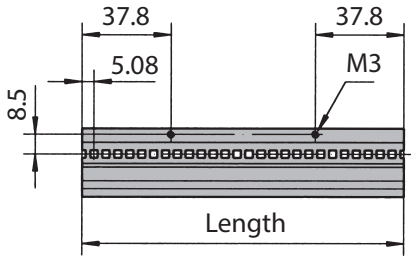
6.2.4.3 Height Divider Right

Length			Part-No.
for HP	mm	inch	**clear passivated**
4.5	22.86	0.90	66-138-80

6.2.5 Standard Internal Extrusion 66-140

- Edge connector extrusion according to IEC60603-2
- **Scope of delivery:**
  - 1 edge connector extrusion without assembly material



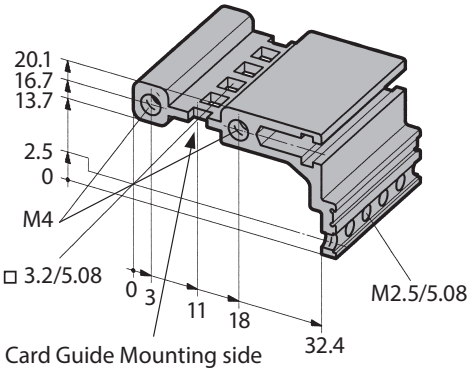


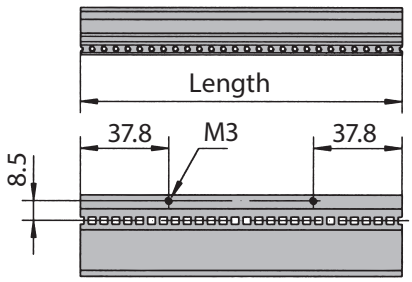
6.2.5.1 Standard Version

Length			Part-No.	
for HP	mm	inch	clear passivated	raw
42	218.4	8.60	66-140-60	-
63	325.1	12.80	66-140-61	-
81	416.6	16.40	66-140-22	-
84	431.8	17.00	66-140-23	-
	1350.0	53.14	-	66-140-19

6.2.6 Standard Internal Extrusion 66-137

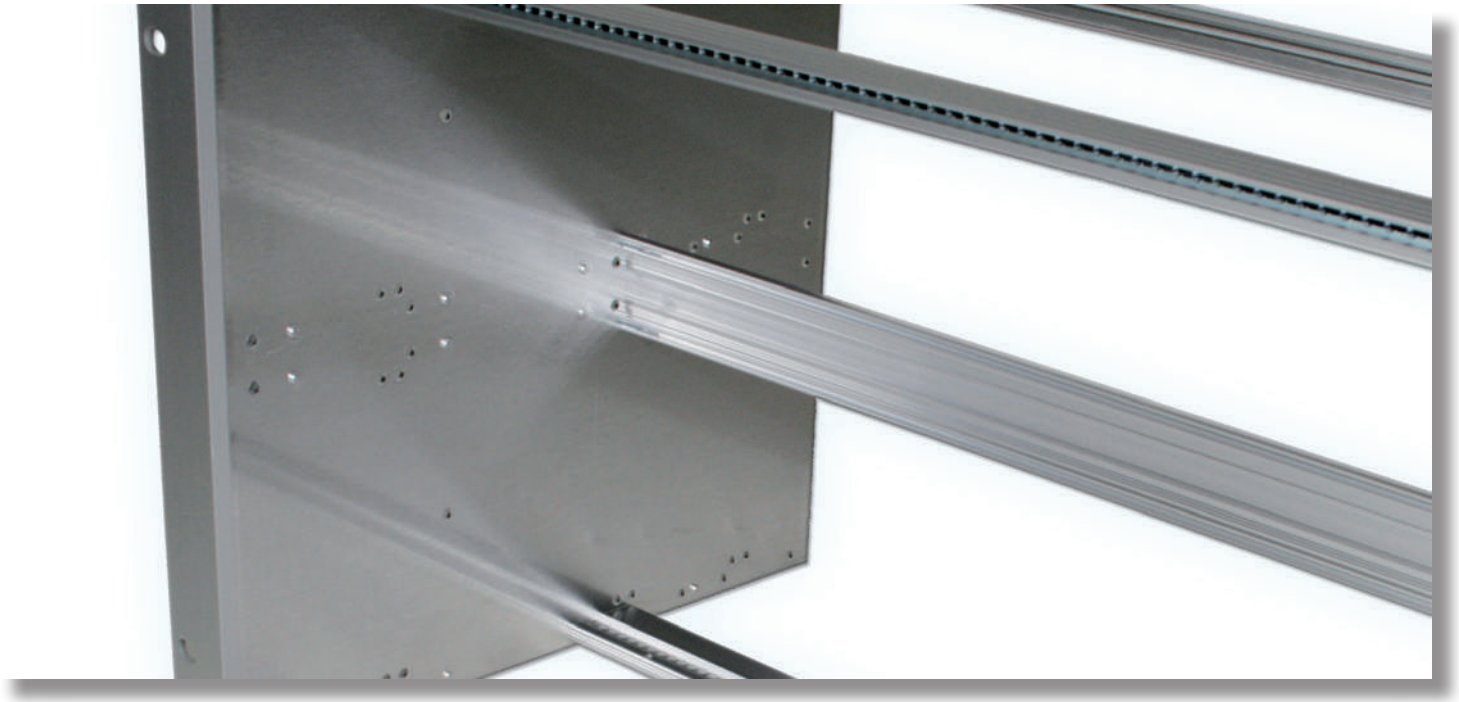
- Edge connector extrusion according to IEC60603-2 with groove
- Accept 1.8 x 5 mm tapped strips
- **Scope of delivery:**
  - 1 edge connector extrusion without assembly material





6.2.6.1 Standard Version

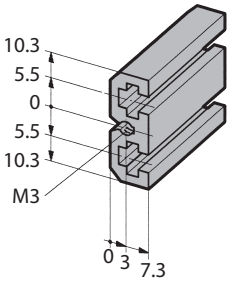
Length			Part-No.
for HP	mm	inch	clear passivated
63	325.1	12.80	66-137-21
84	431.8	17.00	66-137-23



6.3 Center Extrusions

6.3.1 Double Extrusion 66-192 for Insulated Backplane Mounting

- For mounting backplanes, matches 66-193, 66-288
- For use with insulating strips
- Insulating strip see 7.4.3
- Accept 2 x 6 mm tapped strips
- **Scope of delivery:**
  - 1 extrusion without assembly material



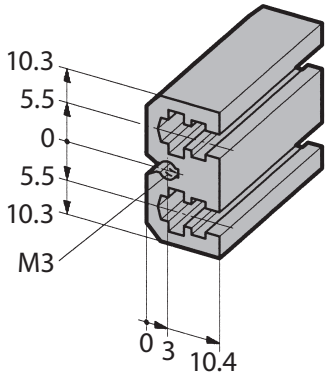
Length			Part-No.	
for HP	mm	inch	clear passivated	raw
84	431.8	17.00	66-192-24	-
	1350.0	53.14	-	66-192-14

Length			Part-No.
for HP	mm	inch	clear passivated
42	213.4	8.40	66-192-20
63	320.0	12.59	66-192-21
81	411.5	16.20	66-192-22
84	426.7	16.79	66-192-23

Assembly material with adapter: 63-175 (63K175 with Torx)

6.3.2 Double Extrusion 66-195 for Conductive Backplane Mounting

- For mounting backplanes without insulating strips
- Matches 66-194, 66-289, 66-290
- Accept 2 x 6 mm tapped strips
- **Scope of delivery:**
  - 1 extrusion without assembly material



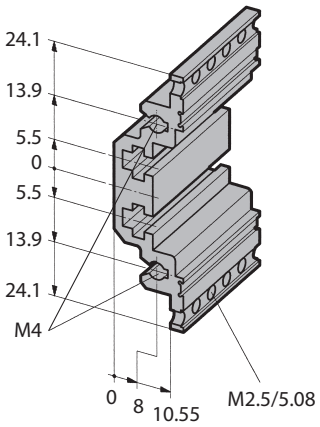
Length			Part-No.	
for HP	mm	inch	clear passivated	raw
84	431.8	17.00	66-195-24	-

Length			Part-No.
for HP	mm	inch	clear passivated
84	426.7	16.77	66-195-23

Assembly material with adapter: 63-175 (63K175 with Torx)

6.3.3 Central Extrusion 66-190

- Double edge connector extrusion IEC60603-2
- Matches 66-137 and 66-140
- Accept 2 x 6 mm tapped strips
- **Scope of delivery:**
  - 1 double edge connector extrusion without assembly material

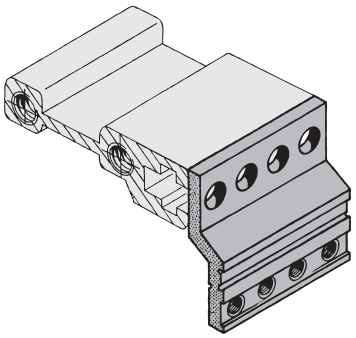


Length			Part-No.	
for HP	mm	inch	**clear passivated**	**raw**
42	218.4	8.60	66-190-26	-
81	416.6	16.40	66-192-22	-
84	431.8	17.00	66-190-23	-

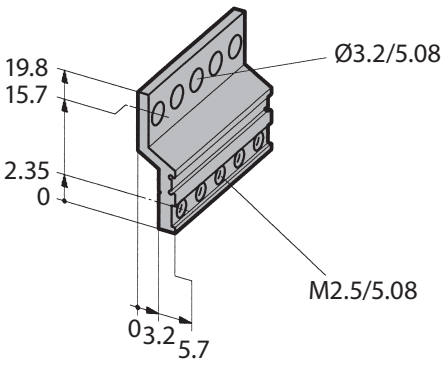


6.4 Edge Connector Extrusion and Insulating Strips

6.4.1 Edge Connector Extrusion 66-145



- For use with standard extrusion 66-144
- **Scope of delivery:**
  - Edge connector extrusion without assembly material



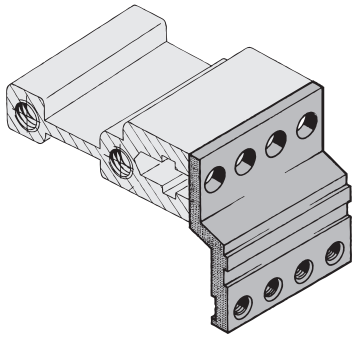
6.4.1.1 Edge Connector Extrusion 66-145

Length			Part-No.	
for HP	mm	inch	clear passivated	raw
8	40.6	1.59	66-145-40	-
18	91.4	3.59	66-145-41	-
28	142.2	5.60	66-145-42	-
42	213.4	8.40	66-145-63	-
63	320.0	12.60	66-145-65	-
84	426.7	16.80	66-145-52	-
	1350.0	53.14	-	66-145-19

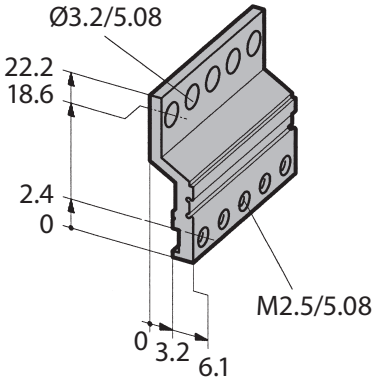
Assembly Material

Description	Part-No.
Assembly material M2.5 (for 2 supplementary extrusions)	63-214

6.4.2 Edge Connector Extrusion 66-147



- For use with extrusions for backplanes 66-193
- **Scope of delivery:**
  - Edge connector extrusion without assembly material



6.4.2.1 Edge Connector Extrusion

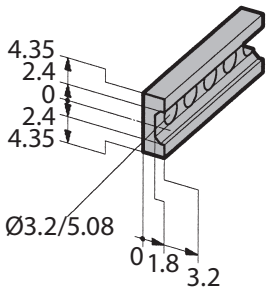
Length for HP	mm	inch	Part-No. clear passivated	raw
8	40.6	1.59	66-147-40	-
18	91.4	3.59	66-147-41	-
28	142.2	5.60	66-147-42	-
42	213.4	8.40	66-147-63	-
63	320.0	12.60	66-147-65	-
84	426.7	16.80	66-147-52	-
	1350.0	53.14	-	66-147-19

Assembly Material

Description	Part-No.
Assembly material M2.5 (for 2 supplementary extrusions)	63-214

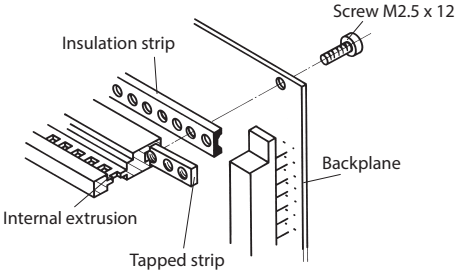
6.4.3 Insulating Strips 66-901

- Plastic grey
- In use with extrusions 66-112, 66-192, 66-193, 66-288
- **Scope of delivery:**
  - 1 insulating strip without assembly material



6.4.3.1 Insulating Strips 66-901

Length for HP	mm	inch	Part-No.
42	216.44	8.52	66-901-20
63	323.12	12.72	66-901-21
81	414.56	16.32	66-901-22
84	429.80	16.92	66-901-23



Mounting with Insulation Strips

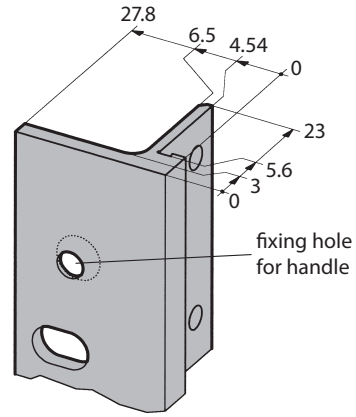
Description	Part-No.
Cross recessed cylinderhead earthing screw M2.5 x 12	5325-12



6.5 Height Extrusions

6.5.1 Height Extrusion 19" 66-175

- 19" height extrusion type 11
- For standard side panel 2 mm
- **Scope of delivery:**
  - 1 height extrusion without assembly material

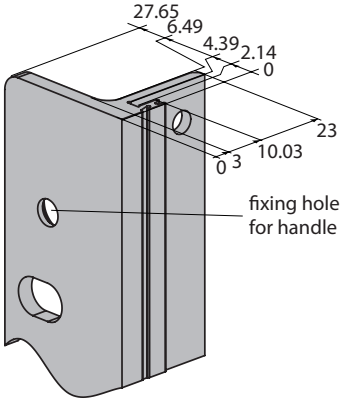


6.5.1 Height Extrusion 66-175

Length for U	mm	inch	Part-No. clear anodised fixing hole for handle without	with
3	132.5	5.20	66-175-23	66-175-33
4	177.0	6.96	66-175-24	66-175-34
6	265.9	10.46	66-175-26	66-175-36
7	310.3	12.21	66-175-27	66-175-37
8	354.8	13.96	66-175-28	66-175-38
9	399.2	15.71	66-175-29	66-175-39
10	443.7	17.47	-	66-175-40
12	532.6	20.96	66-175-32	-

6.5.2 Height Extrusions 19" 66-275

- 19" height extrusion type Systemkit 12K
- For standard side panel 2 mm
- **Scope of delivery:**
  - 1 height extrusion without assembly material

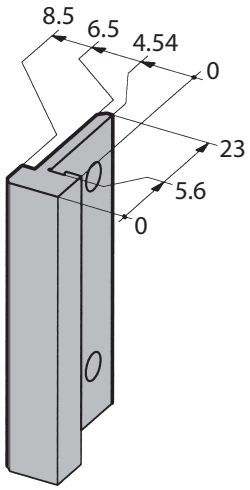


6.5.2 Height Extrusions 19" 66-275

Length for U	mm	inch	Part-No. clear passivated fixing hole for handle without	with
2	88.0	3.46	-	66-275-32
3	132.5	5.20	66-275-23	66-275-33
4	177.0	6.96	66-275-24	66-275-34
6	265.9	10.46	66-275-26	66-275-36
7	310.3	12.21	66-275-27	66-275-37
9	399.2	15.71	66-275-29	66-275-39

6.5.3 Height Extrusion 66-174

- Height extrusion type 11
- For standard side panel 2 mm
- **Scope of delivery:**
  - 1 height extrusion without assembly material

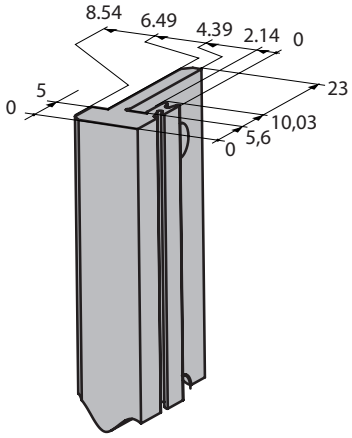


6.5.3 Height Extrusion 66-174

Length for U	mm	inch	Part-No. clear anodised
3	132.5	5.20	66-174-23
4	177.0	6.96	66-174-24
6	265.9	10.46	66-174-26
7	310.3	12.21	66-174-27
8	354.8	13.96	66-174-28
9	399.2	15.71	66-174-29
10	443.7	17.47	66-174-30
12	532.6	20.96	66-174-32

6.5.4 Height Extrusions 66-274

- 19" height extrusion type Systemkit 12K
- For standard side panel 2 mm
- Shape to direct mounting of the EMC-gasket 81-062-xx
- **Scope of delivery:**
  - 1 height extrusion without assembly material



6.5.4.1 Height Extrusions 66-274

Length for U	mm	inch	Part-No. clear passivated
2	88.0	3.46	66-274-22
3	132.5	5.20	66-274-23
4	177.0	6.96	66-274-24
6	265.9	10.46	66-274-26
7	310.3	12.21	66-274-27
9	399.2	15.71	66-274-29

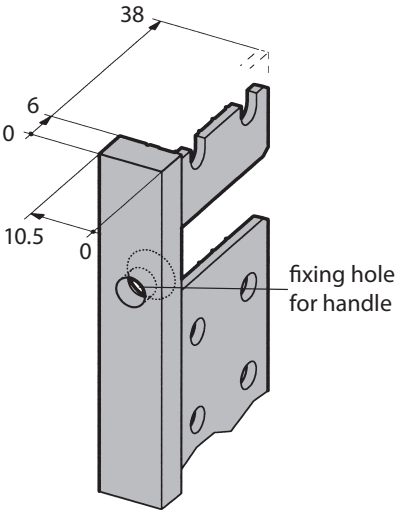
6.5.4.2 Height Extrusions 66-274 with Cut-out for Telescopic Rails

- Cut-out for telescopic rails

Length for U	mm	inch	Part-No. clear passivated left	right
3	132.5	5.20	66-274-63	
4	177.0	6.96	66-274-64	
6	265.9	10.46	66-274-66	66-274-76
7	310.3	12.21	66-274-67	66-274-77
9	399.2	15.71	66-274-69	66-274-79

6.5.5 Height Extrusion 66-173

- Height extrusion for Unibox 14
- Slim version with or without fixing hole for handle
- **Scope of delivery:**
  - 1 height extrusion without assembly material

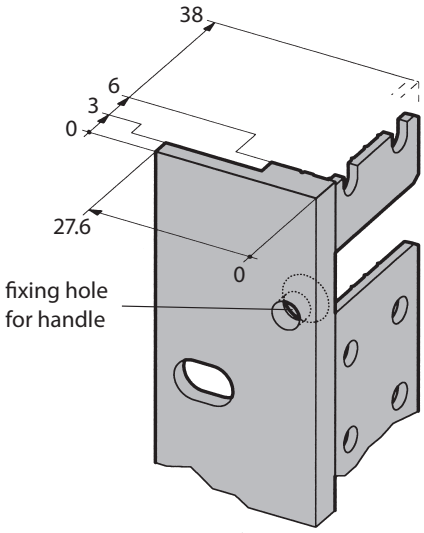


6.5.5 Height Extrusion 66-173

Length for U	mm	inch	Part-No. clear anodised fixing hole for handle without	with
2	88.1	3.46	66-173-20	66-173-21
3	132.5	5.20	66-173-22	66-173-23
4	177.0	6.96	66-173-24	66-173-25
5	221.5	8.72	66-173-26	66-173-27
6	265.9	10.46	66-173-28	66-173-29

6.5.6 Height Extrusion 19" 66-179

- With or without fixing hole for handle
- 19" height extrusion for Unibox 14 / 84 HP
- **Scope of delivery:**
  - 1 height extrusion without assembly material



6.5.6 Height Extrusion 66-179

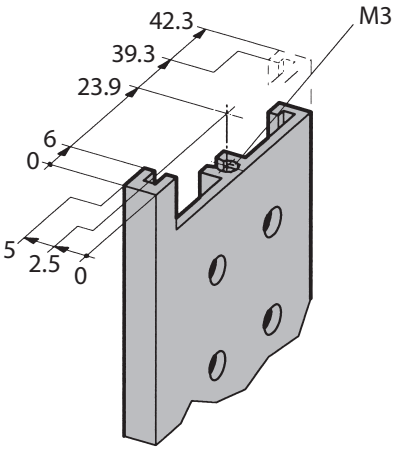
Length for U	mm	inch	Part-No. clear anodised fixing hole for handle without	with
2	88.1	3.46	66-179-22	66-179-32
3	132.5	5.20	66-179-23	66-179-33
4	177.0	6.96	66-179-24	66-179-34
5	221.5	8.72	66-179-25	66-179-35
6	265.9	10.46	66-179-26	66-179-36
7	310.3	12.21	66-179-27	66-179-37
8	354.8	13.96	66-179-28	66-179-38
9	399.2	15.71	66-179-29	66-179-39



6.6 Height Divider Extrusions

6.6.1 Height Divider Extrusion 66-115

- Divider extrusion front
- **Scope of delivery:**
  - 1 height extrusion without assembly material

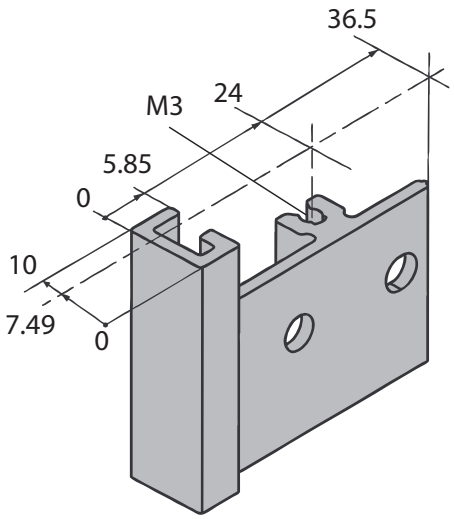


6.6.1 Height Divider Extrusion 66-115

Length for U	mm	inch	Length for M3 mm	Length for M3 inch	Part-No. clear anodised
3	129.1	5.08	112.7	4.44	66-115-21
6	262.4	10.33	246.0	9.68	66-115-25

6.6.2 Height Divider Extrusion 66-107

- Divider extrusion front
- **Scope of delivery:**
  - 1 height extrusion without assembly material

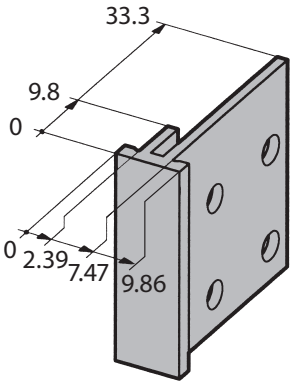


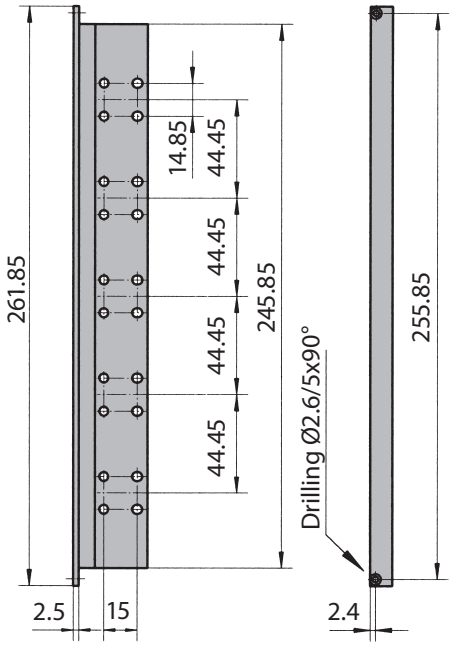
6.6.2 Height Divider Extrusion 66-107

Length for U	mm	inch	Length for M3 mm	Length for M3 inch	Part-No. clear anodised
3	129.1	5.08	112.7	4.44	66-107-44
6	262.4	10.33	246.0	9.68	66-107-47
9	395.4	15.7	379.2	15.7	66-107-49

6.6.3 Height Divider Extrusion 66-266

- EMC divider extrusion
- **Scope of delivery:**
  - 1 height extrusion without assembly material





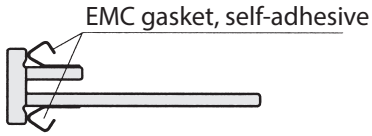
6.6.3 Height Divider Extrusion 66-266

Length for U	mm	inch	Width	Part-No. clear passivated
6	261.8	10.30	2 HP	66-266-26

6.6.3.1 EMC Contact Spring

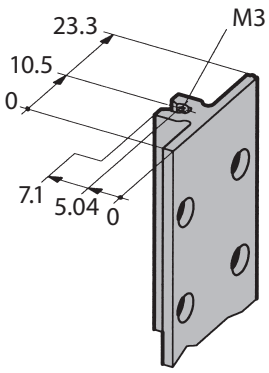
- Stainless steel
- Side front panel end side panel
- EMC dividing extrusion 66-266

For Size	Length mm	Length inch	Packing Units	Part-No.
3 U	107	4.28	4 pcs.	63-873-02
6 U	244.2	9.6	2 pcs.	63-873-05



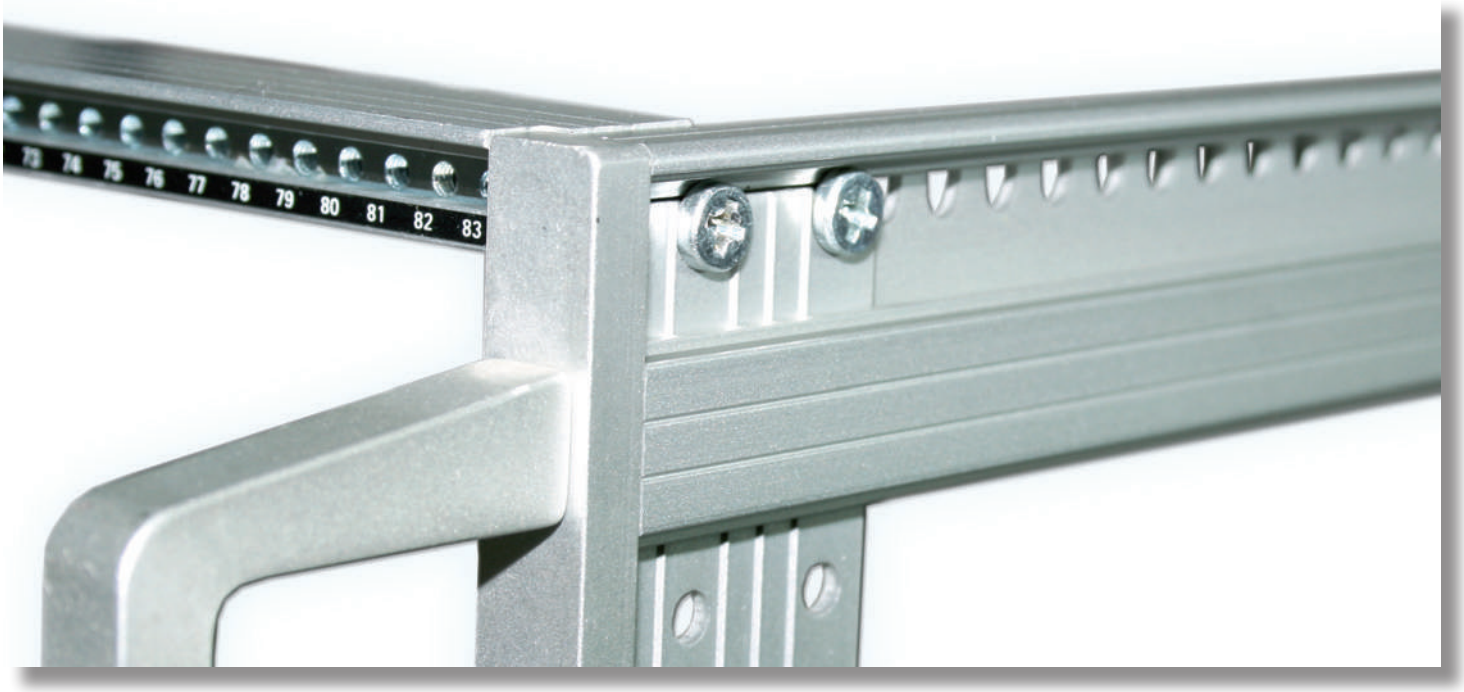
6.6.4 Height Divider Extrusion 66-116

- Divider extrusion rear
- **Scope of delivery:**
  - 1 height extrusion without assembly material



6.6.4 Height Divider Extrusion 66-116

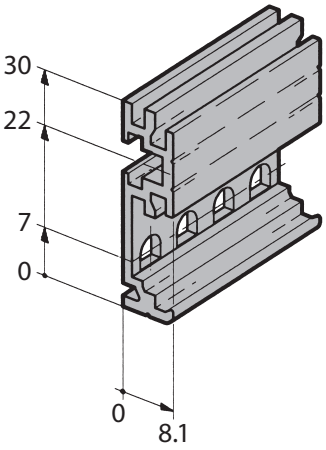
Length for U	mm	inch	Part-No. raw
4	157.0	6.17	66-116-45
6	245.9	9.68	66-116-47
9	379.2	14.92	66-116-49



6.7 Depth Extrusions

6.7.1 Depth Extrusion 66-177

- Depth extrusion for universal sub rack Unibox 14
- **Scope of delivery:**
  - 1 depth extrusion without assembly material

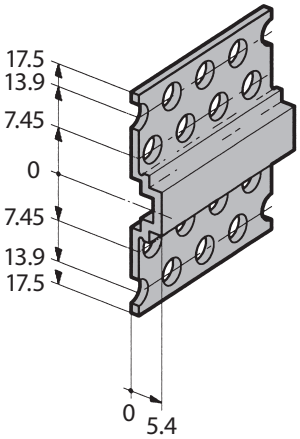


6.7.1.1 Depth Extrusion 66-177

Length		Part-No.
mm	inch	clear anodised
232.6	9.15	66-177-21
292.6	11.51	66-177-22
352.6	13.55	66-177-23
412.6	16.24	66-177-24
532.6	20.96	66-177-26

6.7.2 Depth Divider Extrusion 66-176

- Depth divider extrusion for universal sub rack Unibox 14
- **Scope of delivery:**
  - 1 depth extrusion without assembly material

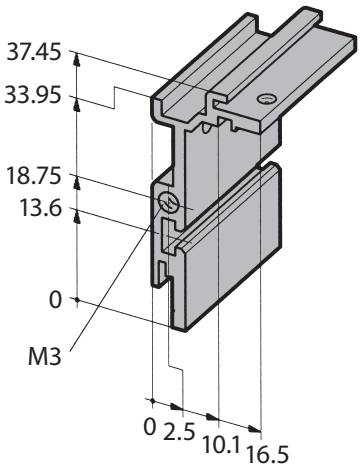


6.7.2.1 Depth Divider Extrusion 66-176

Length		Part-No.
mm	inch	clear passivated
292	11.49	66-176-22
412	16.22	66-176-24
532	20.94	66-176-26

6.7.3 Depth Extrusion 66-188

- To build up customised solutions
- For 6 U cassettes and modules type 23
- **Scope of delivery:**
  - 1 depth extrusion without assembly material

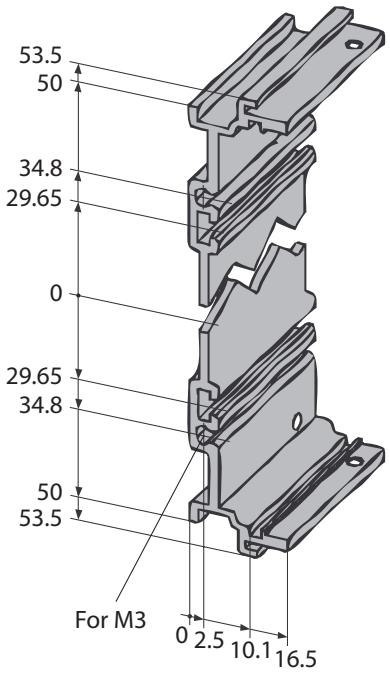


6.7.4 Depth Extrusion 66-188

Length		Part-No.	
mm	inch	clear passivated	raw
165.7	6.52	66-188-20	-
225.7	8.87	66-188-22	-
1350.0	53.14	-	66-188-14

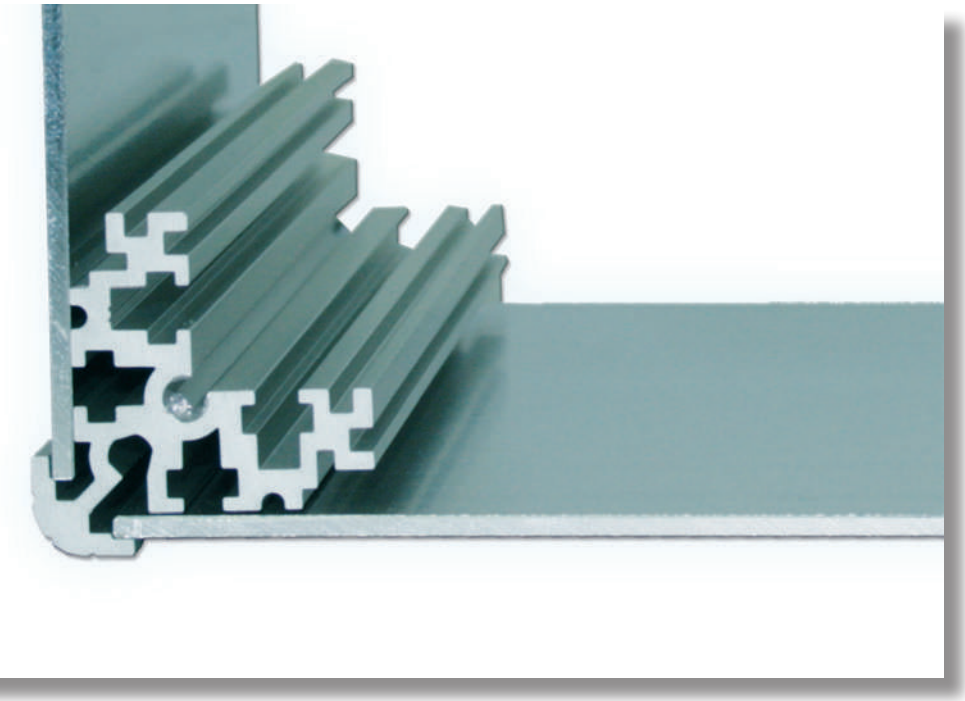
6.7.4 Side Wall Extrusion 66-106

- To build up customised solutions
- For 3 U type 23 cassettes and modules
- **Scope of delivery:**
  - 1 pc. side wall extrusion without assembly material



6.7.5 Side Wall Extrusion 66-106

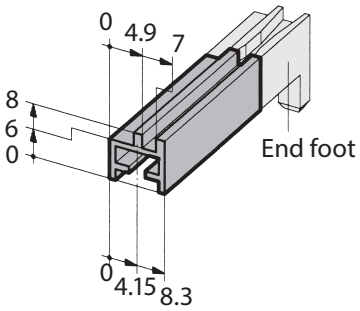
Length		Part-No.	
mm	inch	clear passivated	raw
165.7	6.52	66-106-20	-
225.7	8.87	66-106-21	-
1350.0	53.14	-	66-106-14



6.8 Miscellaneous Extrusions

6.8.1 Card Guide Extrusion 66-122 IEC

- For card thickness: 1.6 mm / 0.06"
- Card guide extrusion, single, clear anodised
- ESD clip not usable
- **Scope of delivery:**
  - 1 extrusion without assembly material





6.8.1.1 Extrusion

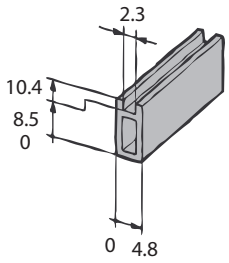
For Card Depth		Length		Part-No. Aluminium
mm	inch	mm	inch	
160	6.30	112.5	4.43	66-122-20
220	8.66	172.5	6.79	66-122-21
280	11.02	232.5	9.15	66-122-22
340	13.38	292.5	11.51	66-122-23
400	15.74	352.5	13.87	66-122-24
-	-	1350	53.15	66-122-14

6.8.1.2 End Feet

Description	Part-No. 1 Pair
End feet plastic, UL94 HB	61-069

6.8.2 Card Guide Extrusion 66-452 IEEE

- For card thickness 1.6 mm / 0.06" and 2.0 mm / 0.08"
- Extrusion: Aluminium
- End feet: Plastic UL94 V-0





6.8.2.1 Extrusion

For Card Depth		Part-No.
mm	inch	
160	6.30	66-452-20
220	8.66	66-452-25
280	11.02	66-452-30
340	13.38	66-452-35
1350	53.14	66-452-14

6.8.2.2 End Feet

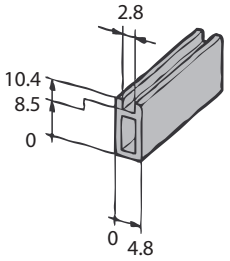
Colour	Part-No. 1 Pair
Black	61-955-01
Red	61-955-03

6.8.2.3 End Feet Offset

Colour	Part-No. 1 Pair
Pearlwhite	61-961-01

6.8.3 Card Guide Extrusion 66-453 IEEE

- For card thickness 2.4 mm / 0.094"
- Extrusion: Aluminium
- End feet: Plastic UL94 V-0





6.8.3.1 Extrusion

For Card Depth		Part-No.
mm	inch	
160	6.30	66-453-20
220	8.66	66-453-25
280	11.02	66-453-30
340	13.38	66-453-35
1350	53.14	66-453-14

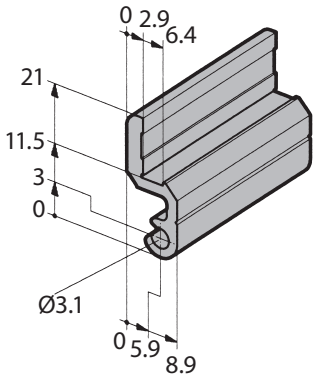
6.8.3.2 End Feet

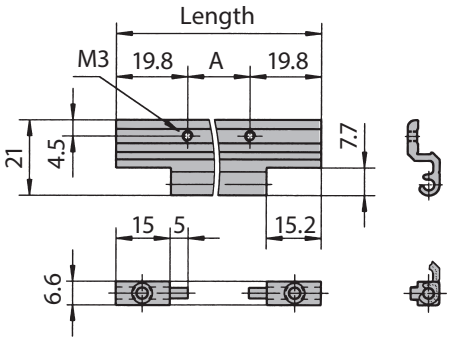
Colour	Part-No. 1 Pair
Black	61-956-01

6.8.4 Hinge Extrusion 66-230

- To build up customised hinged front panels





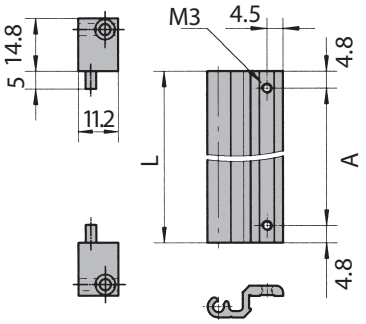


6.8.4.1 Hinge Extrusions for Top/Bottom-Hinged Front Panels

Width	A		L		Part-No.
	mm	Inch	mm	Inch	
42 HP	172.9	6.80	212.5	8.36	66-230-27
63 HP	279.5	11.00	319.1	12.56	66-230-28
84 HP	386.2	15.20	425.8	16.76	66-230-26

6.8.4.2 Assembly Material incl. Hinge Parts for Top/Bottom-Hinged Front-Panels

Description	Part-No.
Incl. screws, tapped strips, nuts in thread M2.5	81-124



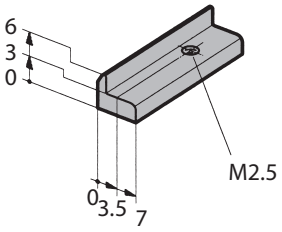
6.8.4.3 Hinge Extrusions for Side-Hinged Front Panels

Width	A		L		Part-No.
	mm	Inch	mm	Inch	
3 U	89.1	3.50	98.7	3.88	66-230-33
4 U	133.6	5.26	143.2	5.63	66-230-34
6 U	222.5	8.76	232.1	9.13	66-230-36
7 U	266.9	10.50	276.5	10.88	66-230-37

6.8.4.4 Assembly Material incl. Hinge Parts for Side-Hinged Front-Panels

Description	Part-No.
Incl. screws, tapped strips, nuts in thread M2.5	81-125

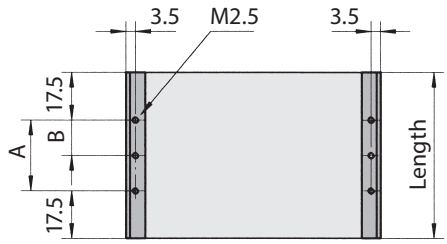
6.8.5 Contact Bracket For EMC Front Panels



6.8.5.1 Contact Bracket For EMC Front Panels

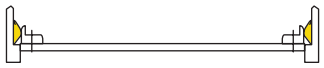
- **Scope of delivery:**
  - Set of 2 brackets
  - 4 countersunk screws M2.5 x 6

Length			Part-No.	
for U	mm	inch	**advanced protection**	**superior protection**
2 U	60.6	2.38	-	66-270-50
3 U	105.0	4.13	-	66-270-51
4 U	149.5	5.88	66-270-42	66-270-52
5 U	238.4	9.38	66-270-44	66-270-54



For	Length		A		B	
Height	mm	inch	mm	inch	mm	inch
2 U	60.6	2.38	25.6	1.00		
3 U	105.0	4.13	70.0	2.75		
4 U	149.5	5.88	114.5	4.50		
6 U	238.4	9.38	203.5	8.00	101.7	4.00

6.8.5.2 EMC Contact Spring

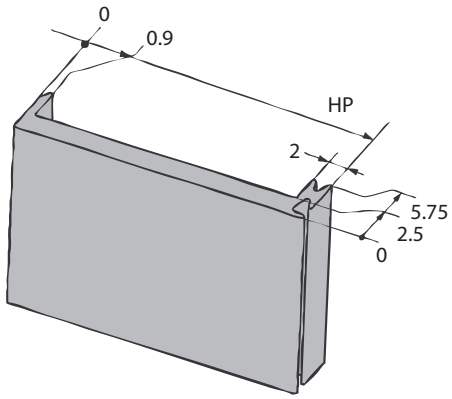


- Stainless steel
- Side front panel end to side panel
- Mounted on side panel of case
- Self-adhesive

For Size	Length		Packing Units	Part-No.
	mm	inch		
3 U	107	4.28	2 pcs.	63-873-01
6 U	2 x 107	2 x 4.28	4 pcs.	63-873-02

6.8.6 Front Panel Extrusion

- For 4 HP to 14 HP
- EMC gasket see below



6.8.6.1 Front Panel Extrusion

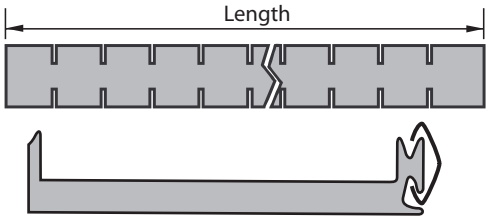
- EMC front panel extrusion according to IEEE standard

Width for size	mm	inch	Length mm	inch	Part-No.
4 HP	20.0	0.78	1350	53.15	66-514-19
5 HP	25.1	0.99	1350	53.15	66-515-19
6 HP	30.2	1.18	1350	53.15	66-516-19
7 HP	35.3	1.38	1350	53.15	66-517-19
8 HP	40.3	1.58	1350	53.15	66-518-19
9 HP	45.4	1.79	1350	53.15	66-519-19
10 HP	50.5	1.99	1350	53.15	66-520-19
12 HP	60.6	2.38	1350	53.15	66-522-19
14 HP	70.8	2.79	1350	53.15	66-534-19



6.8.6.1 EMC Gaskets

- Stainless steel



For size	Length mm	inch	Part-No.
2 U	57.15	2.25	81-062-02
3 U	101.6	4.00	81-062-03
4 U	146.05	5.75	81-062-04
6 U	234.95	9.25	81-062-06
7 U	279.4	11.00	81-062-07
8 U	323.85	12.75	81-062-08
9 U	368.3	14.50	81-062-09



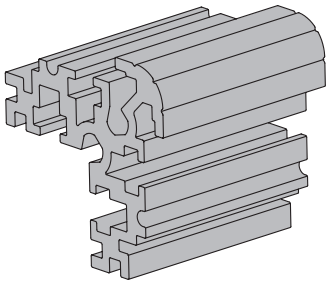
6.8.6.2 Assembly Tool for EMC-Gasket 81-062-xx

- For easy assembly of the EMC gasket onto the extruded front panel
- Fast and reliable
- Only usable for EMC-gaskets 81-062-xx
- Adjustable for size 3 U / 6 U / 9 U
- Material: Base plate aluminium anodised, platform plastic
- **Scope of delivery:**
  - Assembly tool

Description	Part-No.
Assembly aid	81-062-00

6.8.7 Corner Extrusion 66-244

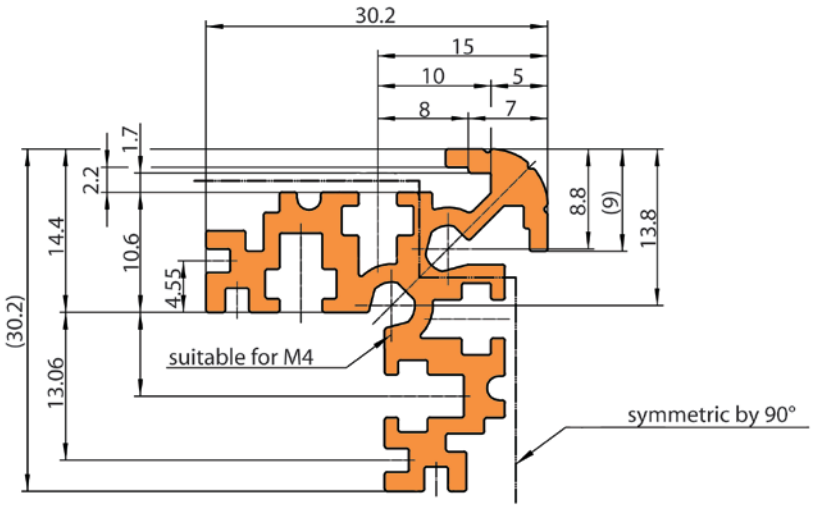
- As used in Varietybox 35
- Accept 2 x 6 mm tapped strips
- Without assembly material
- **Scope of delivery:**
  - 1 corner extrusion





6.8.7 Corner Extrusions 66-244

Length		Part-No.			
mm	inch	clear anodised	black anodised	clear passivated	raw
60	2.36	66-244-060-1	66-244-060-2	66-244-060-3	-
90	3.54	66-244-090-1	66-244-090-2	66-244-090-3	-
120	4.72	66-244-120-1	66-244-120-2	66-244-120-3	-
180	7.08	66-244-180-1	66-244-180-2	66-244-180-3	-
240	9.44	66-244-240-1	66-244-240-2	66-244-240-3	-
300	11.81	66-244-300-1	66-244-300-2	66-244-300-3	-
1350	53.15	66-244-1350-1	66-244-1350-2	66-244-1350-3	66-244-100



E

Notes

Customisation and Services

Customisation and Services



Customised Desktop and Compact Case F | 3



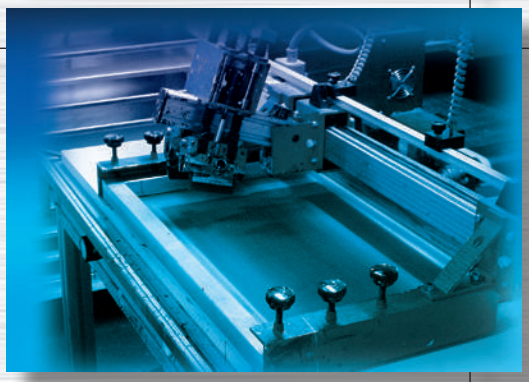
Customised Front Panel Processing F | 5



Electroplating F | 6



Painting F | 7



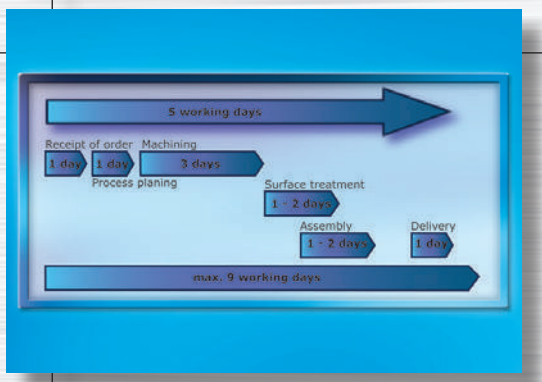
Silk Screen Printing F | 8

Customisation and Services

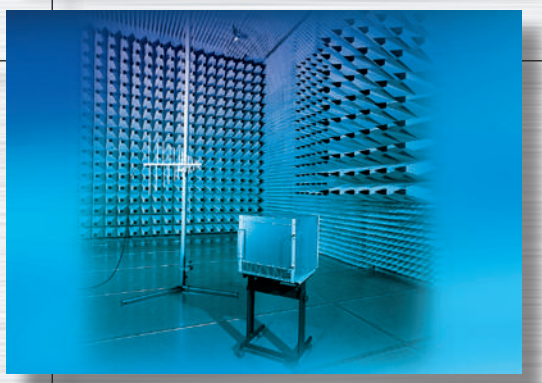
Assembly F | 9



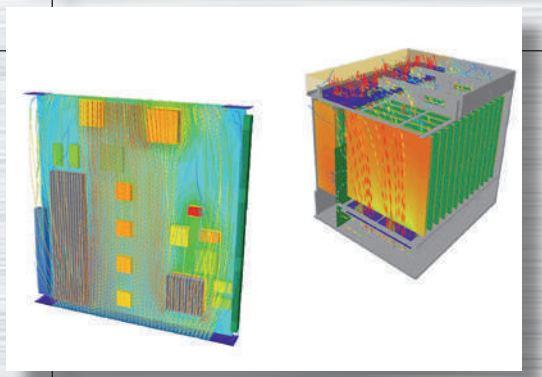
Front Panel Express: The Way it Works.... F | 10



EMC-Service F | 13



Thermal Analysis F | 14



F

Customisation and Services



Customised Desktop and Compact Case Processing

Our G-Box as a basis for your hardware and software solution:

- Few parts = simple assembly
- Balanced cost vs value ratio
- Manufacturing of mini cases in your size and design









Our G-Box as a basis for your mini case
Elma Electronic AG has been operating successfully in electronic packaging for over 40 years. Our know-how is at your disposal. Try us!

Your benefit

- Your electronic devices will be optimally packaged - no compromises
- In any RAL colour
- Cut-outs on the front panel are either punched or laser cut and arranged entirely to your design
- The case can be manufactured as
  - Desktop
  - Wall mount
  - C-rail design
- Your logo or interface markings could be silk-screened
- Thanks to our in house galvanic equipment we are able to passivate your case and thus provide electrical conductivity for EMC protection
- We can also treat your case with one of our protective anodise colours (red, yellow, blue, black or clear)
- Cost effective in small quantities as we are not tied to profiles or tools

Typical Applications

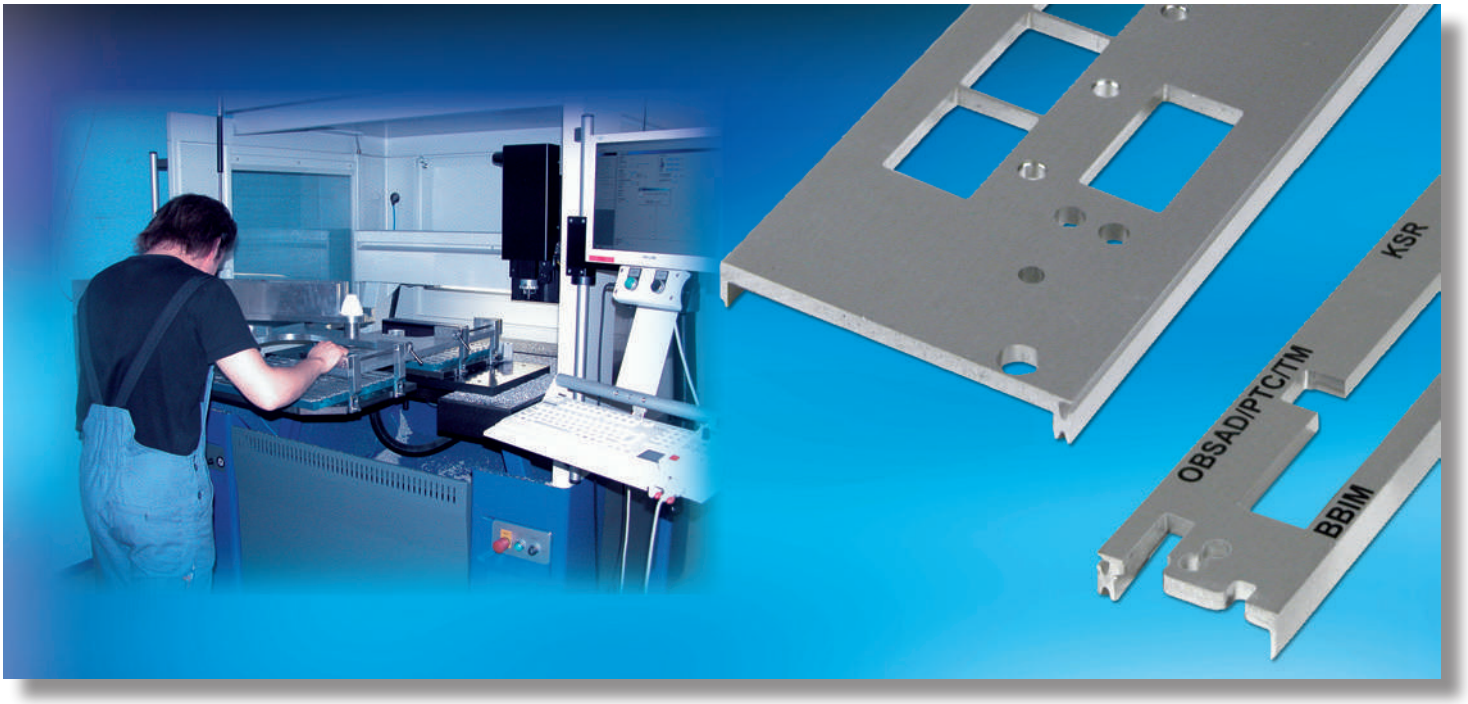
- PC/104 systems
- Embedded systems
- Industrial PC's
- Customised systems with integrated TFT monitors

Our ability to adapt existing components to your application, make Elma your preferred solution partner.

Your Possibilities



*Plastic coated aluminium sheet in RAL 7035



Customised Front Panel Processing

Inexpensive and Efficient

Elma's machining possibilities open a greater range of applications.

The compact CNC milling, drilling and engraving machine is designed for efficient machining of aluminium. The high-frequency spindle runs with an RPM range of up to 60'000. This makes effective and precise machining of all the front panels possible, especially with smaller tools.



It is easy to produce your customised front panel. e.g. with cut-outs for:

- Electronic Connectors (e.g. D-Sub, SCSI, RJ45, USB...)
- Fiber-Optic Connectors
- LEDs
- Switches
- Terminals
- Handles
- Mezzanine Cards
- Display-Elements
- Your individual cut-outs

Use Elma's front panel service not only for machining, but also for silk screen printing, electroplating, painting and assembling.



Electroplating

- Our electroplating facility is one of the biggest and most sophisticated in the area. With more than a hundred programs, we have the possibility, to electroplate almost every aluminium part with it's optimal program.



Anodising

Decorative and Hard Surface in Different Colours:

- Clear
- Deep black (MLW)
- Turquoise blue (PLW)
- Brand red (ML)
- Gold-Yellow (L)
- Blue (G)
- Turquoise green
- *All colours RoHS compliant*

Process:
With the anodic oxidation hard and wear-resistant aluminium surfaces are produced with sulfuric acid electrolytes. These oxide coatings improve not only the corrosion resistance, but can also give a decorative finish to components if a coloured dye is used. The layer thicknesses can be from 5 to 30 µm. Anodic oxide coatings are not electrically conductive.



Passivation

Corrosion Protection, Electrically Conductive:

- Clear *(RoHS compliant)*
- Yellow

Process:
With the passivation procedures by chemical action, thin layers (approx. 0.1 to 0.5 µm) result. These are yellow during the yellow chromate finishing and with the clear passivation finishing transparent. These layers are corrosion resistant and offer an outstanding adhesion for lacquer and powder coatings. Due to the small layer thicknesses the surfaces remain electrically conductive.

Use Elma's front panel service not only for electroplating, but also for machining, silk screen printing, painting and assembling.



Painting



Powder Coating

Powder coating is a method of applying coatings to surfaces without using solvents. The coating is applied as a free flowing powder and heated to cause it to flow and adhere to the surface. The powder may be a thermoplastic or a thermoset polymer.
It is normally used to create a hard finish on metals. Powder coating is mainly used for coating of metals, such as "white goods", aluminium extrusions and automobiles. The polymer used by Elma is polyester-epoxy.

The most common way of applying the powder coating is to spray the powder using an electrostatic gun. The gun imparts an electric charge on the powder, which is then sprayed to the object which is grounded. The object is then heated, and the powder melts to form a hard coating.

Elma's most common colours:

- Light grey, RAL 7035, structure, silky lustre
- Elma blue, Pantone 280C, structure, silky lustre
- Jet black, RAL 9005, structure, silky lustre
- Blue grey, NCS 5010-R90B, structure, silky lustre
- Flame red, RAL 3000, structure, silky lustre
- Other colours upon request

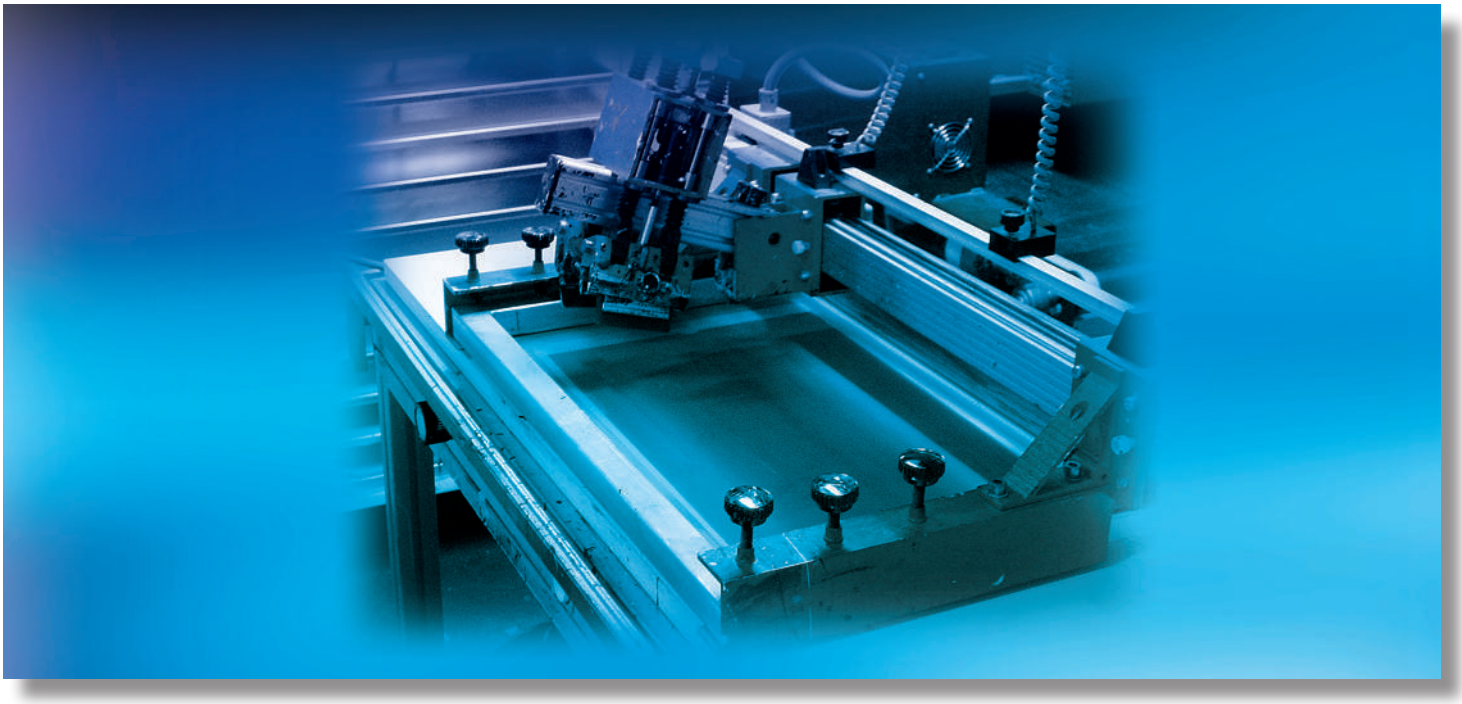
Wet Painting

In a general, lacquer is a clear or coloured coating, that dries by solvent evaporation only which produces a hard, durable finish, that can be polished to a very high gloss, and gives the illusion of depth.

Elma's most common colours:

- Silver/Berluran Pantone 043.094.190, structure
- Other colours upon request

Use Elma's front panel service not only for painting, but also for machining, silk screen printing, electroplating, and assembling.



Silk Screen Printing

Silk screening is a print making technique that creates a sharp-edged single-colour image using a stencil and a porous fabric.



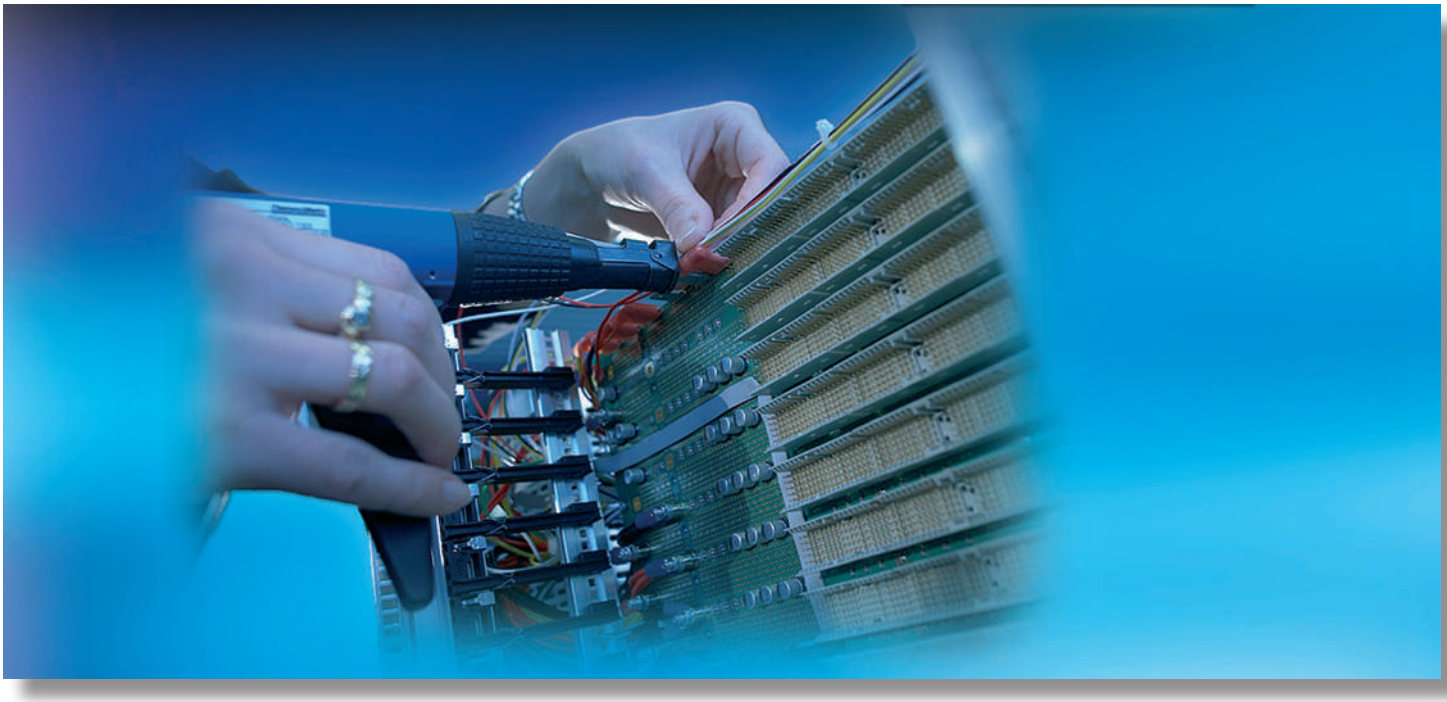
Printing Technique:
A screen is made of a piece of porous, finely woven fabric (originally silk, but typically made of polyester or nylon) stretched over a wooden or aluminium frame. Areas of the screen are blocked off with a non-permeable material - a stencil - which is a negative of the image to be printed; that is, the open spaces are where the ink will appear.

The screen is placed on top of the front panel. Ink is placed on top of the screen, and a squeegee (rubber blade) is used to spread the ink evenly across the screen. The ink passes through the open spaces in the screen onto the front panel below; then the screen is lifted away. The screen can be re-used after cleaning. If more than one colour is being printed on the same surface, the ink is allowed to dry and then the process is repeated with another screen and different colour of ink.

Silk Screen Printing is Used on Front Panels e.g. to:

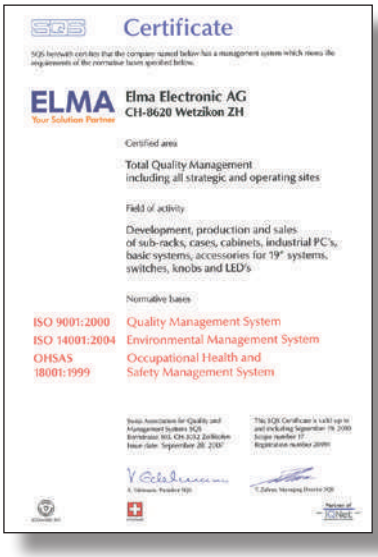
- Label front panel mounted components
- Name the product
- Put your company logo on the product
- Give some safety instructions
- Separate your product from others

Use Elma's front panel service not only for silk screen printing, but also for machining, painting and assembling.



Assembly

By assembly, Elma means the action of putting together the separate parts of what is intended to be assembled. This goes from providing the parts to the final checking/testing of the assembly.



SQS Certificate

SQS herewith certifies that the company named below has a management system which meets the requirements of the normative bases specified below.

ELMA Your Solution Partner

Elma Electronic AG
CH-8620 Wetzikon ZH

Certified area

Total Quality Management
including all strategic and operating sites

Field of activity

Development, production and sales of sub-racks, cases, cabinets, industrial PC's, basic systems, accessories for 19" systems, switches, knobs and LED's

Normative bases

ISO 9001:2000	Quality Management System
ISO 14001:2004	Environmental Management System
OHSAS 18001:1999	Occupational Health and Safety Management System

Swiss Association for Quality and Management Systems SQS
Bernstrasse 103, CH-3052 Zollikofen
Issue date: September 28, 2007

This SQS Certificate is valid up to and including September 19, 2010
Scope number 17
Registration number 20090

Partner of the European Quality Network

Why Choose Elma's Assembly Services?

- Elma's assembly facilities are certified ISO9001:2000
- Elma is equipped for quick and reliable small an large batch assembly
- A flexible working environment can be quickly and efficiantly configured to assembly needs
- The assembly aids are laid out ergonomically
- Elma has a dedicated team of assembly operatives
- Ongoing training and continuous improvement programs ensure up to date employee knowledge
- Regular job rotation provides a multi-skilled assembly team

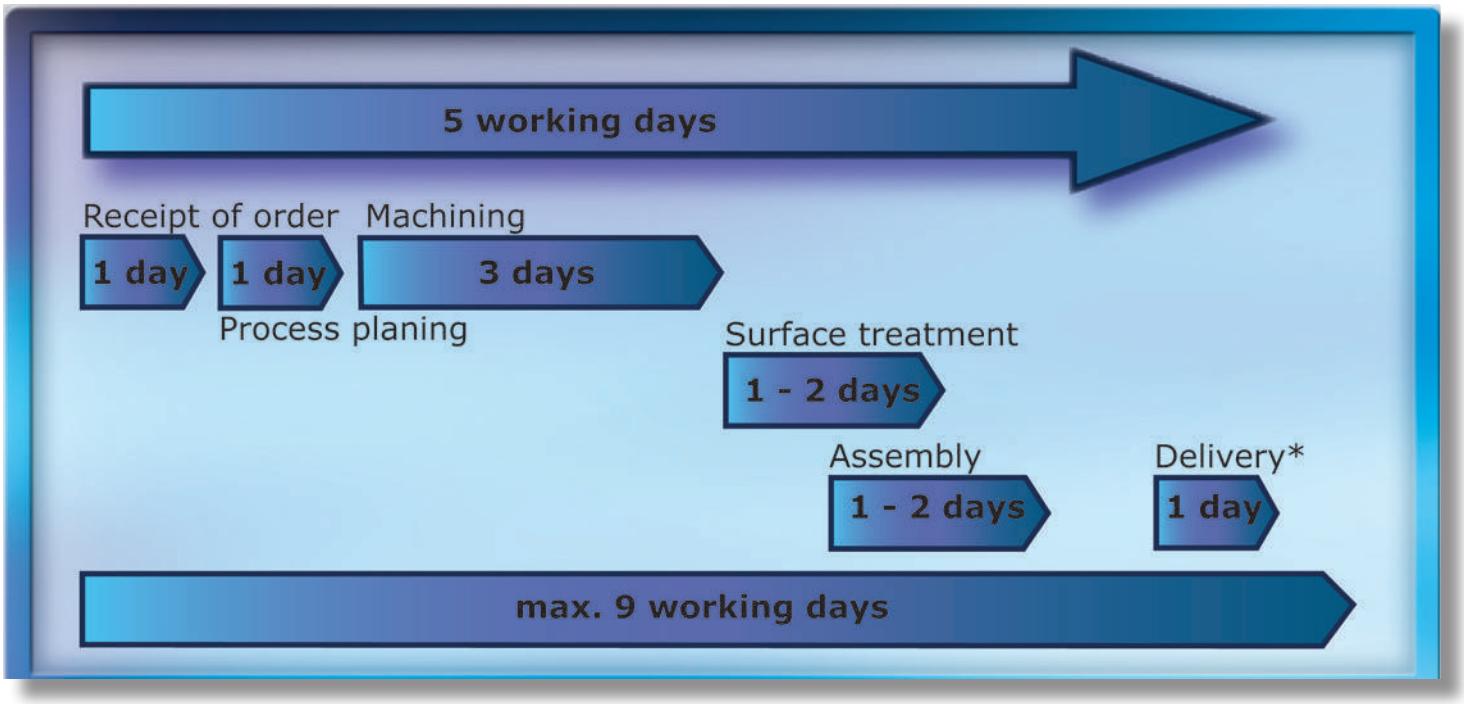
Assembly Possibilities for sub rack and cases:

- Customisation of parts (e.g. cooling fans, power supplies)
- Sub-assemblies
- Chassis assembly
- Cable assembly
- Attaching of markings and labels
- Mechanical and electrical interior assembling of sub racks and cases
- Checking of the assembly
- Final testing (mechanical and electrical)
- Documentation
- Wrapping and packing of the final goods (custom packaging, ship to end user)

Assembly Possibilities for Accessories:

- Mounting of EMC-gaskets
- Putting together handles and front panels
- Pre-assembling of screws and press-fit bushes
- Attaching of markings and labels
- Mechanical and electrical interior assembling of cassettes and modules
- Checking of the assembly
- Final testing (mechanical and electrical)
- Documentation
- Wrapping and packing of the final goods

Use Elma's front panel service not only for assembling, but also for machining, silk screen printing, electroplating and painting.



Front Panel Express: The Way it Works...

- **Customised front panel processing in only 6 - 9 working days!**
- Front panel express is Elma's rapid customisation service for front panels. It is designed to speed up your production programme and provide a fully customised front panel solution to your exect requirements.

1. Choose a front panel size
2. Choose the required handles
3. Draw the requested cut-outs and markings, preferable in a DXF format. You can download files of the handles and front panelsfrom www.elma.com
4. Choose the requested surface:
   - Front side clear anodised and rear side conductive (standard if not indicated differently)
   - Front- and rear side clear passivated
   - Powder coating upon request
5. Send us a positive film 1:1 for the silk screen printing
6. Indicate, if you would like the front panels assembled (standard) or not assembled
7. Send your specifications to our local partner
   - You will receive a promt offer and you can place your order on the same day if required
   - For larger quantities you will receive a separate order confirmation

Note: This front panel express service is only for quantities up to 50 pieces.

*Delivery time might be a bit longer in remote areas

Customisation and Services

Location within the Sub Rack:

- ❑ front mounting
- ❑ rear mounting

EMC-Features:

- ❑ no EMC-Features
- ❑ extruded front panel with EMC-gasket

Dimensions:

front panel height ____ U
front panel width ____ HP
front panel thickness ____ mm ____ inch

Cut-Outs:

- ❑ as per attached paper drawing
- ❑ as per attached dxf/iges file
- ❑ corner radius max. 3 mm
- ❑ corner radius max. 1 mm
- ❑ corner radius max. 0.5 mm

Attached drawing/file number:

Cut-Out Form:

description:

_____

_____

_____

Material:

- ❑ aluminium
- ❑ sheet steel zinc plate

Internal Surface:

- ❑ no specification
- ❑ raw/untreated
- ❑ clear passivation (conductive)
- ❑ anodised, colour: _____
- ❑ powder coated, colour: _____
- ❑ free of lack or colour mist
- ❑ other: _____

External Surface:

- ❑ no specification
- ❑ raw/untreated
- ❑ clear passivation (conductive)
- ❑ anodised, colour: _____
- ❑ powder coated, colour: _____
- ❑ other: _____

Cutout Faces:

- ❑ no specification
- ❑ raw/untreated
- ❑ clear passivation (conductive)
- ❑ anodised, colour:
- ❑ powder coated, colour: _____
- ❑ other: _____

Silk Screen Printing:

- ❑ without
- ❑ single colour: _____
- ❑ multiple colour: _____

Artwork Master:

- ❑ as per attached film
- ❑ as per attached paper drawing
- ❑ as per attached dxf/iges file
- ❑ as per attached tif file

attached drawing/file number: _____

_____

_____

_____

Accessories

Front Panel Screws & Bushes:

- ❑ without
- ❑ press-in bushes M2.5
- ❑ captive screw head: _____

Handles:

- ❑ without
- ❑ top; type: _____
  - ❑ with ESD-pin
  - ❑ with microswitch
- ❑ bottom; type: _____
  - ❑ with ESD-pin
  - ❑ with microswitch

Coding Pins:

- ❑ colour
- ❑ positions: _____

Card Holder:

- ❑ without
- ❑ with 1 card holder in centre
- ❑ with card holder top
- ❑ with card holder bottom

Assembly:

- ❑ to be supplied assembled
- ❑ supplied unassembled

Additional Information:

_____

_____

_____

Send this two pages to your local partner

Company _____ Department _____

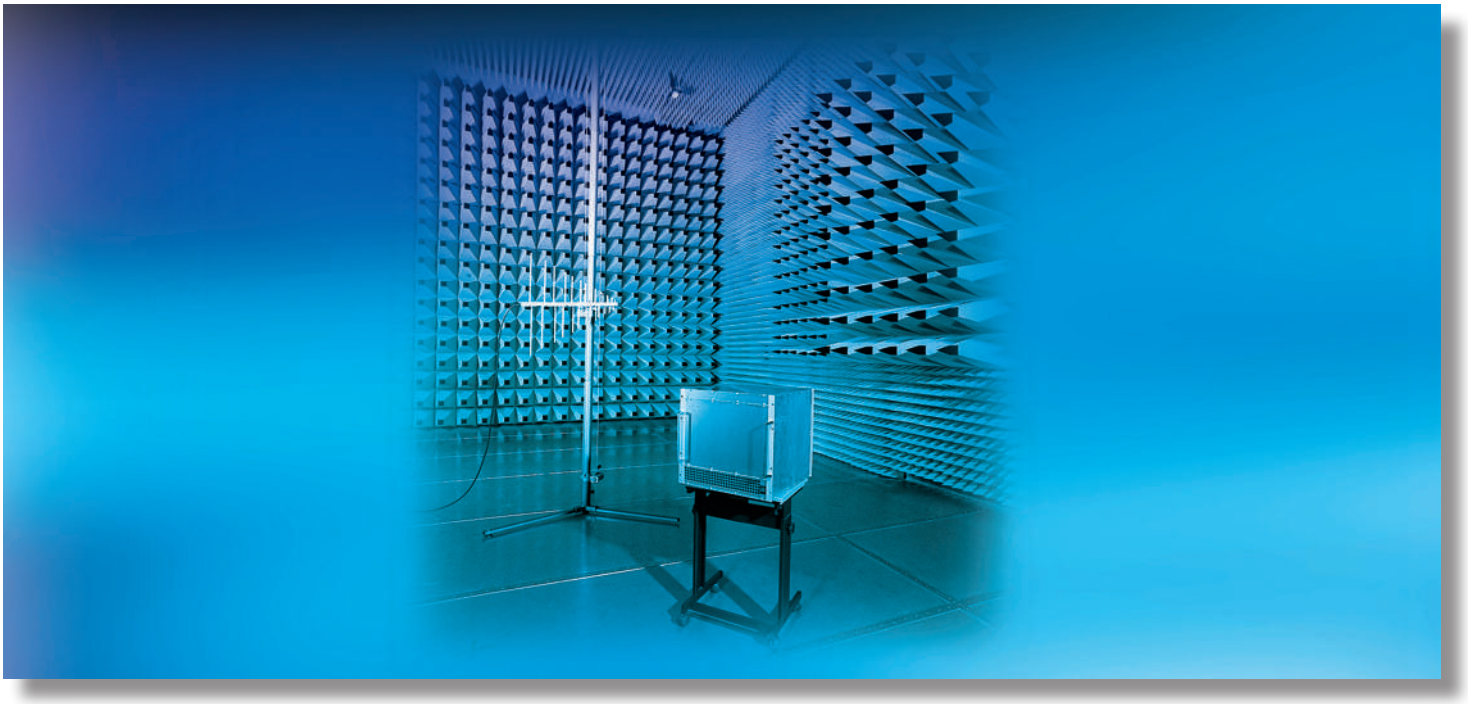
Name _____

Street _____

Postal code _____ City _____

Phone _____ Fax _____

Email _____ Signature _____



EMC-Service

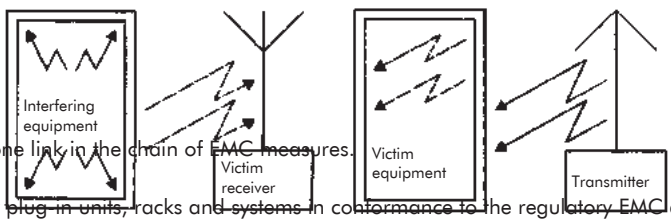
"Electromagnetic comptability is the ability of a system to operate in the intended environment without causing or suffering unacceptable degradation of performance due to unintentinal electromagnetic radiation or response." The EMC characterstics of a system therefore consist of an appropriate immunity from interference (noise immunity) and a limited emission of interference (noise emission).

Elma's EMC concept describes three levels of electromagnetic shielding performance (Performance Level). The attenuation levels will simplify the selection of sub racks for the user. Test setup: The first measurement E1 is without the enclosure. The next measurement E2 is made with the transmitting antenna installed inside the enclosure. The difference between the received signal without and with the enclosure represents the shielding effectiveness in dB.

Performance Level	30 - 230 MHz	230 - 1000 MHz	1000 - 2000 MHz
1 / Elma: Basic level	20 dB	10 dB	0 dB
2 / Elma: Advanced level	40 dB	30 dB	20 dB
3 / Elma: Superior level	60 dB	50 dB	40 dB

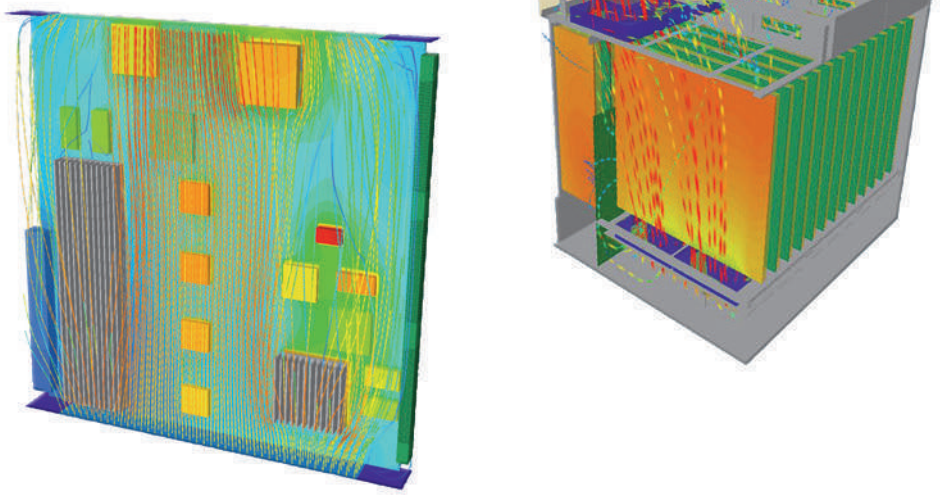
Sources of EMC problems and their containment
The operation of many electrical and electronic devices, e. g. equipment with microprocessors, involves the changing of voltage or current levels. This generates electromagnetic fields, which are radiated into space from the electromagnetic components and are coupled into cables.

The illustration shows the role of a shielded enclosure. It protects the sensitive electronic equipment from the influence and limits the emission of interference.



We are aware that the enclosure is only one link in the chain of EMC measures.

In order to help customers in getting their plug-in units, racks and systems in conformance to the regulatory EMC directives, Elma offers also the possibility to make EMC pre-compliance tests. By using the performant measurement equipment (spectrum analyser and generator from Tektronix) we can provide our customers with measurements that will help in meeting the requirements for EMC, both for radiated and conducted emission.



Thermal Analysis

Today's trend for 19" system based technology is rapidly moving towards "more power", "smaller", "cheaper" and "more integrated". Any of these items can lead to thermal problems. Systems can either be built and tested empirically or be subjected to theoretical simulation and calculations to determine thermal characteristics. Simulation can determine optimum airflow and comporent positioning early in the project lifecycle.

Elma offers CFD (Computational Fluid Dynamics) Simulation early enough in a project to identfy any thermal problems which could adversely affect the performance of the system.
CFD benefits include:

- Optimised solution
- Cost effective, can work from customer CAD data
- Possibility to replace prototype stages in a project
- Faster product development

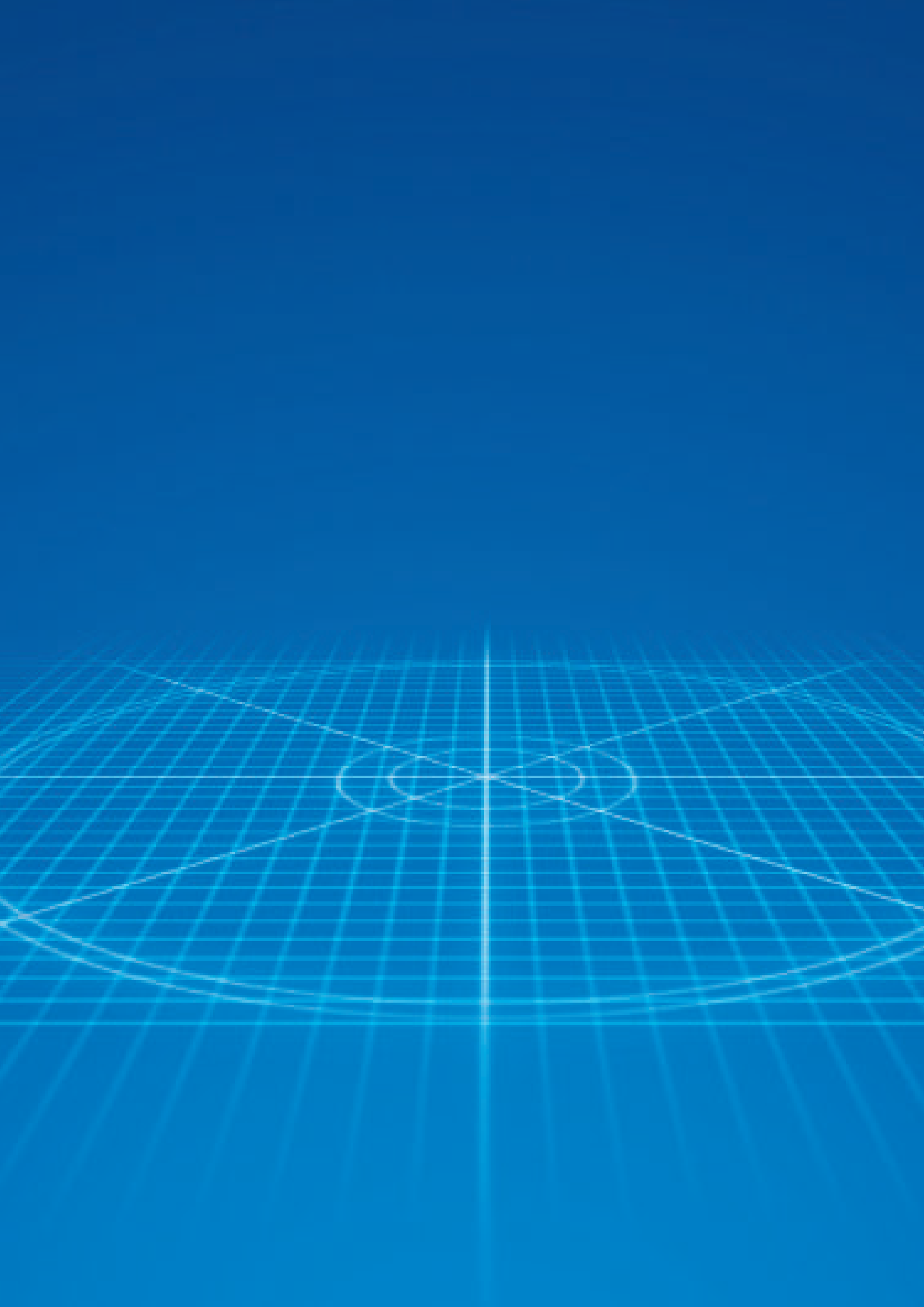
What results can you expect from a thermal simulation?

- Quick proof of the design, before building prototypes
- Optimised flow over the hot components, if required
- Complete flow and temperature field
- Results given in easily accessible visual data and written formats

This is one way for "cool" solutions! May we help you to save more time and money?

For more information and a checklist contact us directly: cfd@elma.ch

Dimensions and Technical Information



1. Dimensions

1.1 Conversion Tables G | 2

1.2 19" Rack Dimensions G | 3

1.3 Sub Rack Dimensions G | 4

1.4 Dimensions of Plug-In Board Assemblies G | 6

2. IP Protection Classes G | 12

3. EMC Security G | 13

4. Ventilation G | 17

1.1 Conversion Tables

1.1.1 Conversion Table U Height Units (Nominal Height)

U	mm	inch	U	mm	inch	U	mm	inch
1	44.45	1.75	19	844.55	33.25	37	1644.65	64.75
2	88.90	3.50	20	889.00	35.00	38	1689.10	66.50
3	133.35	5.25	21	933.45	36.75	39	1733.55	68.25
4	177.80	7.00	22	977.90	38.50	40	1778.00	70.00
5	222.25	8.75	23	1022.35	40.25	41	1822.45	71.75
6	266.70	10.50	24	1066.80	42.00	42	1866.90	73.50
7	311.15	12.25	25	1111.25	43.75	43	1911.35	75.25
8	355.60	14.00	26	1155.70	45.50	44	1955.80	77.00
9	400.05	15.75	27	1200.15	47.25	45	2000.25	78.75
10	444.50	17.50	28	1244.60	49.00	46	2044.70	80.50
11	488.95	19.25	29	1289.05	50.75	47	2089.15	82.25
12	533.40	21.00	30	1333.50	52.50	48	2133.60	84.00
13	577.85	22.75	31	1377.95	54.25	49	2178.05	85.75
14	622.30	24.50	32	1422.40	56.00	50	2222.50	87.50
15	666.75	26.25	33	1466.85	57.75	51	2266.95	89.25
16	711.20	28.00	34	1511.30	59.50	52	2311.40	91.00
17	755.65	29.75	35	1555.75	61.25	53	2355.85	92.75
18	800.10	31.50	36	1600.20	63.00	54	2400.30	94.50

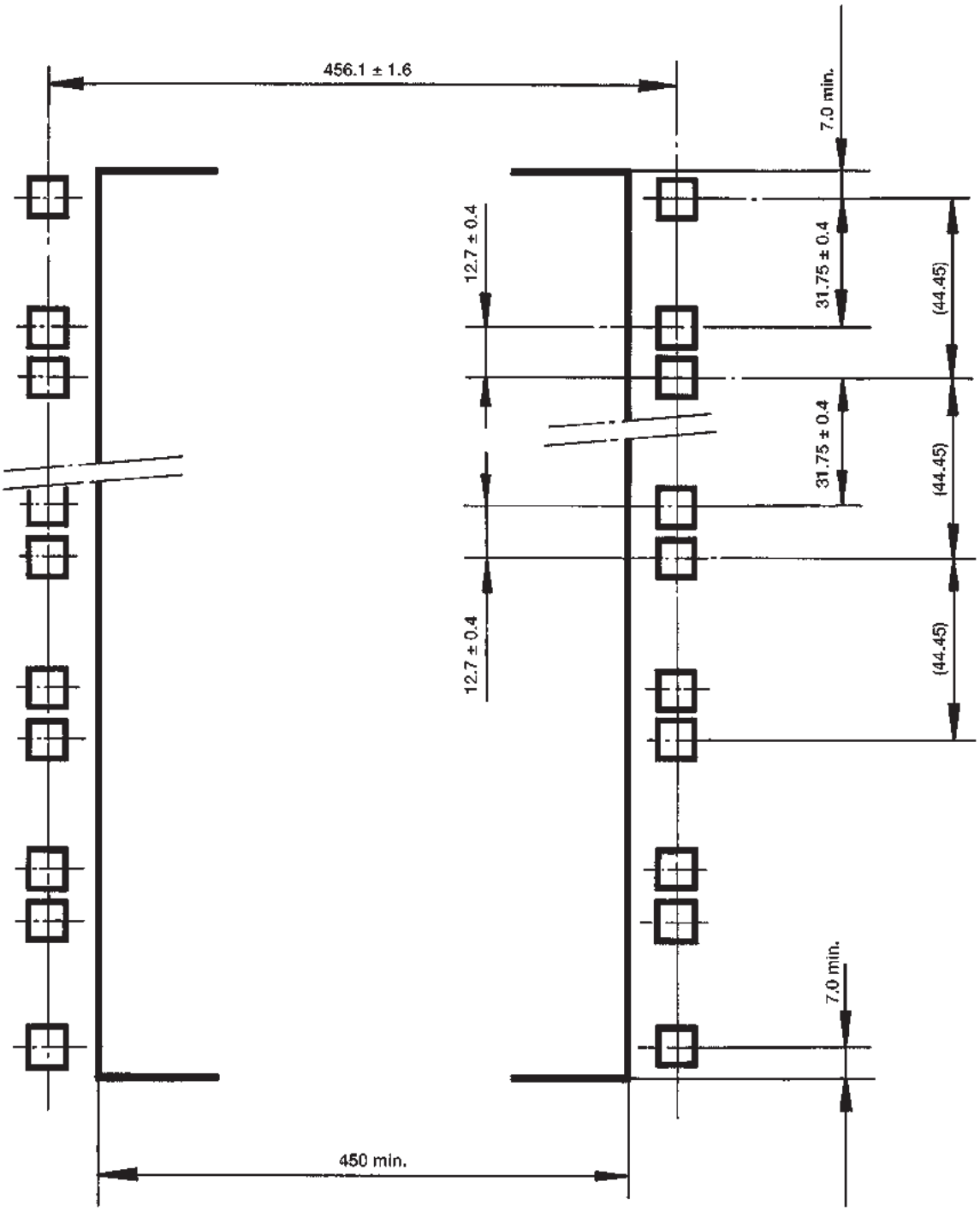
1.1.2 Conversion Table U Height Units (Effective Height for Front Panel Modules)

U	mm	inch	U	mm	inch	U	mm	inch	U	mm	inch
1	43.05	1.71	6	265.90	10.46	11	488.05	19.21	16	710.40	27.96
2	88.10	3.46	7	310.30	12.21	12	532.60	20.96	17	754.85	29.71
3	132.55	5.21	8	354.75	13.96	13	577.05	22.71	18	799.30	31.46
4	177.00	6.96	9	399.20	15.71	14	621.50	24.46			
5	221.45	8.71	10	443.65	17.46	15	665.05	26.21			

1.1.3 Conversion Table Width Divisions HP Horizontal Pitch

HP	mm	inch	HP	mm	inch	HP	mm	inch
1	5.08	0.20	29	147.32	5.80	57	289.56	11.40
2	10.16	0.40	30	152.40	6.00	58	294.64	11.60
3	15.24	0.60	31	157.48	6.20	59	299.72	11.80
4	20.32	0.80	32	162.56	6.40	60	304.80	12.00
5	25.40	1.00	33	167.64	6.60	61	309.88	12.20
6	30.48	1.20	34	172.72	6.80	62	314.96	12.40
7	35.56	1.40	35	177.80	7.00	63	320.04	12.60
8	40.64	1.60	36	182.88	7.20	64	325.12	12.80
9	45.72	1.80	37	187.96	7.40	65	330.20	13.00
10	50.80	2.00	38	193.04	7.60	66	335.28	13.20
11	55.88	2.20	39	198.12	7.80	67	340.36	13.40
12	60.96	2.40	40	203.20	8.00	68	345.44	13.60
13	66.04	2.60	41	208.28	8.20	69	350.52	13.80
14	71.12	2.80	42	213.36	8.40	70	355.60	14.00
15	76.20	3.00	43	218.44	8.60	71	360.68	14.20
16	81.28	3.20	44	223.52	8.80	72	365.76	14.40
17	86.36	3.40	45	228.60	9.00	73	370.84	14.60
18	91.44	3.60	46	233.68	9.20	74	375.92	14.80
19	96.52	3.80	47	238.76	9.40	75	381.00	15.00
20	101.60	4.00	48	243.84	9.60	76	386.08	15.20
21	106.68	4.20	49	248.92	9.80	77	391.16	15.40
22	111.76	4.40	50	254.00	10.00	78	396.24	15.60
23	116.84	4.60	51	259.08	10.20	79	401.32	15.80
24	121.92	4.80	52	264.16	10.40	80	406.40	16.00
25	127.00	5.00	53	269.24	10.60	81	411.48	16.20
26	132.08	5.20	54	274.32	10.80	82	416.56	16.40
27	137.16	5.40	55	279.40	11.00	83	421.64	16.60
28	142.24	5.60	56	284.48	11.20	84	426.72	16.80
						85	431.80	17.00

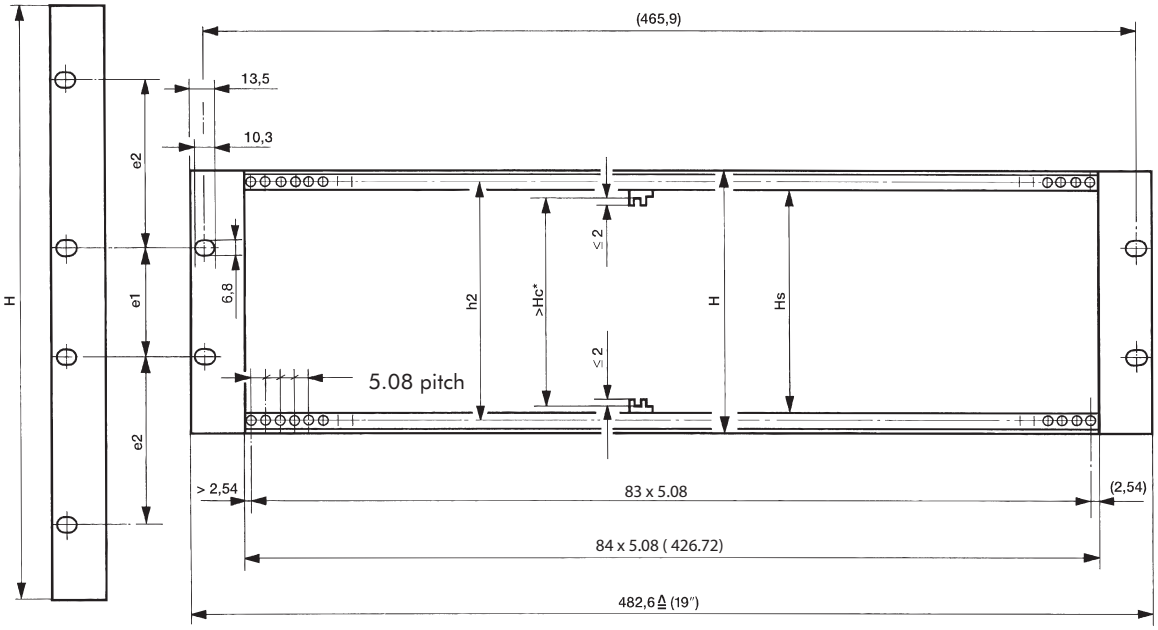
1.2 19" Rack Dimensions



Tolerances between two holes within a distance of 1 m: ± 0.4 mm

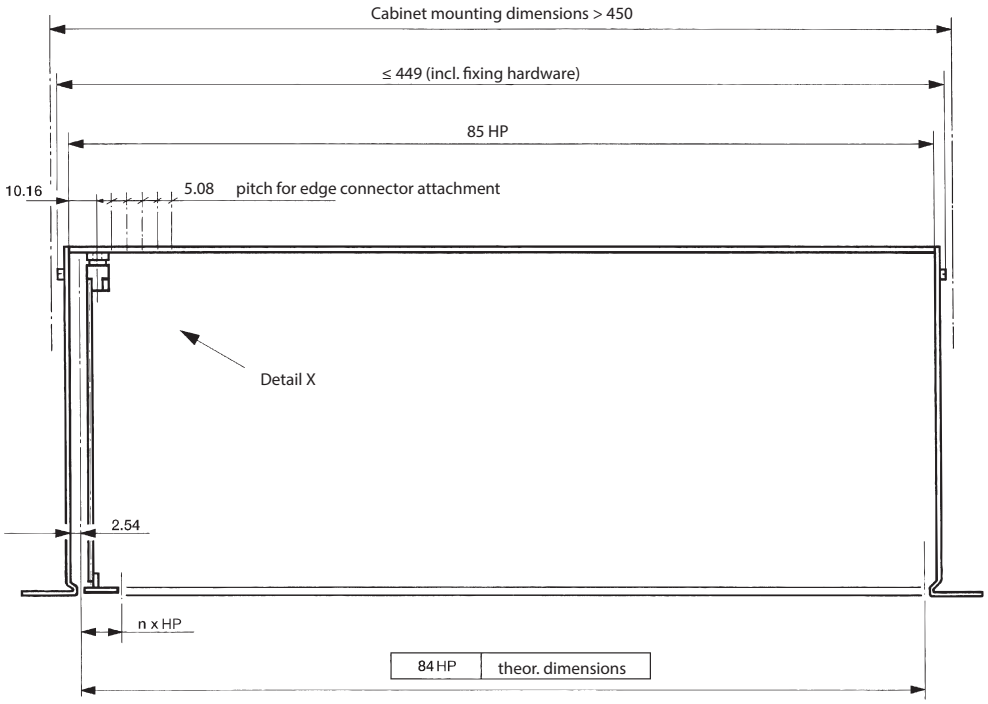
1.3 Sub Rack Dimensions

Front view

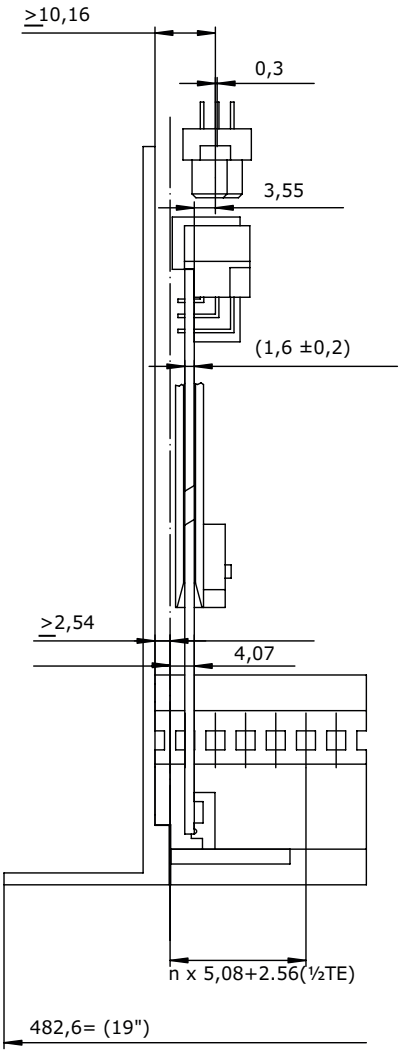


*Hc = For card height, see page 189

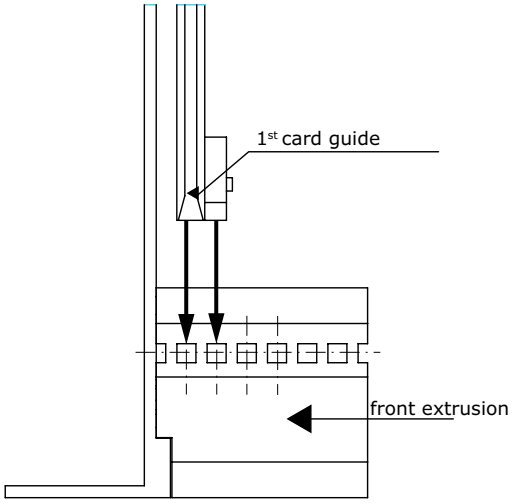
Plan view



Position of 1st Plug-In Board Assembly
(Detail X)



Position of 1st Card Guide

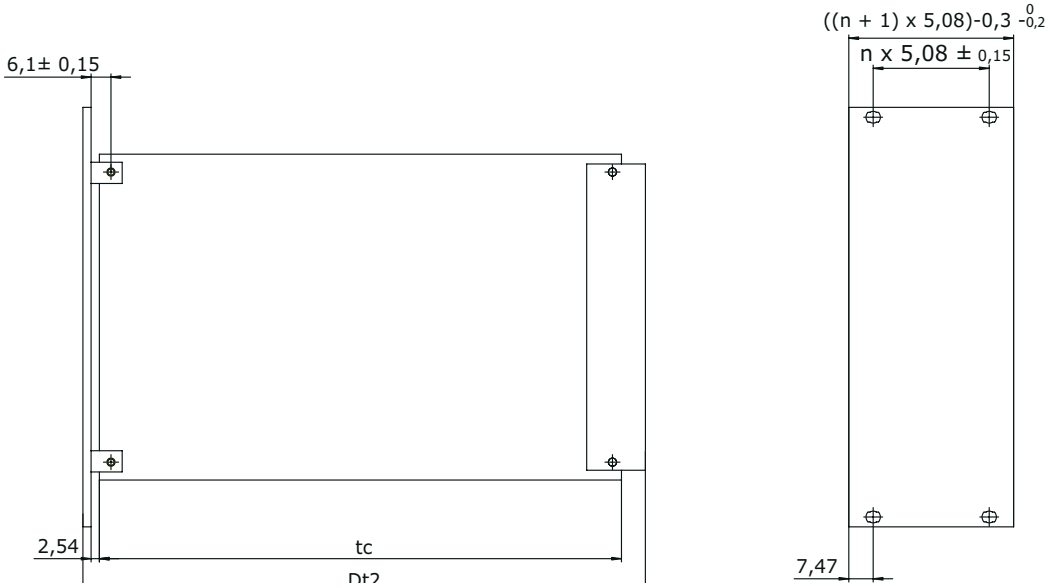


1.3.1 Dimensions:

Nominal height U	H		e1		e2		h2		Hs	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
1U	43.60	1.71	31.75	1.25	–	–	33.60	1.32	23.60	0.92
2U	88.05	3.46	76.2	3.00	–	–	78.05	3.07	68.05	2.67
3U	132.50	5.21	57.15	2.25	–	–	122.50	4.82	112.50	4.42
4U	176.95	6.96	101.6	4.00	–	–	166.95	6.57	156.95	6.17
5U	221.40	8.71	146.1	5.75	–	–	211.40	8.32	201.40	7.92
6U	265.85	10.46	190.5	7.50	–	–	255.85	10.07	245.85	9.67
7U	310.30	12.21	57.15	2.25	88.9	3.50	300.30	11.82	290.30	11.42
8U	354.75	13.96	76.2	3.00	101.6	4.00	344.75	13.57	334.75	13.17
9U	399.20	15.71	120.6	4.74	101.6	4.00	389.20	15.32	379.20	14.92
10U	443.65	17.46	165.1	6.50	101.6	4.00	433.65	17.07	423.65	16.67
11U	488.10	19.21	146.1	5.75	133.3	5.24	478.10	18.82	468.10	18.42
12U	532.55	20.96	190.6	7.50	133.3	5.24	522.55	20.57	512.55	20.17

1.4 Dimensions of Plug-In Board Assemblies

1.4.1 Dimensions of Plug-In Printed Board Assemblies; With Front Panel and Connector to IEC 60297



in mm

Type of Connector	Check Gauge	tc 160 mm	tc 220 mm	tc 280 mm	tc 340 mm	tc 400 mm
B C D E M Q R S	Dt2	169.93±0.4	229.93±0.4	289.93±0.4	349.93±0.4	409.93±0.4
F G H U V	Dt2	171.93±0.4	231.93±0.4	291.93±0.4	351.93±0.4	411.93±0.4

in inch

Type of Connector	Check Gauge	tc 160 mm	tc 220 mm	tc 280 mm	tc 340 mm	tc 400 mm
B C D E M Q R S	Dt2	6.69±0.01	9.05±0.01	11.41±0.01	13.77±0.01	16.13±0.01
F G H U V	Dt2	6.76±0.01	9.13±0.01	11.49±0.01	13.85±0.01	16.21±0.01

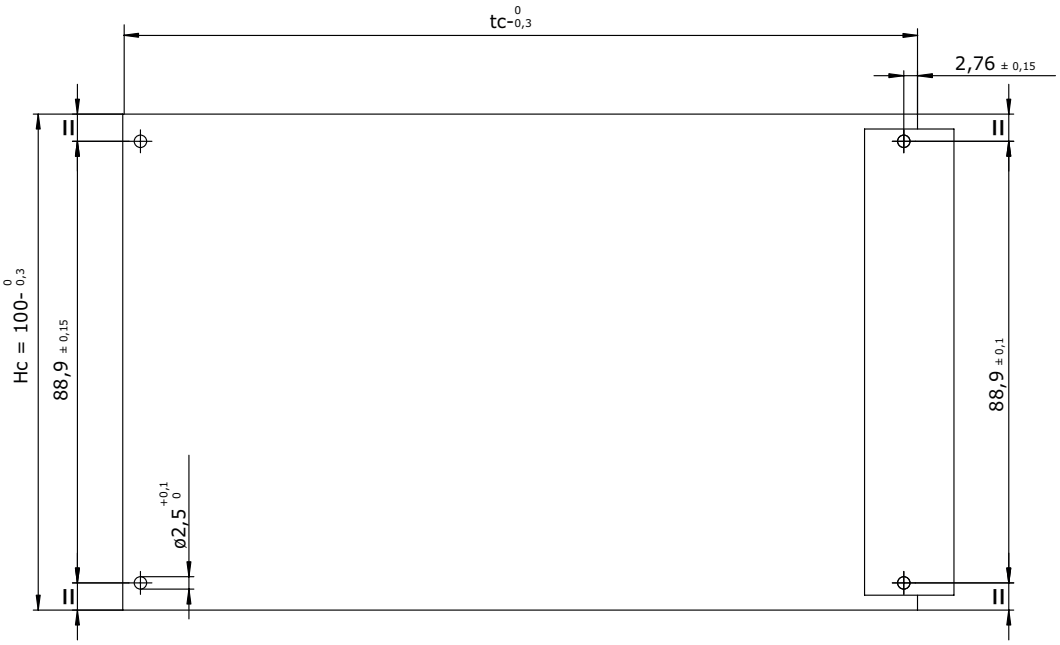
tc = card depth
Dt2 = check gauge for sub rack depth

1.4.2 General Board Sizes, All Dimensions Conform to IEC 60297-3

Nominal Height	Card Height Hc 1		Card Depth (tc)				
	mm	inch	80 mm 3.15"	100 mm 3.93"	160 mm 6.29"	220 mm 8.66"	280 mm 11.02"
2 U	55.55	2.18	X	X	X	X	X
3 U	100.00	3.93	X	X	X	X	X
4 U	144.45	5.68	X	X	X	X	X
5 U	188.90	7.43	X	X	X	X	X
6 U	233.35	9.18	X	X	X	X	X
7 U	277.80	10.93	X	X	X	X	X
8 U	322.25	12.68	X	X	X	X	X
9 U	366.70	14.43	X	X	X	X	X
10 U	411.15	16.18	X	X	X	X	X
11 U	455.60	17.93	X	X	X	X	X
12 U	500.05	19.68	X	X	X	X	X

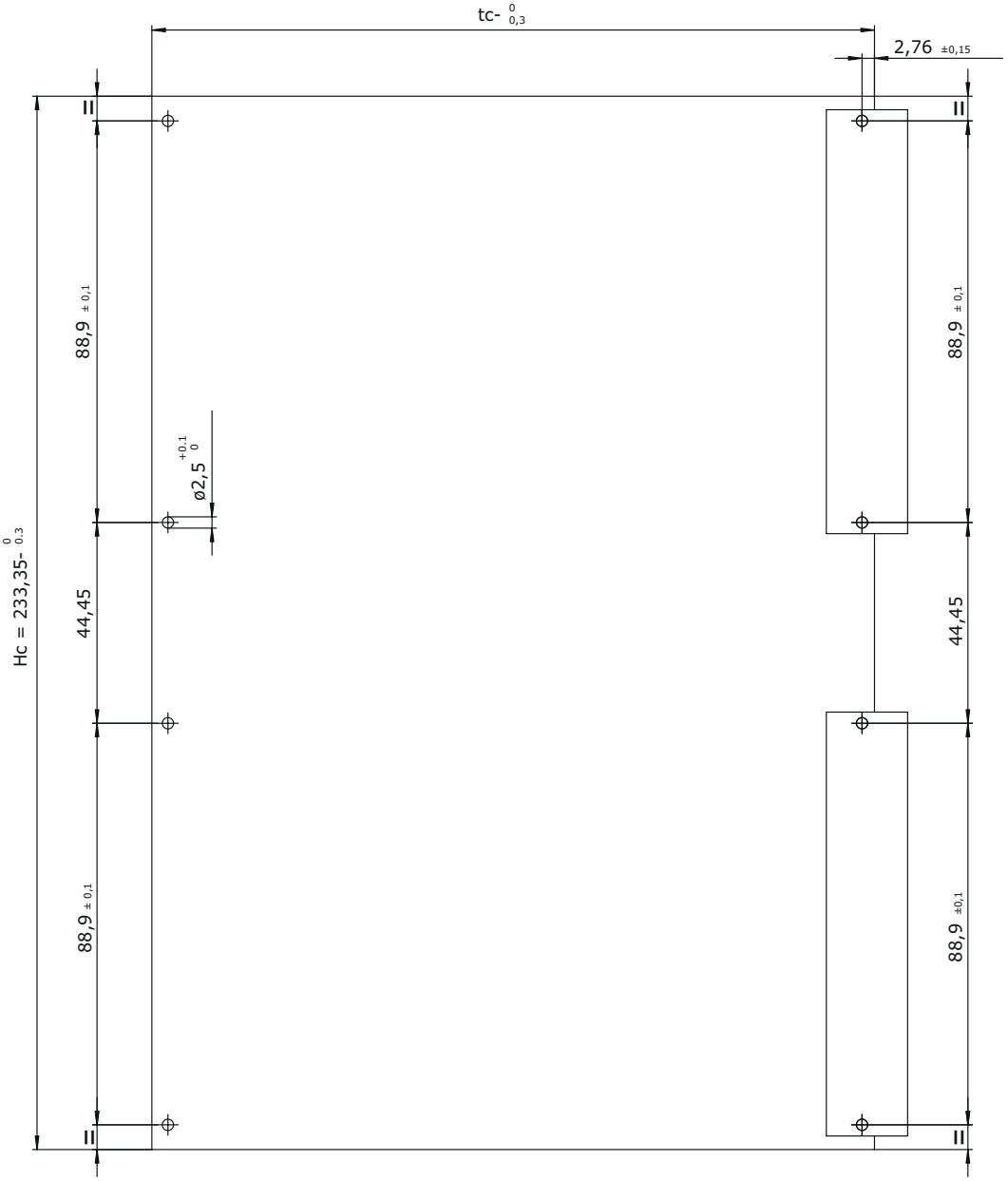
All combinations of the above dimensions are theoretically possible; however, preference should be given to those marked

1.4.3 Line Drawing for (Hc) 100.00 mm (for 3 U), Derived from the IEC 60297 Standard for Connectors



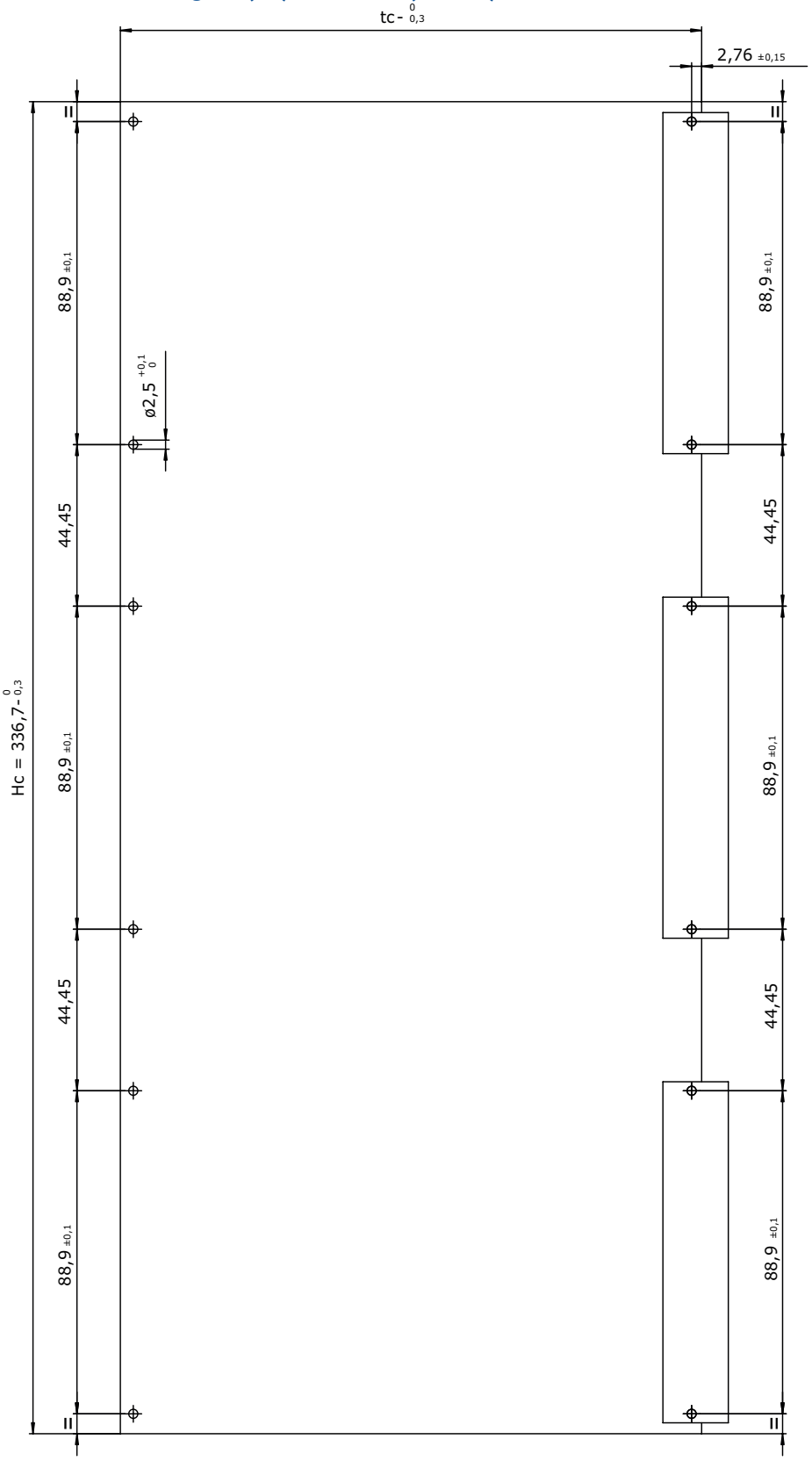
tc = card depth

1.4.4 Line Drawing for (Hc) 233.35 mm (for 6 U), Derived from the IEC 60297 Standard for Connectors



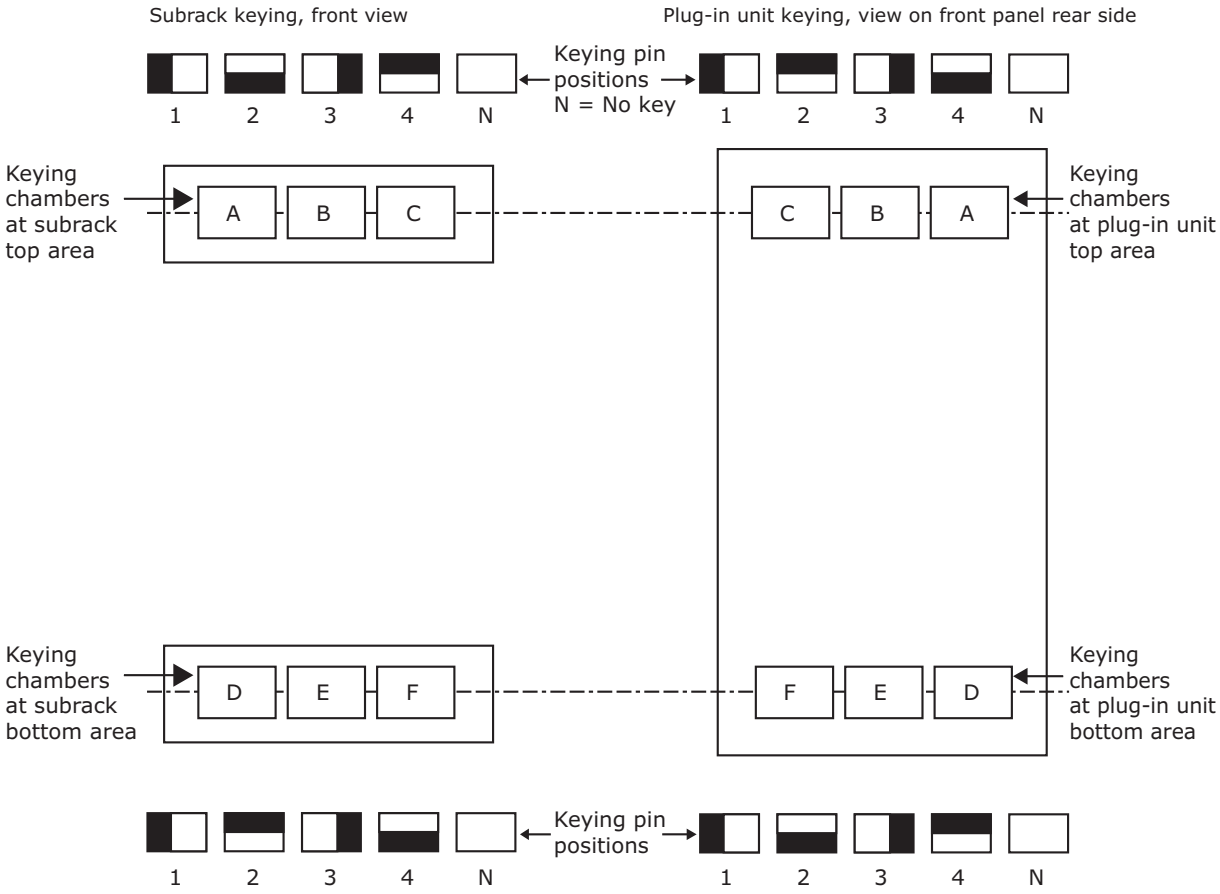
tc = card depth

1.4.5 Line Drawing for (Hc) 366.7 mm (for 9 U), Derived from the IEC 60297 Standard for Connectors

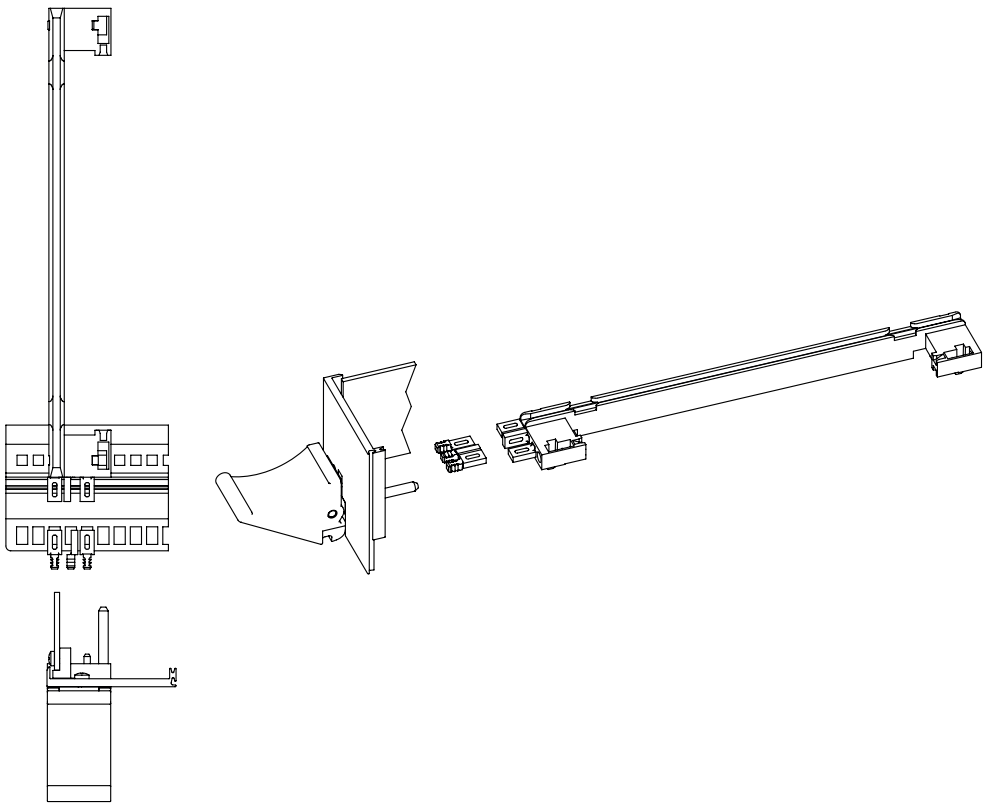


tc = card depth

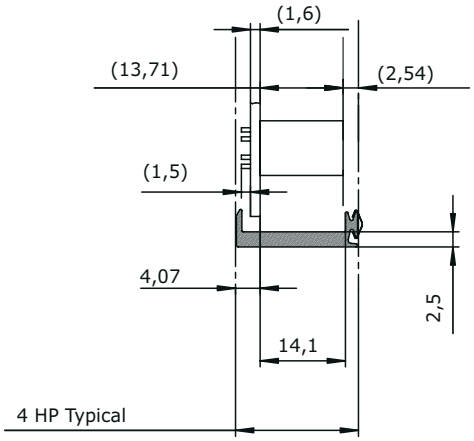
1.4.6 Programming of Keys



NOTE: The corresponding keying chambers on the sub rack and the plug-in unit are indicated by the same letters. The numbering order of keying pins as shown was chosen with the purpose that the corresponding chambers with the same keying pin identification number will not block by inserting a plug-in unit. If corresponding chambers are fitted with different keying identification numbers, the plug-in unit will be blocked and cannot be inserted. On the rear of the sub rack/plug-in unit the letters A, B, C will be on the bottom and D, E, F o the top. The order of letters on the rear is of mirror image.

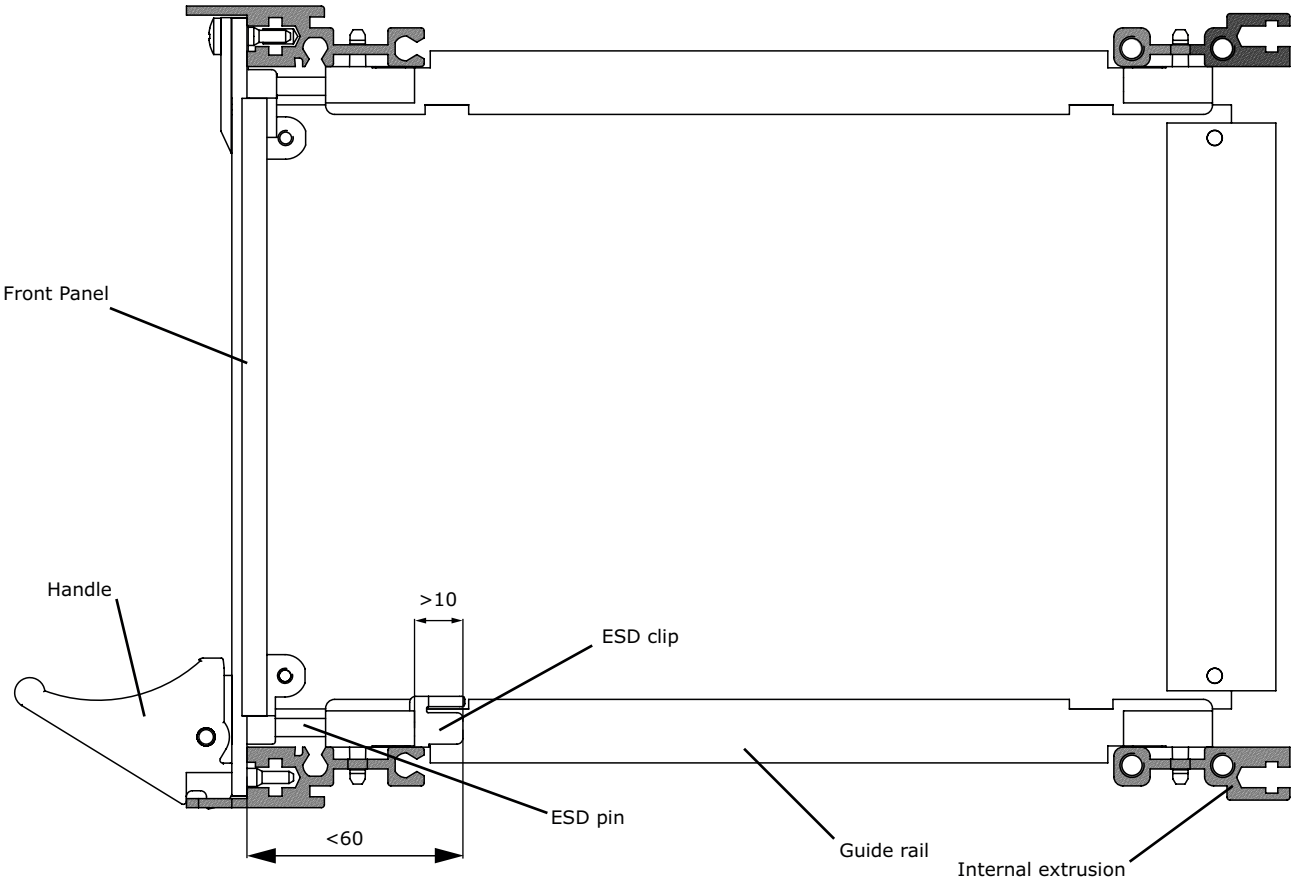


1.4.7 EMC Front Panel/PCB Relationship



1.4.8 Sub Rack/Plug-In Unit Electrostatic Discharge Provisions (ESD)

- For the proper function the clip has to connect to grounded parts of the sub rack and to conductive sections on the printed circuit board.



2.1 IP Protection Classes

- Protection against contact and foreign bodies
- Protection against water
- Acc. to IEC 60529

Evaluation of classification

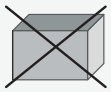
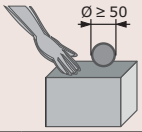
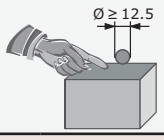
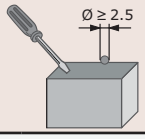
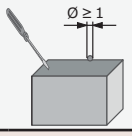
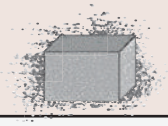
- The test results according to the standard do not entirely exclude leaks and an individual test is therefore recommended in critical cases (with the actual equipment layout)
- The protection class for cabinets and enclosures is specified by IP (International Protection) and two indices

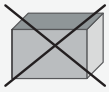
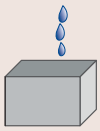
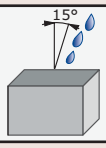
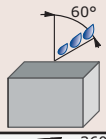
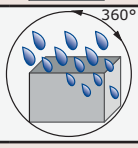
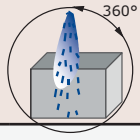
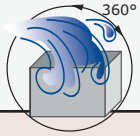
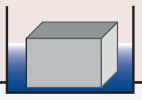
Example IP 55

Protection against penetration by water jets from all directions

Complete protection against contact with internal parts and against dust deposition

IP Protection Classes

First Index	Contact Protection	Foreign-Body Protection
0 	No special protection	
1 	Against large areas of body	Large foreign bodies Ø ≥ 50 mm (1.97")
2 	Against fingers or objects of similar size	Medium-sized foreign bodies Ø ≥ 12.5 mm (0.49")
3 	Against tools, wires, etc. with a thickness of ≥ 2.5 mm	Granular foreign bodies Ø ≥ 2.5 mm (0.10")
4 	Against tools, wires, etc. with thickness ≥ 1.0 mm	Granular foreign bodies Ø ≥ 1.0 mm (0.04")
5 	Complete protection	Dust-protected; dust deposits are permitted, but their volume must not affect the function of the unit
6 	Complete protection	Dust-proof

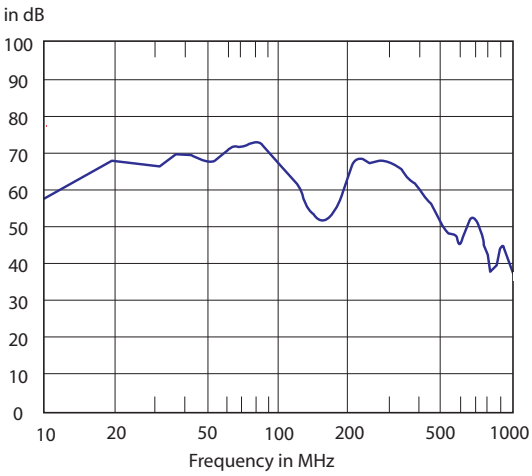
Second Index	Water Protection
0 	No special protection
1 	Against water dripping vertically
2 	Against water dripping at an angle (up to 15° from the vertical)
3 	Against spray water (any direction up to 60° from the vertical)
4 	Against spray water from all directions
5 	Against water jets from a nozzle in all directions
6 	Against inundation
7 	Against immersion
8 	Against submersion

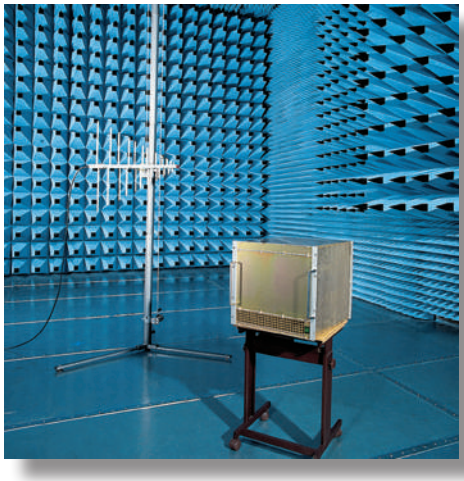


3.1 EMC Security

Elma has taken account of the rapidly increasing importance of electromagnetic compatibility (EMC) of electronic equipment with the provision of special series of enclosures.

Typical attenuation curve
Superior EMC level



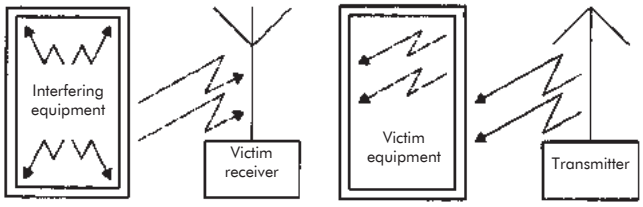


Definition

"Electromagnetic compatibility is the ability of a system to operate in the intended environment without causing or suffering unacceptable degradation of performance due to unintentional electromagnetic radiation or response."
The EMC characteristics of a system therefore consist of an appropriate immunity from interference (noise immunity) and a limited emission of interference (noise emission).

Sources of EMC problems and their containment

The operation of many electrical and electronic devices, e.g. equipment with microprocessors, involves the changing of voltage or current levels. This generates electromagnetic fields, which are radiated into space from the electromagnetic components and are coupled into cables. The illustration shows the role of a shielded enclosure. It protects the sensitive electronic equipment from the influence of external interference and limits the emission of interference.



We are aware that the enclosure is only one link in the chain of EMC measures.

The two kinds of attenuation

An enclosure acts as a barrier between the source and the victim of the interference. The intensity of the radiation is attenuated and further propagation prevented.
The degree of enclosure attenuation determines the efficiency of the metal shield. It is defined as the logarithm of the ratio of field strengths outside and inside the enclosure.

$$\text{Shielding effectiveness} = 20 \log \frac{\vec{E}_A}{\vec{E}_I} \quad \text{or} \quad 20 \log \frac{\vec{H}_A}{\vec{H}_I}$$

$\vec{E}_A$ = Electrical field outside case
$\vec{E}_I$ = Electrical field inside case
$\vec{H}_A$ = Magnetic field outside case
$\vec{H}_I$ = Magnetic field inside case

Attenuation	Shielding factor	Damping
40 dB	100:1	99.0 %
60 dB	1 000:1	99.9 %
80 dB	10 000:1	99.99 %

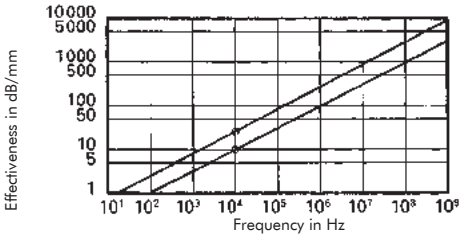
The total shielding consists of the absorption loss and the reflection loss. The absorption loss is produced by the dissipation of energy in the shield material. It is directly proportional to the material thickness. In the lower frequency range a sufficient shielding effectiveness can only be achieved by the absorption loss. The reflection loss is produced by reflections of the electro-magnetic waves at the surface of the shielding material. A difference is drawn between the reflection loss in the near field (distance from source $<\lambda/2\pi$) and in the far field (distance from source $>\lambda/2\pi$).

$$\lambda = \frac{c}{f}$$

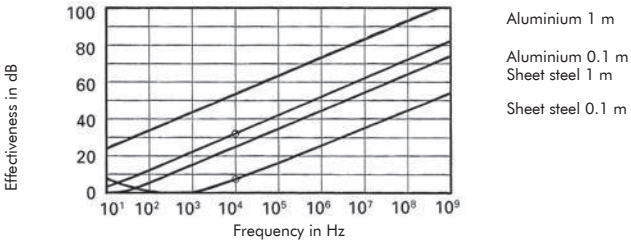
λ = wavelength of interfering signal in m
c = velocity of light 3 x 10^8 m/s
f = frequency in Hertz

Example for determination of the total shielding effectiveness of sheet steel 1 mm thick and sheet aluminium 1 mm thick at a frequency of 10 kHz and a distance from the source of interference of 0.1 m.

Absorption loss



Reflection loss in near field



Absorption loss	– steel	25 dB
	– alu	10 dB
Reflection loss	– steel	6 dB
	– alu	32 dB
Total shield effectiveness	– steel	25+ 6 = 31 dB
	– alu	32+10 = 42 dB

The sheet aluminium shield has an 11 dB, i.e. 3.5 times, higher attenuation than the sheet steel shield.

Enclosure openings

Ideal shielding can be achieved by placing the electronic components in a metal enclosure welded all round. This is only very rarely possible, however, in practical applications. Openings are required for operation and indications, for cable entries, for ventilation and for the mounting and removal of components. The individual parts of the enclosure must be electrically conductive with good continuity across the joints in order to prevent a reduction of the shielding effectiveness. Without conductive gasket or contacts with closely situated contact points (e.g. screws) gaps are produced, which produce antenna effects owing to their length.

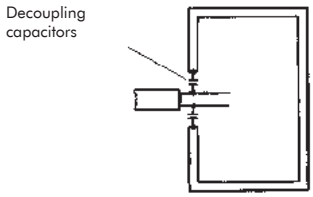
Gaps lengths less than $^1/_{20}$ of the wavelength only have a negligible effect on enclosure shielding effectiveness. In units subject to strong radiation, the gap length should be kept shorter than $^1/_{50}$ of the wavelength.

EMC gaskets

The primary function of an EMC gasket is the reduction of the interface resistance across a joint of the enclosure. The lower the interface resistance, the better the seal. The interface resistance depends on the surface resistance of the enclosure parts, the conformability of the seal, the contact pressure and the conductivity of the seal. Elma enclosures are provided with copper-beryllium contact strips and a plastic foam seal, sheated with a conductive metal. These seals ensure low interface resistance. The effectiveness of the EMC gasket under extreme environmental conditions, e.g. humid heat, is extremely important.

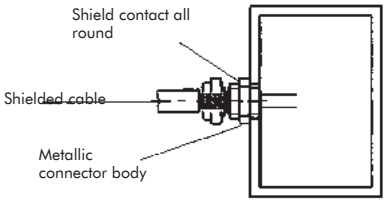
Cable entries

Careful consideration should be paid to the cable entries in the enclosure. Errors in cable runs can result in the required shielding effectiveness being almost entirely lost. The following possibilities are available for correct execution of cable entries and exits.



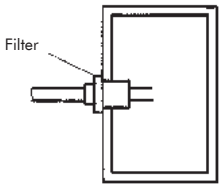
1st possibility

Decoupling capacitors. Decouple all cable wires with a capacitor of low value (10 nF) and very short connections to the enclosure.



2nd possibility:

Shielded cables. The shield contacts the enclosure all round via a cable fitting or a metallic connector body.



3rd possibility:

Filter. The filter must be screwed to a good conducting surface of the enclosure.

G

Elma EMC Concept

The Elma EMC concept is based on three shielding levels. This enables specific requirements to be taken into account at reasonable cost and, if necessary, for retrofitting units.
The three levels differ in the length of slots between the defined contact points. The slot lengths (provide antenna effect) determine the RF shielding.

EMC Basic level

- all enclosure parts connected together to conduct
- long slots
- for applications in the low-frequency range

Advanced EMC level

- all enclosure parts connected together to conduct
- slot lengths reduced by additional contact points
- for applications in the medium-frequency range

Superior EMC level

- all enclosure parts connected together to conduct
- slots closed by EMI/RFI gaskets
- for applications in the high-frequency range

The shielding effectiveness of an enclosure remains a theoretical consideration if the fittings, cable runs and enclosure openings are not also considered. The shielding effectiveness measured for the Elma enclosure, however, provides basic information about their quality.
For most applications an enclosure with the components joined electrically conductive is sufficient. Units for data processing (digital technology) generate practically no interference in the frequency range >100 MHz and also do not respond to interference in this frequency range, provided the printed circuit boards have been carefully laid out.

Definite results are only obtained by measurements on fully assembled and wired units equipped with connecting cables.

Good electromagnetic compatibility is the result of a carefully considered concept.

The weakest element determines the overall noise immunity.

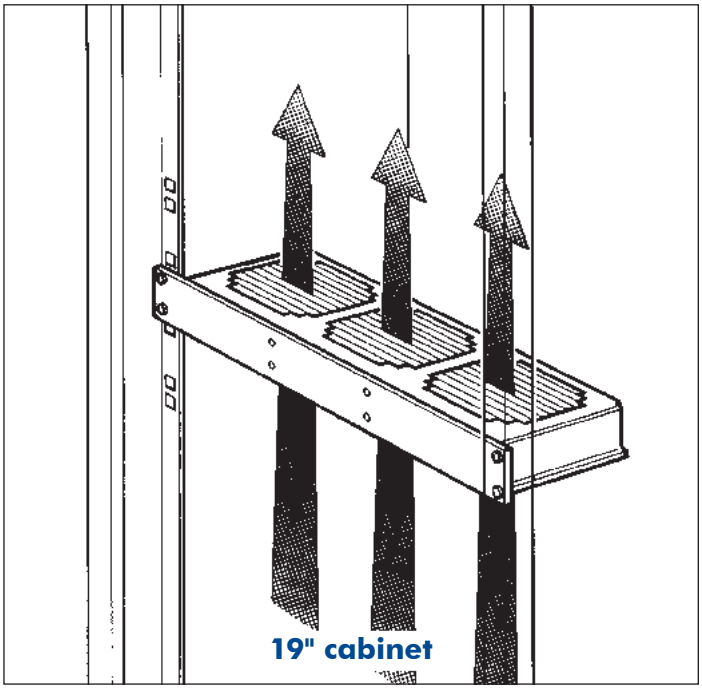
4.1 Ventilation

Forced air-cooling = Reliability for your electronic components

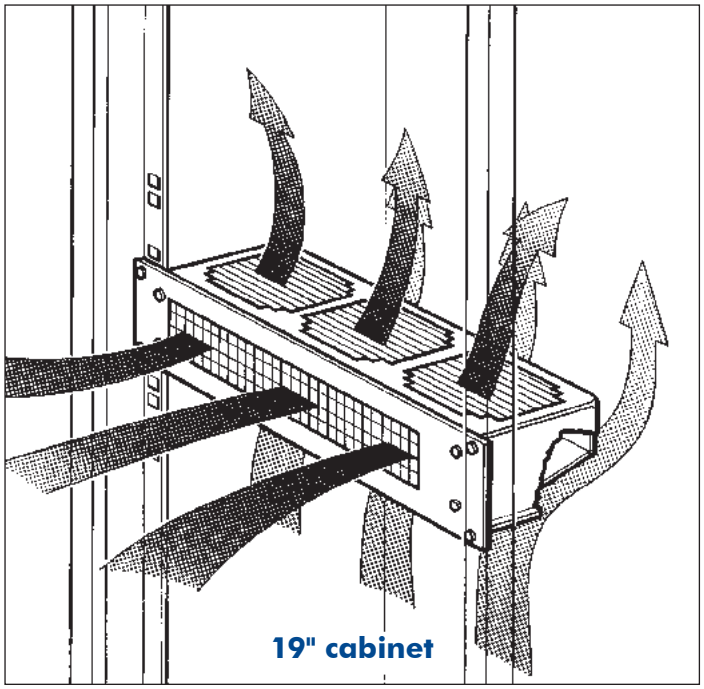
Natural convection is more often than not an inadequate way of dissipating the heat generated by electronic devices. With today's trend to miniaturization and high packing densities, the maximum permitted temperature is soon exceeded – with adverse effects for the life-time of the electronic components.
A considerable improvement is achieved with forced air-cooling.

Besides ventilation, air-cooling equipment must also ensure a low noise level and feature the option of partial cooling.

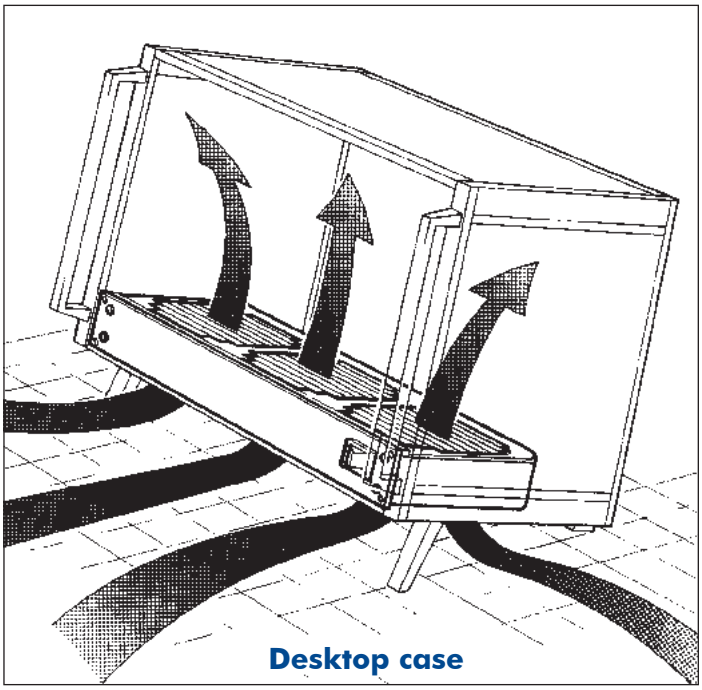
Elma has a comprehensive range of fan modules which are the ideal solution for 19" cabinets, 19" racks and desktop cases.



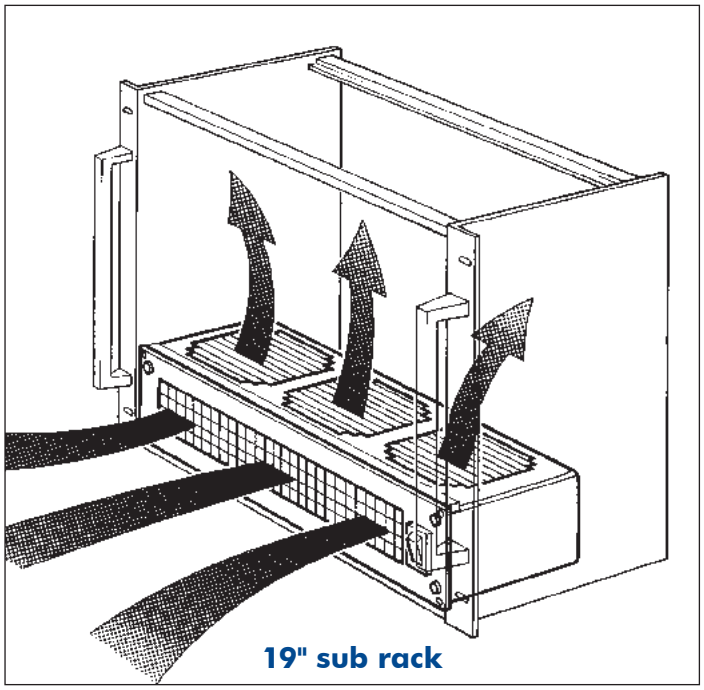
19" cabinet



19" cabinet



Desktop case



19" sub rack

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General:

Technical information

The volumetric flow of air "V" required to cool an electrical device depends upon the power loss "P_V" produced by the device and the difference "$\Delta\vartheta$" between the operating temperature ϑ_B of the components and its ambient temperature ϑ_U. The volumetric flow of cooling air which is necessary for a given component operating temperature can be determined in close approximation by using the following equation:

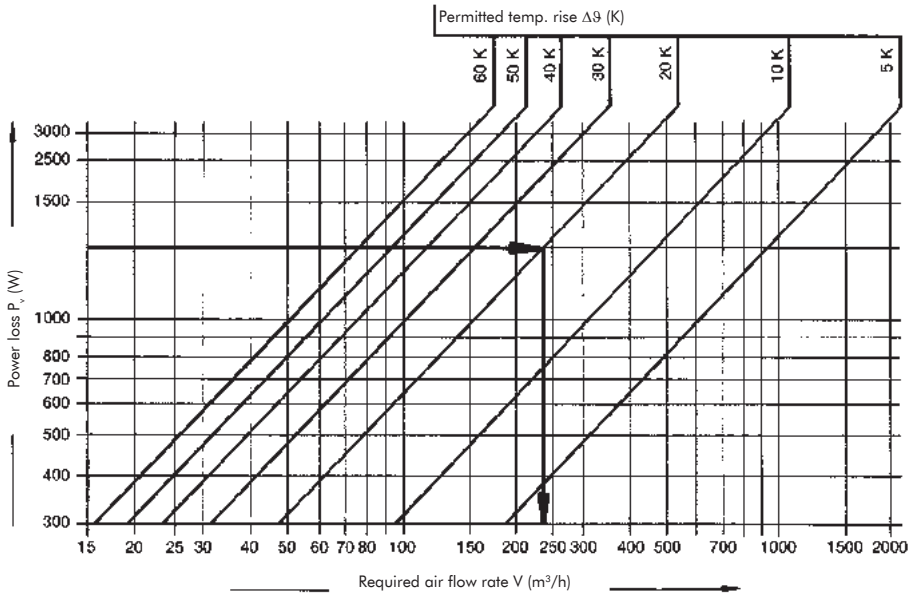
$$V = \frac{3.1 \square P_V}{\Delta\vartheta}$$

where V (m^3/h) = Volumetric flow of cooling air
P_V (W) = Power loss
$\Delta\vartheta$ (K) = Temperature difference $\vartheta_B - \vartheta_U$

3.1 = Constant, from $\frac{1}{C_P \square \varphi}$

C_P = Isobaric spec. heat capacity $\left(0.27 \frac{Wh}{kg\ k}\right)$

φ = Air density $\left(1.20 \frac{kg}{m^3} \text{ at } 20\ °C\right)$



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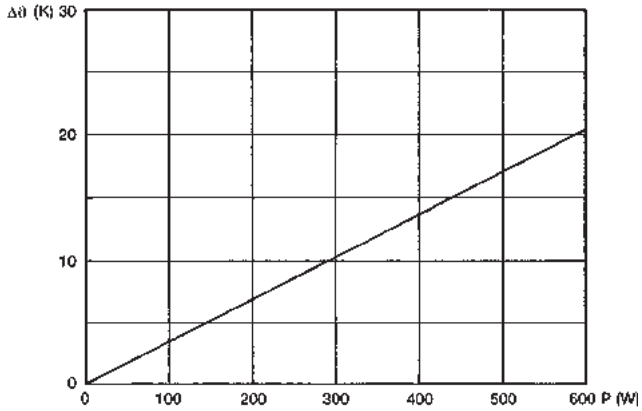
Fan modules:

Technical information

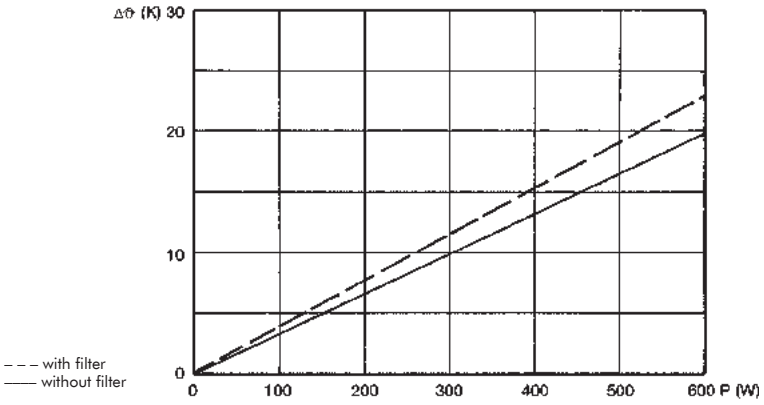
The fan modules were tested in a type-14 Elma case. 21 double eurocards rated at approximately 25 watts power loss each, spaced at intervals of 4HP (1HP = 5.08 mm/0.20"), formed the basis for the performance test carried out on the fan modules. The diagrams below allow the possible $\Delta\vartheta$ to be determined as a function of the power loss P.

$$\Delta\vartheta = \vartheta_{card} - \vartheta_{ambient}$$

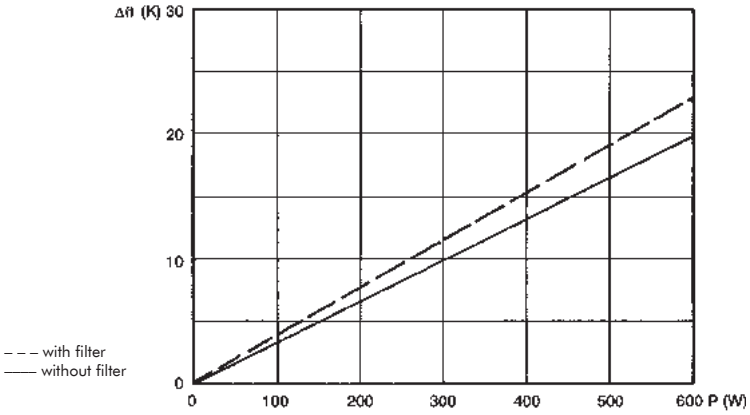
Fan module **1U**, vertical air intake (3 fans 69–430–20)



Fan module **2U**, vertical air intake (3 fans 1925–79)



Fan module **2U**, horizontal air intake (3 fans 1925–79)



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ELMA
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5325-12	A | 4_43
5325-12	B | 1_41
5325-12	B | 2_60
5325-12	B | 3_66
5325-12	E | 2_5
5325-12	E | 6_16
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7820-91	E | 5_3
7820-92	E | 5_3
7820-95	C | 2_16
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7820-95	E | 5_3
7821-300	C | 2_16
7821-300	C | 2_19
7821-300	E | 5_3
7821-2000	C | 2_16
7821-2000	C | 2_19
7821-2000	E | 5_3

Notes



As a global player we are leader in Eurocard-based and custom Standard System Platform solutions. With various rackmount, desktop, or portable chassis styles, Elma assembles the backplane, power supplies, cooling solution, and peripherals to your exact specification. With a modular design approach, Elma can provide you a tailored solution while saving time, effort, and money. You receive a quality, customised solution based upon a proven base platform.

Applications

- Communications
- Industrial
- Aerospace / Military
- Test and Measurement
- Transportation
- Medical
- Scientific
- High-performance Computing

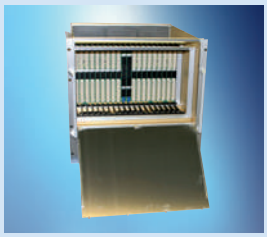
Custom Solutions

Elma has been designing industry standard and custom chassis solutions for the embedded systems market for over 30 years. Our highly experienced team of engineers are experts in mechanical and electrical enclosure design and balancing thermal management, EMC, shock/vibration, system monitoring, reliability and maintainability issues. Our test and validation lab ensures your product meets the most stringent of requirements.

Test/Validation

- Shock & Vibration to MIL-STD-810F, 167, and 901D
- EMC testing to MIL-STD-461D, FCC A, FCC B and CE
- NEBS testing to meet levels 1, 2 and 3
- In-house cooling analysis and airflow testing
- Environmental testing: temperature, humidity, etc.
- Reliability analysis per MIL-HDBK-217F
- Power supply testing and qualifying





Products

- AdvancedTCA
- CompactPCI/ cPCI Express
- cPSB (PICMG 2.16)
- MicroTCA
- Rugged COTS/ATR
- VME/64x
- VXI/PXI
- VPX (VITA 46/48, REDI)
- VXS (VITA 41)
- Accessories
- Custom Solutions

Rugged Solutions

Superior solutions require a solid foundation.
Elma VME/VME64x, cPCI, VXI, PXI, VPX, VXS, ATCA, and Switched Fabric enclosure systems provide an optimal platform on which to build your application.
A wide range of products and a modular approach to design allows Elma to meet the requirements of the most demanding applications. Based on quality Swiss components and proven design concepts, Elma's systems are used as the critical building blocks for many successful applications.



Applications

- Aerospace
- Defense
- Homeland Security
- Aerial Reconnaissance
- Other Rugged

Military Solutions

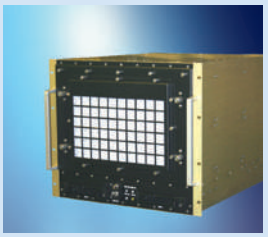
We are a developer and producer of high-end electronic packaging systems and specialist products for the COTS, defense and high-availability sector.

The company has been a forerunner in providing COTS system enclosure solutions and over the last 10 years has built a strong market position.

Services

- In-house pre-compliance testing
- Thermal management simulation
- Custom IO solutions
- Custom PSU solutions








Products

- 19" rugged chassis
- ATR (ARINC & custom)
- Custom rugged solutions
- Convection cooled
- Conduction cooled
- Sealed variants
- Liquid cooled

Capabilities

- Shock & Vibration
- Thermal management
- EMC
- Custom I/O wiring
- Lifetime support

Backplanes



Elma's high-performance backplanes are designed to meet the needs of a wide range of applications and markets. We offer you the largest selection in the industry of standard backplanes to PICMG and VITA specifications. Our expertise in highly-complex custom backplane solutions is second-to-none. With over 3,000 projects to date, you benefit from our extensive experience – saving you time, effort, and money. The flexibility of our production facilities allows us to manufacture prototypes as well as high volumes, complex MIL-standard backplanes, or meet quick-turn requirements.

Applications

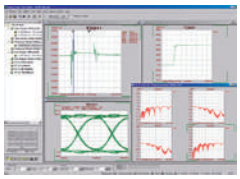
- Aerospace
- Military and Security
- Industrial Automation
- Telecommunications
- Transportation
- Medical
- Scientific
- Infrastructure

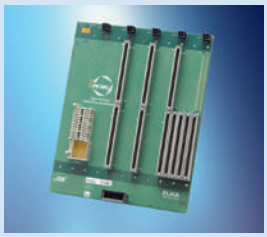
Custom Solutions

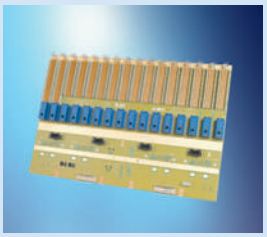
As data rates up to 10 Gbit/s per differential pair place highest performance demands on backplanes, you need a design team that is up to the challenge. Elma Bustronic and Elma Trenew Electronic, Elma's backplane divisions, are leaders and innovators in high-speed custom backplane design. Our signal integrity analysis and simulation/characterization tools, ensure that we supply you with an efficient cost-effective design solution.

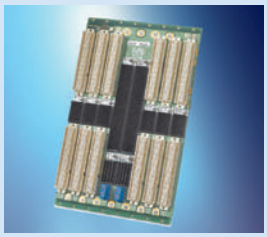
Services

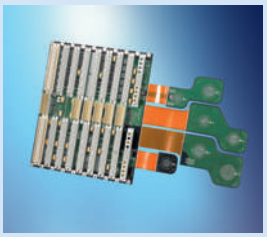
- Custom design
- Manufacturing & assembly
- Characterization & measurements
- Pre-design simulation
- Contract manufacturing











Products

- AdvancedTCA
- CompactPCI
- CompactPCI Express
- CPSB (PICMG 2.16)
- MicroTCA
- PXI/VXI
- VME/VME64x
- VPX (VITA 46)
- VXS (VITA 41)
- Accessories

Capabilities

- High speed design verified to 10 Gbps and beyond
- Signal performance optimization
- Analysing of high-frequency analog effects
- Characterization of input differential insertion loss, return loss, and near-end and far-end crosstalk
- S-parameters
- Tools & Software include: state-of-the-art VNA and TDR from Agilent, HSPICE, P-CAD signal integrity, Iconnect, and more

Elma is a global manufacturer of products for housing electronic systems. Take advantage of the know-how of our development and applications engineers that create products which are more than mere packaging of your electronics.

The latest equipment for development, production and logistics provides the preconditions to satisfy your high quality standards.



Applications

- Telecom Equipment
- Test and Measurement Equipment
- Industrial Automation
- Medical Equipment
- Security Systems
- Railway Rolling Stock

Custom Solutions

Your needs together with the experience and ideas of the Elma Electronic Packaging Team give you the advantage to create solutions to every specific application.

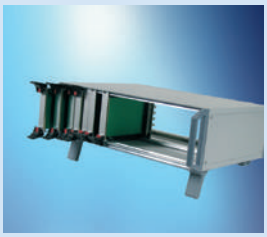
Our worldwide team with experience in design, EMC, FEM, thermal simulation and state-of-the-art CAD system, are ready to develop solutions to meet your next project challenge.

Services

- Custom designs
- Thermal analysis and simulation
- EMC consulting
- Manufacturing
- Front panel processing
- Assembling
- Electroplating on aluminium













Products

- Sub racks
- Enclosures
- Front panels
- Injector/Ejector handles
- Accessories
- Custom
- Handles



Elma is a designer and manufacturer of custom and standard cabinet enclosures.
Products include 19" server racks, cabinet enclosures, command desks & consoles, table rack & wall mount enclosures, accessories, and complete enclosure systems.

The company offers a fast, flexible response to customer needs and extensive practical knowledge in tailoring solutions to specific applications.

Applications

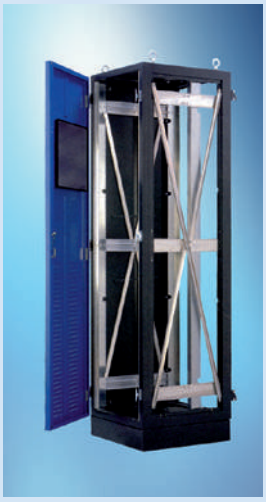
- Telecom
- Communications
- Industrial
- Aerospace / Military
- Test and Measurement
- Medical

Cabinet solutions

Elma offers a wide range of proven design platforms and experience from hundreds of complex packaging projects where extensive customisation was required to meet customer specifications.

The company's flexible manufacturing system and modular design techniques offers economical production and fast turn-around.

Additional services include silk screening, painting, tool making, validation testing, and agency certification.







Products

- Industrial
- MIL-Rugged
- Harsh Environment
- Seismic Ready
- Telecom/Server
- EMC Shielded

Elma designs and manufactures switches for the most demanding man-machine interface requirements, from industrial applications to defense.

Quality, reliability and customisation capability have always been the hallmarks of our design competence and success with our customers.



Applications

- Handheld and Mobile Radios
- Industrial Process Controls
- Test and Measurement Equipment
- Professional Audio Systems
- Medical Monitoring and Lab Devices
- Cockpit Controls and Simulators
- Construction Site Control

Customised High Performance Switching Solutions for Two-Way Radios

Radio manufacturers from all over the world choose Elma switching solutions because of the outstanding product quality and our ability to quickly realise the customer's requirements.

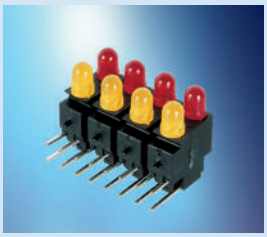












Products

- Coded Switches
- Encoders
- Rotary Switches
- Keylock Switches
- Audio Switches
- Knobs and Accessories
- LED Arrays



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