

Front panels, plug-in units



... the perfect shell for valuable electronics



Online front panel service from apra-norm

Create your customised front panel online

(without software download):

www.frontpanel-online.com



Easily design your individual 19" front or blind from aluminium online at www.frontpanel-online.com
You will receive the quotation in return - quick and easy!

- Alternatively you may of course also e-mail your CAD data in DXF, DWG, MI, IGS, STP or SAT to: fp@apra.de

2 ... and if you want more

- almost **unlimited design possibilities**: front panel with multi-colour print, logos, photos by digital printing, silk or pad printing.

Printing data as vector data in formats DXF, DWG, PDF, AI or CDR can be used.

Please transfer all scripts to vector graphics and indicate colour precise.

- large range of materials available (sheet metal, aluminium, plastics)
- many mechanical treatments possible: • **milling** • **punching** • **lasing** • **injection moulding**
- surface refinement (galvanising, powder coating)



Our production possibilities for enclosures and parts made of metal or plastics



Punching, laser cutting

- ▶ laser cutting
- ▶ punching
- ▶ embossing
- ▶ marking



Bending

- ▶ free bending
- ▶ clinching
- ▶ settling
- ▶ automated bending with robots



Milling / chamfering

- ▶ front panel customisation
- ▶ cutouts
- ▶ space chamfering
- ▶ edge chamfering
- ▶ surface refinement



Welding

- ▶ laser welding
- ▶ stud welding
- ▶ customary welding



Insertion

- ▶ stud bolts
- ▶ nuts
- ▶ inside thread nuts
- ▶ earthing lugs



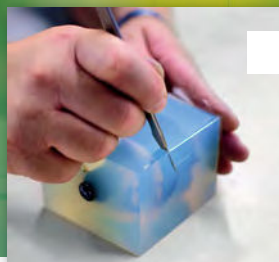
Surface technology

- ▶ powder coating
- ▶ wet painting
- ▶ chromating



Production possibilities for plastic parts and enclosures

- ▶ milling and bending technology
- ▶ injection moulding



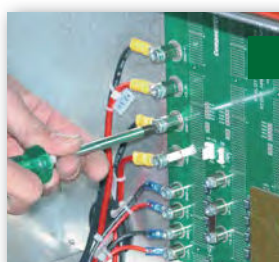
Prototyping for plastic parts

- ▶ vacuum casting of prototypes and small batches
- ▶ 3D printing rapid prototyping



Printing/foils

- ▶ digital printing
- ▶ silk screening
- ▶ pad printing
- ▶ keypads
- ▶ decor foils



Preassembly / tailoring

- ▶ switches, pushbuttons, earthing, customised components
- ▶ cable assembly
- ▶ complete or part assembly
- ▶ acc. to customer's specification



243 • Front panel

Front panel

- anodised front
- conductive rear

Material:

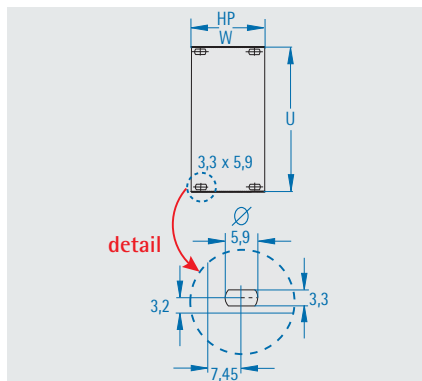
aluminium 2,5 mm

Delivery:

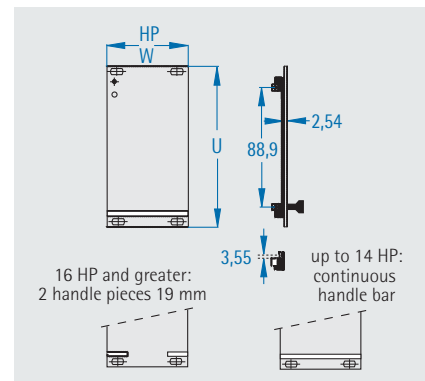
unmounted

See page 131 for matching screw holder and neck screws.

Type A



Type C



- plastic handle bar
- plastic PCB mounting plate

Delivery

Item	Pc.	Description
1	1	Front panel

Delivery

Item	Pc.	Description
1	1	Front panel
2	1/2	Plastic handle
3	1/2	Identification plates
4	1/2	PCB mounting bracket
5		Assembly material

HP	Width W mm	2 U H = 84,5 mm		3 U H = 129,0 mm		4 U H = 173,5 mm	6 U H = 262,5 mm	
		Type A	Type C	Type A	Type C	Type A	Type A	Type C
2	10,0	-	-	243-002-45	-	-	243-602-45	-
3	15,0	-	-	243-003-45	243-703-45	-	243-603-45	243-603-65
4	20,1	-	-	243-004-45	243-704-45	243-404-45	243-604-45	243-604-65
5	25,1	-	-	243-005-45	243-705-45	-	243-605-45	243-605-65
6	30,2	-	-	243-006-45	243-706-45	-	243-606-45	243-606-65
7	35,2	-	-	243-007-45	243-707-45	-	243-607-45	243-607-65
8	40,3	-	-	243-008-45	243-708-45	243-408-45	243-608-45	243-608-65
10	50,4	-	-	243-010-45	243-710-45	-	243-610-45	243-610-65
12	60,6	-	-	243-012-45	243-712-45	-	243-612-45	243-612-65
14	70,8	243-214-45	-	243-014-45	243-714-45	243-414-45	243-614-45	243-614-65
16	80,9	-	-	243-016-45	243-716-45	-	243-616-45	243-616-65
18	91,1	-	-	243-018-45	243-718-45	-	243-618-45	243-618-65
20	101,2	-	-	243-020-45	243-720-45	-	243-620-45	243-620-65
21	106,3	-	-	243-021-45	243-721-45	243-421-45	243-621-45	243-621-65
24	121,5	-	-	243-024-45	243-724-45	243-424-45	243-624-45	-
26	131,7	-	-	243-026-45	-	-	243-626-45	-
28	142,0	243-228-45	-	243-028-45	243-728-45	243-428-45	243-628-45	243-628-65
30	152,0	-	-	243-030-45	-	-	243-630-45	-
35	177,5	-	-	243-035-45	-	-	243-635-45	-
40	202,8	-	-	243-040-45	-	-	243-640-45	-
42	213,0	243-242-45	-	243-042-45	243-742-45	243-442-45	243-642-45	243-642-65
48	243,5	-	-	243-048-45	-	-	243-648-45	-
54	274,0	-	-	243-054-45	-	-	243-654-45	-
56	284,1	243-256-45	-	243-056-45	-	-	243-656-45	-
63	319,7	243-263-45	-	243-063-45	243-763-45	243-463-45	243-663-45	243-663-65
84	426,4	243-284-45	-	243-084-45	243-784-45	243-484-45	243-684-45	243-684-65



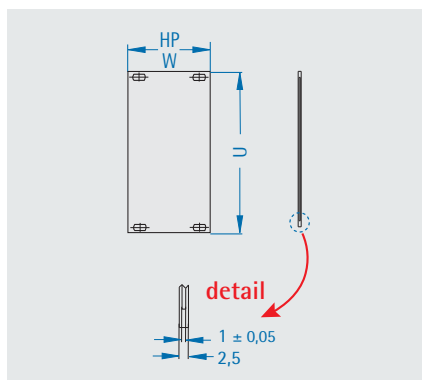
EMC front panel

- anodised front
- conductive rear
- with side grooves for clipping on EMC contact springs

Material:
aluminium 2,5 mm
Delivery:
unmounted

See page 131 for matching screw holder and neck screws.

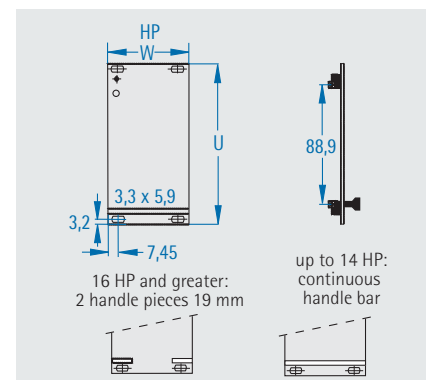
Type A - EMC



Delivery

Item	Pc.	Description
1	1	Front panel

Type C - EMC



- plastic handle bar
- plastic PCB mounting plate

Delivery

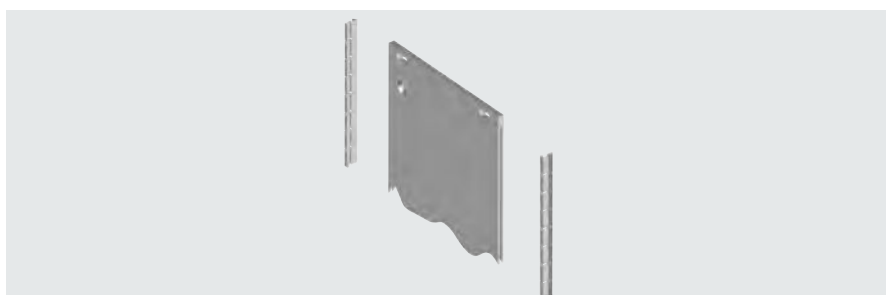
Item	Pc.	Description
1	1	Front panel
2	1/2	Plastic handle
3	1/2	Identification plates
4	2/4	PCB mounting bracket
5		Assembly material

HP	Width W mm	3 U H = 129,0 mm		6 U H = 262,5 mm	
		Type A	Type C	Type A	Type C
2	10,0	243-802-13	-	-	-
3	15,0	243-803-13	-	243-803-16	-
4	20,1	243-804-13	243-804-33	243-804-16	243-804-36
5	25,1	243-805-13	243-805-33	243-805-16	243-805-36
6	30,2	243-806-13	243-806-33	243-806-16	243-806-36
7	35,2	243-807-13	243-807-33	243-807-16	243-807-36
8	40,3	243-808-13	243-808-33	243-808-16	243-808-36
10	50,4	243-810-13	243-810-33	243-810-16	243-810-36
12	60,6	243-812-13	243-812-33	243-812-16	243-812-36
14	70,8	243-814-13	243-814-33	243-814-16	243-814-36
16	80,9	243-816-13	243-816-33	243-816-16	243-816-36
21	106,3	243-821-13	243-821-33	243-821-16	-
28	142,0	243-828-13	-	243-828-16	-
42	213,0	243-842-13	-	243-842-16	-
63	319,7	243-863-13	-	243-863-16	-
84	426,4	243-884-13	-	243-884-16	-

EMC contact springs

The contact springs are clipped onto the side grooves so that the front panels contact one another.

U	L mm	Order no.
3	97	671-184
6	232	671-185



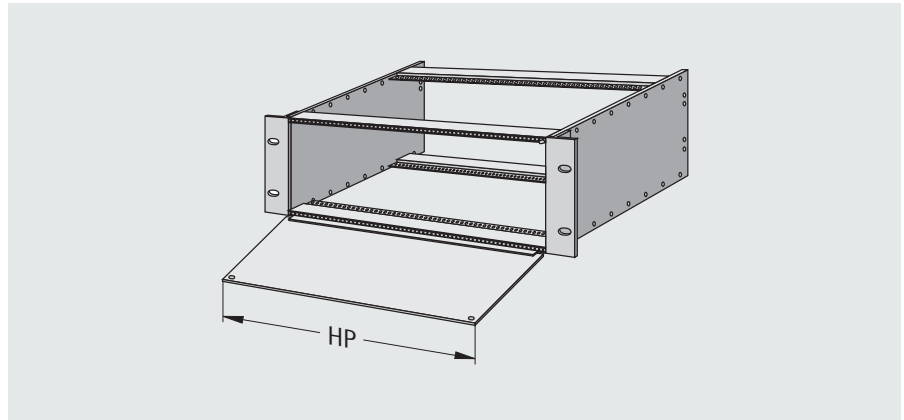


Front panel, bottom-hinged

- with side groove for EMC springs
- can be mounted on top or bottom
- plate is mounted to the module rail; installation width is therefore not decreased
- opening angle = 180° if not limited by other components

Finish:

anodised front, conductive rear



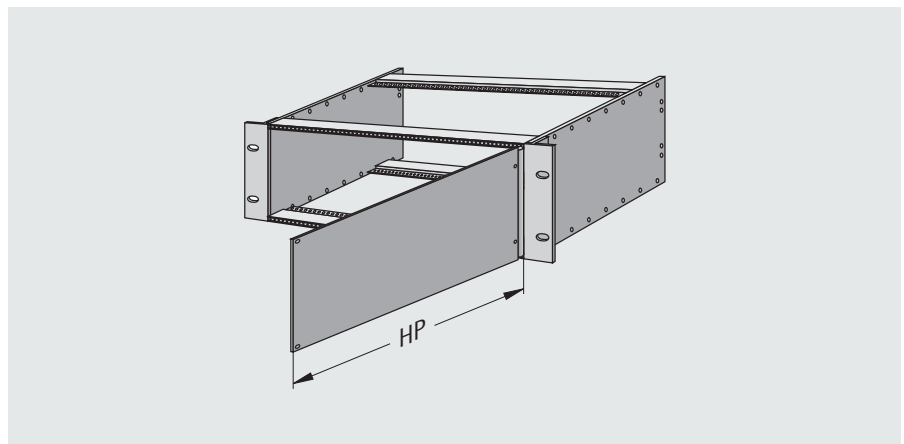
U	HP	Order no.
3	42	244-342-13
3	84	244-384-13
6	42	244-742-16
6	84	244-784-16

Front panels, pivoted

- with side groove for EMC springs
- can be mounted on the right or left
- hinge requires 2 HP width
- mounted on module rails (M 2.5)
- opening angle = 180° if not limited by other components for example handles

Finish:

anodised front, conductive rear

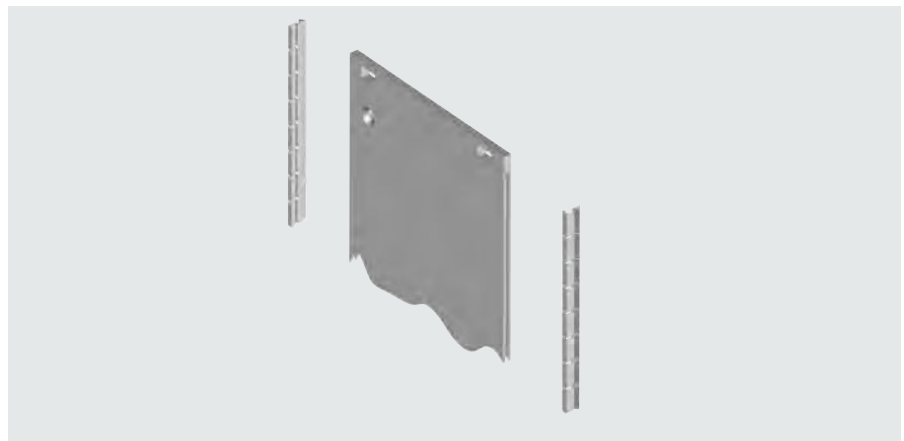


U	HP	Order no.
3	42	244-142-13
3	84	244-184-13
6	42	244-542-16
6	84	244-584-16

EMC contact springs

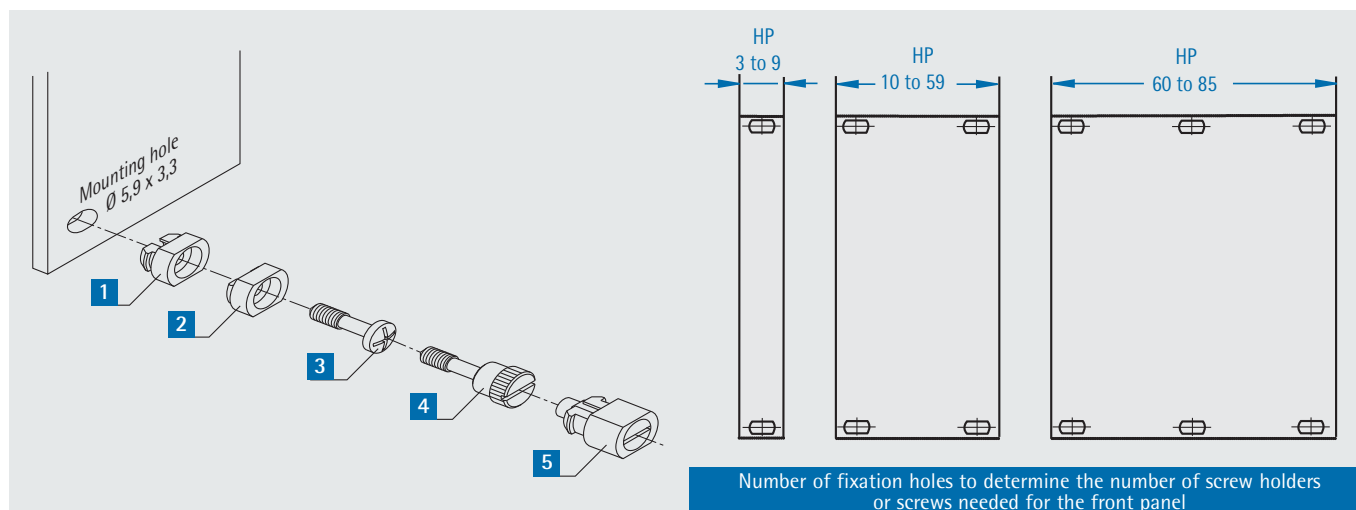
The contact springs are clipped onto the side grooves so that the front panels contact one another.

U	L mm	Order no.
3	97	671-184
6	232	671-185





Fastening front panels



1 Screw holder, plastic

- fits all front panels with hole Ø 5,9 mm x 3,3 mm
- can be pressed in manually
- packing unit: 100 pieces

2 Screw holder, brass

- fits all front panels with hole Ø 5,9 mm x 3,3 mm
- nickel-plated
- brass screw holders must be pressed into place with a tool or a level press

3 Neck screw, M 2.5 x 12

- recessed head
- nickel-plated
- packing unit: 100 pieces

* When ordering front panels on the same time, the screw holder will be pressed in.

Colour	Order no.
light grey	250-697-02
black	250-697-05

Delivery	Order no.
1 piece	250-697
100 pieces	250-697-03
1 piece	250-697-04*

Order no.
250-602

4 Knurled screw M 2.5 x 12,2

- knurled and slotted
- nickel-plated brass
- packing unit: 100 pieces

5 Quick closure

- with slot
- no threaded inserts or sliding nuts required
- open and close with a quarter turn
- protected against twisting
- vibration-free
- cannot be lost
- easy and quick mounting
- packing unit = 100 pieces

Finish:
similar to RAL 7035 light grey

Order no.
250-611-02

Order no.
250-607-00

Handle bar, plastics



Finish:
handle bar: grey
aluminium strips: natural colour anodised

HP	L mm	Order no.
3	13,90	250-750-03
4	19,10	250-750-04
5	24,10	250-750-05
6	30,00	250-750-06
7	34,20	250-750-07
8	39,30	250-750-08
10	49,50	250-750-10
12	59,70	250-750-12
14	69,90	250-750-14



250 • Aluminium handle bar / PCB mounting bracket

Aluminium handle bar

Finish:

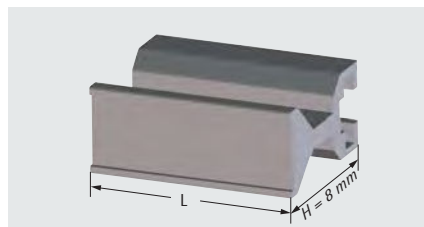
naturally coloured anodised

Please order assembly material separately.

Assembly material

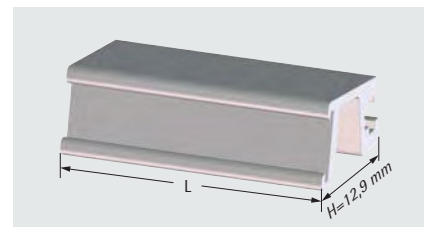
Square nut M 2,5
630-192
Oval-head screw M 2,5 x 6
630-092

Aluminium handle bar "trapezoidal"



HP	L mm	Order no.
3	14,00	250-653
4	19,10	250-654
5	24,10	250-655
6	29,20	250-656
7	34,20	250-657
8	39,30	250-658
10	49,40	250-660
12	59,60	250-662
14	69,80	250-664

Aluminium handle bar "sloped"



HP	L mm	Order no.
3	14,60	250-680-03
4	19,70	250-680-04
5	24,80	250-680-05
6	29,90	250-680-06
7	35,00	250-680-07
8	40,00	250-680-08
10	50,20	250-680-10
12	60,30	250-680-12
14	70,50	250-680-14

PCB fixing

1 PCB fixing

- plastics, single piece

Order no.
250-701

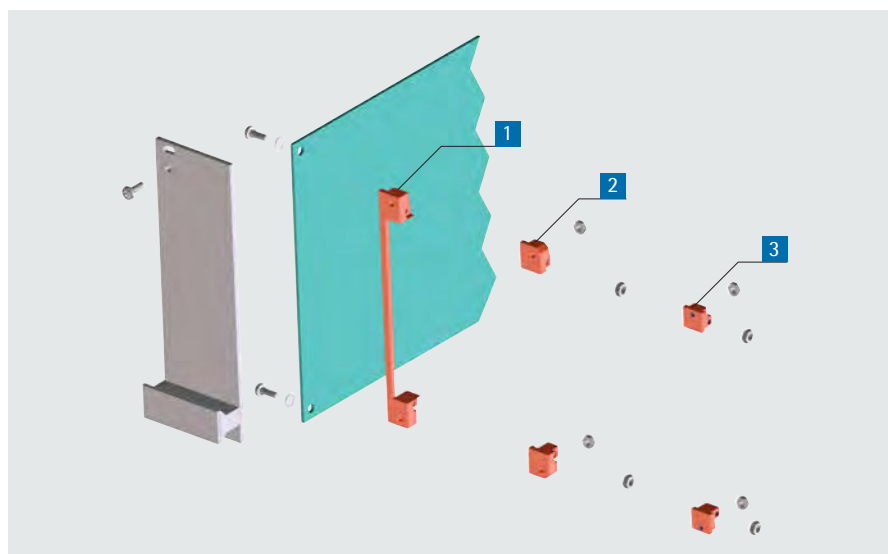
2 PCB fixing

- plastics, divided

Order no. (pair)
250-700

3 PCB fixing

- zinc die cast
- if front panel is electroconductive it can be integrated to the contact-voltage protection or shielding using a conductor track on the PCB
- with M 2.5 thread for fixing front panel and PCB



Please order mounting material separately.

Can only be used with handle bar 250-750-XX (see page 131)

Order no.
250-698

Assembly material for Item 1-3

Order no.
250-707



PCB cover

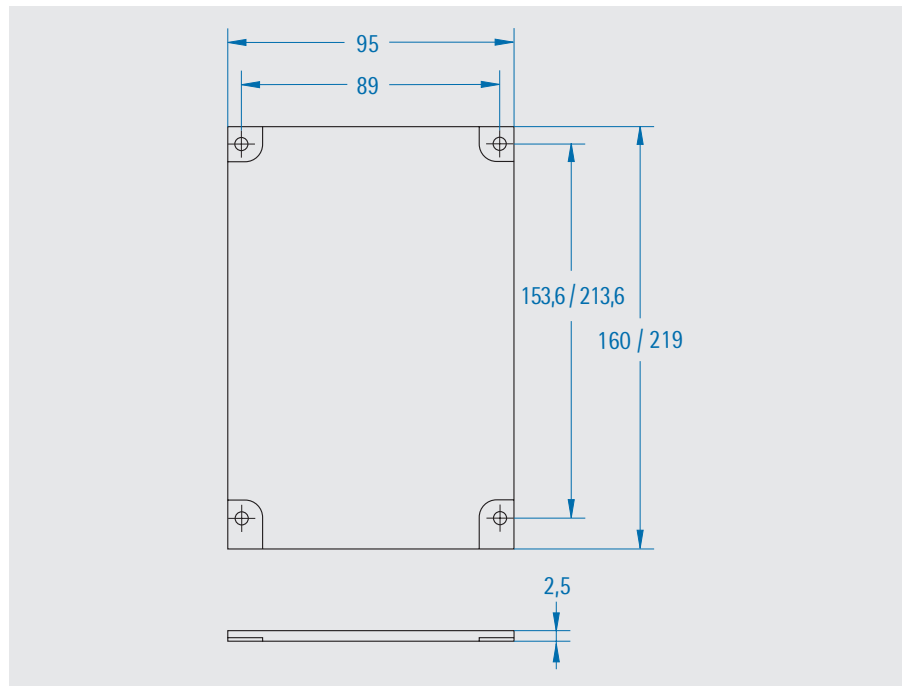
- protects the PCB's solder side
- electrically insulated
- protects from damage and short circuits
- can be coated with copper conductive paint
- fits 100 x 160 mm, 233,35 x 160 mm, 100 x 220 mm and 233,35 x 220 mm PCBs with plug-in connection acc. to IEC 60603-2
- **surface resistance:** 10^{15} Ohm
- **dielectric strength ASTM D 149:** 20 kV
- **heat resistance acc. to DIN 53460:** 130 °C

Material:

plastics, flammability rating acc. to UL 94 V-0

Finish:

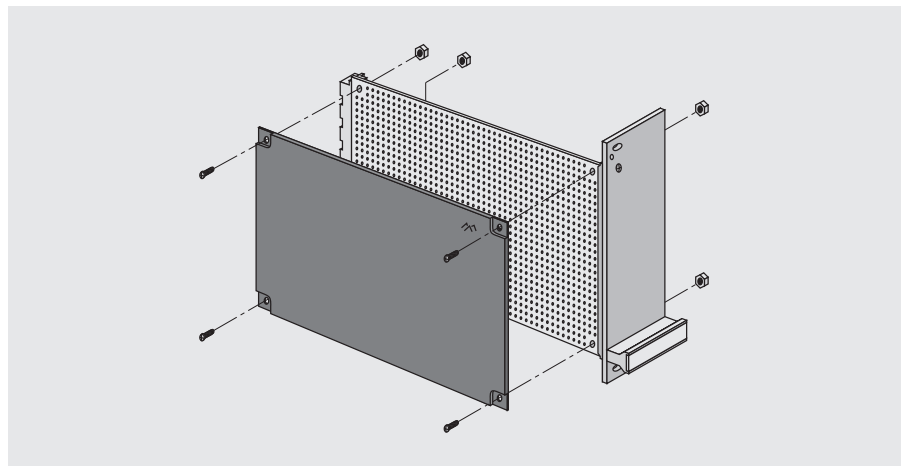
black



Description	Order no.
For PCB 100 x 160 mm	258-200
For PCB 100 x 160 mm, with copper conductive paint	258-200-51
For PCB 100 x 220 mm	258-250
For PCB 100 x 220 mm, with copper conductive paint	258-250-51
Assembly material	250-711

PCB cover, shortened model

We recommend mounting a 1.5 mm shortened cover when using cards with front panels mounted with plastic PCB mounting plates (item 1).



Description	Order no.
PCB cover, shortened	258-199

Mounting material

Description	Packaging unit	Order no.
Hexagon nut M2,5	100 pieces	630-182
Oval head screw M2,5x10	100 pieces	630-094



Plug-in components with IEEE insertion and extraction handle

- fulcrum can change positions for increased leverage to overcome high inserting and withdrawing force
- can be used for subracks with IEEE insertion/ extraction handle function (see page 83)
- works with the following module rails:
 - standard module rail with 10 mm extension (241-049-XX)
 - enforced module rail with 10 mm extension (241-500-XX)
- two types of front panels are available:

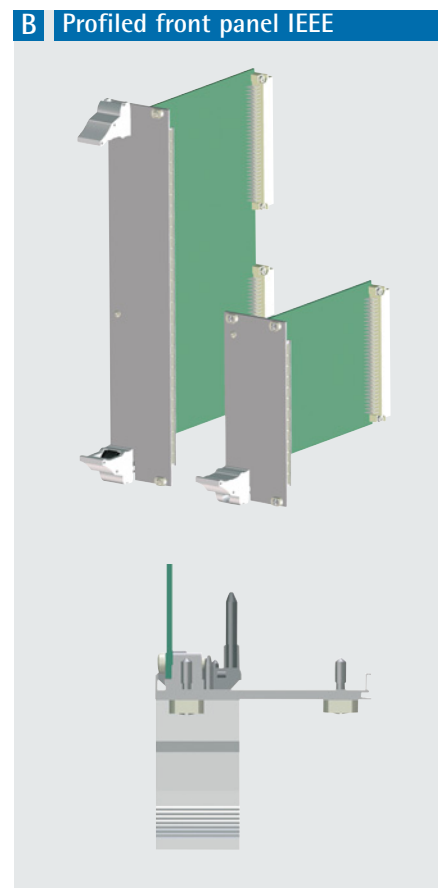
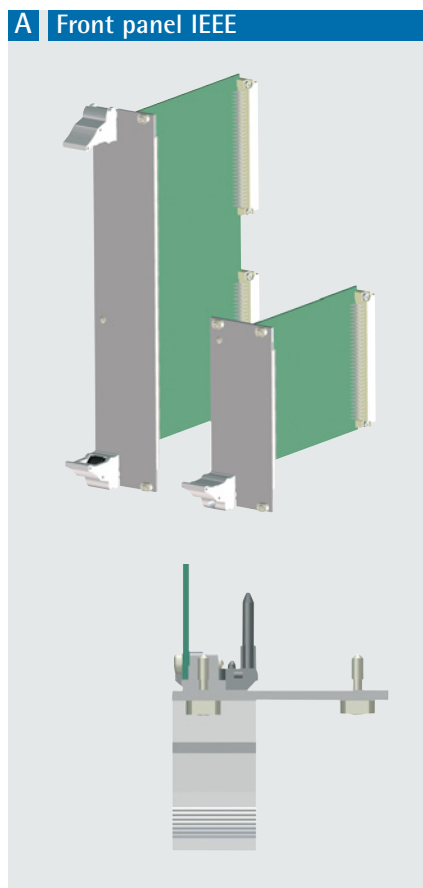


A Front panel IEEE with side groove for EMC contact springs

Material: aluminium
Surface: front side anodised, rear side conductive

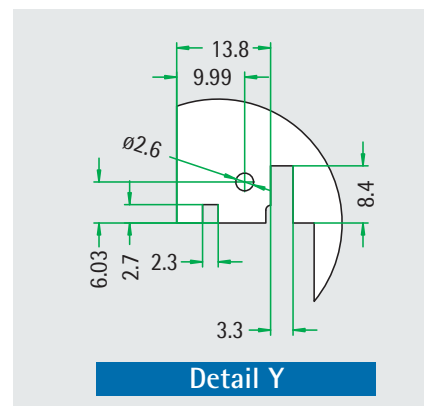
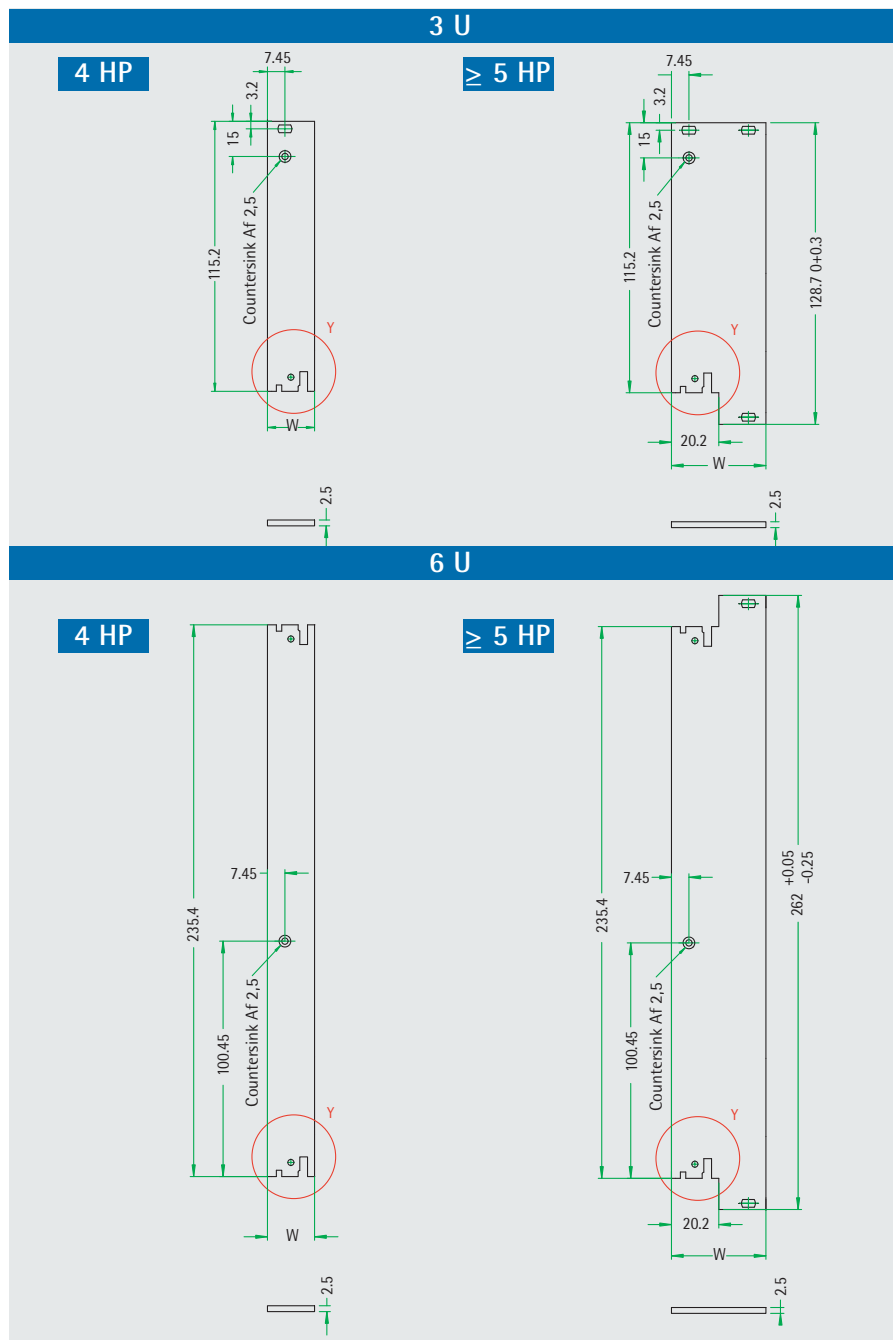
B Profiled front panel IEEE

Material: aluminium profile extrusion
Surface: chromated





Front panel IEEE with side groove for EMC contact springs



Delivery

Item	Pc.	Description
1	1	Front panel
2	0-3	Screw holder inserted
3	1	PCB mounting bracket
4	0-3	Neck screw M 2,5
5	1	Oval-head countersunk screw M 2,5 x 6

EMC contact springs



U	L mm	Order no.
3	97	671-184
6	232	671-185

Please order insertion/ extraction handles and EMC contact springs separately.

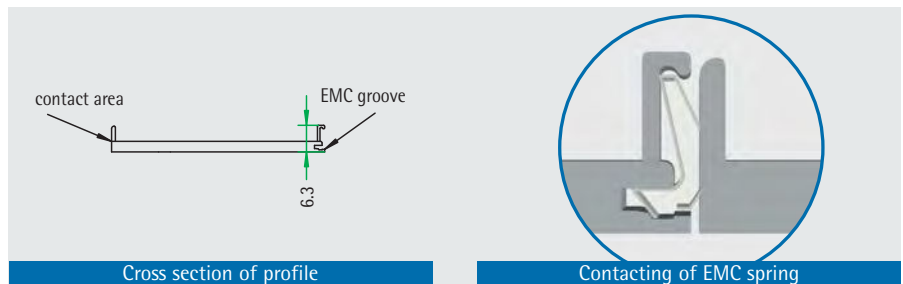
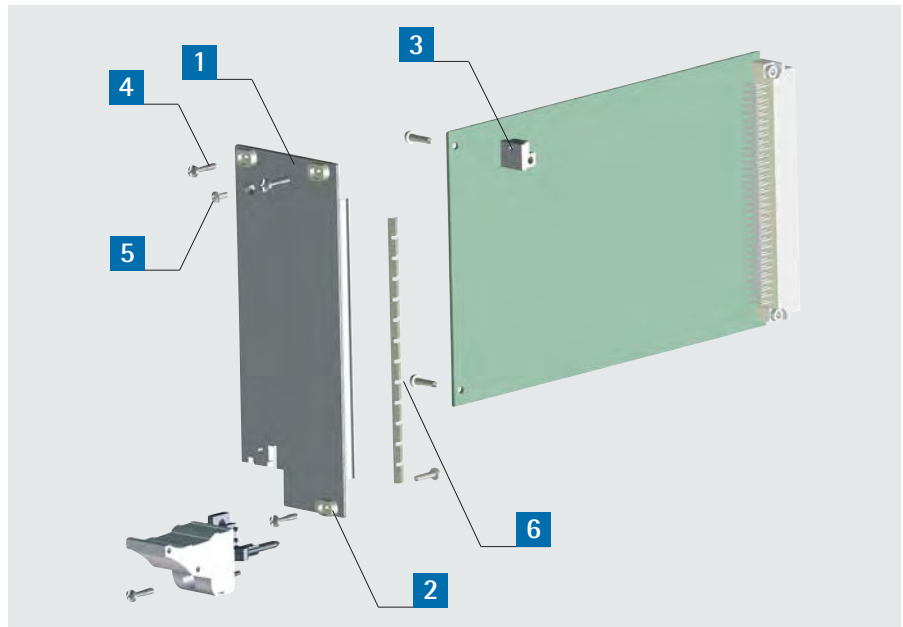
HP	W mm	3 U	6 U
4	20,10	244-604-13	244-604-16
5	25,10	244-605-13	244-605-16
6	30,20	244-606-13	244-606-16
7	35,20	244-607-13	244-607-16
8	40,30	244-608-13	244-608-16
10	50,40	244-610-13	244-610-16
12	60,60	244-612-13	244-612-16



244 • Profiled front panel IEEE

Profiled front panel IEEE

Material:
aluminium extrusion



Other dimensions on request!

Delivery

Item	Pc.	Description
1	1	Profiled front panel
2	0-3	Screw holder, inserted
3	1	PCB bracket
4	0-3	Neck screw M 2.5
5	1	Oval-head countersunk screw M 2.5 x 6
6	1	EMC contact springs

HP	W mm	U	Order no.
4	20,10	3	244-004-03
6	30,20	3	244-006-03
8	40,30	3	244-008-03
4	20,10	6	244-004-06
6	30,20	6	244-006-06
8	40,30	6	244-008-06



IEEE injection / extraction handle • 611



IEEE injection / extraction handle

- the following two versions are available:



1 Injection / extraction handle without locking function



Colour:
RAL 7035 light grey

Position on front panel	Order no.
Bottom	611-615
Top	611-616

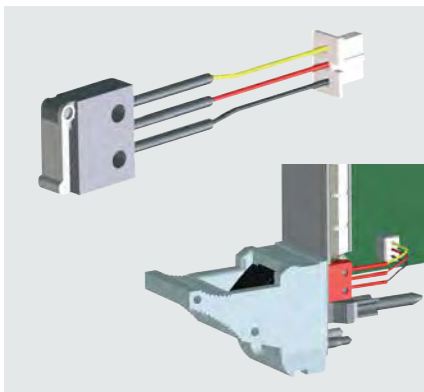
2 Injection / extraction handle with locking function



Colour:
lever: RAL 7035 light grey
key: RAL 9005 black

Position on front panel	Order no.
Bottom	611-617
Top	611-618

Micro switch

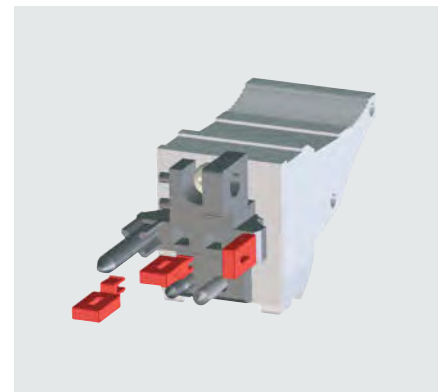


- max. switching current: 50 mA
- temperature range: -25 °C up to 70°C
- mechanical lifetime: 50.000 switches
- electronic lifetime: 20.000 switches

PCB fixing set for 3U

Set includes:
1 PCB bracket
1 screw M 2.5 x 6
2 screws M 2.5 x 10
2 flat washer d=2.6

Coding pins



- packing unit = 100 pieces

Colour:
similar to RAL 7035

The adequate plugs are not included in the delivery.

Order no. (1 piece)
230-245

Order no. (Set)
250-713

Order no.
240-163-50