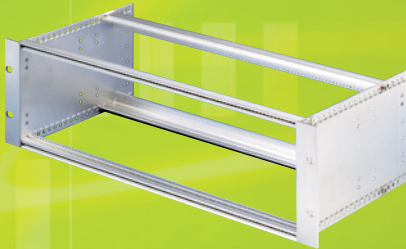


19" electronic packaging





19" electronic packaging



3 U subrack 245

page 82

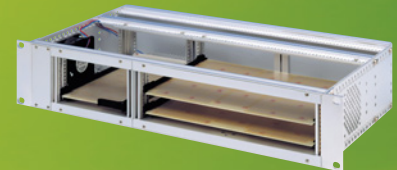
- width: 84 HP or 42 HP
- can be used for backplanes and connectors acc. to IEC 60603-2
- available as:
 - standard subrack 82
 - EMC subrack 86



6 U subrack 245

page 89

- width: 84 HP
- can be used for backplanes and connectors acc. to IEC 60603-2



2 U subrack 245

page 92

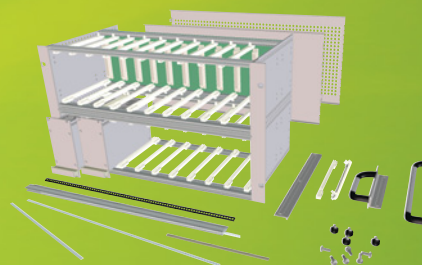
- width: 84 HP
- can be used for backplanes and connectors acc. to IEC 60603-2
- horizontal expansion kits 3 U / 6 U available



19" power distribution subrack 3 U

page 97

- for the installation of automatic circuitbreakers
- fast access to the wiring space
- stable accommodation of components acc. to DIN 43 880 in build sizes 1-3
- strain relief of the rear-side cable via cable guard rail



Individual Configuration 245

page 99

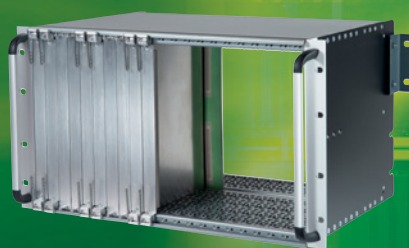
Based on a wide range of components you will be able to exactly fit your needs. Just contact us if there are any questions about customising your subrack.



Frames / brackets

page 123

- easy installation into instrument panels or front doors
- the frame is designed for the installation of active components, plug-in units or eurocards 100 x 160 mm.



Subrack „Heavy Load“

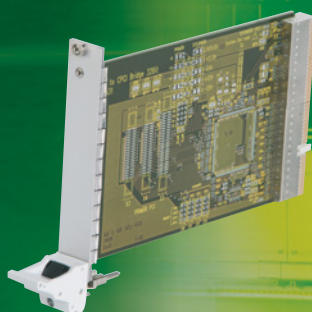
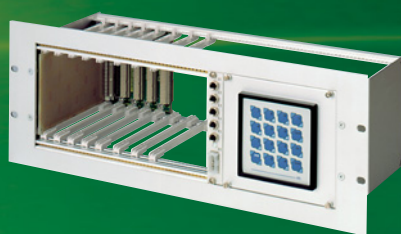
page 94

- designed for rough environments
- strengthened and extended front brackets and double fixed module rails
- tested for resonance, vibration and shock acc. to IEC 61587-1 (2012-09) DL3 and static load acc. to SL1
- EMC compatible design

Subrack „apra R-TYPE“

page 95

- high shock and vibration resistance
- front and rear IO (160 mm / 80 mm)
- 21 x 4 HP slot type A
- possible thickness of PCB 1.4 to 2.6 mm
- 19" brackets in the rear for mounting on the rear 19" level



19" frame 4 U

page 124

- can be installed in switch cabinet doors or similar applications
- for installing active components and/or 100 mm x 160 mm eurocards

Front panels, plug-in units

page 125

- front panels 128
- EMC front panels 129
- plug-in units 134
- front panels IEEE 135
- profile front panels IEEE 136
- injector / extractor handle IEEE 137

Sub-units, cassettes

page 138

- EMC sub-units 3 U / 6 U 138
- sub-units U 141
- sub-units 6 U 142
- EMC cassettes 3 U/6 U 144
- cassettes 3 U 146
- cassettes 6 U 147



19" subrack 245



Reference analyses

The standard subrack 245-312-11
underwent the following reference analyses:

- DIN EN 50155
Railway use of electrical equipment on rail vehicles
the following were tested: vibrations · broadband noise · long-term test Fh
shock stressing – Ea test acc. to DIN 61 373

- DIN EN 61587-1
Electromechanical designs for electronic systems:
tests for mechanical, climate and safety requirements for cabinets,
racks and plug-in units.
Requirements for shock and vibration stability:
the following were tested: dynamic tests, DL 3 · resonance analysis – test Fc
sine wave-form – test Fc
vibrations, sine wave-form – test Fc
shock stressing – test Ea
static test SL1: maximum deflection < 0.4mm

19" subrack 245

- for plug-in modules acc. to IEC 60297-3-101/-102/-103 and IEEE 1101.10/1101.11
- EMC-compliant design
- wide range of standard products
- individual configurations available
- also available as VME bus or CompactPCI system
- wide range of accessories
- on request: complete solutions with integrated ventilation concepts

All tests were passed with excellent results.
The independent test laboratory did not discover any defects.



19" subrack 3 U

- basic kit with a wide range of accessories
- easy and quick assembly: only two screws per module rail
- depth mounting increment $d = 10$ mm
- module rails are prevented from rotating
- please ask for our assembly service.

Application:

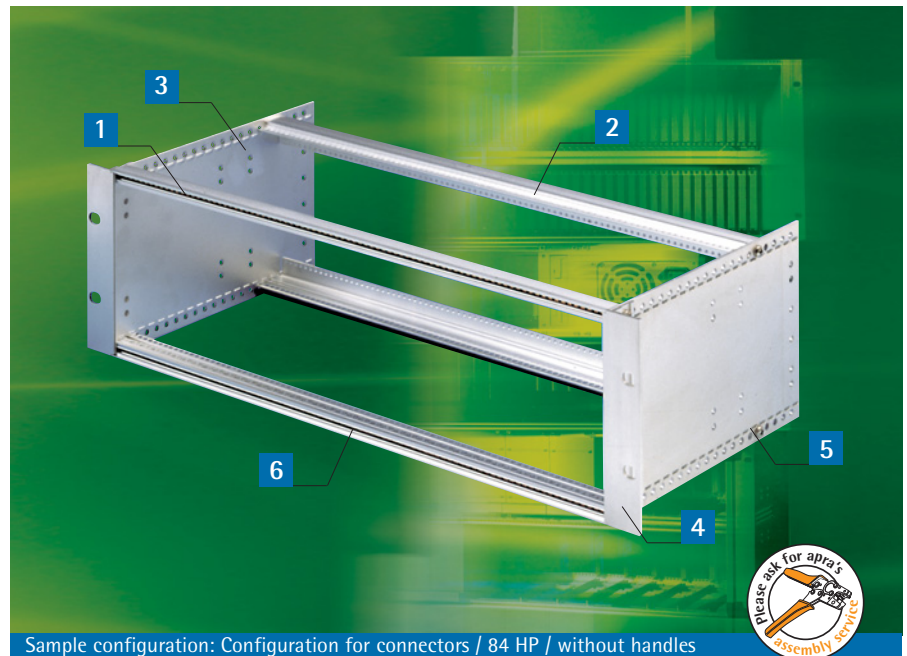
for plug-in modules acc. to
IEC 60297-3-101/-102/-103 and
IEEE 1101.10/1101.11

Material:

side panels: aluminium 2,5 mm
module rails: aluminium extrusion
front brackets: aluminium extrusion

Delivery:

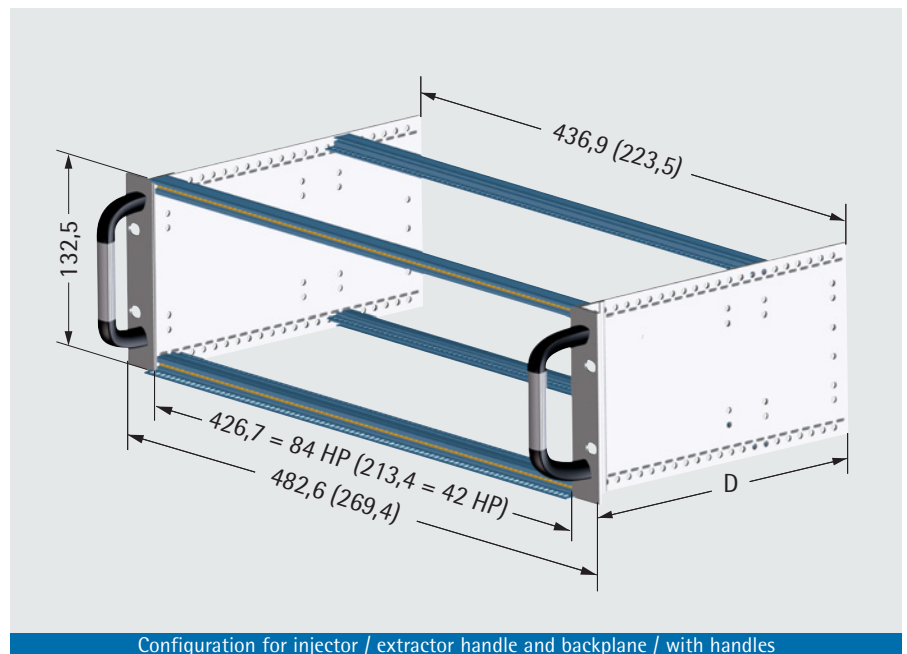
kit form



Sample configuration: Configuration for connectors / 84 HP / without handles

Delivery

Item	Pc.	Description
1	2	Module rails, front
2	2	Module rails, rear
3	2	Side panels
4	2	Front fixing bracket with or without handle
5	8	Oval head screws, M 4 x 12, toothed head
6	2	Threaded inserts M 2,5 7 mm x 2 mm
7	2	Threaded inserts M 2,5 5 mm x 1,5 mm (only for rear BUS module rails)
8		Assembly material



Configuration for injector / extractor handle and backplane / with handles



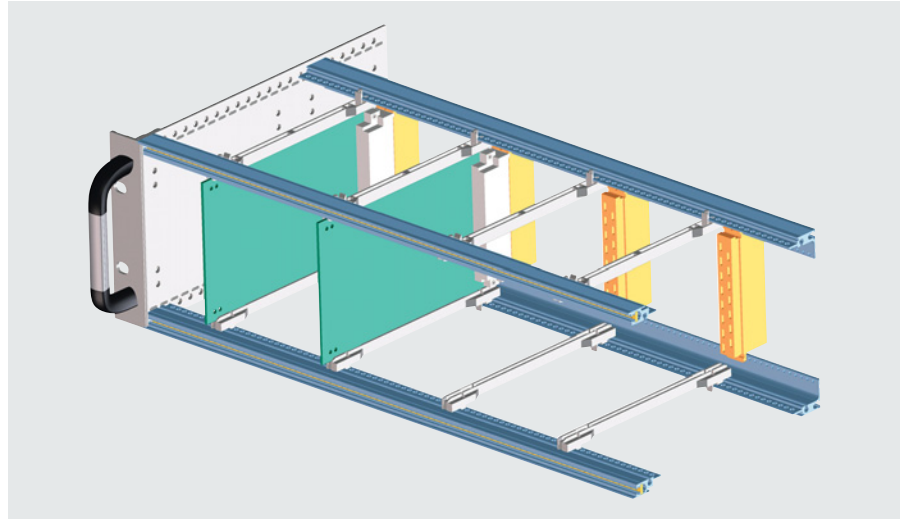
Configuration for connectors according to IEC 60603-2

front

standard module rails 241-022
threaded inserts M 2,5

rear

narrow module rails 241-019
with integrated mounting rails for plug-
in connections acc. to IEC 60603-2



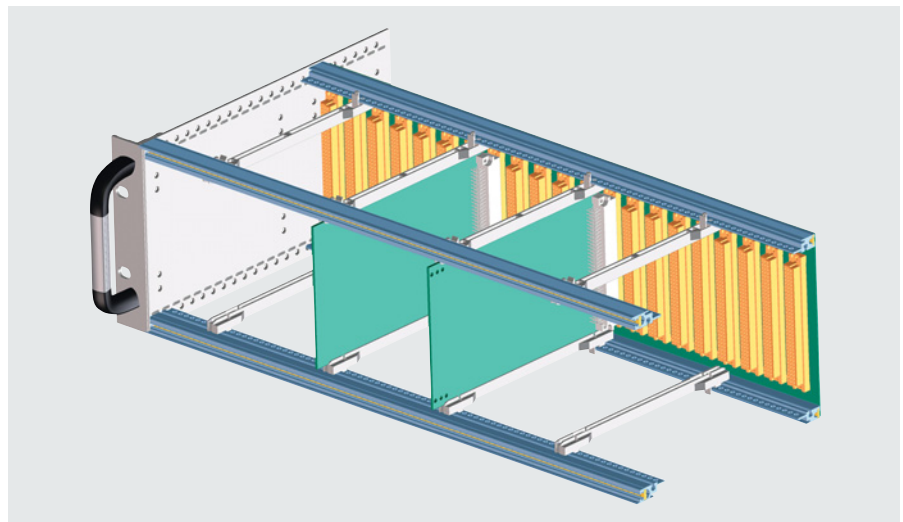
Configuration for backplane

front

standard module rails 241-022
threaded inserts M 2,5

rear

BUS module rails 241-013
threaded inserts M 2,5



Please order insulating strips or contact strips
separately (see p.115).

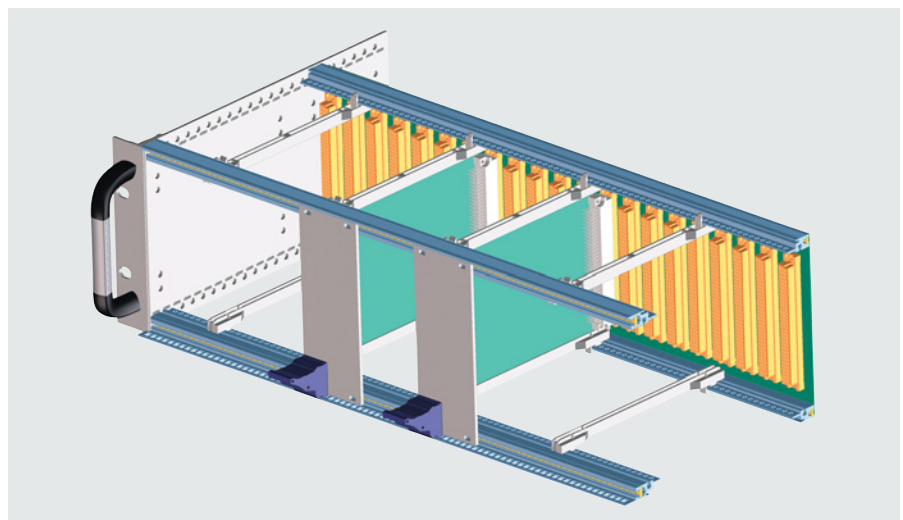
Configuration for injector / extractor handle and backplane for CPCI acc. to IEEE

front

standard module rails 241-022,
standard module rails 241-049
with 10 mm clearance for insertion/
extraction handle
threaded inserts M 2,5

rear

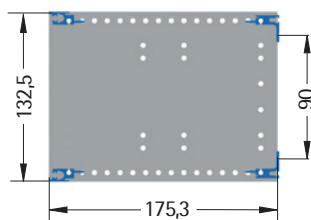
BUS module rails 241-013
threaded inserts M 2,5



Please order insulating strips or contact strips
separately (see p.115).

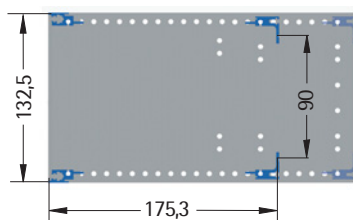


Depth 176 mm



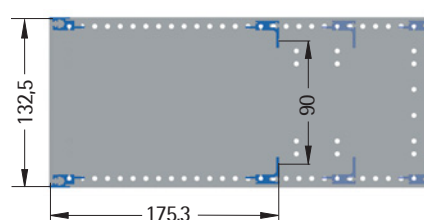
Description	Order no.
84 HP, with handle	245-314-11
84 HP, without handle	245-311-11
42 HP, with handle	245-334-11
42 HP, without handle	245-331-11

Depth 236 mm



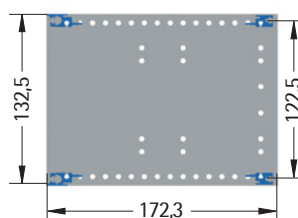
Description	Order no.
84 HP, with handle	245-315-11
84 HP, without handle	245-312-11
42 HP, with handle	245-335-11
42 HP, without handle	245-332-11

Depth 296 mm



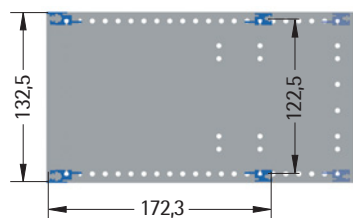
Description	Order no.
84 HP, with handle	245-316-11
84 HP, without handle	245-313-11
42 HP, with handle	245-336-11
42 HP, without handle	245-333-11

Depth 176 mm



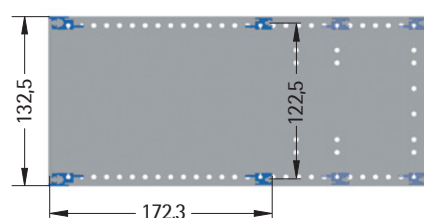
Description	Order no.
84 HP, with handle	245-314-21
84 HP, without handle	245-311-21
42 HP, with handle	245-334-21
42 HP, without handle	245-331-21

Depth 236 mm



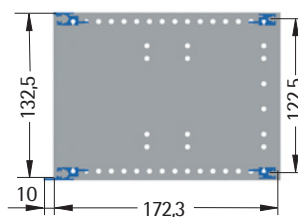
Description	Order no.
84 HP, with handle	245-315-21
84 HP, without handle	245-312-21
42 HP, with handle	245-335-21
42 HP, without handle	245-332-21

Depth 296 mm



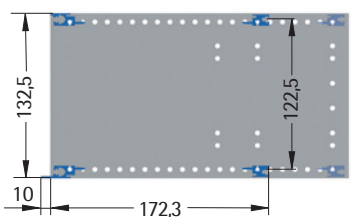
Description	Order no.
84 HP, with handle	245-316-21
84 HP, without handle	245-313-21
42 HP, with handle	245-336-21
42 HP, without handle	245-333-21

Depth 176 mm



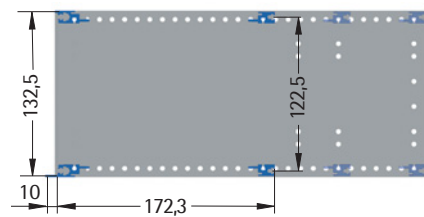
Description	Order no.
84 HP, with handle	245-314-31
84 HP, without handle	245-311-31
42 HP, with handle	245-334-31
42 HP, without handle	245-331-31

Depth 236 mm



Description	Order no.
84 HP, with handle	245-315-31
84 HP, without handle	245-312-31
42 HP, with handle	245-335-31
42 HP, without handle	245-332-31

Depth 296 mm



Description	Order no.
84 HP, with handle	245-316-31
84 HP, without handle	245-313-31
42 HP, with handle	245-336-31
42 HP, without handle	245-333-31

Other depths available on request. All drawings shown in side view. The lighter coloured rear rails show optional installation options.



245 • 19" subrack 3 U, EMC

19" subrack 3 U, EMC

- protects against electromagnetic environmental influences
- chromated surfaces connect all components, which are thus conductive
- expanded EMC delivery:
 - module rails, rear (item 2)
 - cover brackets (item 6)
- module rails are prevented from rotating

Application:

for plug-in modules acc. to
IEC 60297-3-101/-102/-103 and
IEEE 1101.10/1101.11

Material:

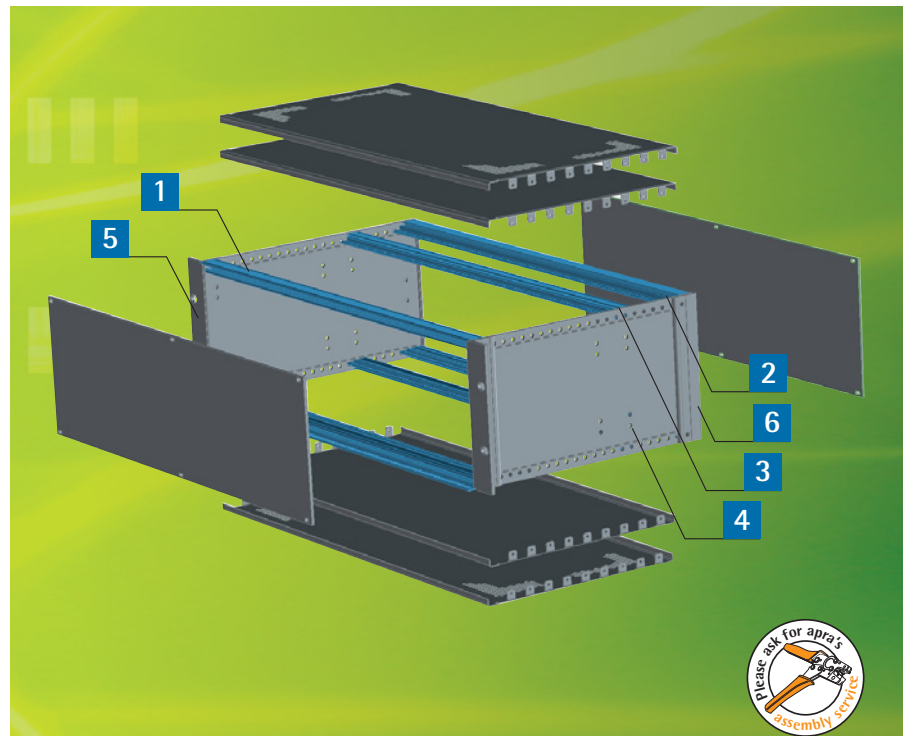
side panels: aluminium 2,5 mm

module rails: aluminium extrusion

front brackets: aluminium extrusion

Delivery:

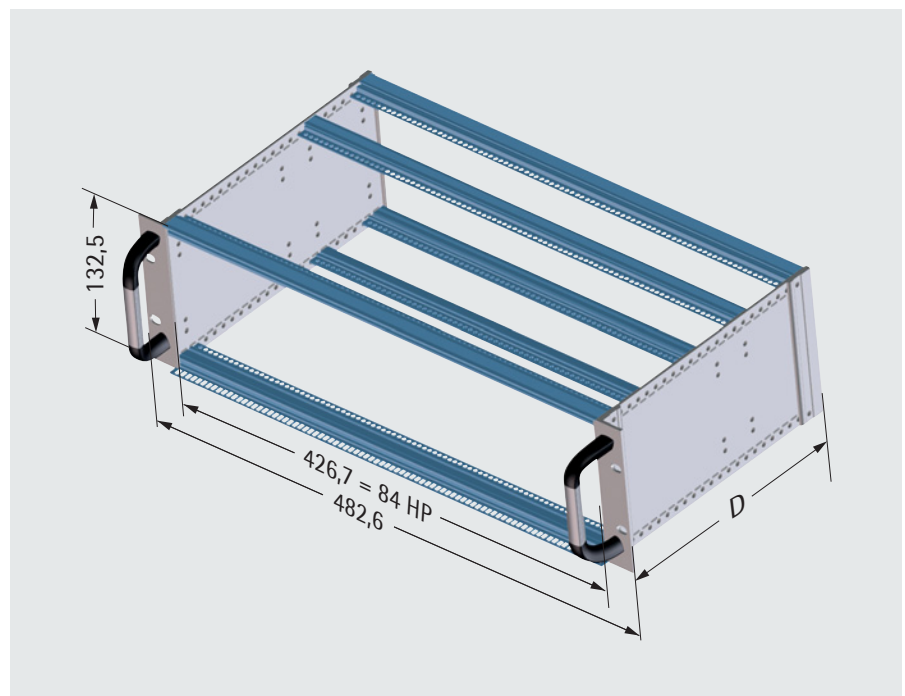
kit form



To achieve complete EMC shielding please order shielding plates, front panels and corresponding EMC clips separately.

Delivery

Item	Pc.	Description
1	2	Module rails, front
2	2	Module rails, rear
3	2	Module rails, middle
4	2	Side panels
5	2	Front angle bracket with or without handle
6	2	Cover bracket
7	4	Threaded inserts M 2,5 7 mm x 2 mm
8	2	Threaded inserts M 2,5 5 mm x 1,5 mm (only for middle BUS module rail)
9	12	Oval head screws, M 4 x 12, toothed head
		Assembly material





Configuration for connectors according to IEC 60603-2

front

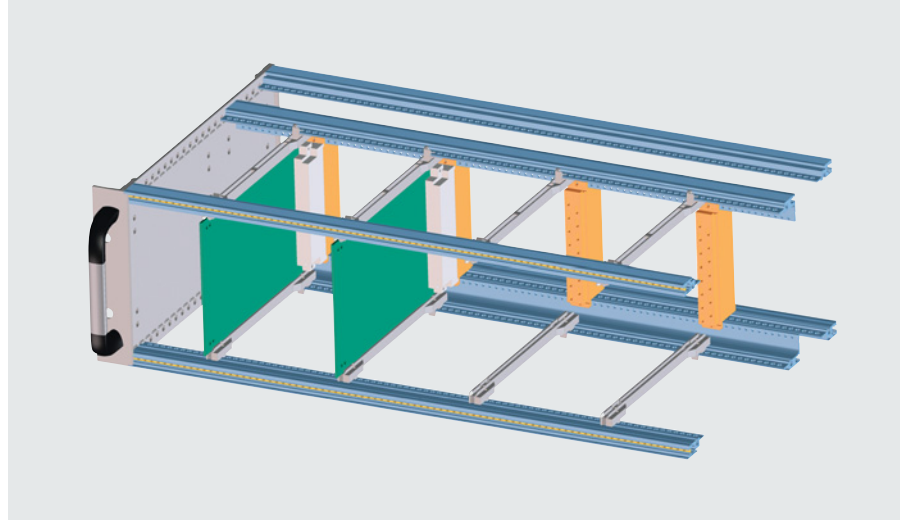
standard module rails 241-022
threaded inserts M 2,5

middle

narrow module rails 241-019
with integrated mounting rails for plug-in connections acc. to IEC 60603-2

rear

standard module rails 241-022
threaded inserts M 2,5



Configuration for backplane

front

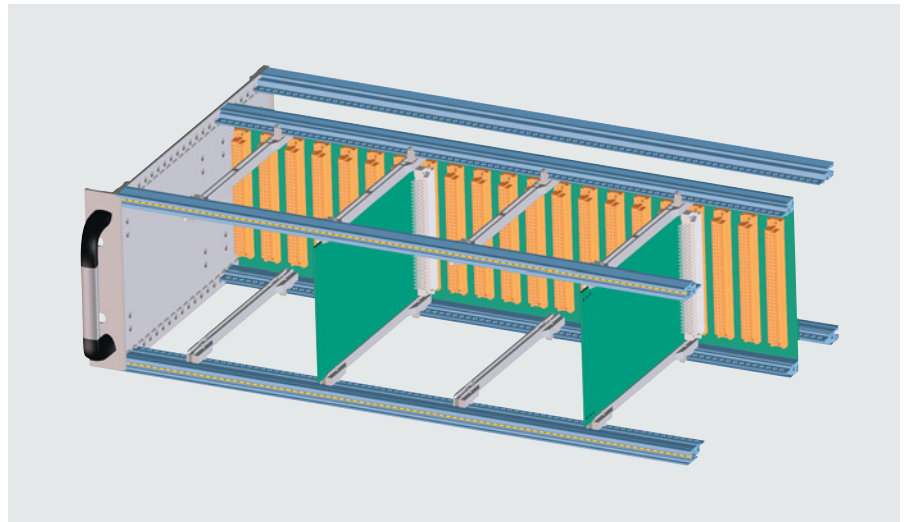
standard module rails 241-022
threaded inserts

middle

BUS module rails 241-013
threaded inserts M 2,5

rear

standard module rails 241-022
threaded inserts M 2,5



Please order insulating strips or contact strips separately (see p.115).

Configuration for injector / extractor handle and backplane for CPCI acc. to IEEE

front

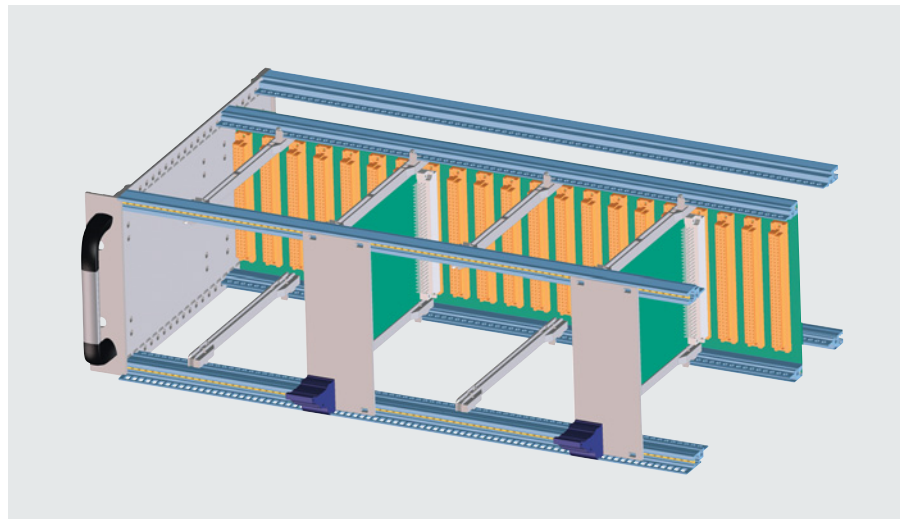
standard module rails 241-022,
standard module rails 241-049
with 10 mm clearance for insertion/
extraction handle
threaded inserts M 2,5

middle

BUS module rails 241-013
threaded inserts M 2,5

rear

standard module rails 241-022
threaded inserts M 2,5

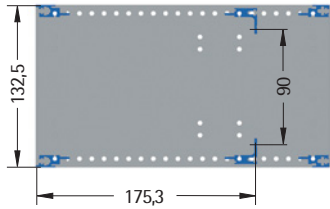


Please order insulating strips or contact strips separately (see p.115).

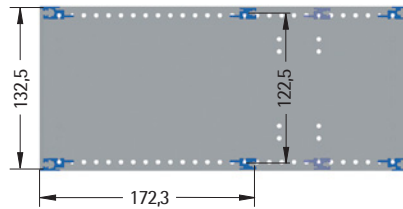


Configuration for connectors according to IEC 60603-2

Depth 236 mm



Depth 296 mm

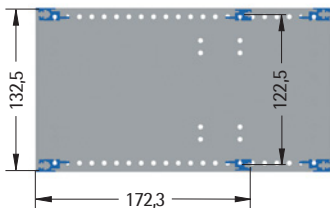


Description	Order no.
84 HP, with handle	245-315-16
84 HP, without handle	245-312-16

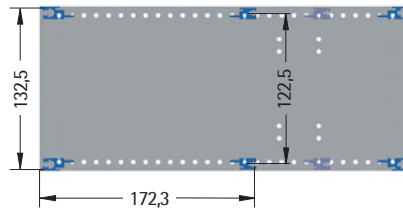
Description	Order no.
84 HP, with handle	245-316-16
84 HP, without handle	245-313-16

Configuration for backplane

Depth 236 mm



Depth 296 mm

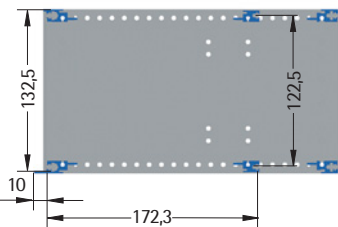


Description	Order no.
84 HP, with handle	245-315-26
84 HP, without handle	245-312-26

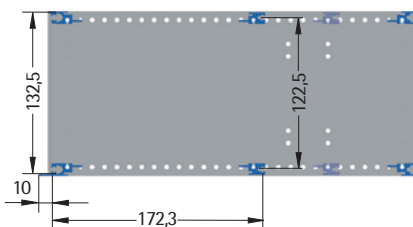
Description	Order no.
84 HP, with handle	245-316-26
84 HP, without handle	245-313-26

Configuration for injector / extractor handle and backplane

Depth 236 mm



Depth 296 mm



Description	Order no.
84 HP, with handle	245-315-36
84 HP, without handle	245-312-36

Description	Order no.
84 HP, with handle	245-316-36
84 HP, without handle	245-313-36

Other depths available on request. All drawings shown in side view. The lighter coloured rear rails show optional installation options.



19" subrack, 6 U, single row

- basic kit with a wide range of accessories
- easy and quick assembly
- depth mounting increment $d = 10\text{mm}$
- module rails are prevented from rotating

Application:

for plug-in modules acc. to IEC 297-3 and IEEE 1101.10/1101.11

Material:

side panels: aluminium 2.5 mm

module rail: aluminium extrusion

front brackets: aluminium extrusion

Delivery:

kit form

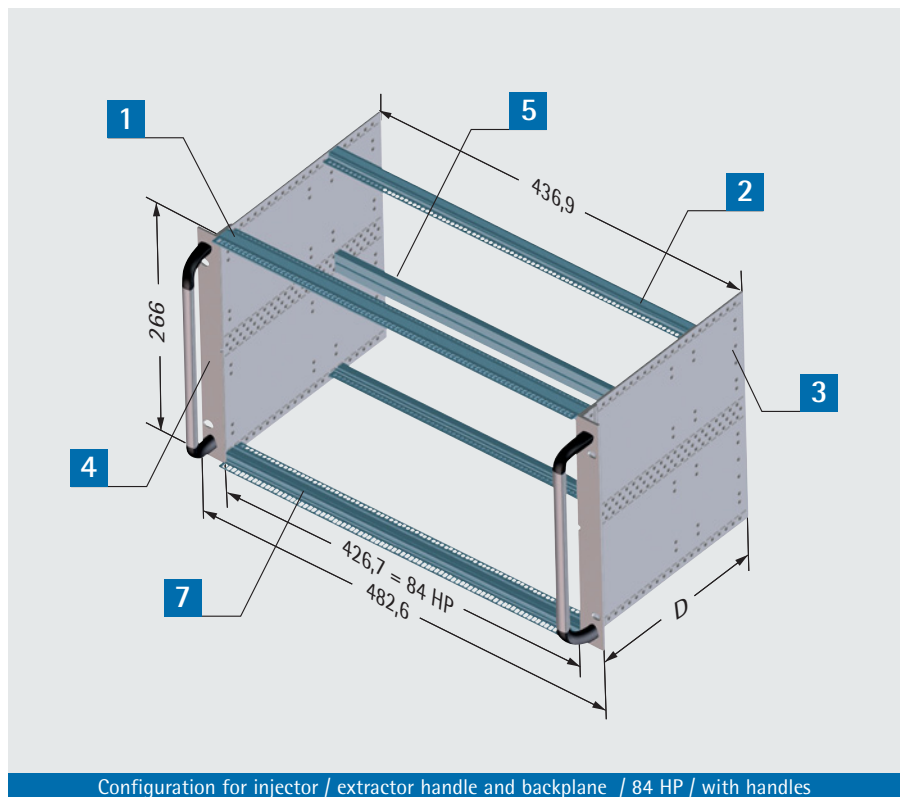


Sample configuration

Also available as double-row version - please contact us!

Delivery

Item	Pc.	Description
1	2	Module rails, front
2	2	Module rails, rear
3	2	Side panels
4	2	Front angle bracket with or without handle
5	1	Mounting rail
6	8	Oval head screws, M 4 x 12, toothed head
7	2	Threaded inserts M 2,5 7 mm x 2 mm
8	4	Threaded inserts M 2,5 5 mm x 1,5 mm (only if rear BUS module rail)
9		Assembly material



Configuration for injector / extractor handle and backplane / 84 HP / with handles



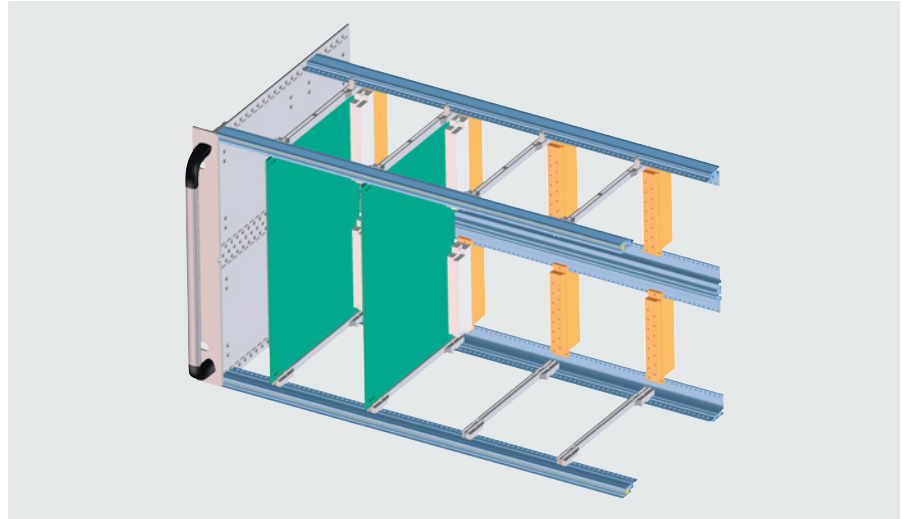
Configuration for connectors according to IEC 60603-2

front

standard module rails 241-022
threaded inserts M 2,5

rear

narrow module rails 241-019
and support rail with integrated mounting rails for plug-in connections acc. to IEC 60603-2



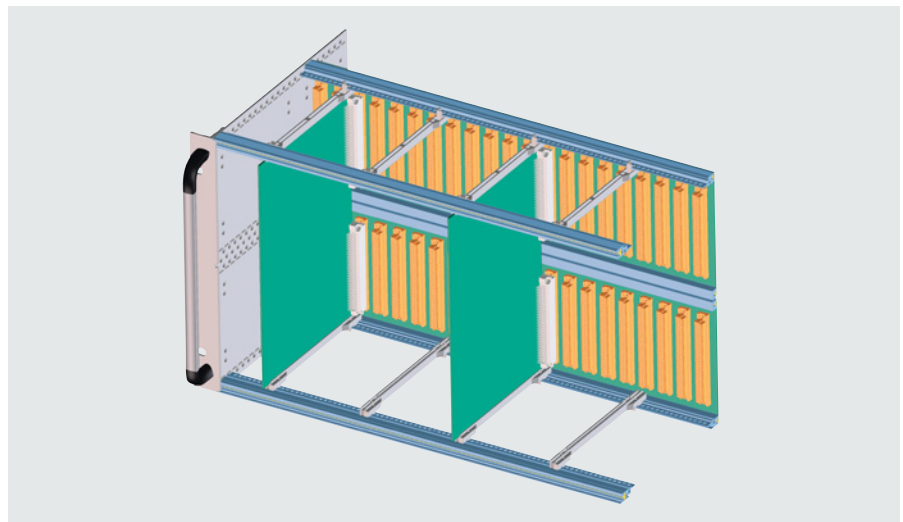
Configuration for backplane

front

standard module rails 241-022
with threaded inserts, M 2.5

rear

BUS module rails 241-013
with threaded inserts, M 2.5
and BUS support rail 241-020
with threaded inserts, M 2.5



Please order insulating strips or contact strips separately (see p.115).

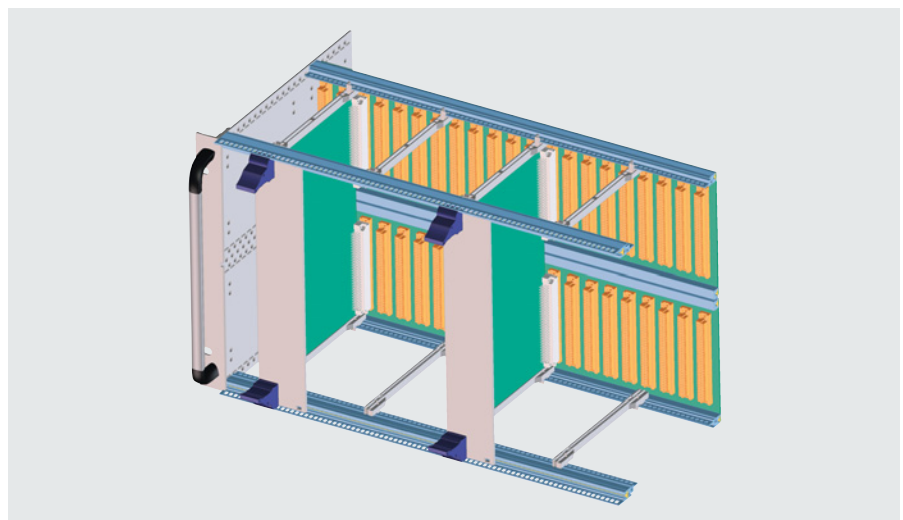
Configuration for injector / extractor handle and backplane for CPCI acc. to IEEE

front

standard module rails 241-049
with 10 mm clearance for insertion/
extraction handle
threaded inserts M 2,5

rear

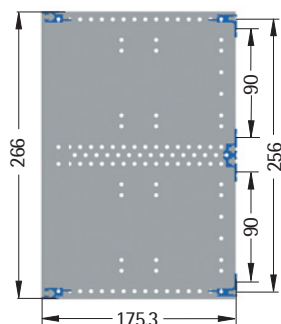
BUS module rails 241-013
with threaded inserts, M 2.5
and BUS support rail 241-020
with threaded inserts, M 2.5



Please order insulating strips or contact strips separately (see p.115).

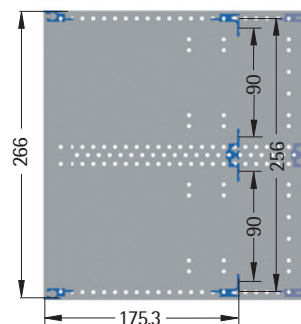


Depth 176 mm



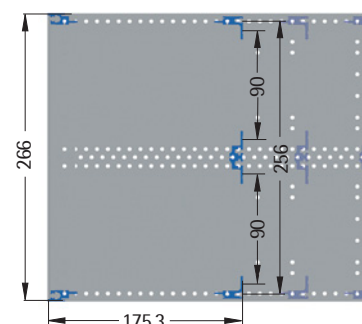
Description	Order no.
84 HP, with handle	245-614-11
84 HP, without handle	245-611-11

Depth 236 mm



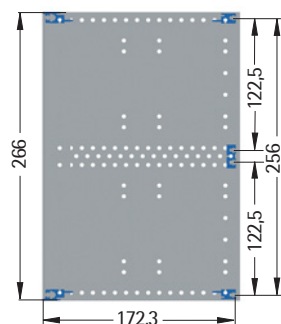
Description	Order no.
84 HP, with handle	245-615-11
84 HP, without handle	245-612-11

Depth 296 mm



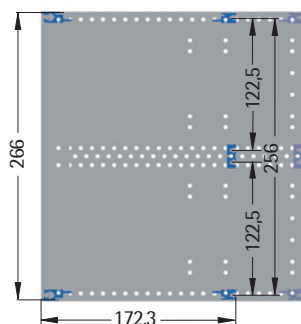
Description	Order no.
84 HP, with handle	245-616-11
84 HP, without handle	245-613-11

Depth 176 mm



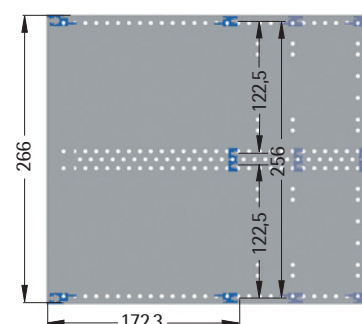
Description	Order no.
84 HP, with handle	245-614-21
84 HP, without handle	245-611-21

Depth 236 mm



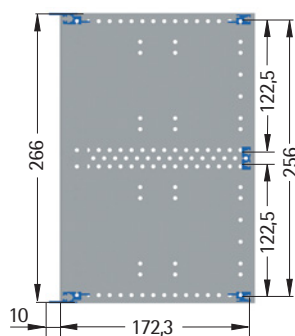
Description	Order no.
84 HP, with handle	245-615-21
84 HP, without handle	245-612-21

Depth 296 mm



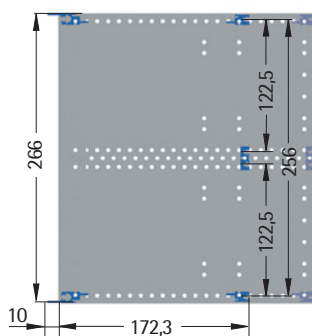
Description	Order no.
84 HP, with handle	245-616-21
84 HP, without handle	245-613-21

Depth 176 mm



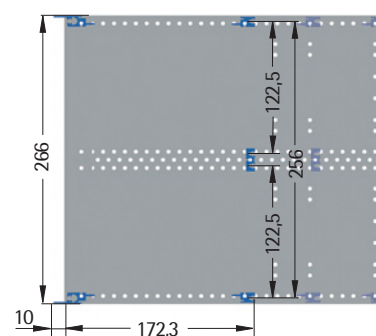
Description	Order no.
84 HP, with handle	245-614-31
84 HP, without handle	245-611-31

Depth 236 mm



Description	Order no.
84 HP, with handle	245-615-31
84 HP, without handle	245-612-31

Depth 296 mm



Description	Order no.
84 HP, with handle	245-616-31
84 HP, without handle	245-613-31

Other depths available on request. All drawings shown in side view. The lighter coloured rear rails show optional installation options.



245 • 19" subrack 2 U

19" subrack 2 U

- perforated side panels with fan option
- ideal for installing subracks vertically in appropriate 19" apra-norm wall-mounted enclosures
- module rails are prevented from rotating

Application:

for plug-in modules acc. to
IEC 60297-3-101/-102/-103 and
IEEE 1101.10/1101.11

Material:

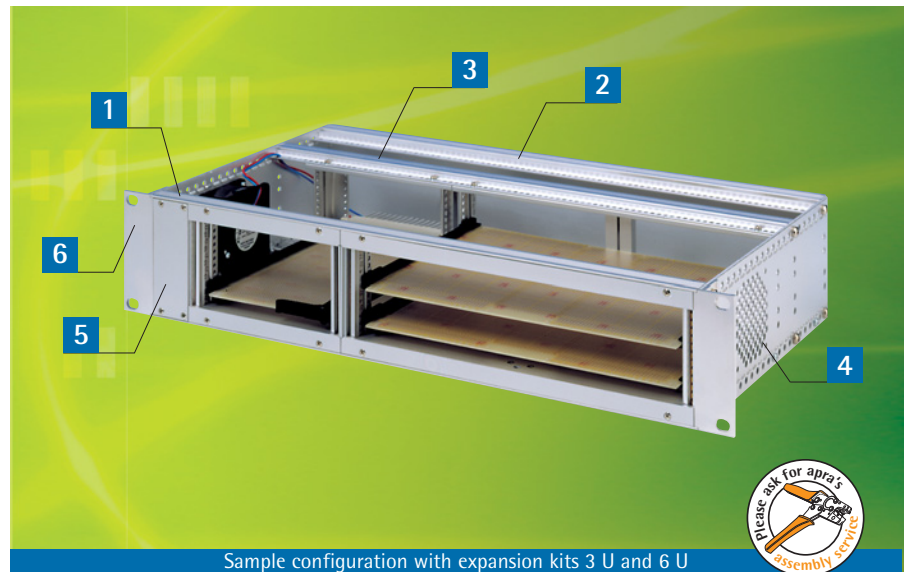
side panels: aluminium 2,5 mm

module rails: aluminium extrusion

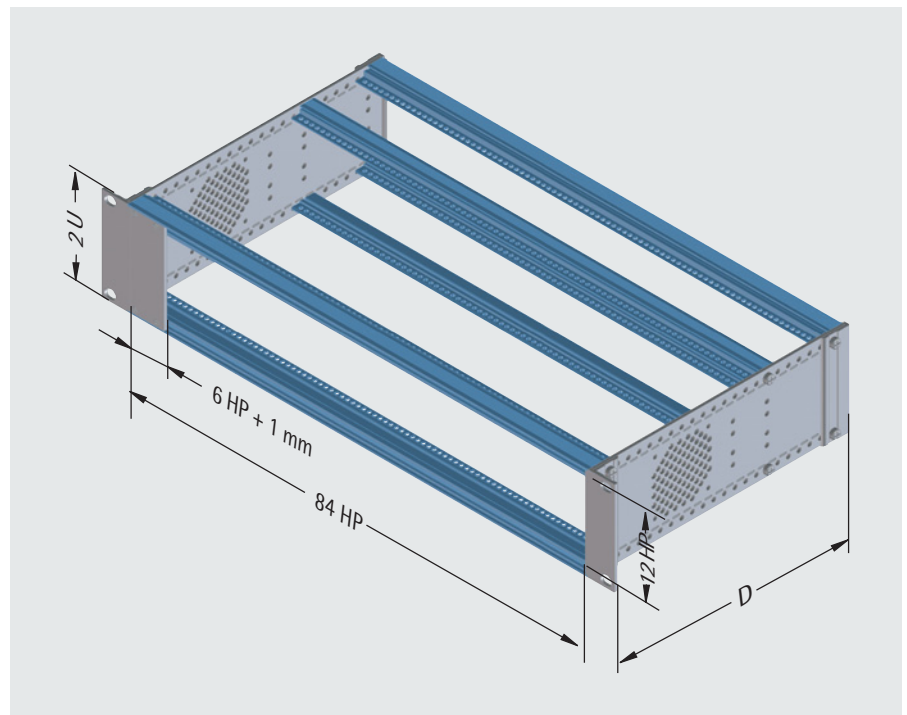
front brackets: aluminium extrusion

Delivery:

kit form



Sample configuration with expansion kits 3 U and 6 U



Delivery

Item	Pc.	Description
1	2	Module rails, front
2	2	Module rails, rear
3	2	BUS module rails, middle
4	2	Side panels, perforated
5	1	Front panel 6 HP
6	2	Front angle bracket
7	2	Cover bracket
8	4	Threaded inserts M 2,5 7 mm x 2 mm
9	2	Threaded inserts M 2,5 5 mm x 1,5 mm
10	12	Oval head screws, M 4 x 12, toothed head
11		Assembly material

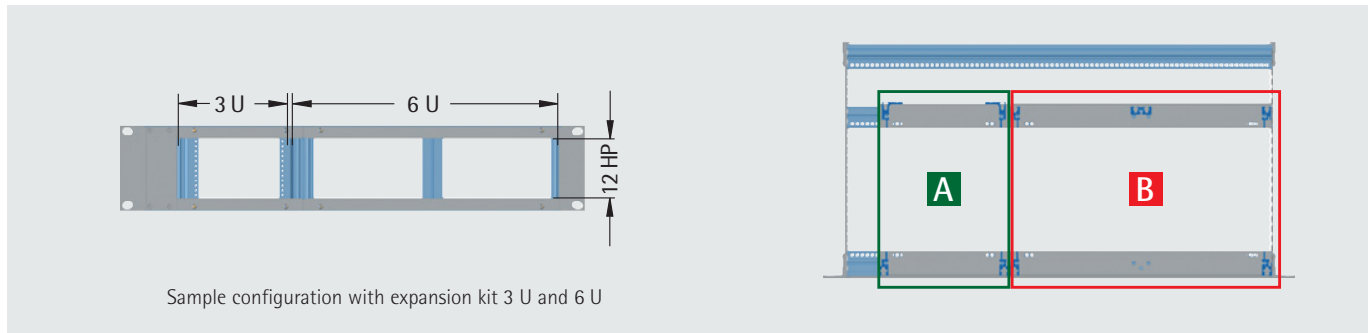
Description	Order no.
D=236 mm	245-212-28
D=296 mm	245-213-28



Expansion kits

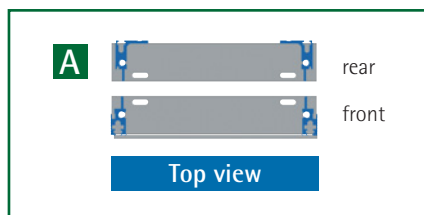
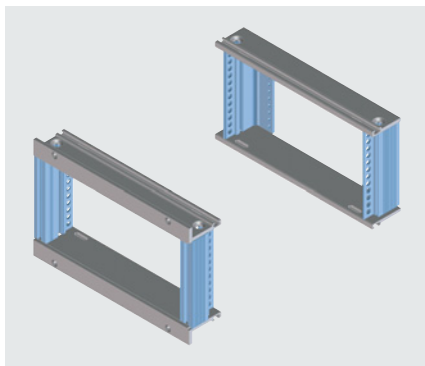
- for installing eurocards or double eurocards horizontally in a 2 U subrack
- the following combinations are possible in 84 HP subracks:

1x 3 U expansion kit + 1x 6 U expansion kit or up to 3x 3 U expansion kits



Horizontal expansion kits for 3U subracks on p. 110. Other expansion kits available on request.

Expansion kit 3 U / 12 HP

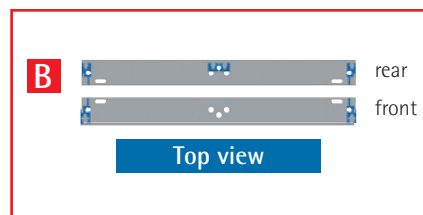
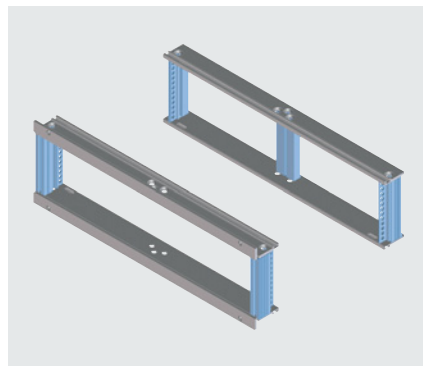


- for installing eurocards horizontally
- front: standard module rails 241-022
- rear: narrow module rails 241-019 with integrated mounting rail for plug-in connectors acc. to IEC 60603-2

Order no.

245-312-61

Expansion kit 6 U / 12 HP



- for installing double eurocards horizontally
- front: standard module rails No. 241-022
- rear: BUS module rails No. 241-013 and BUS support rail No. 241-020

Order no.

245-612-62



246 • 19" subrack 6 U „Heavy Load“

19" subrack 246 "Heavy Load"

This heavy load subrack was especially designed for rough environments to ensure efficient electronics such as railway technology, energy and power stations, for strongly vibrating machineries or defence industry.

Strengthened and extended front brackets as well as double fixed module rails stand the test at high load due to shock and vibration. Further more, higher weight capacities can be taken. This has been confirmed by an independent institute by tests for resonance, vibration and shock acc. to IEC 61587-1 (2012-09) DL3 and static load acc. to SL1.

Its EMC compatible design has been approved by test acc. to VG95373, part 15, with a high interference resistance within a frequency range of 30 MHz up to 2 GHz.

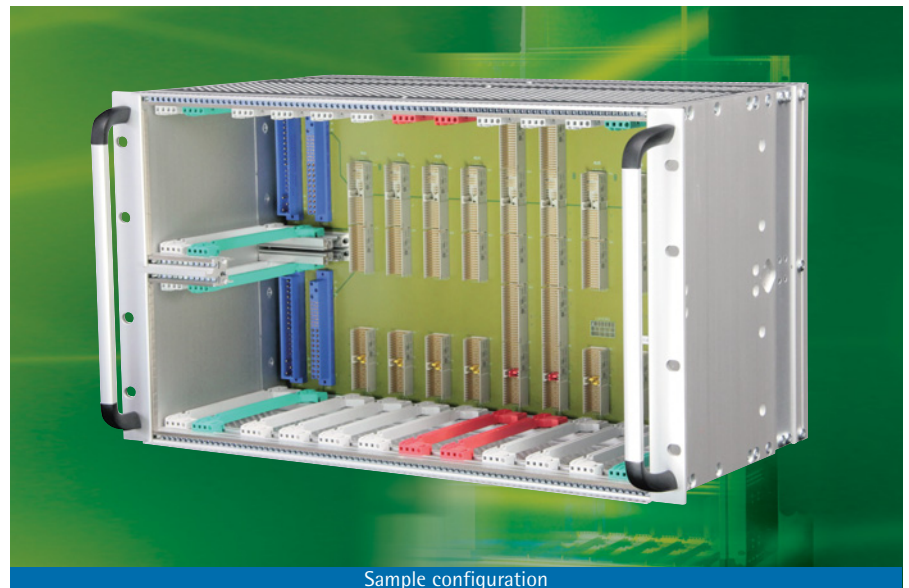
All accessory components like card guides, handles, etc. of the standard series 245 can be used.

Material:

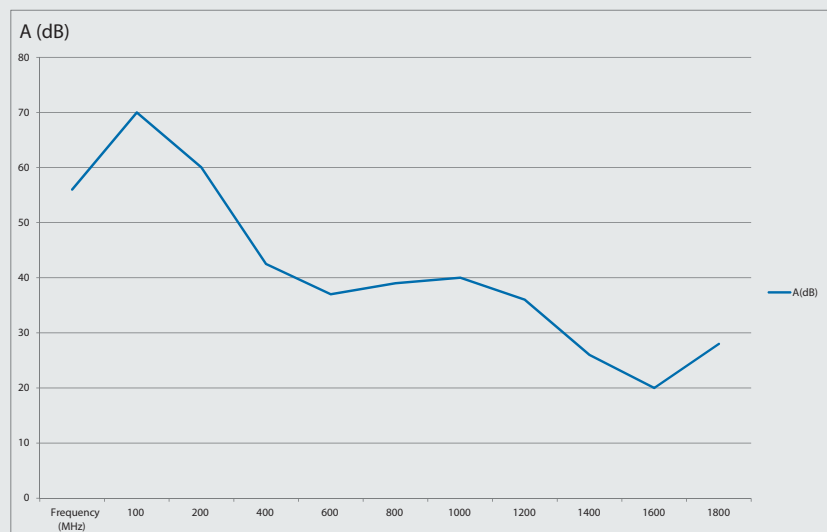
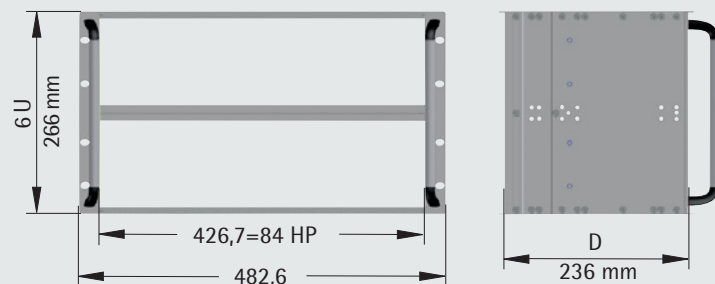
aluminium anodised

Delivery:

unmounted, kit form (without backplane and expansion kit)



Sample configuration



(Fig: average graph of shielding measured from 4 sides, simplified diagram)



Ruggedized subrack „apra R-TYPE”

- high shock and vibration resistance
- front and rear IO (160 mm / 80 mm)
- 21 x 4 HP slot type A
- possible thickness of PCB
1.4 to 2.6 mm
- 19" brackets in the rear for mounting
on the rear 19" level
- additional brackets for mounting with
central balance point

Application:

for plug-in components acc. to

IEC 60297-3-108,

but no cassettes or sub units possible

Material:

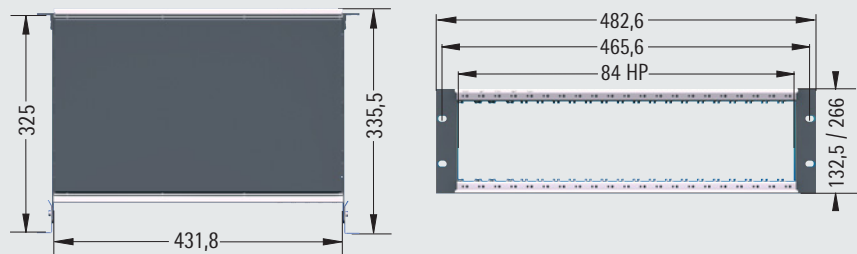
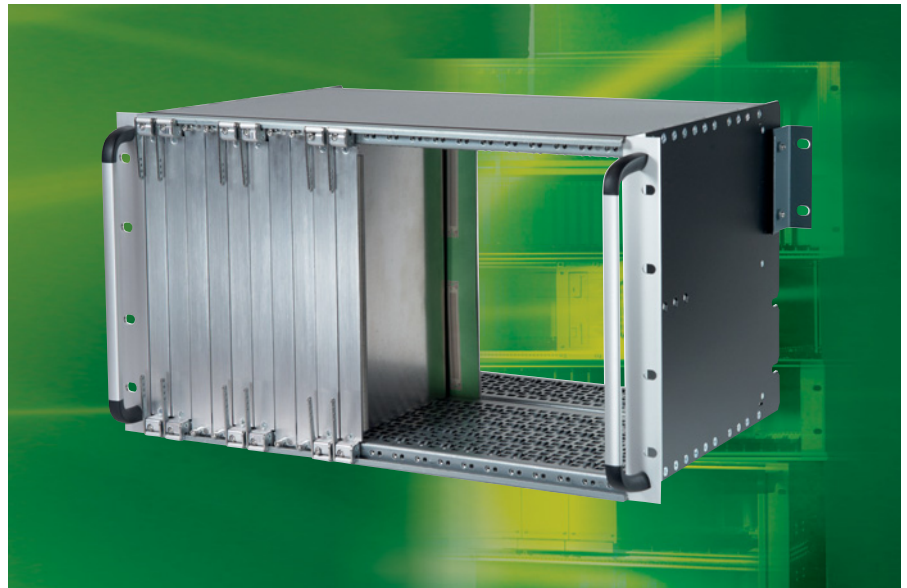
sheet steel / aluminium

Finish:

RAL 9010 / zined

Delivery:

kit form, unmounted

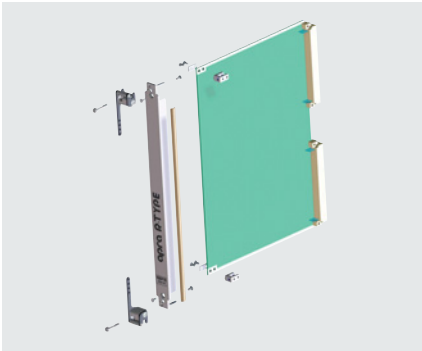


HP	U	Order no.
84	3	245-318-00
84	6	245-618-00

Other configurations on request!



Plug-in module R-Type



- screwed to plug-in component or blind panel/ subrack by M 3
- screwed to PC board/ front panel (3 U and 6 U) by 4 x M 2.5
- type A or B possible by turning the PC board fixing
- injector/ extractor handle for maximum front panel utilisation
- centring by advanced pin
- unilateral fabric gasket for EMC shielding
- PC board thickness 1.4 to 2.6 mm

Blind panel 4 HP



Delivery

Item	Description
1	Blind panel
2	EMC fabric gasket
3	Assembly material

U	Order no.
3	245-318-05
6	245-618-05

Front panel 4 HP

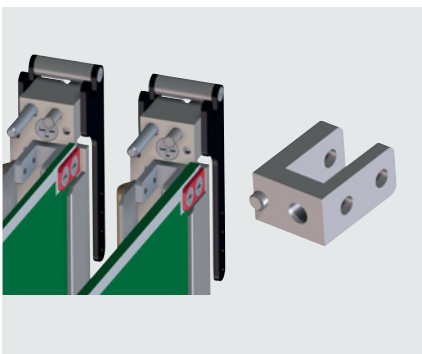


Delivery

Item	Description
1	Front panel
2	Handle (top)
3	Handle (bottom)
4	EMC fabric gasket
5	PCB mounting bracket
6	Assembly material

U	Order no.
3	245-318-10
6	245-618-10

PCB mounting bracket



- slot version type A and type B
- type A = type A, but 0,5 HP offset

Application:

for PCB acc. to IEC 60297-3-108

Material:

aluminum

Finish:

conductive

Delivery:

kit form, unmounted



19" power distribution subrack 3 U for automatic circuit breakers

- for the installation of automatic circuitbreakers
- fast access to the wiring space
- stable accommodation of components acc. to DIN 43 880 in build sizes 1-3
- strain relief of the rear-side cable via cable guard rail
- mounting width for components = 378 mm, matched 21 x size 1

Material:

side panels: aluminium 2.5 mm

module rail: aluminium profile

front bracket: aluminium profile

Finish:

transparent, chromated

Delivery:

assembly set

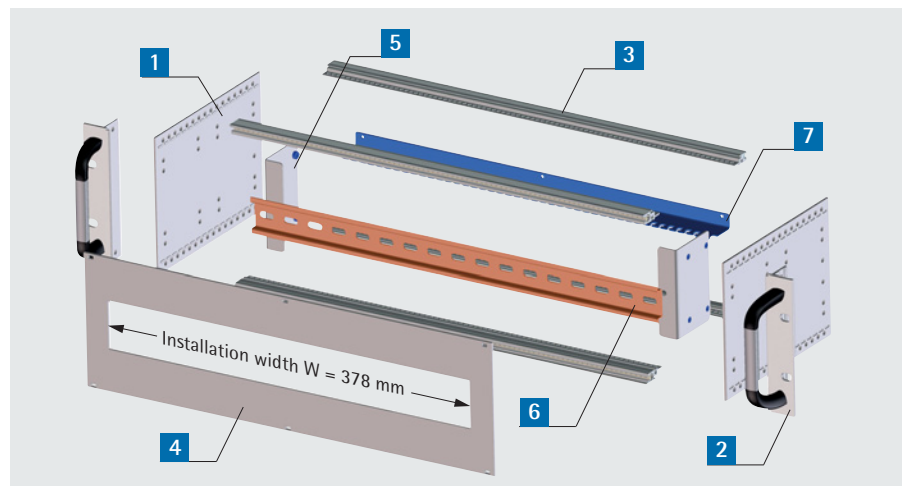


Sample configuration with cover strips

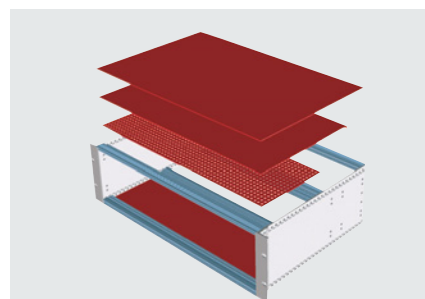
Delivery

Item	Pc.	Description
1	2	Side panels
2	2	Front angle bracket with handles
3	4	Module rails
4	1	Front panel
5	2	Angle bracket
6	1	Top hat rail TS 35/7,5
7	1	Cable guard rail
8	1	Assembly material

Order no.
245-311-80



Cover panel, solid



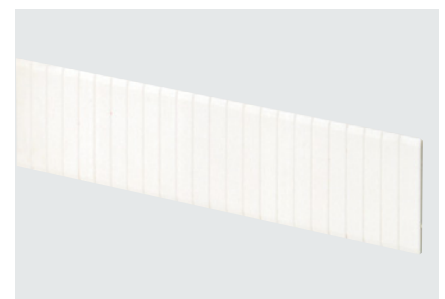
- for top and bottom mounting

Material:

aluminium 1 mm

HP	Order no.
84	240-662-85

Cover strip S 35 G



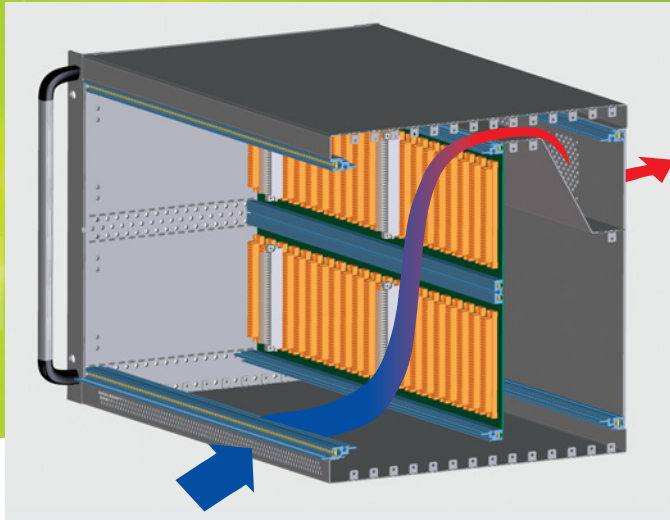
- to conceal the front panel openings
- length: 219 mm, pre-punched in 9 mm increments for easy removal

Material:

plastics

Finish: similar to RAL 9010

Order no.
640-222-00



Subrack 7 U

- optimised active cooling from front, bottom to rear, top

Compact PCI 7 U

- EMC-shielded CompactPCI system integrated in a 19"-subrack
- designed for board assembly with up to eight CompactPCI boards 6 U, 160 mm, 220 mm or 280 mm depth at the front
- 6 U, 8 Slot CompactPCI backplane Rev. 3.0, 64 bit, 66 MHz, system slot on the left



Compact PCI 8 U

- EMC-shielded CompactPCI system integrated in a 19"-subrack
- designed for board assembly with up to eight CompactPCI boards 6 U, 160mm depth at the front
- 6 U, 8 Slot CompactPCI backplane Rev. 3.0, 64 bit, 66 MHz, system slot on the left

Individual configuration 245

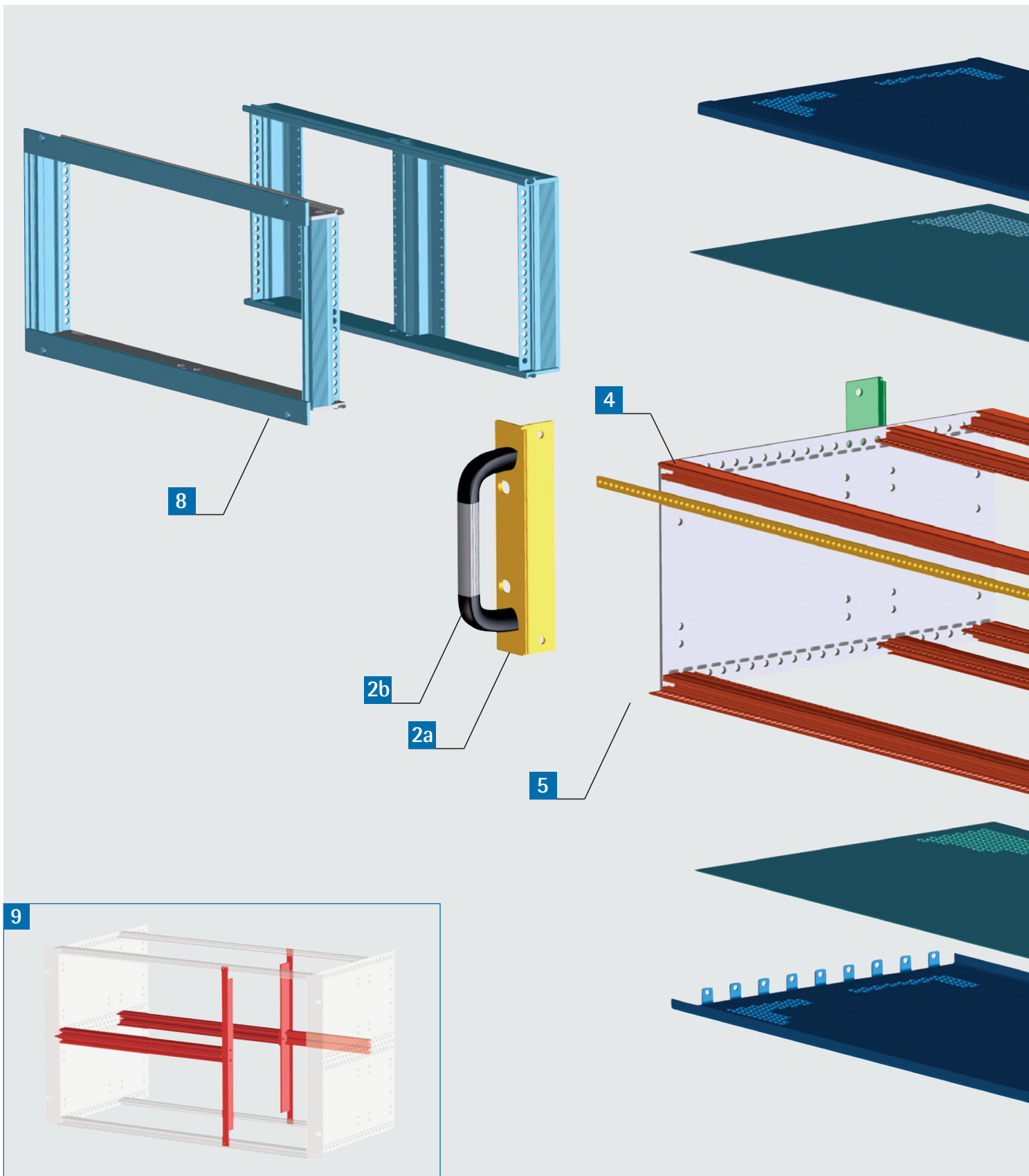


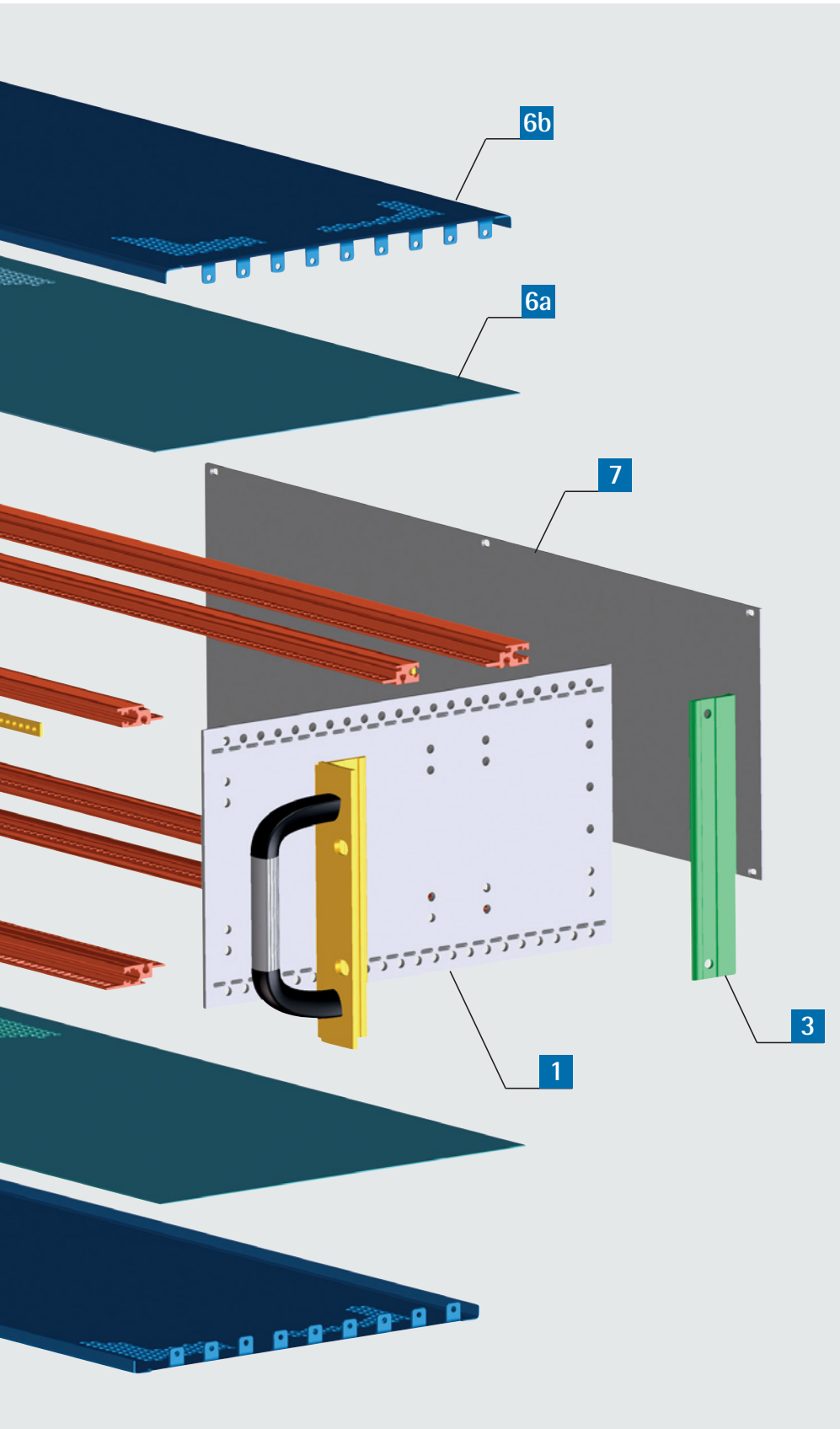
... the perfect shell for valuable electronics



245 • 19" subrack, individual configuration

Individual configuration: Design your customised subrack 245.





Item	Description	page
1	Side panel	102
2a	Front bracket	103
2b	Front panel handle	103
3	Cover bracket	104
4	Module rails	105
5	Threaded inserts	107
6a	Cover panel	108
6b	EMC cover panel	109
7	Rear panel	109
8	Horizontal expansion kit (3 U subrack)	110
9	Vertical expansion kit (6 U Subrack)	111
10	EMC contact clip (w/o fig.)	113
11	Assembly material	112

Accessories (without fig.)	page
Z-rails	114
Insulating strips	115
Contact strips	115
Card guides:	
- standard	116
- integrated	117
- with coding	118
- divided	120
Card lock	121
Extraction handle	121
Group lock	121
Extension kit	122
Connecting kit	122

Other dimensions and electromechanical components on request!



Customised front panels including print, foils, input systems or keyboards –

please ask for our front panel express!





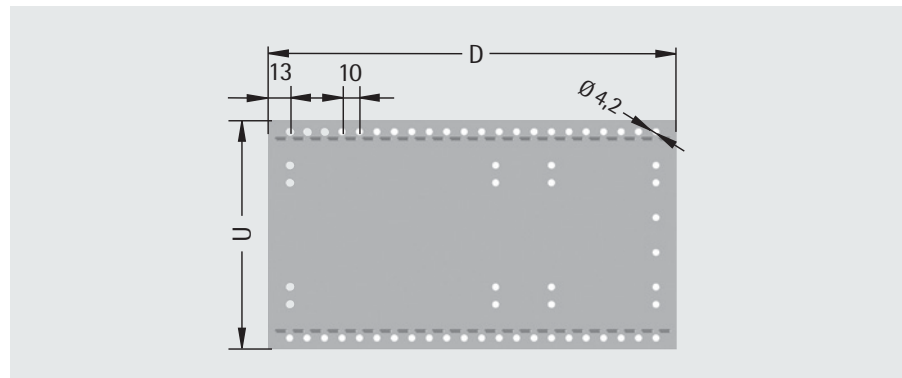
245 • 19" subrack, individual configuration

1a Side panel, not ventilated

- side panels can be expanded by use of the expansion kit (see page 122)

Material:

aluminium 2,5 mm



U	H mm	D mm	Order no.
3	132,5	176	245-301-50
		236	245-302-50
		296	245-303-50
		336	245-309-53
		356	245-304-50
4 (3+2 x 1/2)	177	296	245-403-50
		356	245-404-50
4	177	296	245-943-50
6	266	176	245-601-50
		236	245-602-50
		296	245-603-50
		336	245-609-53
		356	245-604-50
7 (6+2x 1/2)	310,5	296	245-703-50
		356	245-704-50

Other dimensions on request!

1b Side panel, perforated

- prepared with ventilation holes and studs for the mounting of fans
- side panels can be expanded by use of the expansion kit (see page 122)

Material: aluminium 2,5 mm

Matching fan 2 U

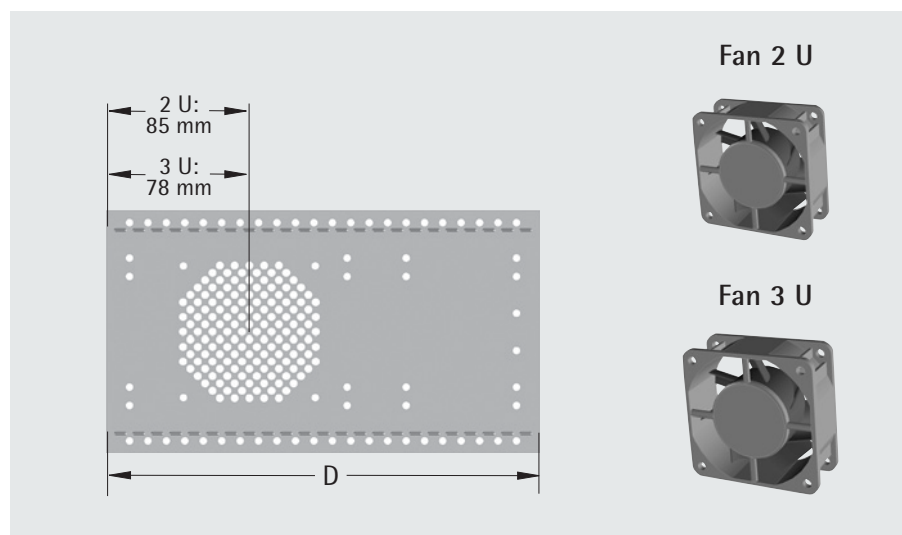
- dimensions: 60 x 60 x 25 mm
- voltage: 12 V
- fan output: 40 m³/h

Order no.
230-825

Matching fan 3 U

- dimensions: 80 x 80 x 25 mm
- voltage: 12 V
- fan output: 58 m³/h

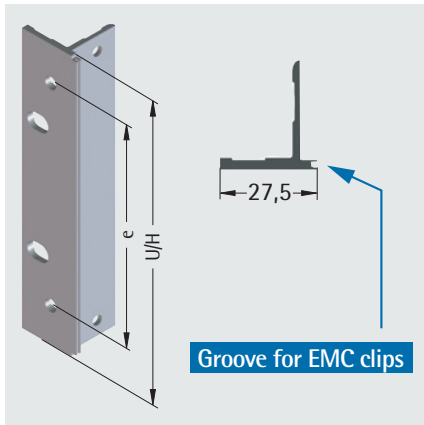
Order no.
230-828



U	H mm	D mm	Order no.
2	88	236	245-202-50
		296	245-203-50
3	132,5	176	245-301-58
		236	245-302-58
		296	245-303-58
		356	245-304-58



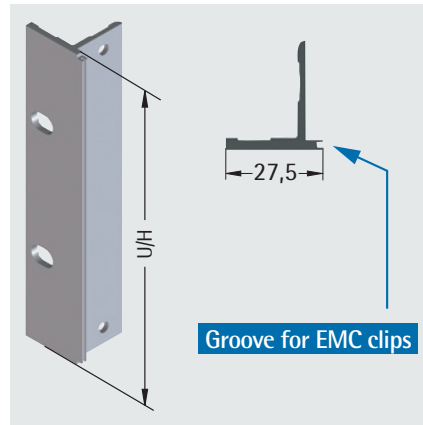
2a Front bracket with holes for handle



- with integrated groove for inserting EMC contact springs [11] (see p. 113)

Material:
aluminium

2a Front bracket without holes for handle



- with integrated groove for inserting EMC contact springs [11] (see p. 113)

Material:
aluminium

U	H mm	e	Order no.
3	132,5	98	241-002-03
4	177	142	241-002-04
4 (3+2x 1/2)	177	142	241-002-44
6	266	232	241-002-06
7	310,5	276	241-002-07
7 (6+2x 1/2)	310,5	276	241-002-47

U	H mm	Order no.
2	88	241-002-12
3	132,5	241-002-13
4	177	241-002-14
4 (3+2x 1/2)	177	241-002-54
6	266	241-002-16
7	310,5	241-002-17
7 (6+2x 1/2)	310,5	241-002-57

2b Front panel handles



- fits 19" subracks

Material:

end pieces: plastic, black (with M 5)

handle extrusion: anodised aluminium

Delivery:

assembled

Delivery

Item	Pc.	Description
1	2	End pieces
2	1	Handle extrusion

U	e mm	Order no. (1 piece)
3	98	611-336-00
4	142	611-334-00
6	232	611-337-00
7	276	611-337-10

Countersunk screw for handle mounting

- Set = 100 pieces

Order no.
630-121

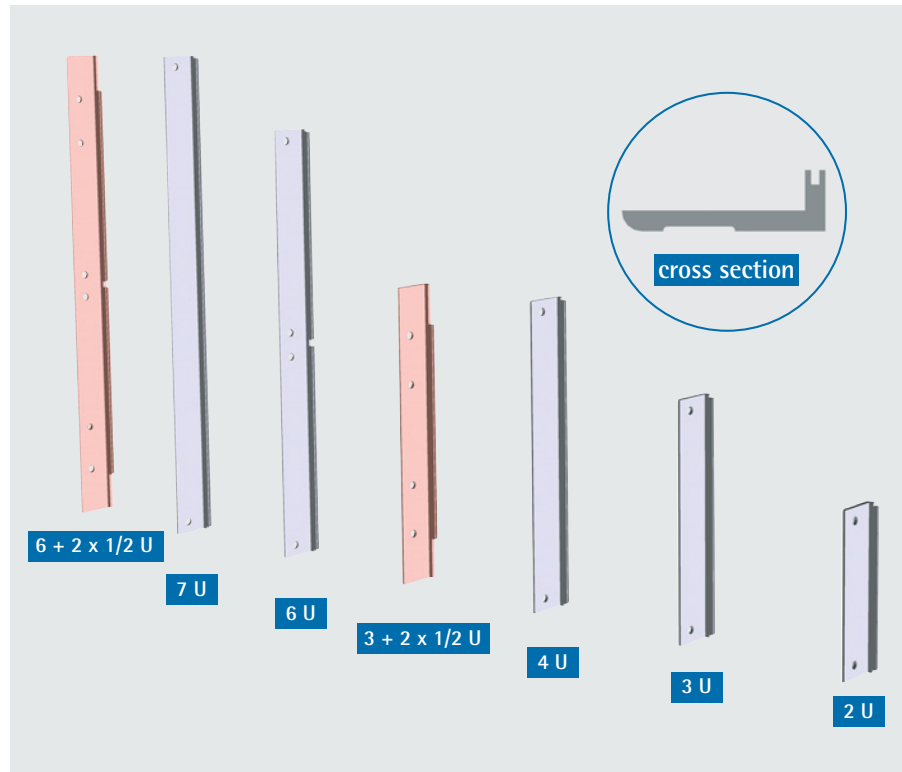


245 • 19" subrack, individual configuration

3 Cover bracket

- for covering the gap between side and rear or front panel
- with groove for EMC contact clips [11] (see p. 113) for EMC protection of the rear

Material:
aluminium



U	H mm	Order no.
2	88	241-037-02
3	132,5	241-037-03
4	177	241-037-04
4	177	241-037-54
3 + 2 x 1/2	177	241-037-54
6	266	241-037-06
7	310,5	241-037-07
7	310,5	241-037-57
6 + 2 x 1/2	310,5	241-037-57



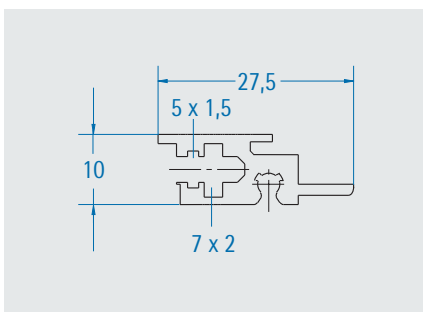
4 Module rails

The following module rails are available:



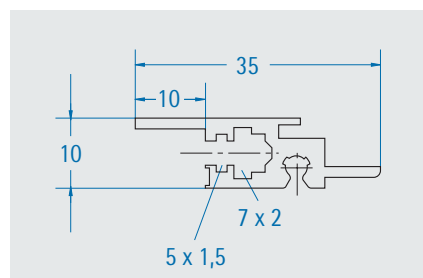
Module rails are 1 HP longer than the subrack's nominal width. Other lengths available on request.

Standard module rail



- for mounting plug-in units and back panels
- with grooves for threaded inserts
- mounting in upper or lower position

Standard module rail with 10 mm clearance

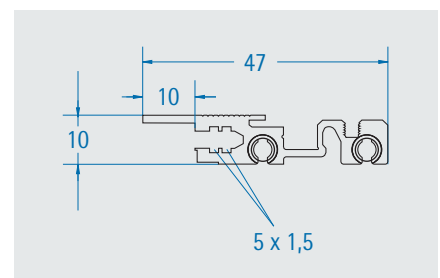


- for plug-in units with IEEE handle
- with grooves for threaded inserts
- mounting in upper or lower position

See p. 137 for matching IEEE handles!

HP	L mm	Order no.
85	431,90	241-022-01
64	325,20	241-022-05
57	289,70	241-022-02
43	218,50	241-022-03
29	147,40	241-022-04

Reinforced module rail with 10 mm clearance



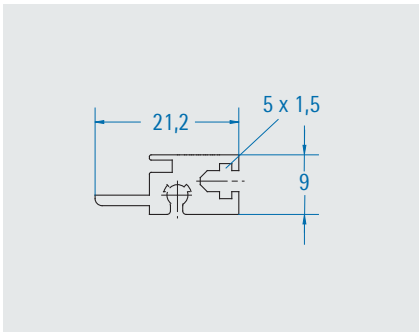
- for plug-in units with IEEE-handle
- for higher mechanical loads
- with grooves for threaded inserts
- mounting in upper or lower position

See p. 137 for matching IEEE handles!

HP	L mm	Order no.
85	431,90	241-500-85
64	325,20	241-500-64
57	289,70	241-500-57
43	218,50	241-500-43
29	147,40	241-500-29



BUS module rail

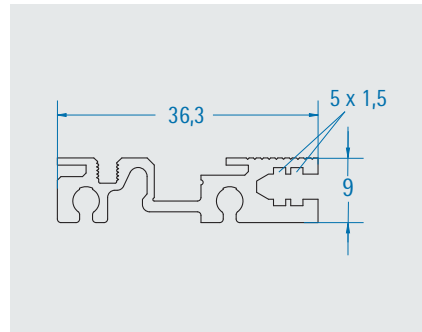


- for mounting BUS cards and back-planes **using EMC springs or insulating strips** (see section beginning on p. 115)
- with grooves for threaded inserts
- mounting in upper or lower position

Please order insulating strips or contact strips separately (see p.115).

HP	L mm	Order no.
85	431,90	241-013-01
64	325,20	241-013-05
57	289,70	241-013-02
43	218,50	241-013-03
29	147,40	241-013-04

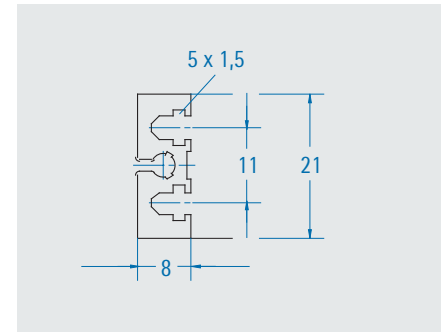
Reinforced BUS module rail



- with integrated contact strips
- for mounting BUS cards and back-planes
- with grooves for threaded inserts
- mounting in upper and lower position

HP	L mm	Order no.
85	431,90	240-513-85
64	325,20	240-513-64
57	289,70	240-513-57
43	218,50	240-513-43
29	147,40	240-513-29

BUS support rail

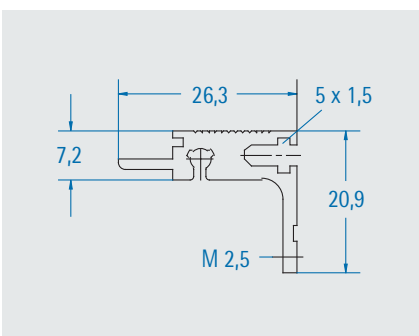


- for mounting BUS cards and back-planes **using EMC springs or insulating strips** (see section beginning on p. 115)
- with grooves for threaded inserts
- mounting in middle position

Please order insulating strips or contact strips separately (see p.115).

HP	L mm	Order no.
85	431,90	241-020-01
64	325,20	241-020-64
57	289,70	241-020-57
43	218,50	241-020-43
29	147,40	241-020-29

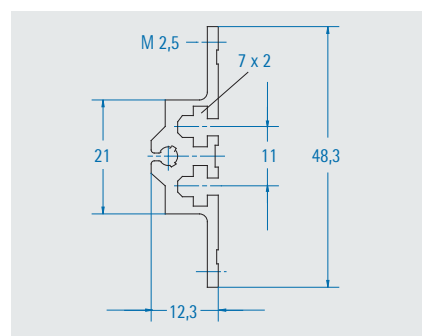
Narrow module rail, integrated



- with integrated mounting rail for connectors acc. to IEC 60603-2
- with grooves for threaded inserts
- mounting in upper or lower position
- notched

HP	L mm	Order no.
85	431,90	267-919-01
64	325,20	267-919-05
57	289,70	267-919-02
43	218,50	267-919-03
29	147,40	267-919-04

Support rail



- with integrated mounting rail for plug-in connections acc. to IEC 60603-2
- with grooves for threaded inserts
- mounting in middle position
- notched

HP	L mm	Order no.
85	431,90	241-108-85
64	325,20	241-108-64
57	289,70	241-108-57
43	218,50	241-108-43
29	147,40	241-108-29



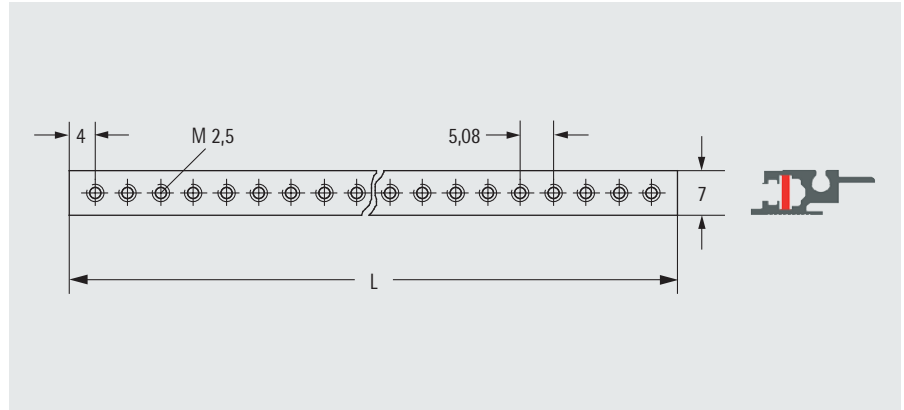
5 Threaded inserts

M 2,5 threaded insert 7 x 2 mm

- threaded inserts, galvanised 7 x 2 mm for use with standard module rails

Finish: galvanised

HP	L mm	Order no.
85	429,90	240-051
64	323,20	240-055
57	287,70	240-052
43	216,50	240-053
29	145,40	240-054

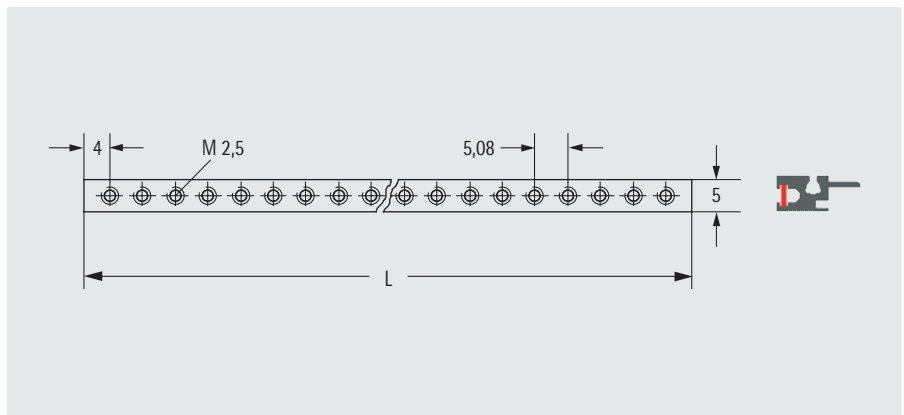


M 2,5 threaded insert 5 x 1.5 mm

- threaded insert M 2,5 for use with BUS module rails/ BUS support rails as well as reinforced module rails

Finish: galvanised

HP	L mm	Order no.
85	429,90	240-061
64	323,20	240-065
57	287,70	240-062
43	216,50	240-063
29	145,40	240-064

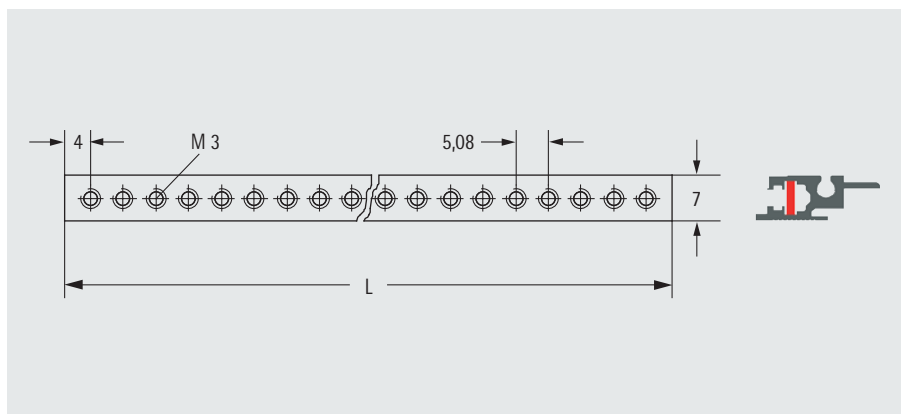


M 3 threaded insert 7 x 2mm

- threaded insert, 7 x 2 mm for use with standard module rails

Finish: galvanised

HP	L mm	Order no.
85	429,90	240-059-85
64	323,20	240-059-64
57	287,70	240-059-57
43	216,50	240-059-43
29	145,40	240-059-29

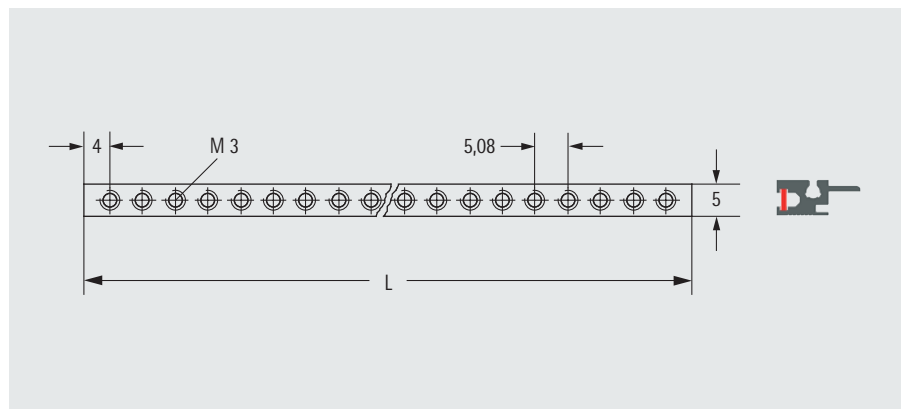


M3 threaded insert 5 x 1.5mm

- threaded insert M 3 for use with BUS module rails / BUS support rails

Finish: galvanised

HP	L mm	Order no.
85	429,90	240-069-85
64	323,20	240-069-64
57	287,70	240-069-57
43	216,50	240-069-43
29	145,40	240-069-29





245 • 19" subrack, individual configuration

6a Cover panel

- for mechanical shielding of subracks
- perforated or closed

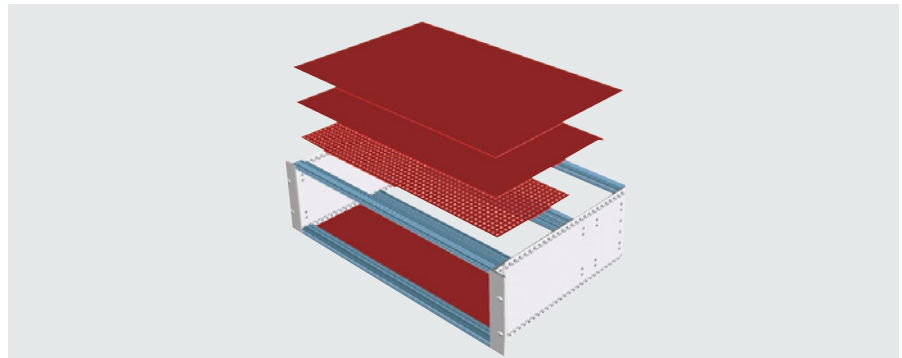
Material:

aluminium panel or perforated aluminium panel 1,0 mm

Degree of protection:

IP 30: closed

IP 20: perforated



Application	Order no. 84 HP		Order no. 42 HP	
	closed	perforated	closed	perforated
Card depth 160 mm plug-in connector IEC 60603-2 	245-011-10	245-011-18	245-031-10	245-031-18
Card depth 160 mm BUS 	240-662-85	240-468-85	240-662-43	240-468-43
Card depth 220 mm plug-in connector IEC 60603-2 	245-012-10	245-012-18	245-032-10	245-032-18
Card depth 220 mm BUS 	240-672-85	240-478-85	240-672-43	240-478-43
Card depth 160 mm / 220 mm plug-in connector Standard IEC 60603-2 	240-671-85	240-475-85	240-671-43	240-475-43
Card depth 160 mm / 220 mm BUS Standard 	240-671-85	240-475-85	240-671-43	240-475-43
Card depth 220 mm plug-in connector IEC 60603-2 Standard 	245-013-10	245-013-18	245-033-10	245-033-18
Card depth 220 mm BUS Standard 	245-013-10	245-013-18	245-033-10	245-033-18
Card depth > 220 mm Standard 	245-014-10	245-014-18	-	-



6b EMC cover panel

- perforated/ closed
- with honeycomb perforations for optimum air flow (approx. 63%)
- EMC-compliant design
- including assembly material

Material:

aluminium

* EMC cover panel 4 U and 7 U are suitable for a x + 2 1/2 U configuration

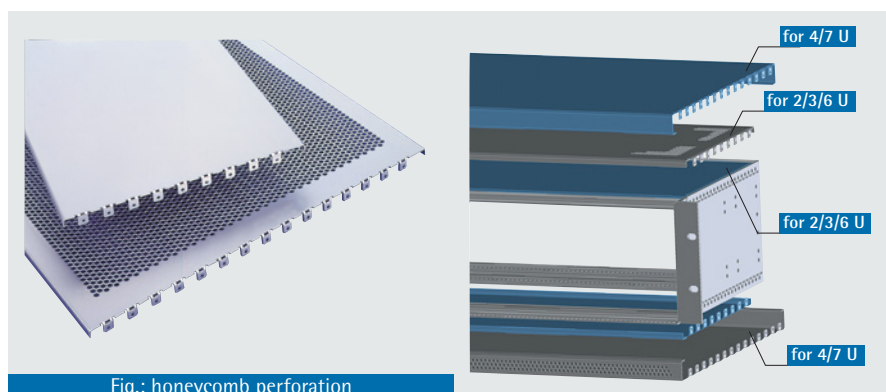


Fig.: honeycomb perforation

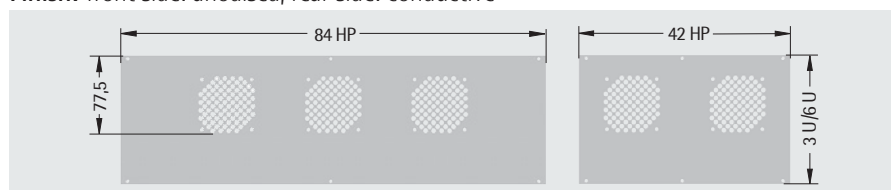
HP	H	D mm	Feature	Order no.
42	2, 3, 6 U	176	not ventilated	245-031-40
			perforated	245-031-48
		236	not ventilated	245-032-40
			perforated	245-032-48
		296	not ventilated	245-033-40
			perforated	245-033-48
84	2, 3, 6 U	176	not ventilated	245-011-40
			perforated	245-011-48
		236	not ventilated	245-012-40
			perforated	245-012-48
		296	not ventilated	245-013-40
			perforated	245-013-48
		356	not ventilated	245-014-40
			perforated	245-014-48
	4, 7 U *	296	not ventilated	245-413-40
			perforated	245-413-48

7 Rear panel

- up to 3 fans can be installed in 84 HP subracks and 2 fans in 42 HP (perforated version)
- including assembly material

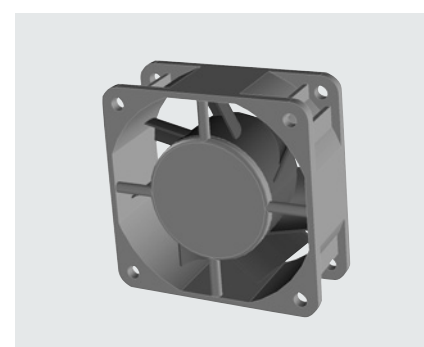
Material: aluminium 2.5 mm

Finish: front side: anodised, rear side: conductive



HP	U	Feature	Order no.
42	3	not ventilated	243-042-45
		perforated	243-803-02
84	3	not ventilated	243-084-45
		perforated	243-803-01
42	6	not ventilated	243-642-45
		perforated	243-806-02
84	6	not ventilated	243-684-45
		perforated	243-806-01

Fan, 12 V



- for installation in the rear panel
- high-power [PAPST] fan
- flow rate: 40 m³/h
- noise level: 40 dB(A)
- W x H x D: 60 mm x 60 mm x 25 mm
- incl. assembly material

Order no.
230-825



245 • 19" subrack, individual configuration

9 Horizontal expansion kit 6 U/20 HP

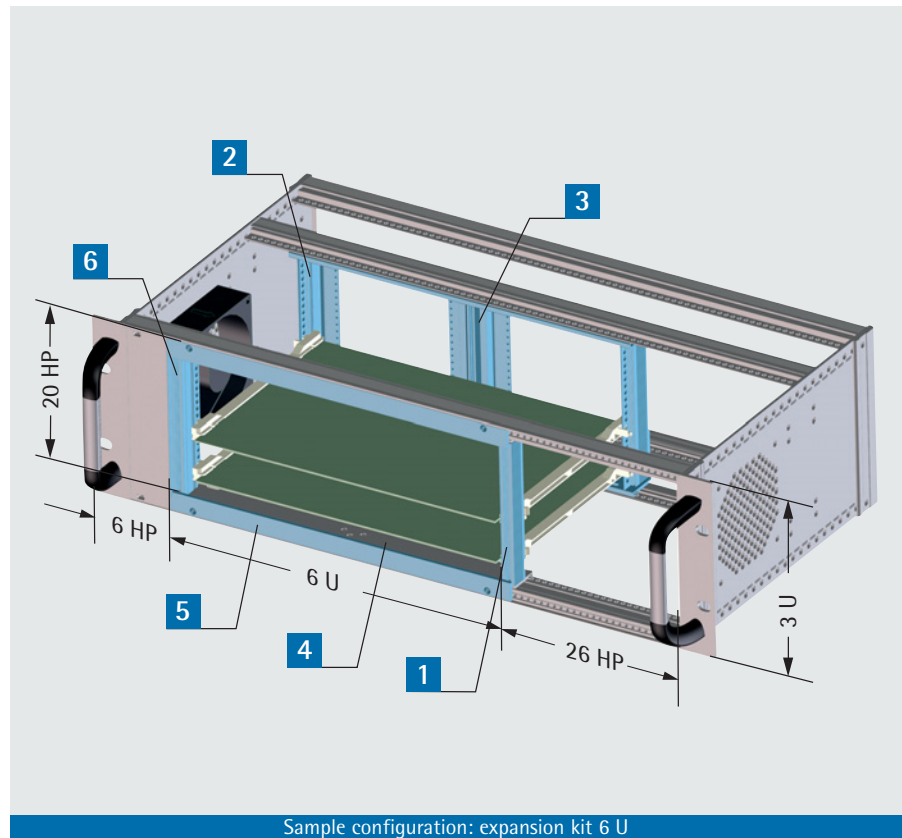
- for installation in 3 U subracks with BUS module rail
- for installing double eurocards horizontally
- PCB's cooled optimally when installed in a subrack with perforated side panels (see fig.)

Application:

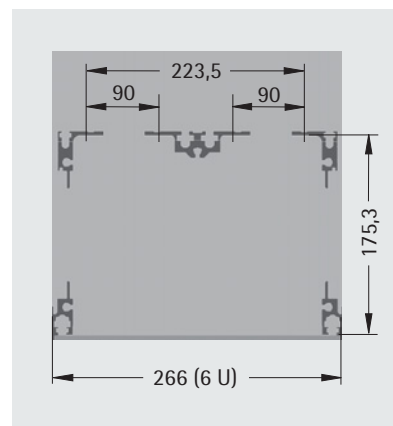
for plug-in modules acc. to IEC 60297-3-101/-102/-103 and IEEE 1101.10/1101.11

Delivery:

kit form



Expansion kit model 1



- depth: 236 mm

front:

- standard module rails, profile no. 241-022

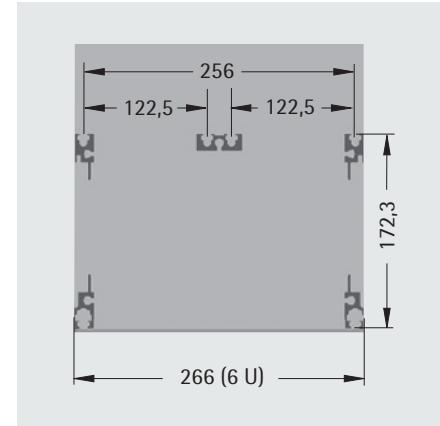
rear:

- narrow module rails with integrated mounting rails, profile no. 241-019 and
- support rail with integrated mounting rail, profile no. 241-008 for plug-in connections acc. to IEC 60603-2

Order no.

245-620-61

Expansion kit model 2



- depth: 236 mm

front:

- standard module rails, profile no. 241-022

rear:

- BUS module rails, profile no. 241-013 and
- BUS support rail, profile no. 241-020

Order no.

245-620-62

Delivery

Item	Pc.	Description
1	2	Module rails, front
2	2	Module rails, rear
3	1	Mounting rail, rear
4	4	Flat rails
5	2	Panels
6	2	Threaded inserts M 2,5 7 mm x 2 mm
7	(4)	Threaded inserts M 2,5 5 mm x 1,5 mm (Model 2)
8		Assembly material



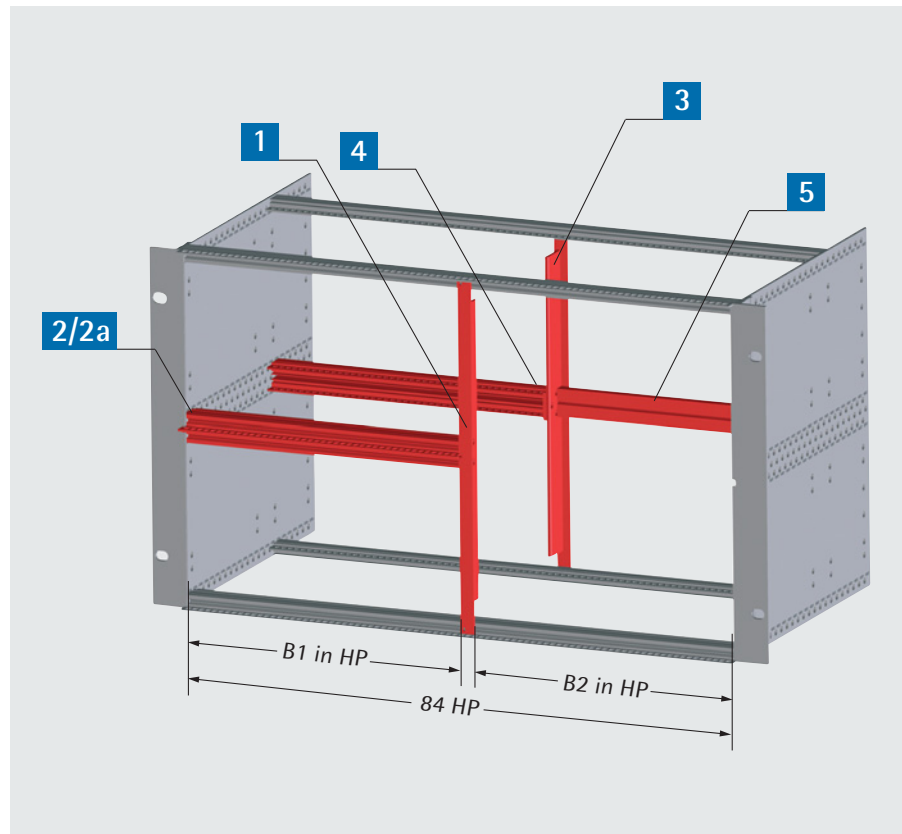
10 Vertical expansion kit 2 x 3 U

- for the separation of the 6 U installation space into 2 x 3 U and 1x 6 U

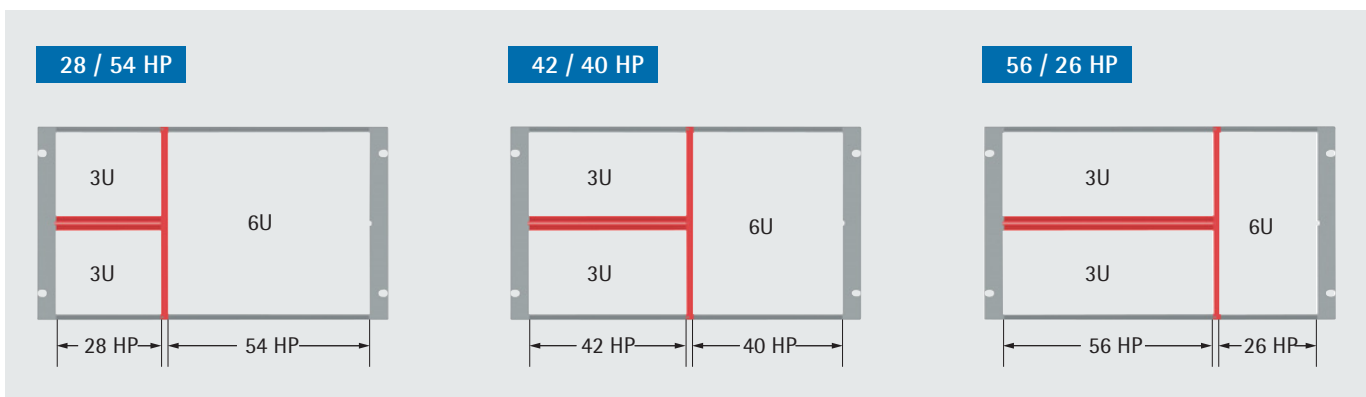
Application:

for plug-in modules acc. to
IEC 60297-3-101/-102/-103 and
IEEE 1101.10/1101.11

By use of the mounting rails, the usable installation space will be reduced to 82 HP.



Versions



Basic design for plug-in components acc. to IEC 60297-3-101/-102/-103

Item	Description	Installation space B1 2 x 3 U	Installation space B2 6 U	Order no.
1	Front mounting strut	-	-	241-087
2	Standard module rails	28 HP	54 HP	241-022-04
		42 HP	40 HP	241-022-03
		56 HP	26 HP	241-022-02
2a	Threaded inserts M 2,5	28 HP	54 HP	240-054
		42 HP	40 HP	240-053
		56 HP	26 HP	240-052



245 • 19" subrack, individual configuration

Components combinable with type A for plug-in connector acc. to IEC 60603-2

Item	Description	Installation space B1 2 x 3 U	Installation space B2 6 U	Order no.
3	Rear mounting strut for narrow module rail with integrated mounting rail	-	-	241-088
4	Narrow module rail with integrated mounting rail	28 HP	54 HP	267-919-04
		42 HP	40 HP	267-919-03
		56 HP	26 HP	267-919-02
5	Mounting rail, integrated	28 HP	54 HP	241-108-02
		42 HP	40 HP	241-108-03
		56 HP	26 HP	241-108-04

Components combinable with type B for BUS cards

Item	Description	Installation space B1 2 x 3 U	Installation space B2 6 U	Order no.
3	Rear mounting strut for BUS module rail	-	-	241-089
4	BUS module rail	28 HP	54 HP	241-013-04
		42 HP	40 HP	241-013-03
		56 HP	26 HP	241-013-02
4	Threaded inserts M 2,5	28 HP	54 HP	240-064
		42 HP	40 HP	240-063
		56 HP	26 HP	240-062
5	Mounting rail BUS	28 HP	54 HP	241-020-02
		42 HP	40 HP	241-020-03
		56 HP	26 HP	241-020-04
5	Threaded inserts M 2,5	28 HP	54 HP	250-060-54
		42 HP	40 HP	250-060-40
		56 HP	26 HP	250-060-26

11 Mounting screws for subracks

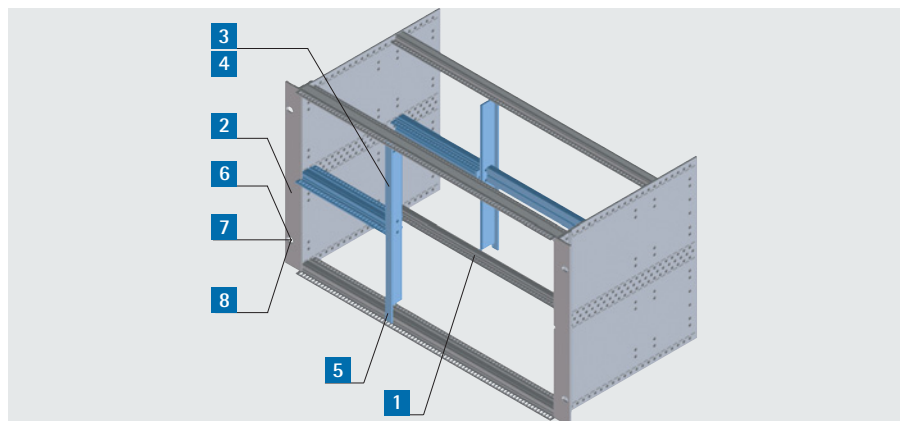
- Packaging unit: 100 pieces

Material:

nickel-plated/galvanised (Item 1, 3, 6)

galvanised (Item 2, 4, 5, 8)

plastic, black (Item 7)



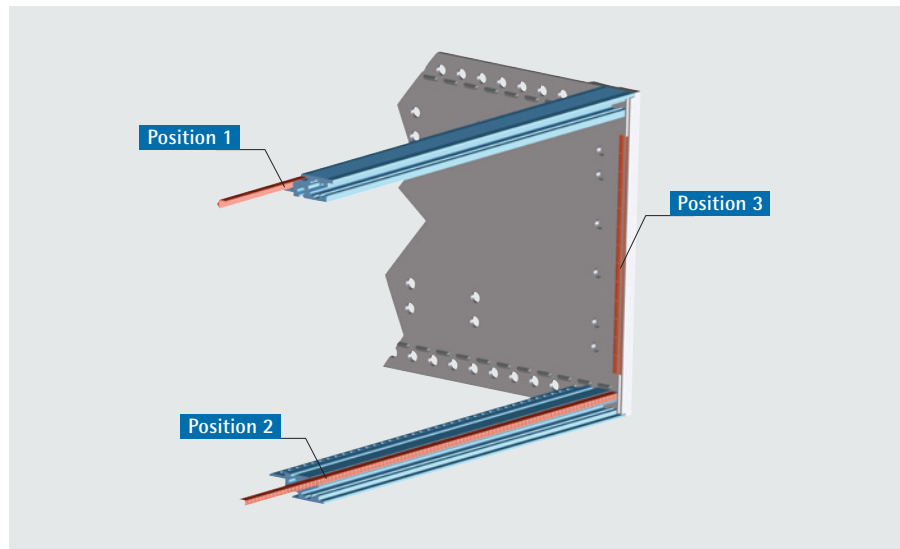
Item	Description	Order no.
1	Oval head screw M 4 x 12 with serration for screw retention	630-096
2	Countersunk screw M 5 x 12 (for mounting of handles)	630-121
3	Oval head screw M 2,5 x 10	630-094
4	Washers ø 2,6	630-152
5	Countersunk screw M 4 x 10	630-119
6	Oval head screw M 5 x 16	630-098
7	Decorative washer with collar (M 5)	610-095
8	Captive nut, gauge number 0,7 mm - 1,7 mm	630-359
8	Captive nut, gauge number 1,8 mm - 2,6 mm	630-362



EMC contact springs

High-quality EMC contact springs increase shield attenuation by bringing individual components into continuous contact with each other.

Material:
 copper beryllium
Finish:
 tin-plated



Position 1

Horizontal EMC contact gasket 1 contacts module rail and cover panel.

HP	L mm	Order no.
84	427,00	671-182
63	318,00	671-163
42	210,30	671-142

Position 2

Horizontal EMC contact gasket 2 contacts module rail and front or rear panel.

HP	L mm	Order no.
84	427,00	671-183
63	318,00	671-164
42	210,50	671-143

Position 3

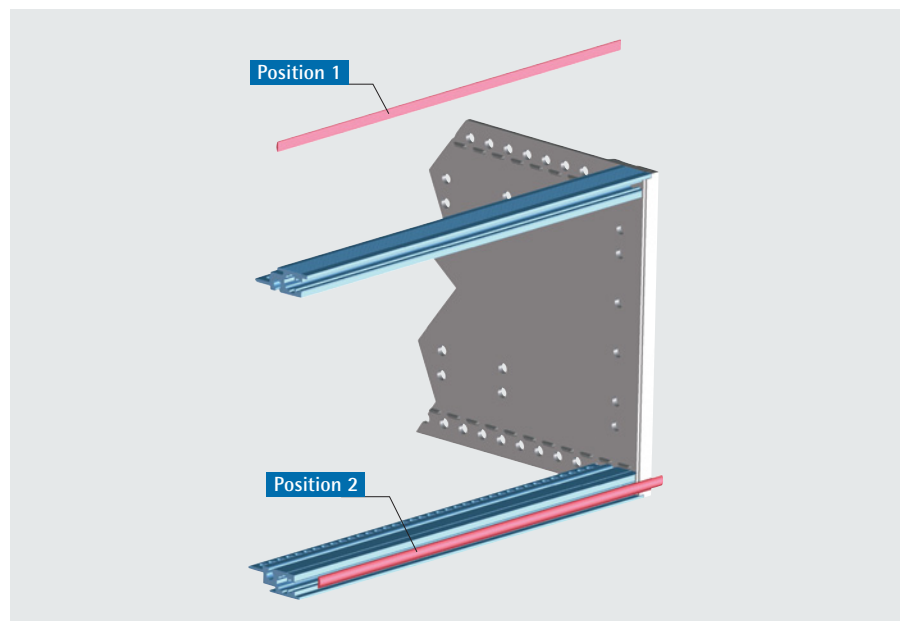
Vertical EMC contact gasket for connecting all front panels with each other and with the front or rear brackets.

U	L mm	Order no.
3	97,00	671-184
6	232,00	671-185

EMC fabric gasket

High-quality EMC fabric gaskets increase the shielding by contacting several components

Material:
 polyester-ripstop-nylon
Finish:
 nickel-copper coated



Position 1

Horizontal EMC fabric gasket 1 contacts module rail and EMC cover panel

HP	L mm	Order no.
84	430,00	671-227-85

Position 2

Horizontal EMC fabric gasket 2 contacts module rail and front or rear panel

HP	L mm	Order no.
84	427,00	671-229-85



245 • 19" subrack, accessories

Z-rail, version 1

- for 32-, 64- and 96-pole connectors acc. to IEC 60603-2
- fits with **BUS module rails** without insulating strip or EMC springs

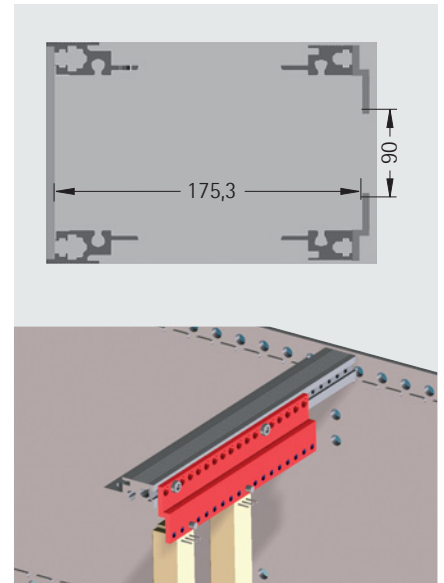
Material:
aluminium

HP	Order no.
85	240-411
57	240-412
43	240-413
29	240-414
10	240-410-10
8	240-410-08
6	240-410-06
4	240-410-04

Assembly material

Order no.
630-092

The Z-rails are 1 HP longer than the subrack's nominal width. Other lengths on request.



Z-rail, version 2

- for 32-, 64- and 96-pole connectors acc. to IEC 60603-2
- fits with **BUS module rails 241-013** with contact or insulating strips and with **BUS module rails 240-513**

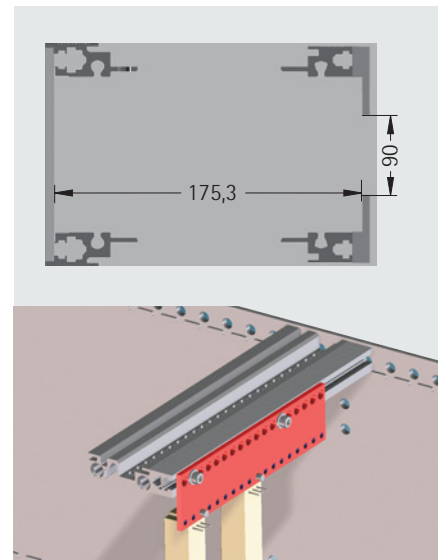
Material:
aluminium

HP	Order no.
85	240-420-85
57	240-420-57
43	240-420-43
29	240-420-29

Assembly material

Order no.
630-092

The Z-rails are 1 HP longer than the subrack's nominal width. Other lengths on request.





Insulating strips

- for insulating backplanes and module rails
- for BUS subracks
- to be used as spacer in order to achieve the required installation depth for plug-in units

Material:

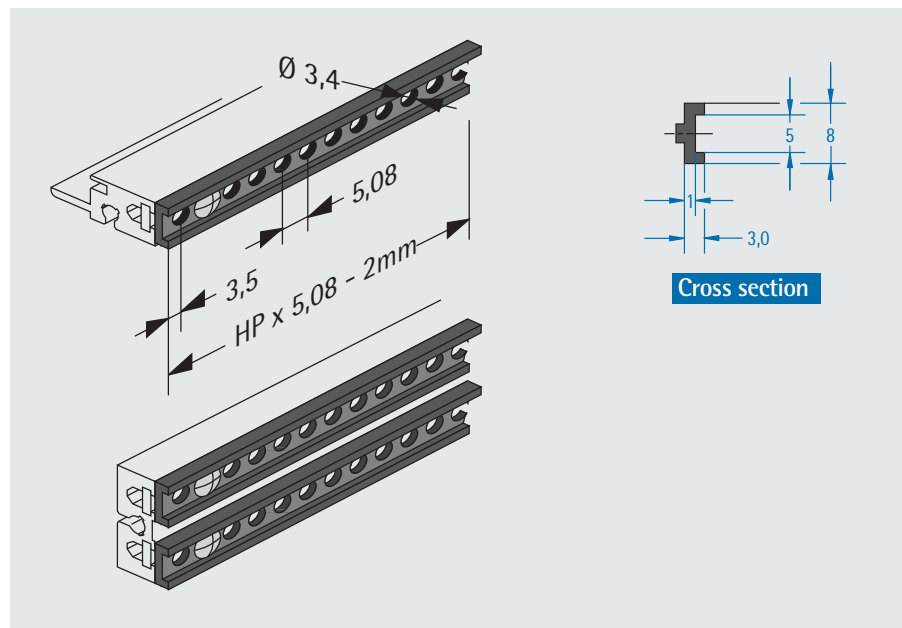
plastic, Noryl UL 94 V-0

Finish:

black

Other lengths available on request.

HP	Order no.
84	250-719
42	250-720
28	250-719-28



Contact strip

- for contacting backplanes and module rails
- to be used as spacer in order to achieve the required installation depth for plug-in units

Material:

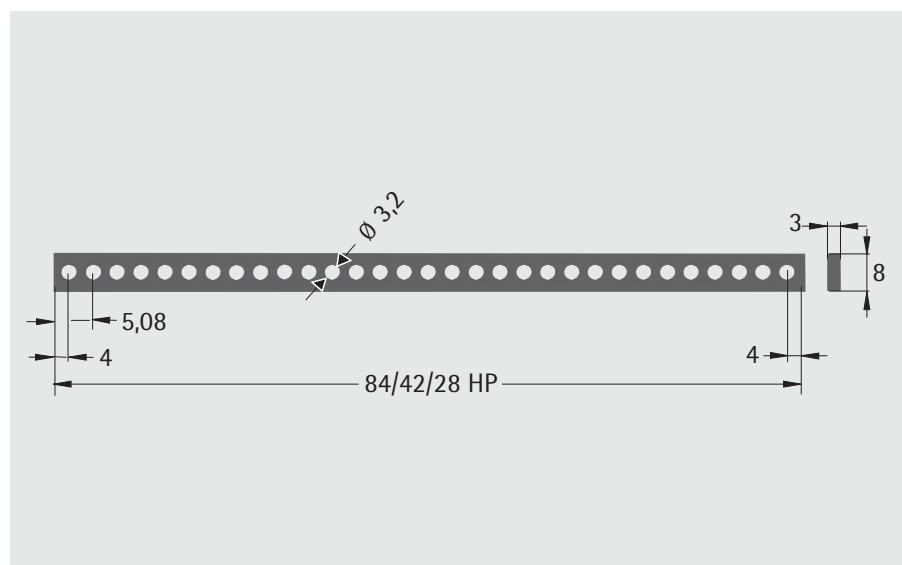
aluminium 3,0 mm

Finish:

transparent chromated

Other lengths available on request.

HP	Order no.
84	250-725-84
42	250-725-42
28	250-725-28





Card guides



Available card guides:

- standard card guide
- integrated card guide
- card guide with IEEE coding
- divided card guide

Standard card guide

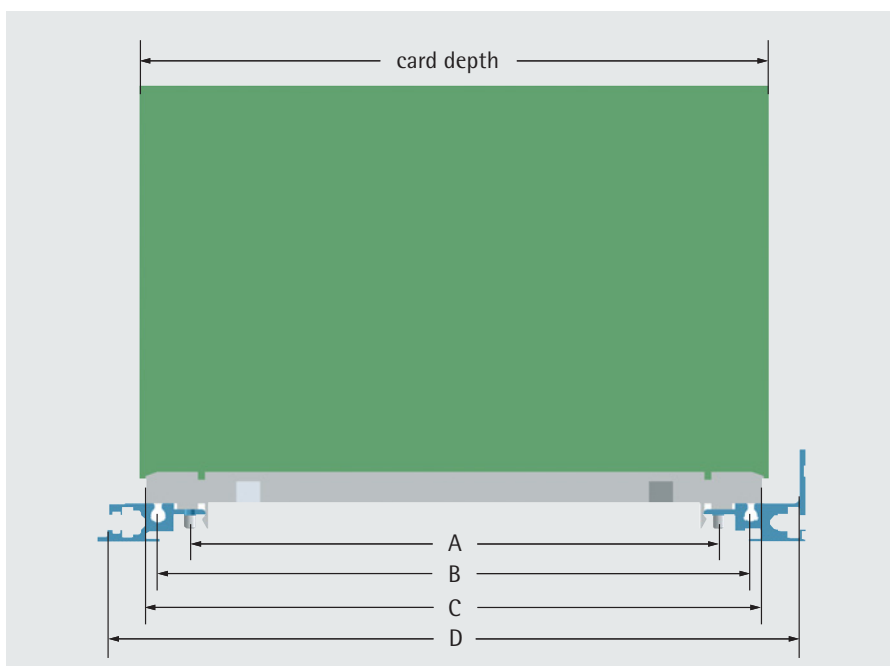
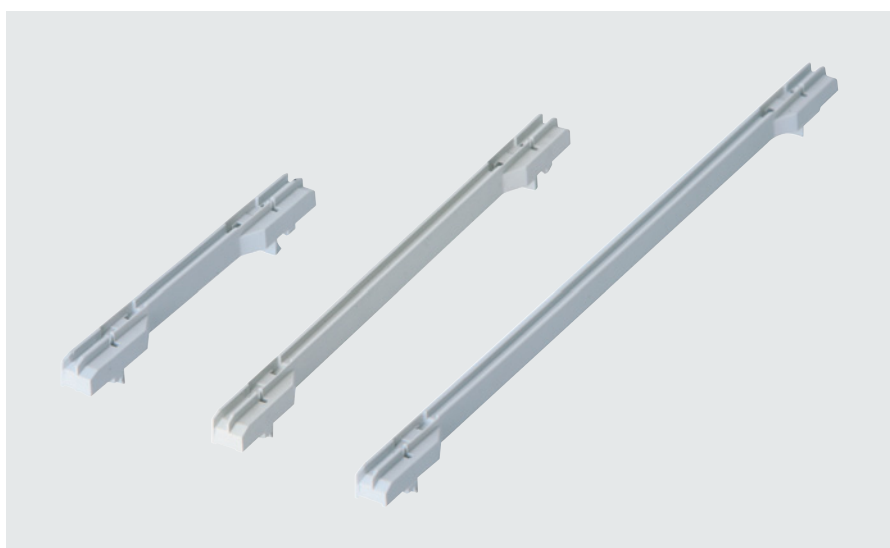
- for installing plug-in modules acc. to IEC 297-3-101/-102/-103
- groove width 2.6 mm for PCB thickness 1.6 mm
- for each card guide two ESD clips can be mounted in order to achieve up to 4 ESD contact points for the PCB
- card guides can be easily assembled to the module rails by simple clipfixation. If required, card guides can be secured with additional screws

Material:

plastic, classified acc. to UL 94-V 0

Finish:

similar RAL 7035 light grey

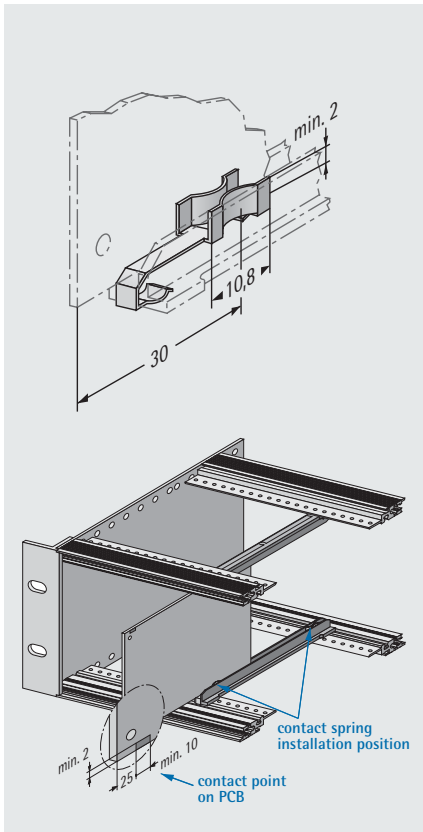


Card depth d mm	Order no.
220	240-406-00
160	240-401-00
100	240-402-00

Card depth mm	Dimensions mm			
	A	B	C	D
220	194	210	216,5	235,3
160	134	150	156,5	175,3
100	74	90	96,5	115,3



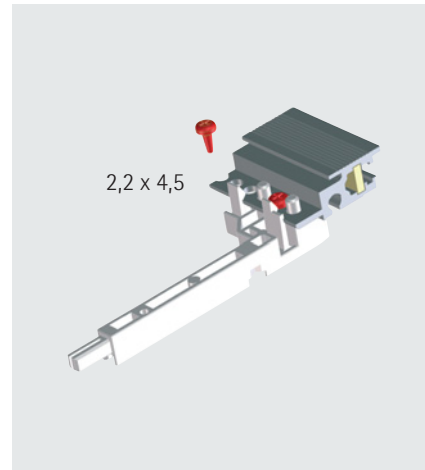
ESD clips for standard card guide



- allows conductive connection of PCB and module rail
- one contact gasket per card guide advised, however two possible

Order no.
240-400-30

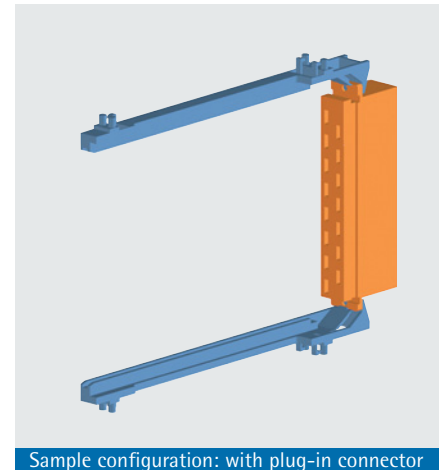
Fixing screw



- for fixing the IEEE card guide

Order no.
631-200

Card guide, integrated



- with integrated attachment for connectors acc. to IEC 60603-2 (cannot be used with profile no. 241-019)
- can be used instead of a z-shaped module rail or the integrated module rail
- particularly suitable for extending a plug-in location of a 3 U backplane (for example power supply)

Material:

plastic, classified acc. to UL 94V-0

Finish:

similar RAL 7035 light grey

Card depth d mm	Order no.
160	240-407-00
220	240-408-00

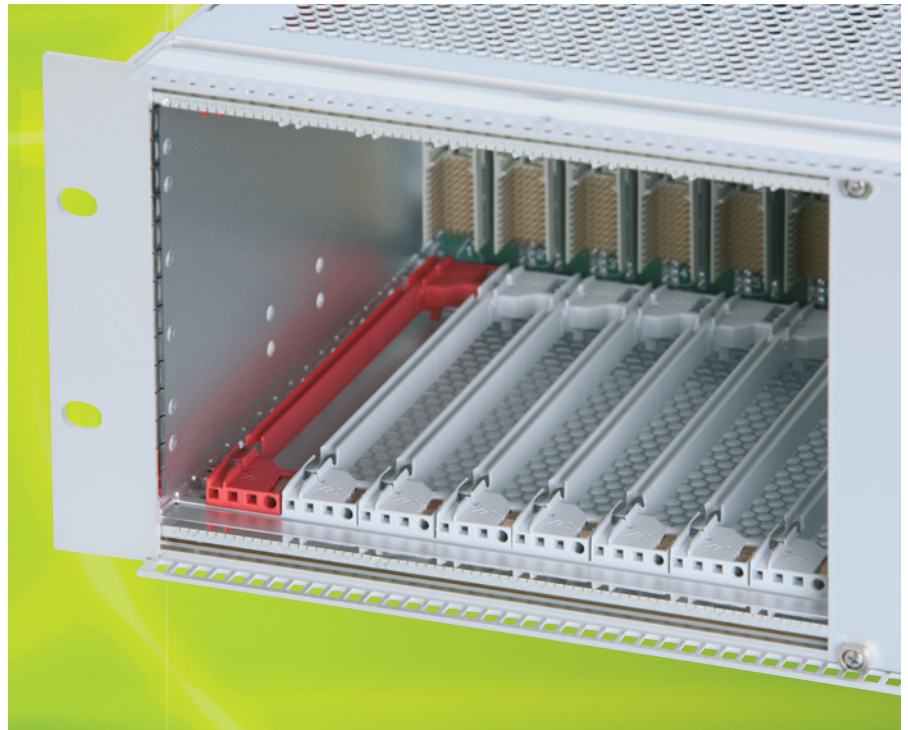


Card guide with IEEE coding

- with pin-chambers for reception of coding pins
- groove width 2.6 mm for PCB thickness 1.6 - 2.0 mm
- can be fitted with 2 ESD clips for discharge of electrostatic charges (recommended: 1x per card guide)
- can be used with ESD clip for contacting the alignment pin of the insertion / extraction handles of front panels

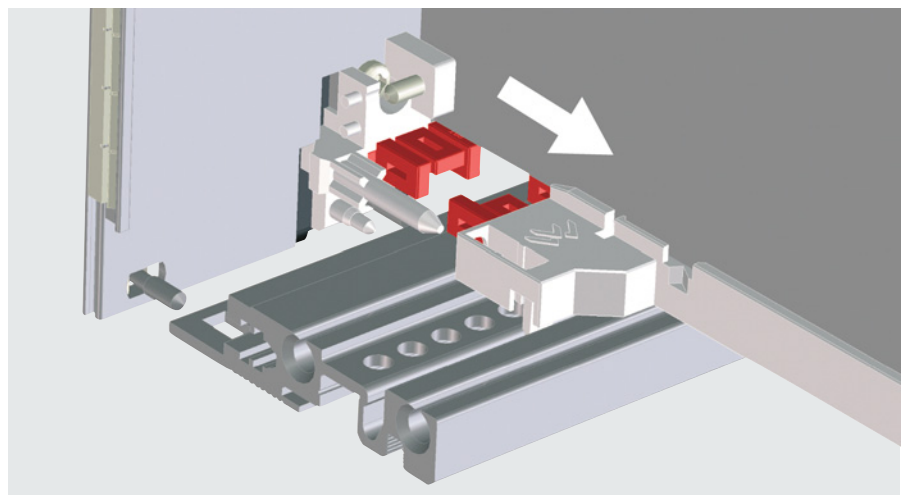
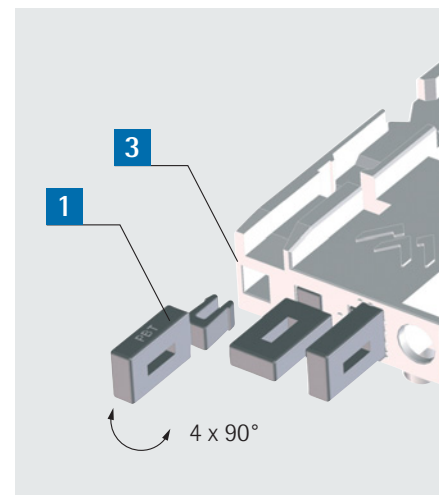
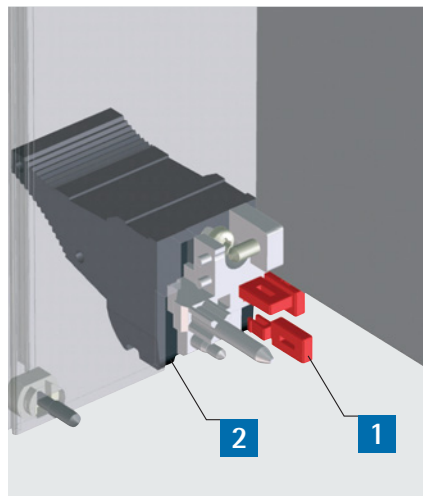
Material:

plastic, classified acc. to UL 94V-0



Application

Coding pins **1** can be inserted into the pin-chambers of the handle **2** and the card guide **3** with function acc. to DIN EN 60297-3-103. By use of the coding pins, the PCB is protected and it is not possible to insert boards by mistake at the wrong position.





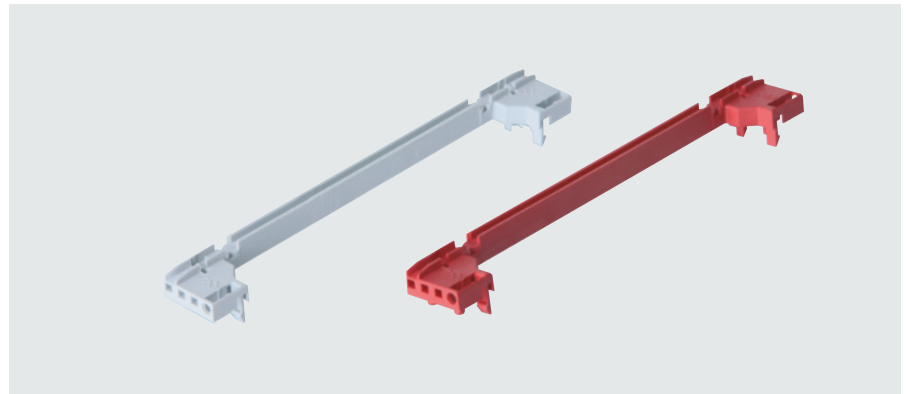
Card guide with IEEE coding 4 HP for card depths of 160 mm

- red colour for system slot / CPU-boards

Finish:

similar RAL 7035 light grey or RAL 3001 signal red

Description	Order no.
grey	240-160-10
red	240-160-20



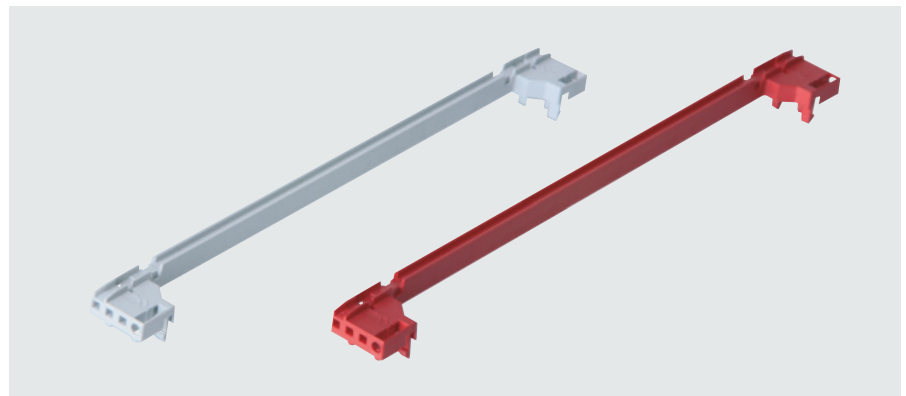
Card guide with IEEE coding 4 HP for card depths of 220 mm

- red colour for system slot / CPU-boards

Finish:

similar RAL 7035 light grey or RAL 3001 signal red

Description	Order no.
grey	240-220-10
red	240-220-20



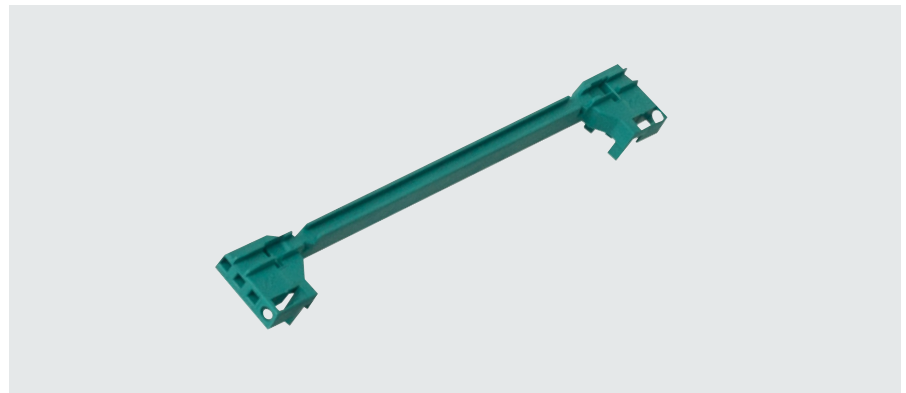
Card guide with IEEE coding, offset 1/2 HP • for card depths of 160 mm

- allows PCB to be populated on both sides, e.g. for power supplies

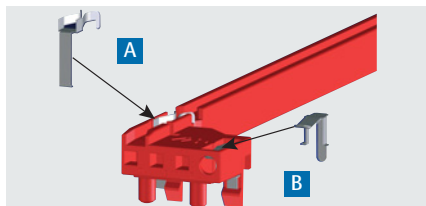
Finish:

green

Order no.
240-160-50



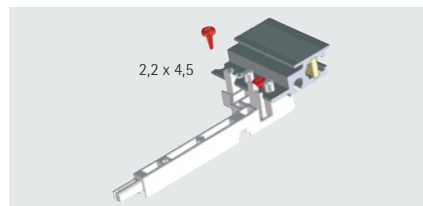
ESD clip



- for discharging electrostatic charges from the PCB [A]
- for discharging electrostatic charges in conjunction with an ESD pin of an injector/ extractor handle [B]

Description	Order no.
ESD spring	240-161-03
ESDspring (alignment pin)	240-162-00

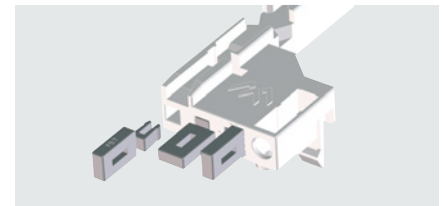
Fixing screw



- for fixing the IEEE card guide

Order no.
631-200

Coding pin



Material:

polycarbonate, classified acc.to UL 94-V 0

Finish:

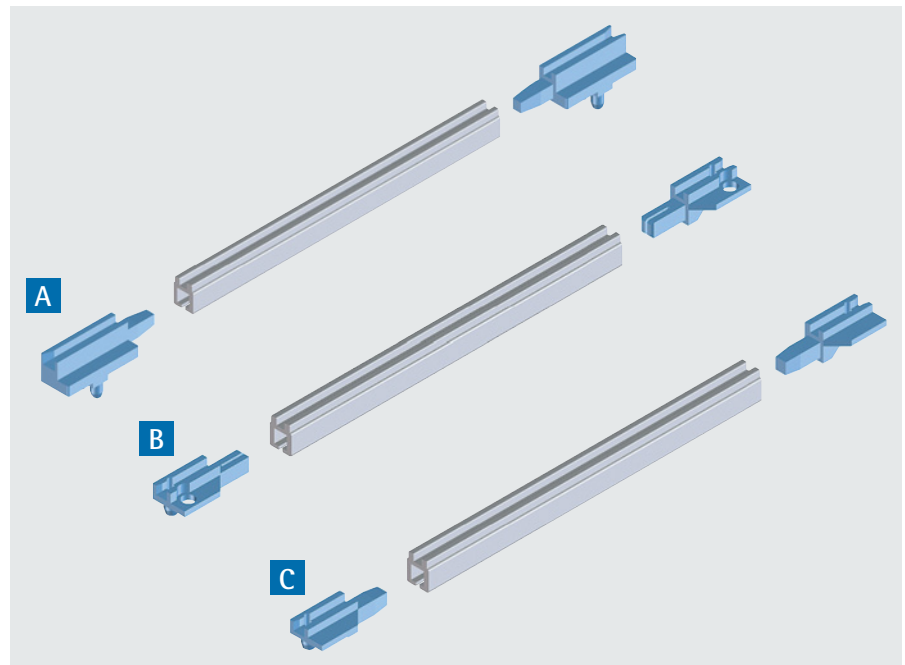
grey

Order no.
240-163-50

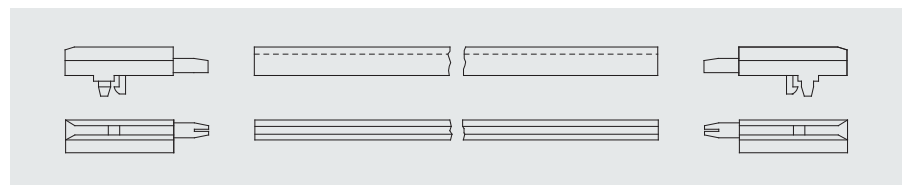


Divided card guides

- consists of 2 end pieces and an aluminium or plastic middle extrusion piece
- middle part: 1000 mm, (can be cut to requested length)



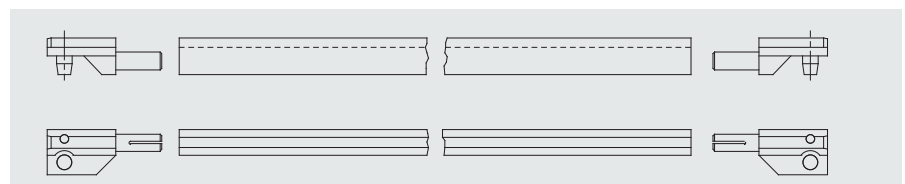
A Divided card guide (standard) for any card depth



Description	Length mm	Material	Order no.
End pieces (pair)	-	plastic (black)	250-721
Middle piece	1000	aluminium	240-005-00
Middle piece	1000	plastic (black)	250-723-00

B Card guide for ISEP PCBs

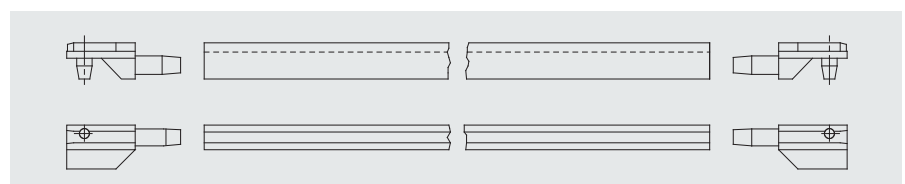
- PCB height in 3 U subracks is 110.49 mm



Description	Length mm	Material	Order no.
End pieces (pair)	-	plastic (black)	250-722
Middle piece	1000	aluminium	240-005-00
Middle piece	1000	plastic (black)	250-723-00

C Card guide for 112.5mm installation headroom in 3 U subrack

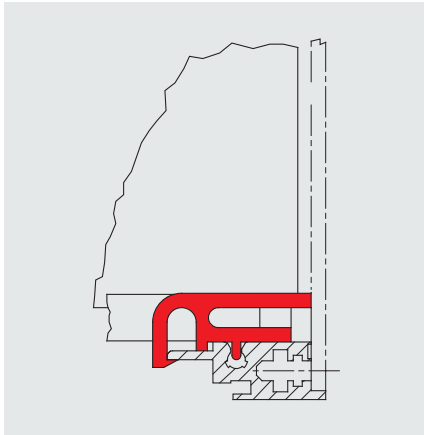
Minimum order quantity 500 pairs!



Description	Length mm	Material	Order no.
End pieces (pair)	-	plastic (black)	250-724
Middle piece	1000	aluminium	240-005-00
Middle piece	1000	plastic (black)	250-723-00



PCB lock



- for fastening PCB's to prevent them from falling out
- can be used with front panels
- snaps into place easily

Material:

plastics, classified acc. to UL 94-V 0

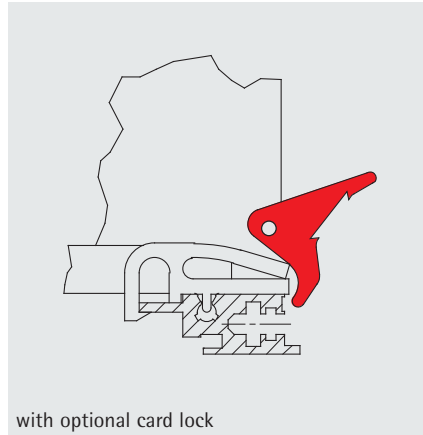
Finish:

similar RAL 7035 light grey

Order no.

250-716

Extraction handle



with optional card lock

- for extracting PCB's
- the optional PCB lock is opened automatically
- with space for attaching designation strips

Material:

plastics

Finish:

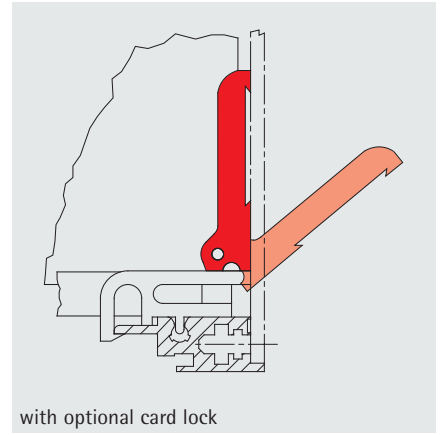
matt black

Cannot be used in combination with a front panel.

Order no.

250-715

Extraction handle, flat version



with optional card lock

- can be used with front panels
- the optional PCB lock is opened automatically

Material:

plastics, classified acc. to UL 94-V 0

Finish:

similar RAL 7035 light grey

Order no.

250-717

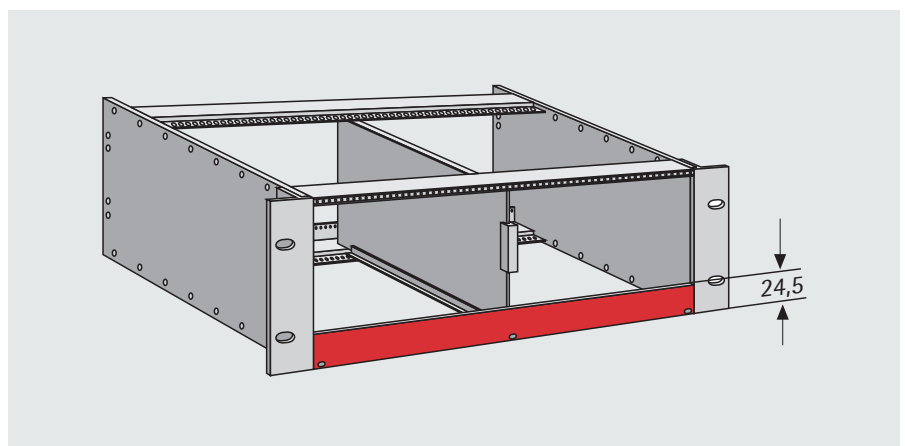
Group lock extrusion

- the aluminium group lock extrusion secures all PCB's
- can be printed with customer-specific information if required

Delivery

Pc.	Description
1	Group lock extrusion, anodised
1	Rubber seal
3/4	Knurled screw
3/4	Screw holder

HP	Order no.
84	240-110-84
63	240-110-63
42	240-110-42





245 • 19" subrack, accessories

Extension kit

- for extending the side wall of the 245 subrack with one or more side panels

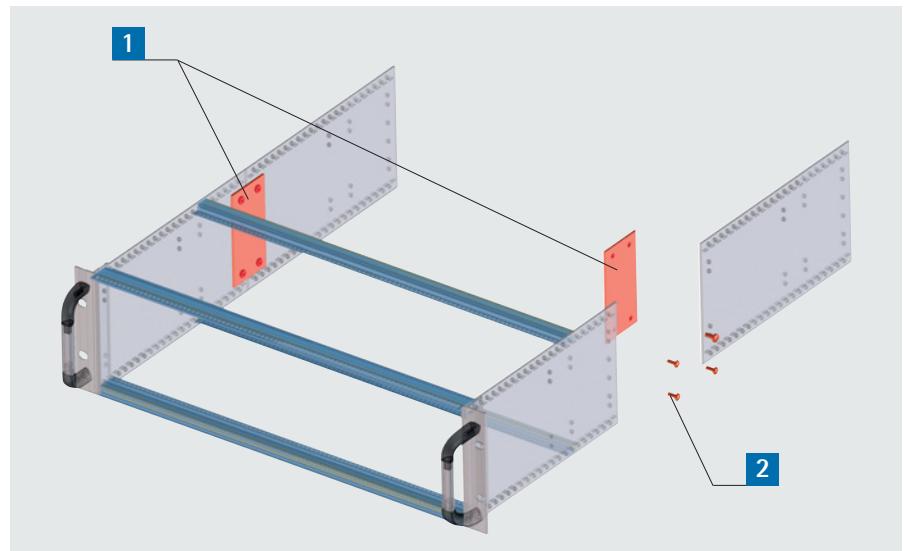
Material:

aluminium 2,0 mm

Delivery

Item	Pc.	Description
1	2	Extension plates
2	8	Oval-head screws M 4 x 5

Order no.
245-000-70



Connecting kit

- for connecting individual subracks to a module subrack

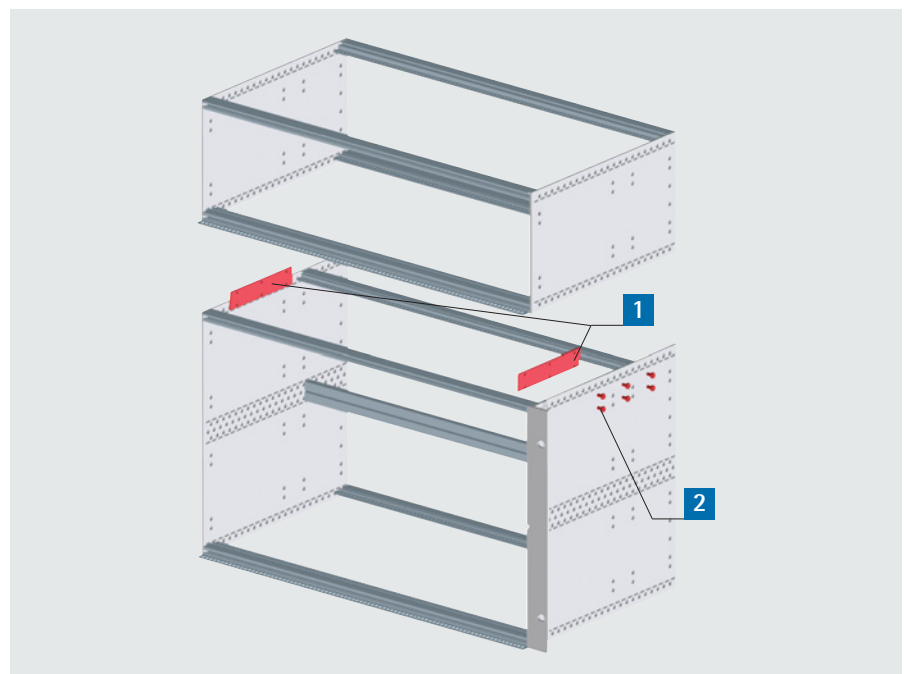
Material:

aluminium 1,5 mm

Delivery

Item	Pc.	Description
1	2	Connecting plates
2	12	Oval-head screws M 3 x 6

Order no.
245-000-80

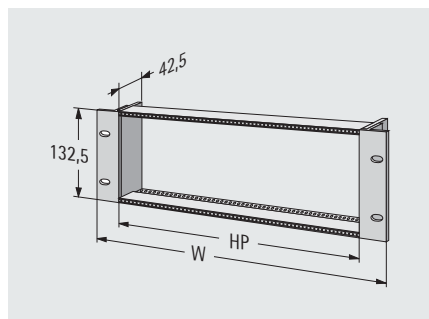


Other accessory parts

Additional components and parts i.e. ETSI adapters or 23" adapters and other parts can be supplied. Please ask us for further information and specifications – we will be glad to design your customised product.



Frame, 3 U



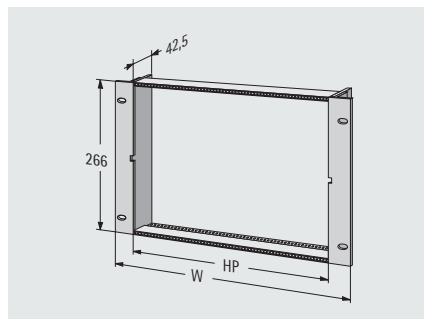
- single row with 2 threaded inserts

Delivery

Item	Pc.	Description
1	2	Front bracket
2	2	Module rails, chromated
3	2	Side pieces
4	2	Threaded inserts
5		Assembly material

HP	W mm	Order no.
84	482,60	242-901
42	269,40	242-911

Frame, 6 U

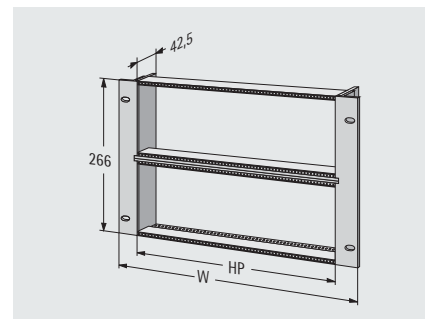


- with 2 threaded inserts

Delivery

Item	Pc.	Description
1	2	Front bracket
2	2	Module rails, chromated
3	2	Side pieces
4	2	Threaded inserts
5		Assembly material

HP	W mm	Order no.
84	482,60	242-903
42	269,40	242-913



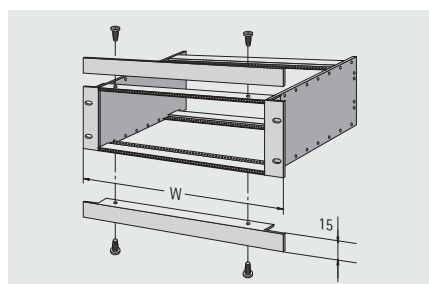
- double row with 4 threaded inserts

Delivery

Item	Pc.	Description
1	2	Front bracket
2	4	Module rails, chromated
3	2	Side pieces
4	4	Threaded inserts
5		Assembly material

HP	W mm	Order no.
84	482,60	242-902
42	269,40	242-912

Cover bracket



- for subbracks in control panels, bracket 15 x 15 x 2 mm
- bracket overlap the cut-out in a control panel

Delivery: unmounted

For the installation of the mounting brackets, additional M3 threads need to be added in the front module rails. The module rail 241-113 (84 HP) can be used alternatively.

Delivery

Item	Pc.	Description
1	1	Bracket
2	2	Countersunk screw M 3 x 8

HP	W mm	Order no.
84	482,60	240-111
42	269,40	240-112

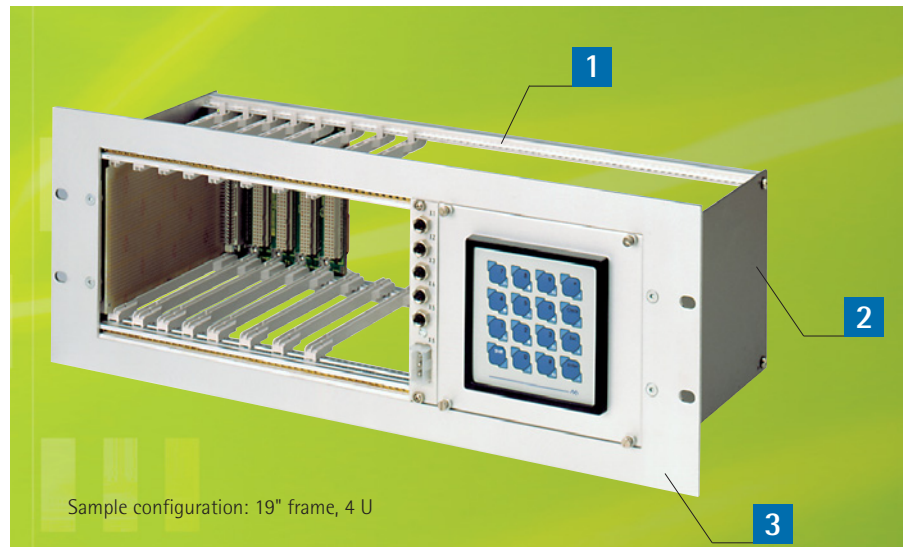


201 • 19" frame, 4 U

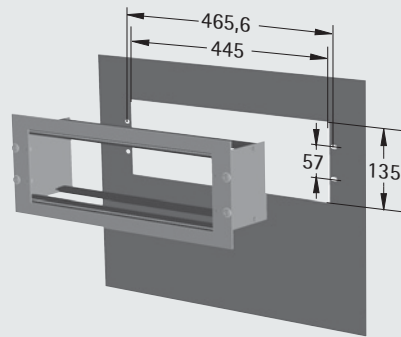
19" frame, 4 U

- this frame is the ideal supplement for control panel enclosures
- can be installed in switch cabinet doors or similar applications
- available installation height: 3 U / 126 mm
- for installing active components and/or 100 mm x 160 mm eurocards
- installed in a 445 mm x 135 mm cut-out and attached on the front using four screws

Delivery: kit form



Control panel cut-out and hole pattern



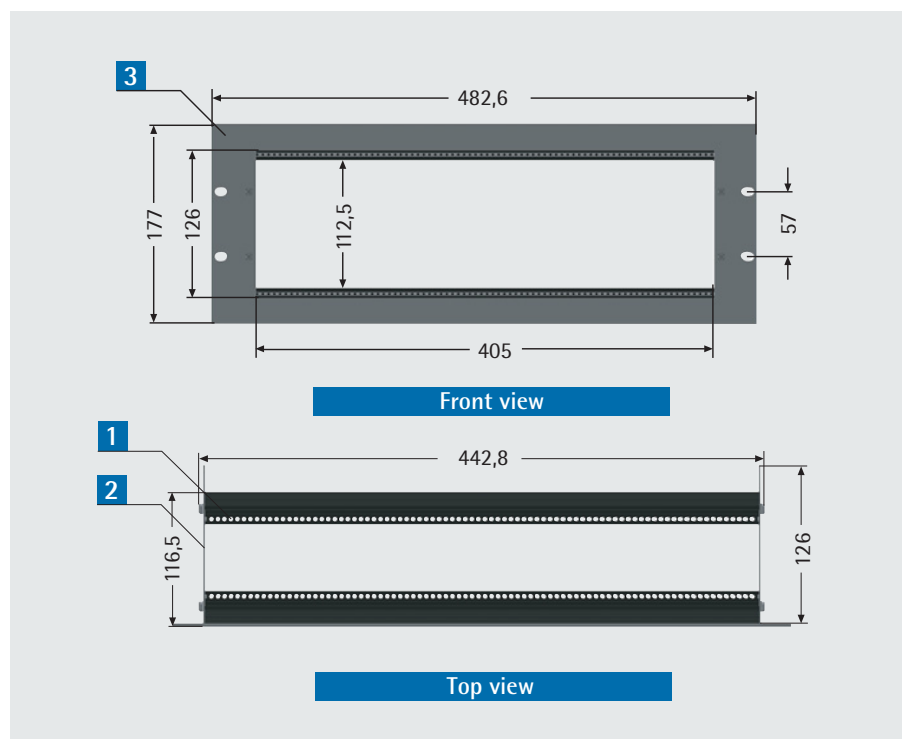
Delivery

Item	Pc.	Description
1	4	Module rails, No. 241-030
2	2	Side panels
3	1	19" front panel, d=2,5 mm
5		Assembly material

Order no.

201-075-00

Other sizes available on request!



Front panels, plug-in units





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



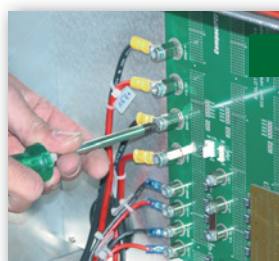
Prototyping for plastic parts

- 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:

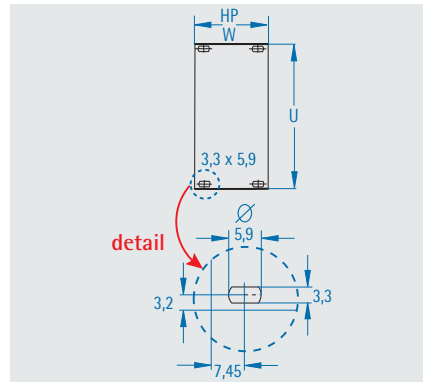
aluminium 2,5 mm

Delivery:

unmounted

See page 131 for matching screw holder and neck screws.

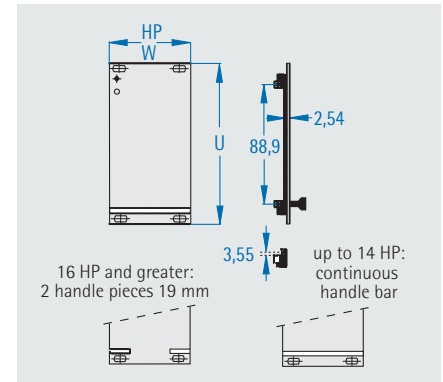
Type A



Delivery

Item	Pc.	Description
1	1	Front panel

Type C



- 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	1/2	PCB mounting bracket
5		Assembly material

HP	Width W mm	2 U H = 84,5 mm Type A	3 U H = 129,0 mm		4 U H = 173,5 mm Type A	6 U H = 262,5 mm	
			Type A	Type C		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:

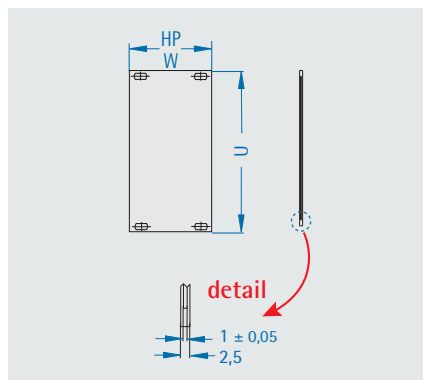
aluminium 2,5 mm

Delivery:

unmounted

See page 131 for matching screw holder and neck screws.

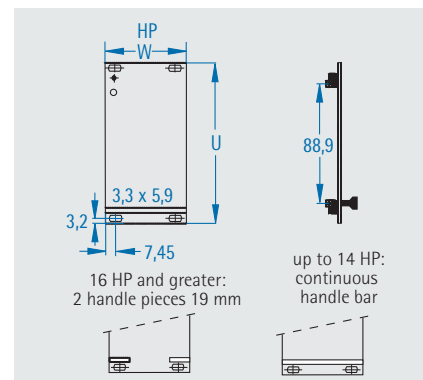
Type A - EMC



Delivery

Item	Pc.	Description
1	1	Front panel

Type C - EMC



- plastic handle bar
- plastic PCB mounting plate

Delivery

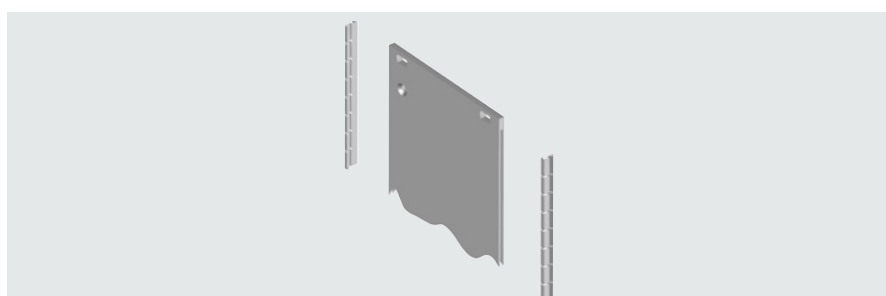
Item	Pc.	Description
1	1	Front panel
2	1/2	Plastic handle
3	1/2	Identification plates
4	2/4	PCB mounting bracket
5		Assembly material

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





243 • EMC front panels

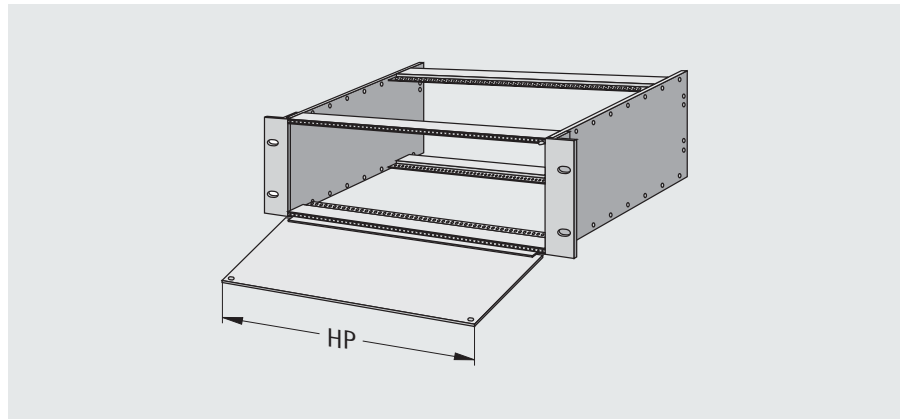
Front panel, bottom-hinged

- 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



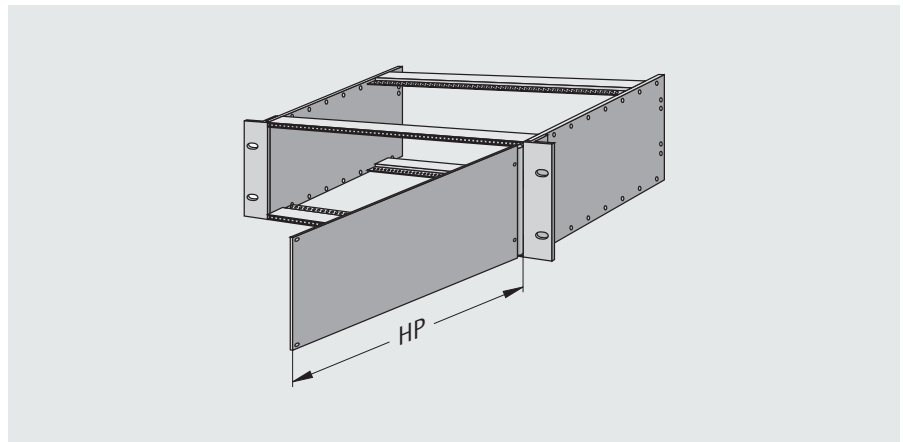
Front panels, pivoted

- 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

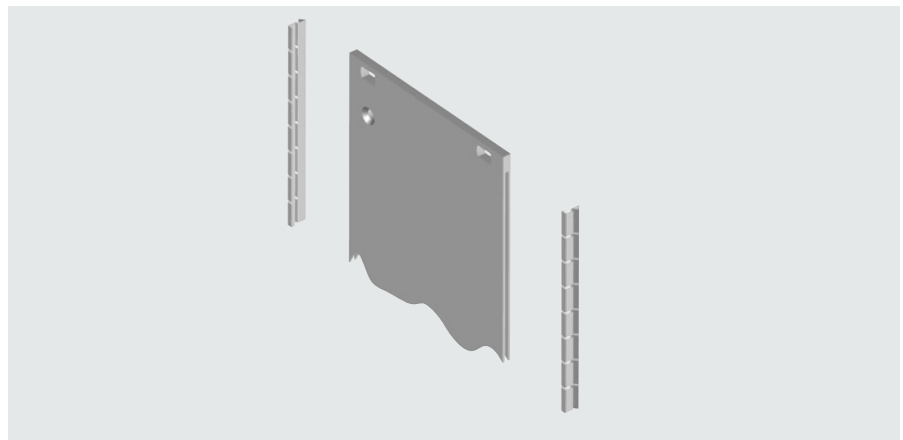
U	HP	Order no.
3	42	244-142-13
3	84	244-184-13
6	42	244-542-16
6	84	244-584-16



EMC contact springs

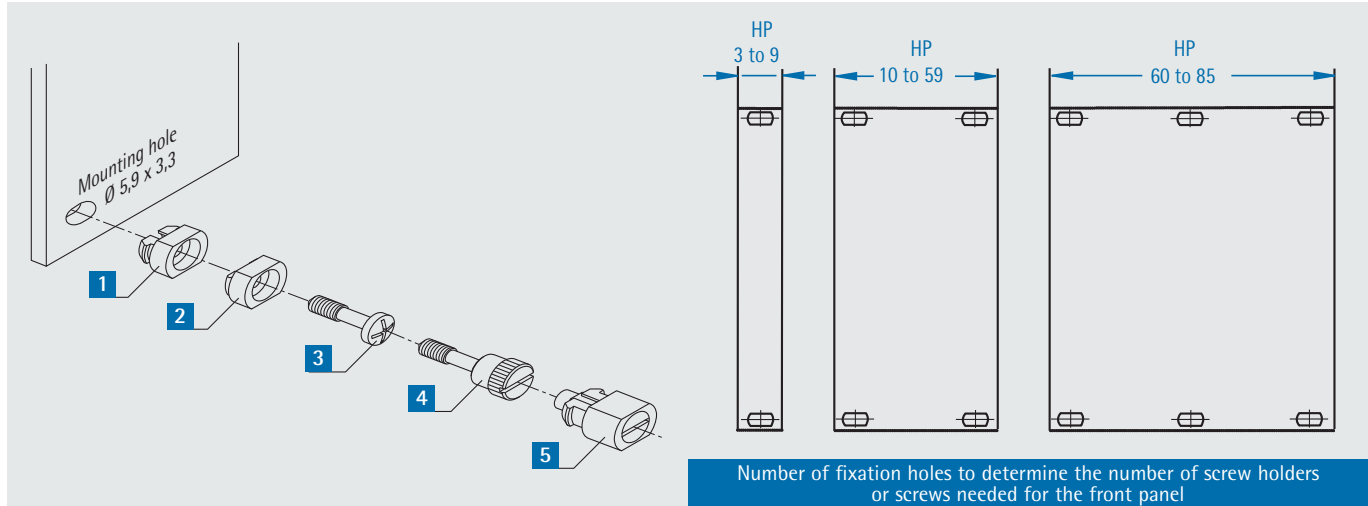
The contact springs are clipped onto the side grooves so that the front panels contact one another.

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

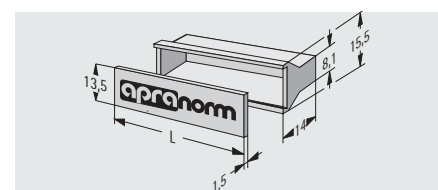
- knurled and slotted
- nickel-plated brass
- packing unit: 100 pieces

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

Handle bar, plastics



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

Order no.
250-611-02

Order no.
250-607-00

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:

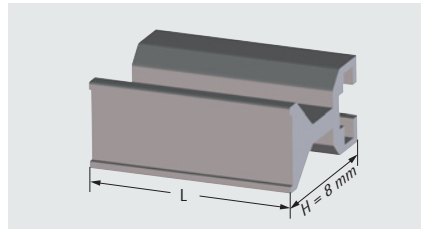
naturally coloured anodised

Please order assembly material separately.

Assembly material

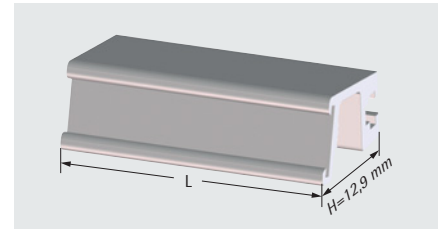
Square nut M 2,5
630-192
Oval-head screw M 2,5 x 6
630-092

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

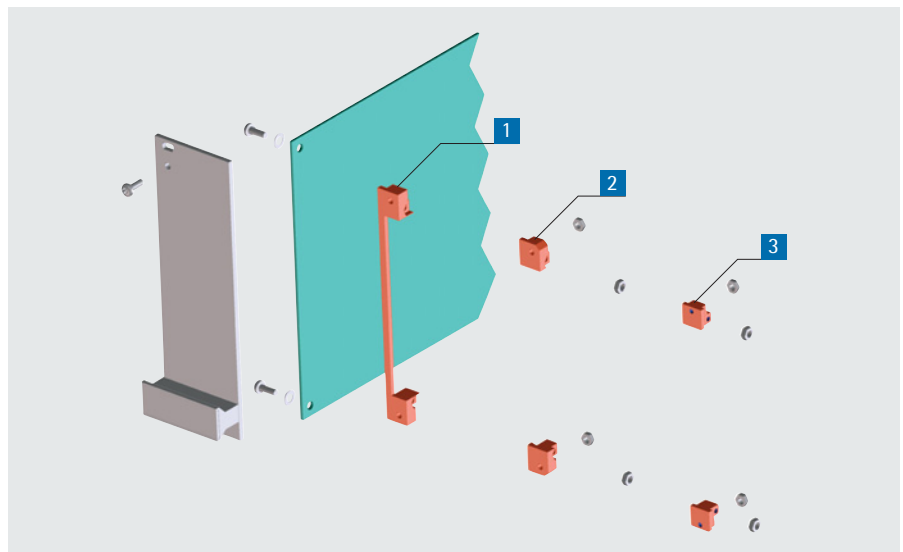
2 PCB fixing

- 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

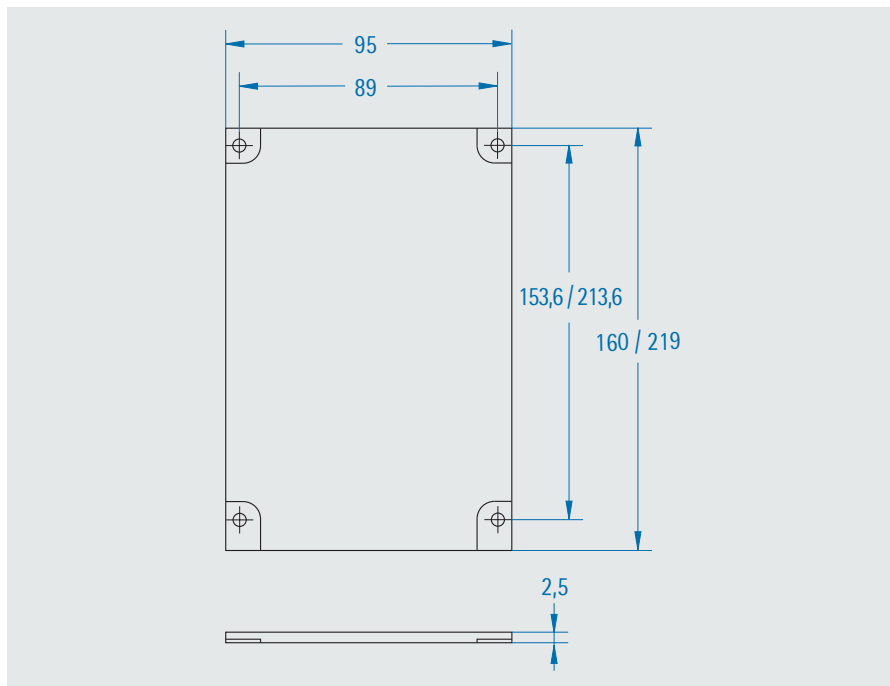
- protects the PCB's solder side
- electrically insulated
- protects from damage and short circuits
- can be coated with copper conductive paint
- fits 100 x 160 mm, 233,35 x 160 mm, 100 x 220 mm and 233,35 x 220 mm PCBs with plug-in connection acc. to IEC 60603-2
- **surface resistance:** 10^{15} Ohm
- **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:

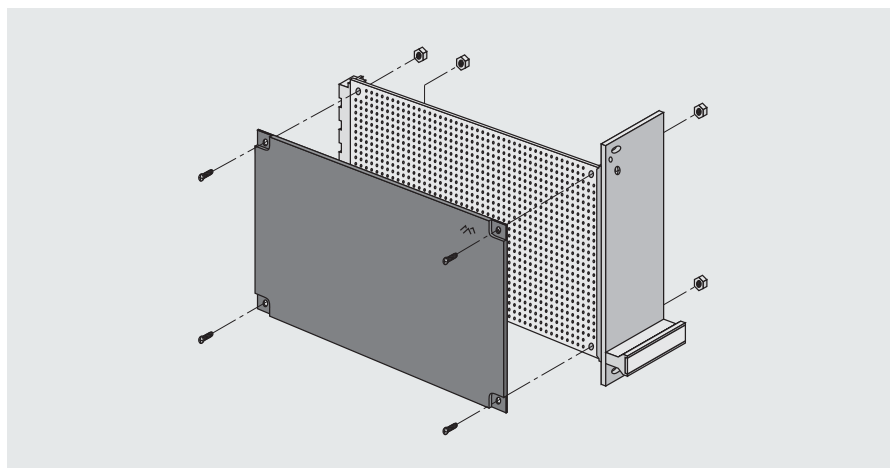
black



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) .

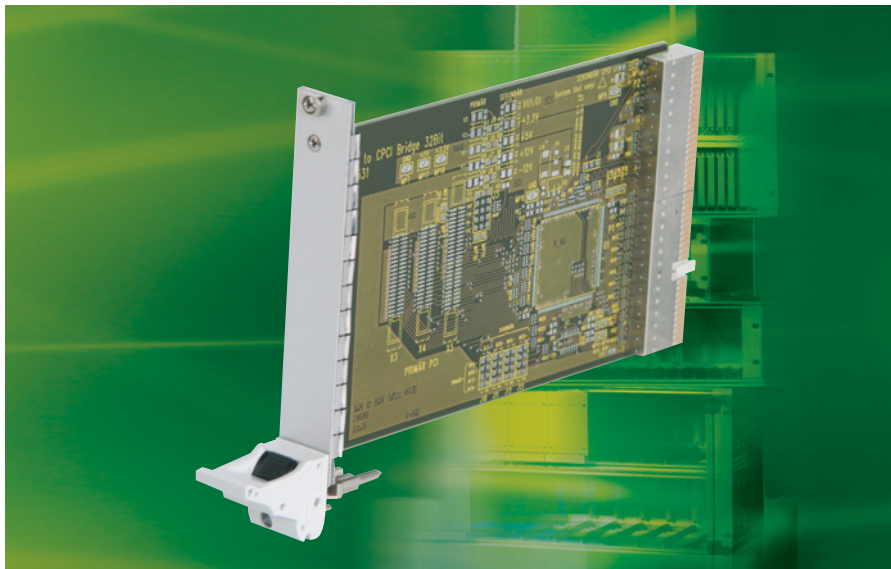


Description	Order no.
PCB cover, shortened	258-199
Assembly material	250-711



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

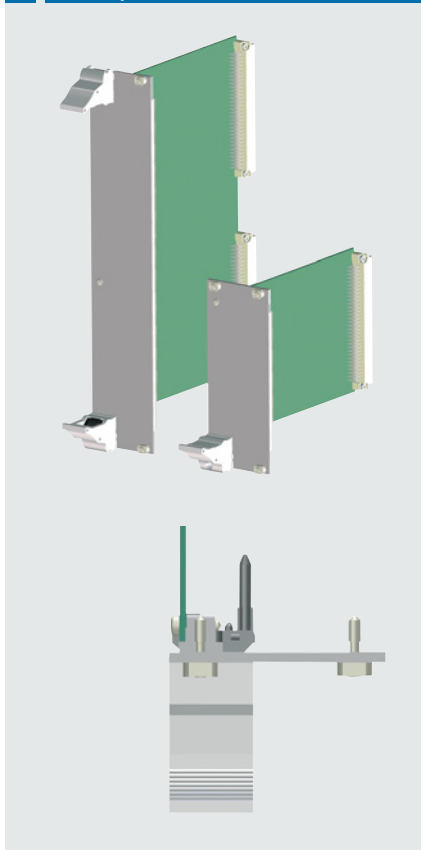
Surface: front side anodised,
rear side conductive

B Profiled front panel IEEE

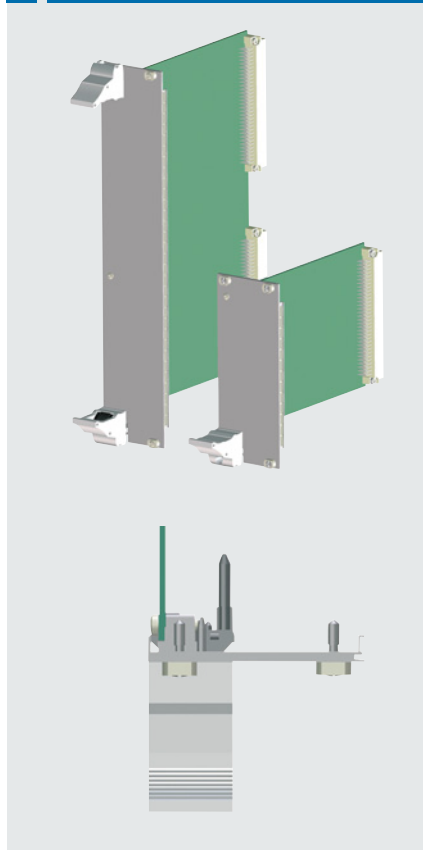
Material: aluminium profile
extrusion

Surface: chromated

A Front panel IEEE

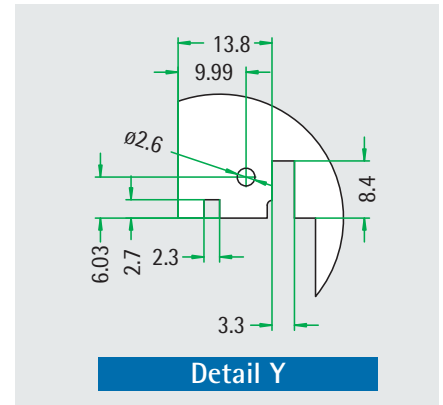
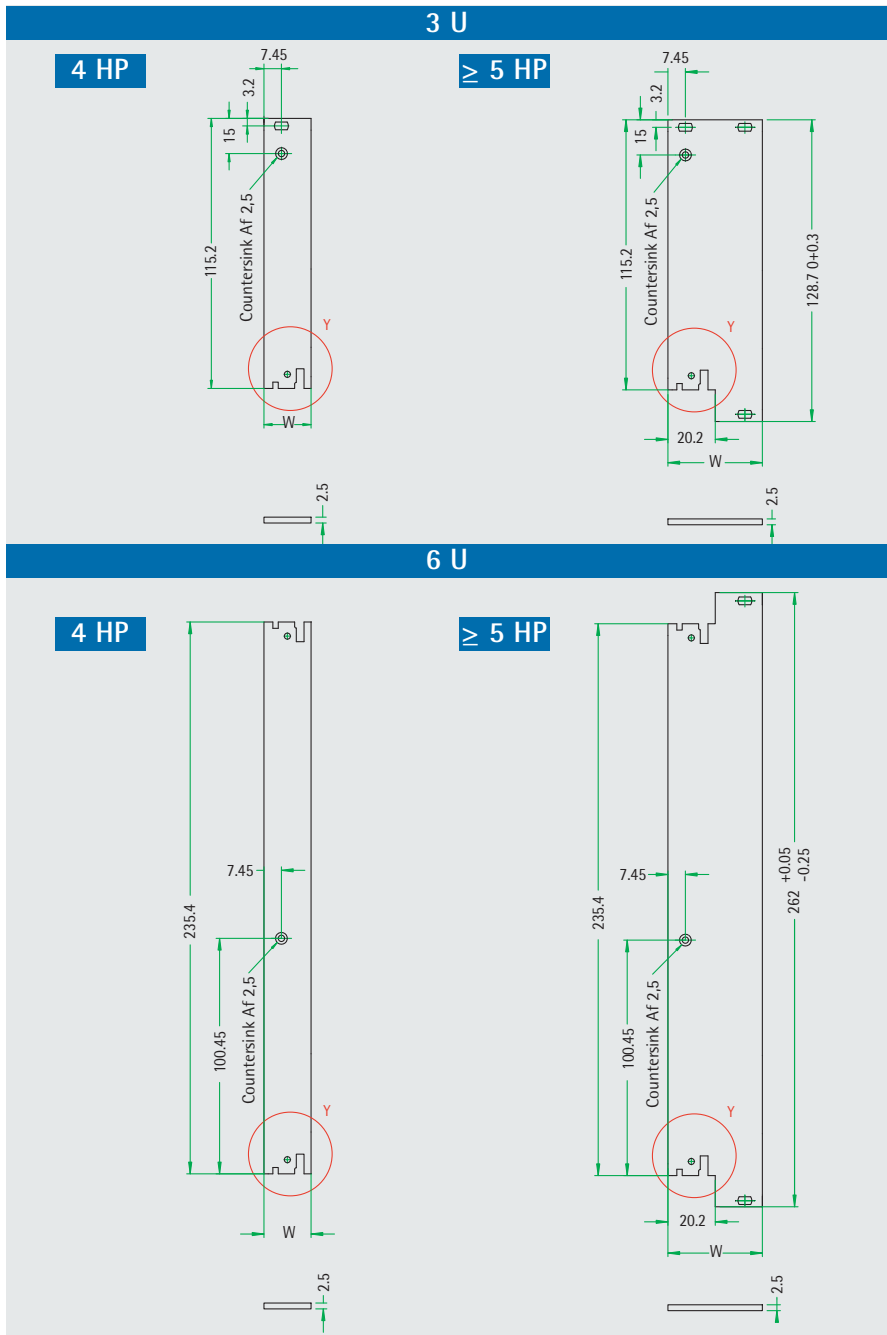


B Profiled front panel IEEE





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



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

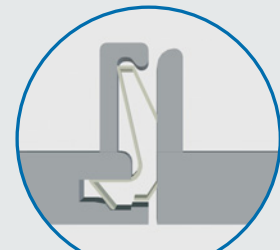
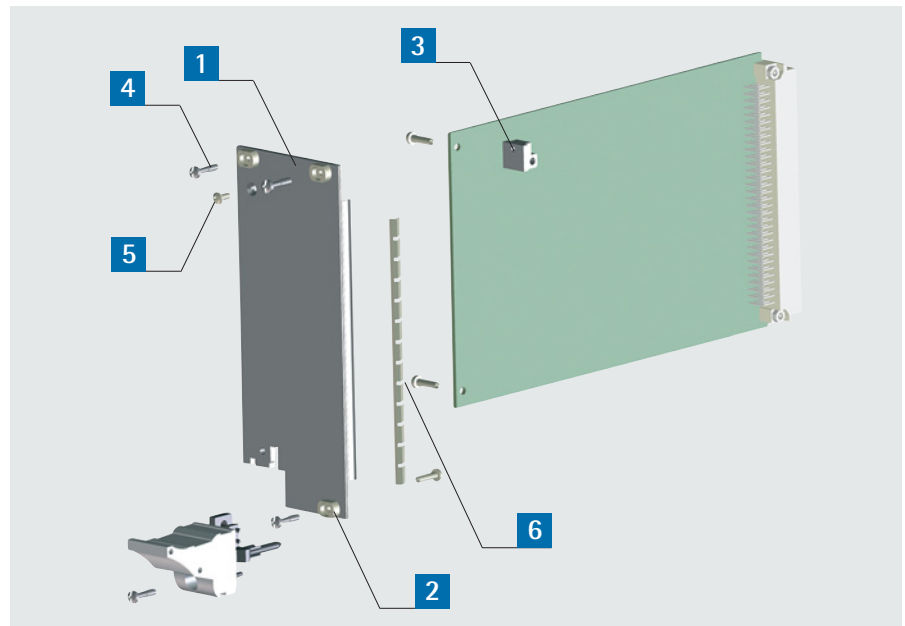
U	L mm	Order no.
3	97	671-184
6	232	671-185



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

Cross section of profile

Contacting of EMC spring

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

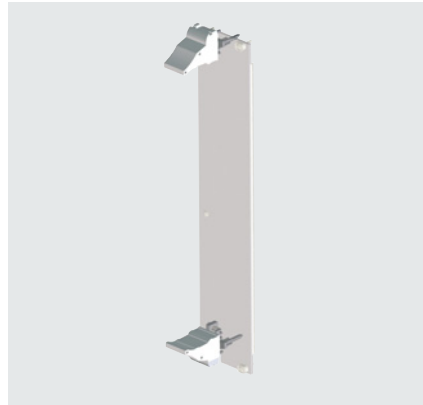


IEEE injection / extraction handle

- the following two versions are available:



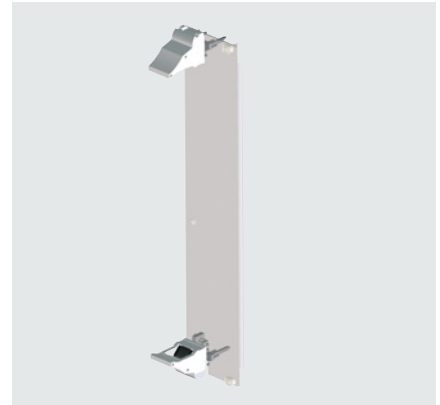
1 Injection / extraction handle without locking function



Colour:
 RAL 7035 light grey

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

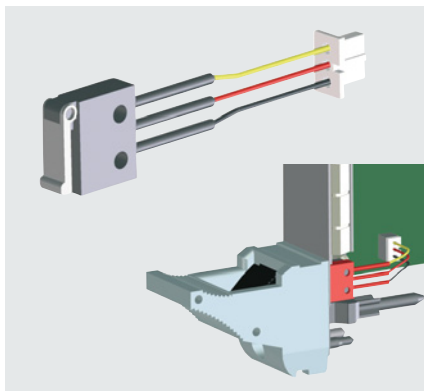
2 Injection / extraction handle with locking function



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

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

Micro switch

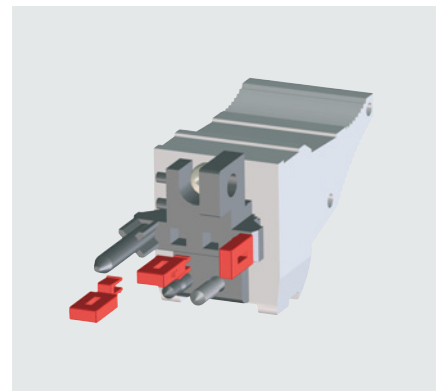


- max. switching current: 50 mA
- temperature range: -25 °C up to 70°C
- mechanical lifetime: 50.000 switches
- electronic lifetime: 20.000 switches

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



247 • EMC compact sub-unit 3 U

EMC compact sub-unit, 3 U

- fits all desktop enclosures and subracks (except ruggedized subrack)
- EMC compliant design
- with side grooves for EMC contact springs
- rear plug-in connection for contact acc. to IEC 60603-2

Application:

for one PCB 100 x 160 mm

Material:

front panel: aluminium 2.5 mm

side section: aluminium extrusion

cover panel: aluminium 1.5 mm

handle: plastics with aluminium strip

Finish:

front panel:

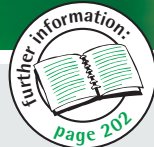
anodised front, conductive rear

side section: transparent chromated

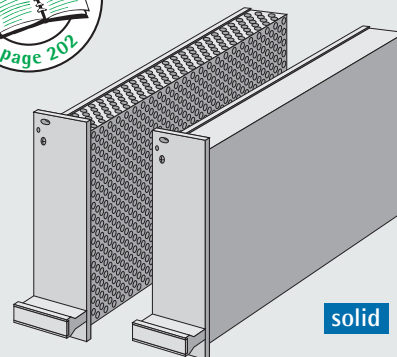
cover hood: transparent chromated

Delivery:

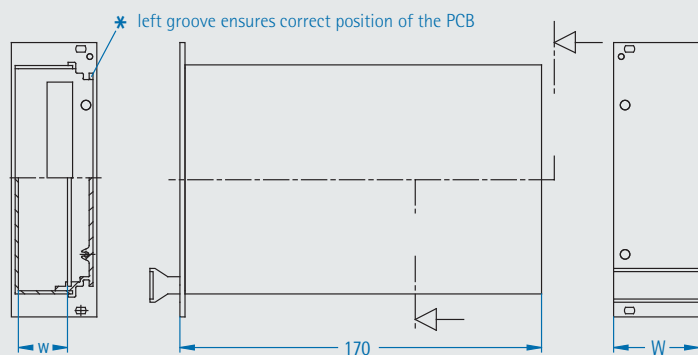
unmounted



perforated



solid



Rear view
(cross section)

Side view

Front view

See page 113 for matching contact springs.

Delivery

Item	Pc.	Description
1	1	Front panel with groove for EMC contact spring
2	1	Side extrusion
3	1	Cover
4	1	Handle, plastics
5		Assembly material

HP	W mm	w mm	Feature	Order no.
6	30,20	12,30	solid	247-921-55
8	40,30	22,50	solid	247-923-55
10	50,40	32,60	solid	247-925-55
6	30,20	12,30	perforated	247-931-55
8	40,30	22,50	perforated	247-933-55
10	50,40	32,60	perforated	247-935-55



EMC sub-unit 3 U / 6 U

- fits all desktop enclosures and subracks (except ruggedized subrack)
- EMC-compliant design
- with side grooves for EMC contact springs
- rear plug-in connection for contact acc. to DIN 41612
- all components are connected with each other conductively

Application:

for **one** PCB

3 U: 100 x 160 mm or 100 x 220 mm

6 U: 233.35 x 160 mm or 233.35 x 220 mm with plug-in connector acc. to IEC 60603-2

Material:

front panel: aluminium 2.5 mm

side section: aluminium extrusion

rear panel: aluminium 1.5 mm

handle: plastics with aluminium strip

cover panels: aluminium 1.0 mm

Finish:

front panel:

anodised front, conductive rear

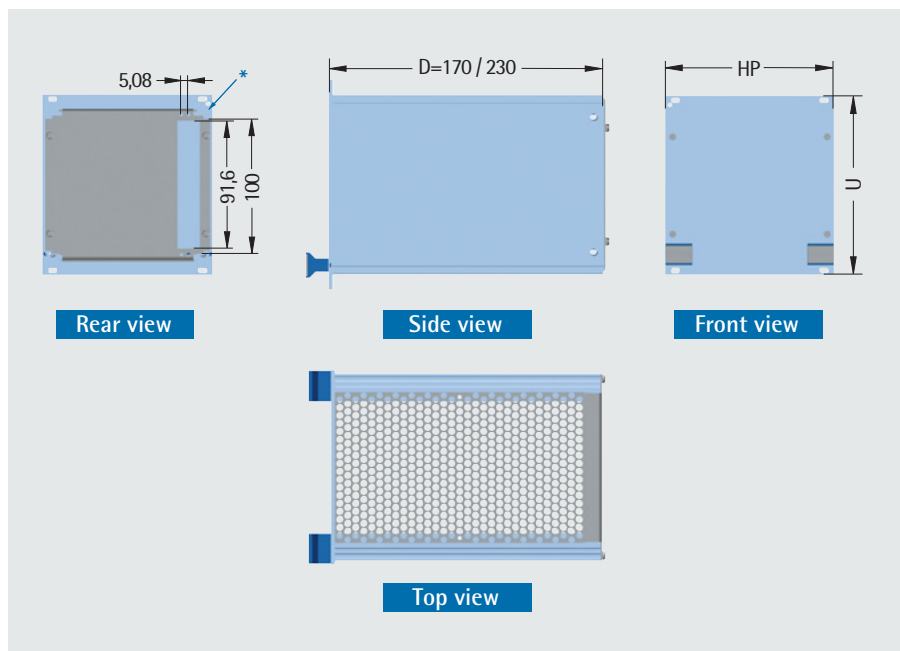
side section: transparent chromated

rear panel: transparent chromated

cover panels: transparent chromated

Delivery:

unmounted



* Left groove ensures that the PCB is in the correct position.

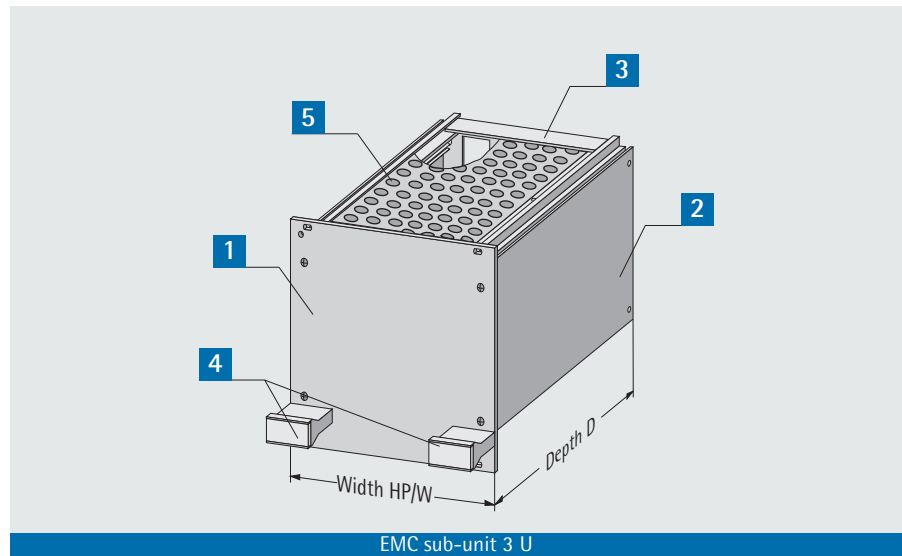


247 • EMC sub-unit 3 U / 6 U

Delivery

Item	Pc.	Description
1	1	Front panel with groove for EMC contact springs
2	2	Side extrusion
3	1	Rear panel
4	1/2	Handle**
5	2	Cover panels, perforated
6	1 set	Assembly material

** The handle is divided in units of 2 x 4 HP at 16 HP and bigger.



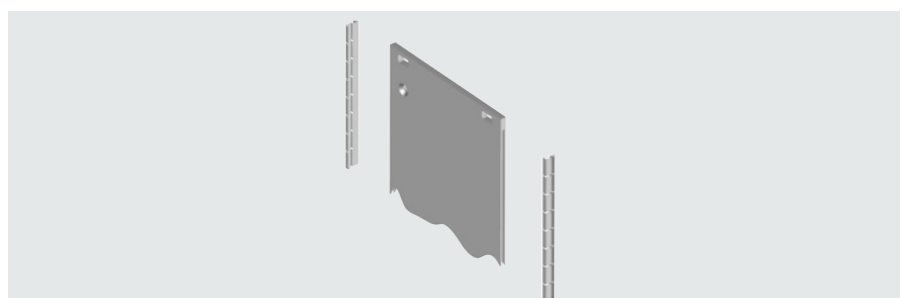
EMC sub-unit 3 U

U	D mm	HP	W mm	Order no.
3	170	12	60,60	247-062-55
		14	70,80	247-064-55
		21	106,30	247-071-55
		24	121,50	247-074-55
		28	142,00	247-078-55
		42	213,00	247-092-55
	230	12	60,60	247-162-55
		14	70,80	247-164-55
		21	106,30	247-171-55
		24	121,50	247-174-55
		28	142,00	247-178-55
		42	213,00	247-192-55
6	170	12	60,60	247-562-55
		14	70,80	247-564-55
		21	106,30	247-571-55
		24	121,50	247-574-55
		28	142,00	247-578-55
		42	213,00	247-592-55
	230	12	60,60	247-662-55
		14	70,80	247-664-55
		21	106,30	247-671-55
		24	121,50	247-674-55
		28	142,00	247-678-55
		42	213,00	247-692-55

EMC contact springs

- fits in the side grooves in the sub-unit front panel

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





Sub-unit 3 U

- with closed or open sides

Application:

for **one** PCB 100 x 160 mm or
100 x 220 mm with connector
acc. to IEC 60603-2

Material:

front panel: aluminium 2.5 mm
side section: aluminium extrusion
rear panel: aluminium 1.5 mm
handle: plastics with aluminium strip

Finish:

front panel: anodised
side extrusion: anodised
rear panel: conductive

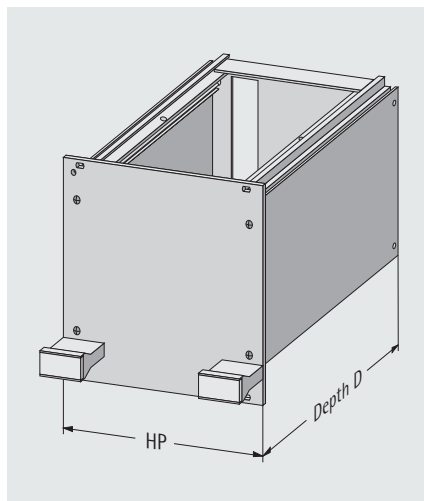
Delivery:

not assembled

Special sizes or customised cassettes and printing
are available on request. Matching side panels as
well as top or bottom panels can be found on
page 143.

* The handle is divided in units of 2 x 4 HP at
16 HP or bigger

Sub-unit 3 U with closed sides

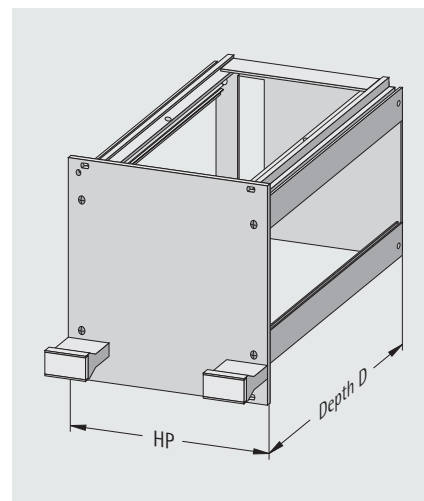


Delivery

Item	Pc.	Description
1	1	Front panel with plastic handle bar*
2	1	Rear panel
3	2	Aluminium extrusions
4		Assembly material

HP	D mm	Order no.
12	170	247-062
14		247-064
21		247-071
24		247-074
28		247-078
42		247-092
12	230	247-162
14		247-164
21		247-171
24		247-174
28		247-178
42		247-192

Sub-unit 3 U with open sides



Delivery

Item	Pc.	Description
1	1	Front panel with plastic handle bar*
2	1	Rear panel
3	4	Aluminium extrusions
4		Assembly material

HP	D mm	Order no.
12	170	247-262
14		247-264
21		247-271
24		247-274
28		247-278
42		247-292
12	230	247-362
14		247-364
21		247-371
24		247-374
28		247-378
42		247-392



247 • Sub-unit 6 U

Sub-unit 6 U

- with closed or open sides

Application:

for one PCB 233.35 x 160 mm or
233.35 x 220 mm with connector
acc. to IEC 60603-2

Material:

front panel: aluminium 2.5 mm
side section: aluminium extrusion
rear panel: aluminium 1.5 mm
handle: plastics with aluminium strip

Finish:

front panel:
anodised front, conductive rear
side section: anodised
rear panel: conductive

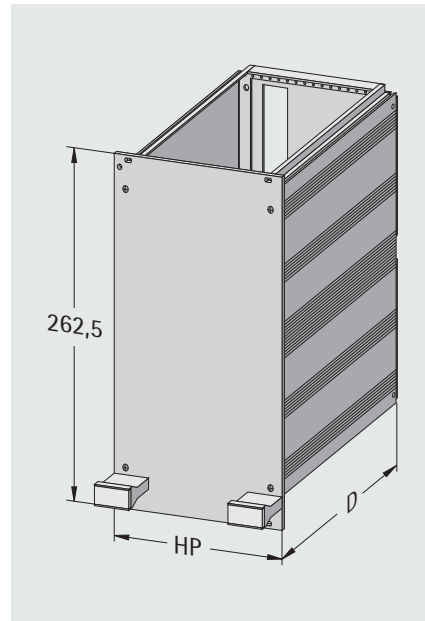
Delivery:

not assembled

Special sizes or customised cassettes and printing
are available on request.

** The handle is divided in units of 2 x 4 HP at
16 HP and bigger.

Sub-unit 6 U with closed sides

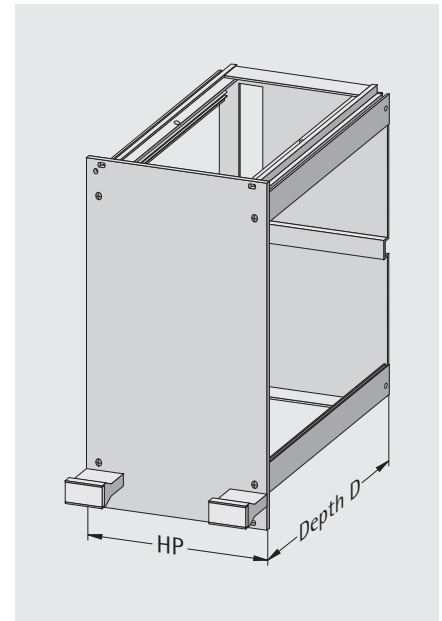


Delivery

Item	Pc.	Description
1	1	Front panel with plastic handle bar*
2	1	Rear panel
3	2	Aluminium extrusions
4		Assembly material

HP	D mm	Order no.
12	170	247-562-50
14		247-564-50
21		247-571-50
24		247-574-50
28		247-578-50
42	230	247-592-50
12		247-662-50
14		247-664-50
21		247-671-50
24		247-674-50
28		247-678-50
42		247-692-50

Sub-unit 6 U with open sides



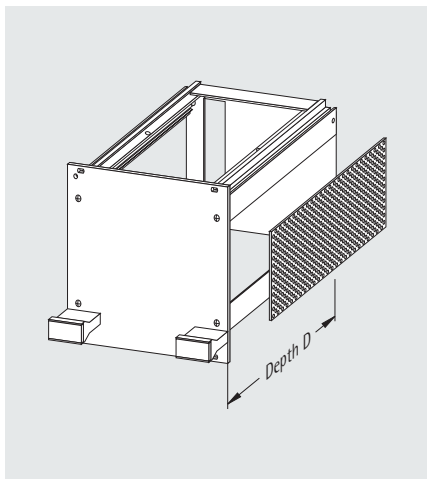
Delivery

Item	Pc.	Description
1	1	Front panel with plastic handle bar*
2	1	Rear panel
3	4	Aluminium extrusions
4		Assembly material

HP	D mm	Order no.
12	170	247-562
14		247-564
21		247-571
24		247-574
28		247-578
42	230	247-592
12		247-662
14		247-664
21		247-671
24		247-674
28		247-678
42		247-692



Side panel 3 U, perforated



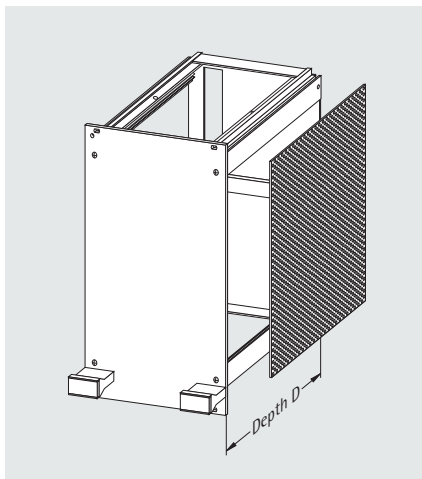
Material:
perforated aluminium panel 1.0 mm
Finish:
transparent chromated

Delivery

Item	Pc.	Description
1	1	Side panel

U	D mm	Order no.
3	170	248-402
3	230	248-502

Side panel 6 U, perforated



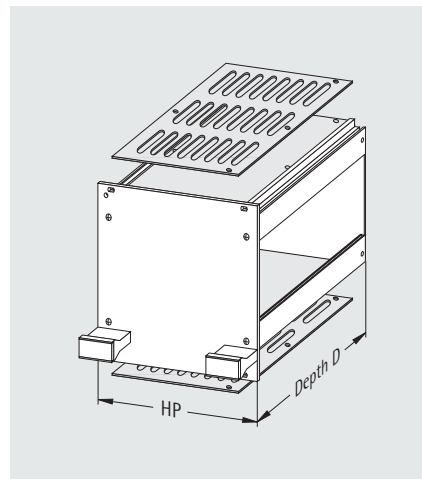
Material:
perforated aluminium panel 1.0 mm
Finish:
transparent chromated

Delivery

Item	Pc.	Description
1	1	Side panel

U	D mm	Order no.
6	170	248-394
6	230	248-494

Top or bottom panel



Material:
aluminium 1.5 mm
Finish:
transparent chromated

Delivery

Item	Pc.	Description
1	1	Top or bottom panel

HP	D mm	Feature	Order no.
12	170	closed	248-112-07
14	170		248-114-07
21	170		248-121-07
24	170		248-124-07
28	170		248-128-07
42	170		248-142-07
12	230		248-312-07
14	230		248-314-07
21	230		248-321-07
24	230		248-324-07
28	230	perforated	248-328-07
42	230		248-342-07
12	170		248-112-05
14	170		248-114-05
21	170		248-121-05
24	170		248-124-05
28	170		248-128-05
42	170		248-142-05
12	230		248-312-05
14	230		248-314-05
21	230		248-321-05
24	230		248-324-05
28	230		248-328-05
42	230		248-342-05



EMC cassette 3 U / 6 U

- fits all desktop enclosures and subracks (except ruggedized subrack)
- EMC compliant design
- with side grooves for EMC springs
- rear panel can hold several female connectors for internal wiring
- with 1 HP mounting grid for internal card guide

Application:

for several PCB's

3 U: 100 x 160 mm or 100 x 220 mm

6 U: 233.35 x 160 mm or 233.35 x 220 mm with connector acc. to IEC 60603-2

Material:

front panel: aluminium, 2.5 mm

side section: aluminium extrusion

rear panel: aluminium, 1.5 mm

handle: plastics with aluminium strip

cover panels: aluminium, 1.5 mm

Finish:

front panel:

anodised front, conductive rear

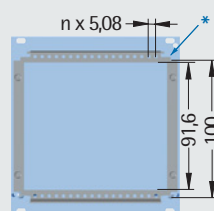
side section: transparent chromated

rear panel: transparent chromated

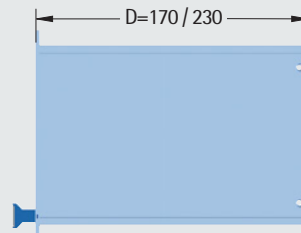
cover panels: transparent chromated

Delivery:

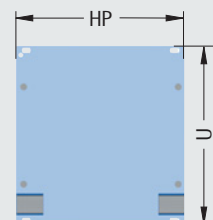
not assembled



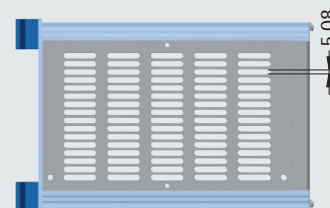
Rear view



Side view



Front view



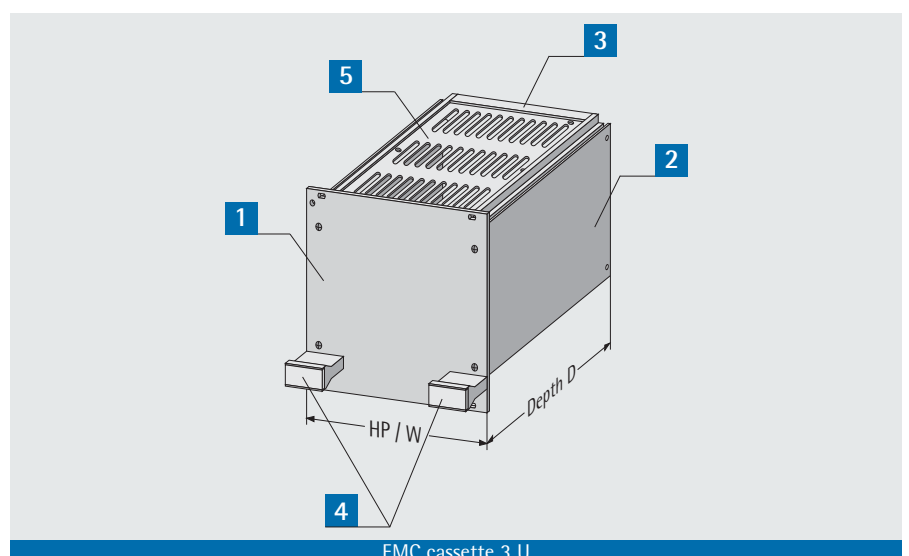
Top view

* Left groove ensures that the PCB is in the correct position.

** The handle is divided in units of 2 x 4 HP at 16 HP and bigger.

Delivery

Item	Pc.	Description
1	1	Front panel with groove for EMC contact springs
2	2	Side extrusion
3	1	Rear panel
4	1/2	Handle*
5	2	Cover panels, perforated
6	1 set	Assembly material

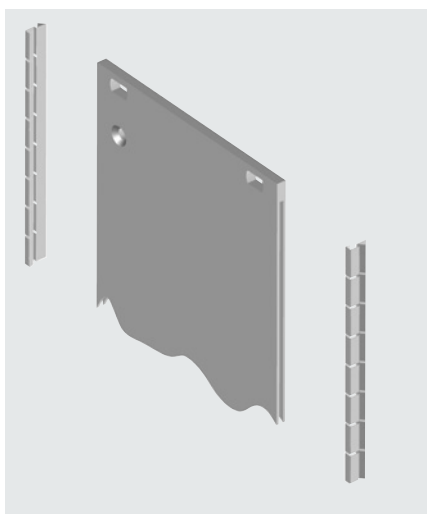


EMC cassette 3 U



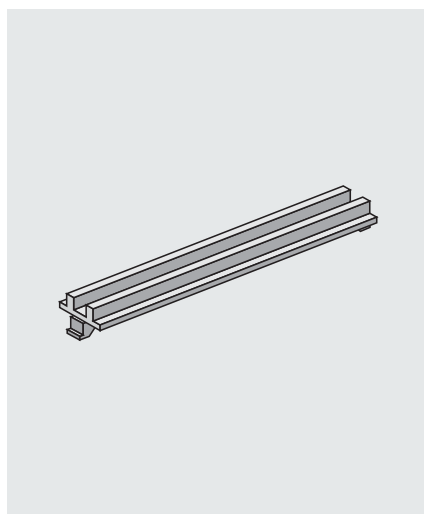
U	D mm	HP	W mm	Order no.
3	170	12	60,60	248-062-55
		14	70,80	248-064-55
		21	106,30	248-071-55
		24	121,50	248-074-55
		28	142,00	248-078-55
		42	213,00	248-092-55
	230	12	60,60	248-162-55
		14	70,80	248-164-55
		21	106,30	248-171-55
		24	121,50	248-174-55
		28	142,00	248-178-55
		42	213,00	248-192-55
6	170	12	60,60	248-712-55
		14	70,80	248-714-55
		21	106,30	248-721-55
		24	121,50	248-724-55
		28	142,00	248-728-55
		42	213,00	248-742-55
	230	12	60,60	248-812-55
		14	70,80	248-814-55
		21	106,30	248-821-55
		24	121,50	248-824-55
		28	142,00	248-828-55
		42	213,00	248-842-55

EMC contact spring



- fits in the side groove of the cassette front panel

Internal card guide



- guides cards inside a cassette
- to clip on top/ bottom panel
- packing unit = 1 piece

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

Order no.
250-712



Cassette 3 U

- 2 models are available
 - with open sides
 - with divided front panel
- with 1 HP mounting grid for internal card guide

Material:

front panel: aluminium 2.5 mm

side section: aluminium extrusion

rear panel: aluminium 1.5 mm

cover panels: aluminium 1.5 mm

handle: plastics with aluminium strip

Finish:

front panel:

anodised front, conductive rear

side section: anodised

rear panel: transparent chromated

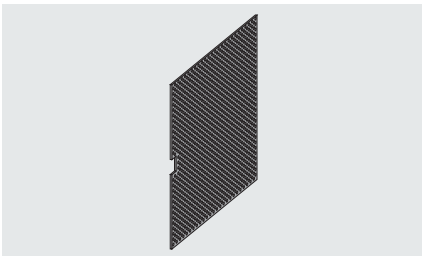
cover panels: transparent chromated

Delivery: unmounted

Special sizes or customised cassettes and printing are available on request.

*The handle is divided in units of 2 x 4 HP at 16 HP or bigger

Side panel, perforated



Material:

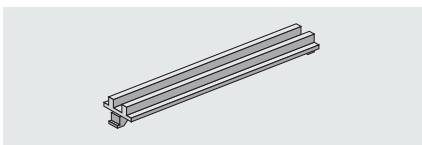
perforated aluminium panel 1.0 mm

Finish:

transparent chromated

U	D mm	Order no.
3	170	248-402
3	230	248-502

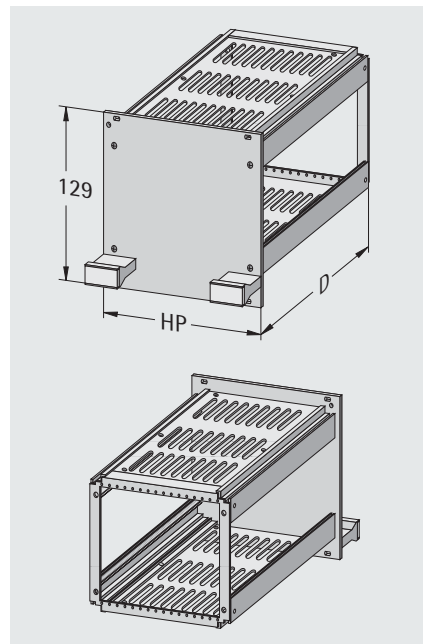
Internal card guide



- guides cards inside a cassette
- to clip on top/ bottom panel
- packing unit = 1 piece

Order no.
250-712

Cassette 3 U with open sides

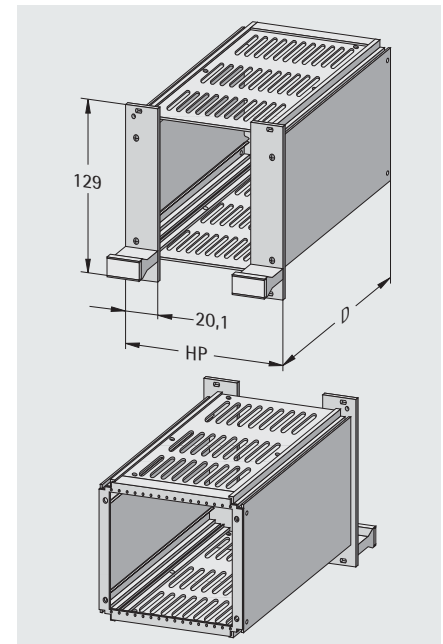


Delivery

Item	Pc.	Description
1	1	Front panel with plastic handle bar*
2	1	Rear panel
3	4	Aluminium extrusions
4	2	Top / bottom panel, perforated
5		Assembly material

HP	W mm	D mm	Order no.
12	60,60	170	248-462
14	70,80	170	248-464
21	106,30	170	248-471
24	121,50	170	248-474
28	142,00	170	248-478
42	213,00	170	248-482
12	60,60	230	248-562
14	70,80	230	248-564
21	106,30	230	248-571
24	121,50	230	248-574
28	142,00	230	248-578
42	213,00	230	248-592

Cassette 3 U with divided front panel



Delivery

Item	Pc.	Description
1	2	Front panel with plastic handle bar*
2	1	Rear panel
3	2	Aluminium extrusions
4	2	Top / bottom panel, perforated
5		Assembly material

HP	W mm	D mm	Order no.
12	60,60	170	248-262
14	70,80	170	248-264
21	106,30	170	248-271
24	121,50	170	248-274
28	142,00	170	248-278
42	213,00	170	248-292
12	60,60	230	248-362
14	70,80	230	248-364
21	106,30	230	248-371
24	121,50	230	248-374
28	142,00	230	248-378
42	213,00	230	248-382



Cassette 6 U

- 2 models are available
 - with open sides
 - with closed sides
- with 1 HP mounting grid for internal card guide

Material:

front panel: aluminium 2.5 mm

side section: aluminium extrusion

rear panel : aluminium 1.5 mm

cover panels: aluminium 1.5 mm

Finish:

front panel:

anodised front, conductive rear

side section: anodised

rear panel: transparent chromated

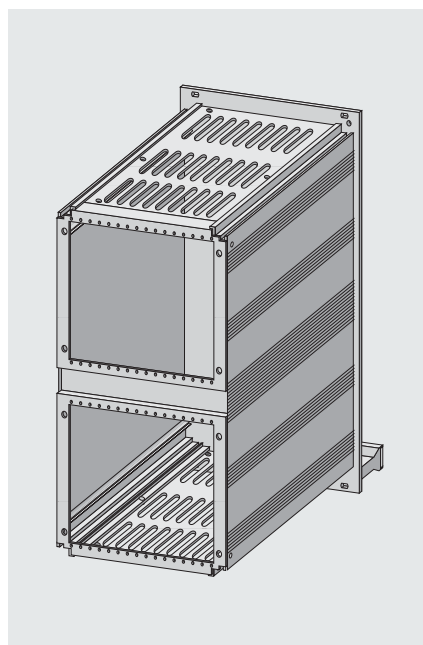
cover panels: transparent chromated

Delivery: not assembled

Special sizes or customised cassettes and printing are available on request.

* The handle is divided in units of 2 x 4 HP at 16 HP or bigger

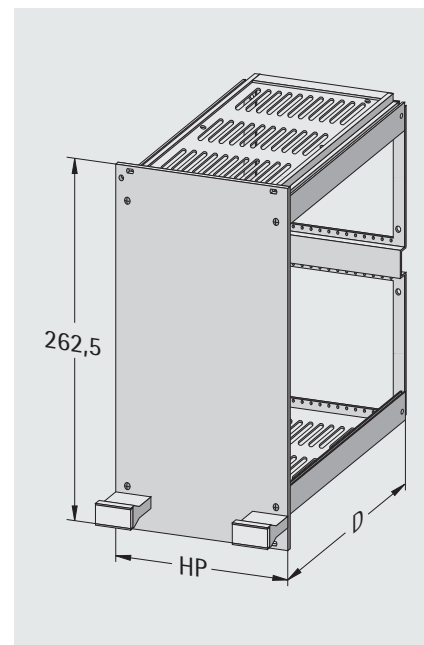
Cassette 6 U with closed sides



Delivery

Item	Pc.	Description
1	1	Front panel with plastic handle bar*
2	1	Rear panel
3	2	Aluminium extrusions
4	2	Top / bottom panel, perforated
5		Assembly material

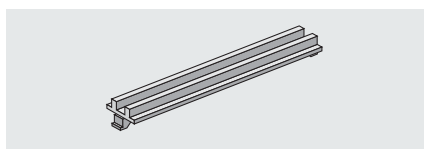
Cassette 6 U with open sides



Delivery

Item	Pc.	Description
1	1	Front panel with plastic handle bar*
2	1	Rear panel
3	4	Aluminium extrusions
4	2	Top / bottom panel, perforated
5		Assembly material

Internal card guide



- guides cards inside a cassette
- to clip on top/ bottom panel
- packing unit = 1 piece

Order no.
250-712

HP	W mm	D mm	Order no.
12	60,60	170	248-712-50
14	70,80	170	248-714-50
21	106,30	170	248-721-50
24	121,50	170	248-724-50
28	142,00	170	248-728-50
42	213,00	170	248-742-50
12	60,60	230	248-812-50
14	70,80	230	248-814-50
21	106,30	230	248-821-50
24	121,50	230	248-824-50
28	142,00	230	248-828-50
42	213,00	230	248-842-50

HP	W mm	D mm	Order no.
12	60,60	170	248-712
14	70,80	170	248-714
21	106,30	170	248-721
24	121,50	170	248-724
28	142,00	170	248-728
42	213,00	170	248-742
12	60,60	230	248-812
14	70,80	230	248-814
21	106,30	230	248-821
24	121,50	230	248-824
28	142,00	230	248-828
42	213,00	230	248-842

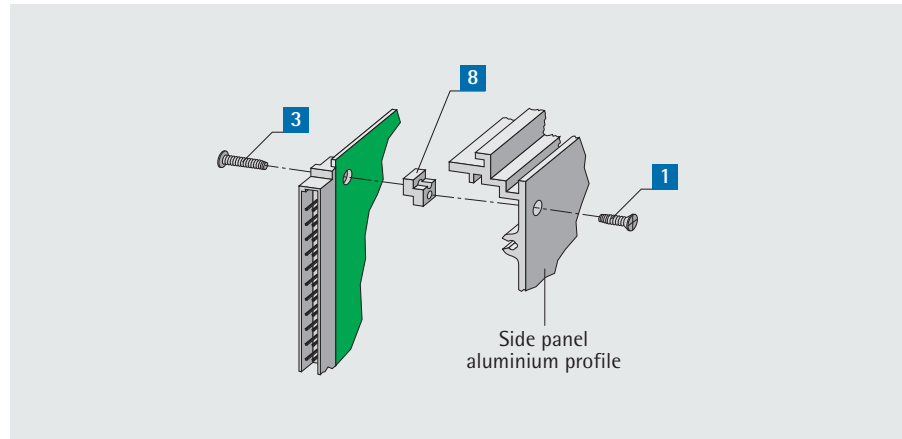


248 • Cassette assembly models for PCB

Model A

PCB is attached to the side of the cassette

Assembly kit A	Order no.
includes: 2x Item 1 2x Item 3 2x Item 8	250-708

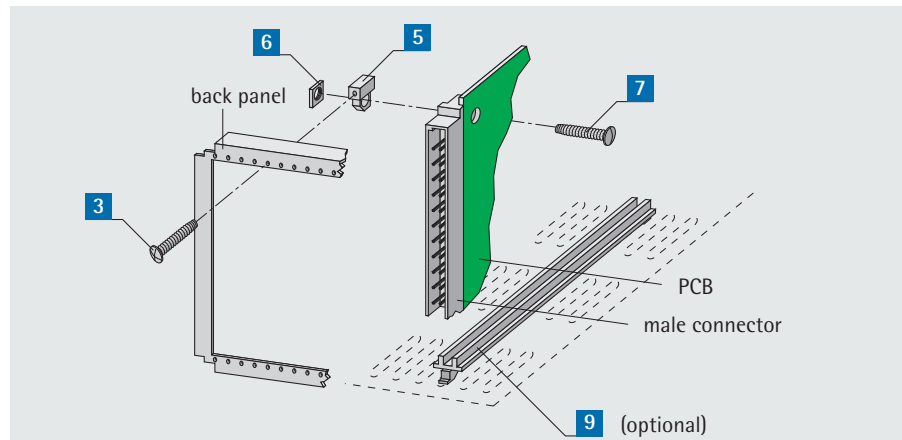


Model B

PCB is attached to the rear of the cassette

- external wiring

Assembly kit B	Order no.
includes: 2x Item 10 2x Item 5 2x Item 6 2x Item 7	250-709

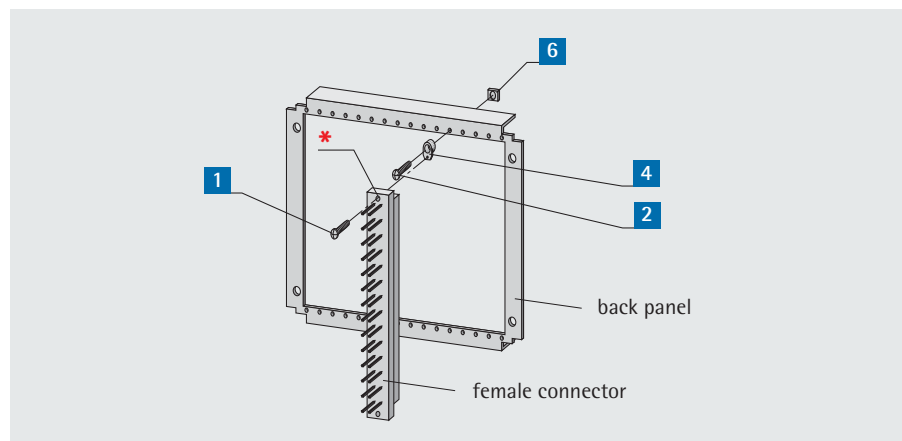


Model C

PCB is attached to the rear of the cassette

- internal wiring

Assembly kit C	Order no.
includes: 2x Item 1 2x Item 2 2x Item 4 2x Item 6	250-710



Item	Description	Order no.	Packing unit
1	Countersunk screw $\varnothing$ 2,2 x 6,5	630-382	100 pieces
2	Countersunk screw M 2,5 x 8	630-127	100 pieces
3	Oval-head screw $\varnothing$ 2,2 x 13	630-383	100 pieces
4	Female connector fixing 32-pole	250-710-01	1 piece
5	Male connector fixing 32-pole	250-709-01	1 piece
6	Square nut M 2,5	630-192	100 pieces
7	Oval-head screw M 2,5 x 16	630-080	100 pieces
8	Bracket	250-708-01	1 piece
9	Internal card guide	250-712	1 piece
10	Oval-head screw $\varnothing$ 2,2 x 9,5	630-381	100 pieces

* Female connector must be counter-bored.
Male connector holder fixes male connector
with Eurocard in sub-unit and cassette.

Please take note of the quantity of the
packing units when ordering individual items