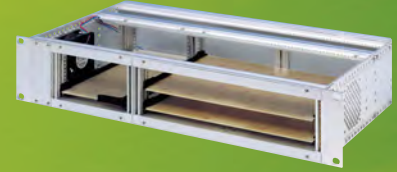


19" electronic packaging





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

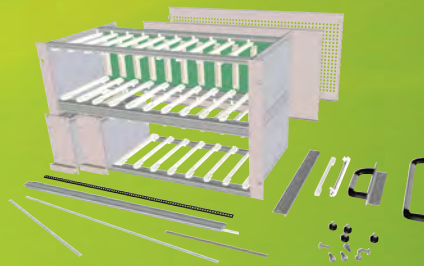
page 89

- 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

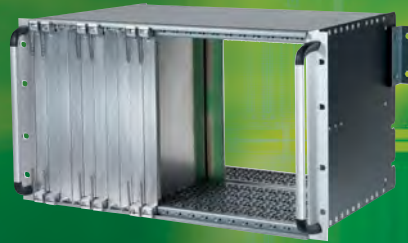
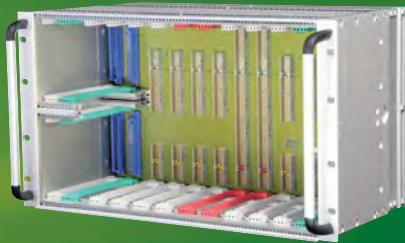
page 99

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“

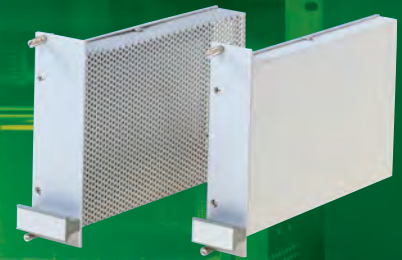
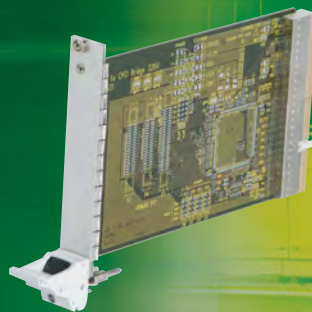
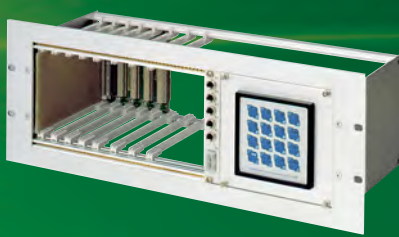
page 94

- 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 units134
- 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:

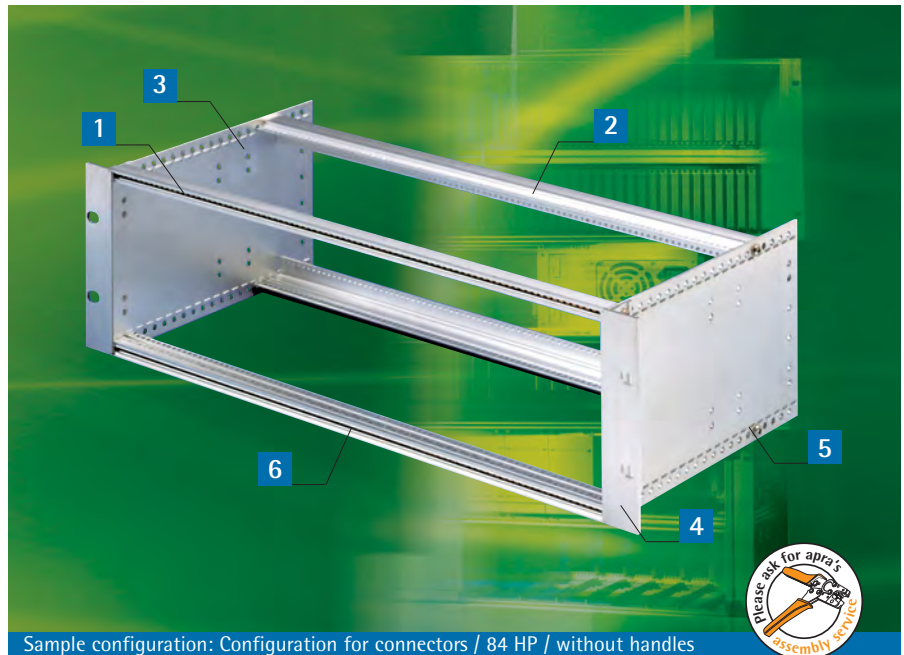
for plug-in modules acc. to IEC 60297-3-101/-102/-103 and IEEE 1101.10/1101.11

Material:

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

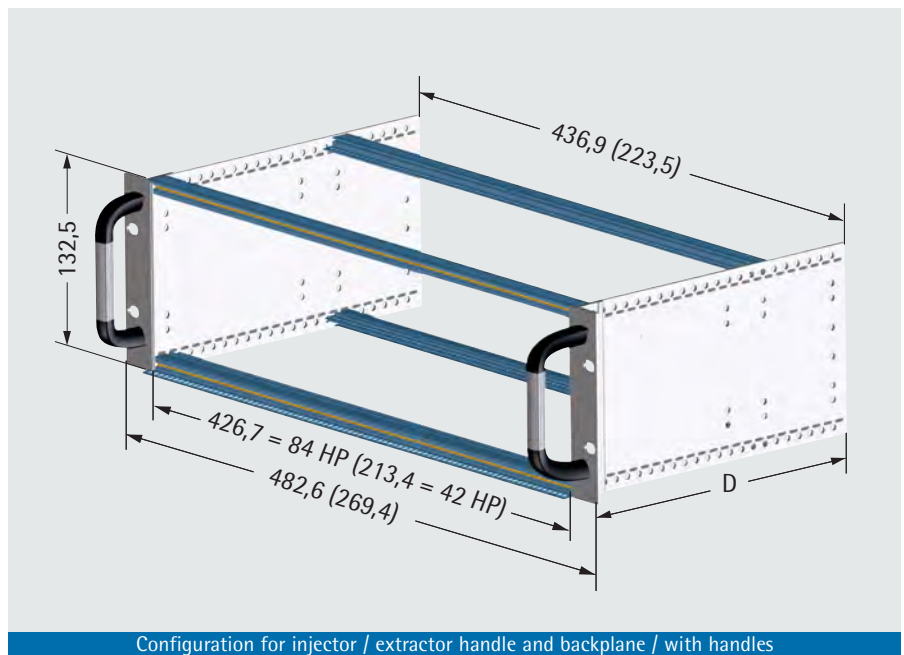
Delivery:

kit form



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





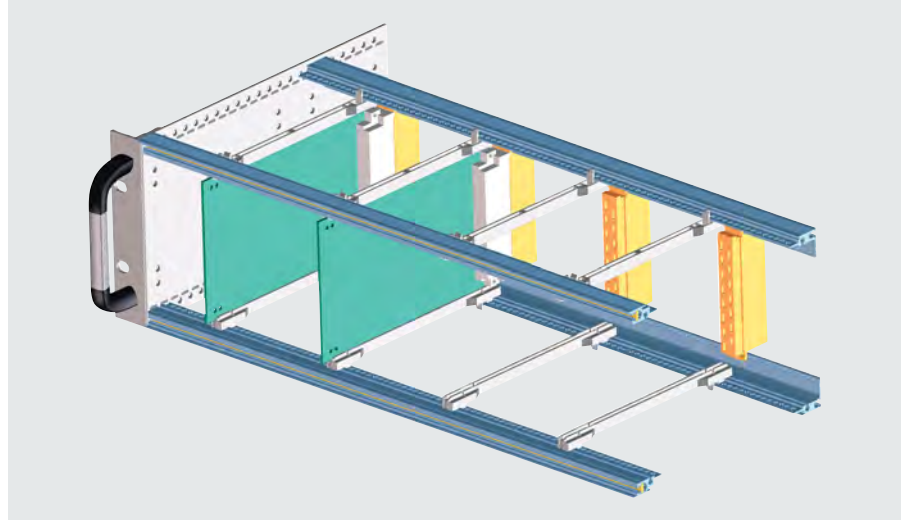
Configuration for connectors according to IEC 60603-2

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



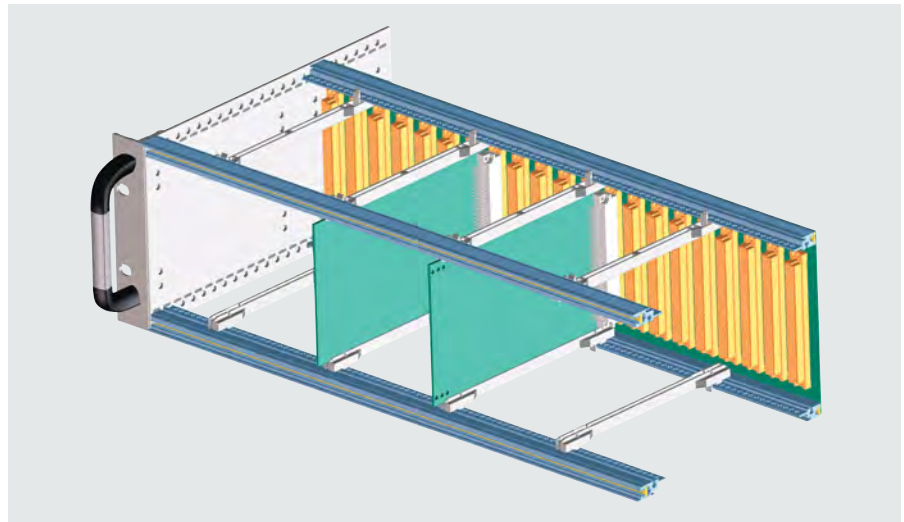
Configuration for backplane

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).

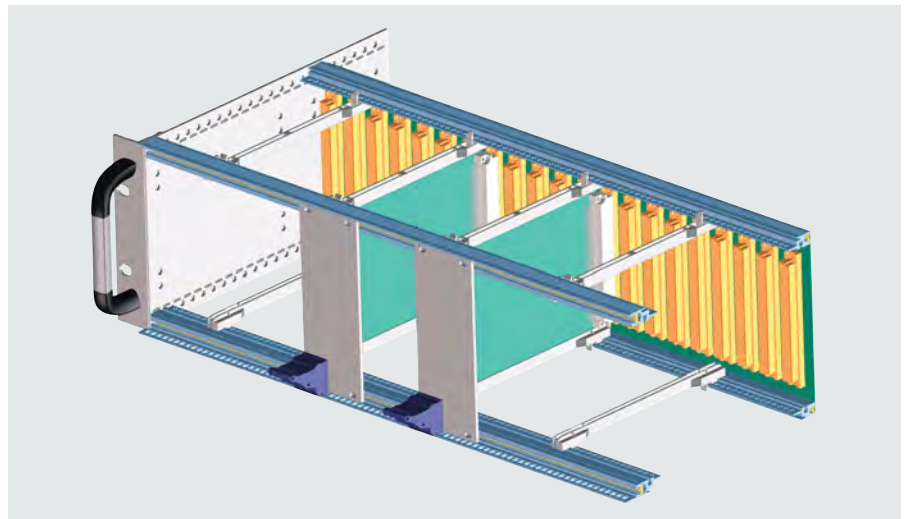
Configuration for injector / extractor handle and backplane for CPCI acc. to IEEE

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

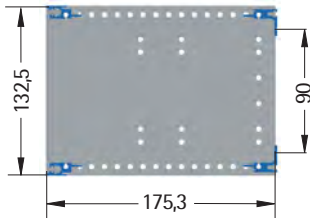
BUS module rails 241-013
threaded inserts M 2,5



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

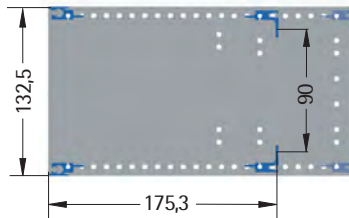


Depth 176 mm



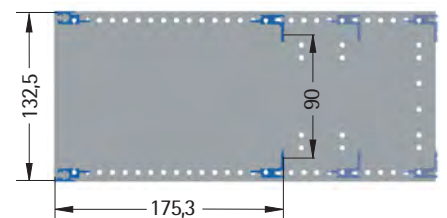
Description	Order no.
84 HP, with handle	245-314-11
84 HP, without handle	245-311-11
42 HP, with handle	245-334-11
42 HP, without handle	245-331-11

Depth 236 mm



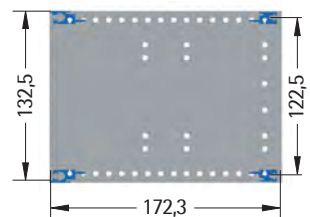
Description	Order no.
84 HP, with handle	245-315-11
84 HP, without handle	245-312-11
42 HP, with handle	245-335-11
42 HP, without handle	245-332-11

Depth 296 mm



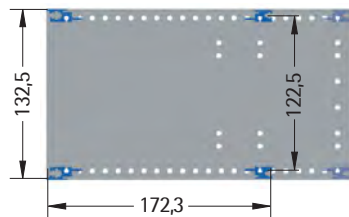
Description	Order no.
84 HP, with handle	245-316-11
84 HP, without handle	245-313-11
42 HP, with handle	245-336-11
42 HP, without handle	245-333-11

Depth 176 mm



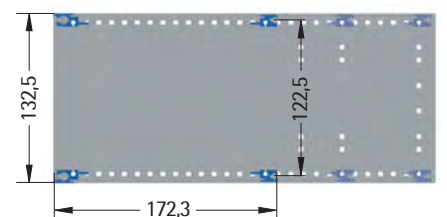
Description	Order no.
84 HP, with handle	245-314-21
84 HP, without handle	245-311-21
42 HP, with handle	245-334-21
42 HP, without handle	245-331-21

Depth 236 mm



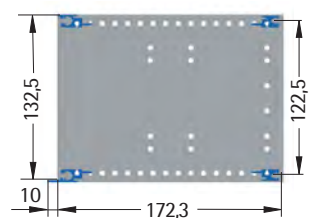
Description	Order no.
84 HP, with handle	245-315-21
84 HP, without handle	245-312-21
42 HP, with handle	245-335-21
42 HP, without handle	245-332-21

Depth 296 mm



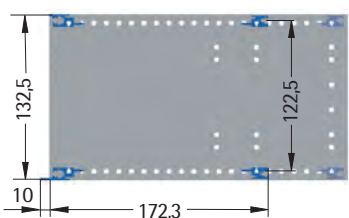
Description	Order no.
84 HP, with handle	245-316-21
84 HP, without handle	245-313-21
42 HP, with handle	245-336-21
42 HP, without handle	245-333-21

Depth 176 mm



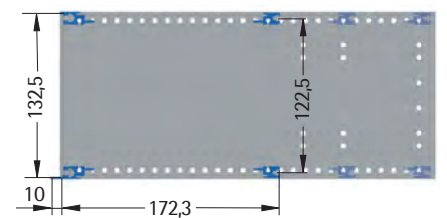
Description	Order no.
84 HP, with handle	245-314-31
84 HP, without handle	245-311-31
42 HP, with handle	245-334-31
42 HP, without handle	245-331-31

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:

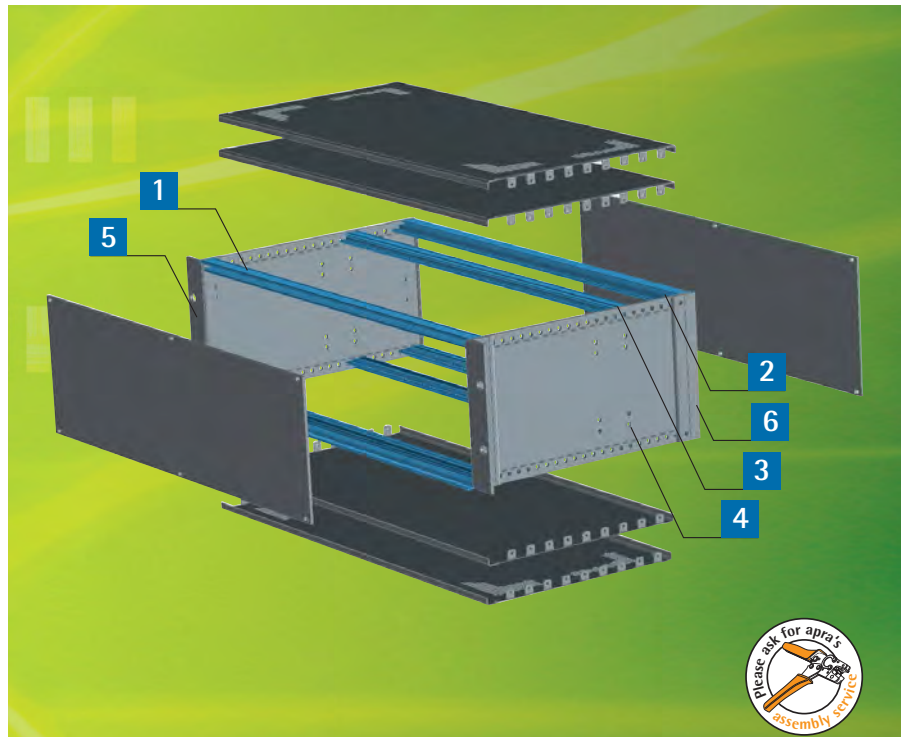
for plug-in modules acc. to IEC 60297-3-101/-102/-103 and IEEE 1101.10/1101.11

Material:

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

Delivery:

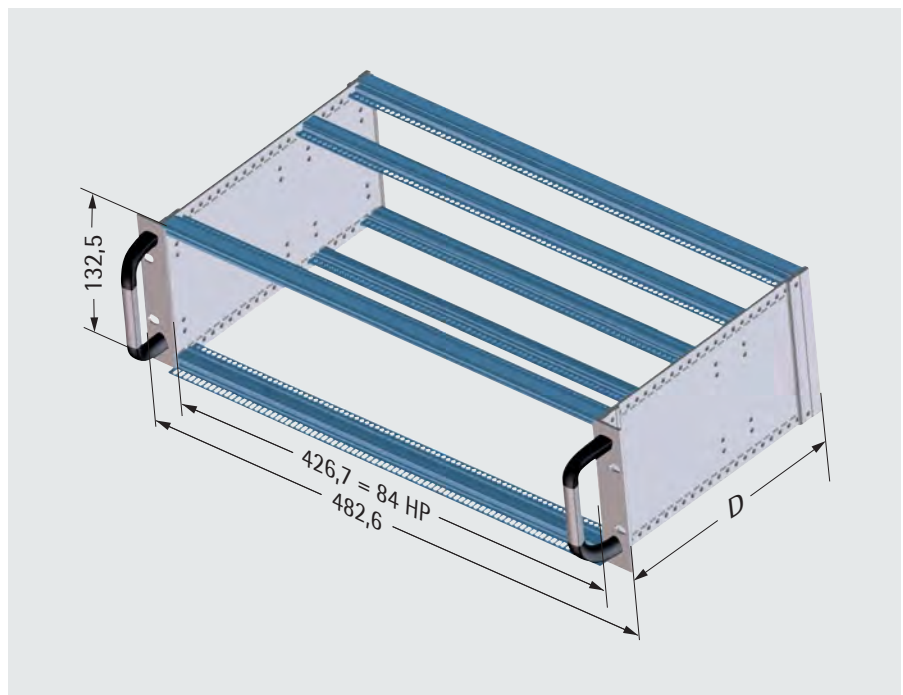
kit form



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

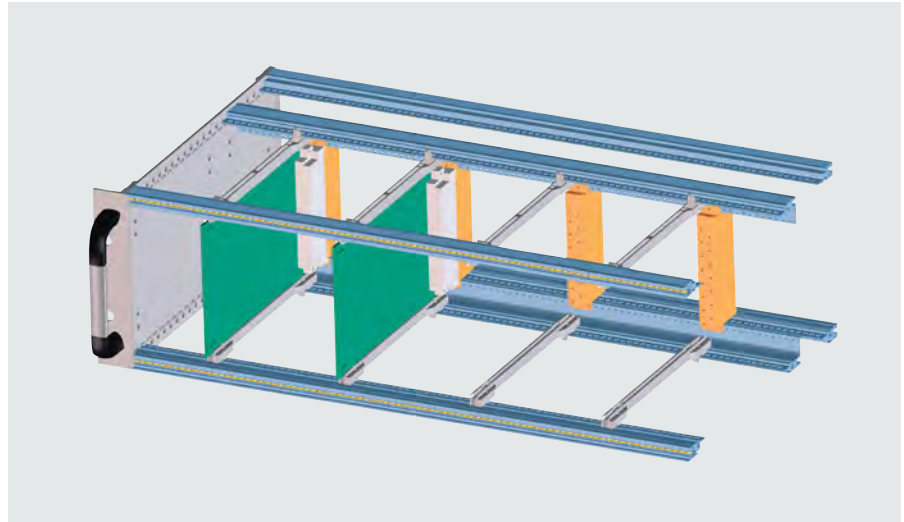
standard module rails 241-022
threaded inserts M 2,5

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

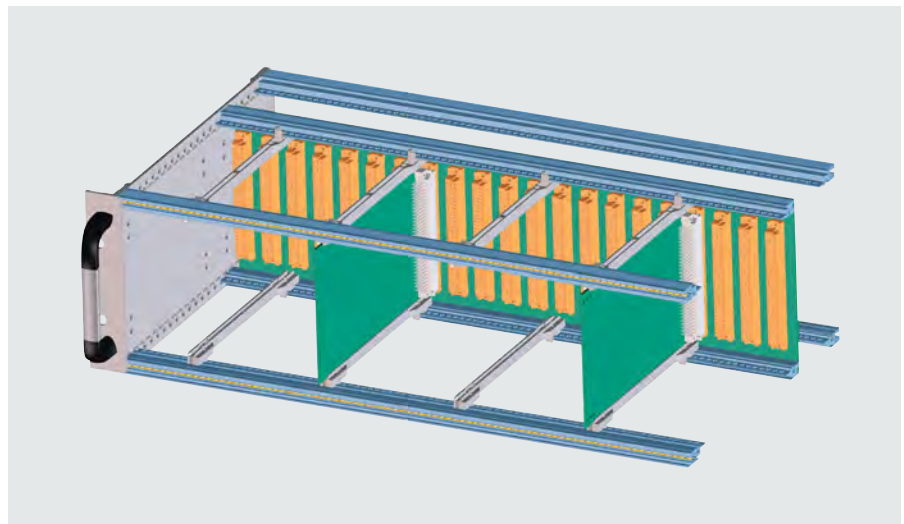
standard module rails 241-022
threaded inserts

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

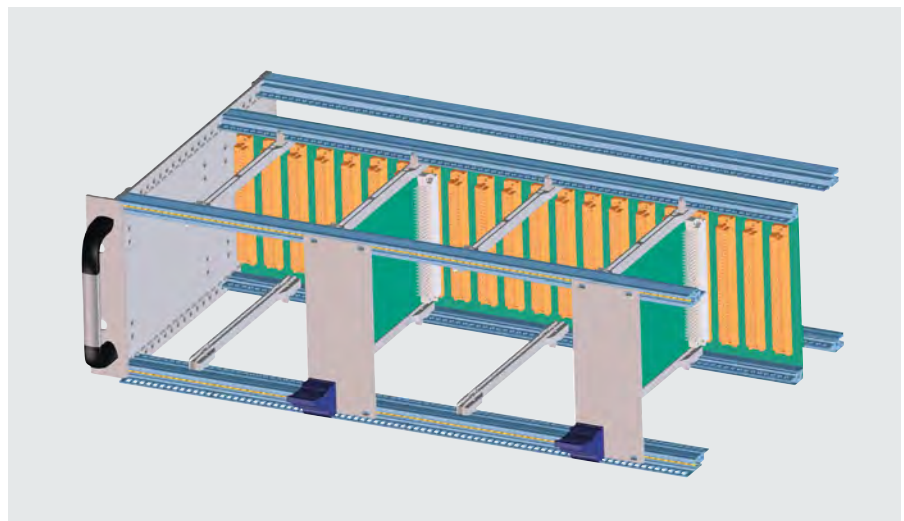
standard module rails 241-022,
standard module rails 241-049
with 10 mm clearance for insertion/
extraction handle
threaded inserts M 2,5

middle

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

rear

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

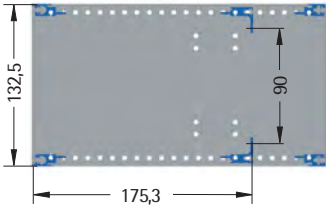


Please order insulating strips or contact strips separately (see p.115).

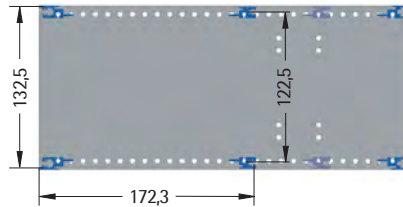


Configuration for connectors according to IEC 60603-2

Depth 236 mm



Depth 296 mm

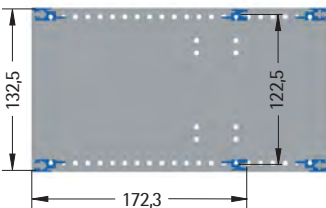


Description	Order no.
84 HP, with handle	245-315-16
84 HP, without handle	245-312-16

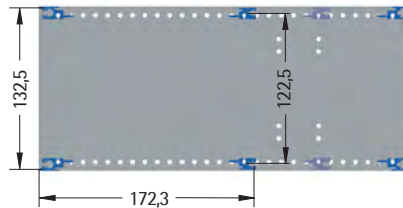
Description	Order no.
84 HP, with handle	245-316-16
84 HP, without handle	245-313-16

Configuration for backplane

Depth 236 mm



Depth 296 mm

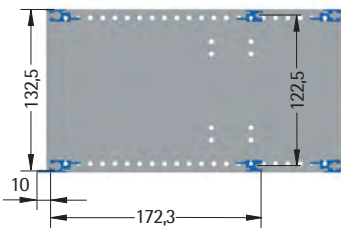


Description	Order no.
84 HP, with handle	245-315-26
84 HP, without handle	245-312-26

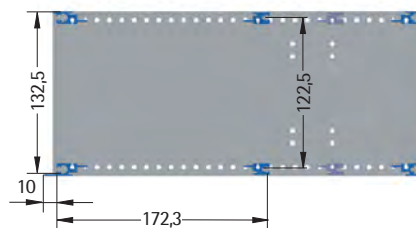
Description	Order no.
84 HP, with handle	245-316-26
84 HP, without handle	245-313-26

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 • 245



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

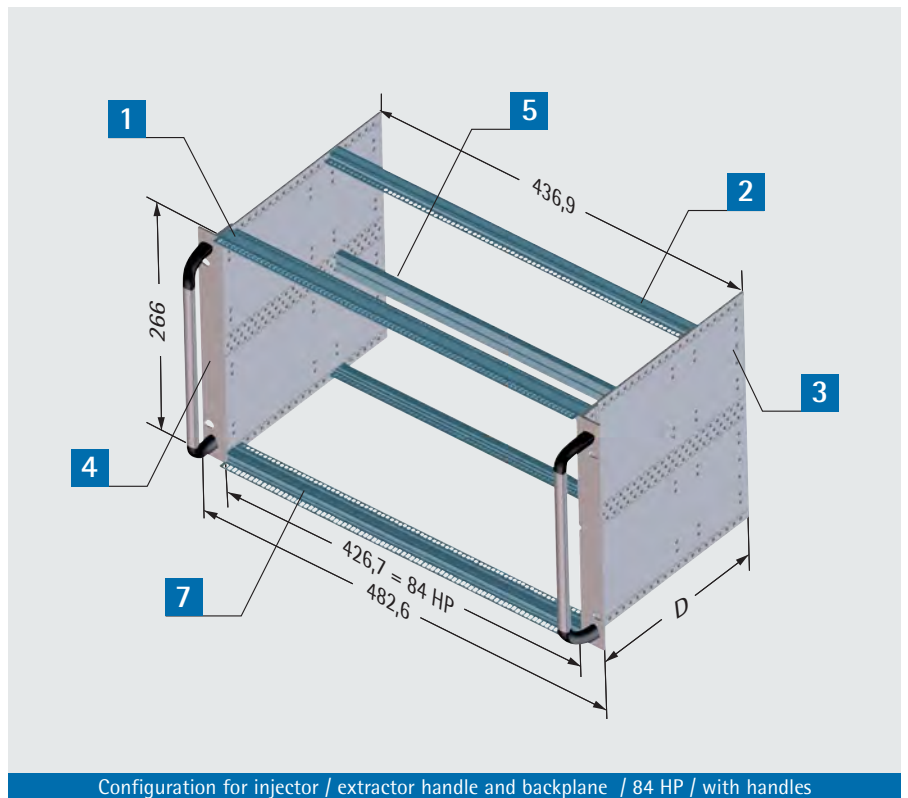


Sample configuration

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



245 • 19" subrack 6 U, single-row

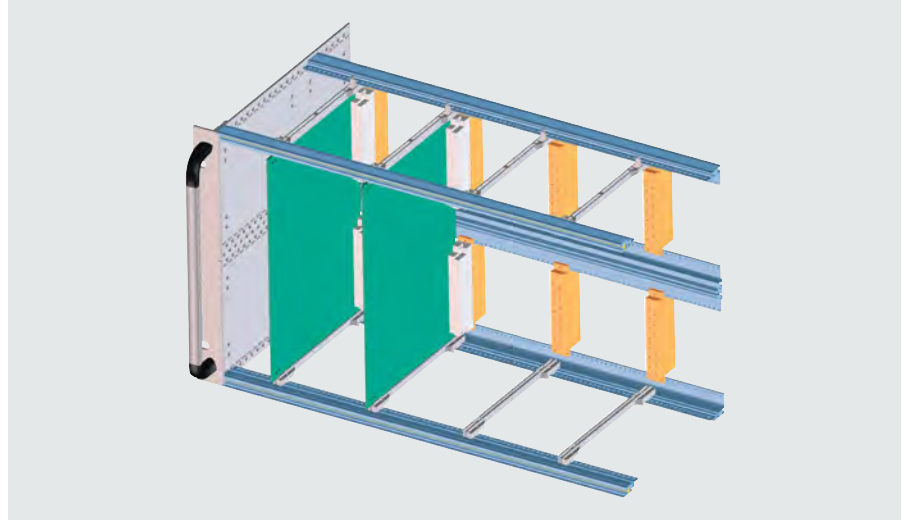
Configuration for connectors according to IEC 60603-2

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



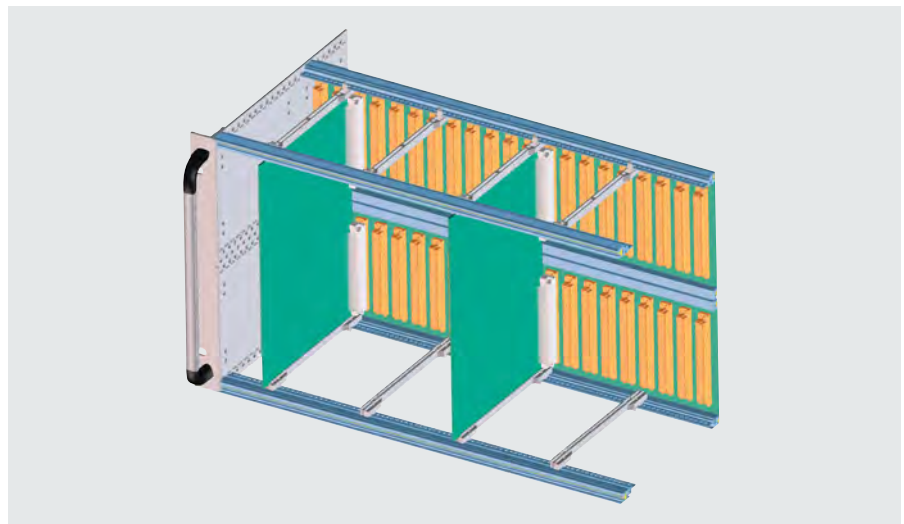
Configuration for backplane

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).

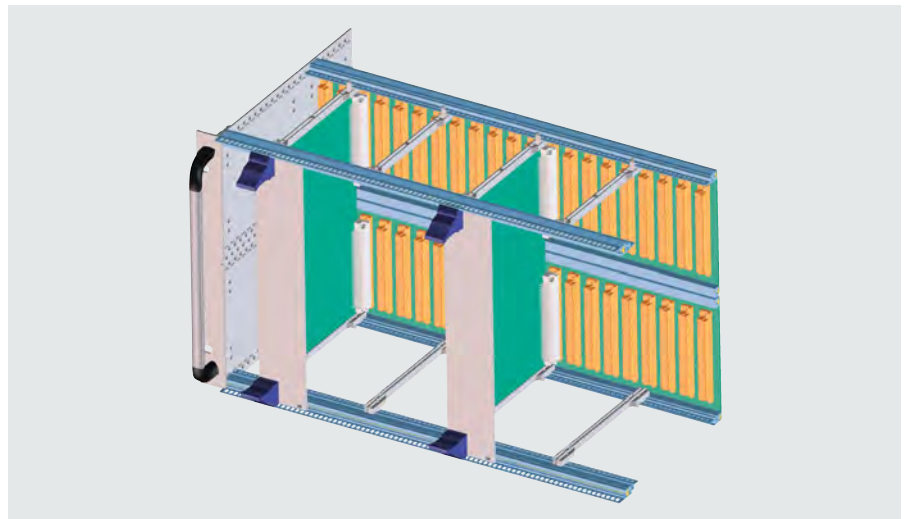
Configuration for injector / extractor handle and backplane for CPCI acc. to IEEE

front

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

rear

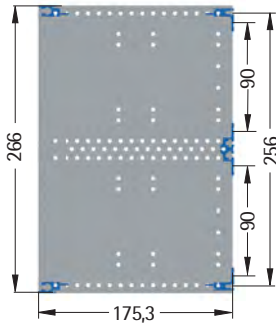
BUS module rails 241-013
with threaded inserts, M 2.5
and BUS support rail 241-020
with threaded inserts, M 2.5



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

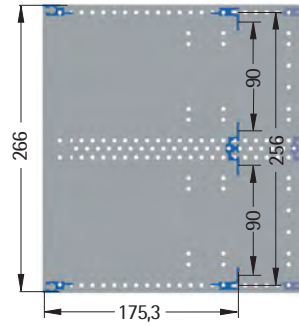


Depth 176 mm



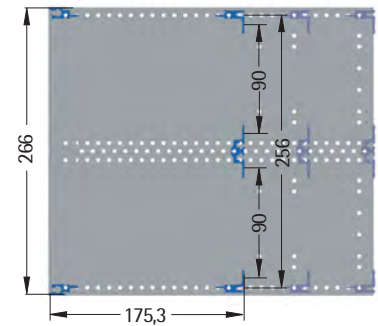
Description	Order no.
84 HP, with handle	245-614-11
84 HP, without handle	245-611-11

Depth 236 mm



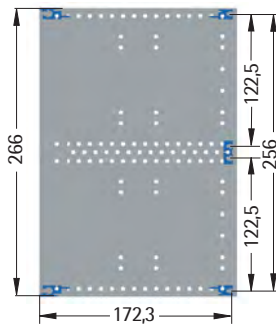
Description	Order no.
84 HP, with handle	245-615-11
84 HP, without handle	245-612-11

Depth 296 mm



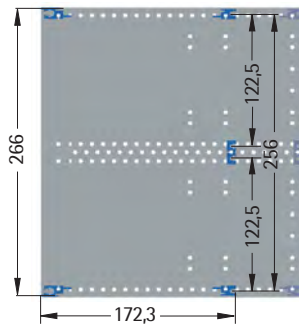
Description	Order no.
84 HP, with handle	245-616-11
84 HP, without handle	245-613-11

Depth 176 mm



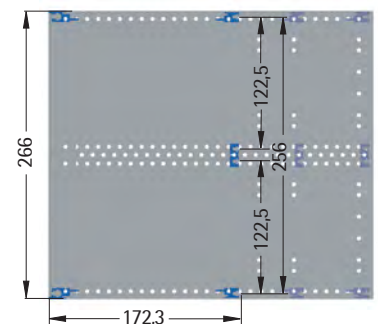
Description	Order no.
84 HP, with handle	245-614-21
84 HP, without handle	245-611-21

Depth 236 mm



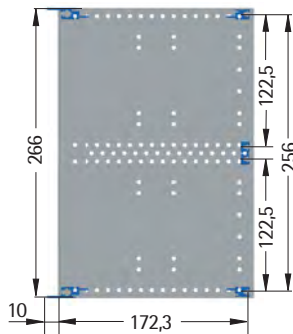
Description	Order no.
84 HP, with handle	245-615-21
84 HP, without handle	245-612-21

Depth 296 mm



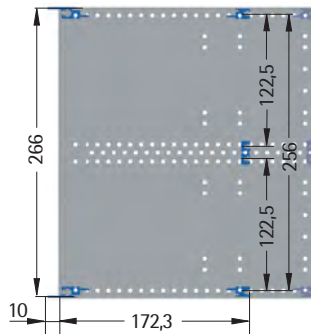
Description	Order no.
84 HP, with handle	245-616-21
84 HP, without handle	245-613-21

Depth 176 mm



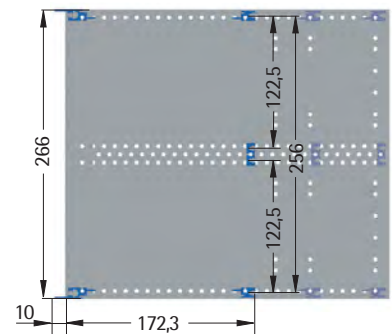
Description	Order no.
84 HP, with handle	245-614-31
84 HP, without handle	245-611-31

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:

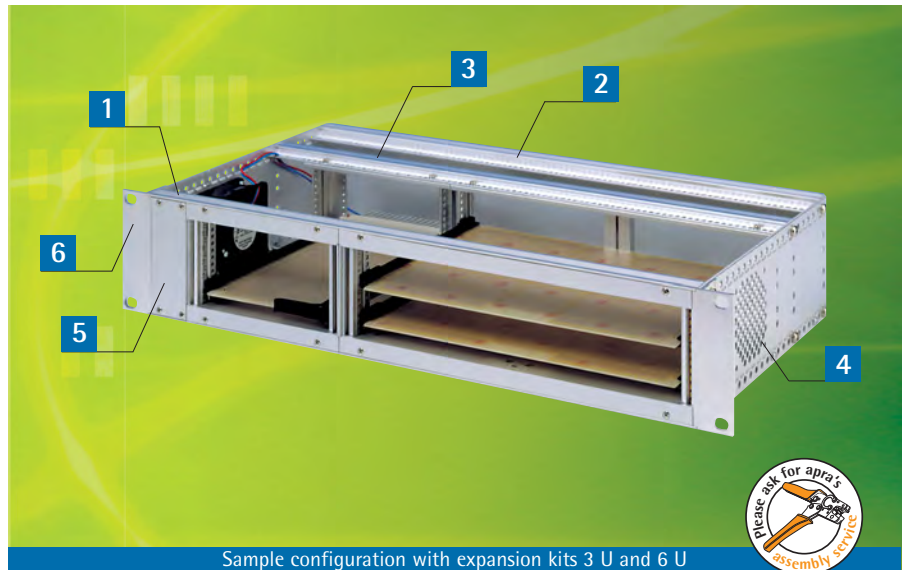
for plug-in modules acc. to IEC 60297-3-101/-102/-103 and IEEE 1101.10/1101.11

Material:

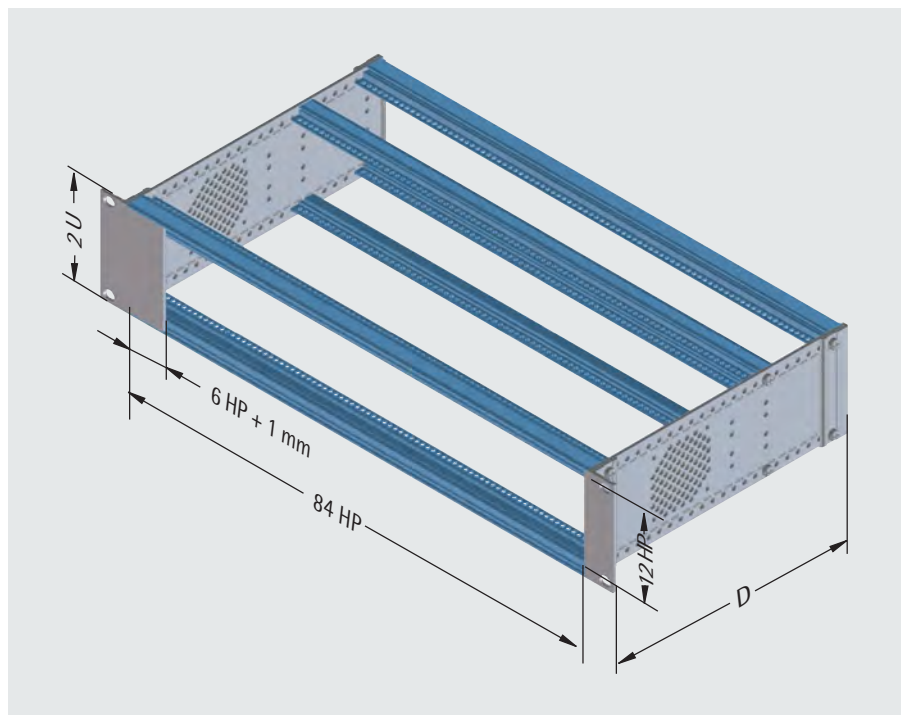
side panels: aluminium 2,5 mm
module rails: aluminium extrusion
front brackets: aluminium extrusion

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

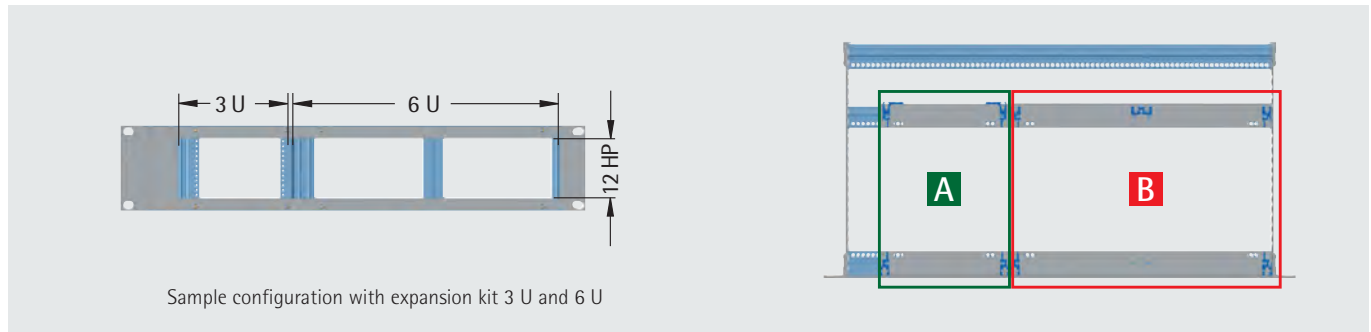
Description	Order no.
D=236 mm	245-212-28
D=296 mm	245-213-28



Expansion kits

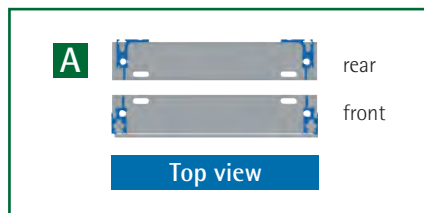
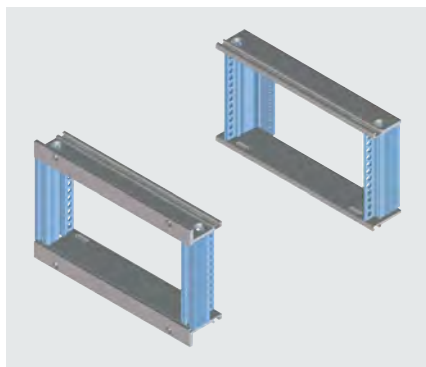
- for installing eurocards or double eurocards horizontally in a 2 U subrack
- the following combinations are possible in 84 HP subracks:

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.

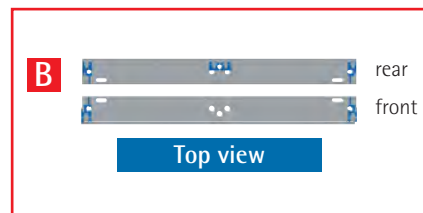
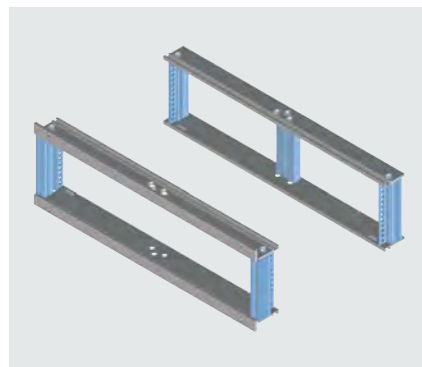
Expansion kit 3 U / 12 HP



- 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