

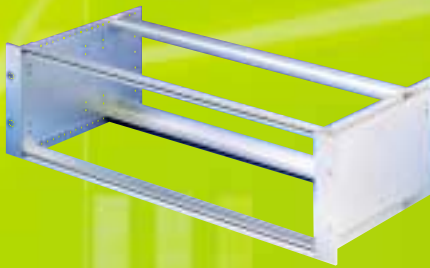
# 19" Subracks



... the perfect shell for valuable electronics



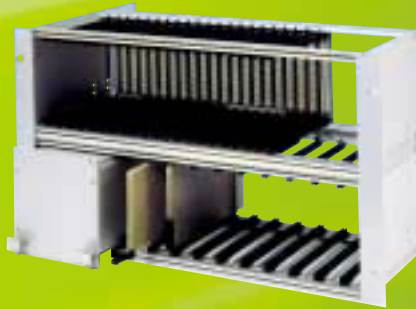
# 19" subracks



### 3 U subrack 245

beginning on page 5.5

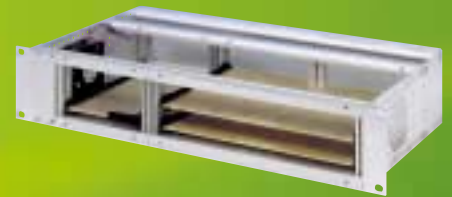
- Width: 84 HP or 42 HP
- can be used for bus boards and plug-in connectors in compliance with DIN 41612
- available as:
  - standard subrack . . . . . 5.5
  - for wall mounting . . . . . 5.8
  - for automatic circuit breakers . 5.10
  - EMC subracks . . . . . 5.25
  - CompactPCI subracks . . . . . 5.31



### 6 U subrack 245

beginning on page 5.11

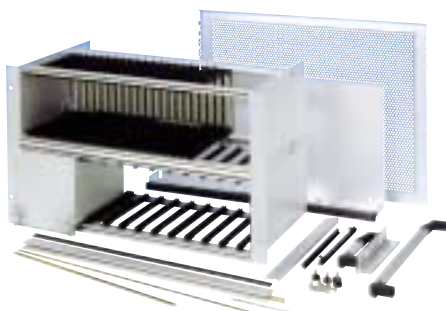
- Width: 84 HP
- can be used for bus boards and plug-in connectors in compliance with DIN 41612
- available as:
  - single-row subrack . . . . . 5.11
  - double-row subrack . . . . . 5.14
  - subrack with expansion kit . . . . 5.17
  - EMC subrack . . . . . 5.18
  - CompactPCI subrack . . . . . 5.31



### 2 U subrack 245

beginning on page 5.20

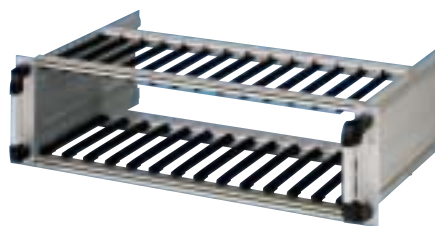
- Width: 84 HP or 42 HP
- Depth: 236/296mm
- can be used for bus boards and plug-in connectors in compliance with DIN 41612



### Individual Configuration 245

beginning on page 5.33

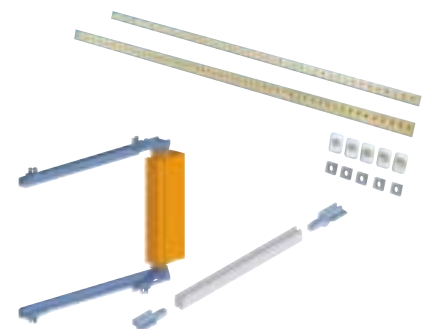
Build your customized series-245 subrack.



### 3 U subrack 270/271

beginning on page 5.48

- subrack, 3 and 6 U
- Width: 84 HP
- Depth: 228/268/308/348/448mm
- can be used for bus boards and plug-in connectors in compliance with DIN 41612



### Accessories

beginning on page 5.51

- Threaded inserts . . . . . 5.52
- Z-rails . . . . . 5.53
- Group lock . . . . . 5.55
- Card lock . . . . . 5.55
- Card guides . . . . . 5.56



### 4 U subrack 245

beginning on page 5.22

- Width: 84 HP
- Depth: 296mm
- ventilation can be integrated
- can be used for bus boards and plug-in connectors in compliance with DIN 41612

### 7 U subrack 245

beginning on page 5.22

- Width: 84 HP
- Depth: 296mm
- ventilation can be integrated
- can be used for bus boards and plug-in connectors in compliance with DIN 41612



### Frame

beginning on page 5.63

- Width: 84 HP or 42 HP
- Depth: 126/174.5mm
- for installing active components and/ or 100mm x 160mm Europe cards



### Customized subracks

beginning on page 5.66

- We develop the optimum subrack solution based on your specific demands



### Front panels and plug-in modules

beginning on page 5.67

Front panels	5.68
Insertion/extraction handle	5.75
Sub-units	5.77
Cassettes	5.82



## 19" subrack 245



## Reference analyses

The standard subrack 24-5312-11 underwent the following reference analyses:

- DIN EN 50 155  
railway use of electrical equipment on rail vehicles  
the following were tested:  
vibrations,  
broadband noise - long-term test Fh  
shock stressing - Ea test in compliance with DIN 61 373
- DIN EN 61 587 mechanical and safety tests for electronic equipment tests for vibrations and shocks for cabinets, racks and plug-in units

the following were tested:  
dynamic tests, DL 4  
resonance analysis - test Fc  
fixed frequency vibration,  
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 components in compliance with IEC 297-3 and IEEE 1101.10/1101.11
- EMC-compliant design
- complete solutions with integrated ventilation
- wide range of standard products
- individual configurations available
- can also be used as a CompactPCI

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





## 19" subrack, 3 U

- high stability
- 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



## Specifications

### Application:

- for plug-in modules in compliance with IEC 297-3 and IEEE 1101.10/1101.11

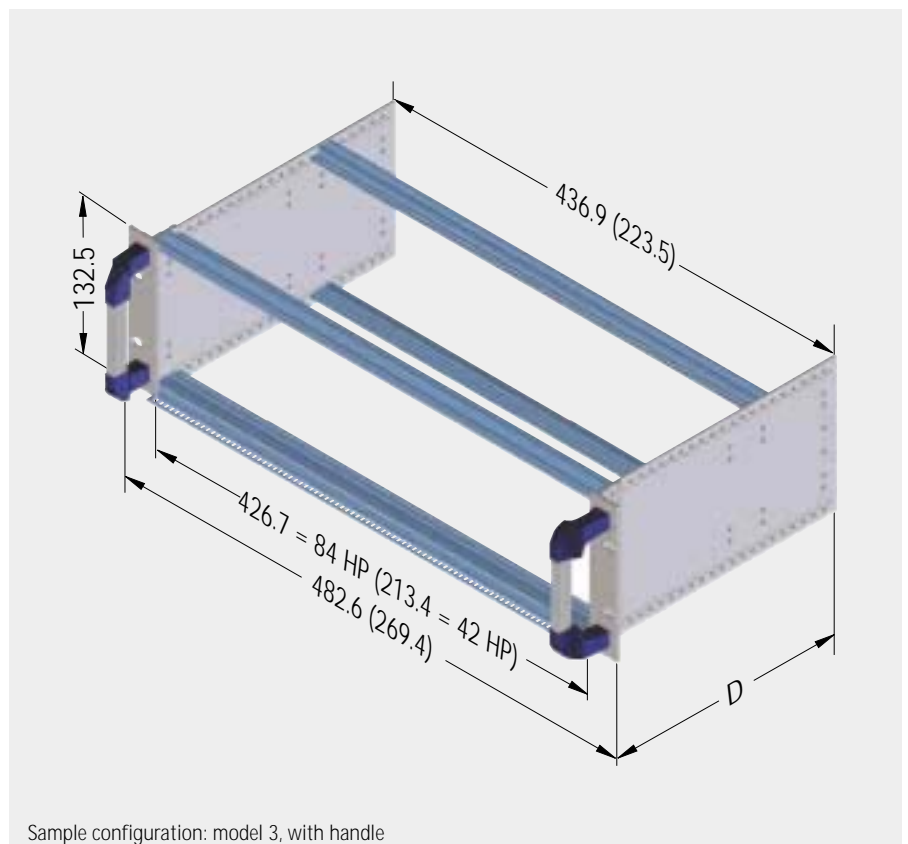
### Material/finish:

- Side panels: aluminium, 2.5mm transparent chromated
- Module rail: aluminium extrusion transparent chromated
- Front fixing brackets: aluminium extrusion transparent chromated

Delivery: kit form

## Included in 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, M4 x 12 toothed head
6	2	Threaded inserts, M2.5 7mm x 2mm
7	2	Threaded inserts, M2.5 5mm x 1.5mm (only for rear BUS module rails)
8		Assembly material



## Accessories

- Expansion kit for 3 U subracks page 5.42
- Shielding panels page 5.39
- Rear panels page 5.38
- Card guides beginning on page 5.56

## Suitable components

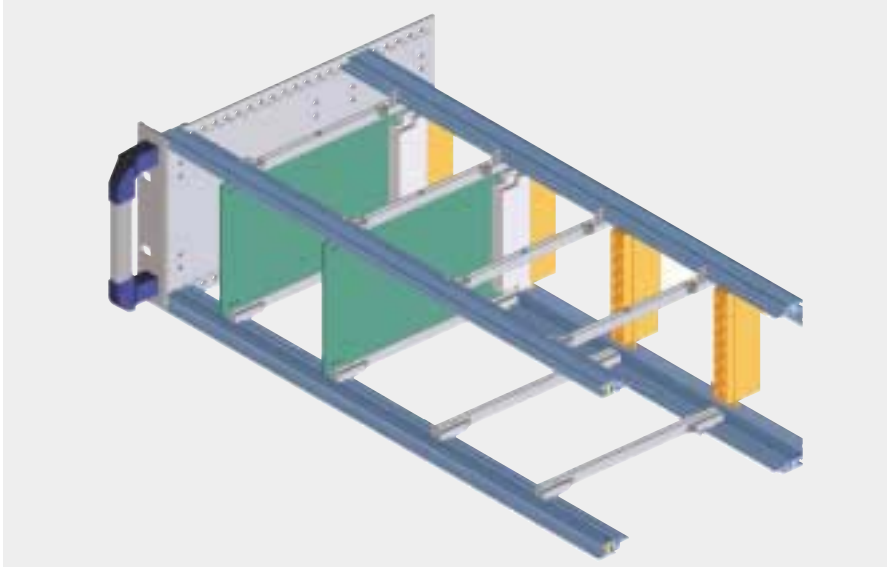
- Insertion/extraction handle beginning on page 5.75
- Front panels beginning on page 5.67
- Cassettes/sub-units beginning on p. 5.77



## 245 • 19" subrack, 3 U



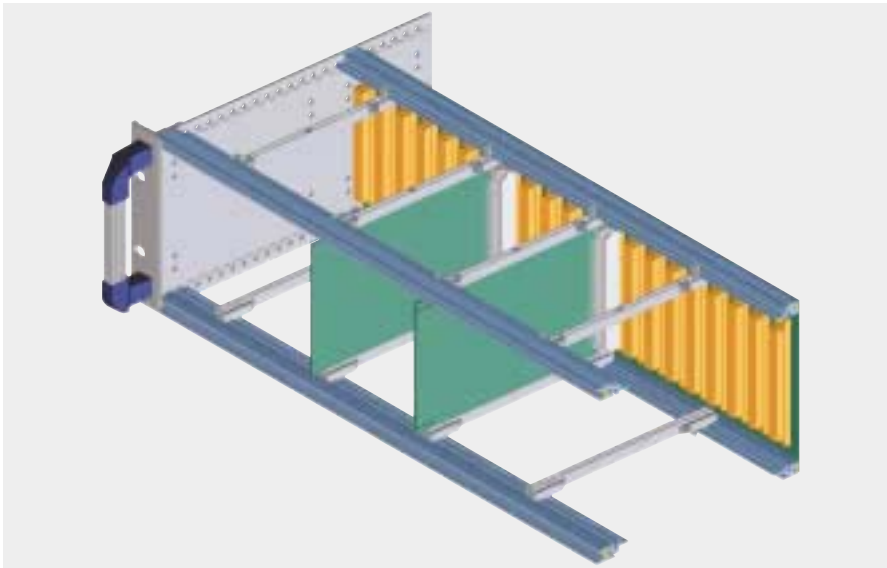
### Models, 3 U



#### Model 1

**front**  
standard module rails 241-022  
with threaded inserts, M2.5

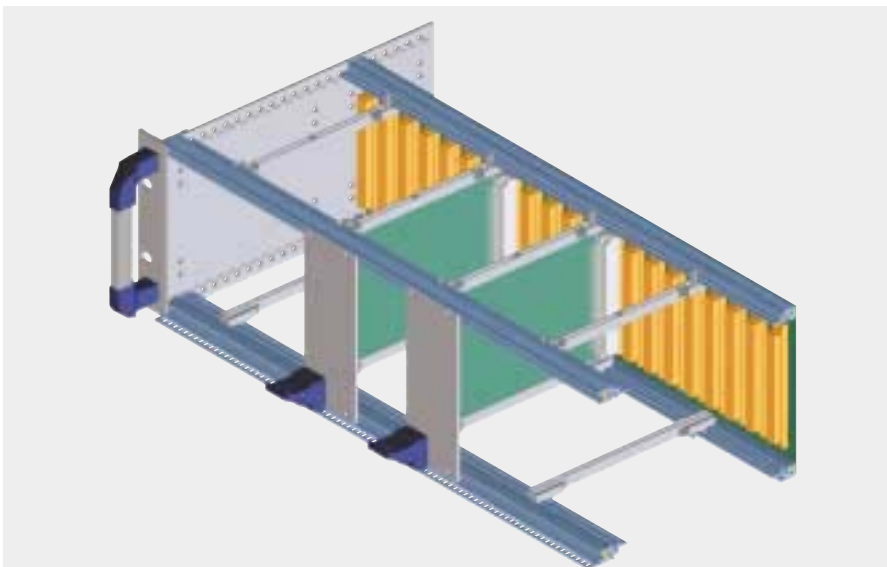
**rear**  
narrow module rails 241-019  
with built-in mounting rails for plug-in  
connections in compliance with  
DIN 41612



#### Model 2

**front**  
standard module rails 241-022  
with threaded inserts, M2.5

**rear**  
BUS module rails 241-013  
with threaded inserts, M2.5



#### Model 3

**front**  
standard module rail 241-022,  
standard module rail 241-019  
with 10mm clearance for insertion/  
extraction handle and threaded inserts,  
M2.5

**rear**  
BUS module rails 241-013  
with threaded inserts, M2.5



Order information

Model 1		Model 2		Model 3	
176mm depth		176mm depth		176mm depth	
Description	Part no.	Description	Part no.	Description	Part no.
84 HP, with handle	24-5314-11	84 HP, with handle	24-5314-21	84 HP, with handle	24-5314-31
84 HP, without handle	24-5311-11	84 HP, without handle	24-5311-21	84 HP, without handle	24-5311-31
42 HP, with handle	24-5334-11	42 HP, with handle	24-5334-21	42 HP, with handle	24-5334-31
42 HP, without handle	24-5331-11	42 HP, without handle	24-5331-21	42 HP, without handle	24-5331-31
236mm depth		236mm depth		236mm depth	
Description	Part no.	Description	Part no.	Description	Part no.
84 HP, with handle	24-5315-11	84 HP, with handle	24-5315-21	84 HP, with handle	24-5315-31
84 HP, without handle	24-5312-11	84 HP, without handle	24-5312-21	84 HP, without handle	24-5312-31
42 HP, with handle	24-5335-11	42 HP, with handle	24-5335-21	42 HP, with handle	24-5335-31
42 HP, without handle	24-5332-11	42 HP, without handle	24-5332-21	42 HP, without handle	24-5332-31
296mm depth		296mm depth		296mm depth	
Description	Part no.	Description	Part no.	Description	Part no.
84 HP, with handle	24-5316-11	84 HP, with handle	24-5316-21	84 HP, with handle	24-5316-31
84 HP, without handle	24-5313-11	84 HP, without handle	24-5313-21	84 HP, without handle	24-5313-31
42 HP, with handle	24-5336-11	42 HP, with handle	24-5336-21	42 HP, with handle	24-5336-31
42 HP, without handle	24-5333-11	42 HP, without handle	24-5333-21	42 HP, without handle	24-5333-31

Note: The lighter colour rear rails show optional installation positions.



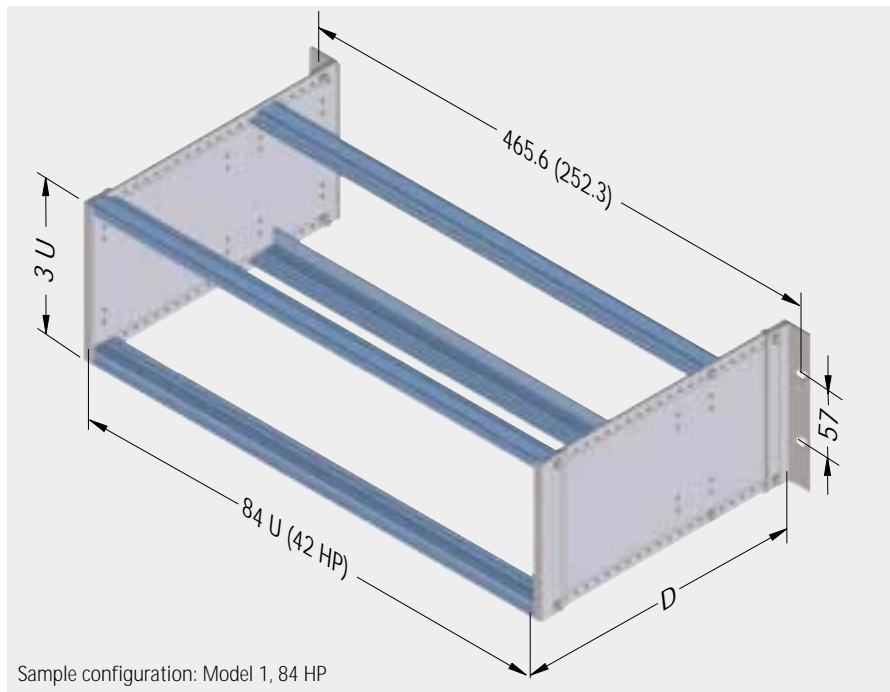
## 245 • 19" subrack, 3 U for wall mounting



### 19" subrack, 3 U for wall mounting

- depth mounting increment  $d = 10\text{mm}$
- can be expanded
- module rails are prevented from rotating

### Specifications



#### Application:

- for plug-in modules in compliance with IEC 297-3 and IEEE 1101.10/1101.11

#### Material/finish:

- Side panels: aluminium, 2.5mm transparent chromated
- Module rail: aluminium extrusion transparent chromated
- Front/cover angle bracket: aluminium extrusion transparent chromated

Delivery: kit form

### Included in delivery

Item	Pc.	Description
1	2	Module rails, front
2	2	Module rails, rear
3	2	Side panels
4	2	Front angle bracket/attachment
5	2	Cover angle bracket
6	8	Oval head screws, M4 x 12 toothed head

Item	Pc.	Description
7	2	Threaded inserts, M2.5 7mm x 2mm
8	2	Threaded inserts, M2.5 5mm x 1.5mm (only for rear BUS module rail)
9		Assembly material





## Order information

Model 1		Model 2		Model 3	
236mm depth		236mm depth		236mm depth	
Description	Part no.	Description	Part no.	Description	Part no.
84 HP	24-5312-17	84 HP	24-5312-27	84 HP	24-5312-37
42 HP	24-5332-17	42 HP	24-5332-27	42 HP	24-5332-37
296mm depth		296mm depth		296mm depth	
Description	Part no.	Description	Part no.	Description	Part no.
84 HP	24-5313-17	84 HP	24-5313-27	84 HP	24-5313-37
42 HP	24-5333-17	42 HP	24-5333-27	42 HP	24-5333-37

Note: The lighter colour rear rails show optional installation positions.

## Accessories

6 U expansion kit for 3 U subracks page 5.42  
 Shielding panels page 5.39  
 Rear panels page 5.38  
 EMC springs page 5.38  
 Card guides beginning on page 5.56

## Matching modules

Sub-units beginning on page 5.77  
 Cassettes beginning on page 5.82  
 Front panels beginning on page 5.67  
 Insertion/extraction handle page 5.75

Note: Other dimensions available on request.



## 245 • 19" subrack, 3 U for automatic circuit breakers

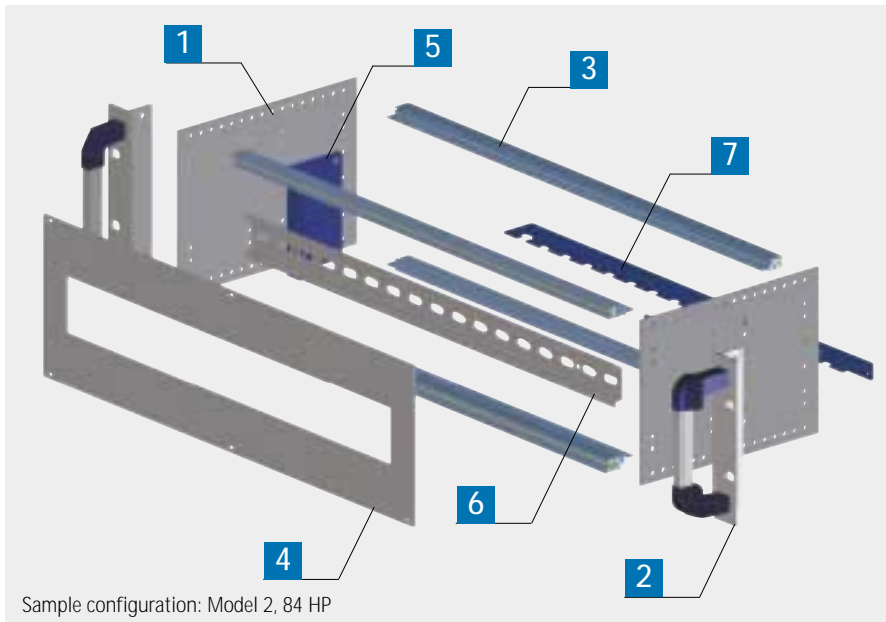


Sample configuration with cover panels (custom version)

### 19" subrack, 3 U for automatic circuit breakers

- quick access to wiring space
- holds components stably in place in compliance with DIN 43 880 in sizes 1-3
- cable ducts for rear cable tension relief

### Specifications



Sample configuration: Model 2, 84 HP

#### Application:

for installing automatic circuit breakers

#### Material/finish:

Side panels: aluminium, 2.5mm transparent chromated  
 Module rail: aluminium extrusion transparent chromated  
 Front fixing brackets: aluminium extrusion transparent chromated

Delivery: kit form

### Included in delivery

Item	Pc.	Description
1	2	Side panels
2	2	Front angle brackets with handles
3	4	Module rails
4	1	Front panel
5	2	Fixing bracket
6	1	Mounting rail TS 35
7	1	Cable duct
8		Assembly material

### Order information

Description	Part no.
19" subrack, 3 U/84 U	24-5311-80

### Accessories

#### Cover strips S 35 G

- for covering cut-outs in the front plate
- for masking in the 9mm grid pre-punched

Material: plastic

Length mm	Part no.
219	64-0222-00



## 19" subrack, 6 U, single row

- strong
- 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



Sample configuration: model 1, without handle

## Specifications

### Application:

- for plug-in modules in compliance with IEC 297-3 and IEEE 1101.10/1101.11
- double Europe cards, 233.35mm x 160mm

### Material/finish:

- Side panels: aluminium, 2.5mm transparent chromated
- Module rail: aluminium extrusion transparent chromated
- Front fixing brackets: aluminium extrusion transparent chromated

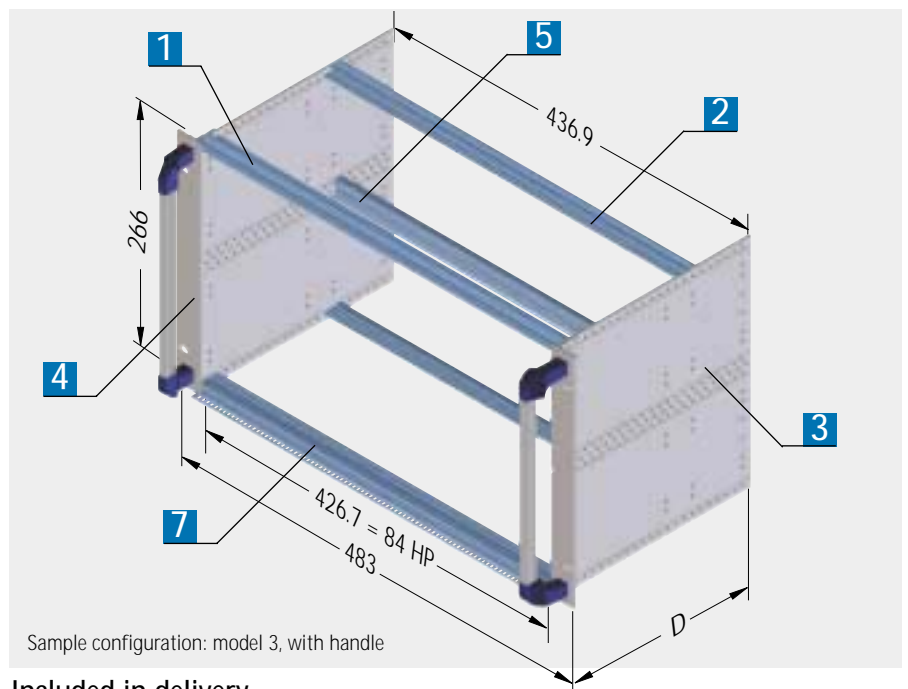
Delivery: kit form

## Accessories

- Expansion kit for 6 U subracks page 5.43
- Shielding panels page 5.39
- Rear panels page 5.38
- EMC contact springs page 5.44
- Card guides page 5.56

## Suitable components

- Front panels beginning on page 5.67
- Cassettes/sub-units beginning on p. 5.77
- Insertion/extraction handle beginning on page 5.75



Sample configuration: model 3, with handle

## Included in 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, M4 x 12 toothed head

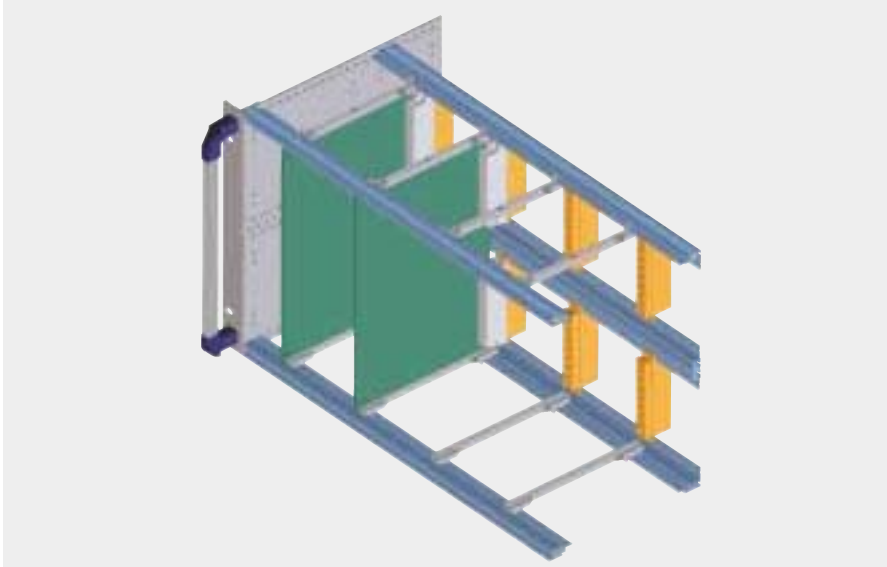
Item	Pc.	Description
7	2	Threaded inserts M2.5 7mm x 2mm
8	4	Threaded inserts M2.5 5mm x 1.5mm (only if rear BUS module rail)
9		Assembly material



## 245 • 19" subrack, 6 U, single row



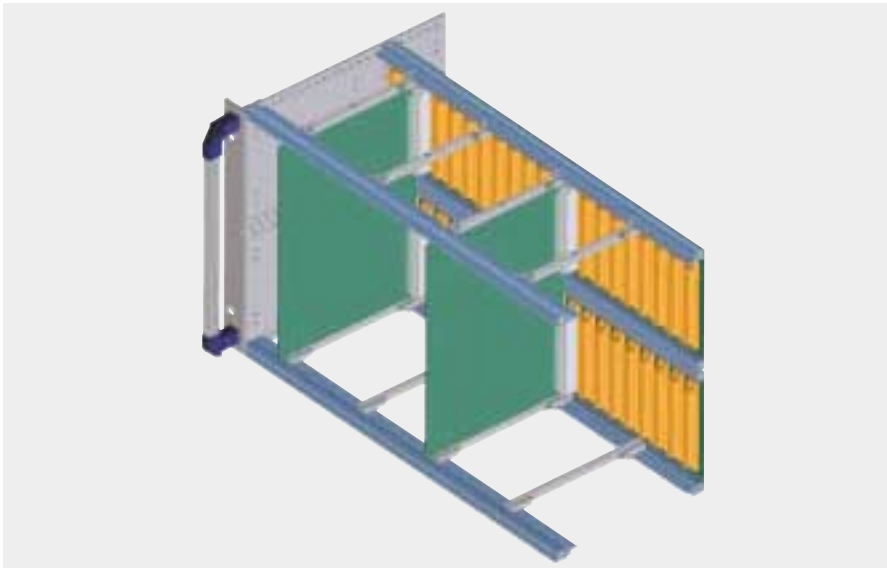
### Models, 6 U, single row



#### Model 1

**front**  
standard module rails 241-022  
with threaded inserts, M2.5

**rear**  
narrow module rails 241-019  
and support rail with integrated mounting  
rails for plug-in connections in compliance  
with DIN 41612

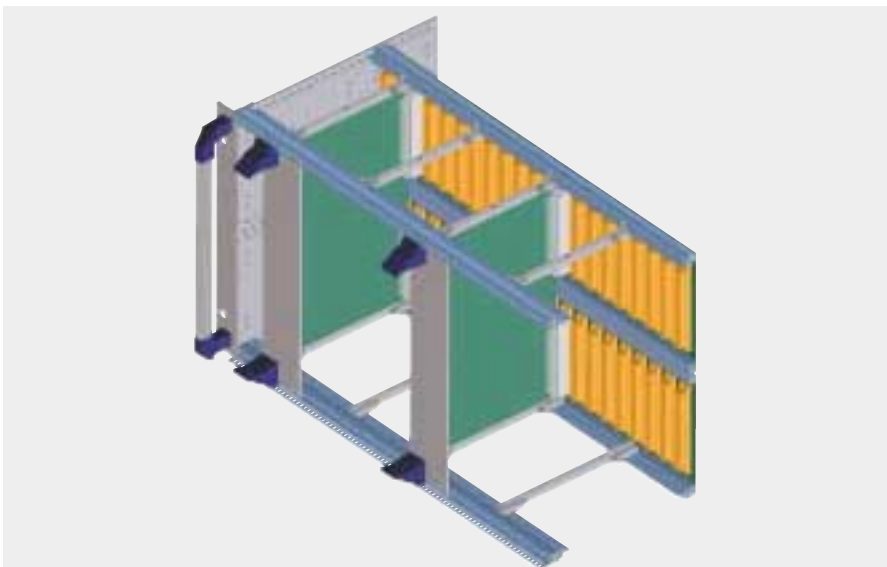


#### Model 2

**front**  
standard module rails 241-022  
with threaded inserts, M2.5

**rear**  
BUS module rails 241-013  
with threaded inserts, M2.5

and BUS support rail 241-020  
with threaded inserts, M2.5



#### Model 3

**front**  
standard module rails 241-049  
with 10mm clearance for insertion/  
extraction handle and for threaded  
inserts, M2.5

**rear**  
BUS module rails 241-013  
with threaded inserts, M2.5

and BUS support rail 241-020  
with threaded inserts, M2.5





Order information

Model 1		Model 2		Model 3	
176mm depth		176mm depth		176mm depth	
<b>Description</b>	<b>Part no.</b>	<b>Description</b>	<b>Part no.</b>	<b>Description</b>	<b>Part no.</b>
84 HP, with handle	24-5614-11	84 HP, with handle	24-5614-21	84 HP, with handle	24-5614-31
84 HP, without handle	24-5611-11	84 HP, without handle	24-5611-21	84 HP, without handle	24-5611-31
236mm depth		236mm depth		236mm depth	
<b>Description</b>	<b>Part no.</b>	<b>Description</b>	<b>Part no.</b>	<b>Description</b>	<b>Part no.</b>
84 HP, with handle	24-5615-11	84 HP, with handle	24-5615-21	84 HP, with handle	24-5615-31
84 HP, without handle	24-5612-11	84 HP, without handle	24-5612-21	84 HP, without handle	24-5612-31
296mm depth		296mm depth		296mm depth	
<b>Description</b>	<b>Part no.</b>	<b>Description</b>	<b>Part no.</b>	<b>Description</b>	<b>Part no.</b>
84 HP, with handle	24-5616-11	84 HP, with handle	24-5616-21	84 HP, with handle	24-5616-31
84 HP, without handle	24-5613-11	84 HP, without handle	24-5613-21	84 HP, without handle	24-5613-31

Note: The lighter colour rear rails show optional installation positions.

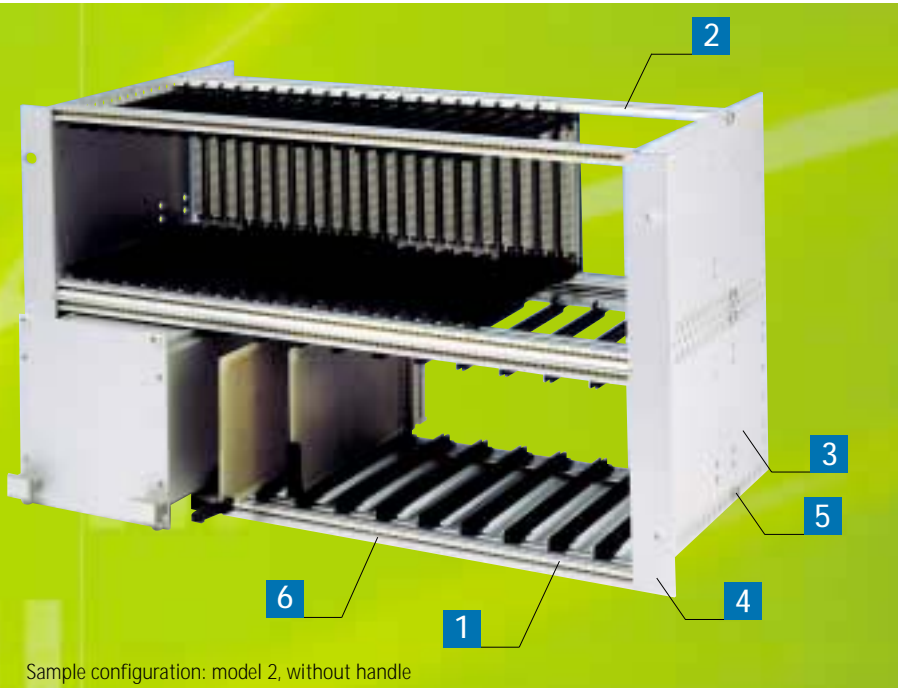


## 245 • 19" subrack, 6 U, double row



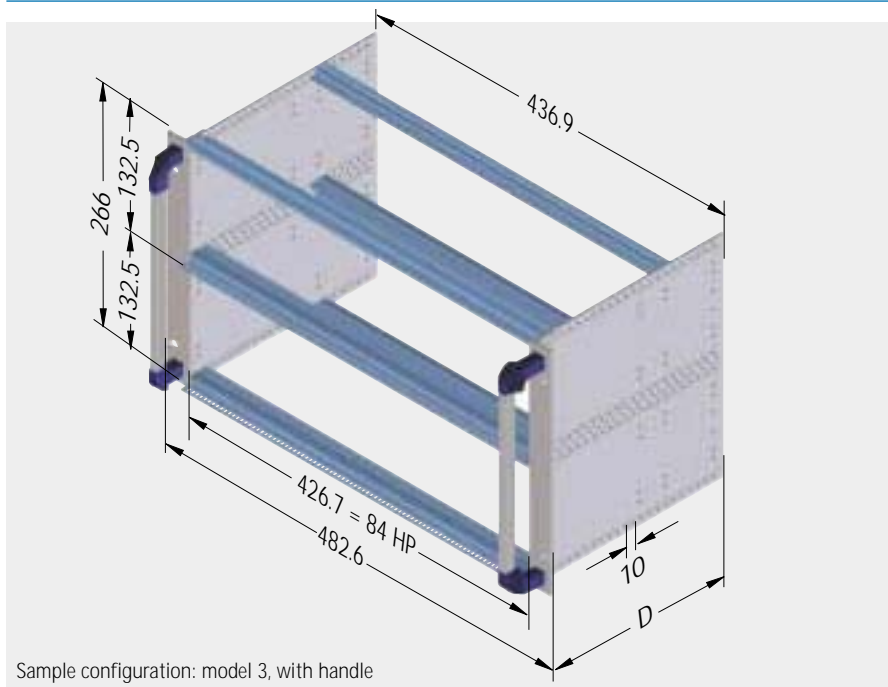
### 19" subrack, 6 U, double row

- high flexibility
- can be expanded to EMC model, even between 2 x 3 U front partitions
- depth mounting increment  $d = 10\text{mm}$
- module rails are prevented from rotating



Sample configuration: model 2, without handle

### Specifications



Sample configuration: model 3, with handle

#### Application:

- for plug-in modules in compliance with IEC 297-3 and IEEE 1101.10/1101.11
- Europe cards, 100mm x 160mm

#### Material/finish:

- Side panels: aluminium, 2.5mm transparent chromated
- Module rail: aluminium extrusion transparent chromated
- Front angle brackets: aluminium extrusion transparent chromated

Delivery: kit form

#### Accessories

- Shielding panels page 5.39
- Rear panels page 5.38
- EMC contact springs page 5.44
- Card guides page 5.56

#### Suitable components

- Front panels beginning on page 5.67
- Cassettes/sub-units beginning on page 5.77
- Insertion/extraction handle beginning on page 5.75

#### Included in delivery

Item	Pc.	Description
1	4	Module rails, front
2	4	Module rails, rear
3	2	Side panels
4	2	Front angle bracket with or without handle
5	16	Oval head screws, M4 x 12 toothed head

Item	Pc.	Description
6	4	Threaded inserts, M2.5 7mm x 2mm
7	4	Threaded inserts, M2.5 5mm x 1.5mm (only if rear BUS module rail)
8		Assembly material



Models, 6 U, double row

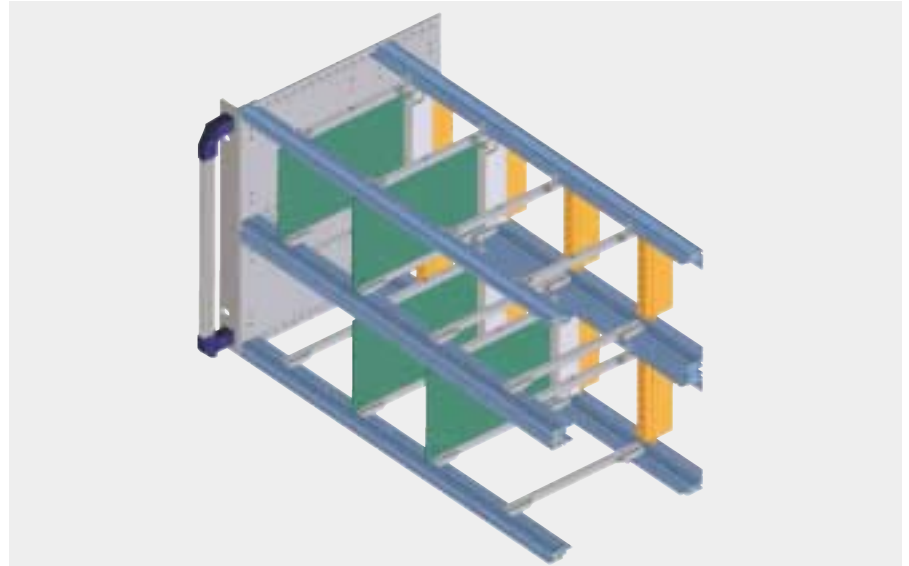
Model 1

front

standard module rails 241-022  
with threaded inserts, M2.5

rear

narrow module rails 241-019  
with integrated mounting rails for  
plug-in connections in compliance  
with DIN 41612



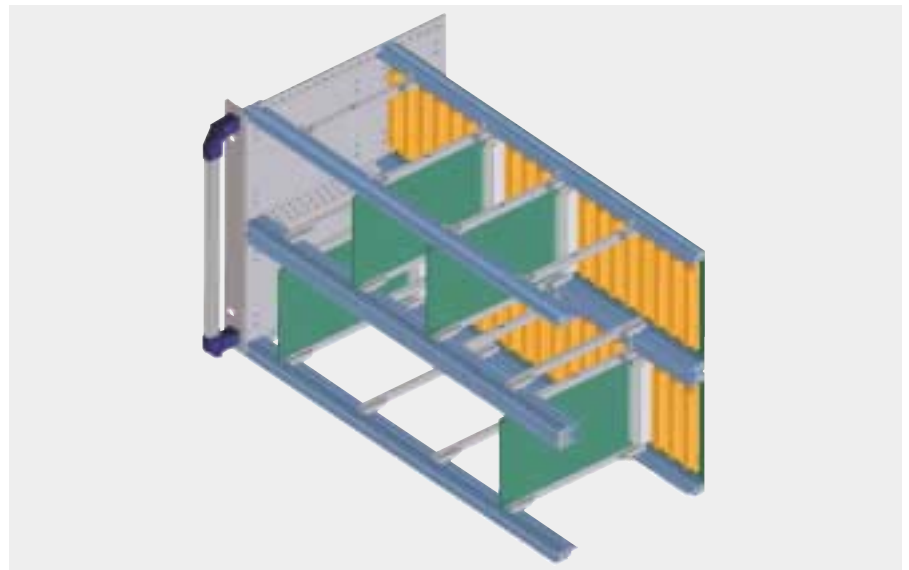
Model 2

front

standard module rails 241-022  
with threaded inserts, M2.5

rear

BUS module rails 241-013  
with threaded inserts, M2.5



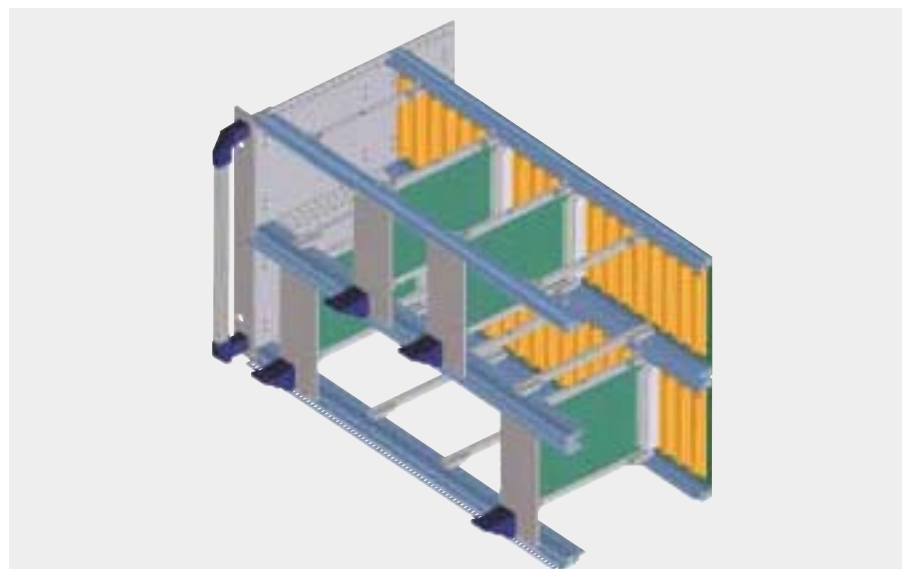
Model 3

front

standard module rails 241-022,  
standard module rails 241-049  
with 10mm clearance for grips for  
inserting/ removing cards and for  
threaded inserts, M2.5

rear

BUS module rails 241-013  
with threaded inserts, M2.5





# 245 • 19" subrack, 6 U, double row



## Order information

Model 1		Model 2		Model 3	
176mm depth		176mm depth		176mm depth	
Description	Part no.	Description	Part no.	Description	Part no.
84 HP, with handle	24-5614-12	84 HP, with handle	24-5614-22	84 HP, with handle	24-5614-32
84 HP, without handle	24-5611-12	84 HP, without handle	24-5611-22	84 HP, without handle	24-5611-32
236mm depth		236mm depth		236mm depth	
Description	Part no.	Description	Part no.	Description	Part no.
84 HP, with handle	24-5615-12	84 HP, with handle	24-5615-22	84 HP, with handle	24-5615-32
84 HP, without handle	24-5612-12	84 HP, without handle	24-5612-22	84 HP, without handle	24-5612-32
296mm depth		296mm depth		296mm depth	
Description	Part no.	Description	Part no.	Description	Part no.
84 HP, with handle	24-5616-12	84 HP, with handle	24-5616-22	84 HP, with handle	24-5616-32
84 HP, without handle	24-5613-12	84 HP, without handle	24-5613-22	84 HP, without handle	24-5613-32

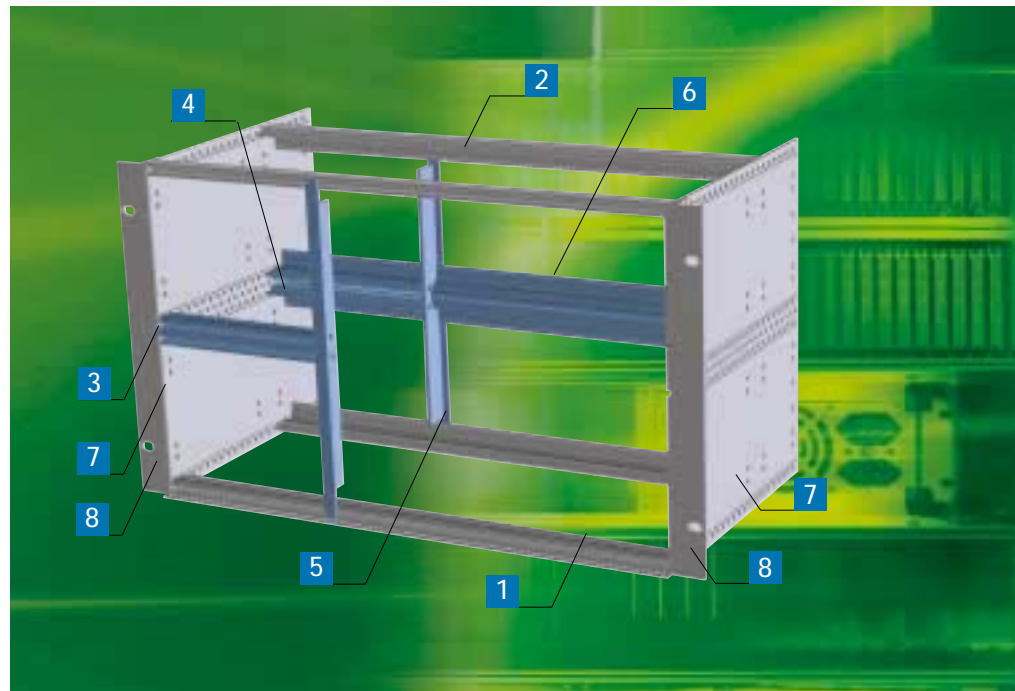
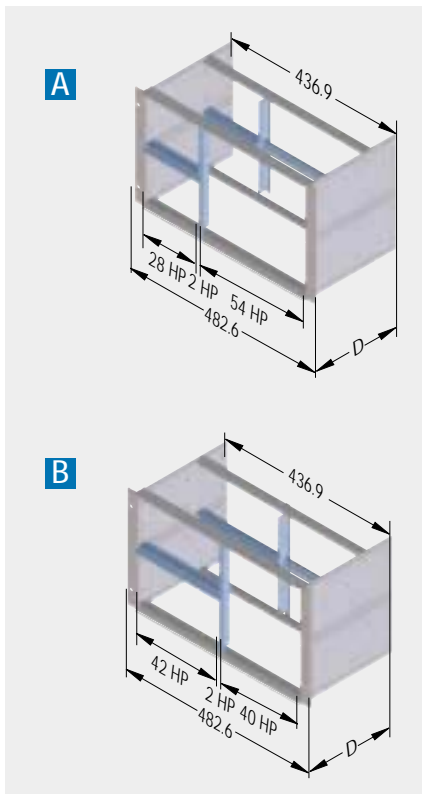




## 19" subrack with 2 x 3 U expansion kit

- high flexibility
- depth mounting increment  $d = 10\text{mm}$
- can be expanded to EMC model, even between the front 2 x 3 U partitions
- module rails are prevented from rotating

## Specifications



### Application:

- for plug-in modules in compliance with IEC 297-3 and IEEE 1101.10/1101.11
- Europe cards, 100mm x 160mm
- double Europe cards, 233.35mm x 160mm

### Material/finish:

- Side panels: aluminium, 2.5mm transparent chromated
- Module rail: aluminium extrusion transparent chromated
- Front angle brackets: aluminium extrusion transparent chromated

Delivery: kit form

## Accessories

- Shielding panels page 5.39
- Rear panels page 5.38
- EMC contact springs page 5.44
- Card guides page 5.56

## Suitable components

- Front panels beginning on page 5.67
- Cassettes/sub-units beginning on page 5.77
- Insertion/extraction handle beginning on page 5.75

## Included in delivery

Item	Pc.	Description
1	2	Module rails, front 85 HP
2	2	Module rails, rear 85 HP
3	2	Module rails, front 29/43/57 HP
4	2	Module rails, rear 29/43/57 HP
5	2	Mounting struts
6	1	Support rail 55.5/41.5/27.5 HP
7	2	Side panels
8	2	Front angle bracket w/w/o handle
9	17	Oval head screws M4 x 12
10	2	Threaded inserts M2.5, 84 HP

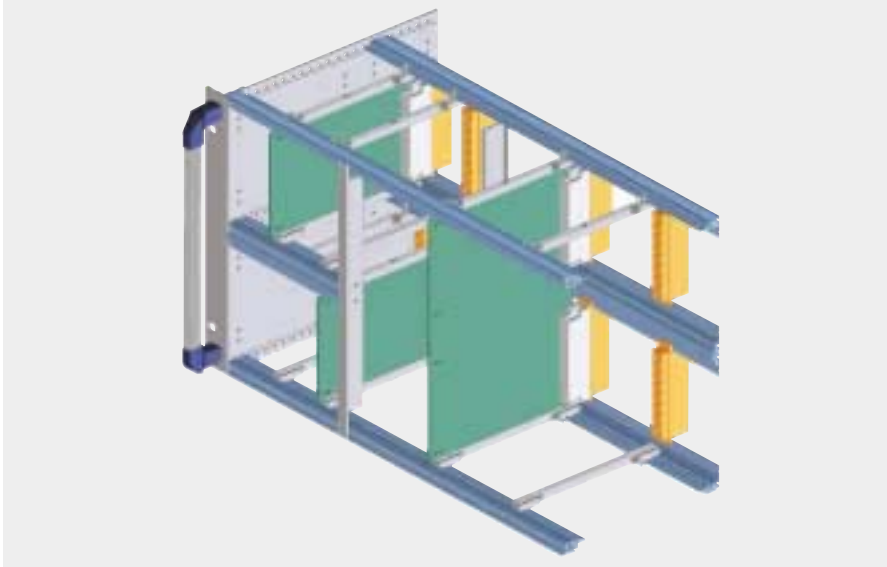
Item	Pc.	Description
11	2	Threaded inserts, M2.5, 84 HP (only for rear BUS module rail)
12	2	Threaded inserts, M2.5 27/41/55 HP
13	2	Threaded insert, M2.5 54/40/26 HP (only for rear BUS module rail)
14	2	Threaded inserts, M2.5 55/41/27 HP (only for rear BUS support rail)
15		Assembly material



## 245 • 19" subrack, 6 U with 2 x 3 U expansion kit



### 6 U models with 2 x 3 U expansion kit



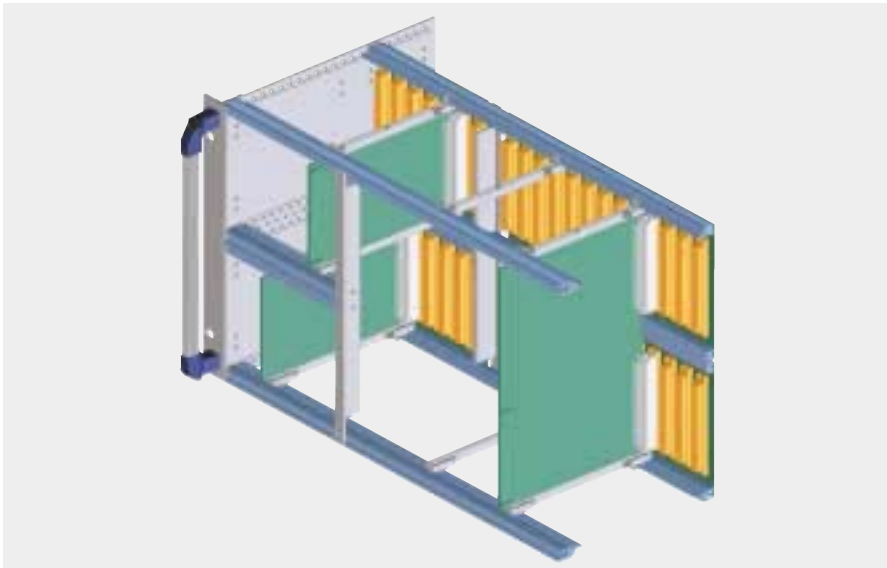
#### Model 1

**front**

standard module rails 241-022  
with threaded inserts, M2.5

**rear**

narrow module rails 241-019  
and support rail with integrated  
mounting rails for plug-in connections  
in compliance with DIN 41612



#### Model 2

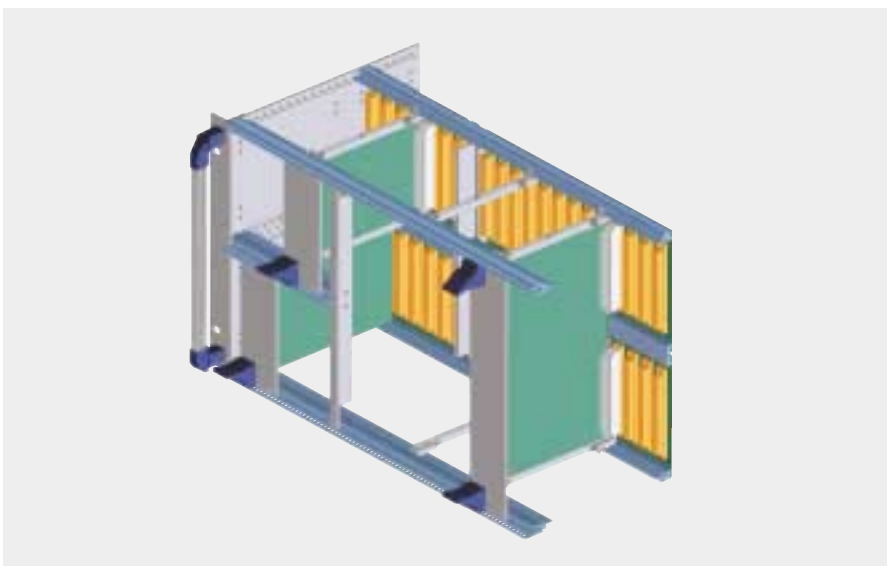
**front**

standard module rails 241-022  
with threaded inserts, M2.5

**rear**

BUS module rails 241-013  
with threaded inserts, M2.5

and BUS support rail 241-020  
with threaded inserts, M2.5



#### Model 3

**front**

standard module rails 241-022,  
standard module rail 241-019  
with 10mm clearance for insertion/  
extraction handle and for threaded  
inserts, M2.5

**rear**

BUS module rails 241-013  
with threaded inserts, M2.5

and BUS support rail 241-020  
with threaded inserts, M2.5



Order information

Model 1		Model 2		Model 3	
236mm depth		236mm depth		236mm depth	
Description	Part no.	Description	Part no.	Description	Part no.
<b>A</b> 28/54 HP, with handle 28/54 HP, w/o handle	24-5615-13 24-5612-13	<b>A</b> 28/54 HP, with handle 28/54 HP, w/o handle	24-5615-23 24-5612-23	<b>A</b> 28/54 HP, with handle 28/54 HP, w/o handle	24-5615-33 24-5612-33
<b>B</b> 42/40 HP, with handle 42/40 HP, w/o handle	24-5615-14 24-5612-14	<b>B</b> 42/40 HP, with handle 42/40 HP, w/o handle	24-5615-24 24-5612-24	<b>B</b> 42/40 HP, with handle 42/40 HP, w/o handle	24-5615-34 24-5612-34
<b>C</b> 56/26 HP, with handle 56/26 HP, w/o handle	24-5615-15 24-5612-15	<b>C</b> 56/26 HP, with handle 56/26 HP, w/o handle	24-5615-25 24-5612-25	<b>C</b> 56/26 HP, with handle 56/26 HP, w/o handle	24-5615-35 24-5612-35
296mm depth		296mm depth		296mm depth	
Description	Part no.	Description	Part no.	Description	Part no.
<b>A</b> 28/54 HP, with handle 28/54 HP, w/o handle	24-5616-13 24-5613-13	<b>A</b> 28/54 HP, with handle 28/54 HP, w/o handle	24-5616-23 24-5613-23	<b>A</b> 28/54 HP, with handle 28/54 HP, w/o handle	24-5616-33 24-5613-33
<b>B</b> 42/40 HP, with handle 42/40 HP, w/o handle	24-5616-14 24-5613-14	<b>B</b> 42/40 HP, with handle 42/40 HP, w/o handle	24-5616-24 24-5613-24	<b>B</b> 42/40 HP, with handle 42/40 HP, w/o handle	24-5616-34 24-5613-34
<b>C</b> 56/26 HP, with handle 56/26 HP, w/o handle	24-5616-15 24-5613-15	<b>C</b> 56/26 HP, with handle 56/26 HP, w/o handle	24-5616-25 24-5613-25	<b>C</b> 56/26 HP, with handle 56/26 HP, w/o handle	24-5616-35 24-5613-35

Note: The lighter colour rear rails show optional installation positions.



## 245 • 19" subrack, 2 U

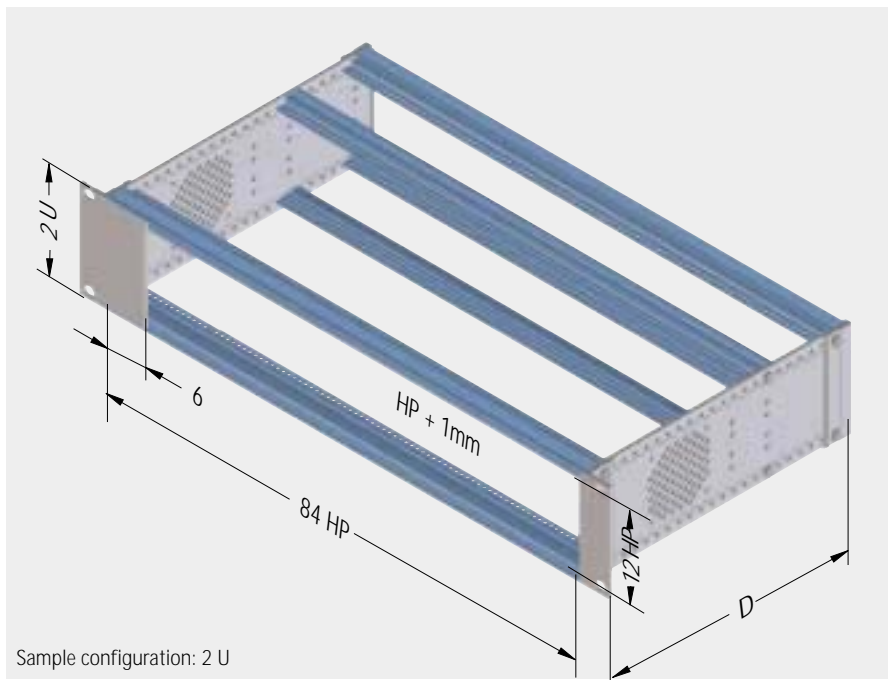


Sample configuration with expansion kits 3 and 6 U

### 19" subrack 2 U, 84 HP

- ventilated side panels with fan option
- ideal for installing subracks vertically in appropriate 19" apra-norm wall-mounted enclosures, such as Vari 2000 (see p. 2.4) or Vari Industry (see p. 2.7)
- module rails are prevented from rotating

### Specifications



Sample configuration: 2 U

#### Application:

- for plug-in modules in compliance with IEC 297-3 and IEEE 1101.10/1101.11

#### Material/finish:

- Side panels: aluminium, 2.5mm transparent chromated
- Module rail: aluminium extrusion transparent chromated
- Front/cover angle bracket: aluminium extrusion transparent chromated

Delivery: kit form

### Models

#### front

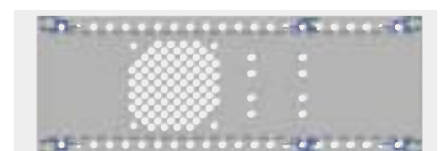
standard module rails 241-022 with threaded inserts, M2.5

#### middle

BUS module rails 241-013 with threaded inserts, M2.5

#### rear

standard module rails 241-022 with threaded inserts, M2.5



Description	Part no.
D = 236mm	24-5212-28
D = 296mm	24-5213-28

### Included in delivery

Item	Pc.	Description
1	2	Module rails, front
2	2	Module rails, rear
3	2	Module rails, middle
4	2	Side panels, ventilated
5	1	Front panel
6	2	Front angle bracket
7	2	Cover angle bracket
8	4	Threaded inserts, M2.5 7mm x 2mm

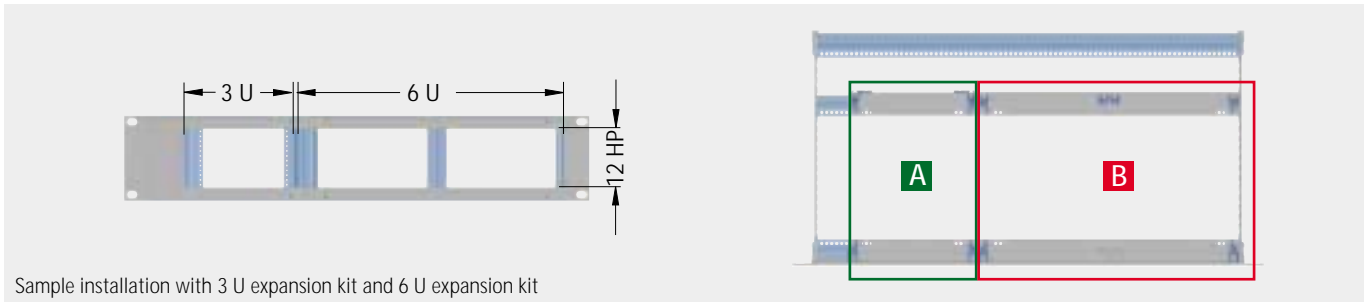
Item	Pc.	Description
9	2	Threaded inserts, M2.5 5mm x 1.5mm (only for rear BUS module rail)
10	12	Oval head screws M4 x 12 toothed head
11		Assembly material





Order information

Expansion kits



Sample installation with 3 U expansion kit and 6 U expansion kit

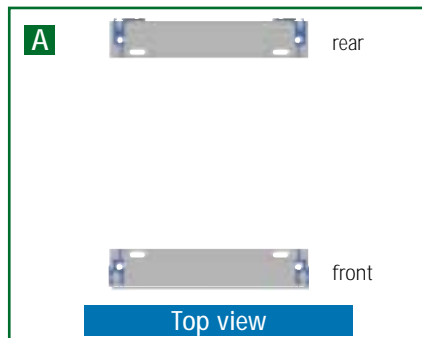
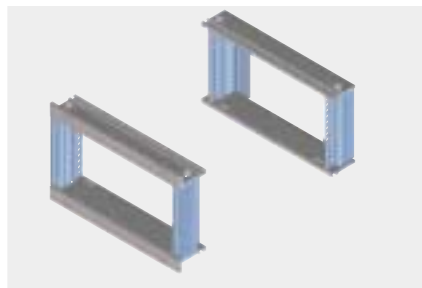
- for installing Europe cards or double Europe cards horizontally in a 2 U subrack
- the following combinations are possible in 84 HP subracks:

one 3 U expansion kit + one 6 U expansion kit

up to three 3 U expansion kits

Expansion kit, 3 U/12 HP

- for installing Europe cards horizontally



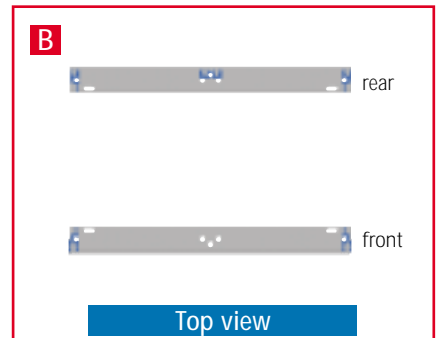
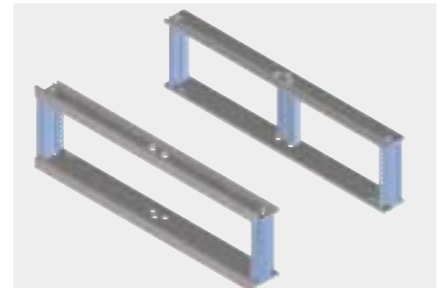
front standard module rails profile no. 241-022

rear narrow module rails with integrated mounting rail for plug-in connections in compliance with DIN 41612, profile no. 241-019

<b>Part no.</b>
24-5312-61

Expansion kit, 6 U/12 HP

- for installing double Europe cards horizontally



front standard module rails profile no. 241-022

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

<b>Part no.</b>
24-5612-62

Accessories

Shielding panels	page 5.39
EMC contact springs	page 5.44
Card guides	page 5.56

Suitable components

Front panels	page 5.67
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Fan, 12V

- flow rate: 40m<sup>3</sup>/h
- noise level: 40dB(A)



<b>Dimensions</b>	<b>Part no.</b>
60 x 60 x 25	230-825

Note: Other expansion kits available on request.



## 245 • 19" subrack, 4 U and 7 U



Sample configuration: 4 U, without handle

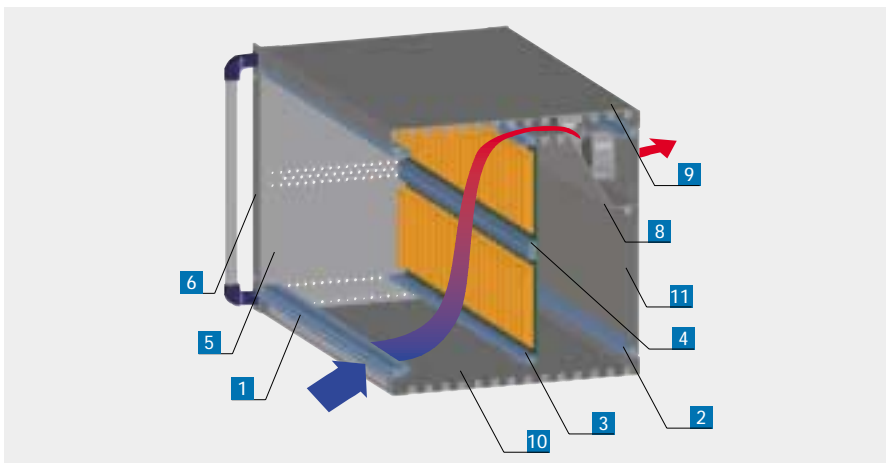


Sample configuration: 7 U, with handle

### 19" subrack, 4 U/7 U

- optimum exhaust of warm air from inside of the subrack
- draws in cooler air through ventilation holes in the front of the subrack
- warm air is blown out through the rear of the subrack by up to 3 fans preventing the modules from heating

### Specifications



#### Application:

- for installation in 19" cabinets or enclosures
- for plug-in modules in compliance with IEC 297-3 and IEEE 1101.10/1101.11

#### Material:

Side panels: aluminium, 2.5mm transparent chromated  
 Module rail: aluminium extrusion transparent chromated

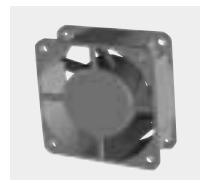
Front/cover angle bracket: aluminium extrusion transparent chromated

Delivery: kit form

#### Accessories

##### Fan, 12V

- flow rate: 40m<sup>3</sup>/h
- noise level: 40dB(A)



Dimensions	Part no.
60 x 60 x 25	230-825

#### Included in delivery

Item	Pc.	Description
1	2	Module rails, front
2	2	Module rails, rear
3	2	Module rails, middle
4	1	Support rail, middle (only for 7 U)
5	2	Side panels
6	2	Front angle bracket with/w/o handle
7	2	Cover angle bracket
8	1	Air guide panel

Item	Pc.	Description
9	1	Top panel
10	1	Floor panel, ventilated
11	1	Rear panel, ventilated
12	4	Threaded inserts, M2.5 7mm x 2mm
13	2	Threaded inserts, M2.5 5mm x 1.5mm (4 pc. for 7 U)
14		Assembly material



### 4 U and 7 U models

#### Model 1

##### 4 U

###### front

standard module rails 241-022

###### middle

narrow module rails 241-019 with integrated mounting rails for plug-in connections in compliance with DIN 41612

###### rear

standard module rails 241-022

##### 7 U

###### front

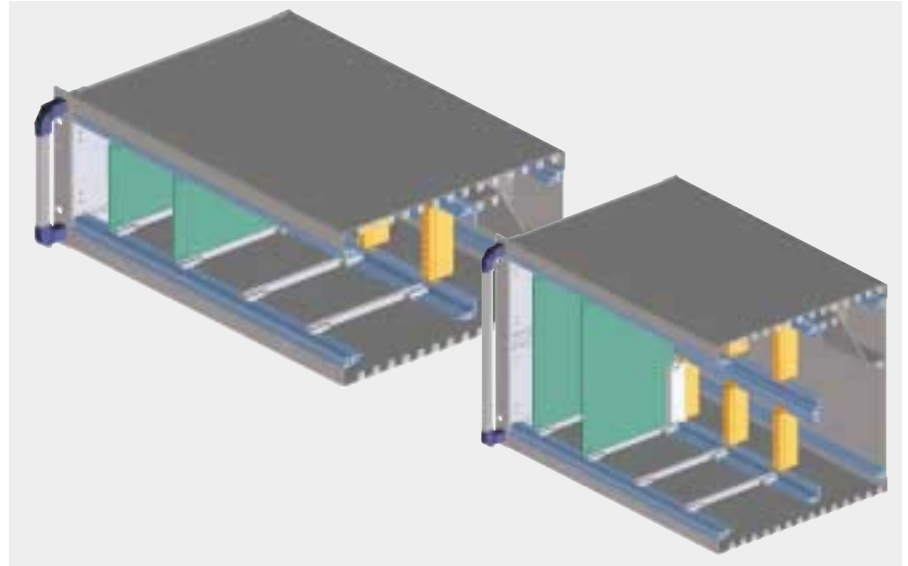
standard module rails 241-022

###### middle

narrow module rails 241-019 and support rails 241-008 with integrated mounting rails for plug-in connections in compliance with DIN 41612

###### rear

standard module rails 241-022



#### Model 2

##### 4 U

###### front

standard module rails 241-022

###### middle

BUS module rails 241-013

###### rear

standard module rails 241-022

##### 7 U

###### front

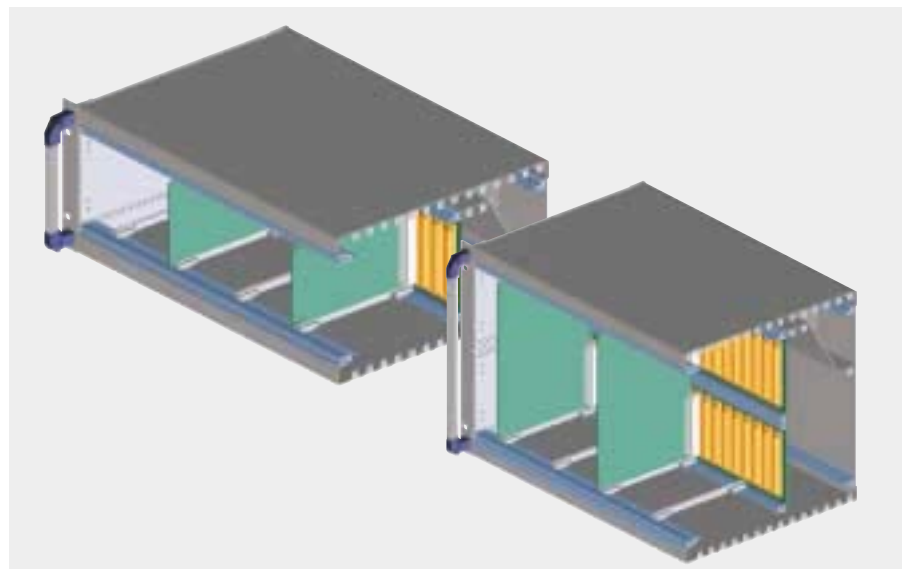
standard module rails 241-022

###### middle

BUS module rails 241-013, BUS support rails 241-020

###### rear

standard module rails 241-022



#### Model 3

##### 4 U

###### front

standard module rail 241-022, standard module rail 241-019 with 10mm clearance for insertion/extraction handle

###### middle

BUS module rails 241-013

###### rear

standard module rails 241-022

##### 7 U

###### front

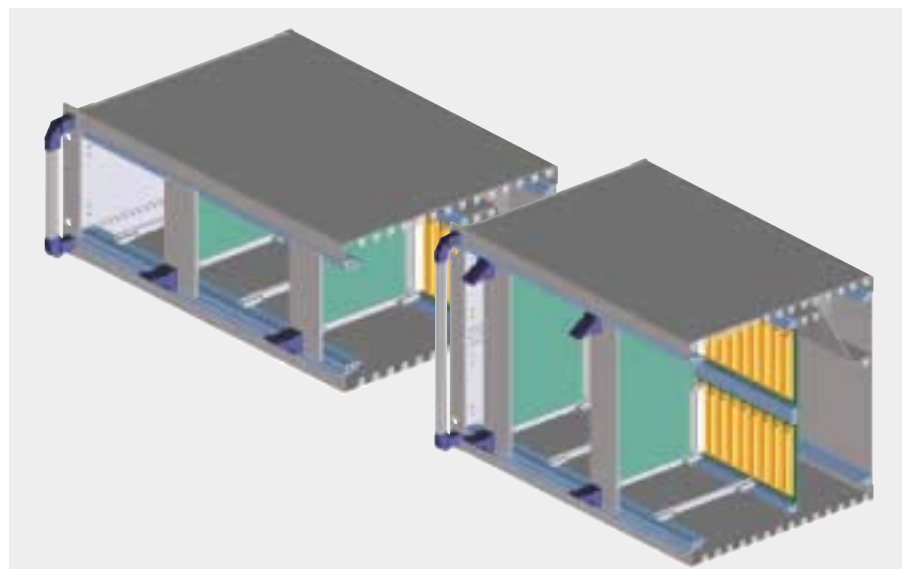
standard module rails 241-049 with 10mm clearance for insertion/extraction handle

###### middle

BUS module rails 241-013, BUS support rails 241-020

###### rear

standard module rails 241-022





# 245 • 19" subrack, 4 U and 7 U



## Order information

4 U		Model 1	Model 2	Model 3	
		296mm depth	296mm depth	296mm depth	
Description	Part no.	Description	Part no.	Description	Part no.
4 U, with handle	24-5484-01	4 U, with handle	24-5484-03	4 U, with handle	24-5484-05
4 U, without handle	24-5484-02	4 U, without handle	24-5484-04	4 U, without handle	24-5484-06

7 U		Model 1	Model 2	Model 3	
		296mm depth	296mm depth	296mm depth	
Description	Part no.	Description	Part no.	Description	Part no.
7 U, with handle	24-5784-01	7 U, with handle	24-5784-03	7 U, with handle	24-5784-05
7 U, without handle	24-5784-02	7 U, without handle	24-5784-04	7 U, without handle	24-5784-06

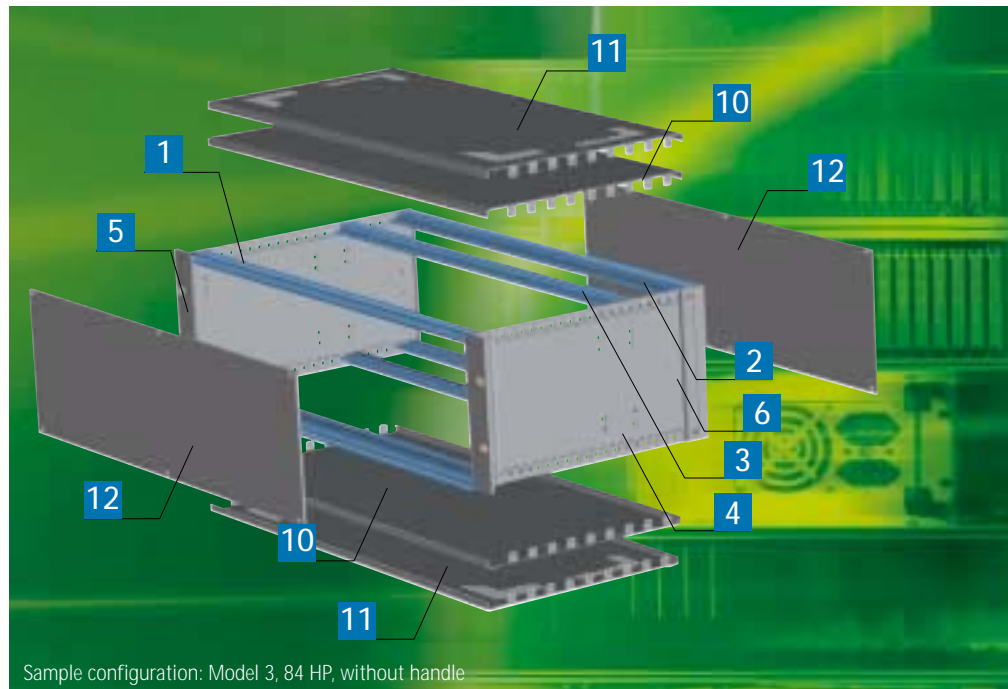
Expansion kits with horizontal partitions for 2 x 3 and 6 U available on request.





**19" subrack, 3 U, 84 HP - EMC**

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



Sample configuration: Model 3, 84 HP, without handle

**Specifications**

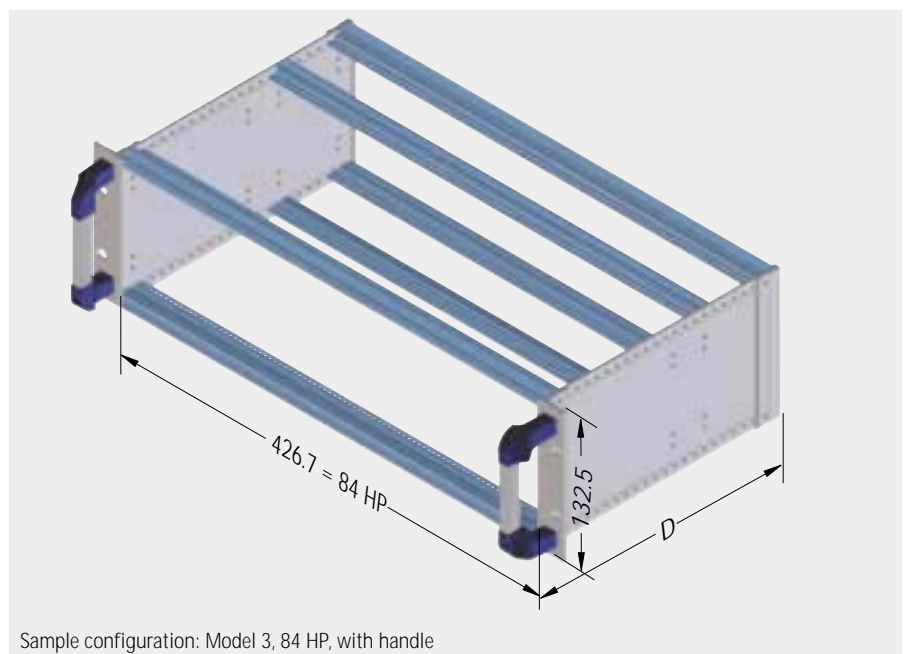
**Application:**

- for plug-in modules in compliance with IEC 297-3 and IEEE 1101.10/1101.11

**Material/finish:**

- Side panels: aluminium, 2.5mm transparent chromated
- Module rail: aluminium extrusion transparent chromated
- Front/cover bracket: aluminium extrusion transparent chromated

**Delivery:** kit form



Sample configuration: Model 3, 84 HP, with handle

**Included in delivery**

Item	Pc.	Description
1	2	Module rails, front
2	2	Module rail, rear
3	2	Module rails, middle
4	2	Side panels
5	2	Front angle bracket with or without handle
6	2	Cover bracket

Item	Pc.	Description
7	4	Threaded inserts, M2.5 7mm x 2mm
8	2	Threaded inserts, M2.5 5mm x 1.5mm (only for middle BUS module rail)
9	12	Oval head screws, M4 x 12 toothed head Assembly material

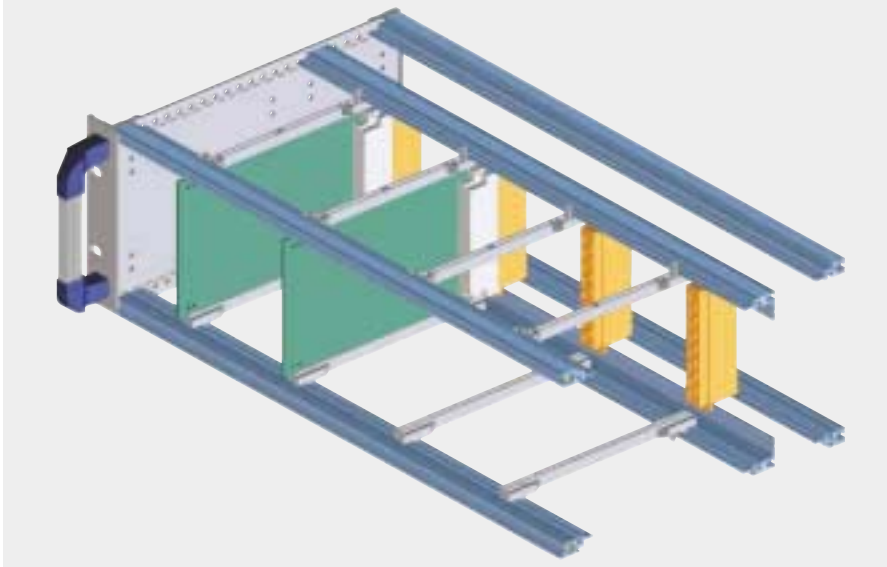
**Note:** Order EMC contact springs (see p. 5.44) separately



## 245 • 19" subrack, 3 U - EMC



### 3 U EMC models

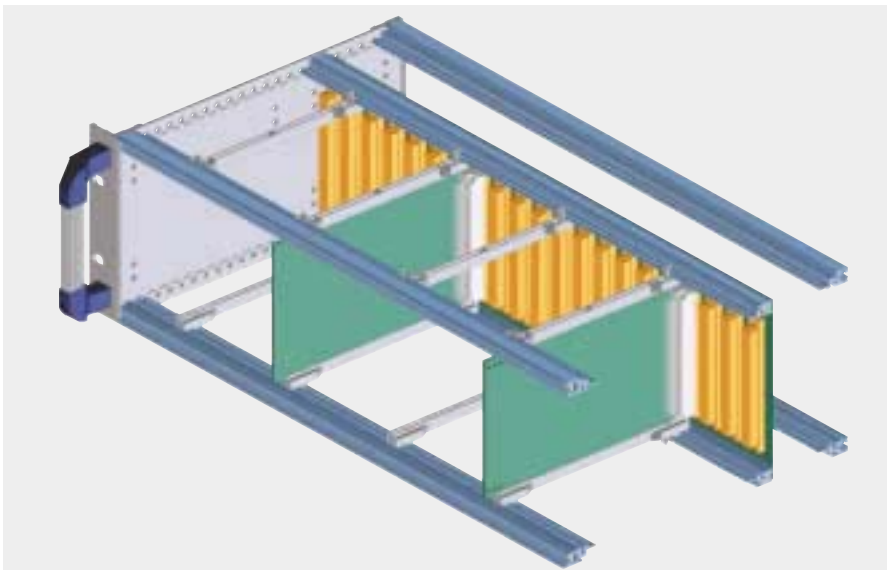


#### Model 1

**front**  
standard module rails 241-022  
with threaded inserts, M2.5

**middle**  
narrow module rails 241-019  
with integrated mounting rails for plug-in  
connections in compliance with DIN 41612

**rear**  
standard module rails 241-022

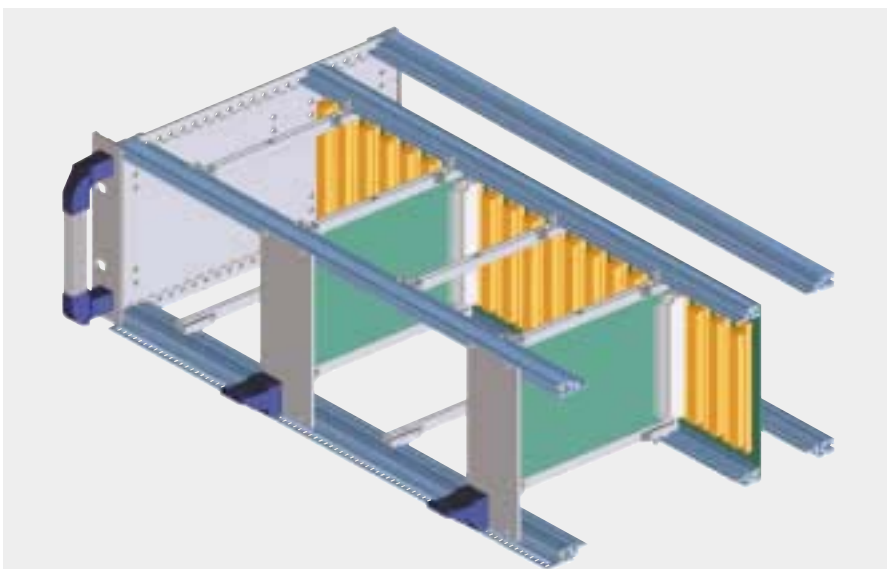


#### Model 2

**front**  
standard module rails 241-022  
with threaded inserts, M2.5

**middle**  
BUS module rails 241-013  
with threaded inserts, M2.5

**rear**  
standard module rails 241-022



#### Model 3

**front**  
standard module rail 241-022,  
standard module rail 241-019  
with 10mm clearance for insertion/  
extraction handle and for threaded  
inserts, M2.5

**middle**  
BUS module rails 241-013  
with threaded inserts, M2.5

**rear**  
standard module rails 241-022



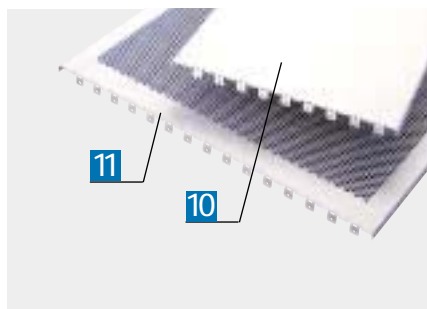
Order information

Model 1		Model 2		Model 3	
236mm depth		236mm depth		236mm depth	
<b>Description</b>	<b>Part no.</b>	<b>Description</b>	<b>Part no.</b>	<b>Description</b>	<b>Part no.</b>
84 HP, with handle	24-5315-16	84 HP, with handle	24-5315-26	84 HP, with handle	24-5315-36
84 HP, without handle	24-5312-16	84 HP, without handle	24-5312-26	84 HP, without handle	24-5312-36
296mm depth		296mm depth		296mm depth	
<b>Description</b>	<b>Part no.</b>	<b>Description</b>	<b>Part no.</b>	<b>Description</b>	<b>Part no.</b>
84 HP, with handle	24-5316-16	84 HP, with handle	24-5316-26	84 HP, with handle	24-5316-36
84 HP, without handle	24-5313-16	84 HP, without handle	24-5313-26	84 HP, without handle	24-5313-36

Note: The lighter colour rear rails show optional installation positions.

Accessories

Shielding panels, 84 HP



The ventilated shielding panels have honeycomb perforations, which allow a maximum amount of air to flow through. They also provide good EMC protection.

**Finish:** transparent chromated  
**Material:** aluminium

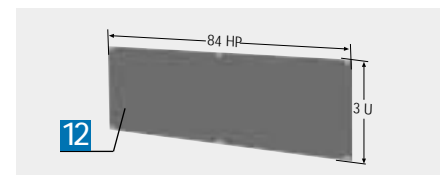
Item	Pc.	Description
10	1	Shielding panel, solid

Depth	D=236	D=296
Part no.	24-5012-40	24-5013-40

Item	Pc.	Description
11	1	Shielding panel, ventilated

Depth	D=236	D=296
Part no.	24-5012-48	24-5013-48

Front/rear shielding panel, 84 HP



**Finish:** anodized exterior, transparent chromated interior

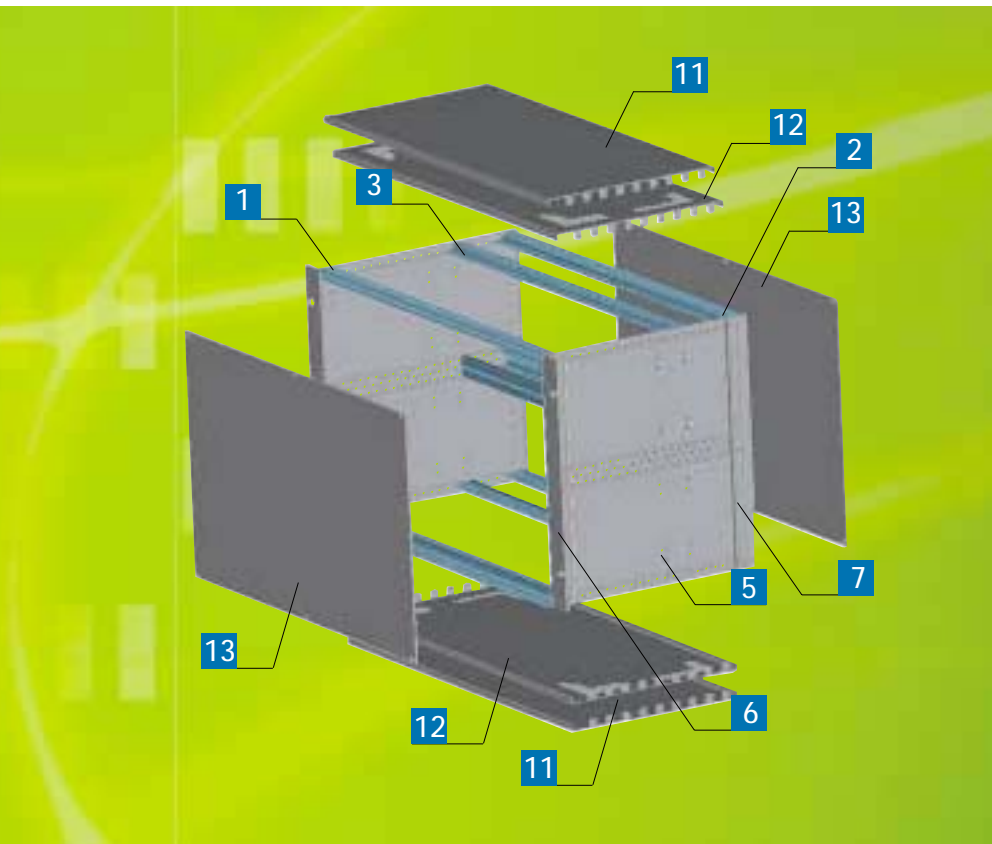
**Material:** aluminium, 2.5mm

Item	Pc.	Description
12	1	Front/rear shielding panel

Height	3 U
Part no.	24-3884-13



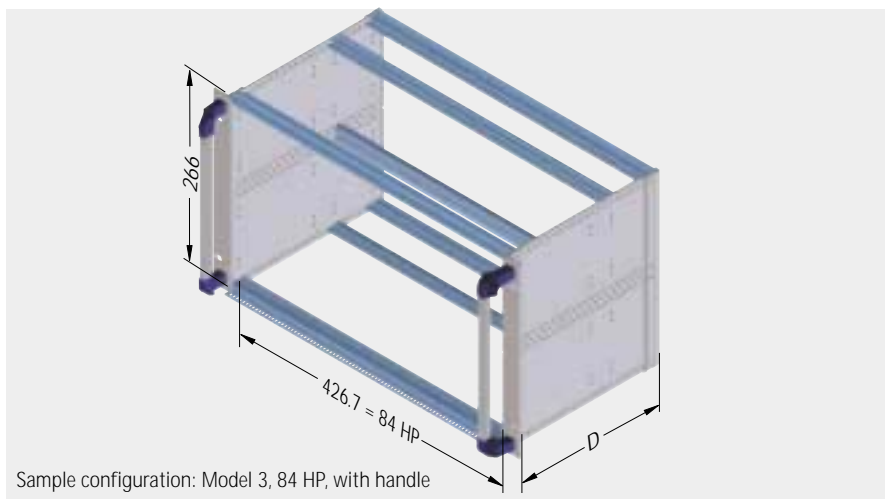
## 245 • 19" subrack, 6 U - EMC



### 19" subrack, 6 U, 84 HP - EMC

- protects against electromagnetic environmental influences
- protects the environment from radiation from the interior
- chromated surfaces connect all components, which are thus conductive
- expanded EMC delivery:
  - module rails, rear (item 2)
  - cover bracket (item 7)
- module rails are prevented from rotating

### Specifications



Sample configuration: Model 3, 84 HP, with handle

#### Application:

- for plug-in modules in compliance with IEC 297-3 and IEEE 1101.10/1101.11

#### Material:

- Side panels: aluminium, 2.5mm transparent chromated
- Module rail: aluminium extrusion transparent chromated
- Front/cover bracket: aluminium extrusion transparent chromated

**Delivery:** kit form

### Included in delivery

Item	Pc.	Description
1	2	Module rails, front
2	2	Module rails, rear
3	2	Module rails, middle
4	1	Support rail, middle
5	2	Side panels
6	2	Front angle bracket with or without handle
7	2	Cover bracket

Item	Pc.	Description
8	4	Threaded inserts, M2.5 7mm x 2mm
9	4	Threaded inserts, M2.5 5mm x 1.5mm (only for middle BUS module rail)
10	14	Oval head screws, M4 x 12 toothed head
		Assembly material

#### Shielding attenuation measurement:

An independent institute conducted shielding attenuation measurements on the subrack in compliance with VG 95373 Part 15 in the frequency range of 30MHz to 1000MHz. The resulting shielding attenuation curve is available on request.





## 6 U - EMC models

### Model 1

#### front

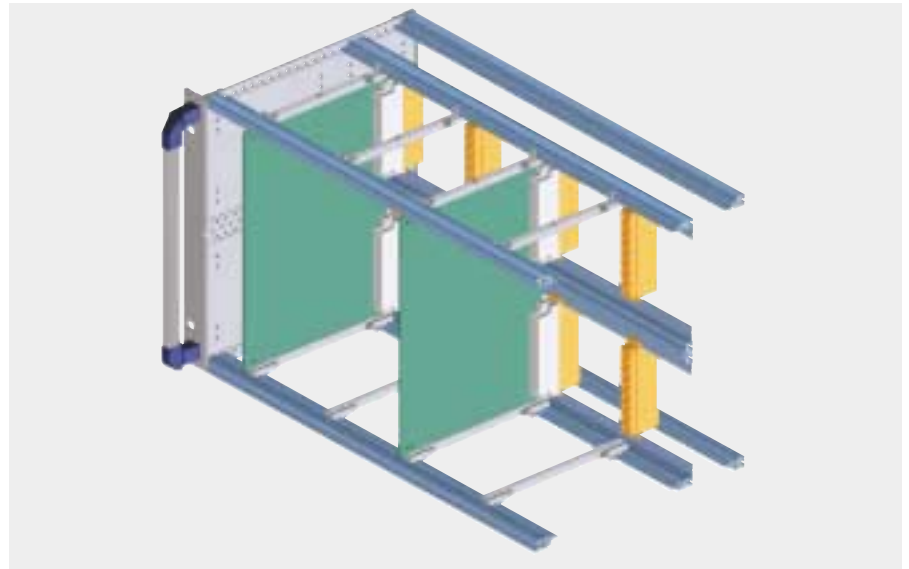
standard module rails 241-022  
with threaded inserts, M2.5

#### middle

narrow module rails 241-019  
and support rail 241-008  
with integrated mounting rails for plug-in  
connections in compliance with DIN 41612

#### rear

standard module rails 241-022  
with threaded inserts, M2.5



### Model 2

#### front

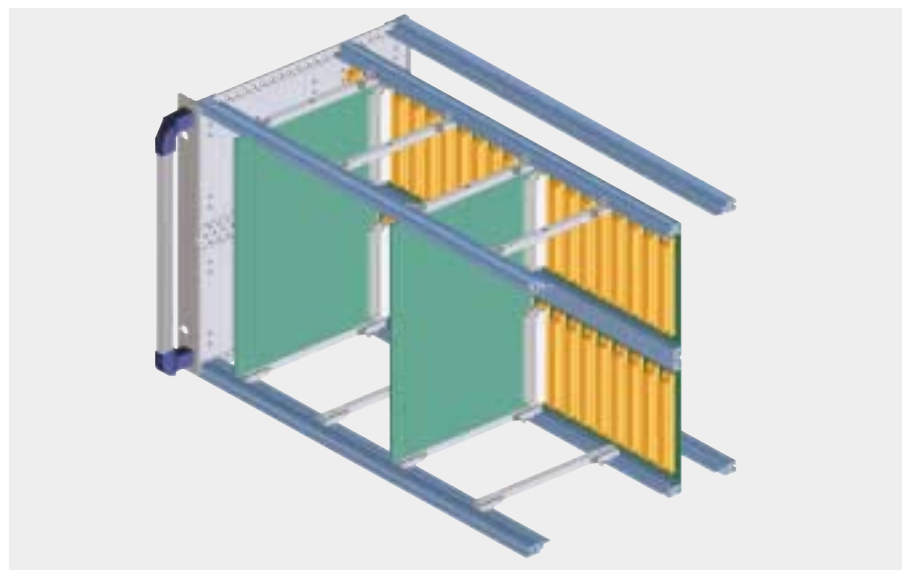
standard module rails 241-022  
with threaded inserts, M2.5

#### middle

BUS module rails 241-013,  
BUS support rail 241-020  
with threaded inserts, M2.5

#### rear

standard module rails 241-022  
with threaded inserts, M2.5



### Model 3

#### front

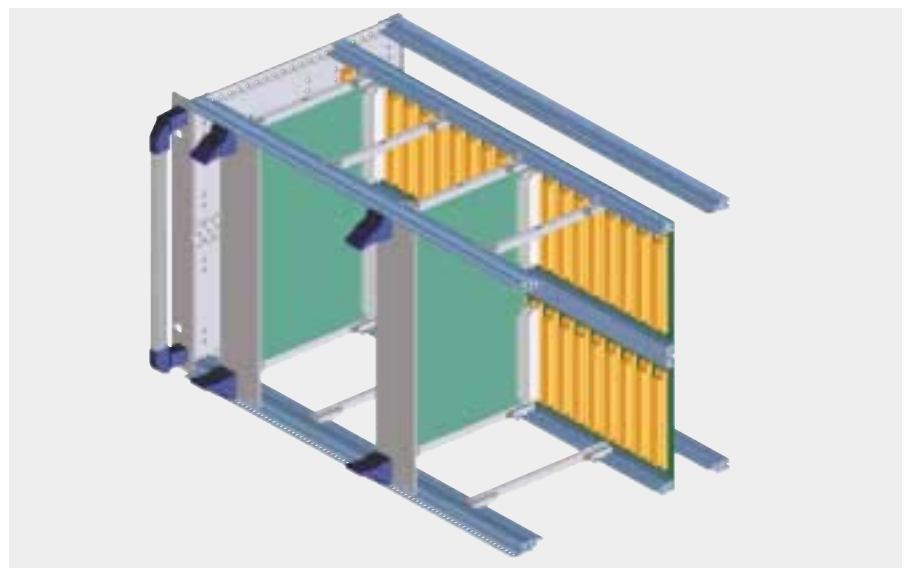
standard module rails 241-049  
with 10mm clearance for insertion/  
extraction handle and for threaded  
inserts, M2.5

#### middle

BUS module rails 241-013,  
BUS support rail 241-020  
with threaded inserts, M2.5

#### rear

standard module rail 241-022  
with threaded inserts, M2.5





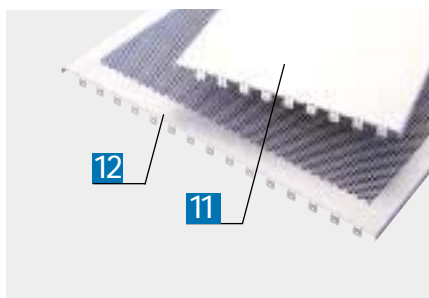
Order information

Model 1		Model 2		Model 3	
236mm depth		236mm depth		236mm depth	
Description	Part no.	Description	Part no.	Description	Part no.
84 HP, with handle	24-5615-16	84 HP, with handle	24-5615-26	84 HP, with handle	24-5615-36
84 HP, without handle	24-5611-16	84 HP, without handle	24-5611-26	84 HP, without handle	24-5611-36
296mm depth		296mm depth		296mm depth	
Description	Part no.	Description	Part no.	Description	Part no.
84 HP, with handle	24-5616-16	84 HP, with handle	24-5616-26	84 HP, with handle	24-5616-36
84 HP, without handle	24-5612-16	84 HP, without handle	24-5612-26	84 HP, without handle	24-5612-36

Note: The lighter colour rear rails show optional installation positions.

Accessories

Shielding panels, 84 HP



The ventilated shielding panels have honeycomb perforations, which allow a maximum amount of air to flow through. They also provide good EMC protection.

Finish: transparent chromated  
Material: aluminium, 1mm

Item	Pc.	Description
11	1	Shielding panel, solid

Depth	D=236	D=296
Part no.	24-5012-40	24-5013-40

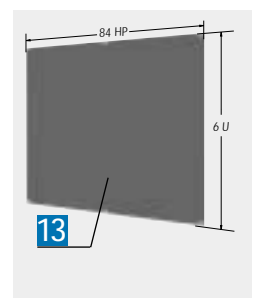
Item	Pc.	Description
12	1	Shielding panel, ventilated

Depth	D=236	D=296
Part no.	24-5012-48	24-5013-48

Front/rear shielding panel, 84 HP

Finish: anodized exterior, transparent chromated interior

Material: aluminium  
2.5mm



Item	Pc.	Description
13	1	Front/rear shielding panel

Height	6 U
Part no.	24-3884-16



### Compact PCI®

- individual configuration according to your needs
- rear card installation also possible (rear I/O)
- EMC-compliant design
- complies with IEC 297-3 and IEEE 1101.10/1101.11
- complies with PICMG 2.0 R 3.0



## Compact PCI®

apra-norm is a member of PICMG Europe.

**Compact PCI®** combines diverse hardware and software options with sturdy 19" technology. The systems' high data transfer rates make them ideal for telecommunications and automation technology use in particular.

The CompactPCI systems developed at apra-norm are based on the 245-series subrack. All extension and accessory parts can be customized. Our specialists would be glad you help you during the design process.

### Individual configuration

Design your own customized **CompactPCI®** with us. Our specialists will advise you at each step as you select the components you require.

#### 1 Subrack

apra-norm's extensive range of standard subrack products provides many construction possibilities for your **CompactPCI®**, whether 3 U or 6 U.

We also offer customized solutions.



Call us: Tel.: +49 65 92-204-0  
We would be happy to assist you!



**2** Backplane



Define the backplane based on the following criteria:

Height	
3 U	<input type="checkbox"/>
6 U	<input type="checkbox"/>

Rear I/O	yes	<input type="checkbox"/>
	no	<input type="checkbox"/>

Number of plug-in locations	1-24	<input type="checkbox"/>
		<input type="checkbox"/>

Card depth Rear I/O	80mm	<input type="checkbox"/>
	100mm	<input type="checkbox"/>

System slots	right	<input type="checkbox"/>
	left	<input type="checkbox"/>

**3** Mains supply/power supply



Define the mains supply based on the following criteria:

Height	
3 U	<input type="checkbox"/>
6 U	<input type="checkbox"/>

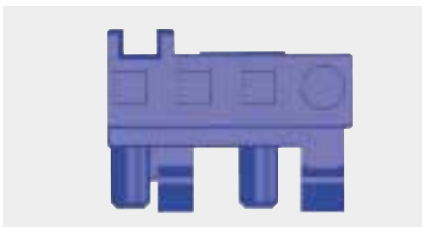
Redundancy	yes	<input type="checkbox"/>
	no	<input type="checkbox"/>

Type	Plug	Power
ATX	-	Watt
CPCI	Positronic plug	<input type="checkbox"/> Watt
	Type-M plug	<input type="checkbox"/> Watt

**Individual Definition** Define your accessories. Our specialists will assist you at each step as you select the components you require. Tel.: +49 6592-204-0 · Fax: +49 6592-204-100.

**4** Accessories

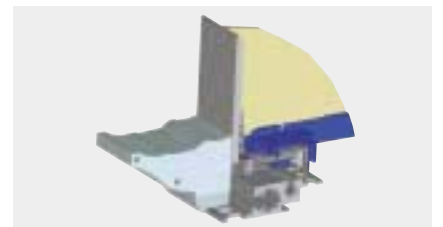
Card guide with/without coding



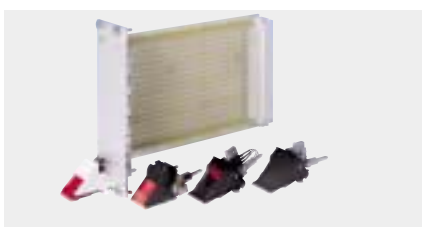
ESD spring for card guide



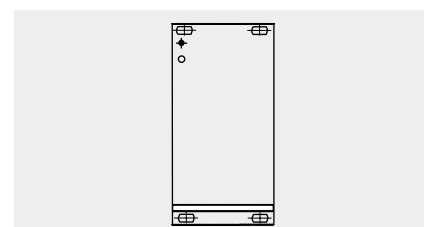
Earth spring for card guide



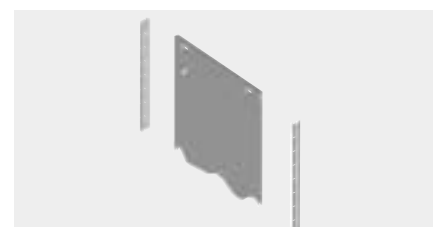
Insertion/extraction handle



Front panels/plug-in modules



EMC contact springs





# Individual Configuration



... the perfect shell for valuable electronics

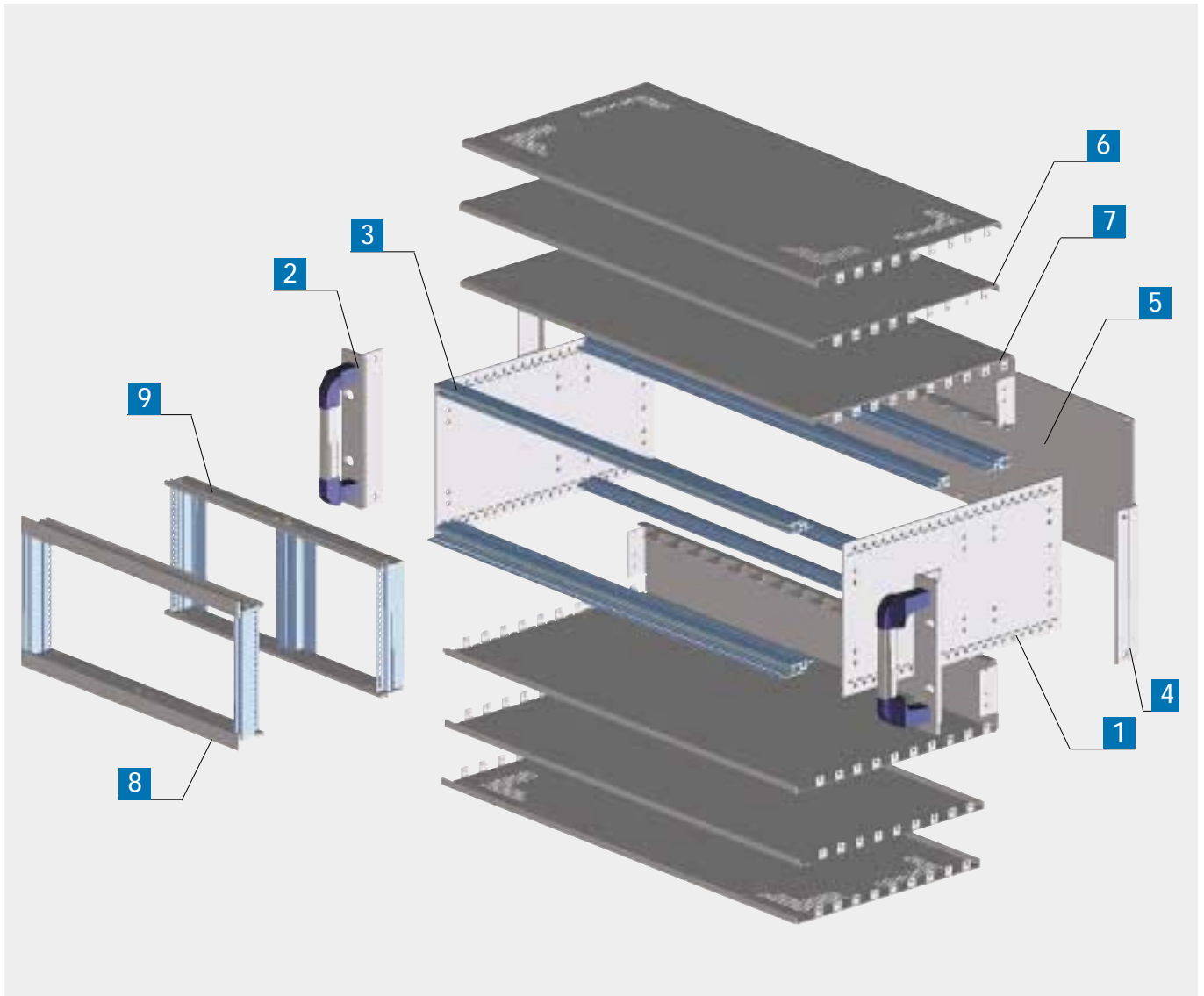


## 245 • 19" subrack



### Individual configuration:

Design your customized subrack 245.  
Select your required enclosure components one at a time.



Item	Description
1	Side panel
2	Front angle bracket
3	Module rails
4	Cover bracket
5	Rear panel
6a	Shielding panel
6b	Cover panel
7	Combination panel
8	Horizontal expansion kit (3 U subracks)
9	Vertical expansion kit (6 U subracks)
10	EMC contact springs



### 1 Side panel

- ventilated or not ventilated

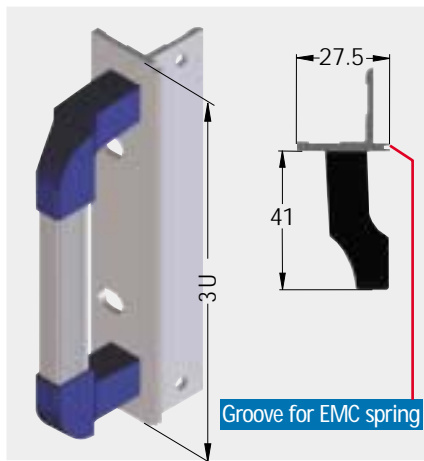
**Finish:**  
transparent chromated

**Material:**  
aluminium, 2.5mm

Side panel, not ventilated				Side panel, ventilated		Matching fan
U	H mm	D mm	Part no.	Part no.	Part no.	
2	88	236	-	24-5202-50	230-825	
2	88	296	-	24-5203-50	230-825	
3	132,5	176	24-5301-50	-	-	
3	132,5	236	24-5302-50	24-5302-58	230-828	
3	132,5	296	24-5303-50	24-5303-58	230-828	
4	177	296	24-5403-50	-	-	
6	266	176	24-5601-50	-	-	
6	266	236	24-5602-50	-	-	
6	266	296	24-5603-50	-	-	
7	310,5	296	24-5703-50	-	-	

### 2 Front angle bracket

#### Front angle bracket with handle

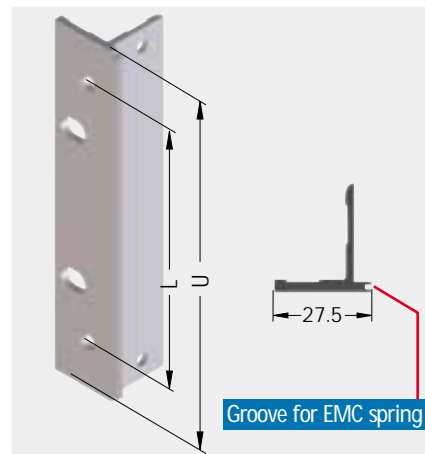


- with integrated groove for inserting EMC contact springs

**Finish:**  
anodized aluminium/chromated  
**Material:**  
aluminium/plastic

U	H mm	Part no. (1 piece)
3	132.5	24-1002-23
4	177	24-1002-34
3 + 2 x 1/2		
6	266	24-1002-26
7	310.5	24-1002-37
6 + 2 x 1/2		

#### Front angle bracket with holes for handle

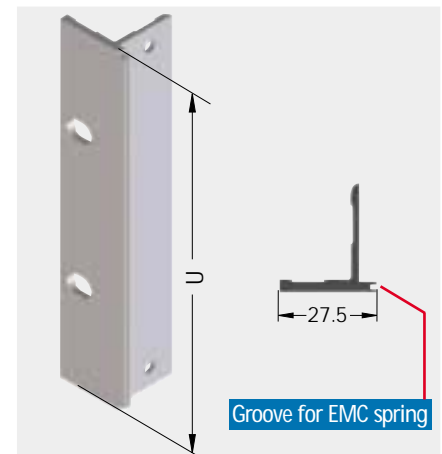


- with integrated groove for inserting EMC contact springs

**Finish:**  
anodized aluminium/chromated  
**Material:**  
aluminium

U	H mm	Distance b/w holes	Part no. (1 piece)
3	132.5	98	24-1002-03
4	177	142.5	24-1002-44
3 + 2 x 1/2			
6	266	231.5	24-1002-06
7	310.5	276	24-1002-47
6 + 2 x 1/2			

#### Front angle bracket without holes for handle



- with integrated groove for inserting EMC contact springs

**Finish:**  
anodized aluminium/chromated  
**Material:**  
aluminium

U	H mm	Part no. (1 piece)
2	88	24-1002-12
3	132.5	24-1002-13
4	177	24-1002-54
3 + 2 x 1/2		
6	266	24-1002-16
7	310.5	24-1002-57
6 + 2 x 1/2		

Note: See p. 5.43 for matching assembly screws.



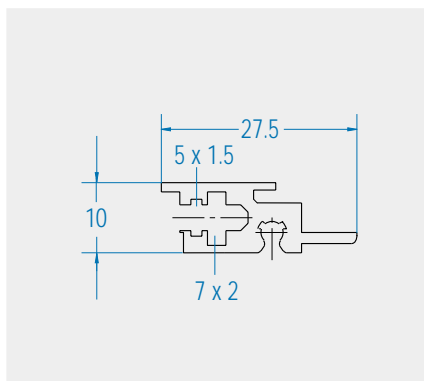
**3** Module rails



**Standard module rail**

- for mounting front panels and rear panels

**Finish:** transparent chromated

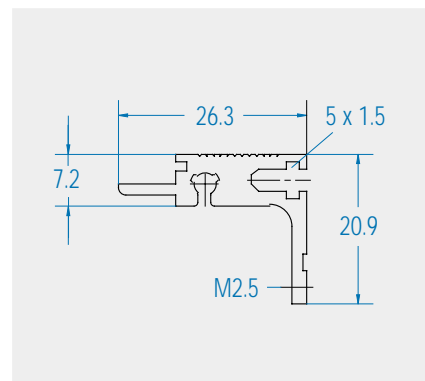


HP	Length mm	Part no.
85	431.9	24-1022-01
64	325.2	24-1022-05
57	289.7	24-1022-02
43	218.5	24-1022-03
29	147.4	24-1022-04

**Narrow module rail**

- with integrated mounting rail for plug-in connections in compliance with DIN 41612

**Finish:** transparent chromated

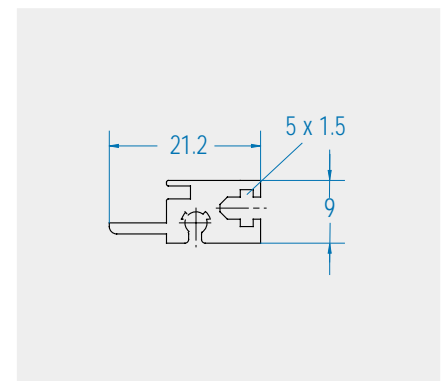


HP	Length mm	Part no.
85	431.9	26-7919-01
64	325.2	26-7919-05
57	289.7	26-7919-02
43	218.5	26-7919-03
29	147.4	26-7919-04

**BUS module rail**

- for mounting BUS boards and back-planes using contact strips, mounting rails or insulating strips (see section beginning on p. 5.54)

**Finish:** transparent chromated



HP	Length mm	Part no.
85	431.9	24-1013-01
64	325.2	24-1013-05
57	289.7	24-1013-02
43	218.5	24-1013-03
29	147.4	24-1013-04

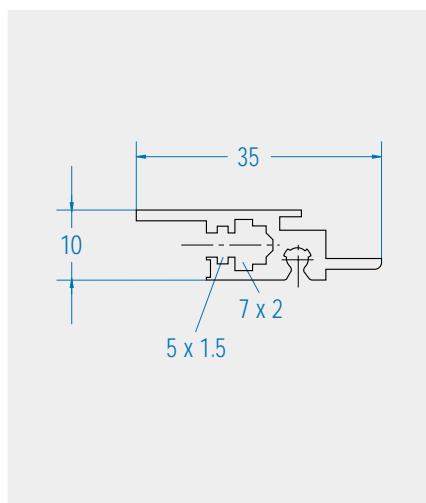




### Standard module rail with 10mm clearance

- for mounting plug-in modules that require force when pulling them out and plugging them into place. See page 5.75 for **matching insertion/extraction handles**.

Finish: transparent chromated

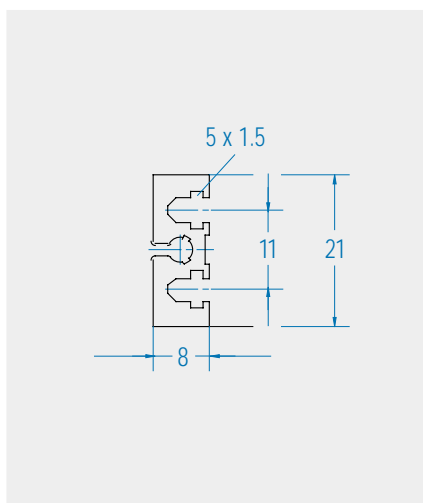


HP	Length mm	Part no.
85	431.9	24-1049-85
64	325.2	24-1049-64
57	289.7	24-1049-57
43	218.5	24-1049-43
29	147.4	24-1049-29

### BUS support rail

- for mounting BUS boards and back-planes using contact strips, mounting rails or insulating strips (see section beginning on p. 5.54)

Finish: transparent chromated

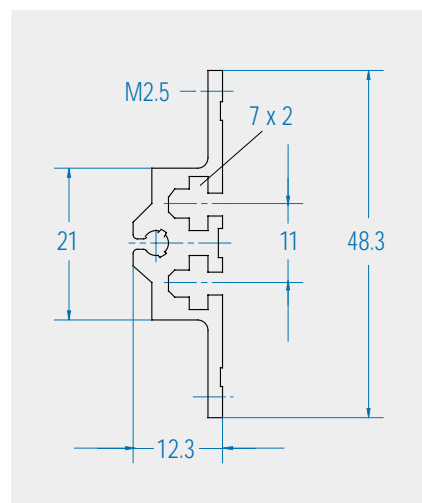


HP	Length mm	Part no.
85	431.9	24-1020-01
64	325.2	24-1020-64
57	289.7	24-1020-57
43	218.5	24-1020-43
29	147.4	24-1020-29

### support rail

- with integrated mounting rail for plug-in connections in compliance with DIN 41612

Finish: transparent chromated

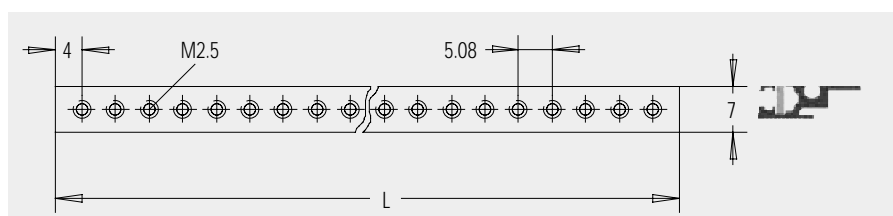


HP	Length mm	Part no.
85	431.9	24-1108-85
64	325.2	24-1108-64
57	289.7	24-1108-57
43	218.5	24-1108-43
29	147.4	24-1108-29

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

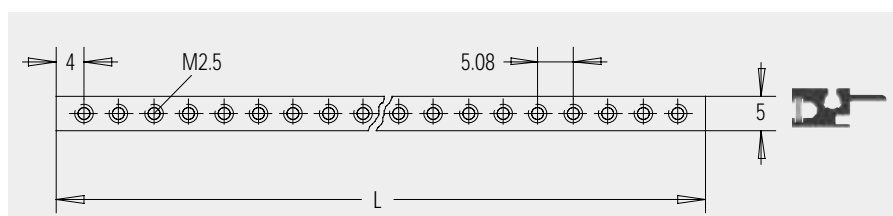
### Threaded inserts

#### M2.5 threaded inserts, 7mm x 2mm for use with standard module rails



HP	Length mm	Part no.
85	429.9	240-051
64	323.2	240-055
57	287.7	240-052
43	216.5	240-053
29	145.4	240-054

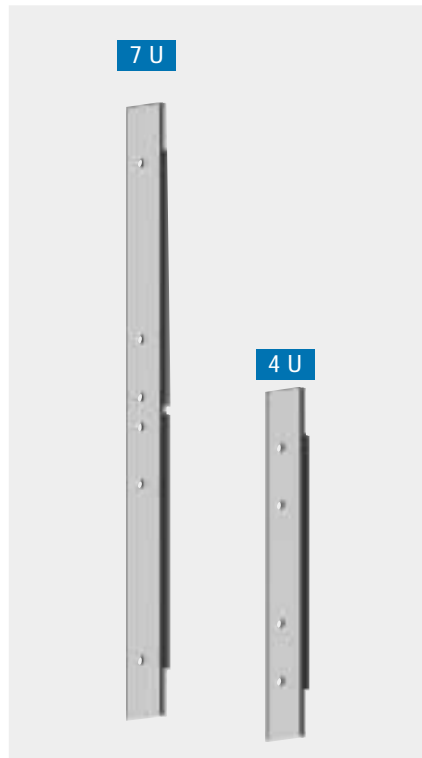
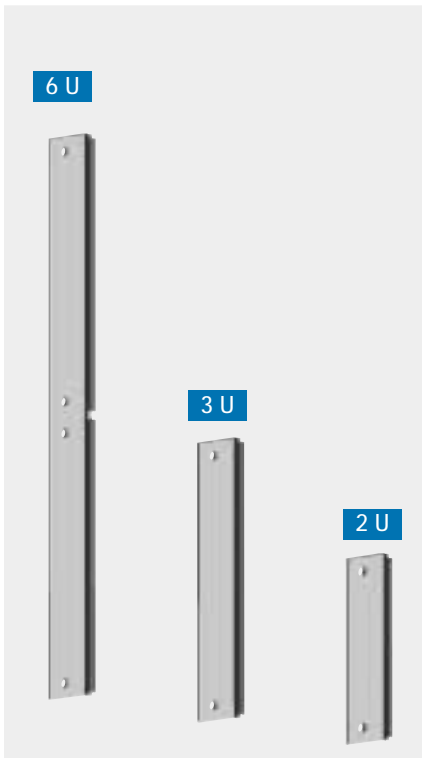
#### M2.5 threaded inserts, 5mm x 1.5mm for use with BUS module rails/support rails



HP	Length mm	Part no.
85	429.9	240-061
64	323.2	240-065
57	287.7	240-062
43	216.5	240-063
29	145.4	240-064



**4** Cover bracket



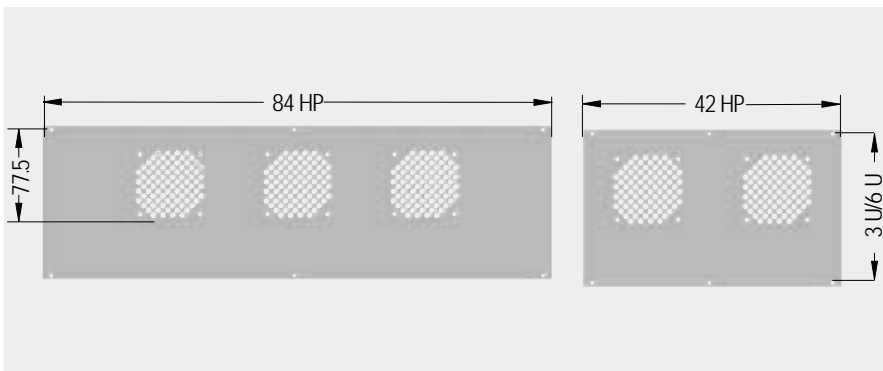
- for covering the gap between the side panel and the front panels
- with groove for EMC contact springs

**Finish:**  
transparent chromated

**Material:**  
aluminium

U	H mm	Part no. (1 piece)
2	88	24-1037-02
3	132.5	24-1037-03
4	177	24-1037-54
3 + 2 x 1/2		
6	266	24-1037-06
7	310.5	24-1037-57
6 + 2 x 1/2		

**5** Rear panel



**Matching fan, 12V**



- up to 3 fans can be installed in 84 HP subracks and 2 fans in 42 HP
- incl. assembly material

**Finish:**  
Front side: anodized  
Rear side: transparent chromated

**Material:**  
aluminium, 2.5mm

- for installation in the rear panel
- high-power **PAPST** fan
- flow rate: 40m<sup>3</sup>/h noise level: 40dB (A)
- W x H x D: 60mm x 60mm x 25mm
- incl. assembly material

HP	Rear panel, ventilated		Rear panel, not ventilated	
	3 U	6 U	3 U	6 U
84	24-3803-01	24-3806-01	24-3084-45	24-3684-45
42	24-3803-02	24-3806-02	24-3042-45	24-3642-45

Description	Part no.
Fan, 12V	230-825



### 6a Shielding panel

- ventilated/not ventilated
- with honeycomb perforations for optimum air flow
- EMC-compliant design
- incl. assembly material

**Finish:**  
transparent chromated

**Material:**  
aluminium

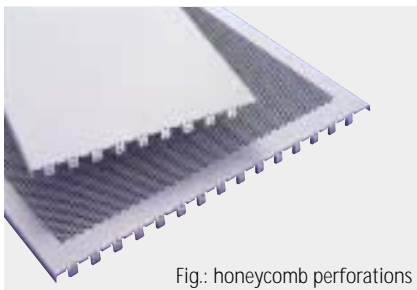
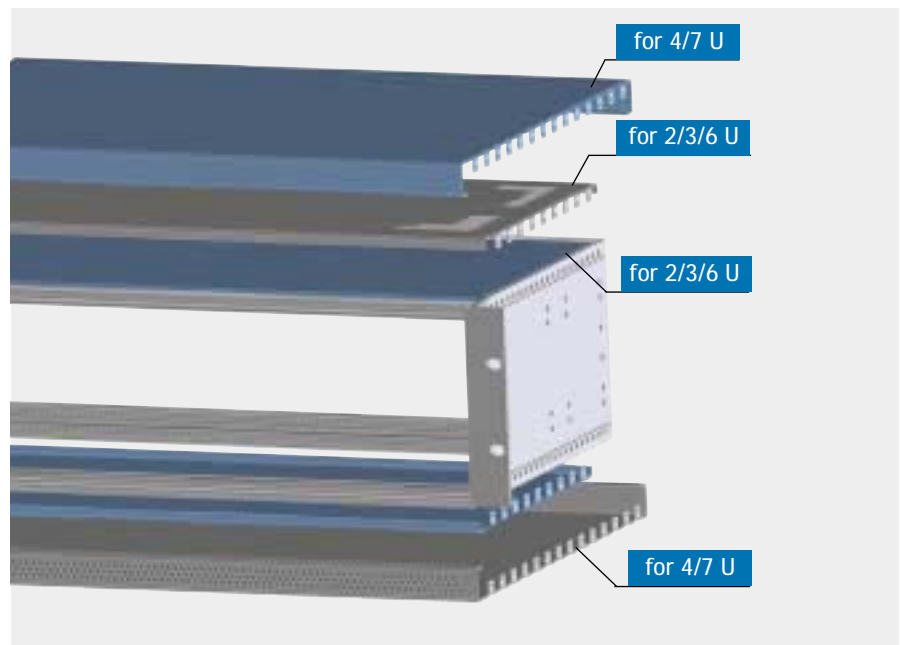


Fig.: honeycomb perforations



### Order information

Depth \ Height	Part no., 84 HP			Part no., 42 HP		
	D=176mm	D=236mm	D=296mm	D=176mm	D=236mm	D=296mm
2 U, 3 U						
ventilated	24-5011-48	24-5012-48	24-5013-48	24-5031-48	24-5032-48	24-5033-48
not ventilated	24-5011-40	24-5012-40	24-5013-40	24-5031-40	24-5032-40	24-5033-40
4 U, 7 U						
ventilated	-	-	24-5413-48	-	-	-
not ventilated	-	-	24-5413-40	-	-	-

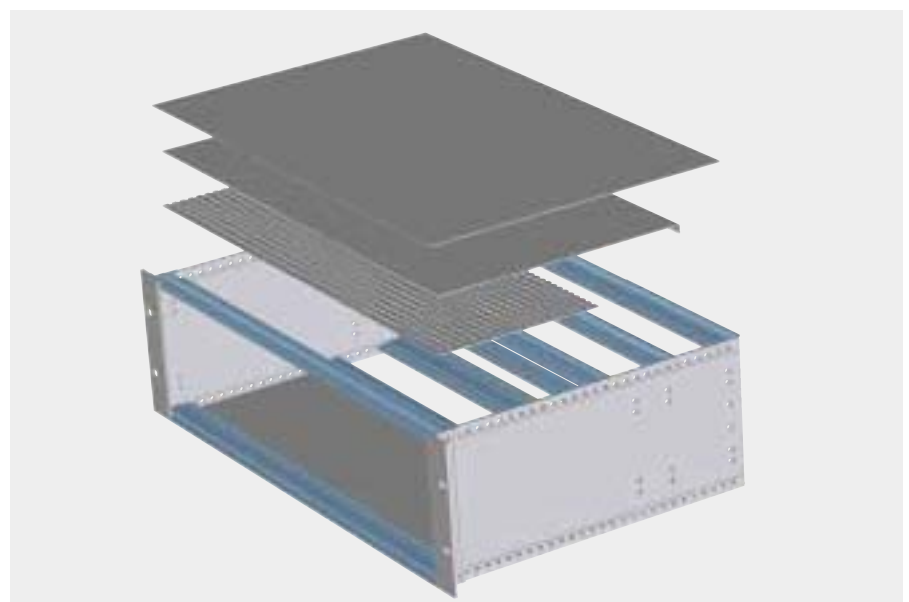
### 6b Cover panel

- for mechanical shielding of subrack
- ventilated or solid

**Finish:**  
transparent chromated

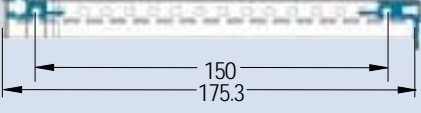
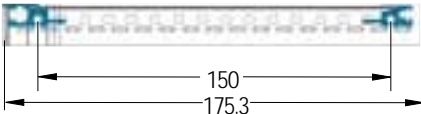
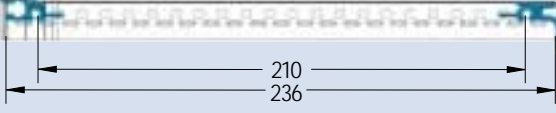
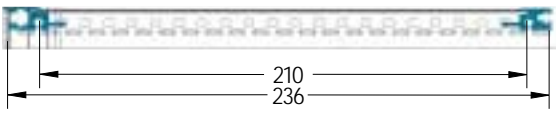
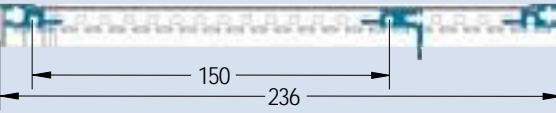
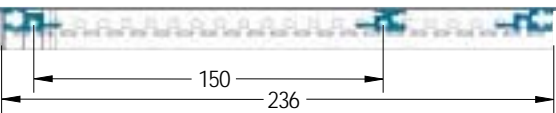
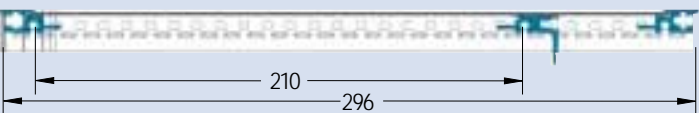
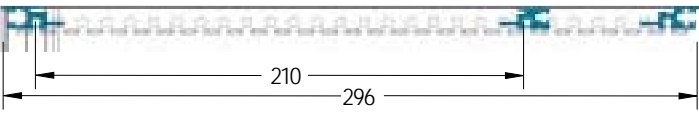
**Material:**  
perforated aluminium panel  
or aluminium panel

**Degree of protection:**  
IP 20/30





Order information

Application	84 HP		42 HP	
	solid	ventilated	solid	ventilated
Card depth: 160mm DIN 41612 plug-in connector 	24-5011-10	24-5011-18	24-5031-10	24-5031-18
Card depth: 160mm BUS 	24-0662-85	24-0468-85	24-0662-43	24-0468-43
Card depth: 220mm DIN 41612 plug-in connector 	24-5012-10	24-5012-18	24-5032-10	24-5032-18
Card depth: 220mm BUS 	24-0672-85	24-0478-85	24-0672-43	24-0478-43
Card depth: 160mm/ 220mm DIN 41612 plug-in connector Standard 	24-0671-85	24-0475-85	24-0671-43	24-0475-43
Card depth: 160mm/ 220mm BUS Standard 	24-0671-85	24-0475-85	24-0671-43	24-0475-43
Card depth: 220mm DIN 41612 plug-in connector Standard 	24-5013-10	24-5013-18	24-5033-10	24-5033-18
Card depth: 220mm BUS Standard 	24-5013-10	24-5013-18	24-5033-10	24-5033-18



## 7 Combination panel

- top/bottom panel with integrated rear panel
- no rear module rails required
- integrated cable management bar with straps (see fig. 1)
- customized, shielded cable access opening due to flexible EMC textile seal (see fig. 2)
- entry for cables up to 10mm in diameter
- incl. assembly material

**Finish:**  
transparent chromated

**Material:**  
aluminium

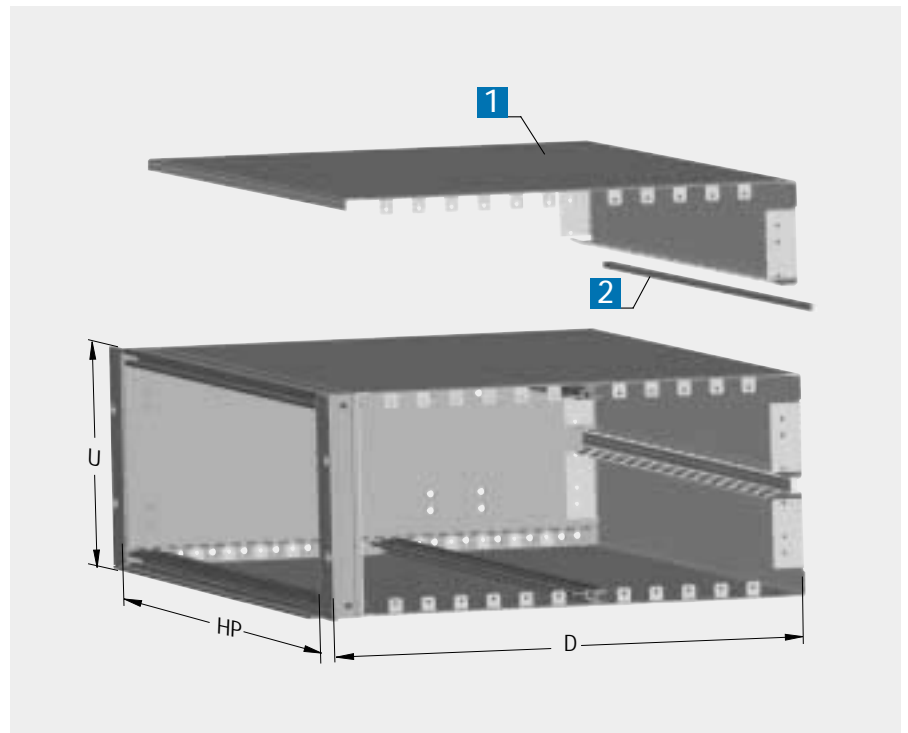


Fig. 1: integrated cable management bar with straps



Fig. 2: cable entry opening with EMC seal

### Order information

#### Included in delivery

Item	Pc.	Description
1	1	Combination panel
2	1	EMC textile seal with sheath
3		Assembly material

Depth \ Height	Part no., 84 HP		Part no., 42 HP	
	D=236mm	D=296mm	D=236mm	D=296mm
3 U				
ventilated	24-5312-48	24-5313-48	24-5332-48	24-5333-48
not ventilated	24-5312-40	24-5313-40	24-5332-40	24-5333-40
6 U				
ventilated	24-5612-48	24-5613-48	24-5632-48	24-5633-48
not ventilated	24-5612-40	24-5613-40	24-5632-40	24-5633-40

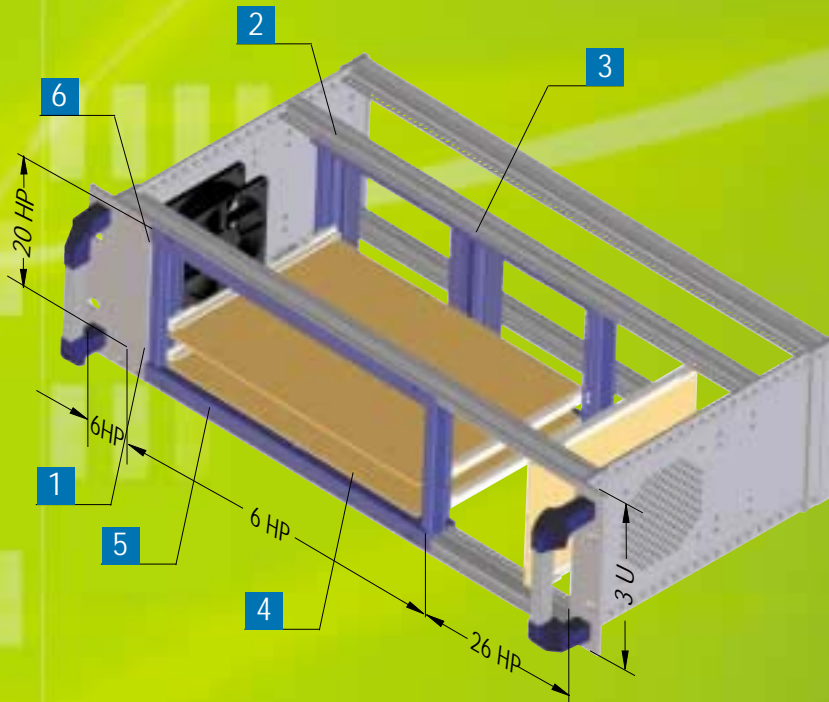




## 245 • 19" subrack



### 8 Horizontal expansion kit 6 U/20 HP



Sample configuration: 6 U expansion kit

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

#### Application:

- for plug-in modules in compliance with IEC 297-3 and IEEE 1101.10/1101.11

#### Finish:

Module rails and support rails:  
transparent chromated

Flat rails:  
anodized

Panels:  
anodized exterior  
transparent chromated interior

**Delivery:** kit form

### Order information

Model 1	Model 2
front standard module rails profile no. 241-022	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 in compliance with DIN 41612	rear BUS module rails profile no. 241-013 and BUS support rail profile no. 241-020
<b>236mm depth</b>	<b>236mm depth</b>
<b>Part no.</b> 24-5620-61	<b>Part no.</b> 24-5620-62

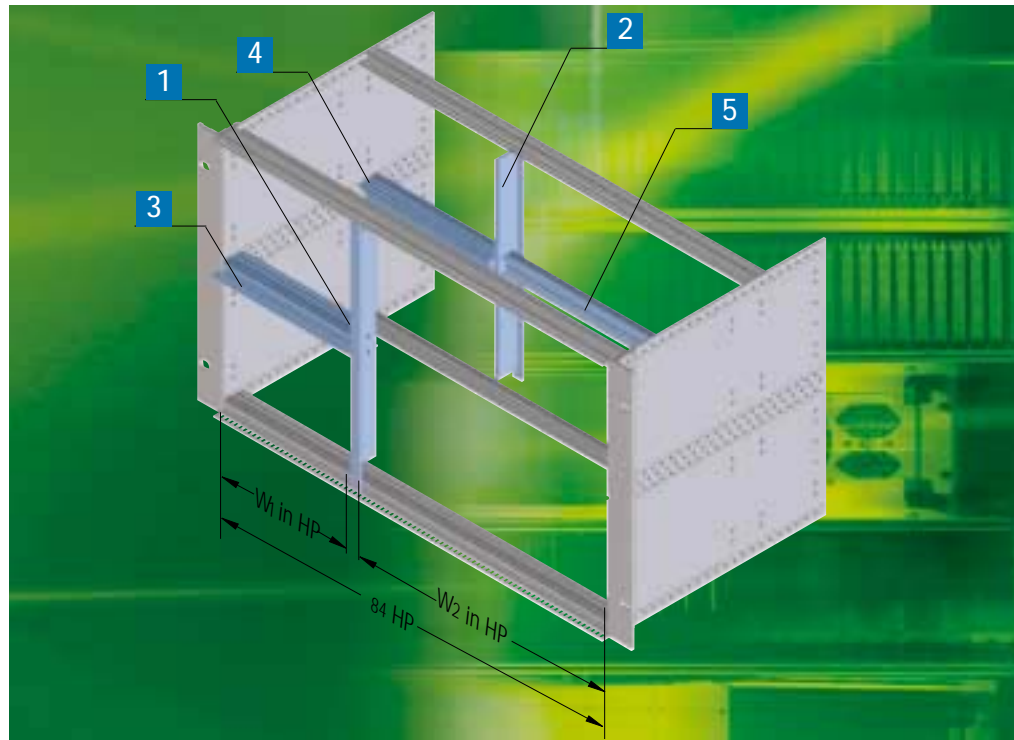
### Included in delivery

Item	Pc.	Description
1	2	Module rails, front
2	2	Module rails, rear
3	1	Support rail, rear
4	4	Flat rails, chromated
5	2	Panels, anodized exterior chromated interior
6	2	Threaded inserts, M2.5 7mm x 2mm
7	2	Threaded inserts, M2.5 5mm x 1.5mm
8		Assembly material



### 9 Vertical expansion kit 2 x 3 U

- for plug-in modules in compliance with IEC 297-3 and IEEE 1101.10/1101.11
- module rails 1 HP longer than nominal length
- support rails 1.5 HP longer than nominal length
- threaded inserts HP = nominal length



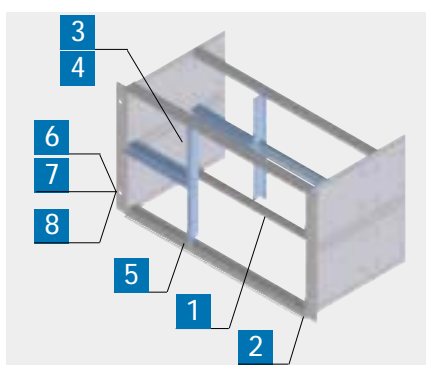
#### Mounting struts

Item		Part no.
1	front mounting strut	241-087
2	rear mounting strut for narrow module rail with integrated mounting rail	241-088
	rear mounting strut for BUS module rail	241-089

#### Module rails

B1	B2	Standard module rail	Threaded insert M2.5	Narrow module rail with integrated mounting rail	BUS Module rail	Threaded insert M2.5	Mounting rail integrated 32 pole	support rail BUS	Threaded insert M2.5
		Item 3			Item 4			Item 5	
28 HP	54 HP	24-1022-04	240-054	26-7919-04	24-1013-04	240-064	24-1108-02	24-1020-02	25-0060-54
42 HP	40 HP	24-1022-03	240-053	26-7919-03	24-1013-03	240-063	24-1108-03	24-1020-03	25-0060-40
56 HP	26 HP	24-1022-02	240-052	26-7919-02	24-1013-02	240-062	24-1108-04	24-1020-04	25-0060-26

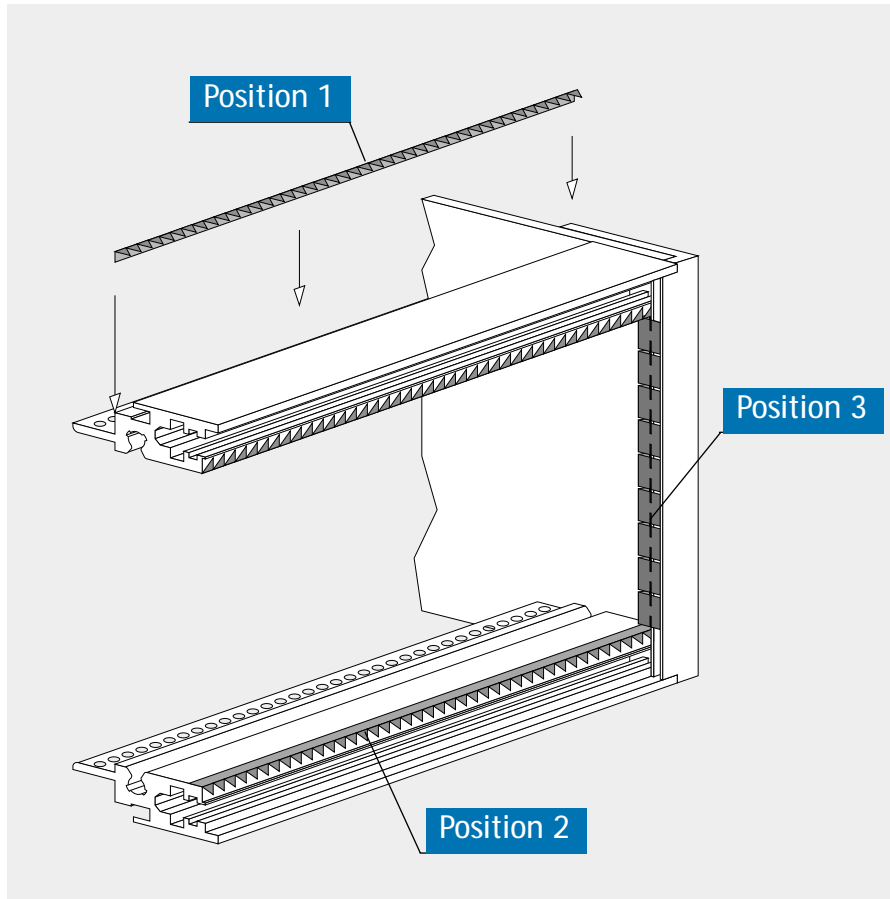
#### Mounting screws for subracks



Item	Description	Part no. (100 pc.)
1	Oval head screw, M4 x 12 with toothed head	630-096
2	Countersunk screw, M5 x 12 (for mounting handle)	630-121
3	Oval head screw, M2.5 x 10	630-094
4	Washer, 2.6 diameter	630-152
5	Countersunk screw, M4 x 10	630-119
6	Oval head screw, M5 x 16	630-098
7	Decorative washer with collar	610-095
8	Captive nut, M5 for increasing the mounting bracket thickness 0.7mm - 1.7mm	630-359
8	Captive nut, M5 for increasing the mounting bracket thickness 1.8mm - 2.6mm	630-362



10 EMC contact springs



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

**Position 1**

Horizontal EMC contact spring 1 contacts module rail and shielding panel.

HP	Length mm	Part no.
84	427	671-182
63	318	671-163
42	204	671-142

**Position 2**

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

HP	Length mm	Part no.
84	427	671-183
63	318	671-164
42	204	671-143

**Position 3**

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

U	Length mm	Part no.
3	97.0	671-184
6	232.0	671-185

EMC contact spring set

• for fitting a complete 3 U or 6 U single-row subrack

U	HP	Part no.
3	84	671-190
	63	671-191
	42	671-192
6	84	671-193
	63	671-194
	42	671-195

Included in delivery

Pc.	Description
4	Position 1
4	Position 2
4	Position 3

Note: See the section beginning on page 5.67 for EMC front panels.

Note: You can find more information on other accessories and expansion parts in the accessories section beginning on page 5.51.

# 19" Subrack 242

- Discontinued Model -



... the perfect shell for valuable electronics





## Subrack 242

For years many of our customers have relied on the proven quality of apra-norm's 19" subrack system 242.



19" subrack 242

- proven quality
- many models
- for plug-in components in compliance with IEC 297-3
- can be customized

To ensure our customers' satisfaction in the future, we have updated this system to today's technical requirements.

In addition to integrating up-to-date details like insertion/extraction handles and coded card guides, we also updated the subrack's EMC features to the current state of technology.

The result of our efforts is the new subrack system 245.

apra-norm is offering a ten-year performance warranty to ensure that our customers who have adapted their products to the subrack 242 will be able to continue to work with them for the long term without having to make changes!

**apra-norm 10-year performance warranty  
on all parts and accessories for the subrack 242**





## Subrack 242 models

### 19" subrack, 3 U

- for 100mm x 160mm Europe cards
- side panel depths 172, 210, 270mm
- depth mounting increment  $d = 10\text{mm}$

**Material:**

Side panels:  
aluminium, 2.5mm transparent  
chromated

Module rails:  
aluminium, 2.5mm transparent  
chromated

Front angle brackets:  
anodized aluminium



Sample configuration: 3 U, with handle

### 19" subrack, 6 U

- for 100mm x 160mm Europe cards



Sample configuration: 6 U, double row with handle

### 19" subrack with sub-units

- for 100mm x 160mm Europe cards  
and 233.35mm x 160mm double  
Europe cards



Sample configuration: 6 U with expansion kit and handle



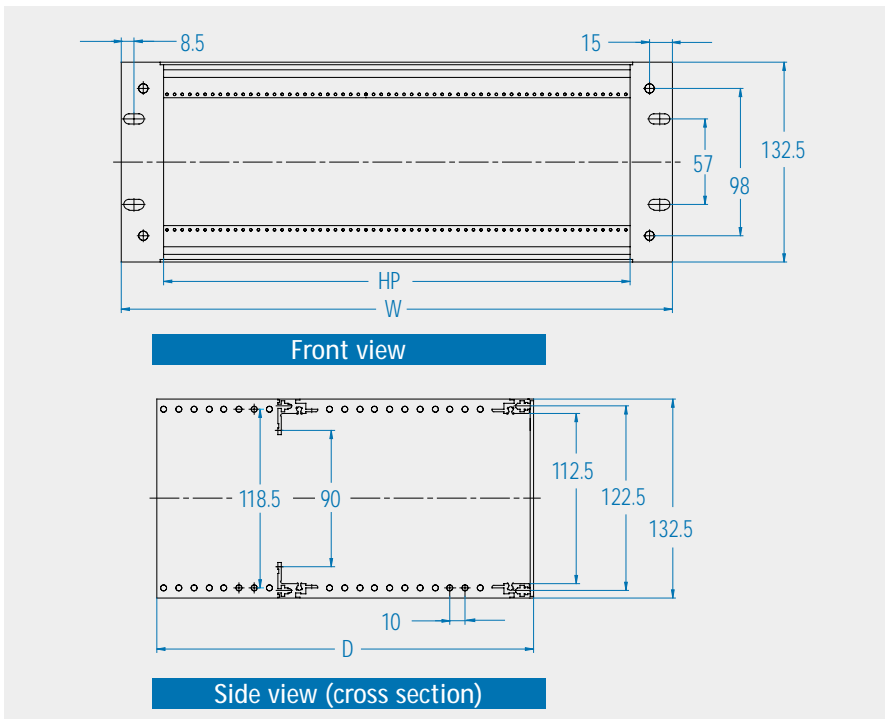
## 270 • 19" profi set subrack, 3 U



### 19" subrack, 3 U profi set

- high stability due to extruded side panels
- ideal for mobile use
- can be retrofitted to 19" plug-in unit or desktop enclosure (see p. 5.49)
- depth mounting increment  $d = 10\text{mm}$
- large plug-in depth, up to 448mm

### Specifications



#### Application:

for plug-in components in compliance with IEC 297-3

#### Construction:

The side panels consist of decorative aluminium extrusions with side universal mounting grids in 10mm increments. This design allows universal variation options for different card depths and additional module rail models. Specific subrack models can be constructed from standard stock parts for any application.

#### Material:

aluminium

#### Delivery:

kit form

### Order information

Dimensions		Part no., without handles				
HP	W mm	D = 228 mm	D = 268 mm	D = 308 mm	D = 348 mm	D = 448 mm
84	482.6	270-201	270-211	270-221	270-231	270-241
42	269.5	270-203	270-213	270-223	-	-

Dimensions		Part no., with handles				
HP	W mm	D = 228 mm	D = 268 mm	D = 308 mm	D = 348 mm	D = 448 mm
84	482.6	270-206	270-216	270-226	270-236	270-246
42	269.5	270-208	270-218	270-228	-	-

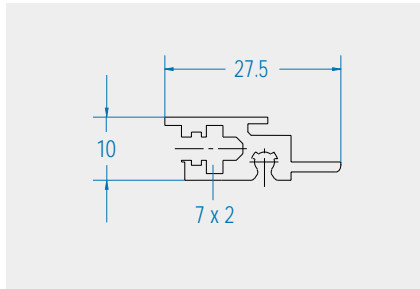
### Included in delivery

Item	Pc.	Description
1	2	Side panels, aluminium extrusion
2	2	Module rails, chromated aluminium extrusion
3	2	Module rails with integrated mounting rails for plug-in connections in compliance with DIN 41612, chromated
4	2	Threaded inserts
5	2	Front angle bracket
6	2	Handle
7	1 set	Assembly material



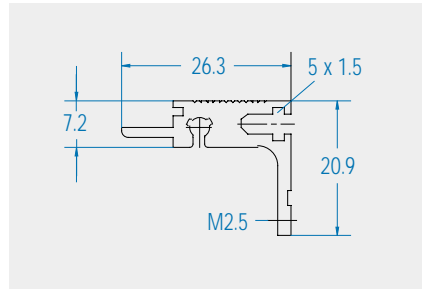
## Accessories

### Standard module rail



HP	Length mm	Part no.
85	431.9	24-1022-01
43	218.5	24-1022-03

### Module rail



HP	Length mm	Part no.
85	431.9	26-7919-01
43	218.5	26-7919-03

### Card guide



- for 160mm-long Europe cards

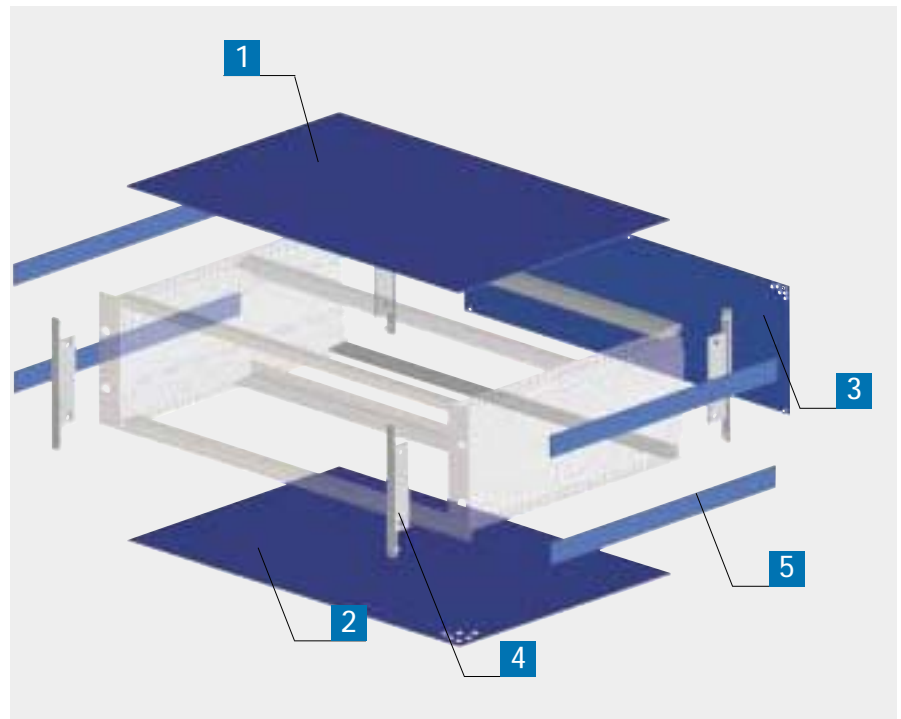
Material:

plastic, grey, listed according to UL 94 V-1

Part no. (1 piece)
240-401

## Desktop expansion kit

- complete kit for expanding/transforming the 19" subrack profi set into a desktop enclosure or 19" plug-in unit



### Included in delivery

Item	Pc.	Description
1	1	Top shell
2	1	Bottom shell, ventilated
3	1	Rear panel, ventilated
4	4	Cover bracket, plastic
5	4	Decorative strips, side
6		Assembly material incl. 4 base feet

### Order information

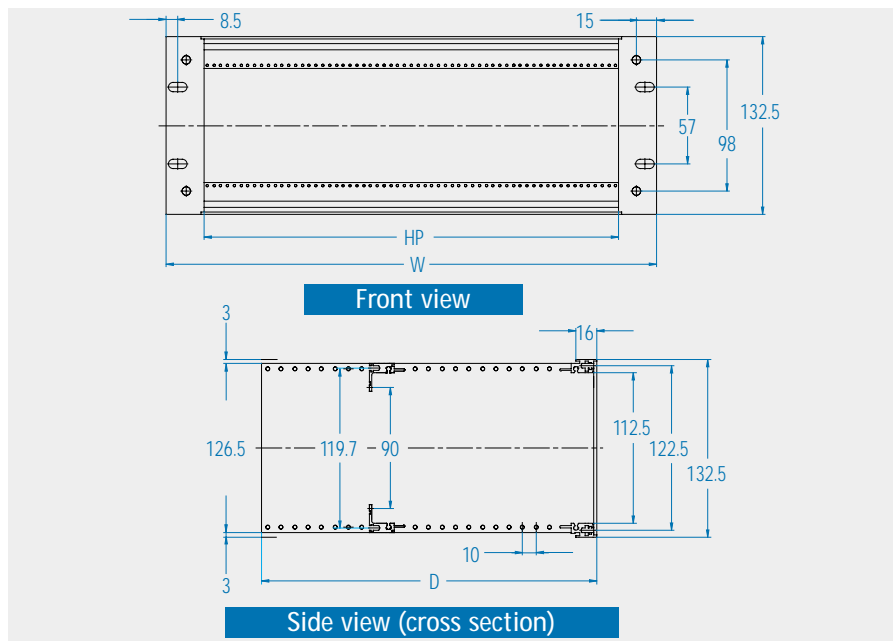
Dimensions		Part no., without handles				
HP	W mm	D = 228 mm	D = 268 mm	D = 308 mm	D = 348 mm	D = 448 mm
84	482.6	27-0206-20	27-0216-20	27-0226-20	27-0236-20	27-0246-20
42	269.5	27-0208-20	27-0218-20	27-0228-20	-	-



**19" subrack, 3 U profi set**

- high stability due to extruded side panels
- ideal for mobile use
- side panels shortened for installation on sliding rails
- depth mounting increment  $d = 10\text{mm}$
- large plug-in depth, up to 448mm

**Specifications**



**Application:**

for plug-in components in compliance with IEC 297-3

**Construction:**

**total subrack height:**  
 front angle bracket, 132.5mm high  
 side panel, 126.5mm high  
 (height makes subrack suitable for installation on sliding rails)

**Installation widths:**

84 HP, 42 HP in stock

**Material:**

aluminium

**Delivery:**

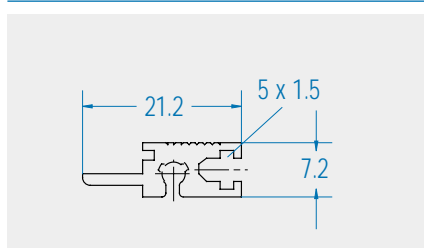
kit form

**Order information**

Dimensions		Part no., with handles				
HP	W mm	D = 228 mm	D = 268 mm	D = 308 mm	D = 348 mm	D = 448 mm
84	482.6	271-206	271-216	271-226	271-236	271-246
42	269.5	271-208	271-218	271-228	-	-

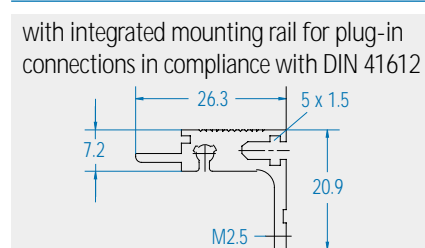
**Accessories**

**Rear narrow module rail**



HP	Length mm	Part no.
85	431.9	24-1016-01
43	218.5	24-1016-03

**Rear narrow module rail**



HP	Length mm	Part no.
85	431.9	26-7919-01
43	218.5	26-7919-03

**Included in delivery**

Item	Pc.	Description
1	2	Side panels, aluminium extrusion
2	2	Module rails, chromated aluminium extrusion
3	2	Module rails with integrated mounting rails for plug-in connections in compliance with DIN 41612, chromated
4	2	Threaded inserts
5	2	Front angle bracket
6	2	Handle
7	1 set	Assembly material



# Accessories 245/270/271



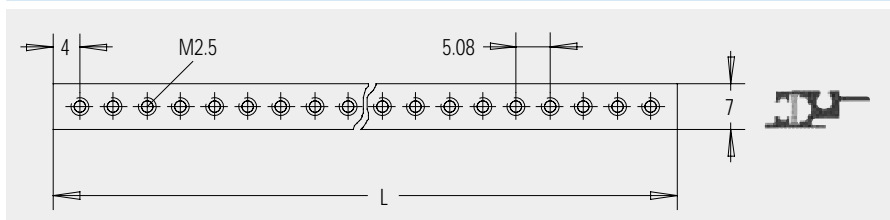
... the perfect shell for valuable electronics





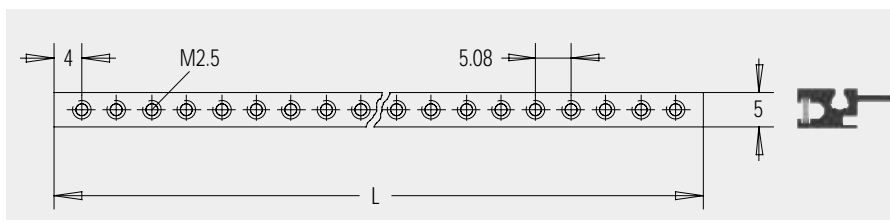
Threaded inserts

M2.5 threaded inserts, 7mm x 2mm for use with standard module rails



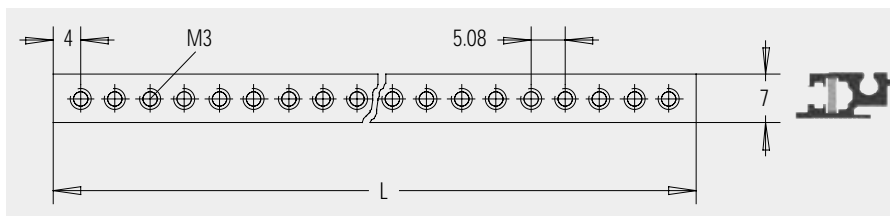
HP	Length mm	Part no.
85	429.9	240-051
64	323.2	240-055
57	287.7	240-052
43	216.5	240-053
29	145.4	240-054

M2.5 threaded inserts, 5mm x 1.5mm for use with BUS module rails/support rails



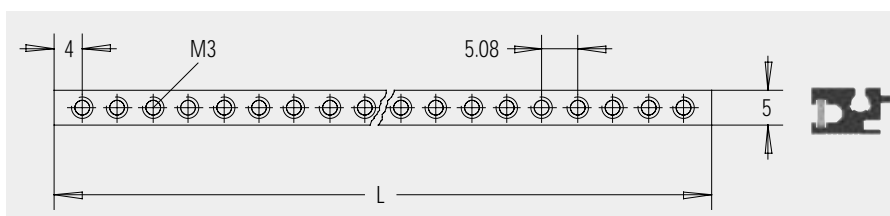
HP	Length mm	Part no.
85	429.9	240-061
64	323.2	240-065
57	287.7	240-062
43	216.5	240-063
29	145.4	240-064

M3 threaded inserts, 7mm x 2mm for use with standard module rails



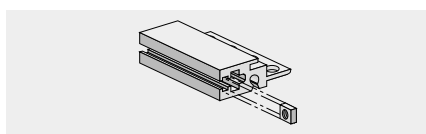
HP	Length mm	Part no.
85	429.9	24-0059-85
64	323.2	24-0059-64
57	287.7	24-0059-57
43	216.5	24-0059-43
29	145.4	24-0059-29

M3 threaded inserts, 5mm x 1.5mm for use with BUS module rails/support rails



HP	Length mm	Part no.
85	429.9	24-0069-85
64	323.2	24-0069-64
57	287.7	24-0069-57
43	216.5	24-0069-43
29	145.4	24-0069-29

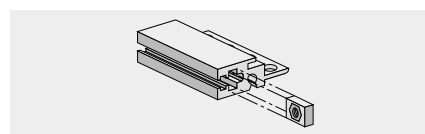
Square nut M2.5



- for use as sliding nut for 5mm x 1.5mm groove
- cannot be used with front panel screws and screw holders

Part no. (100 pc.): 630-192
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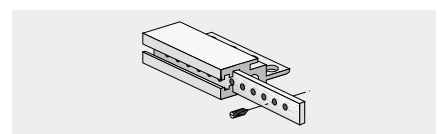
Nut holder



- consists of M2.5 hex nut and plastic nut holder
- fits 7mm x 2mm groove

Part no. (100 pc.): 250-704
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Setscrew M2.5 x 8 DIN 553



- suitable for fixing threaded inserts

Part no. (100 pc.): 630-351
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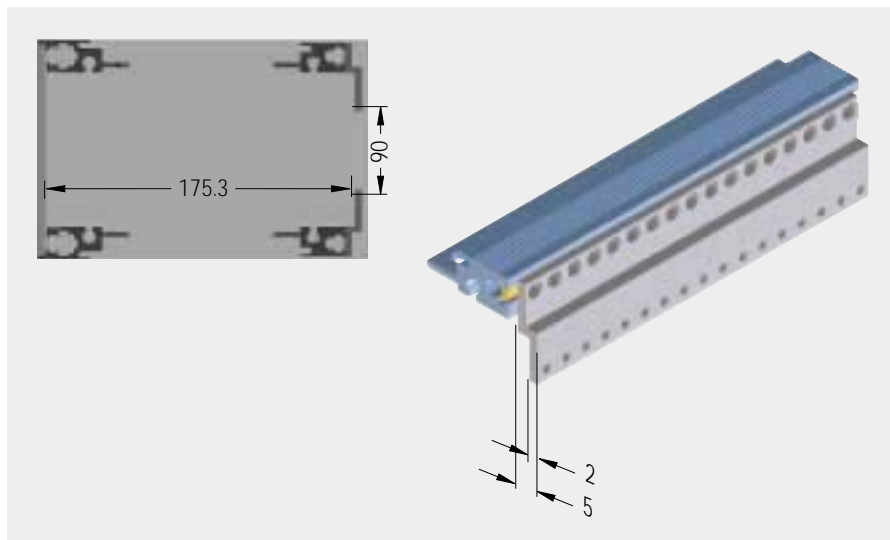


### Z-rails

- for 32-, 64- and 96-pole plug-in connectors in compliance with **DIN 41612**
- fit when used with **BUS module rails** without insulating or contact strips

Material: aluminium

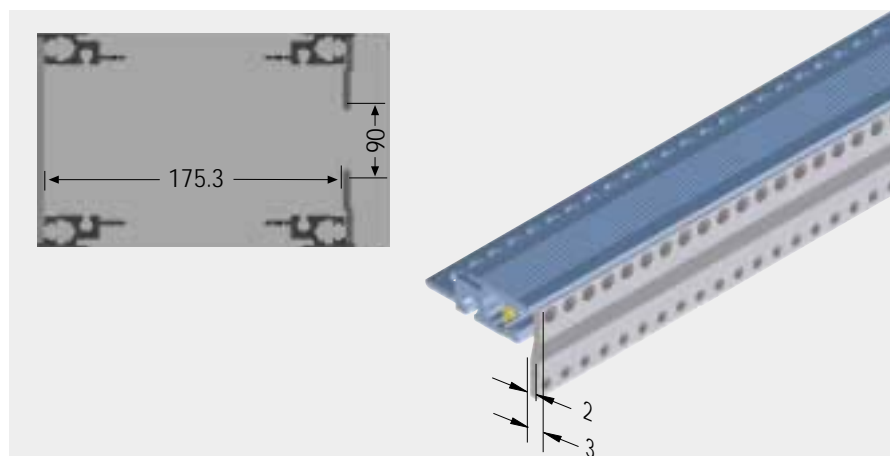
HP	Part no.
85	240-411
57	240-412
43	240-413
29	240-414
64	240-415
10	24-0410-10
8	24-0410-08
6	24-0410-06
4	24-0410-04



- for 32-, 64- and 96-pole plug-in connectors in compliance with **DIN 41612**
- fits when used with **standard module rails**

Material: aluminium

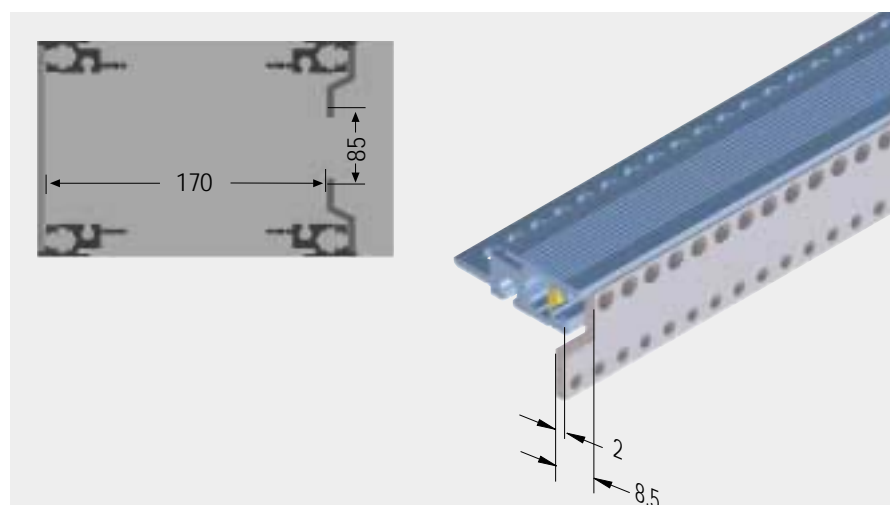
HP	Part no.
85	240-441
57	240-442
43	240-443
29	240-444



- for 31-pole plug-in connectors in compliance with **DIN 41617**
- fits when used with **standard module rails**

Material: aluminium

HP	Part no.
85	240-451
57	240-452
43	240-453
29	240-454



### Assembly material

- Rails are mounted on threaded inserts or sliding nuts (see p. 5.52).

Mounting screws	Part no. (100 pc.)
M2.5 x 12	630-082

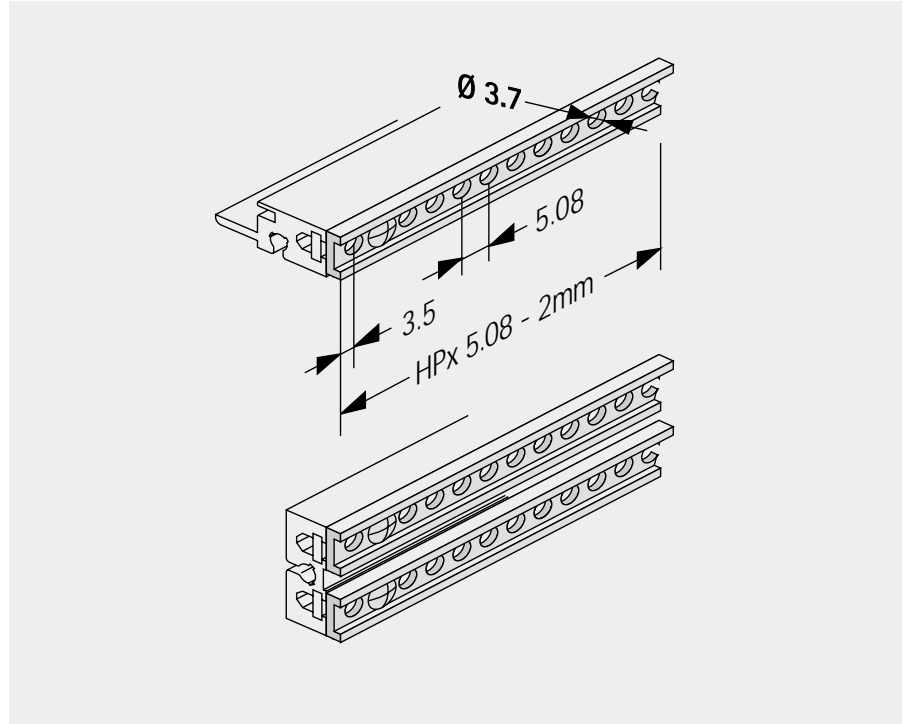
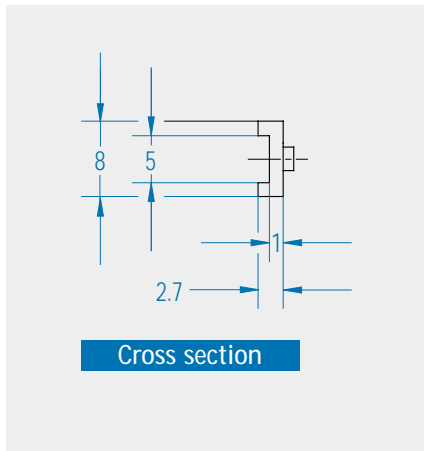


### Insulating strips

- for insulating backplanes and module rails
- for BUS subracks
- for reaching the standardized plug-in module plug-in depth

Material: plastic

Colour: black



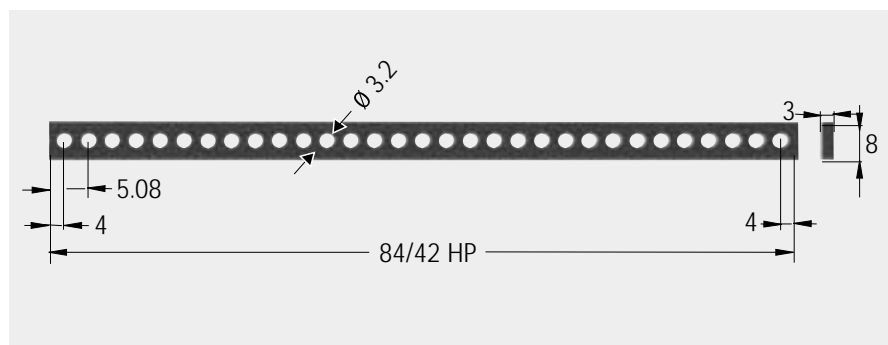
HP	Part no.
84	250-719
42	250-720
28	25-0719-28

Other lengths available on request.

### Contact strips

- for contacting backplanes and module rails
- for achieving the standardized plug-in module plug-in depth

Material: aluminium  
transparent chromated



HP	Part no.
84	25-0725-84
42	25-0725-42
28	25-0725-28

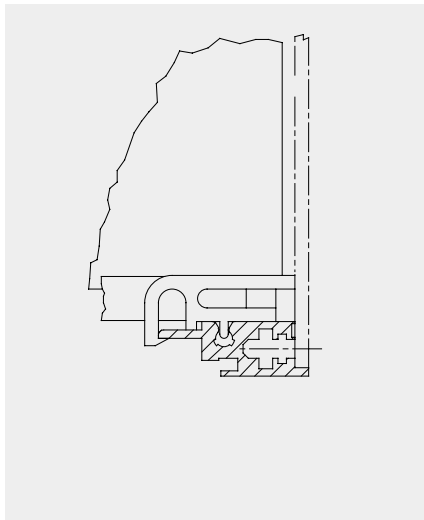
Other lengths available on request.



### Card lock

- can be used with front panels
- for fastening single plug-in cards to prevent them from falling out
- snaps into place easily

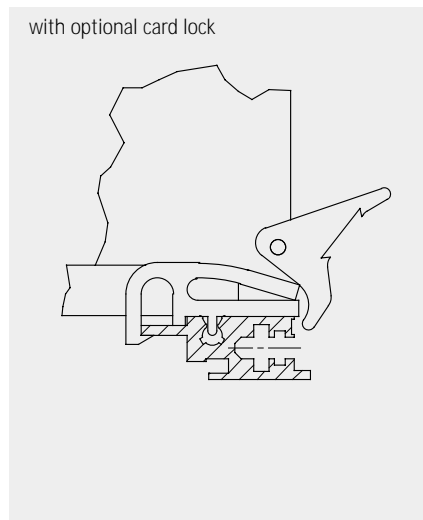
**Material:** plastic  
**Colour:** black



### Extraction handle

- for extracting plug-in cards
- the optional card securing device is opened automatically
- with space for attaching designation strips

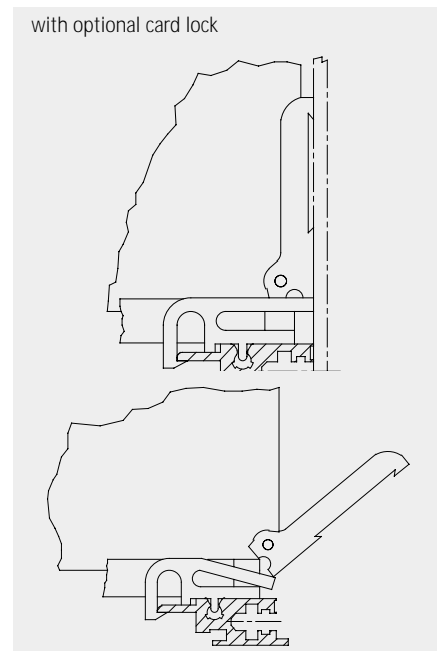
**Material:** plastic  
**Colour:** black



### Extraction handle

- can be used with front panels
- the optional card securing device is opened automatically

**Material:** plastic  
**Colour:** black



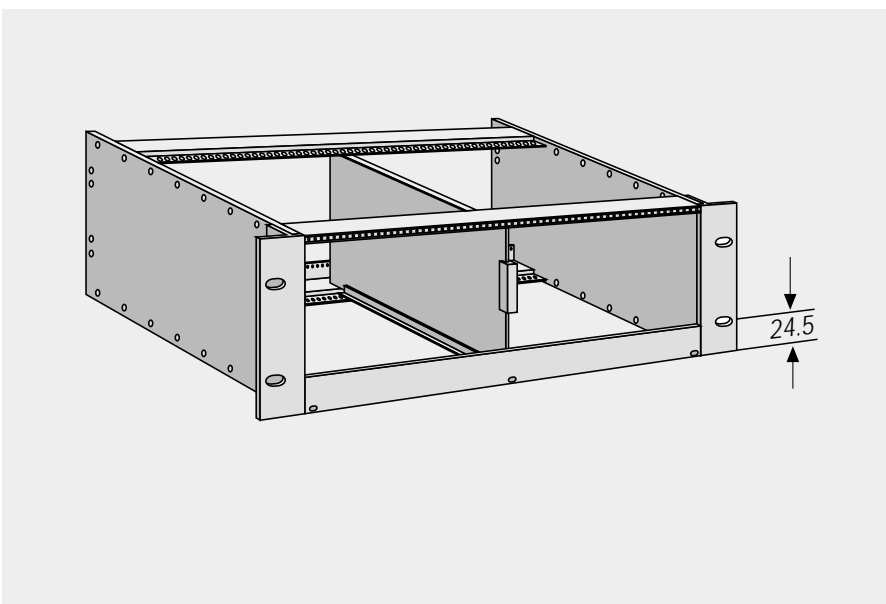
**Note:** cannot be used with front plates.

<b>Part no.</b>
250-716

<b>Part no.</b>
250-715

<b>Part no.</b>
250-717

### Group lock

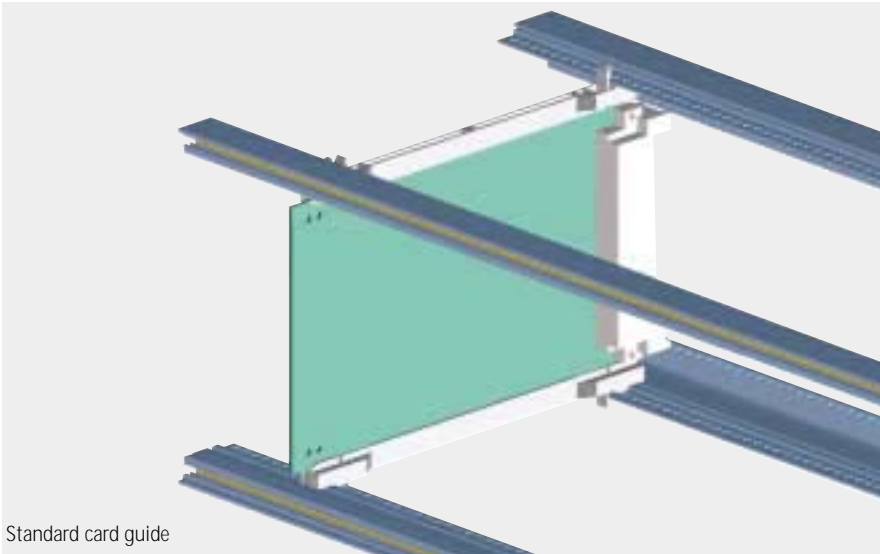


The aluminium extruded group lock secures all PCB's.

#### Included in delivery

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

HP	Part no.
84	24-0110-84
63	24-0110-63
42	24-0110-42



Standard card guide

### Standard card guide

- for installing plug-in modules in compliance with IEC 297-3
- 1.6mm-thick cards in compliance with IEC 297-3 and DIN 40801 Part 1

### Card guide

- can be fit with 2 contact springs, creating up to 4 contact points per plug-in card
- card guide can be clipped onto the module rails; can also be screwed on with a plastic connecting screw

#### Finish:

similar to RAL 7035 light grey (D = 160mm)  
black (D = 220mm)

#### Material:

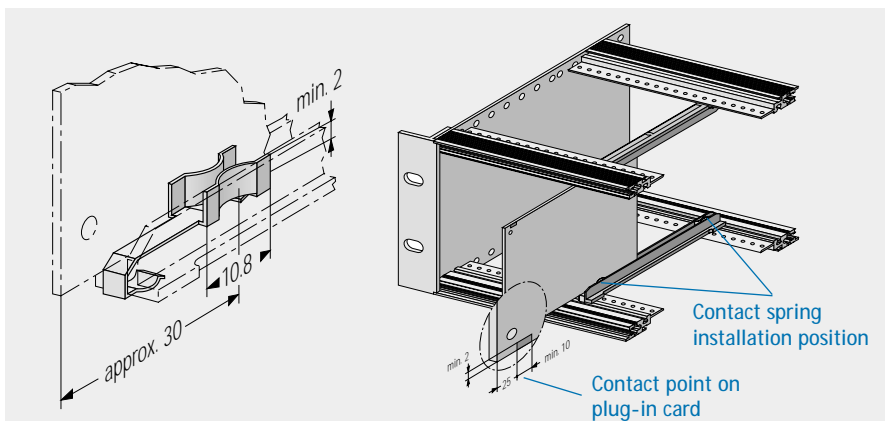
plastic, listed according to UL 94 V-1  
(D = 160mm)

For card depths mm	Part no.
160	240-401
100	240-402



### Contact spring for card guide 240-401

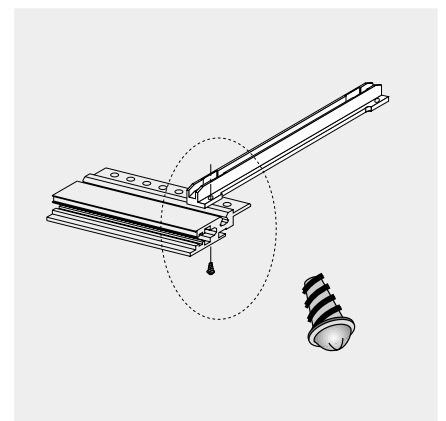
- allows PCB and module rail to connect at up to 4 positions



Part no. (1 piece)  
24-0400-00

### Plastic connecting screw, 2.5mm x 6mm

- for fastening standard card guides



Part no. (100 pc.)  
630-572





### Reinforced card guide

- for use with heavy cards or plug-in modules
- card guide can be clipped onto the module rails; can also be screwed on with a plastic connecting screw

**Finish:**  
black

**Material:**  
plastic

For card depths mm	Part no.
160	240-405
220	240-406
matching plastic connecting screw 3mm x 7mm for fastening the reinforced card guide (100 pc.)	630-574



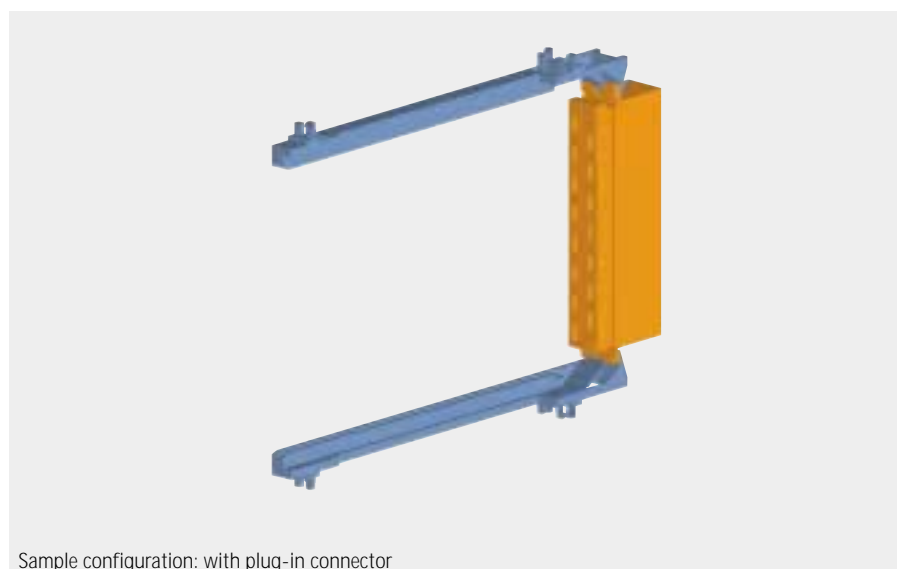
### Integrated card guide

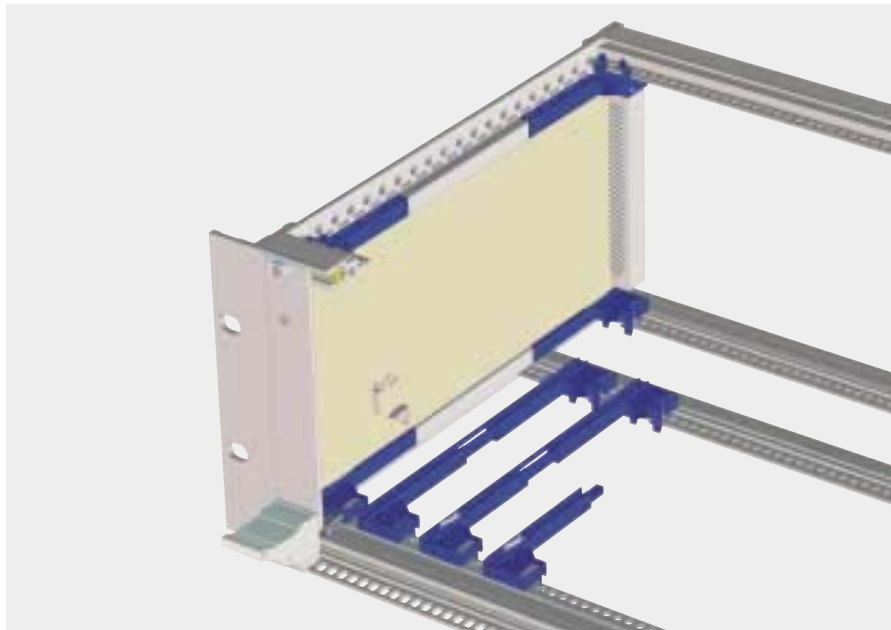
- with integrated attachment for plug-in connectors in compliance with DIN 41612  
(cannot be used with profile no. 241-019)
- particularly suitable for expanding a plug-in location for 3 U bus boards (for example mains supply)

**Finish:**  
black

**Material:**  
plastic

For card depths mm	Part no. (pair)
160	240-407



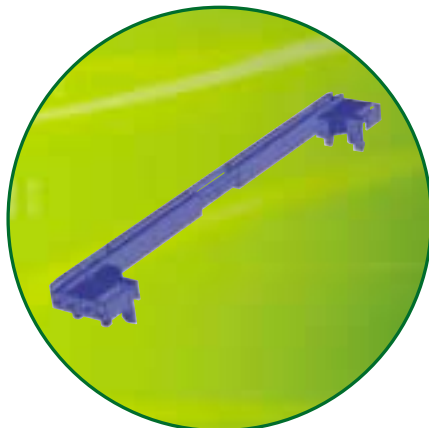


### Card guide with coding

- card guide complies with IEC 297-5 and IEEE 1101.10
- for 1.6mm - 2mm-thick PCB's
- can be used for card depths of 80mm, 160mm and > 160mm
- can be separated at the middle and extended by inserting a middle piece (for example Al extrusion) for card depths > 160mm
- can be fitted with 2 ESD springs for dissipating electrostatic charges from the card
- can be fitted with an earthing spring for accepting a front panel's guide pin or earthing pin of the insertion/ extraction handle.

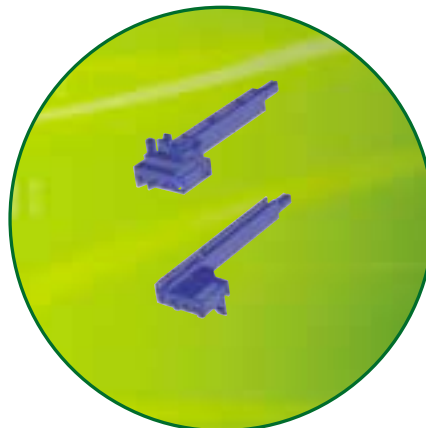
### flexible application options

#### 1. Card depth: 160mm



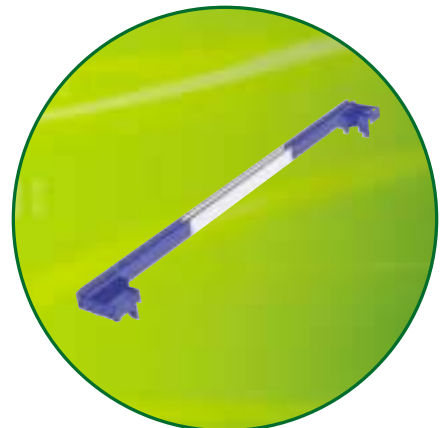
- unchanged

#### 2. Card depth: 80mm



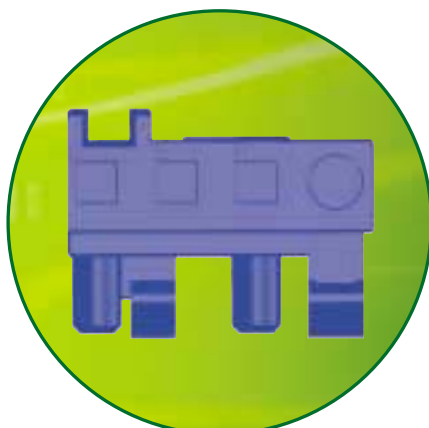
- split at the midpoint
- screwed onto the module rail

#### 3. Card depth > 160mm

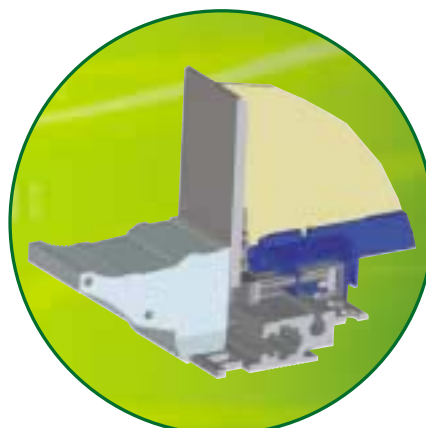


- split at the midpoint
- with middle extension piece

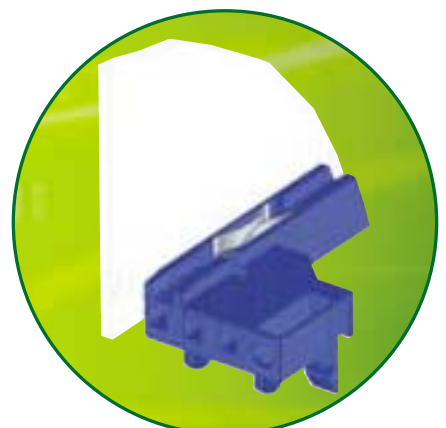
### Features



#### Integrated coding



#### Earth fields that can be integrated



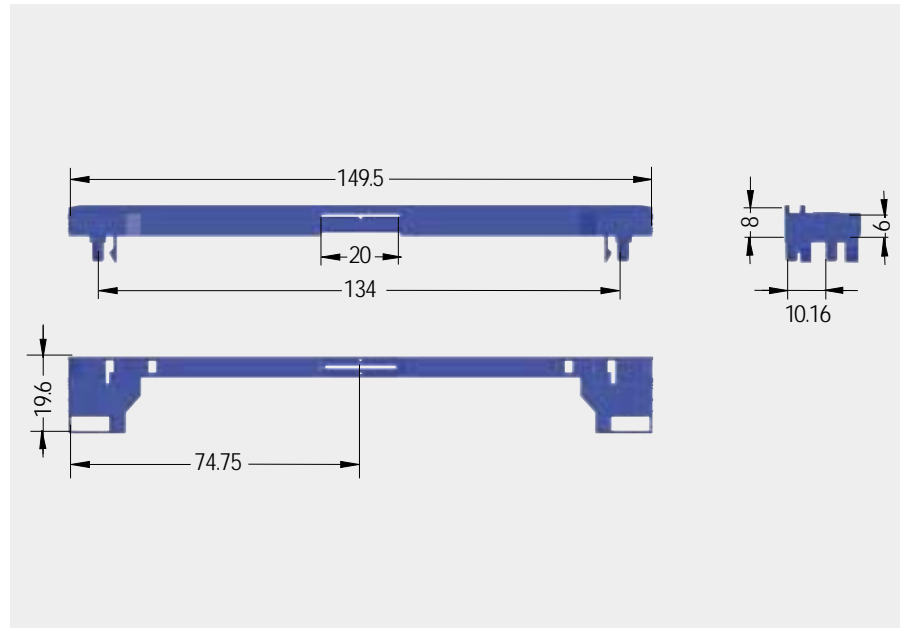
#### ESD springs, can be integrated



### Specifications

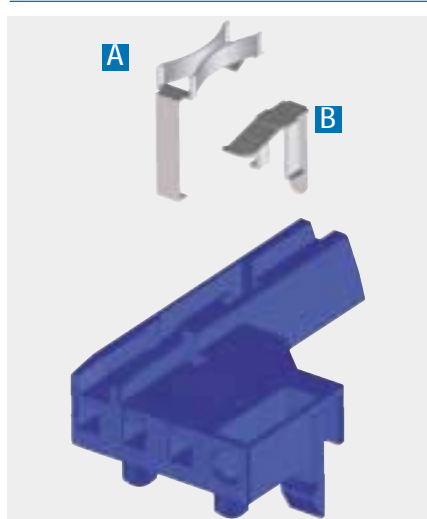
**Finish:**  
similar to RAL 7035 light grey

**Material:**  
plastic,  
listed in compliance with UL 94 V-1



<b>Part no.</b>
24-0160-00

### ESD spring/earth spring



- A** • for dissipating electrostatic charges from the PCB
- B** • for accepting the earth pin of a front plate insertion/extraction handle

### Extension piece



- for extending the card guide with coding at the midpoint
- extrusion for inserting into the card guide end pieces

**Material:** aluminium

### Plastic connecting screw, 2.5mm x 6mm

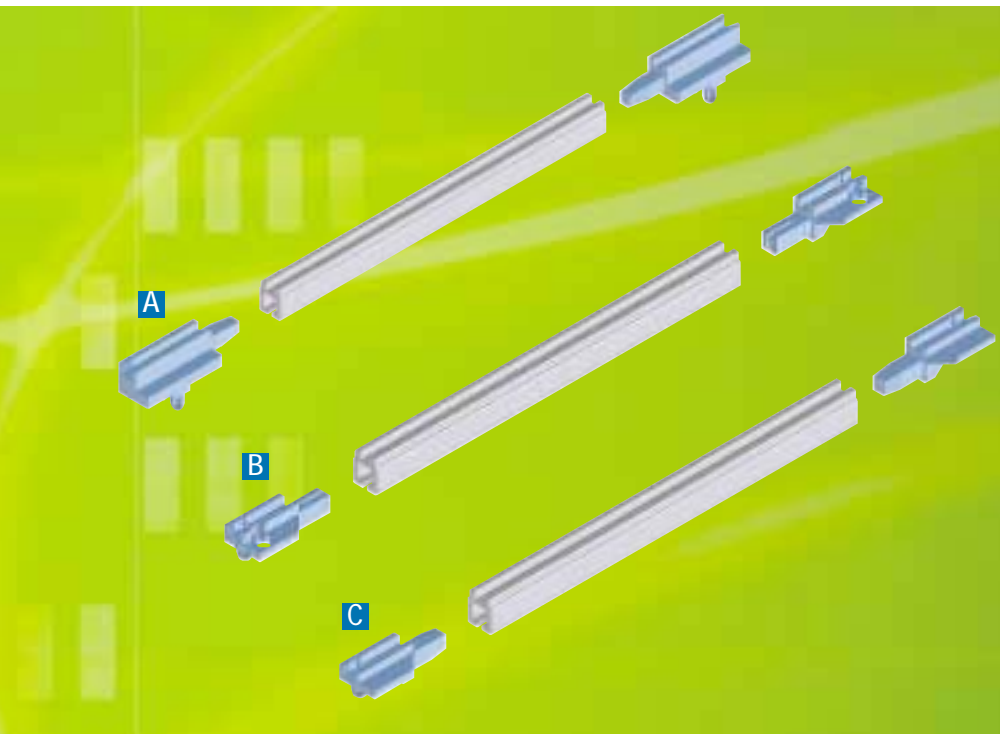


- for screwing down the card guide with coding

Description	Part no.
<b>A</b> ESD spring	24-0161-00
<b>B</b> Earth spring	24-0162-00

Description	Part no.
For 220mm-deep cards	24-0163-01
For 280mm-deep cards	24-0163-02

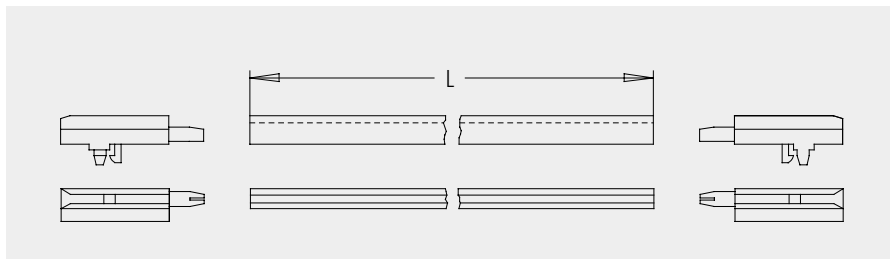
<b>Part no. (100 pc.)</b>
630-572



### Divided card guides

- consists of 2 end pieces and an aluminium or plastic middle extrusion piece

#### A Divided card guide (standard) for any card depth



#### End pieces

<b>Part no. (pair)</b>
250-721

#### Extrusion piece

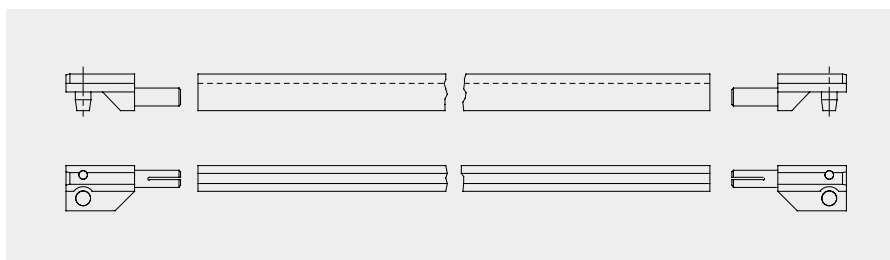
aluminium, 1000mm for adjusting

<b>Part no.</b>
24-0005-00

plastic, 1000mm for adjusting

<b>Part no.</b>
25-0723-00

#### B Card guide for ISEP PCB's PCB height in 3 U subracks is 110.49mm



#### End pieces

<b>Part no. (pair)</b>
250-722

#### Extrusion piece

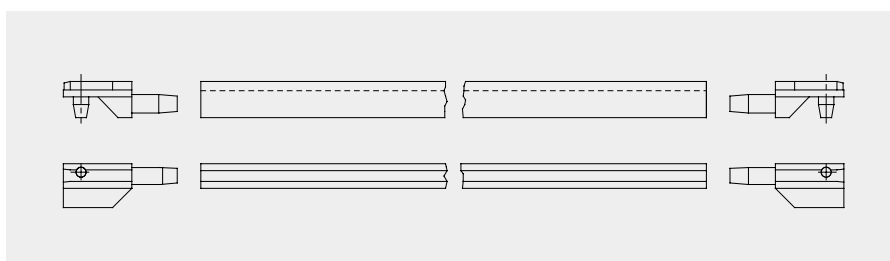
aluminium, 1000mm for adjusting

<b>Part no.</b>
24-0005-00

plastic, 1000mm for adjusting

<b>Part no.</b>
25-0723-00

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



#### End pieces

<b>Part no. (pair)</b>
250-724

#### Extrusion piece

aluminium, 1000mm for adjusting

<b>Part no.</b>
24-0005-00

plastic, 1000mm for adjusting

<b>Part no.</b>
25-0723-00



### Extension kit

- for lengthening a subrack 245 using one or more side panels

**Finish:**  
transparent chromated

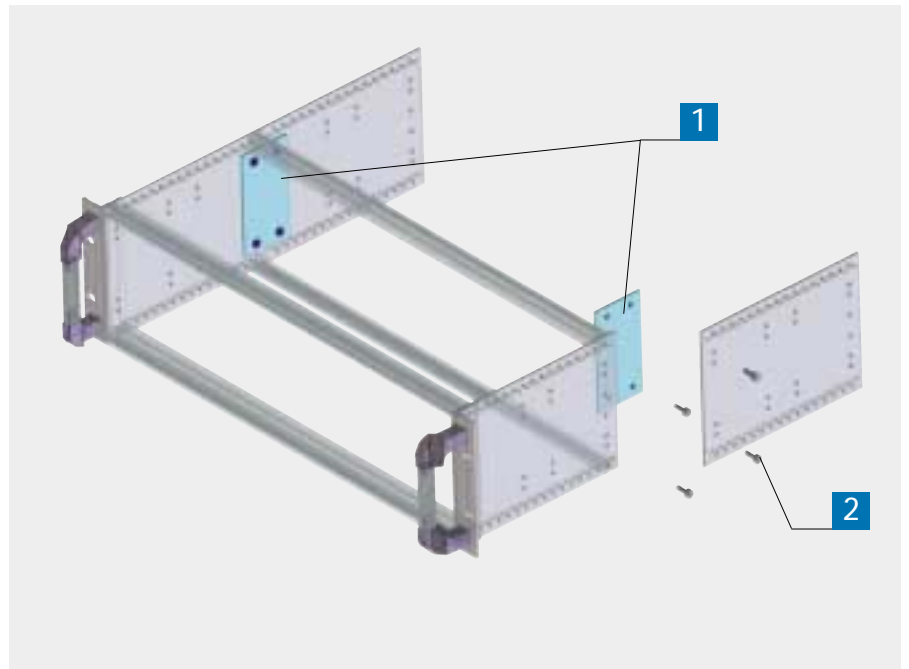
**Material:**  
aluminium

#### Included in delivery

Item	Pc.	Description
1	2	Extension plates
2	8	Oval head screws, M4 x 8

#### Order information

Part no.
24-5000-70



### Connecting kit

- for connecting individual subracks to a module subrack

**Finish:**  
transparent chromated

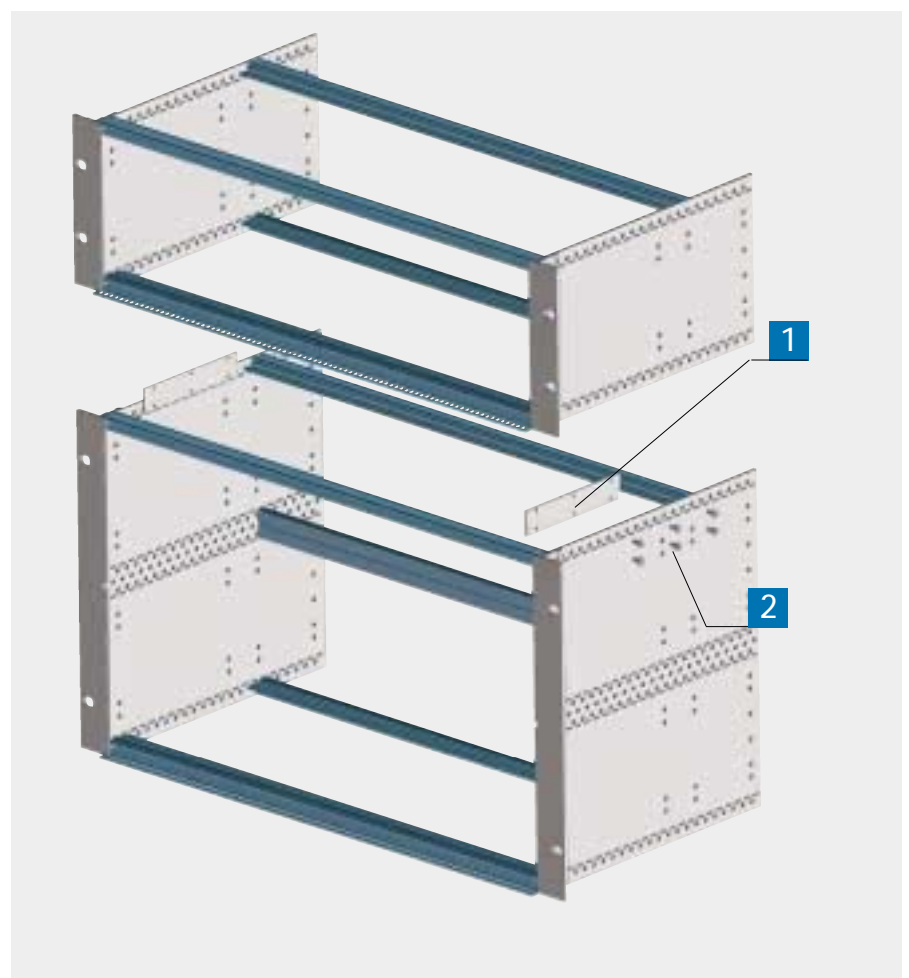
**Material:**  
aluminium

#### Included in delivery

Item	Pc.	Description
1	2	Connecting plates
2	12	Oval head screws, M3 x 6

#### Order information

Part no.
24-5000-80





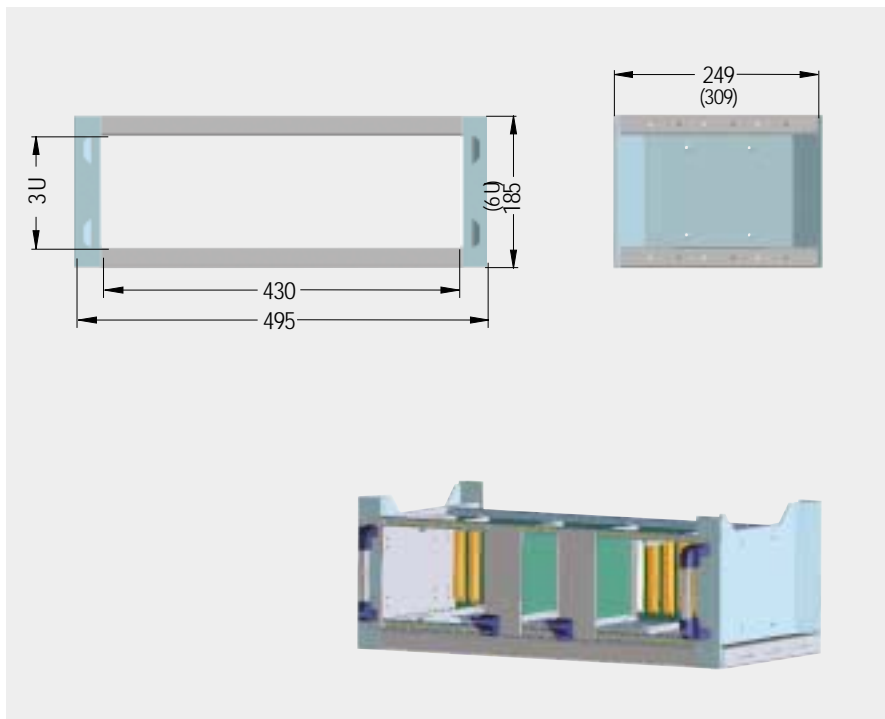


**Subrack cover**

- fits subracks 245
- quick installation
- integrated ventilation
- inexpensive alternative to 19" enclosures



**Specifications**



**Application:**  
for quick subrack 245 mounting

**Finish:**  
RAL 9002 grey white

**Material:**  
aluminium

**Degree of protection:**  
IP 30

**Delivery:**  
not assembled

**Included in delivery**

Item	Pc.	Description
1	2	Side panels
2	2	Top/bottom panels
3		Assembly material

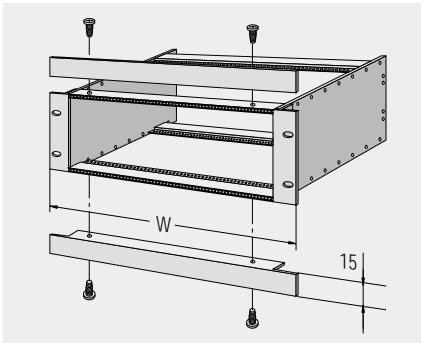
**Order information**

U	for D=236mm	for D=296mm
3	24-5312-78	24-5313-78
6	24-5612-78	24-5613-78



## Mounting angle

- for subracks in control panels, angle 15 x 15 x 2
- angles overlap the cut-out in a control panel



HP	B mm	Part no.
84	482.6	240-111
42	269.4	240-112

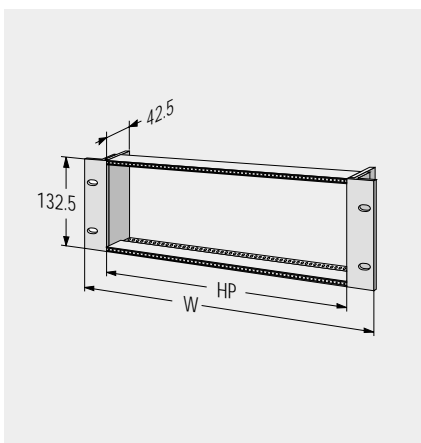


## Frame, 3 U

- single row with 2 threaded inserts

### Included in delivery

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



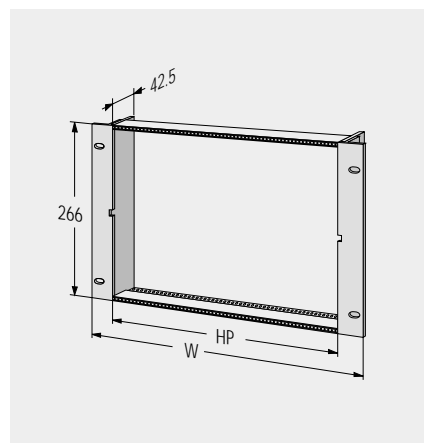
HP	W mm	Part no.
84	482.6	242-901
42	269.4	242-911

## Frame, 6 U

- single row with 2 threaded inserts

### Included in delivery

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



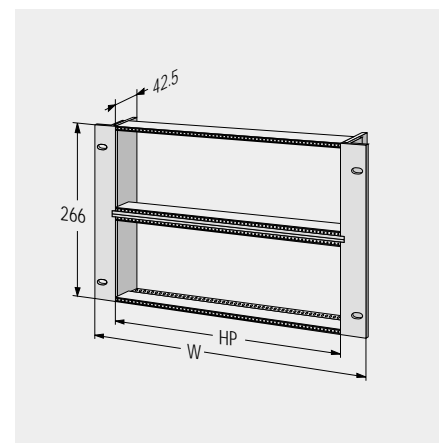
HP	W mm	Part no.
84	482.6	242-903
42	269.4	242-913

## Frame, 6 U

- double row with 4 threaded inserts

### Included in delivery

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



HP	W mm	Part no.
84	482.6	242-902
42	269.4	242-912



## 201 • Frame, 4 U (for front mounting using screws)



Sample configuration: 19" frame, 4 U

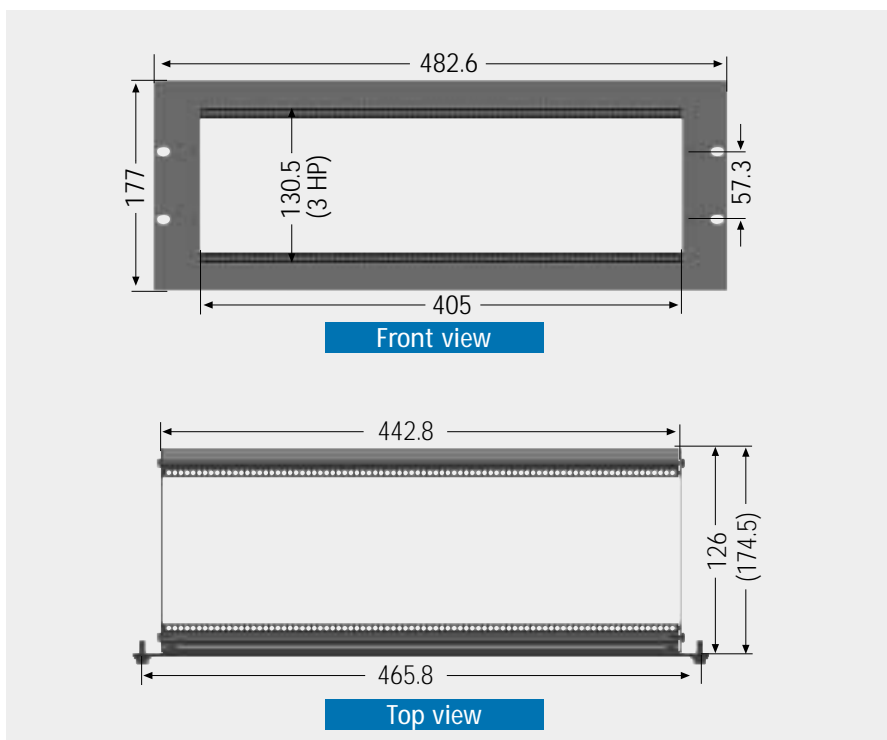
### 19" frame, 4 U

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

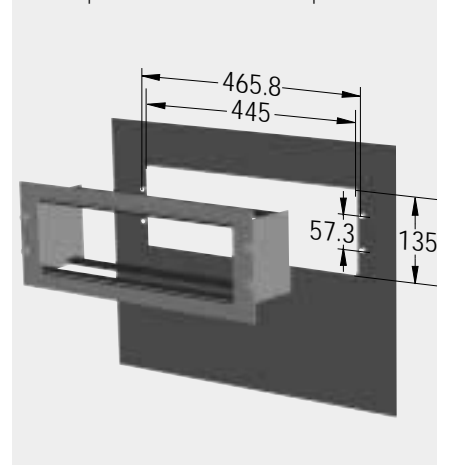
Delivery: kit form

### Included in delivery

Item	Pc.		Description
	D=126 mm	D=1745 mm	
1	4	2	Module rails profile no. 241-030
2	-	2	BUS module rails profile no. 241-013
3	2	2	Side panels
4	1	1	19" front plate d=2.5mm
5	4	4	Countersunk screws M4 x 10
6	4	4	Oval head screws M4 x 12
7	4	4	Combination nuts
8	4	4	Threaded inserts, M3
9	4	4	Oval head screws, M6 x 16
10	4	4	Washers, 6.4 diameter



Control panel cut-out and hole template:



Other widths available on request.

Depth mm	Part no.
174.5	20-1075-06
126	20-1075-00



## 19" frame, 4 U

- for installing active components and/or 100mm x 160mm Europe cards
- available installation height: 3 U
- installed in a 445mm x 135mm cut-out and attached from the rear using fixing clamps

Delivery: kit form

### Included in delivery

Item	Pc.		Description
	D=126 mm	D=174.5 mm	
1	4	2	Module rails profile no. 241-030
2	-	2	BUS module rails profile no. 241-013
3	2	2	Side panels
4	1	1	19" front plate d=2.5mm
5	4	4	Countersunk screws M4 x 10
6	4	4	Oval head screws M4x12
7	4	4	Combination nuts
8	4	4	Threaded inserts, M3
9	4	4	Fixing clamp

Other widths available on request.

Depth mm	Part no.
174.5	20-1075-09
126	20-1075-05

### Fixing clamp

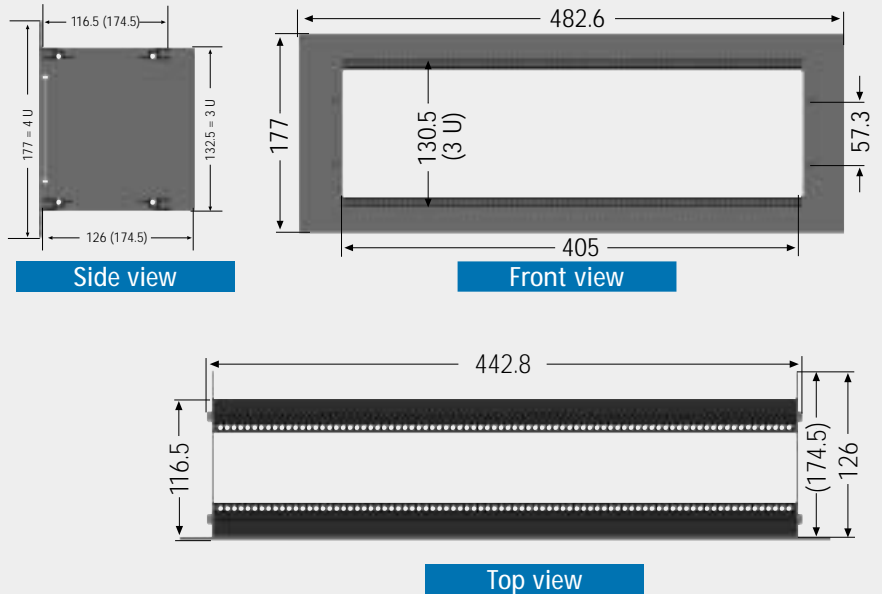
- approx. 190mm long
- M5 threaded rod with pressure piece

Part no.
443-002



Sample configuration: 19" frame, 4 U

Dimensions in parentheses for part no. 20-1075-09.





Visions become reality ...



Special subrack

- for Compact PCI



Special subrack

- with front plug-in connectors



# Front Panels and Plug-in Modules



... the perfect shell for valuable electronics



## Our Internet front panel service for you!

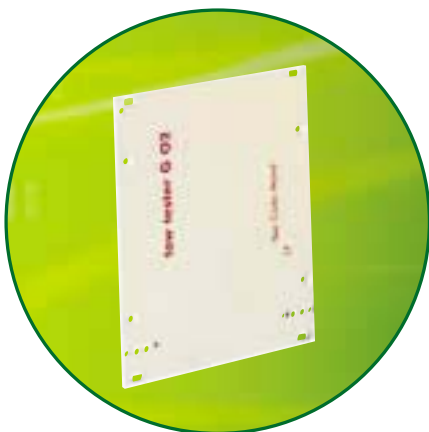
We offer a free 19" front panel download on our homepage at [www.apra.de](http://www.apra.de) so you can keep your costs to a minimum. Simply download the CAD file (in dxf format) with your desired front panel size. Then draw in your customized cut-outs, embossings, etc. and

[e-mail the finished drawing to vertrieb@apranorm.apra.de](mailto:vertrieb@apranorm.apra.de) in dxf format.

You can also send supplemental [screen printing files in tif, eps, cdr, bmp format](#) at the same time. Please also specify colours for any painting or screen printing.

You will receive a quote for the number you requested shortly thereafter. It can't get any easier or faster than that!

### Samples



Front panel with screen printing



Front panel, lasered



Front panel, stamped

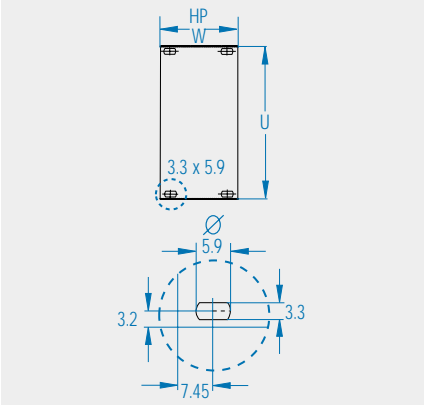


### Front panels customized at apra-norm





**Type A**

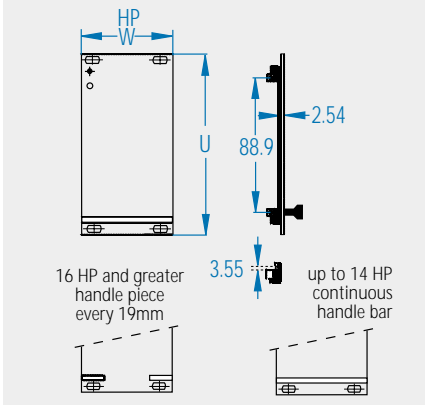


Included in delivery

Item	Pc.	Description
1	1	Front panel

**Type C**

with plastic handle bar and plastic PCB mounting plate



Included in delivery

Item	Pc.	Description
1	1	Front panel Plastic handle
2	1	Labels PCB mounting strip
3	1	Assembly material
4	1	
5		

**Front panels**

- anodized front, transparent chromated rear

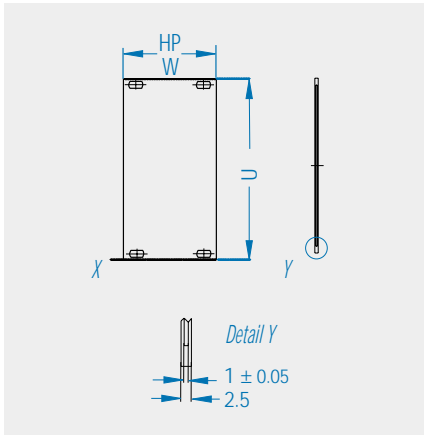
Material: aluminium, 2.5mm

Note: See p. 5.73 for matching screw holder and neck screws.

HP	Width mm	Part no.					
		2 U H = 84.5mm Type A	3 U H = 129.0mm Type A	Type C	4 U H = 173.5mm Type A	6 U H = 262.5mm Type A	Type C
2	10.0		24-3002-45			24-3602-45	
3	15.0		24-3003-45	24-3703-45		24-3603-45	24-3603-65
4	20.1		24-3004-45	24-3704-45		24-3604-45	24-3604-65
5	25.1		24-3005-45	24-3705-45		24-3605-45	24-3605-65
6	30.2		24-3006-45	24-3706-45		24-3606-45	24-3606-65
7	35.2		24-3007-45	24-3707-45		24-3607-45	24-3607-65
8	40.3		24-3008-45	24-3708-45		24-3608-45	24-3608-65
10	50.4		24-3010-45	24-3710-45		24-3610-45	24-3610-65
12	60.6		24-3012-45	24-3712-45		24-3612-45	24-3612-65
14	70.8	24-3214-45	24-3014-45	24-3714-45	24-3414-45	24-3614-45	24-3614-65
16	80.8		24-3016-45	24-3716-45		24-3616-45	24-3616-65
18	91.1		24-3018-45	24-3718-45		24-3618-45	24-3618-65
20	101.2		24-3020-45	24-3720-45		24-3620-45	24-3620-65
21	106.3		24-3021-45	24-3721-45		24-3621-45	24-3621-65
24	121.5		24-3024-45			24-3624-45	
26	131.7		24-3026-45			24-3626-45	
28	142.0	24-3228-45	24-3028-45	24-3728-45	24-3428-45	24-3628-45	
30	152.0		24-3030-45			24-3630-45	
35	177.5		24-3035-45			24-3635-45	
40	202.8		24-3040-45			24-3640-45	
42	213.0	24-3242-45	24-3042-45		24-3442-45	24-3642-45	
48	243.5		24-3048-45			24-3648-45	
54	274.0		24-3054-45			24-3654-45	
56	284.1	24-3256-45	24-3056-45			24-3656-45	
63	319.7	24-3263-45	24-3063-45		24-3463-45	24-3663-45	
84	426.4	24-3284-45	24-3084-45		24-3484-45	24-3684-45	



## Type A

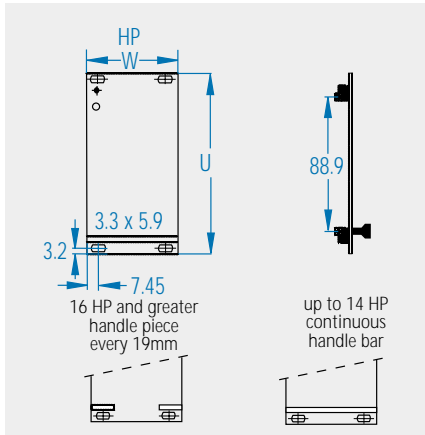


Included in delivery

Item	Pc.	Description
1	1	Front panel

## Type C

with plastic handle bar and die-cast PCB mounting strip



Included in delivery

Item	Pc.	Description
1	1	Front panel
2	1	Plastic handle
3	1	Labels
4	2	PCB mounting strip
5		Assembly material

## Front panels

- anodized front, transparent chromated rear
- with side grooves for clipping on EMC contact springs

Material: aluminium, 2.5mm

Note: See p. 5.73 for matching screw holder and neck screws.

HP	Width mm	Part no.			
		3 U H = 129.0mm		6 U H = 262.5mm	
		Type A	Type C	Type A	Type C
2	10.0	24-3802-13		24-3802-16	
3	15.0	24-3803-13		24-3803-16	
4	20.1	24-3804-13	24-3804-33	24-3804-16	24-3804-36
5	25.1	24-3805-13	24-3805-33	24-3805-16	24-3805-36
6	30.2	24-3806-13	24-3806-33	24-3806-16	24-3806-36
7	35.2	24-3807-13	24-3807-33	24-3807-16	24-3807-36
8	40.3	24-3808-13	24-3808-33	24-3808-16	24-3808-36
10	50.4	24-3810-13	24-3810-33	24-3810-16	24-3810-36
12	60.6	24-3812-13	24-3812-33	24-3812-16	24-3812-36
14	70.8	24-3814-13	24-3814-33	24-3814-16	24-3814-36
16	80.8	24-3816-13	24-3816-33	24-3816-16	24-3816-36
21	106.3	24-3821-13		24-3821-16	
28	142.0	24-3828-13		24-3828-16	
42	213.0	24-3842-13		24-3842-16	
63	319.7	24-3863-13		24-3863-16	
84	426.4	24-3884-13		24-3884-16	

## EMC contact spring (order separately)

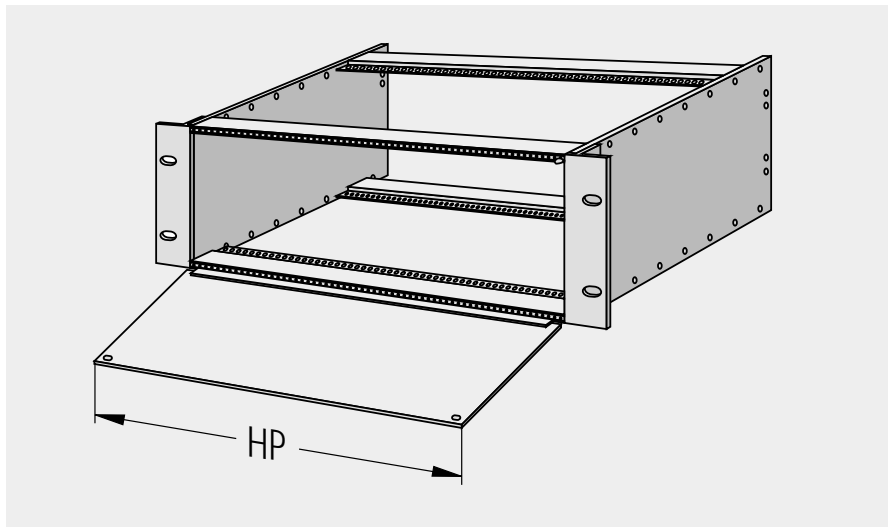
The contact springs are clipped onto the side grooves so that the front panels contact one another.



U	Length mm	Part no.
3	97	671-184
6	232	671-185

Front plates with custom treatments or printing are available on request.



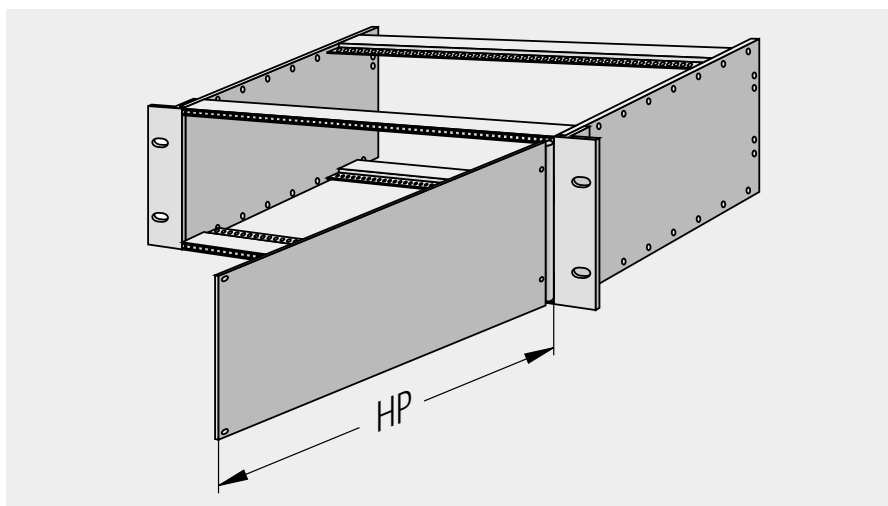


### Front plates, flip-down

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

**Finish:** anodized front  
transparent chromated rear

Width (W)	3 U	6 U
42 HP	24-4342-13	24-4742-16
84 HP	24-4384-13	24-4784-16

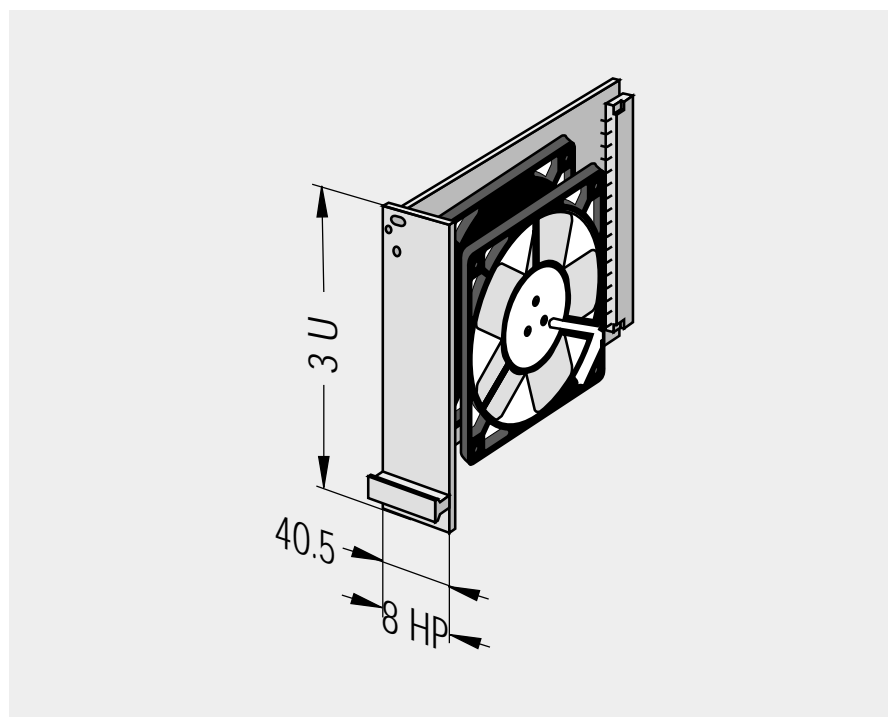


### Front panels, hinged

- with side slit for EMC springs
- can be mounted on the right or left
- hinge requires 2 HP width
- mounted on module rails (M2.5)
- opening angel = 180°, if not limited by other components, for example handles

**Finish:** anodized front  
transparent chromated rear

Width (W)	3 U	6 U
42 HP	24-4142-13	24-4542-16
84 HP	24-4184-13	24-4584-16



### Fan connecting plate, 3 U, 8 HP

- with fan panel in 100mm x 160mm Europe card format
- fan panel with fan and type-C plug-in connector, 32-pole, fully assembled and wired according to customer specifications
- fan connected to plug-in connection according to customer specifications
- particularly suitable for ventilating PCB's installed horizontally

### Included in delivery

Item	Pc.	Description
1	1	Front plate, type C
2	1	Fan panel
3	1	Fan, 60 x 60 x 25mm
4	1	Male connector
5		Assembly material

<b>Part no.:</b>
230-050



## Fastening front panels

### 1 Screw holder, plastic

- can be pressed into place manually

<b>Part no. (100 pc.)</b>
25-0697-02

### 2 Screw holder, brass

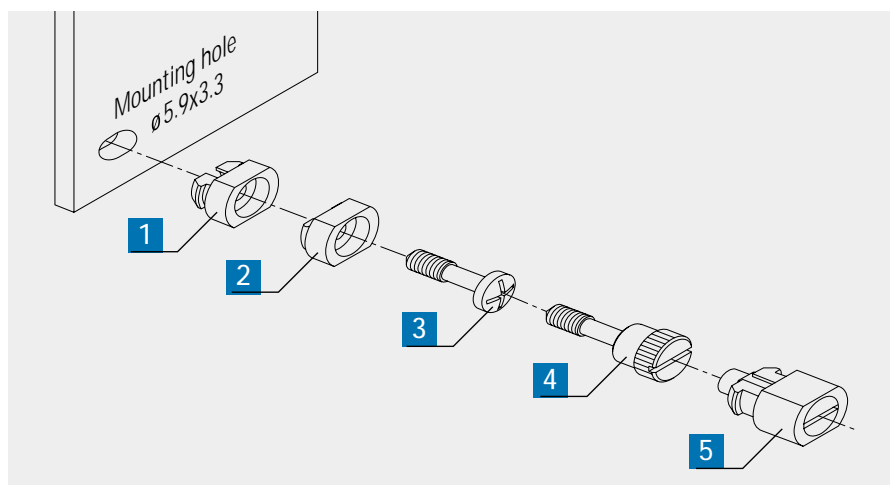
- nickel-plated
- for earthing front panel
- brass screw holders must be pressed into place with a tool or a level press

<b>Description</b>	<b>Part no.</b>
1 piece	250-697

<b>Description</b>	<b>Part no.</b>
100 pc.	25-0697-03

- when ordering front panels and screws, panels come fitted with screw holders

<b>Part no. (1 piece)</b>
25-0697-04



### 3 Neck screw, M2.5 x 12

- Phillips head
- nickel-plated

<b>Part no. (100 pc.)</b>
250-602

### 4 Knurled screw M2.5

- knurled and slotted
- nickel-plated brass

<b>Part no. (100 pc.)</b>
25-0611-02

### 5 Quick closure

- 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

<b>Part no. (100 pc.)</b>
25-0607-00

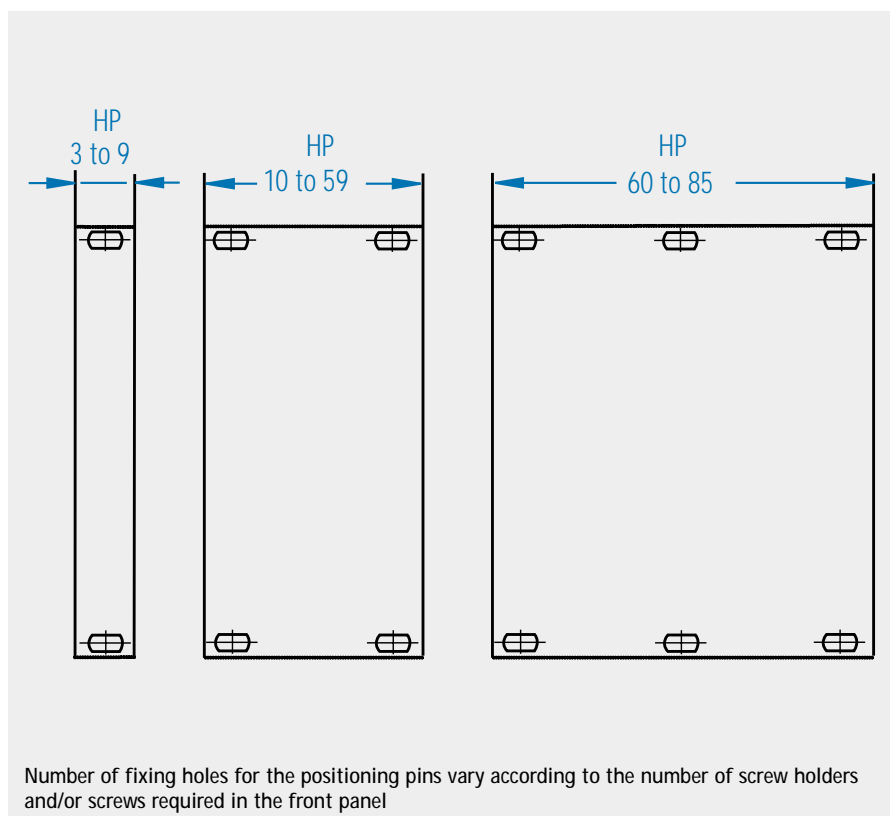
## Handle bar, plastic

- with insertable aluminium strip allowing for easy and custom printing
- handle centred easily using painted positioning pins

**Finish:** handle bar, grey aluminium strips, 2.5mm, natural colour anodized



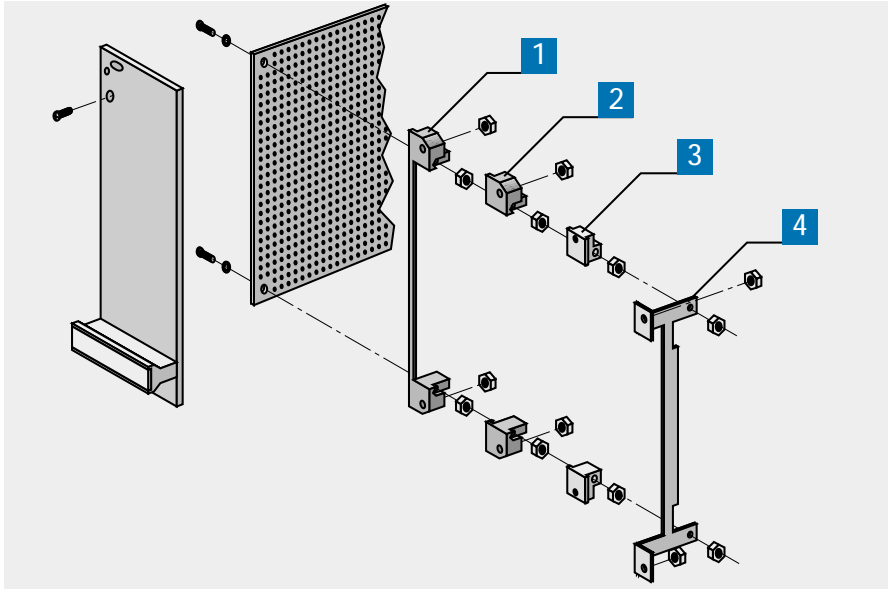
HP	Length (L) mm	Part no.
3	13.9	25-0750-03
4	19.1	25-0750-04
5	24.1	25-0750-05
6	30.0	25-0750-06
7	34.2	25-0750-07
8	39.3	25-0750-08
10	49.5	25-0750-10
12	59.7	25-0750-12
14	69.9	25-0750-14



Number of fixing holes for the positioning pins vary according to the number of screw holders and/or screws required in the front panel



PCB mounting plate



**3** PCB mounting plate

- die-cast zinc
- Attention:**  
can only be used with handle bar 25-0750-... (see p. 5.67)
- if the front panel is designed as an electrical conductor, it can be integrated into the contact-voltage protection or screening measures using a conductor track on the PCB
- with M2.5 thread for fixing front panel and PCB

Description	Part no.
PCB mounting plate	250-698

**1** PCB mounting plate

- plastic, single piece

Description	Part no.
PCB mounting plate	250-701

**2** PCB mounting plate

- plastic, divided

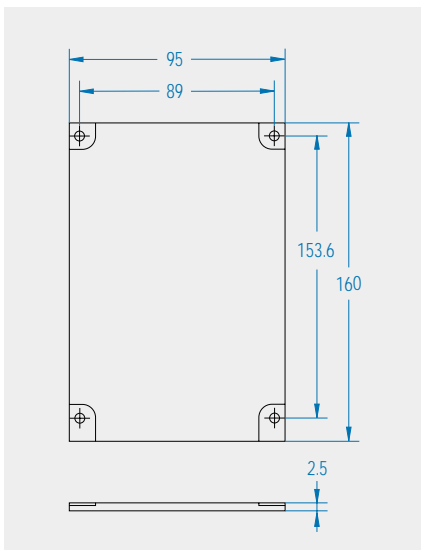
Description	Part no. (pair)
PCB mounting plate	250-700

**4** PCB mounting plate

- sheet steel, galvanized
- for 20mm deeper installation

Description	Part no.
PCB mounting plate	250-702

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 160mm or 233.35 x 160mm PCB's with plug-in connection in compliance with DIN 41612

Specifications

**Material:** plastic, black listed in compliance with UL 94 V-0

**Surface resistance:**  
10<sup>15</sup> Ohm

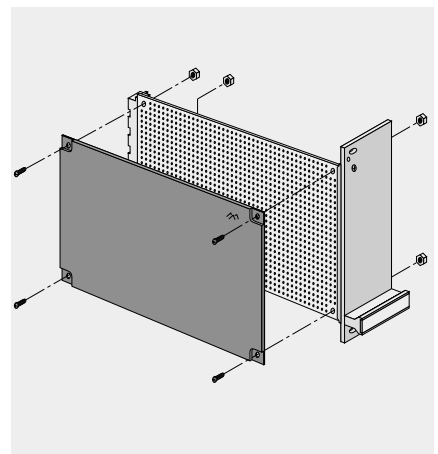
**ASTM D 149 dielectric strength:**  
20kV

**DIN 53460 heat distortion temperature:**  
130°C

Description	Part no.
3 U	258-200

Shortened model

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



Part no.
258-199



## Plug-in modules with insertion/extraction handle, 3 U/6 U • 244

Plug-in modules with insertion/  
extraction handle in compliance  
with IEEE 1101.10  
IEC 48 D/119/CD

- fulcrum can change positions for increased leverage to overcome high inserting and withdrawing force
- insert function is only possible with module rails 241-049
- remove function is also possible with standard module rails 241-022

**Material:** front panel  
aluminium, 2.5mm

**Finish:** anodized front,  
transparent chromated  
rear

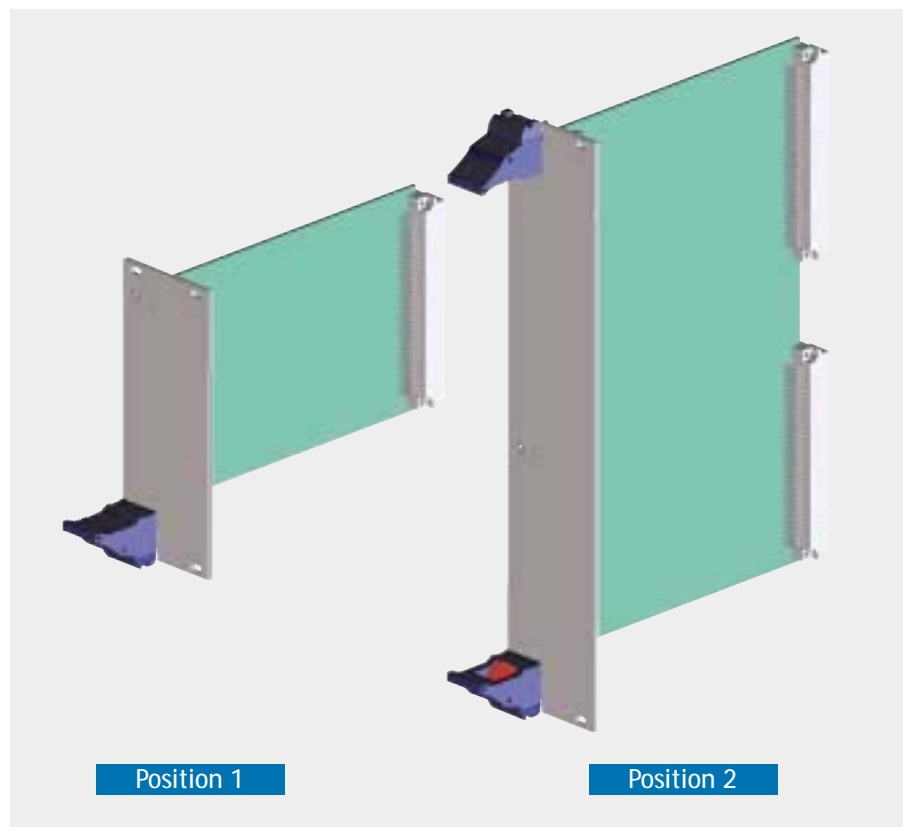


### Position 1

Insertion/extraction handle without lock

### Position 2

Insertion/extraction handle with lock

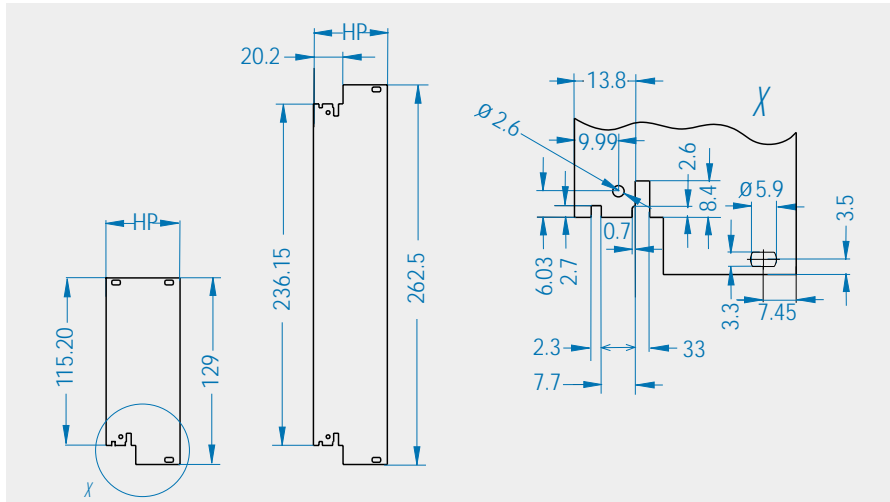




## 244 • Front panels for insertion/extraction handle, 3 U/6 U



### Front panel, 3 and 6 U



### Included in delivery

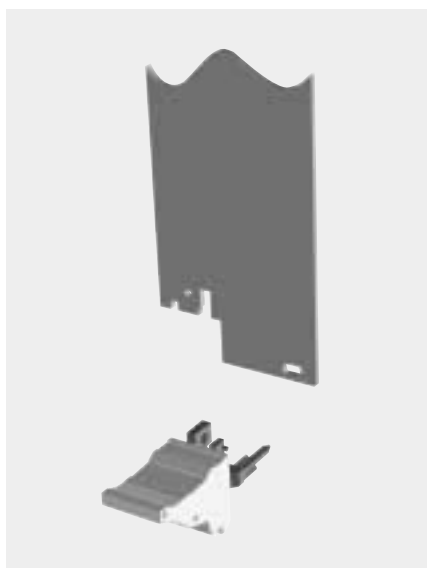
Item	Pc.	Description
1	1	Front panel
2	1/3	Screw holder inserted
3	1	PCB, die-cast
4	1/3	Neck screw M2.5
5	1	Oval head countersunk screw M2.5 x 6

HP	Width mm	Part no.	
		3 U	6 U
4	20.1	24-4604-13	24-4604-16
5	25.1	24-4605-13	24-4605-16
6	30.2	24-4606-13	24-4606-16
7	35.2	24-4607-13	24-4607-16
8	40.3	24-4608-13	24-4608-16
10	50.4	24-4610-13	24-4610-16
12	60.6	24-4612-13	24-4612-16

Order insertion/extraction handles and EMC contact springs separately!

### Insertion/extraction handle without lock

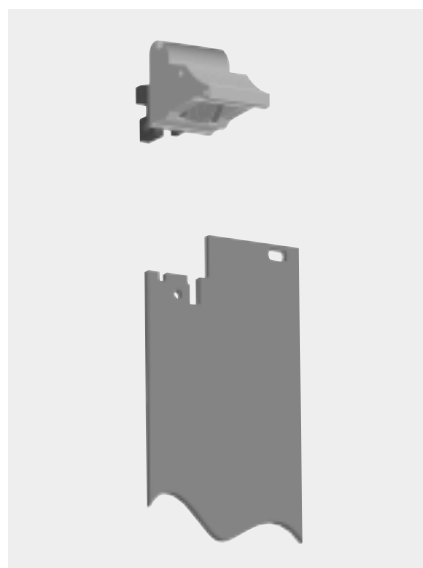
Colour: RAL 7035 light grey



Position on the front panel	Part no.
bottom	611-615
top	611-616

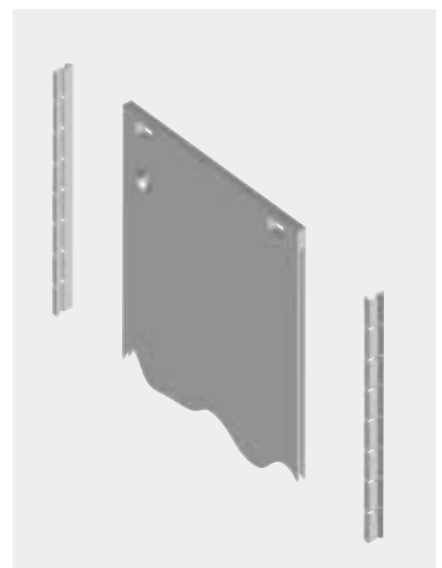
### Insertion/extraction handle with lock

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



Position on the front panel	Part no.
bottom	611-617
top	611-618

### EMC contact spring



U	Length mm	Part no. (1 piece)
3	97	671-184
6	232	671-185





## EMC compact sub-unit, 3 U

- fits all series-245, 270 and 271 subracks
- EMC-compliant design
- with side grooves for EMC contact springs
- plug-in connection for contact in compliance with DIN 41612



## Specifications

### Application:

for 100mm x 160mm PCB

### Material/finish:

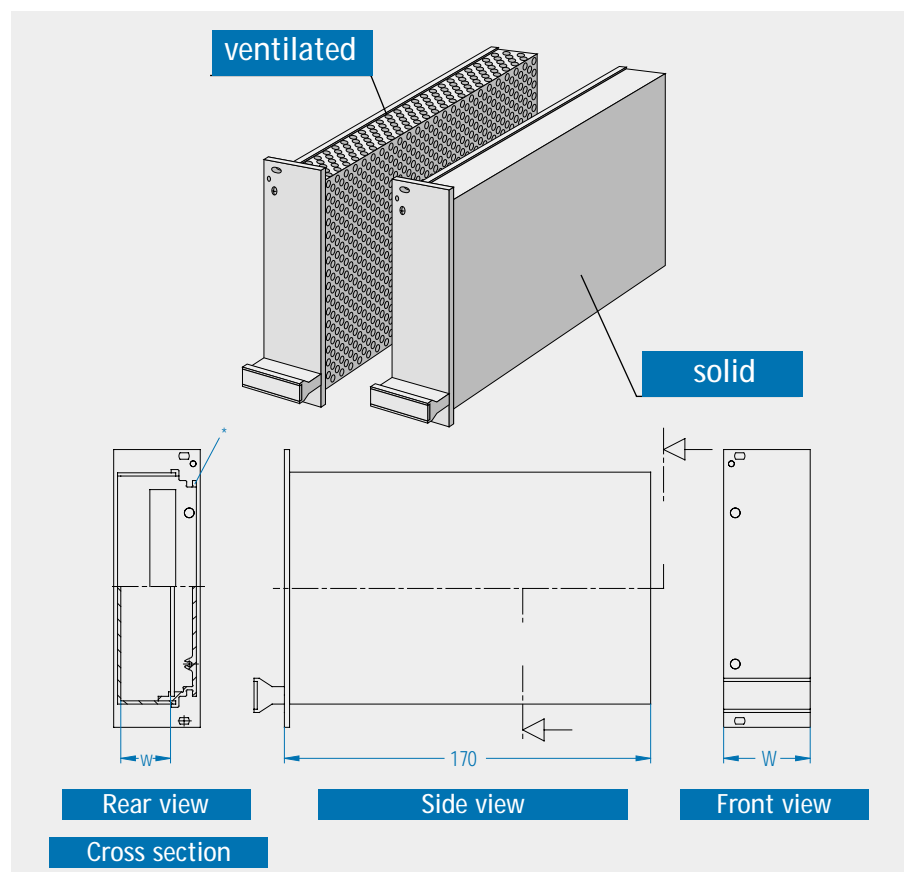
- Front panel: aluminium, 2.5mm  
anodized front  
transparent chromated rear
- Side section: aluminium extrusion  
transparent chromated
- Cover hood: aluminium, 1.5mm  
transparent chromated
- Handle: aluminium panel  
with plastic

### Standards:

IEC 297-3

### Delivery:

not assembled



\*Note: left groove ensures that the PCB is in the correct position

## Included in delivery

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

## Order information

Width W mm	b mm	Part no.	
		solid	ventilated
6 HP	30.2	24-7921-55	24-7931-55
8 HP	40.3	24-7923-55	24-7933-55
10 HP	50.4	24-7925-55	24-7935-55

\*Note: See p. 5.79 for matching EMC contact springs.



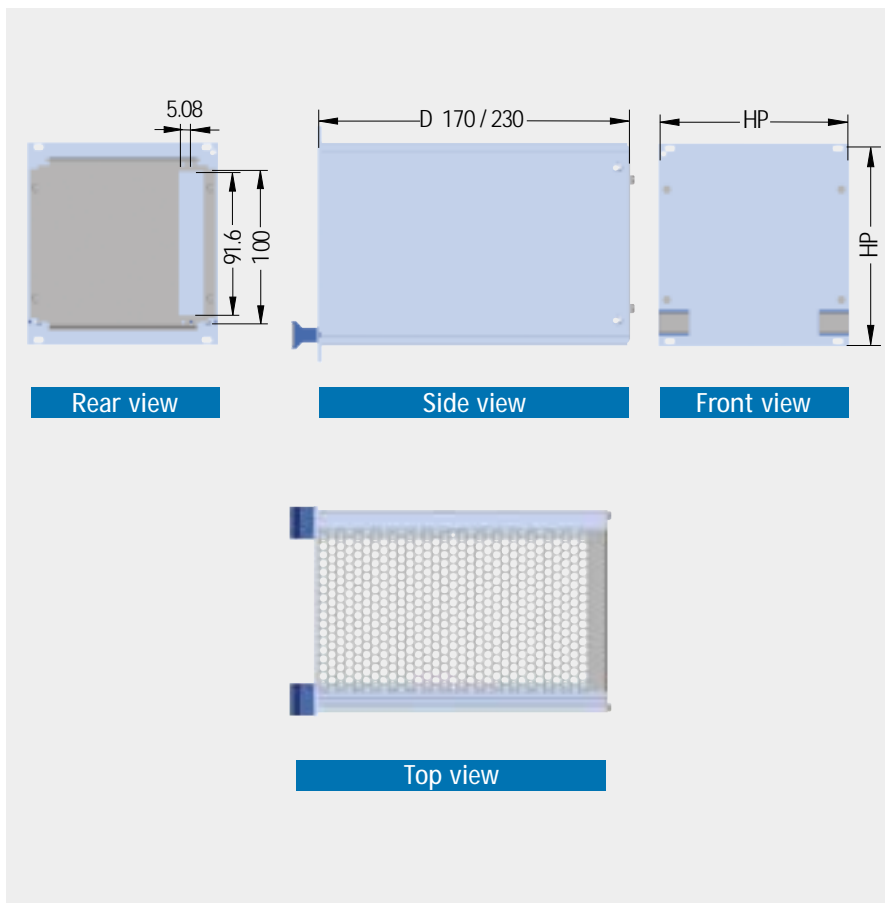
## 247 • EMC sub-unit, 3 U/6 U



### EMC sub-unit, 3 U/6 U

- fits all series-245, 270 and 271 subracks
- EMC-compliant design
- with side grooves for EMC contact springs
- plug-in connection for contact in compliance with DIN 41612
- all components are connected with each other conductively

### Specifications



#### Application:

for PCB

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

**6 U:** 233.35 x 160 or 233.35 x 220mm  
with plug-in connector in compliance with DIN 41612

#### Material/finish:

- Front panel: aluminium, 2.5mm anodized front transparent chromated rear
- Side section: aluminium extrusion transparent chromated
- Rear panel: sheet steel, 1.5mm galvanized and blue passivated
- Handle: aluminium panel with plastic
- Cover panels: aluminium transparent chromated

#### Standards:

IEC 297-3

#### Delivery:

not assembled

\*Note: left groove ensures that the PCB is in the correct position



## Specifications

### Included in delivery

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

\*Note: the handle is divided in units 16 HP and greater.

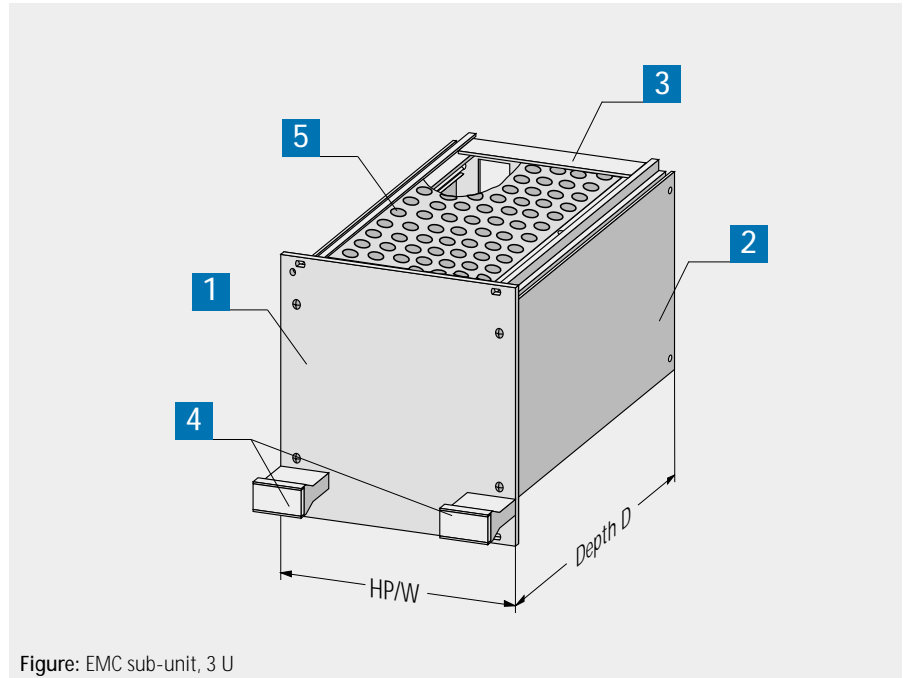


Figure: EMC sub-unit, 3 U

### Order information

HP	Part no., 3 U		Part no., 6 U	
	D = 170mm	D = 230mm	D = 170mm	D = 230mm
12	24-7062-55	24-7162-55	24-7562-55	24-7662-55
14	24-7064-55	24-7164-55	24-7564-55	24-7664-55
21	24-7071-55	24-7171-55	24-7571-55	24-7671-55
24	24-7074-55	24-7174-55	24-7574-55	24-7674-55
28	24-7078-55	24-7178-55	24-7578-55	24-7678-55
42	24-7092-55	24-7192-55	24-7592-55	24-7692-55

### Accessories

#### EMC contact spring



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

U	Length mm	Part no. (1 piece)
3	97	671-184
6	232	671-185

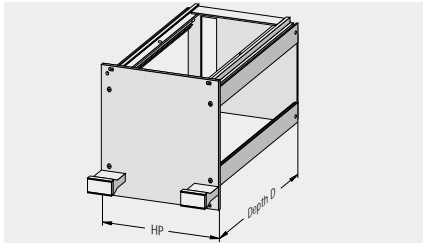
Note: See p. 5.73 for front panel screws.



## 247 • Sub-unit, 3 U, open



### Sub-unit, 3 U with open sides

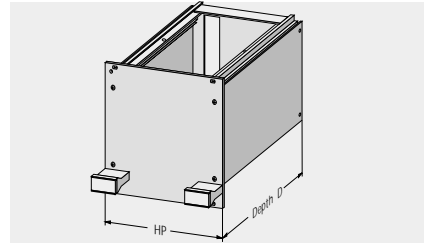


#### Included in delivery

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

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

### Sub-unit, 3 U with solid sides



#### Included in delivery

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

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

### Sub-unit, 3 U, open

- with open or solid sides

#### Application:

for PCB

**3 U:** 100 x 160mm or 100 x 220mm with plug-in connector in compliance with DIN 41612

#### Material/finish:

Front panel: aluminium, 2.5mm anodized

Side extrusion: anodized aluminium

Rear panel: sheet steel, 1.5mm galvanized and blue passivated

Handle: aluminium panel with plastic

#### Standards:

IEC 297-3

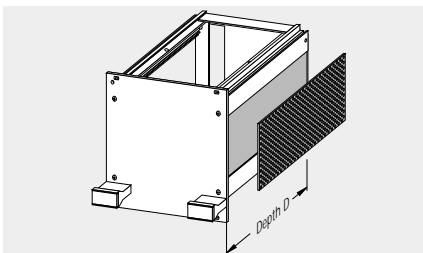
#### Delivery:

not assembled

**Note:** Special sizes or sub-units with special treatments and printing are available on request.

### Expansion parts

#### Side panel, ventilated



#### Included in delivery

Item	Pc.	Description
1	1	Side panel

Part no.	
D = 170mm	D = 230mm
248-402	248-502

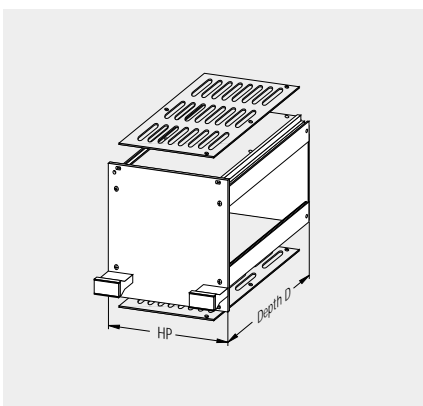
#### Finish:

transparent chromated

#### Material:

perforated aluminium panel

#### Top or bottom panel



#### Included in delivery

Item	Pc.	Description
1	1	Top or bottom panel

#### Finish:

transparent chromated

**Material:** aluminium, 1.5mm

HP	Part no., solid		Part no., ventilated	
	D = 170mm	D = 230mm	D = 170mm	D = 230mm
12	24-8112-07	24-8312-07	24-8112-05	24-8312-05
14	24-8114-07	24-8314-07	24-8114-05	24-8314-05
21	24-8121-07	24-8321-07	24-8121-05	24-8321-05
24	24-8124-07	24-8324-07	24-8124-05	24-8324-05
28	24-8128-07	24-8328-07	24-8128-05	24-8328-05
42	24-8142-07	24-8342-07	24-8142-05	24-8342-05



**Sub-unit, 6 U, open**

- with open or solid sides

**Application:**

for PCB

**6 U:** 233.35 x 160mm or 233.35 x 220mm with plug-in connector in compliance with DIN 41612

**Material/finish:**

Front panel: aluminium, 2.5mm anodized

Side extrusion: anodized aluminium

Rear panel: sheet steel, 1.5mm galvanized and blue passivated

Handle: aluminium panel with plastic

**Standards:**

IEC 297-3

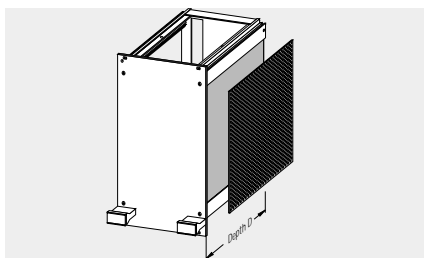
**Delivery:**

not assembled

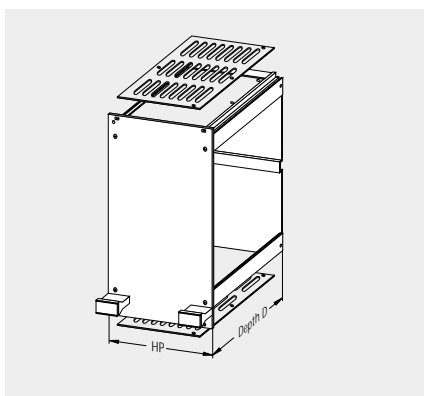
**Note:** Special sizes or sub-units with special treatments and printing are available on request.

**Expansion parts**

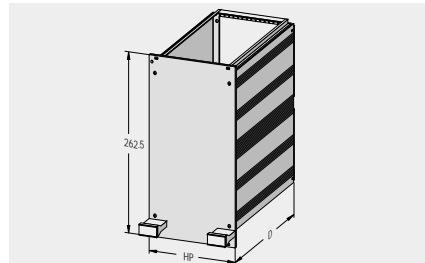
**Side panel, ventilated**



**Top or bottom panel**



**Sub-unit, 6 U with solid sides**

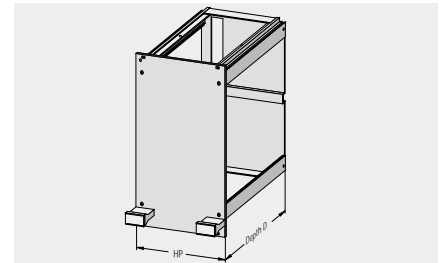


**Included in delivery**

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

HP	Part no.	
	D = 170mm	D = 230mm
12	24-7562-50	24-7662-50
14	24-7564-50	24-7664-50
21	24-7571-50	24-7671-50
24	24-7574-50	24-7674-50
28	24-7578-50	24-7678-50
42	24-7592-50	24-7692-50

**Sub-unit, 6 U with open sides**



**Included in delivery**

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

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

**Included in delivery**

Item	Pc.	Description
1	1	Side panel

Part no.	
D = 170mm	D = 230mm
248-394	248-494

**Finish:**

transparent chromated

**Material:**

perforated aluminium panel

**Included in delivery**

Item	Pc.	Description
1	1	Top or bottom panel

HP	Part no., solid		Part no., ventilated	
	D = 170mm	D = 230mm	D = 170mm	D = 230mm
12	24-8112-07	24-8312-07	24-8112-05	24-8312-05
14	24-8114-07	24-8314-07	24-8114-05	24-8314-05
21	24-8121-07	24-8321-07	24-8121-05	24-8321-05
24	24-8124-07	24-8324-07	24-8124-05	24-8324-05
28	24-8128-07	24-8328-07	24-8128-05	24-8328-05
42	24-8142-07	24-8342-07	24-8142-05	24-8342-05

**Finish:**

transparent chromated

**Material:** aluminium, 1.5mm

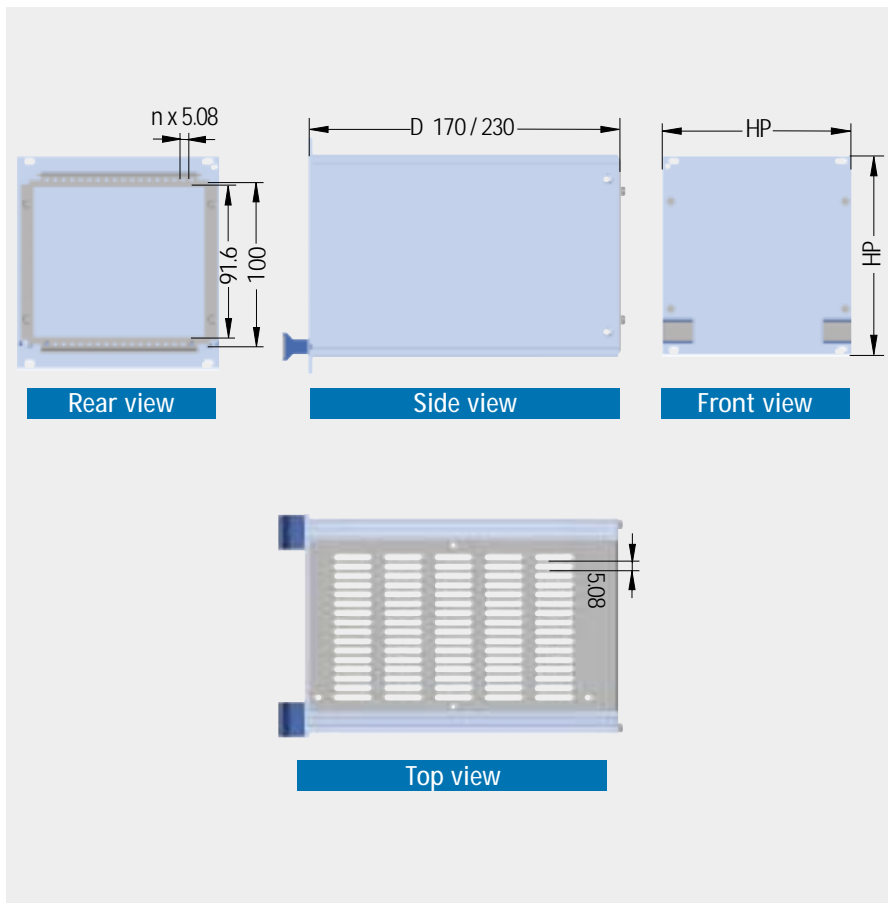




### EMC cassette, 3 U/6 U

- fits all series-245, 270 and 271 subracks
- 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

### Specifications



#### Application:

for several PCB's

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

**6 U:** 233.35 x 160mm or 233.35 x 220mm

with plug-in connector in compliance with DIN 41612

#### Material/finish:

Front panel: aluminium, 2.5mm  
anodized front  
transparent chromated rear

Side section: aluminium  
transparent chromated

Rear panel: sheet steel, 1.5mm  
galvanized and blue passivated

Handle: aluminium panel  
with plastic

Cover panels: aluminium  
transparent chromated

#### Standards:

IEC 297-3

#### Delivery:

not assembled



## Specifications

### Included in delivery

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

\*Note: the handle is divided in units 16 HP and greater.

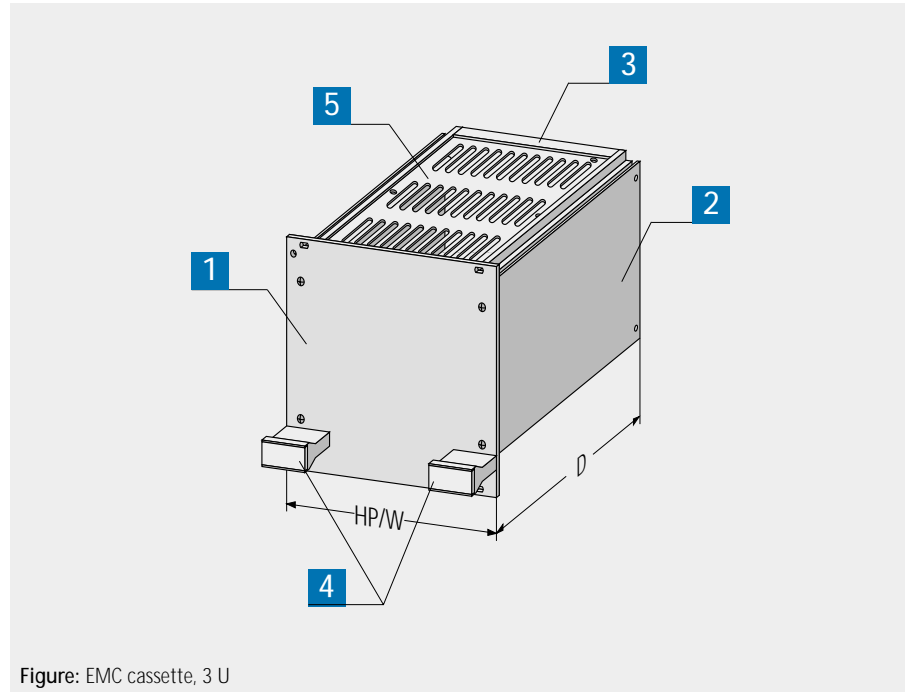


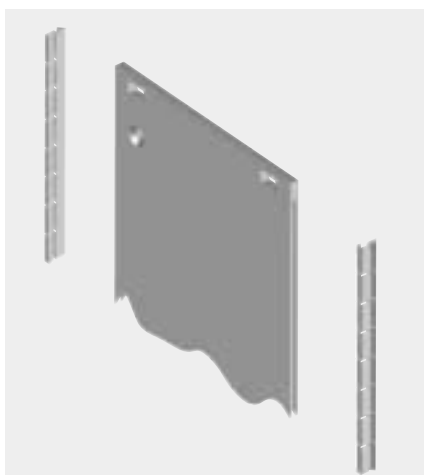
Figure: EMC cassette, 3 U

### Order information

HP	B mm	Part no., 3 U		Part no., 6 U	
		D = 170mm	D = 230mm	D = 170mm	D = 230mm
12	60.6	24-8062-55	24-8162-55	24-8712-55	24-8812-55
14	70.8	24-8064-55	24-8164-55	24-8714-55	24-8814-55
21	106.3	24-8071-55	24-8171-55	24-8721-55	24-8821-55
24	121.5	24-8074-55	24-8174-55	24-8724-55	24-8824-55
28	142.0	24-8078-55	24-8178-55	24-8728-55	24-8828-55
42	213.0	24-8092-55	24-8192-55	24-8742-55	24-8842-55

## Accessories

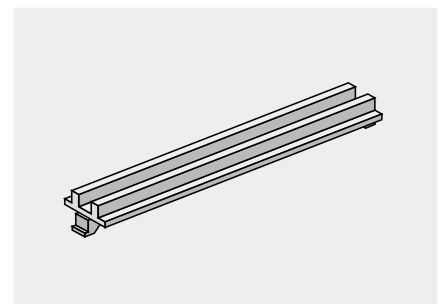
### EMC contact spring



- fits in the side groove in the cassette front panel

U	Length mm	Part no. (1 piece)
3	97	671-184
6	232	671-185

### Internal card guide



- guides cards inside a cassette

Part no. (1 piece)
250-712

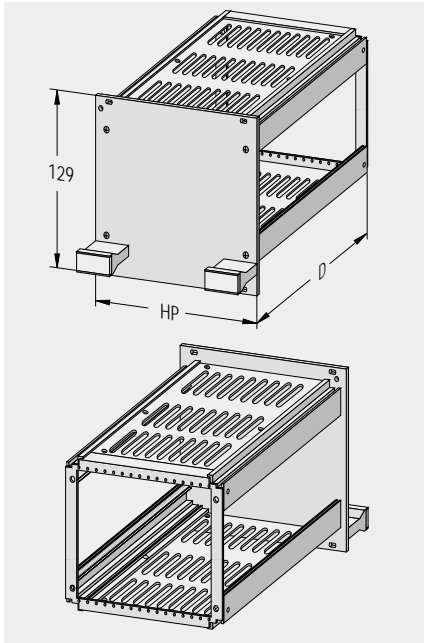
Note: See p. 5.73 for front panel screws.



## 248 • Cassette, 3 U, open/with divided front panel



### Cassette, 3 U with open sides

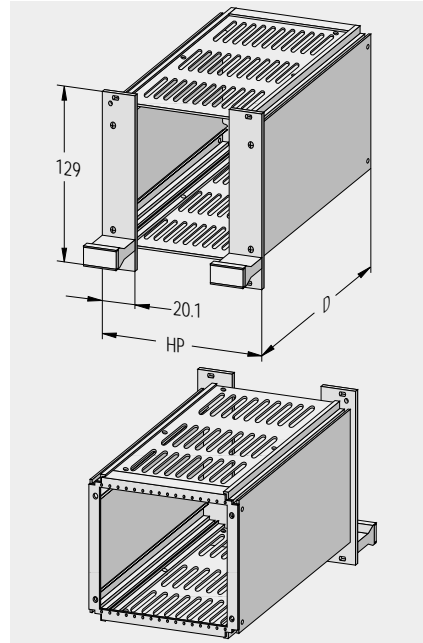


#### Included in delivery

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

HP	W mm	Part no.	
		D = 170mm	D = 230mm
12	60.6	248-462	248-562
14	70.8	248-464	248-564
21	106.3	248-471	248-571
24	121.5	248-474	248-574
28	142.0	248-478	248-578
42	213.0	248-482	248-592

### Cassette, 3 U with divided front panel



#### Included in delivery

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

HP	W mm	Part no.	
		D = 170mm	D = 230mm
12	60.6	248-262	248-362
14	70.8	248-264	248-364
21	106.3	248-271	248-371
24	121.5	248-274	248-374
28	142.0	248-278	248-378
42	213.0	248-292	248-382

### 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, 2.5mm anodized  
 Side section: anodized aluminium  
 Rear panel: sheet steel, 1.5mm galvanized and blue passivated  
 Cover panels: aluminium, 1.5mm transparent chromated

#### Standards:

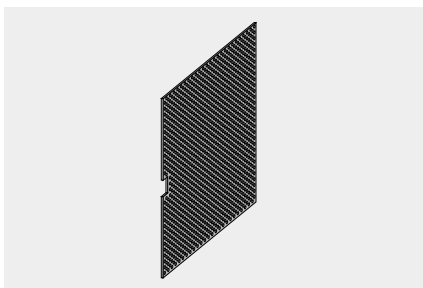
IEC 297-3

#### Delivery:

not assembled

### Expansion parts for cassette, 3 U, open

#### Side panel

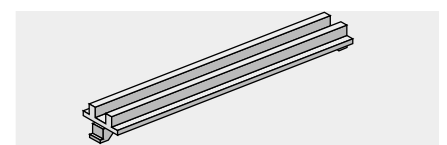


**Finish:**  
transparent chromated

**Material:**  
perforated aluminium panel

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

#### Internal card guide



- guides cards inside a cassette

Part no.: (1 piece)
250-712



# Cassette, 6 U, open or solid • 248

## Cassette, 6 U

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

### Material:

Front panel: aluminium, 2.5mm anodized  
 Side section: anodized aluminium  
 Rear panel : sheet steel, 1.5mm galvanized and blue passivated  
 Cover panels: aluminium, 1.5mm transparent chromated

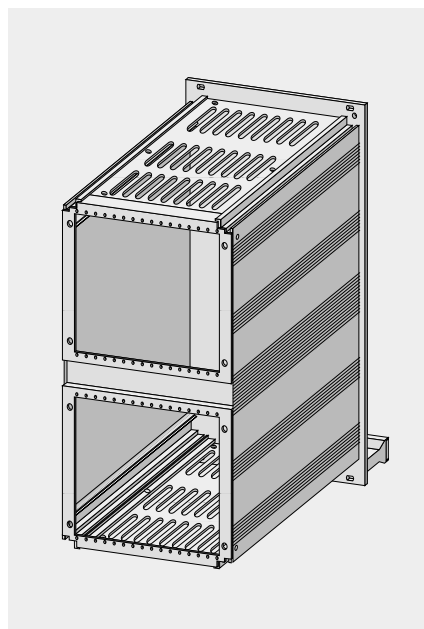
### Standards:

IEC 297-3

### Delivery:

not assembled

## Cassette, 6 U with solid sides



### Included in delivery

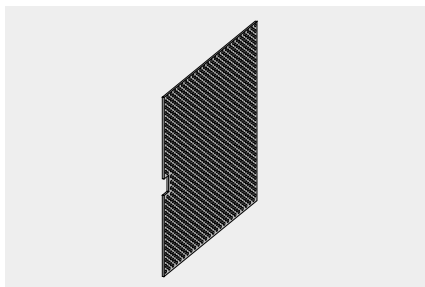
Item	Pc.	Description
1	1	Front panel with plastic handle bar
2	1	Rear panel
3	2	Aluminium extrusions
4	2	Top/bottom panels, ventilated
5	1 set	Assembly material

HP	W mm	Part no.	
		D = 170mm	D = 230mm
12	60.6	24-8712-50	24-8812-50
14	70.8	24-8714-50	24-8814-50
21	106.3	24-8721-50	24-8821-50
24	121.5	24-8724-50	24-8824-50
28	142.0	24-8728-50	24-8828-50
42	213.0	24-8742-50	24-8842-50

\*Note: Special sizes or cassettes with special treatments and printing are available on request.

## Expansion parts for cassette, 6 U, open

### Side panel

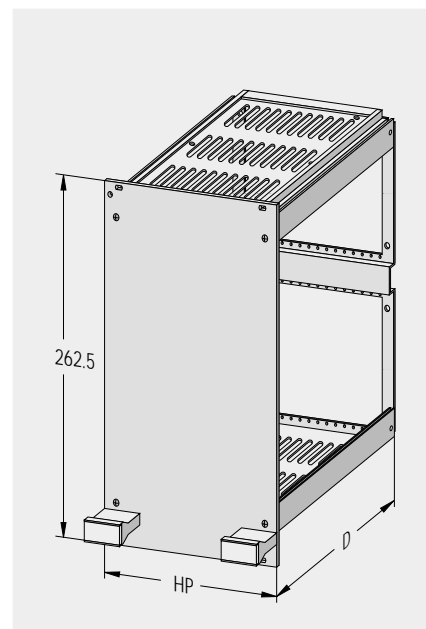


**Finish:**  
transparent chromated

**Material:**  
perforated aluminium panel

U	D mm	Part no.
6	170	248-392
6	230	248-492

## Cassette, 6 U with open sides

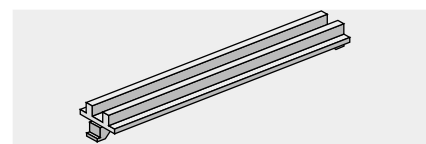


### Included in delivery

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

HP	W mm	Part no.	
		D = 170mm	D = 230mm
12	60.6	248-712	248-812
14	70.8	248-714	248-814
21	106.3	248-721	248-821
24	121.5	248-724	248-824
28	142.0	248-728	248-828
42	213.0	248-742	248-842

### Internal card guide



- guides cards inside a cassette

Part no.: (1 piece) 250-712
--------------------------------



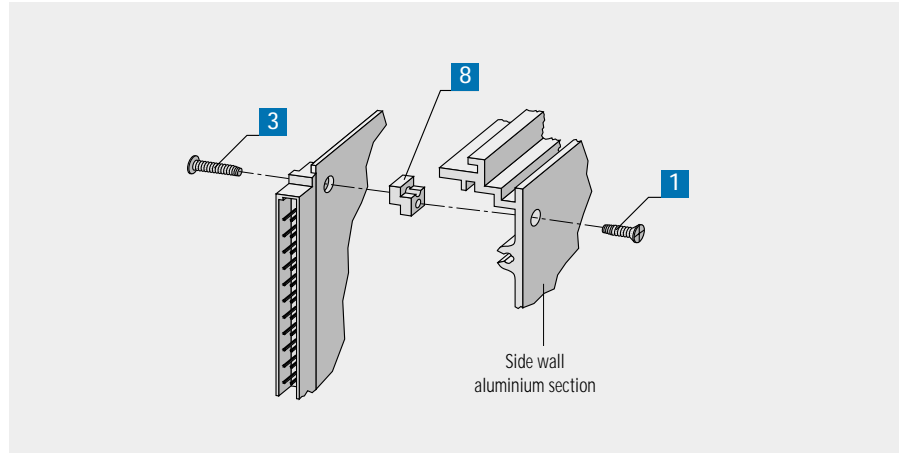
## 248 • Cassette assembly models



### Model A

PCB is attached to the side of the cassette

Description	Part no.
<b>Assembly kit A</b>	
includes: 2x item 1 2x item 3 2x item 8	250-708

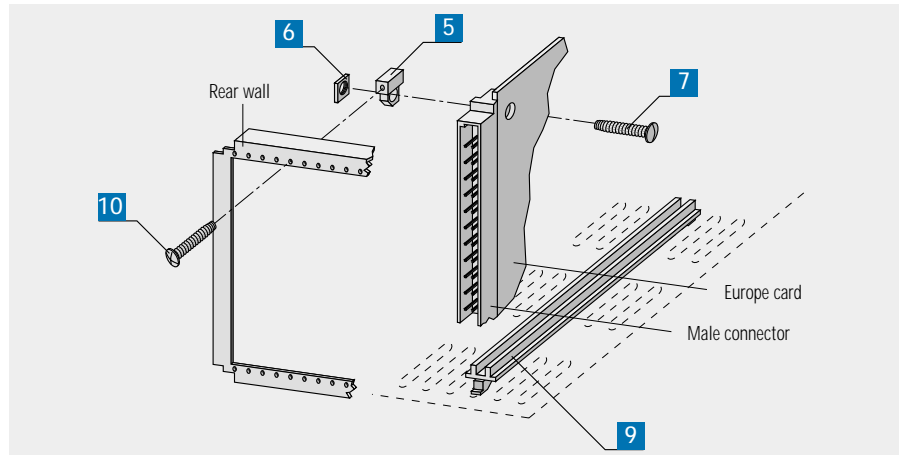


### Model B

PCB is attached to the rear of the cassette

- external wiring

Description	Part no.
<b>Assembly kit B</b>	
includes: 2x item 10 2x item 5 2x item 6 2x item 7	250-709

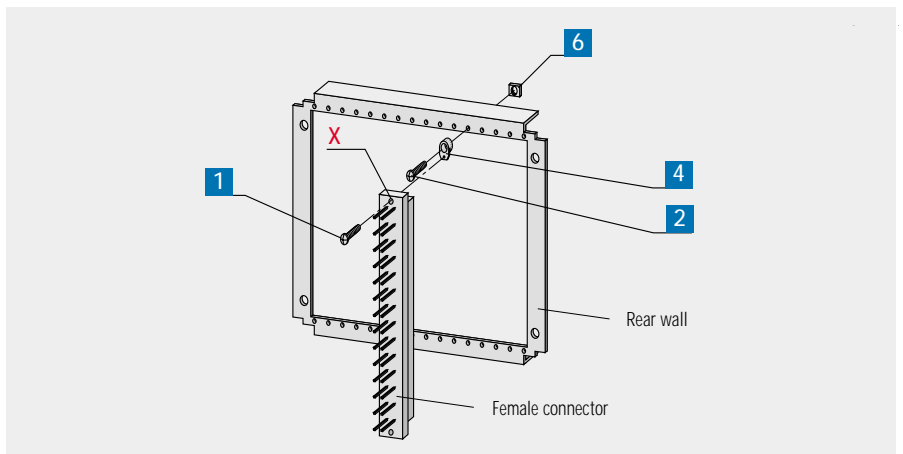


### Model C

PCB is attached to the rear of the cassette

- internal wiring

Description	Part no.
<b>Assembly kit C</b>	
includes: 2x item 1 2x item 2 2x item 4 2x item 6	250-710



**X** The female connector must be countersunk. The male connector fixings are used to attach the male connector to Europe cards in sub-units and cassettes.

**\*Note:** Please note the packing units (see parentheses) when ordering individual items.

Item	Description	Part no.*
1	Countersunk screw $\varnothing$ 2.2 x 6.5	630-382 (100 pieces)
2	Countersunk screw M2.5 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	25-0710-01 (1 piece)
5	Male connector fixing 32 pole	25-0709-01 (1 piece)
6	Square nut M2.5	630-192 (100 pieces)
7	Oval head screw M2.5 x 16	630-080 (100 pieces)
8	Angle bracket	25-0708-01 (1 piece)
9	Internal card guide	250-712 (1 piece)
10	Oval head screw $\varnothing$ 2.2 x 9.5	630-381 (100 pieces)





### Disk drive cassettes, 3U

- 2 models are available:
  - Disk drive cassette, 1 slot/14 HP, holds one 3-1/2" disk drive
  - disk drive cassette, 2 slots/20 HP, holds two 3-1/2" disk drives



### Specifications

**Application:**

holds 3-1/2" hard drives

Front panel, side extrusions and

Mounting panels: anodized

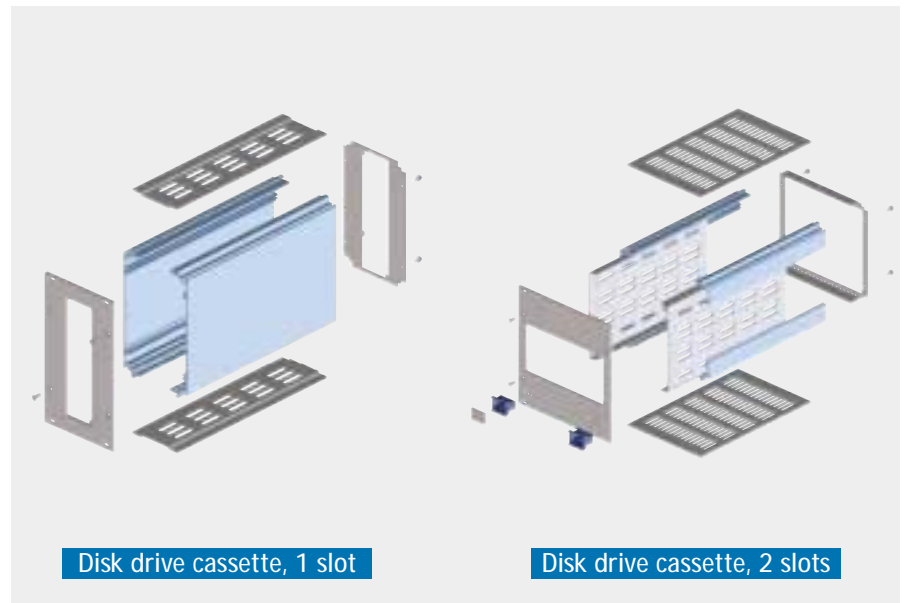
Rear panel: galvanized

**Standards:**

IEC 297-3

**Delivery:**

not assembled



Disk drive cassette, 1 slot

Disk drive cassette, 2 slots

#### Included in delivery

Item	Pc.	Description
1	1	Front panel (item 24-8003-24 has plastic handle bar)
2	1	Rear panel
3	4	Open sides (only in 2-slot cassette)
4	2	Closed sides (only in 1-slot cassette)
5	2	Top/Bottom panels
6	2	Mounting panels (for item 24-8003-24)
7	1 set	Assembly material

#### Order information

Description	Part no.
Disk drive cassette, 1 slot	24-8003-12
Disk drive cassette, 2 slots	24-8003-24

