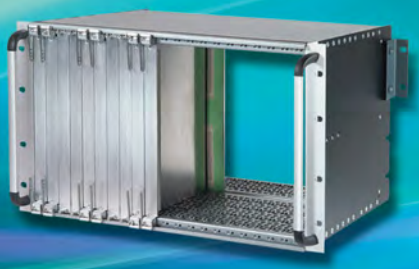
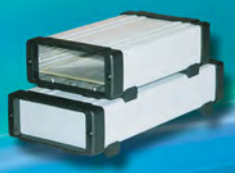
19" technology and electronic enclosures





for 45 years – the perfect shell for valuable electronics

apra norm®

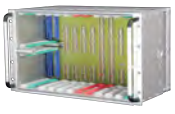
Content

Cabinet system aprack page 7

19" enclosure systems page 25

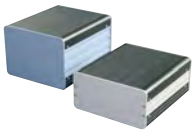
Industrial PC enclosures page 51

19" plug-in units page 65

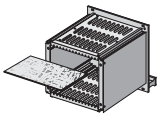


19" electronic packaging page 79

Desktop enclosures page 149



Small cases page 175



Technical information page 195

www.apra.de

Other products from the apra group can be found at www.apra.de

Our products: always the

19" cabinet system aprack

- for applications in audio, video or test and measurement technology
- light aluminium extrusion frame
- wide range of accessories
- free assembly service

19" plug-in units

- 19" computer plug-in units
- 19" front panels and dummy panels
- 19" universal plug-in units
- 19" flat modules
- 19" plug-in units for displays, keyboards and fans

19" enclosure systems

- desktop enclosures
- 19" enclosures

19" cabinet and enclosure solutions for industrial applications and data systems technology

- 19" cabinet system TiRAX
- 19" cabinet system NETcell
- 19" wall-mounting enclosures
- power distribution systems
- air conditioning technology
- cable management

www.apranet.de

perfect shell for your valuable electronics

19" electronic packaging

- subracks
- subrack „Heavy Load"
- ruggedized subrack „apra R-TYPE"
- EMC subracks
- customised subracks
- cassettes, plug-in modules, front panels

Small enclosures

- modem enclosures
- aluminium extrusion enclosures
- desk consoles

Panel instrument cases and enclosures for top hat rail

- enclosures acc. to IEC 61554
- plastic injection moulding
- plastic mould construction

Plastic enclosures

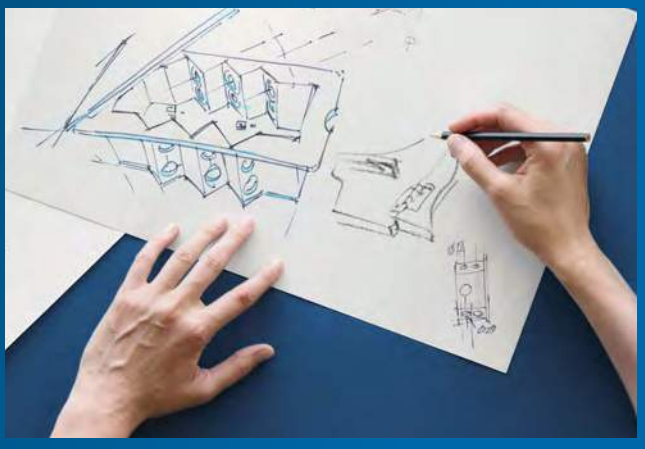
- individual plastic enclosures without tooling costs
- even the most sophisticated requests concerning form and materials can be realised
  - from 1 to 100.000 pieces in different production techniques
  - **3D printing:** the fast way to your protoype
  - **digital printing:** flexible, fast and economic
  - foil technology
- mixed materials: the perfect combination of plastics and metal

www.apra-plast.de

We transform your ideas into your enclosure

the counselling

professional and competent:
you inform us about your requirements. together, we work out the shape, function, material and the suitable production technique for your enclosure.



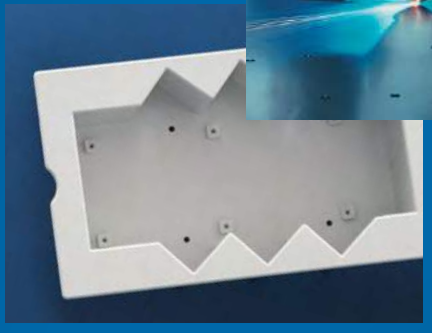
the design

customised und functional:
our engineering team develops the perfect enclosure for your requirements.

the production

quality-conscious and up to date:
state-of-the-art machines, highly qualified staff and consistent quality controls are essential to us.

That's how the vision of your „perfect shell" for valuable electronics comes true.



Our production possibilities

for enclosures and parts made of metal and plastics

Punching, laser cutting

- laser cutting
- punching
- embossing
- marking

Surface technology

- powder coating
- wet painting
- chromating

Bending

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

Production possibilities for plastic parts and enclosures

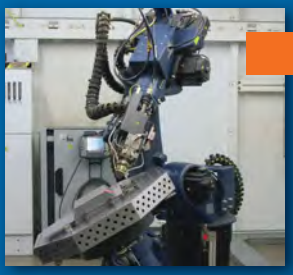
- milling and bending technology
- injection moulding

Milling / chamfering

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

Prototyping for plastic parts

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



Welding

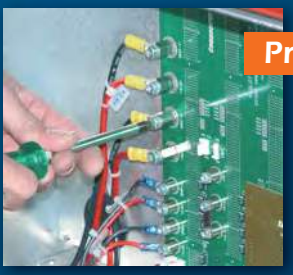
- laser welding
- stud welding
- customary welding

Printing/foils

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

Insertion

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



Preassembly / tailoring

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

Custom-made enclosure technology

functionality · ergonomics · pre-cabling
product design · IP protection · EMC shielding
… all under one roof!

Cabinet system aprack

... the perfect shell for valuable electronics

Cabinet systems

aprack® electronics cabinet

from page 7

- Components 10
- Accessories 17

You can find other cabinet systems for industrial use and data centre here:

www.apranet.de

19" cabinet system TiRAX

19" cabinet system NETcell

the all-purpose cabinet

aprack®

Sample configurations

19" aprack cabinet system

- elegant design
- rack can be assembled very quickly (8 screws)
- 19" mountings with adjustable mounting depth
- light aluminium construction
- various accessories
- available with subdivided rear door with 3 U installation space, for installing plug-in units or fan modules, or for cable entry
- doors with turning lever lock
- numerous assembly options for extension components due to fixing notches in the extrusions
- free assembly service, also for custom configurations of extension and accessory parts

Specifications

Application:
cabinet system for installing 19" plug-in units, 19" subracks, shelves, etc. suitable for office and laboratory use such as measurement and testing technology or for audio / video appliaction as well as industrial use.

Construction:
sturdy aluminium extrusion frame with aluminium die-cast corners

Finish:
cabinet: RAL 7035 light grey
frame: RAL 7011 iron grey

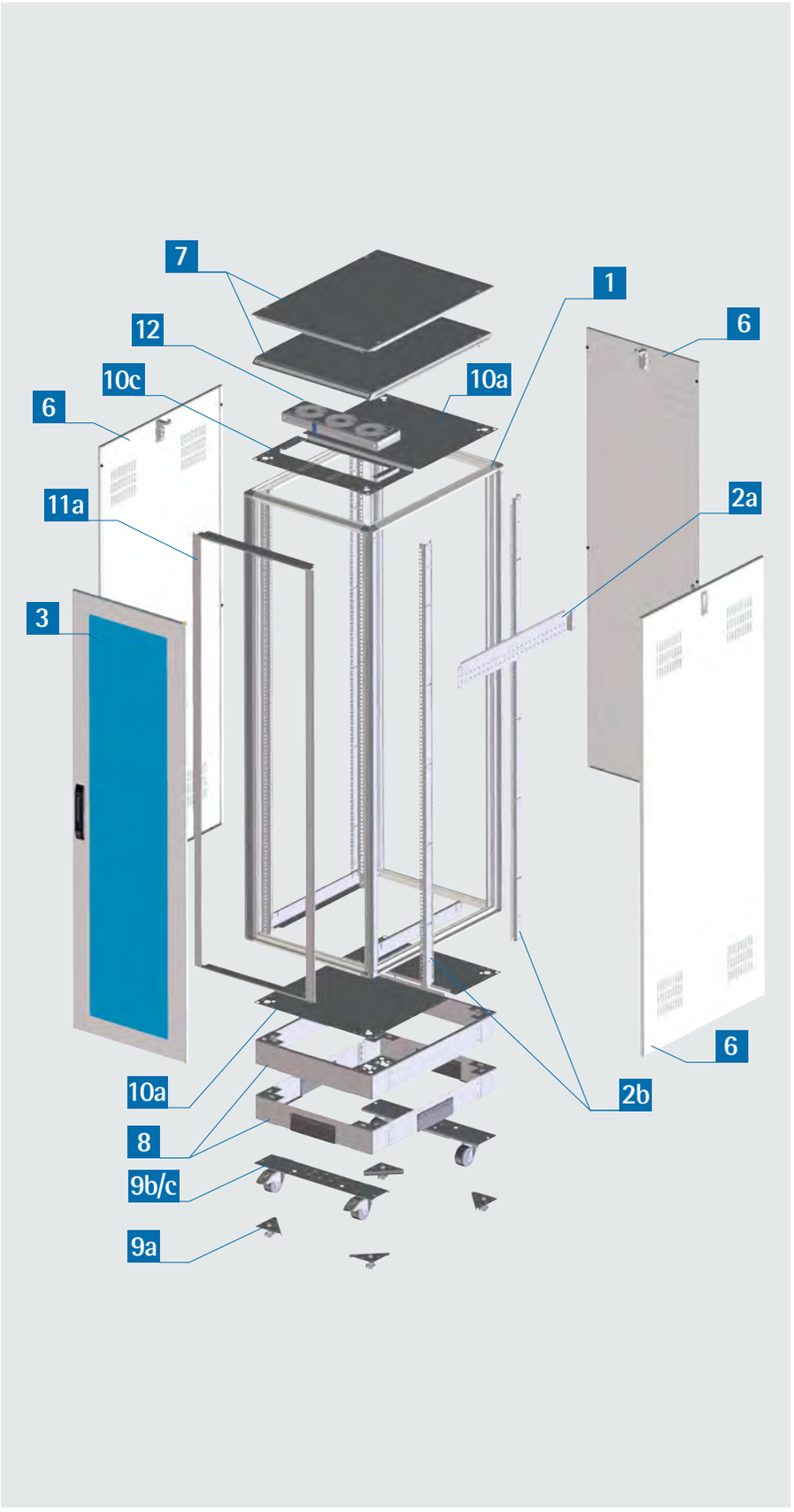
Standards: dimensions acc. to IEC 60297-3-100

Degree of protection: IP 20

Delivery: assembled

Individual configuration:

Design your own customised cabinet.
Select your required cabinet components one at a time.



Pos.	Description	page
1	Rack	11
2a	Tie-bar	11
2b	Vertical mounting (ASA)	11
3	Safety glass door	12
4	Door, solid (without fig.)	12
5	Short door, solid (without fig.)	12
6	Side / rear panel, ventilated	13
7	Top cover ventilated / solid	13
8	Base ventilated / solid / with cable entry	14
9a	Adjusting feet, set	14
9b	Castor set Ø 100 mm	14
9c	Castor set Ø 66 mm	14
10a	Cover plate, solid	15
10b	Cover plate for cable entry (without fig.)	15
10c	Cover plate for fan module	15
11a	Blind cover set for cabinets with recessed vertical mountings	16
11b	Blind panel set for cabinets with vertical mountings in the standard position	16
12	Basic fan module	20

www.apra.de

1 Rack (mounted)

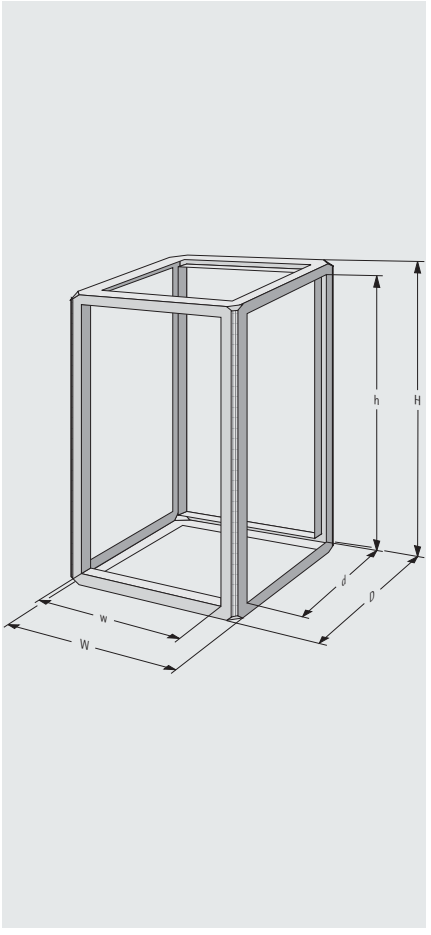
Material: aluminium extrusion
Finish: RAL 7011 iron grey

U describes maximum mounting height!

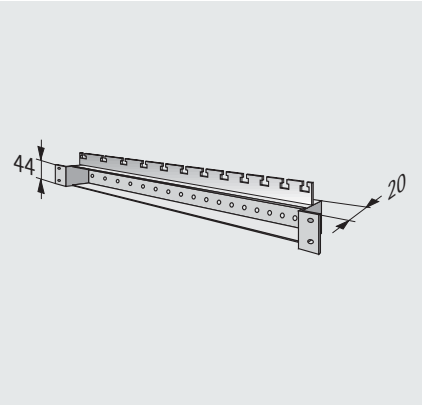
Scope of delivery

Pc.	Description
1	Bottom frame
1	Top frame
4	Vertical extrusions (19" vertical mountings not included)

H mm	U	W mm	D mm	Order no.
600	11	600	800	111-036
800	16	600	600	111-038
800	16	600	800	111-138-00
1000	20	600	600	111-040
1000	20	600	800	111-140
1200	25	600	600	111-042
1200	25	600	800	111-142-00
1600	34	600	600	110-316
1600	34	600	800	110-326
1800	38	600	600	110-318
1800	38	600	800	110-328
2000	43	600	600	110-320
2000	43	600	800	110-330



2a Tie-bar



- for variable installation of 19" vertical mountings inside 600 mm wide cabinets
- can be used as cable management bracket

Material:
sheet metal 2 mm
Finish:
galvanised

D mm	Order no. (1 piece)
600	110-089
800	110-090

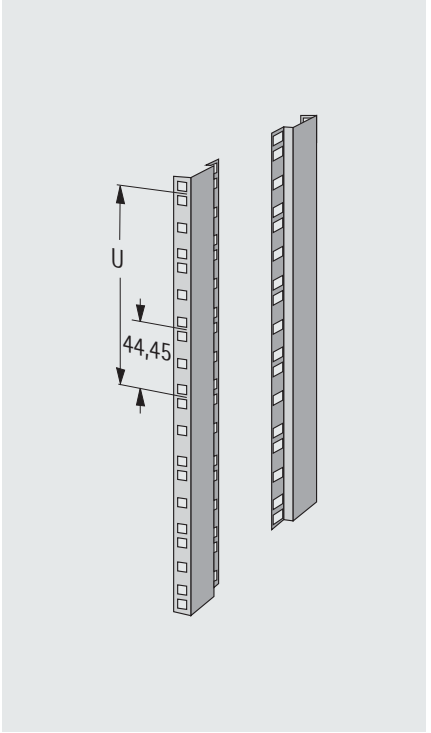
2b Vertical mounting, ASA

- incl. assembly material

Material:
sheet metal 2 mm
Finish:
galvanised

The vertical mountings 12 U and 15 U are meant to be used for partly 19" extension level.

H mm	U	Order no. (pair)
600	11	110-070-50
-	12	110-101-50
-	15	110-102-50
800	16	110-080-50
1000	20	110-090-50
1200	25	110-100-50
1600	34	110-103-50
1800	38	110-104-50
2000	43	110-105-50



Label for vertical mounting, ASA

- label for vertical mounting, ASA
- self-adhesive
- 1-55 U division
- can be cut to height

Order no.
316-120-91

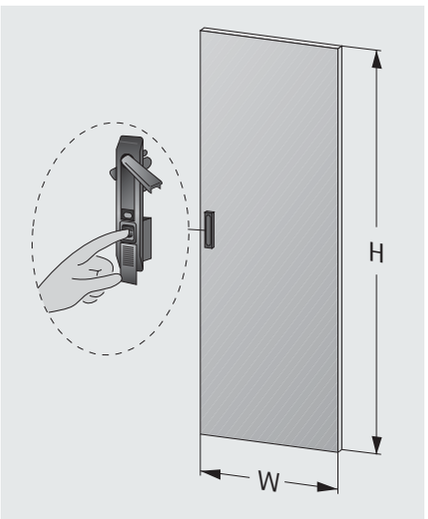
3 Glass door

- can be used as front or rear door
- clear safety glass 4 mm
- swing handle with push button
- profile semi-cylinder (optional)

Material:
sheet metal 1,5 mm
Finish:
RAL 7035 light grey

H mm	U	W mm	Order no.
800	16	600	110-570-08
1000	20	600	110-570-10
1200	25	600	110-570-12
1600	34	600	110-570-16
1800	38	600	110-570-18
2000	43	600	110-570-20

4 Door, solid

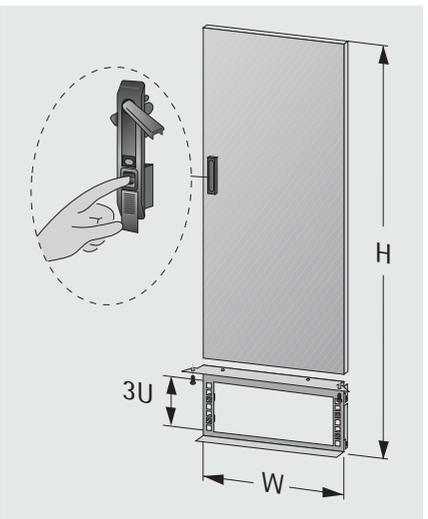


- can be used as front or rear door
- swing handle with push button
- profile semi-cylinder (optional)

Material:
sheet metal 1 mm
Finish:
RAL 7035 light grey

H mm	U	W mm	Order no.
600	11	600	110-251-00
800	16	600	110-253
1000	20	600	110-255-00
1200	25	600	110-254
1600	34	600	110-271
1800	38	600	110-272
2000	43	600	110-274

5 Short door, solid



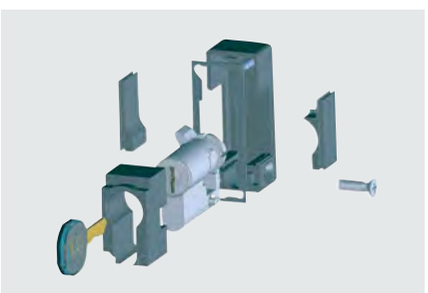
- can be used as front or rear door
- swing handle with push button
- profile semi-cylinder (optional)
- 3 U installation frame (under door or above) included

Material:
sheet metal 1 mm
Finish:
RAL 7035 light grey

Cable entry on page 23!

H mm	U	W mm	Order no.
1600	34	600	110-634-00
1800	38	600	110-635-00
2000	43	600	110-636-00

Profile semi-cylinder



- profile semi-cylinder with lock EK333 for swing handle
- useable for positions 3, 4 and 5 in exchange of push button

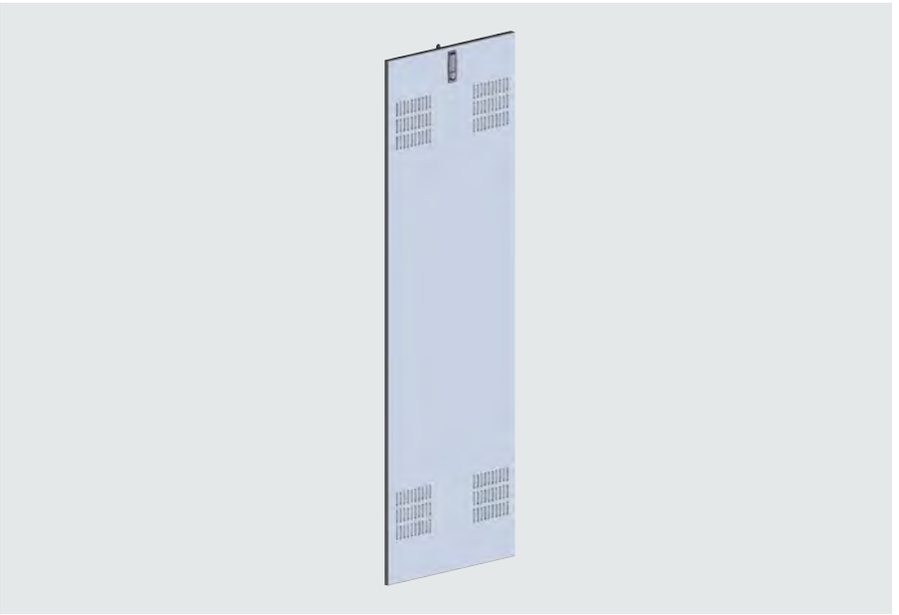
Order no.
676-316-00

www.apra.de

6 Side / rear panel, ventilated

- can be used as side or rear panel
- with lock EK 333

Material:
sheet metal 1 mm
Finish:
RAL 7035 light grey

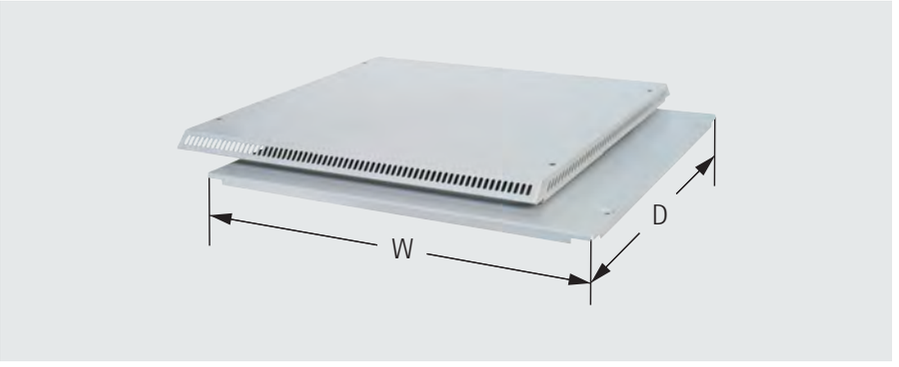


H mm	W/D mm	Order no.
600	600	111-116
	800	110-193-10
800	600	111-118
	800	110-194-00
1000	600	111-120
	800	110-195-00
1200	600	111-122
	800	110-196-00
1600	600	110-184
	800	110-190
1800	600	110-185
	800	110-191
2000	600	110-186
	800	110-192

7 Top cover

- ventilated (H=25mm) or closed (flat)

Material:
aluminium 1,5 mm
Finish:
RAL 7035 light grey

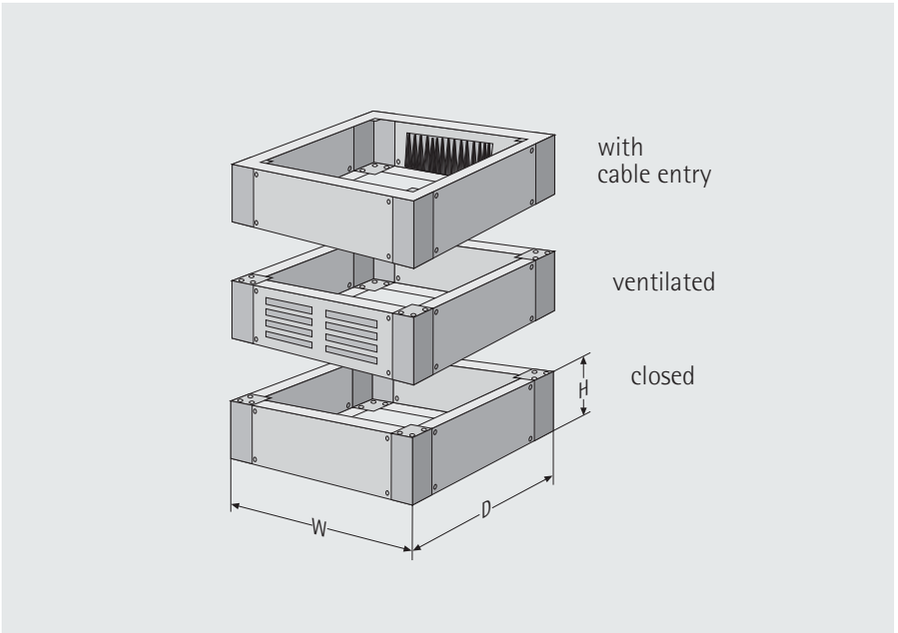


W mm	D mm	Description	Order no.
600	600	closed	110-051-20
		with side ventilation slots	110-060-00
	800	closed	110-052-20
		with side ventilation slots	110-061-00

8 Base

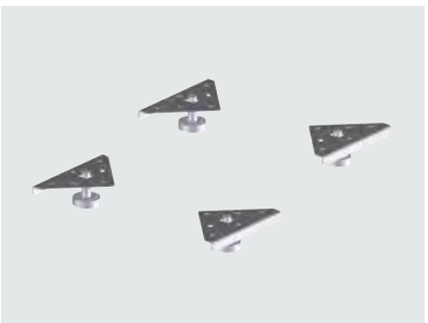
- base, H=100 mm

Material:
sheet metal 1,5/2 mm
Finish:
RAL 7011 iron grey



W mm	D mm	Description	Order no.
600	600	closed	110-004
	800		110-005
	600	ventilated	110-106
	800		110-107
	600	with cable entry	110-206-00
	800		110-207-00

9a Adjusting feet (4 pcs.)



- incl. base plate and assembly material
- to attach to the rack 1 or the base 8
- set = 4 pieces

Material:
holding plate: sheet metal 2,5 mm
Finish:
galvanised

Description	Order no. (set)
mounted on rack	110-012
mounted on base	318-026-02

9b Castor set Ø 100 mm

- fastened directly to the cabinet
- castor diameter: d=100 mm
- carrying capacity per castor: 100kg in total: 300 kg max.
- cabinet height + 118 mm
- with brake (2x)
- set = 4 castors

Material:
holding plate: sheet metal 2,5 mm
Finish:
galvanised

Order no.
110-603-20

9c Castor set Ø 66 mm

- fastened directly to the cabinet
- castor diameter: d=66 mm
- carrying capacity per castor: 70 kg, in total: 210 kg max.
- cabinet height + 82 mm
- with brake (2x)
- set = 4 castors

Material:
holding plate: sheet metal 2,5 mm
Finish:
galvanised

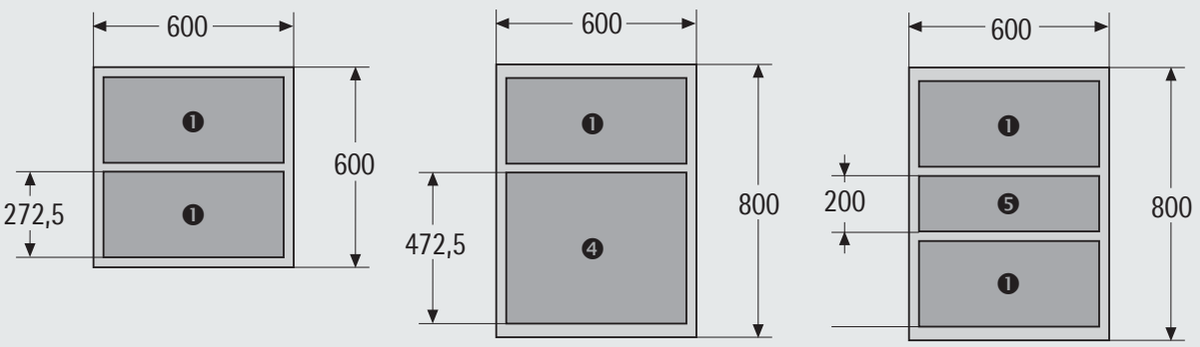
Order no.
110-603-10

www.apra.de

10 Cover plates

- cover plates to cover the top or bottom openings

The following cover plate combinations (sizes 1, 4 and 5) are possible:



10a Cover plate, solid

Material:
sheet metal 1,5 mm
Finish:
RAL 7035 light grey

Size	Order no.
1	110-700-00
4	110-703-00
5	110-714-00

10b Cover plate for cable entry

Material:
sheet metal 1,5 mm
Finish:
RAL 7035 light grey

Size	Order no.
1	110-711-00

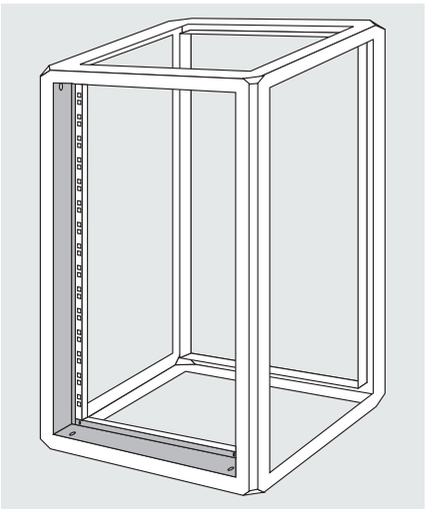
10c Cover plate for fan module

- for mounting of fan modules 12

Material:
sheet metal 1,5 mm
Finish:
RAL 7035 light grey

Size	Order no.
1	110-708-10

11a Blind cover set for cabinets with recessed vertical mountings



- for masking the opening between the vertical mountings and rack
- for cabinets with 32 mm recessed vertical mountings
- distance between glass door and front plate = 62 mm

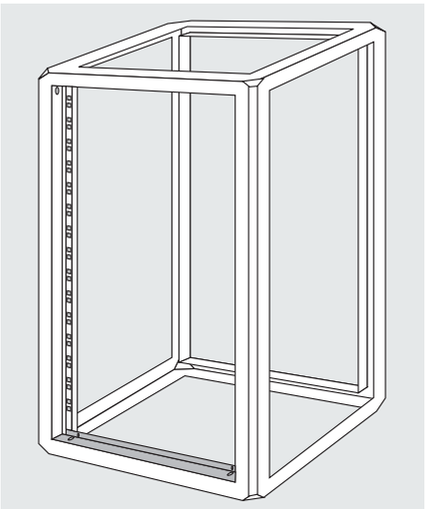
Material:
aluminium 2 mm
Finish:
RAL 7011 iron grey or
RAL 7035 light grey

Scope of delivery

Pc.	Description
2	Panels, vertical
2	Panels, top/bottom
	Assembly material

H mm	Colour	Order no.
600	RAL 7035	110-406-50
	RAL 7011	110-406-02
800	RAL 7035	110-408-00
	RAL 7011	110-408-02
1000	RAL 7035	110-410-00
	RAL 7011	110-410-02
1200	RAL 7035	110-412-00
	RAL 7011	110-412-02
1600	RAL 7035	110-416-00
	RAL 7011	110-416-02
1800	RAL 7035	110-418-00
	RAL 7011	110-418-02
2000	RAL 7035	110-420-00
	RAL 7011	110-420-02

11b Blind cover set for cabinets with vertical mountings in the standard position



- for masking the opening between the vertical mountings and rack
- for cabinets with vertical mountings in the standard position
- distance between glass door and front plate = 30 mm

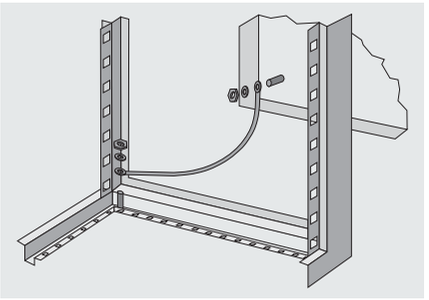
Material:
aluminium 2 mm
Finish:
RAL 7011 iron grey or
RAL 7035 light grey

Scope of delivery

Pc.	Description
2	Panels, top/bottom
	Assembly material

H mm	Colour	Order no.
600	RAL 7035	110-407-00
	RAL 7011	110-407-05
800	RAL 7035	110-406-00
	RAL 7011	110-406-05
1000	RAL 7035	110-407-00
	RAL 7011	110-407-05
1200	RAL 7035	110-406-00
	RAL 7011	110-406-05
1600	RAL 7035	110-406-00
	RAL 7011	110-406-05
1800	RAL 7035	110-407-00
	RAL 7011	110-407-05
2000	RAL 7035	110-406-00
	RAL 7011	110-406-05

Earthing kit

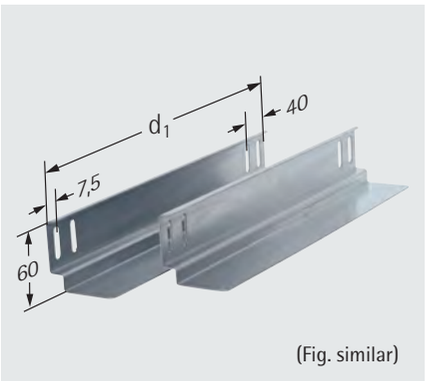


- allows an earthing of all cabinet components in compliance with VDE

Order no.
110-533-10

www.apra.de

Sliding rail, adjustable height

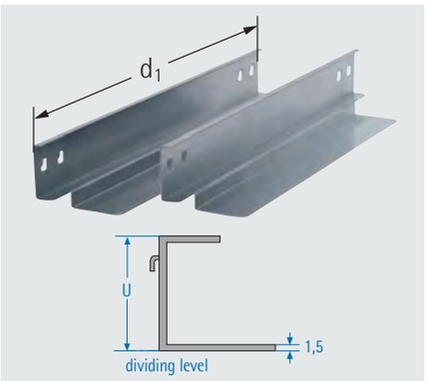


- for installing to a front or rear vertical mounting
- 1 pair
- incl. assembly material

Material:
sheet steel 1.5 mm
Finish:
galvanised

Cabinet depth (D)	d1 mm	Order no.
600	420	110-096
800	520	110-097
800	620	110-098

Sliding rail, hanging



- to hinge into front or rear vertical mounting
- 1 pair
- not suitable to mount subracks

Material:
sheet steel 1.5 mm
Finish:
galvanised

The support surface for built-in plug-in units is 1.5 mm above the partition. Pay attention to the offset between the plug-in unit front plate and chassis.

Cabinet depth (D)	d1 mm	Order no.
600	400	110-086-10
800	500	110-087-00
800	600	110-088-10

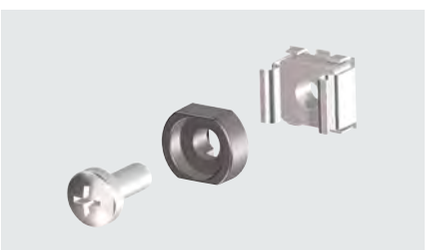
Mounting plate

- for individual mounting of components (e.g. enclosures for top hat rail)
- to be mounted on the rack

Material:
sheet steel 2.0 mm
Finish:
galvanised

H mm	W mm	Order no.
800	600	110-107-08
1000	600	110-107-10
1200	600	110-107-12
1400	600	110-107-14
1600	600	110-107-16
1800	600	110-107-18
2000	600	110-107-20

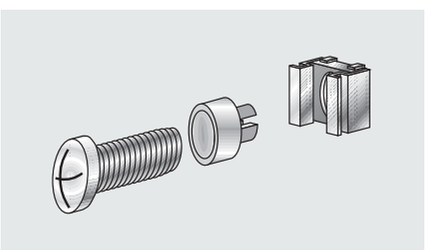
M5 screw set (50 pieces)



- required for installing 19" components in cabinets or enclosures
- included in delivery:
  - 50 screws, M 5 x 12
  - 50 captive nuts, M 5-8
  - 50 decorative washers, M 5

Order no.
630-991

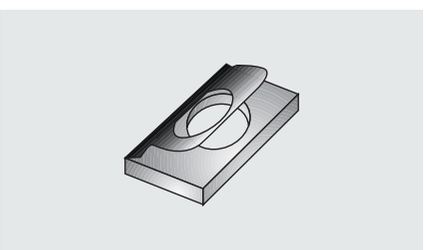
M6 screw set (50 pieces)



- required for installing 19" components in cabinets or enclosures
- included in delivery:
  - 50 screws, M 6 x 16
  - 50 captive nuts, M 6-8
  - 50 decorative washers, M 6 with collar

Order no.
630-994

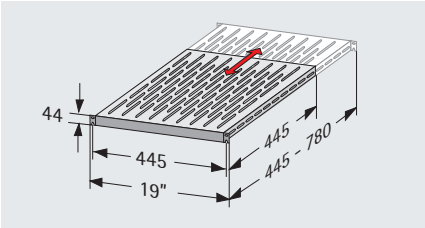
Spring nut, M5 (50 pieces)



- for sliding into the profile grooves of the rack 1
- included in delivery:
  50 pieces M5

Order no.
630-015-50

19"-shelf 1 U "VARIplain" with 19" mounting

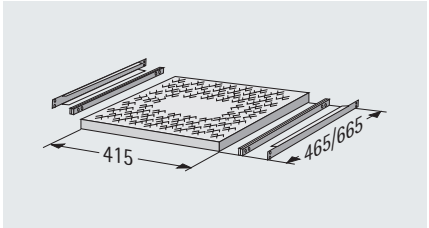


- fixed mounting
- depth variable due to VARIplain technology
- telescopic: 445 - 780 mm (see figure)
- easy one-man installation due to open long hole in the 19" front (hinged)

Material:
sheet metal 2 mm
Finish:
RAL 7035 light grey
Load capacity:
150 kg (distributed load)

Order no.
316-036-99

Shelf 1 U for cabinets with 19" mounting, extractable, 1,5 U

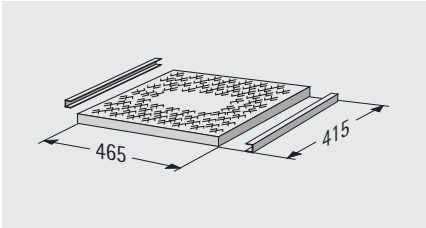


- extractable
- ventilated
- high quality telescopic rails with maximum extension, hold-in and disconnect
- includes assembly material
- mounting to 19" level
- Space requirement (height) approx. 1.5 U

Material:
sheet metal 1,5 mm
Finish:
RAL 7035 light grey
Load capacity:
approx. 40 kg

D mm	d mm	Order no.
600	465	110-876-10
800	665	110-877-12

Shelf 1 U for cabinets without 19" mounting, 1,5 U

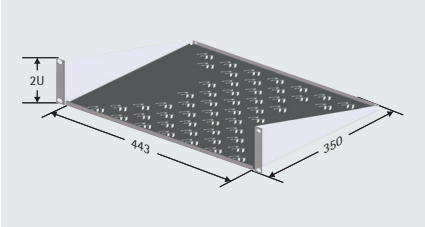


- fixed installation or extractable (high quality telescopic rails with maximum extension, hold-in and disconnect)
- for depths D=600 mm and D=800 mm
- ventilated
- includes assembly material
- can only be mounted to the rack
- Space requirement (height) approx. 1.5 U

Material:
sheet metal 1,5 mm
Finish:
RAL 7035 light grey
Load capacity:
approx. 40 kg

Description	Order no.
fixed	110-870-10
extractable	110-873-10

Shelf, for cabinets with only one 19" vertical level



- fixed installation
- mounts easily onto the front or rear 19" mounting brackets
- ventilated
- incl. assembly material

Material:
sheet metal 1,5 mm
Finish:
RAL 7035 light grey
Load capacity:
15 kg

U	Order no.
2	315-810-20
3	315-810-00

www.apra.de

19" plastic cover panel 1U

- air separation function
- visual upgrade of the rack by concealing free 19" surfaces
- stylish design due to rounded front surface of the panel
- short assembly time: the blind panel is easily clipped into the 19" grid without tools
- can be removed and reinserted at any time and without tools
- protection against dust entry
- fire protection classification to UL 94 V-0
- weigth-saving in comparison to customary metal panels

Material:
Lexan 920, flammability rating acc. to UL94V-0, RoHS compliant

Finish:
RAL 7016 anthracite grey or
RAL 7035 light grey
Delivery:
set = 10 pieces
set = 136 pieces

RAL 7016 anthracite grey RAL 7035 light grey

Colour	Delivery	Order no.
RAL 7016 anthracite grey	Set = 10 pieces	213-156-25
RAL 7035 light grey	Set = 10 pieces	213-156-30
RAL 7016 anthracite grey	Set = 136 pieces	213-156-40
RAL 7035 light grey	Set = 136 pieces	213-156-45

19" cover panel, sheet metal

Material:
sheet metal 1,5 mm
Finish:
RAL 7035 light grey or
RAL 9005 jet black
Dimensions (H x W x D):
1-4 U x 482,6 x 10 mm

RAL 7035 light grey RAL 9005 jet black

U	Colour	Order no.
1	RAL 7035 light grey	213-156-00
	RAL 9005 jet black	213-156-10
2	RAL 7035 light grey	213-158-00
	RAL 9005 jet black	213-158-10
3	RAL 7035 light grey	213-159-00
	RAL 9005 jet black	213-159-10
4	RAL 7035 light grey	213-160-00
	RAL 9005 jet black	213-160-10

12 Basic fan module

- unrivalled light weight
- budget-priced
- simple mounting
- genius modularity – registered design
- suitable for all applications of enclosures and cabinet technology
- long lifetime and reliability due to high-class fans
- integrated fan cover
- highest flammability rating due to use of most modern plastics of classification UL 94V-0
- basic module: up to 3 fans 230 V
- speed-controlled basic module: 3 fans 12 V

Material:
polycarbonate UL 94 V-0
Finish:
RAL 9005 deep black
Dimensions (H x W x D):
44 x 450 x 140 mm

Power cords are not included in delivery - please order separately!

Description	Description	Voltage V	Air flow rate m³/h	Order no.
fan module 1-fold	Basic module	230	160	230-500-01
fan module 2-fold	Basic module	230	320	230-500-02
fan module 3-fold	Basic module	230	480	230-500-03
fan module 3-fold	speed-controlled	12	up to 450	230-500-53

Power cord, standard

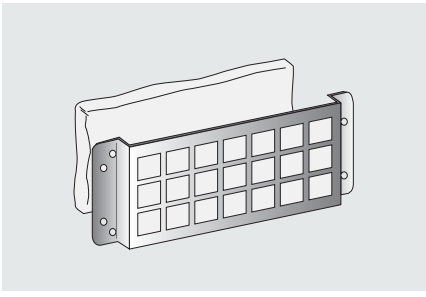
Connection	L mm	Order no.
earthed plug	3000	640-044-05
rubber connector	3000	230-500-15
without plug	3000	230-500-16

Power cord with thermostat

- with thermostat 0-60°C

Connection	L mm	Order no.
earthed plug	3000	230-500-04
rubber connector	3000	230-500-05
without plug	3000	230-500-06

Filter set for fan module

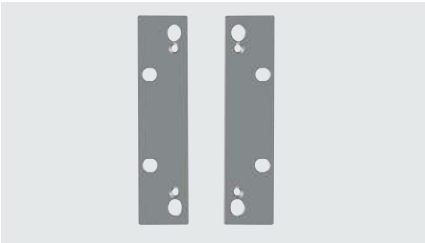


Material:
filter fleece / sheet metal 1 mm, galvanised

Order no.
316-100-99

www.apra.de

Installation set for fan module



- 3U kit for installation of the fan modules 12 on a 19" shelf support

Material:
sheet steel 1.5 mm
Finish:
RAL 7035 light grey

Order no.
230-500-24

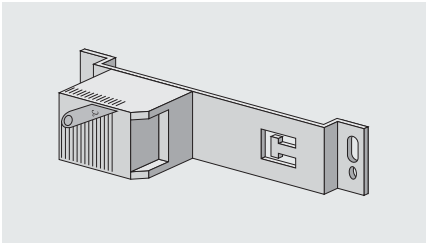
19" temperature indicator / regulator module 1U

- the module is equipped with a temperature indicator and temperature sensor
- mounting material included (excl. power cord)
- temperature indicator range: -20°C to 99°C
- regulator adjustment range: -20°C to 70°C
- operating voltage: 230 V
- switch contacts, zero volt: 250 V, 8 A (2x)
- connection: terminal strip

Material: sheet steel 1,5 mm/ plastics
Finish: RAL 7035 light grey

Order no.
213-148-00

Thermostat, 230V



- with fixing bracket and integrated tension relief
- control range 0 – 60°C
- fixing to rack or 19" level
- incl. assembly material

Order no.
110-804

Multiple socket strips 1U

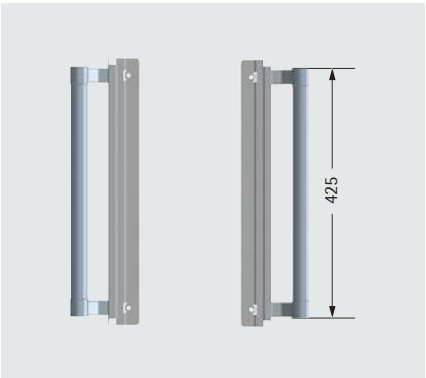
(Fig. similar)

- with 19" mounting brackets
- with overload protection
- VDE, CE, GS compliant
- earthed sockets and UTE standard sockets
- 230 V AC, 16 A

Colour:
RAL 7035 light grey

Description	Modules	Order no.
earthed	8 sockets	591-402-00
UTE	7 sockets	591-402-60

Handle set

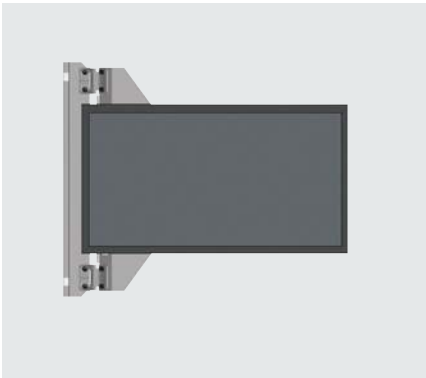


- well-designed handle set
- for a better handling of the rack
- flexible adjustment of height
- for lateral mounting on the rack 1

Material:
handle hold: aluminium anodised
fixing: sheet steel 1.5 mm
Finish:
fixing: RAL 7035 light grey

Order no.
110-715-20

TFT display bracket



- easy assembly of TFT displays on the rack
- adjustable via friction hinge
- delivery without TFT monitor

Material:
sheet steel 1.5 / 2.0 mm
Finish:
RAl 7035 light grey

Order no.
110-012-06

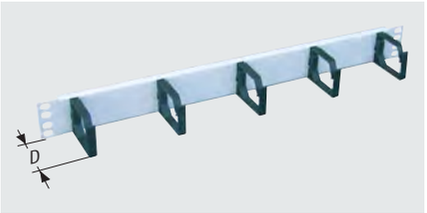
19" cable guide panel 1 U / 2 U with metal hoops

- for clear and neat horizontal cable routing in the 19" level
- incl. 4 cable hoops with movable plastic locks

Material / Finish:
panel: sheet steel 1.5 mm, RAL 7035 light grey or RAL 9005 deep black
cable hoops: sheet steel, chrome-plated
locks: Lexan 920 (flammability acc. to UL94 V-0, RoHS compliant)
Dimensions (H x W x D):
44/88 x 482,6 x 90 mm

U	Colour	Order no.
1	RAL 7035	213-145-41
1	RAL 9005	213-145-42
2	RAL 7035	213-145-43
2	RAL 9005	213-145-44

19" cable guide panel 1 U with plastic hoops



- for clear and neat horizontal cable routing in the 19" level
- incl. 5 cable hoops with assembly material

Material:
panel: sheet steel 1.5 mm
cable hoops: plastics, black
Finish:
RAL 7035 light grey or
RAL 9005 deep black
Dimensions (H x W x D):
44 x 482,6 x 60 mm

Colour	Order no.
RAL 7035	213-145-00
RAL 9005	213-145-30

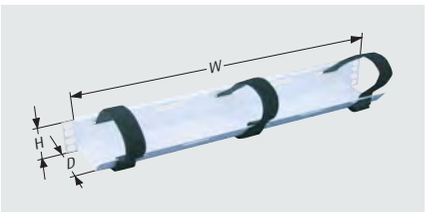
19" switch panel, plastic 1 U

- for clear and neat horizontal cable routing in the 19" level
- weight-saving in comparison to traditional metal panels
- fire protection classification to UL94 V-0

Material:
plastic (polyamide)
Finish:
black (similar to RAL 9005)
Dimensions (H x W x D):
44 x 482,6 x 66 mm

Order no.
213-145-80

19" cable guide panel 1 U with velcro® strips



- for clear and neat horizontal cable routing in the 19" level with velcro® fixing
- incl. 3 velcro® strips and assembly material

Finish:
RAL 7035 light grey or
RAL 9005 deep black
Dimensions (H x W x D):
44 x 482,6 x 90 mm

Colour	Order no.
RAL 7035	213-161-00
RAL 9005	213-161-10

19" cable routing panel with cover panel 1 U / 2 U

- for clear and neat horizontal cable routing in the 19" level
- with adjustment options
- removable front panel

Material:
sheet steel 1.5 / 2.0 mm
Finish:
RAL 7035 light grey
RAL 9005 deep black
Dimensions (H x W x D):
44/88 x 482.6 x 100 mm

U	Colour	Order no.
1	RAL 7035	213-145-65
1	RAL 9005	213-145-95
2	RAL 7035	213-145-68
2	RAL 9005	213-145-98

19" cable duct 1 U with brush

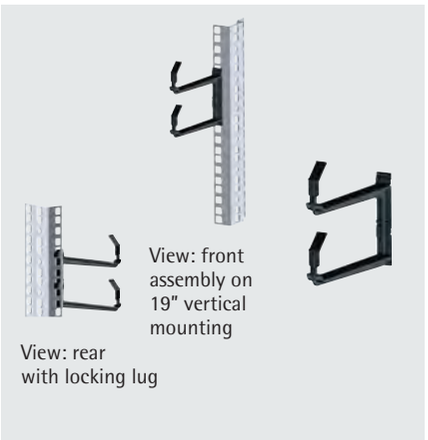
- for cable access behind the 19" mounting
- mounting to 19" level

Material:
sheet steel 1.25 mm/ plastics
Finish:
RAL 7035 light grey
RAL 9005 deep black
Dimensions (H x W x D):
44 x 482.6 x 12 mm

Colour	Order no.
RAL 7035	213-146-00
RAL 9005	213-146-10

www.apra.de

"Universal" cable clip set

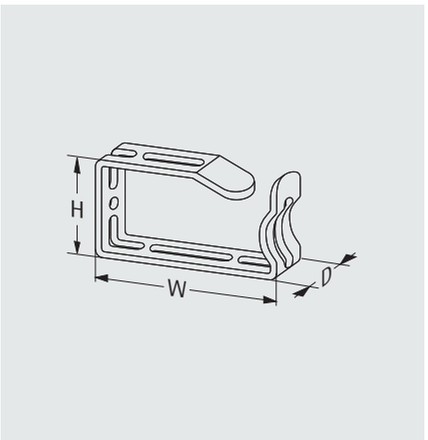


- to clip into 19" standard vertical mounting
- set = 10 pieces

Material:
plastics, black

Order no.
640-030-35

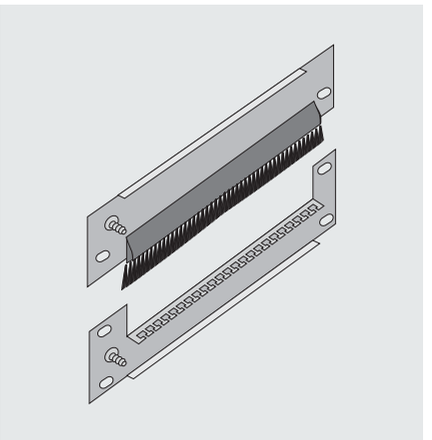
Cable hoop, metal



- for positioning cables vertically to the 19" level

Dimensions (H x W x D) mm	Order no.
47 x 85 x 23	640-036-27
66 x 125 x 23	640-036-37
88 x 125 x 23	640-036-47

19" cable entry, 3 U



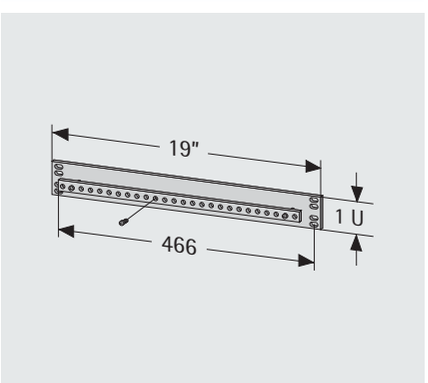
- with built-in cable management bracket and brush
- incl. assembly material

Material:
sheet steel 1.5 mm
Finish:
RAL 7035 light grey

The cable entry opening can be installed in the 3 U installation space underneath the short rear door.

Order no.
110-713-00

Potential equalisation bar



- for 19" or cabinet installation
- connection: 27 x M 5
- rail cross-section: 50 mm²

Material:
sheet steel / copper

Order no.
640-028-00

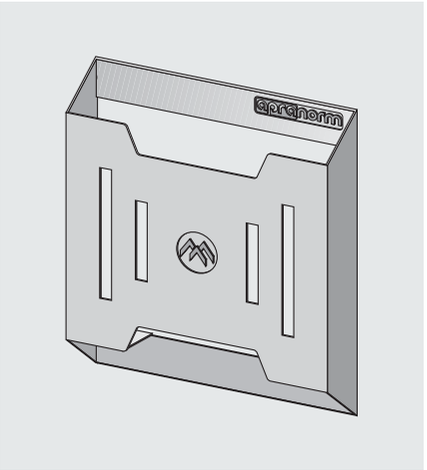
LED cabinet light

- cost-optimised LED technology with a power consumption of 5W (light intensity equivalent to a 75W light bulb)
- internal power supply unit with wide range voltage 100-230 V/ AC
- long-life and no maintenance (service life at 20°C = 60,000h)
- available with on/off switch or motion detector
- magnetic attachment for individual mounting in the cabinet

Connection sockets and connections must be ordered separately!

Description	Order no.
LED cabinet light with switch	640-143-05
LED cabinet light with motion detector	640-143-06
connecting socket without cord	640-143-07
connecting socket with EURO plug, l= 2.5m	640-143-08

Document pocket

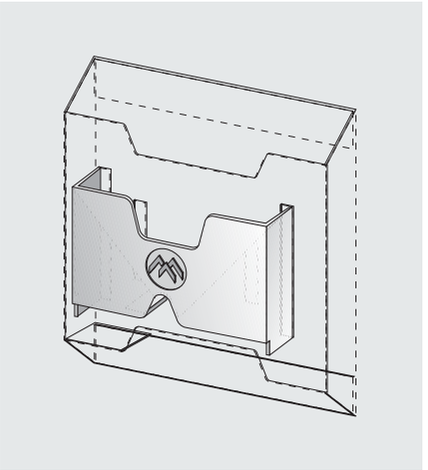


- self-adhesive
- heat-resistant to 60 °C
- your company's logo can be affixed

Material:
plastics, black
Load capacity:
3 kg

Order no.
640-100

CD holder for document pocket

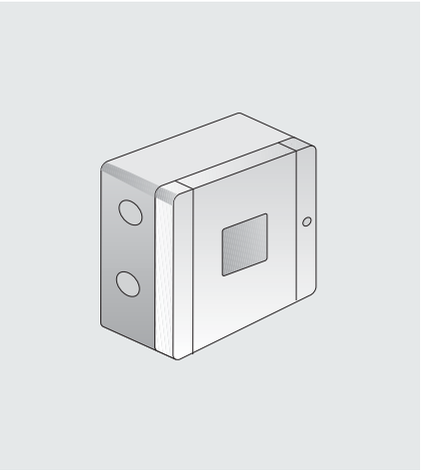


- practical supplement
- the CD/ diskette holder can be hung in the document pocket

Material:
aluminium 2.0 mm
Finish:
RAL 7035 light grey

Order no.
640-100-10

Mains socket



- cable distribution socket
- easy and quick assembly

Order no.
640-059

"Universal" velcro strip

- for quickly securing non 19" components
- length: 300 mm, width: 20 mm
- back to back mounting
- set = 10 pieces

Material:
velcro, black

Order no.
671-122-08

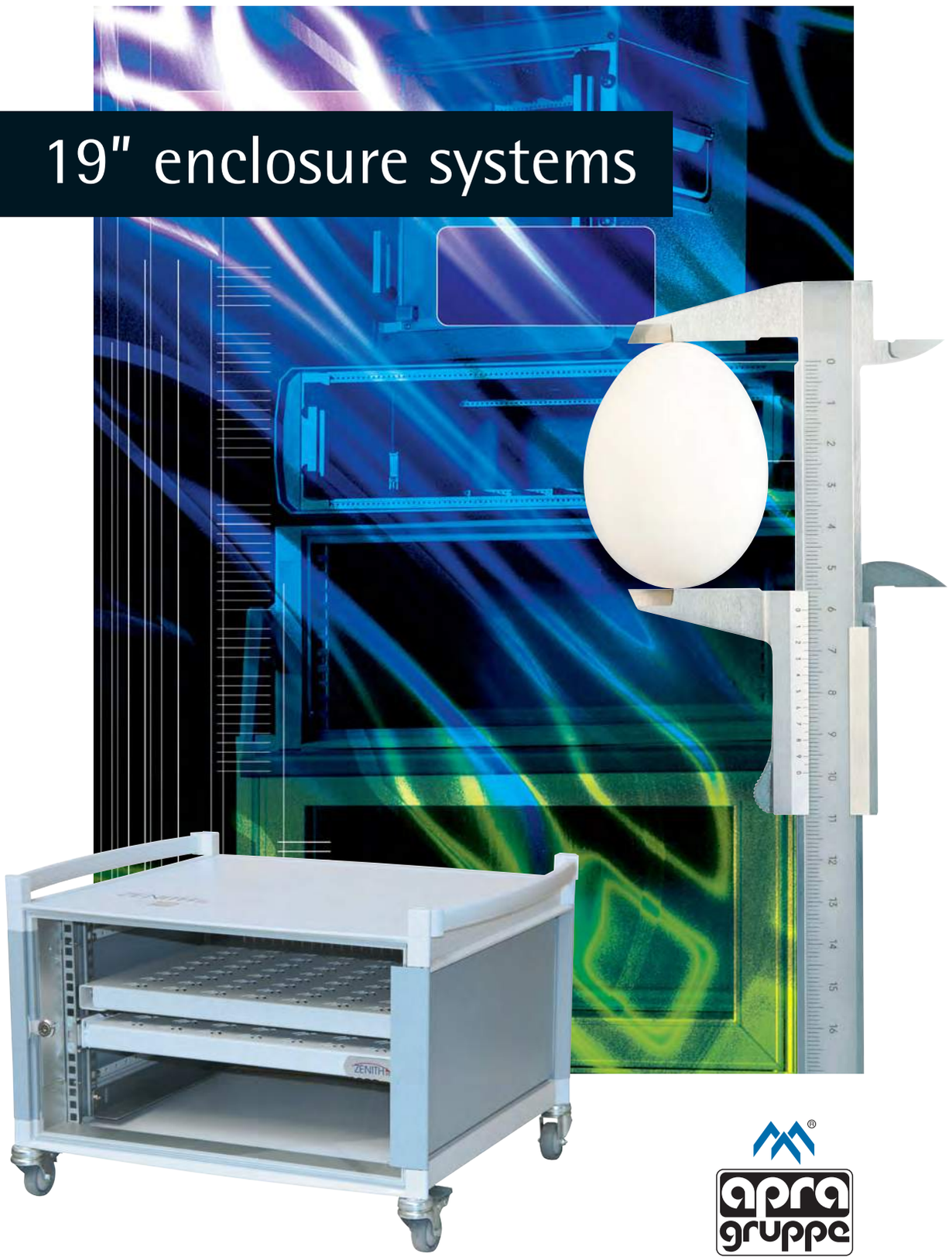
Velcro mount "universal"

- used to accommodate velcro up to w=20 mm
- for screws M4 (not included)
- set = 10 pieces

Material:
plastics, black

Order no.
583-001-08

19" enclosure systems



apra gruppe

... the perfect shell for valuable electronics

19" enclosure systems

apra norm
www.apra.de

ZENITH 2.0

page 27

- striking design
- invisible ventilation
- integrated handle section
- 1/2 19" version available
- IP 42/20

Vitaro

page 31

- universal enclosure system
  - 19" enclosure
  - universal enclosure
  - wall-mounting enclosure
- extremely short assembly time
- special fixing system; no screws required for assembly
- IP 20

apra line

page 37

- removable cover parts
- integrated handle
- also available as desktop enclosure
- IP 20/30

apraTEK

page 46

- solid welded design for high mechanical requirements
- integrated handle
- IP 20

apraLITE

page 48

- quickly dismountable
- light construction
- integrated handle
- 1/2 19" version available
- IP 20/30

www.apra.de

exceptional functionality

ZENITH 2.0

Sample configuration:
enclosure with viewing door and solid rear panel

All individual pieces of the frame construction are designed for easy handling and high flexibility.

When developing these enclosures, apra focused on long lifetime and solid construction and protecting components from external influences. The advanced design with a high recognition rate and functionality distinguishes this enclosure and sets the standard for its competition.

The exceptional processing, which ranges from technical sophistication to quality details, supplements this optimum enclosure design.

19" enclosure system ZENITH 2.0

- future-oriented, functional design
- integrated side handle bar
- integrated "invisible" ventilation
- individual division by depth grids possible
- modular construction
- can be used as a 19" cabinet system up to 18 U
- installation dimensions acc. to IEC 60297-3-100

Matching 19" plug-in units see page 65

Matching 19" subracks see page 79

19" enclosure system ZENITH 2.0

Application:
19" plug-in units, shelves and 19" sub-racks can be installed in the enclosure. As available up to 18 U of space it can also be used as a cabinet system.

Construction:
solid structure consisting of front and rear aluminium die-cast frames and extruded sections.
The side walls and top panels are protected against access from outside and can be demounted from inside!
An "invisible" passive ventilation system is integrated in all enclosures.

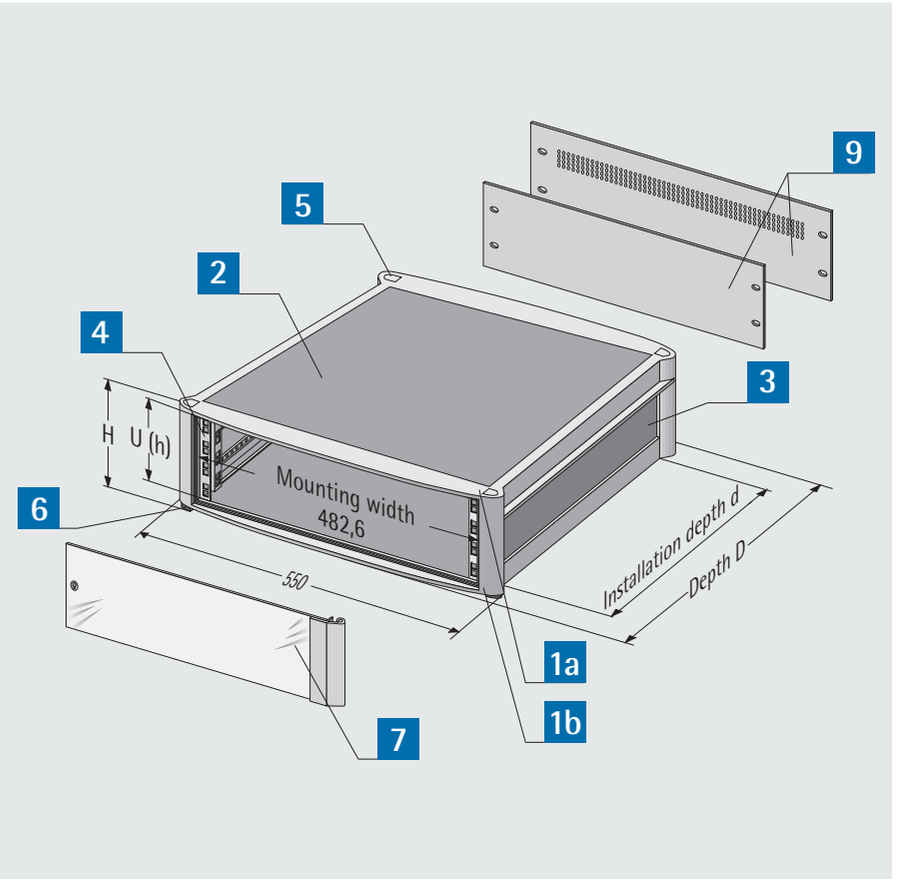
Finish:
frames and top panels:
RAL 7035 light grey
vertical extrusions and side panels:
RAL 7001 silver grey

Delivery:
assembled

Standard
installation dimensions acc. to
IEC 60297-3-100

Delivery: assembled

Technical information



Available components

Item	Description
1a	Front frame with side handle bar
1b	Bottom frame
2	Top/ bottom panel
3	Side panel
4	Vertical mounting
5	Screw blind
6	Enclosure foot
7	Viewing door with sash fastener
8	Blind cover set (without fig.)
9	Rear panel (ventilated/closed)

19" enclosure

Delivery

Item	Pc.	Description
1a	1	Front frame with side handle bar
1b	1	Bottom frame
2	2	Top/bottom panel
3	2	Side panel
4	4	Vertical mounting
5	4	Screw blind
6	4	Enclosure foot

19" enclosure with viewing door

Delivery

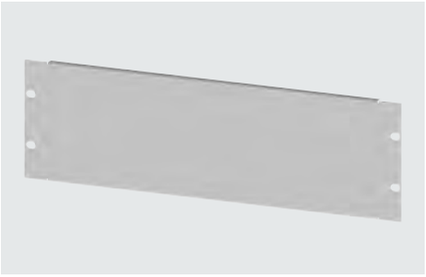
Item	Pc.	Description
1a	1	Front frame with side handle bar
1b	1	Bottom frame
2	2	Top/bottom panel
3	2	Side panel
4	4	Vertical mounting
5	4	Screw blind
6	4	Enclosure feet
7	1	Viewing door with sash fastener
8	1	Blind cover set

Enclosures with a door have an 50 mm shorter installation depth because the mounting brackets are recessed. Doors in standard version are hinged on the right side, but can also be hinged on the left side upon request.

Order data and dimensions

Enclosure depth (D) mm	Installation depth (d) mm	Enclosure height U	Enclosure height (H) mm	Installation height (h) mm	Order no. 19" enclosure	Order no. Sliding rail for 19" enclosure	Order no. 19" enclosure with viewing door	Order no. Sliding rail for 19" enclosure with viewing door
525	450	3	170,6	132,5	160-503-10	160-012-52	160-503-60	160-012-56
		4	215,1	177	160-504-10		160-504-60	
		6	304,1	266	160-506-10		160-506-60	
		9	437,1	399	160-509-10		160-509-60	
625	550	4	215,1	177	160-604-10	160-012-62	160-604-60	160-012-66
		6	304,1	266	160-606-10		160-606-60	
		9	437,1	399	160-609-10		160-609-60	
		12	570,6	532,5	160-612-10		160-612-60	
		15	703,3	667	160-615-10		160-615-60	
		18	836,8	800	160-618-10		160-618-60	

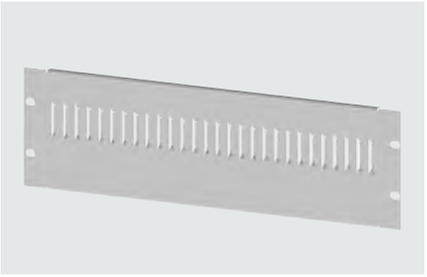
Rear panel, solid



Material: aluminium 1.5 mm
Finish: RAL 7035 light grey

Installation height U	Order no.
2	150-702
3	150-703
4	150-704
5	150-705
6	150-706
9	150-709

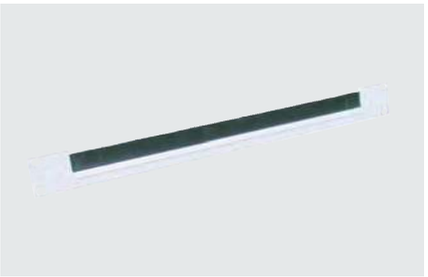
Rear panel, ventilated



Material: aluminium 1.5 mm
Finish: RAL 7035 light grey

Installation height U	Order no.
2	150-712
3	150-713
4	150-714
5	150-715
6	150-716
9	150-719

19" cable duct 1 U



- for cable entry
- mounting to a 19" level

Material: sheet steel 1.25 mm
Finish: RAL 7035 light grey
Dimensions (H x W x D):
44 x 482,6 x 12 mm

Order no.
213-146-00

Shelf, fixed

Load capacity: 30 kg
Finish: RAL 7035 light grey

*For use with 50 mm recessed vertical mountings

Description	Order no.
for D=525 mm	160-015-40
for D=525 mm	160-015-80*
for D=625 mm	160-015-30
for D=625 mm	160-015-70*

Shelf, extractable

Load capacity: 30 kg
Finish: RAL 7035 light grey

Description	Order no.
for D=525 mm	160-015-20
for D=625 mm	160-015-10

Carrying handle

Load capacity: 50 kg / pair
Finish: RAL 7035 light grey
Delivery: mounted to enclosure

Description	Order no. (pair)
for D=525 mm	160-014-45
for D=625 mm	160-014-46

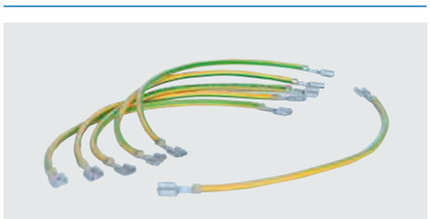
Castor set

- 4 steering rollers, 2 with parking
- assembly material included
- wheel diameter: 50 mm
- load capacity: 120 kg

Delivery: mounted to enclosure

Order no. (set)
160-014-80

Earthing kit



- allows an earthing of all cabinet components acc. to VDE

For installation height	Order no. (set)
3 - 6 U	160-033-10
9 - 15 U	160-039-10
18 U	160-048-10

M5 screw set

Delivery:
- 50 oval head screws M 5 × 12
- 50 cage nuts M 5 x 12
- 50 decorative washers M 5 with collar

Order no. (set)
630-991

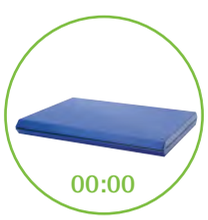
www.apra.de

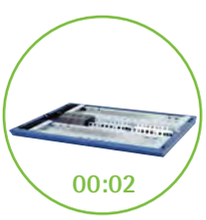
Probably the „fastest" enclosure in the world

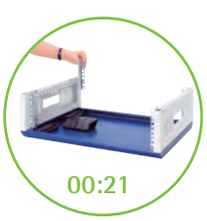
Sample configuration

Vitaro®

Vitaro can be assembled within less than 60 seconds:





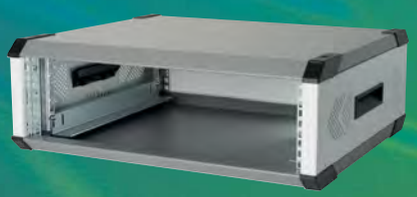


19" enclosure system Vitaro®

- universal enclosure system:
  - 19" enclosure
  - universal enclosure
  - wall-mounting enclosure
- extremely short assembly time
- no screws required for assembly due to special fixing system*
- attractive design
- light aluminium construction
- stackable
- integrated handles
- assembly kit system requiring minimum storage and transportation space
- various expansion options
- modular accessories
- protection system IP 20
- special models available on request

* Enclosure can also be assembled using screws additionally.

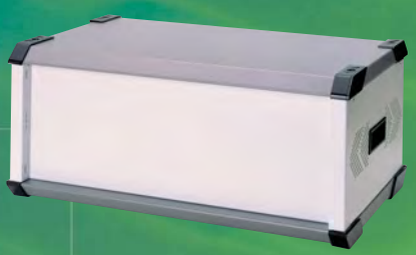
One basic enclosure, three options



Model 1:
19" enclosure 3/4/6 U

The enclosure has vertical mountings that are inserted without tools and is ready for you to install 19" components.

Installation dimensions comply with IEC 60297-3-100



Model 2:
Universal enclosure

We can customise this universal enclosure to your requirements on request, whether you require stamps, embossing or printing.

Model 3:
Wall-mounting enclosure

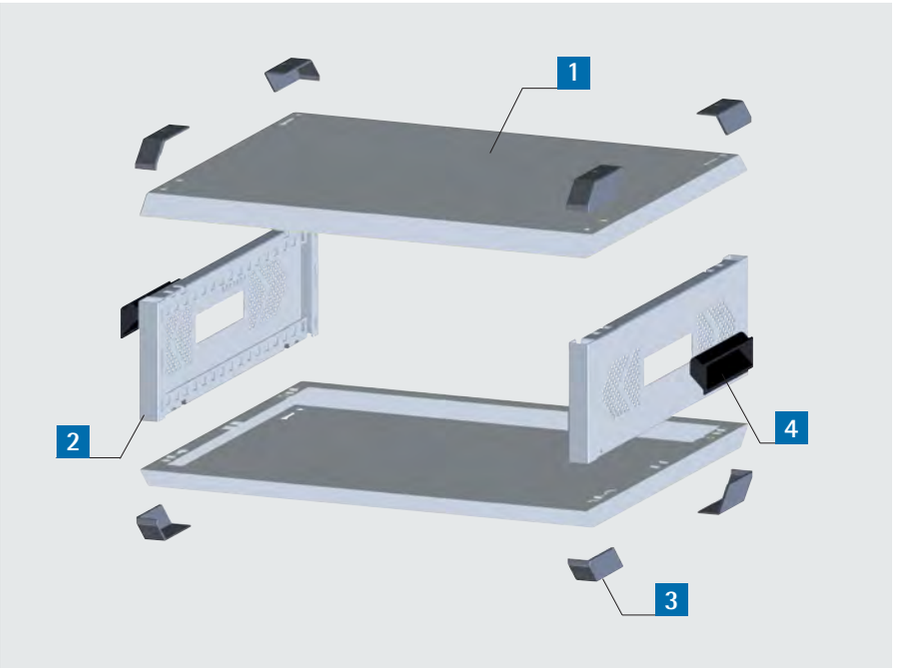
You can use a wall mounting set (see page 35) to transform enclosure models 1 or 2 into a wall-mounting enclosure.

www.apra.de

Vitaro basic enclosure

Application:
can be used as a 19" enclosure, wall-mounting enclosure or universal enclosure for customised use; ideal for installing 19" components acc. to IEC 60297-3-100 and 297-3-101.
Construction:
aluminium shell construction with plug-in tab system; no tools required for assembly. 4 screws can be used for extra security (included in delivery).
Material:
top/ bottom panels: aluminium 1.5 mm
side panels: aluminium 1.2 mm
Finish:
top/bottom panels:
RAL 7037 dust grey
side panels:
RAL 7035 light grey
Degree of protection:
IP 20

Installation depth d=D-46 mm, enclosure width W = 537 mm. Additional enclosure sizes (e.g. 84 HP, 63 HP, 42 HP) are available on request.



Exploded view: Basic enclosure

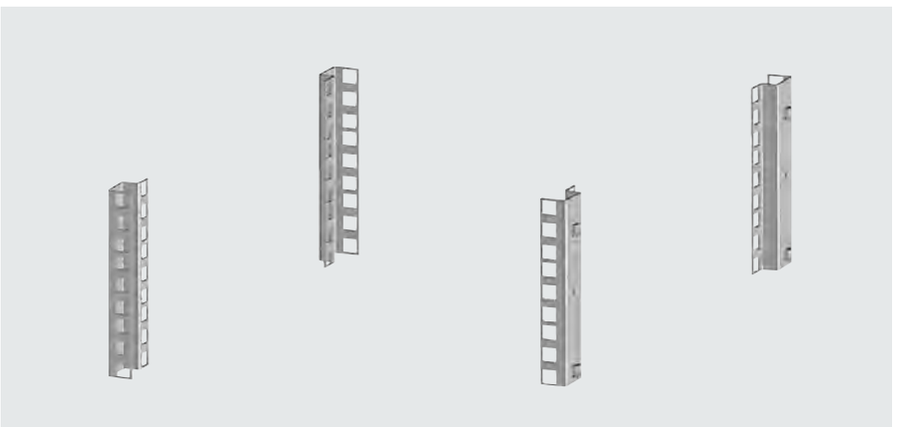
Delivery

Item	Pc.	Description
1	2	Top/ bottom panels
2	2	Side panels
3	8	Decorative corners, stackable
4	1	Assembly set: 4 enclosure feet, 2 handles, 4 retaining screws

D mm	Description	Order no.
350	Basic enclosure 3 U	195-313-00
450		195-413-00
550		195-513-00
350	Basic enclosure 4 U	195-314-00
450		195-414-00
550		195-514-00
350	Basic enclosure 6 U	195-316-00
450		195-416-00
550		195-516-00

Vitaro expansion kit 19" enclosure

The basic enclosure can be transformed into a full 19" enclosure using plug-in vertical mountings. No tools are required.
Material:
sheet steel 1.5 mm
Finish:
galvanised



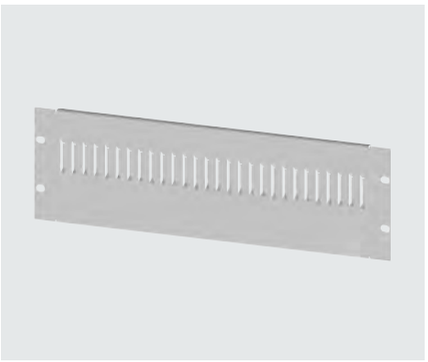
Please order rear panel separately (see page 34).

Delivery

Item	Pc.	Description
1	4	Vertical mounting

Expansion kit	Order no.
3 U	195-053-00
4 U	195-054-00
6 U	195-056-00

19" rear panel

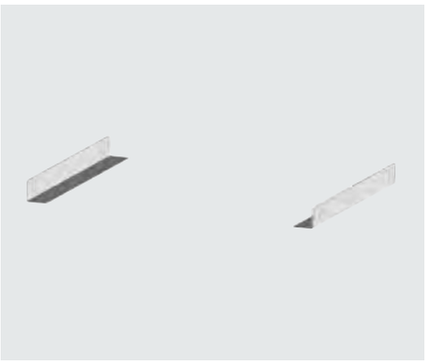


- ventilated or closed
- assembly material included

Material:
aluminium 1.5 mm
Finish:
RAL 7035 light grey

Height	Feature	Order no.
3 U	not ventilated	195-023-00
	ventilated	195-023-10
4 U	not ventilated	195-024-00
	ventilated	195-024-10
6 U	not ventilated	195-026-00
	ventilated	195-026-10

Sliding rails, adjustable height



- assembly material included

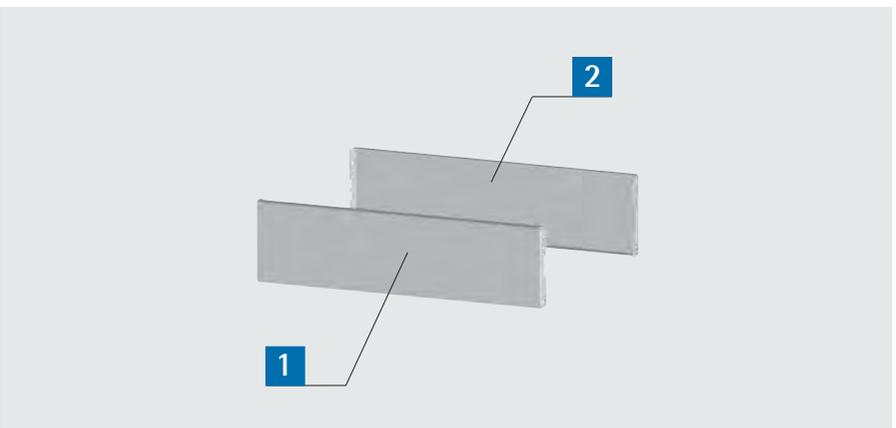
Material:
sheet steel 1.5 mm
Finish:
galvanised
Load capacity:
15 kg/ pair

Description	Order no.
for D=350 mm	195-382-00
for D=450 mm	195-482-00
for D=550 mm	195-582-00

Vitaro expansion set universal enclosure

You can customise our basic enclosure using **customised front and rear panels** (screens, stamps, embossing).

You can find plug-in installation / mounting plates for horizontal and vertical installation in the accessories section on page 35.



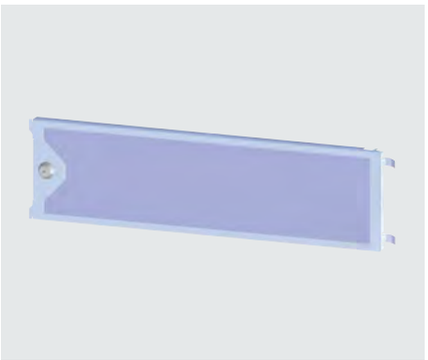
Delivery

Item	Pc.	Description
1	1	Front panel, plug-in
2	1	Rear panel, plug-in

Expansion kit	Order no.
3 U	195-063-00
4 U	195-064-00
6 U	195-066-00

www.apra.de

Door with plexiglas pane, plug-in

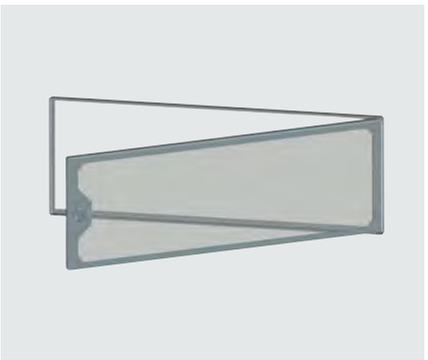


- with plexiglas pane and cylinder sash fastener
- demountable without tools

Material:
stackable door: aluminium 1.5 mm
door: plexiglas
Finish: RAL 7035 light grey

Description	Order no.
3 U	195-073-00
4 U	195-074-00
6 U	195-076-00

Swing door with frame



- to be screwed onto the enclosure
- with plexiglas pane and cylinder sash fastener

Material:
frame: sheet steel 2 mm
swing door: aluminium 1.5 mm
door: plexiglas 4.0 mm
Finish: RAL 7035 light grey

Description	Order no.
3 U	195-073-12
4 U	195-074-12
6 U	195-076-12

Mounting plate, plug-in

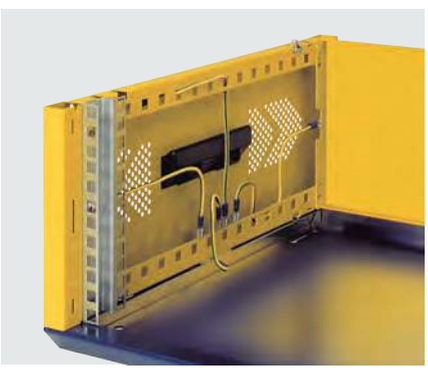
- for vertical mounting
- can be inserted at different depths

Material: aluminium 1.5 mm
Finish: RAL 7035 light grey

The mounting plate 3 U can also be installed horizontally in all enclosure sizes as a shelf.

Description	Order no.
3 U	195-063-02
4 U	195-064-02
6 U	195-066-02

Earthing set



- for earth connection of all enclosure parts acc. to VDE

Description	Order no.
for 19" enclosure	195-080-10
for desktop enclosure	195-080-12
for universal enclosure	195-080-12

Blind cover set

- for extension components installed 50 mm towards the rear
- 2 horizontal and 2 vertical panels included
- self-locking, no assembly material required

Material: aluminium 1.0 mm
Finish: RAL 7035 light grey

Description	Order no.
3 U	195-083-10
4 U	195-084-10
6 U	195-086-10

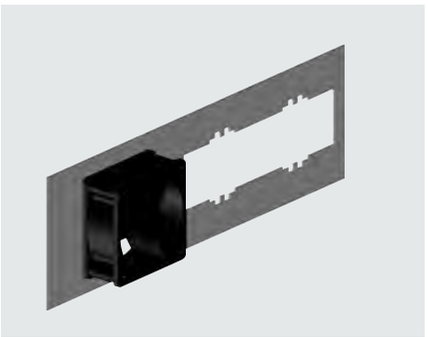
Wall mounting set

- fits all Vitaro models
- no tools required for mounting brackets to the enclosure

Material: sheet steel 2.0 mm
Finish: RAL 7035 light grey

Description	Order no.
for D=350 mm	195-380-00
for D=450 mm	195-480-00
for D=550 mm	195-580-00

Fan support with 12 V fan



- plugs into the side wall
- high-quality PAPST-fan
- flow rate: 40 m3/h
- noise level: 40 dB (A)

Material: aluminium 1.0 mm

Description	Order no.
for D=350 mm	195-380-10
for D=450 mm for D=550 mm	195-480-10

Prop-up and carrying handle

- handle can be set in 30° steps by pressing a button to snap it into place

Finish:
handle: RAL 9011 graphite black
handle extrusion: anodised
button, screw blind: plastics, black
Load capacity:
50 kg

Order no.
195-080-30

Screw set M 5 (50-fold)

- necessary for mounting of 19" components into enclosures
- included in delivery:
  - 50 oval head screws M 5 x 12
  - 50 cage nuts M 5 - 8
  - 50 decorative washers M 5 with collar, flattened

Order no.
630-991

Front panel fixing (50-fold)

- no cage nuts required
- to mount lightweight 19" components such as dummy or front panels
- clamping range (front panel + grid): 4 – 6 mm
- consisting of:
  - 50 lens head screws M 5 x 12
  - 50 washers for screws M 5, flattened

Order no.
630-991-10

www.apra.de

Universal enclosure system for use as 19" enclosure and as desktop enclosure

apra line

Sample configuration

apraLine has a future-oriented design and optimum functionality. Its elegant lines set it apart from the usual rectangular shaped enclosures.

The apraLine product family is completed by a desktop enclosure with the same design (see the section on desktop enclosures on page 149).

19" enclosure system apra line

- ergonomic recessed handles
- easy-to-maintain and cost-saving design principle: all facing panels can be easily removed from the assembled enclosure
- optimum heat dissipation due to ventilated bottom and back pieces
- earthing kit for VDE-compliant earth connection acc. to DIN EN 60204 part 1 and DIN 46008
- installation dimensions acc. to IEC 60297-3-100

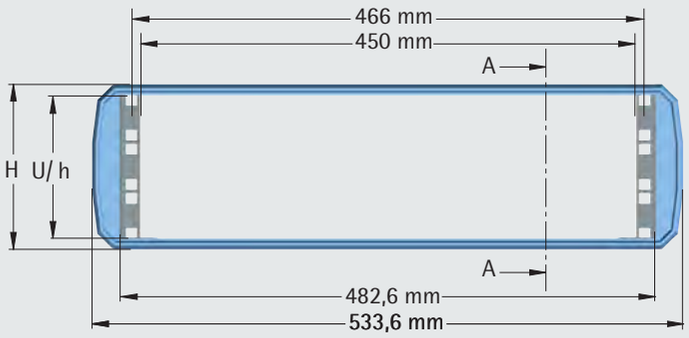
Matching 19" plug-in units page 65

Matching 19" subracks page 79

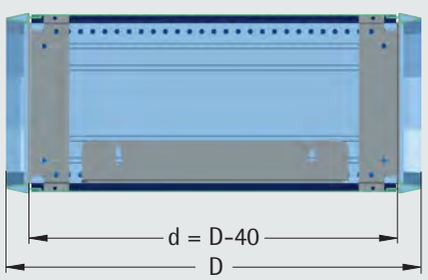
19" enclosure system apra line

Application:
19" plug-in units, shelves and 19" sub-racks can be installed in the enclosure.
Construction:
the identical front and rear frames with a variable width consist of two lateral plastic pieces, which are connected with aluminium extrusions.
These frames are connected by solid extrusions and screwed on to the mounting rails. Ergonomic recessed handles and grooves for using mounting nuts are integrated into the extrusions.

Finish:
cover panels:
RAL 7035 light grey
frame and side sections:
RAL 7001 silver grey
Protection system:
IP 30: not ventilated
IP 20: ventilated
Delivery:
assembled
Standard:
installation dimensions acc. to IEC 60297-3-100



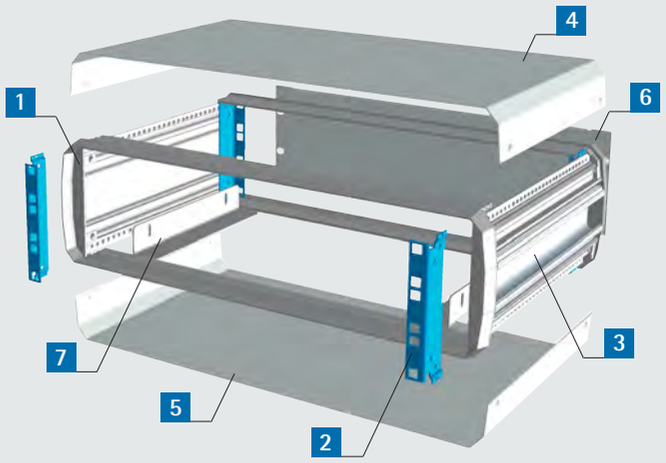
front view
H = enclosure height
U / h = installation height



section A-A
D = enclosure depth
d = installation depth

Delivery

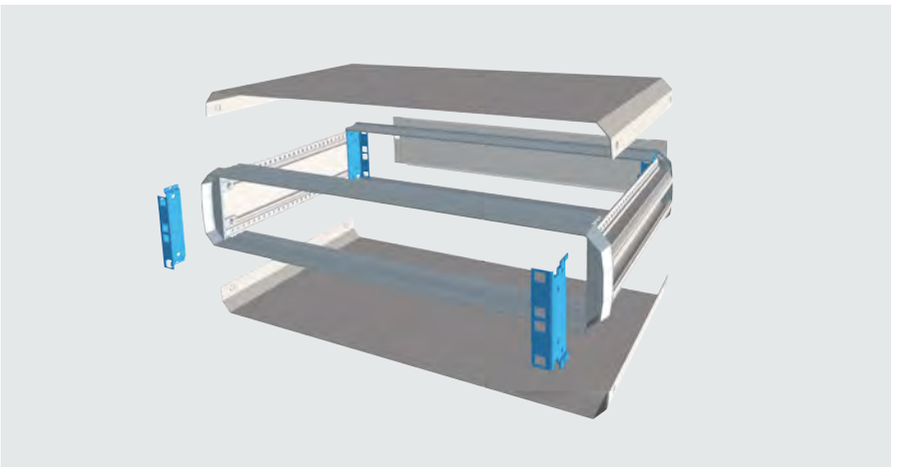
Item	Pc.	Description
1	2	Frames front and rear
2	4	Vertical mountings
3	2	Side panels
4	1	Top panel
5	1	Bottom panel (ventilated/not ventilated)
6	1	Rear panel (ventilated/ not ventilated)
7	2	Sliding rails (beginning at 3 U)
8		Assembly material



19" enclosure 2 U

Delivery

Item	Pc.	Description
1	2	Frames front and rear
2	4	Vertical mountings
3	2	Side panels
4	1	Top panel
5	1	Bottom panel (ventilated/not ventilated)
6	1	Rear panel (ventilated/ not ventilated)
8		Assembly material

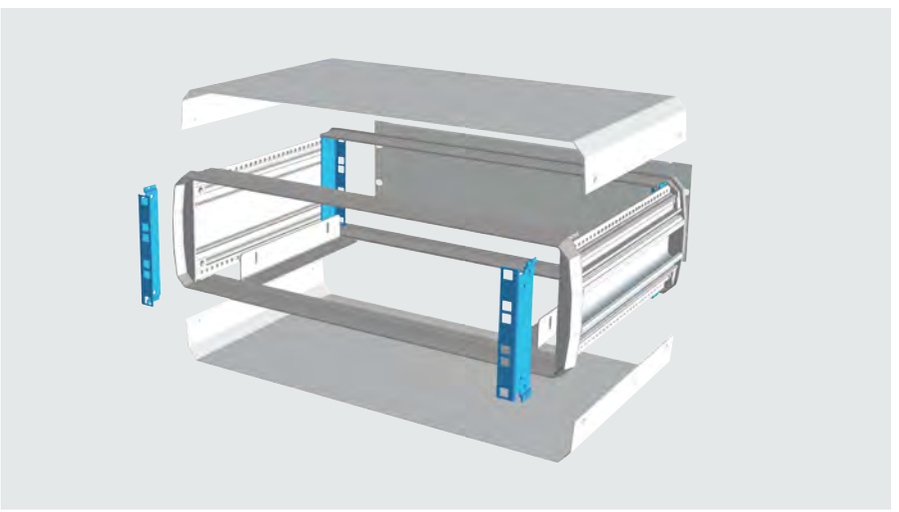


D mm	d mm	Description	Enclosure height H mm	Order no.
262	222	not ventilated	105	140-201
262	222	ventilated in rear and bottom panel	105	140-251
302	262	not ventilated	105	140-211
302	262	ventilated in rear and bottom panel	105	140-261

19" enclosure 3 U

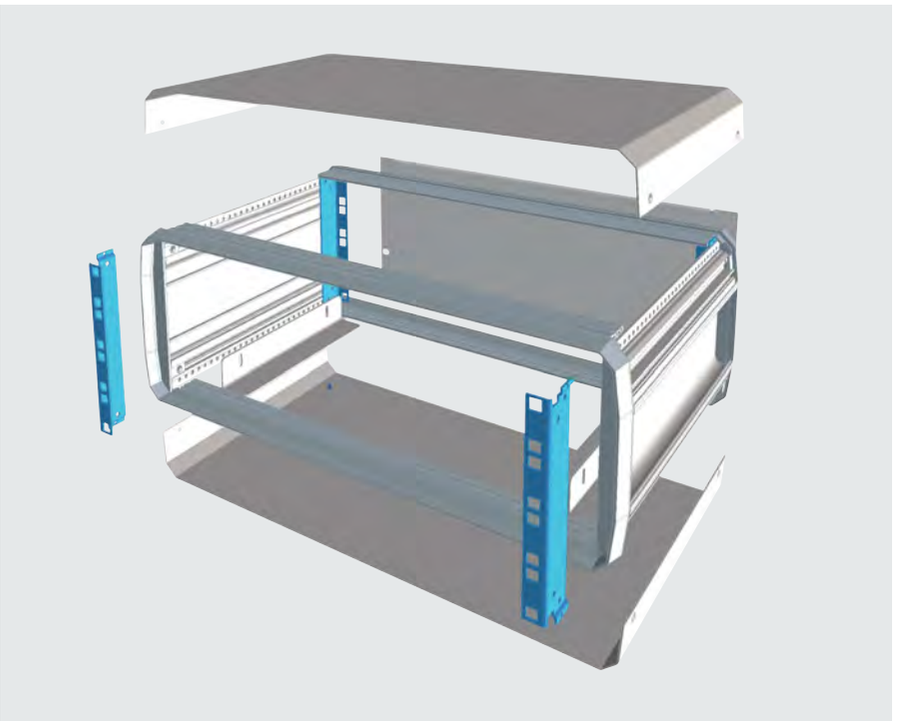
Delivery

Item	Pc.	Description
1	2	Frames front and rear
2	4	Vertical mountings
3	2	Side panels
4	1	Top panel
5	1	Bottom panel (ventilated/not ventilated)
6	1	Rear panel (ventilated/ not ventilated)
7	2	Sliding rails
8		Assembly material



D mm	d mm	Description	Enclosure height H mm	Order no.
262	222	not ventilated	150	140-301
262	222	ventilated in rear and bottom panel	150	140-351
302	262	not ventilated	150	140-311
302	262	ventilated in rear and bottom panel	150	140-361
342	302	not ventilated	150	140-321
342	302	ventilated in rear and bottom panel	150	140-371
382	342	not ventilated	150	140-331
382	342	ventilated in rear and bottom panel	150	140-381
482	442	not ventilated	150	140-341
482	442	ventilated in rear and bottom panel	150	140-391

19" enclosure 4 U



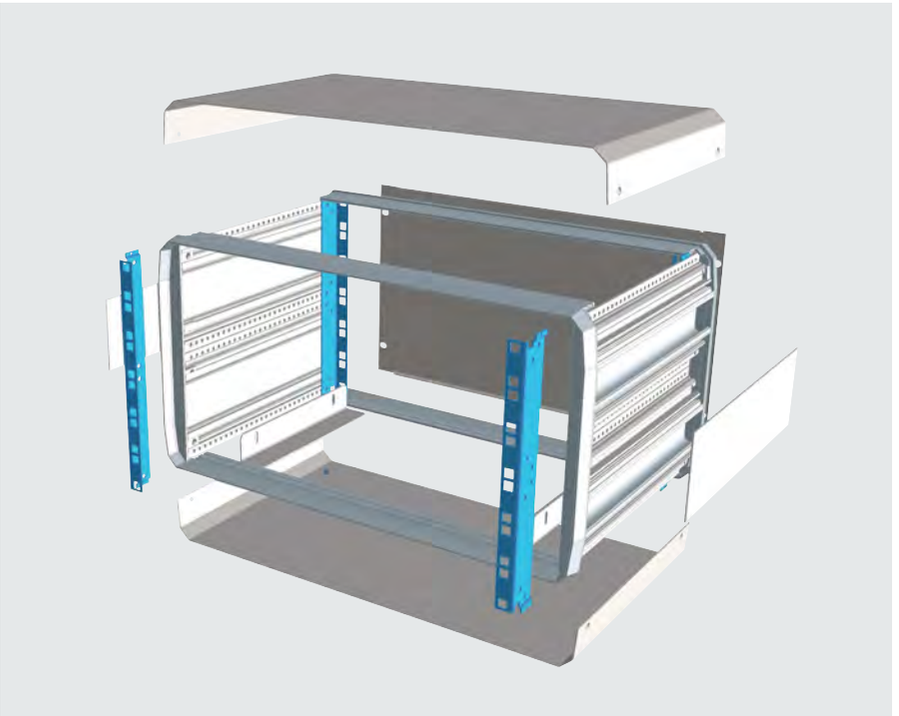
Delivery

Item	Pc.	Description
1	2	Frames front and rear
2	4	Vertical mountings
3	2	Side panels
4	1	Top panel
5	1	Bottom panel (ventilated/ not ventilated)
6	1	Rear panel (ventilated/ not ventilated)
7	2	Sliding rails
8		Assembly material

D mm	d mm	Description	Enclosure height H mm	Order no.
262	222	not ventilated	194	140-401
262	222	ventilated in rear and bottom panel	194	140-451
302	262	not ventilated	194	140-411
302	262	ventilated in rear and bottom panel	194	140-461
342	302	not ventilated	194	140-421
342	302	ventilated in rear and bottom panel	194	140-471
382	342	not ventilated	194	140-431
382	342	ventilated in rear and bottom panel	194	140-481
482	442	not ventilated	194	140-441
482	442	ventilated in rear and bottom panel	194	140-491

www.apra.de

19" enclosure 6 U

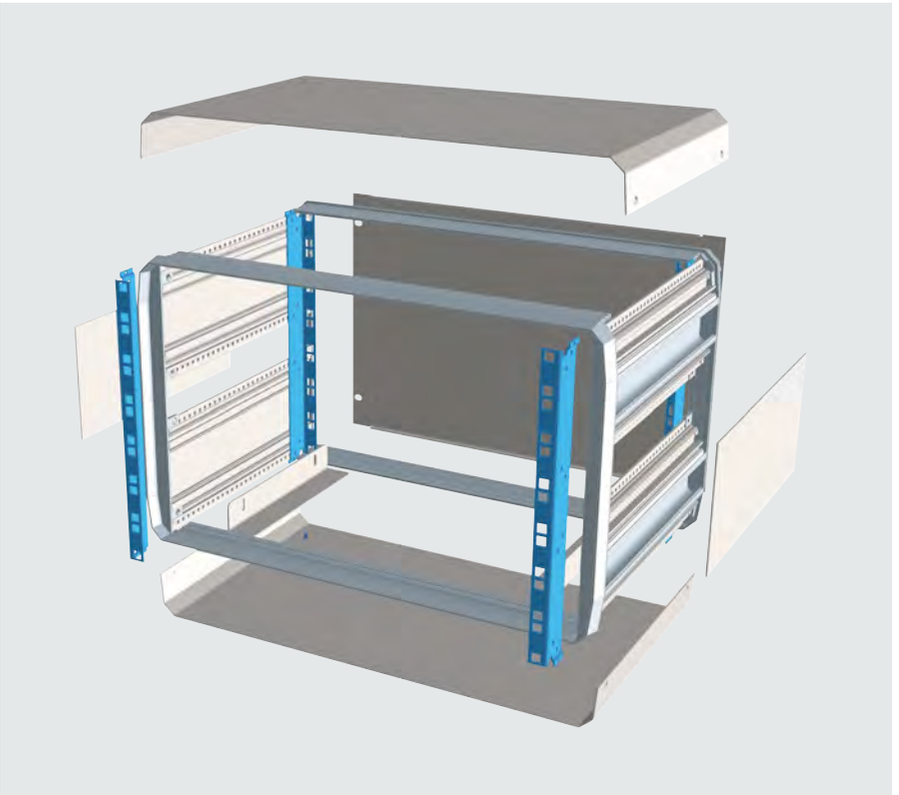


Delivery

Item	Pc.	Description
1	2	Frames front and rear
2	4	Vertical mountings
3	2	Side panels
4	1	Top panel
5	1	Bottom panel (ventilated/not ventilated)
6	1	Rear panel (ventilated/ not ventilated)
7	2	Sliding rails
8		Assembly material

D mm	d mm	Description	Enclosure height H mm	Order no.
262	222	not ventilated	283	140-601
262	222	ventilated in rear and bottom panel	283	140-651
302	262	not ventilated	283	140-611
302	262	ventilated in rear and bottom panel	283	140-661
342	302	not ventilated	283	140-621
342	302	ventilated in rear and bottom panel	283	140-671
382	342	not ventilated	283	140-631
382	342	ventilated in rear and bottom panel	283	140-681
482	442	not ventilated	283	140-641
482	442	ventilated in rear and bottom panel	283	140-691

19" enclosure 7 U



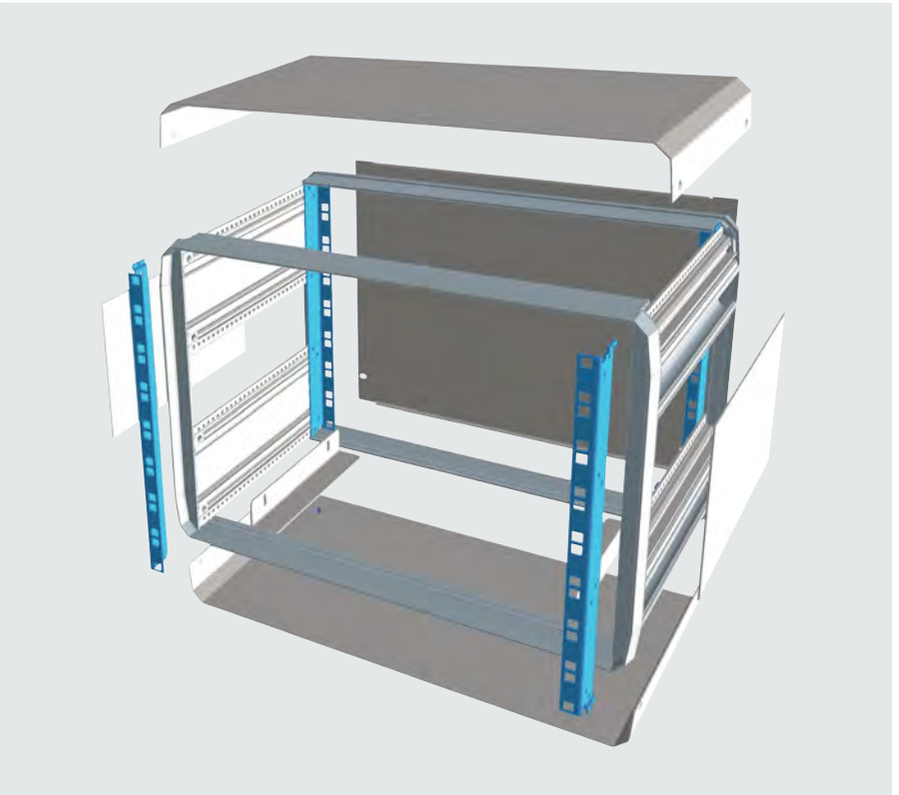
Delivery

Item	Pc.	Description
1	2	Frames front and rear
2	4	Vertical mountings
3	2	Side panels
4	1	Top panel
5	1	Bottom panel (ventilated/not ventilated)
6	1	Rear panel (ventilated/ not ventilated)
7	2	Sliding rails
8		Assembly material

D mm	d mm	Description	Enclosure height H mm	Order no.
342	302	not ventilated	328	140-721
342	302	ventilated in rear and bottom panel	328	140-771
382	342	not ventilated	328	140-731
382	342	ventilated in rear and bottom panel	328	140-781
482	442	not ventilated	328	140-741
482	442	ventilated in rear and bottom panel	328	140-791

www.apra.de

19" enclosure 8 U

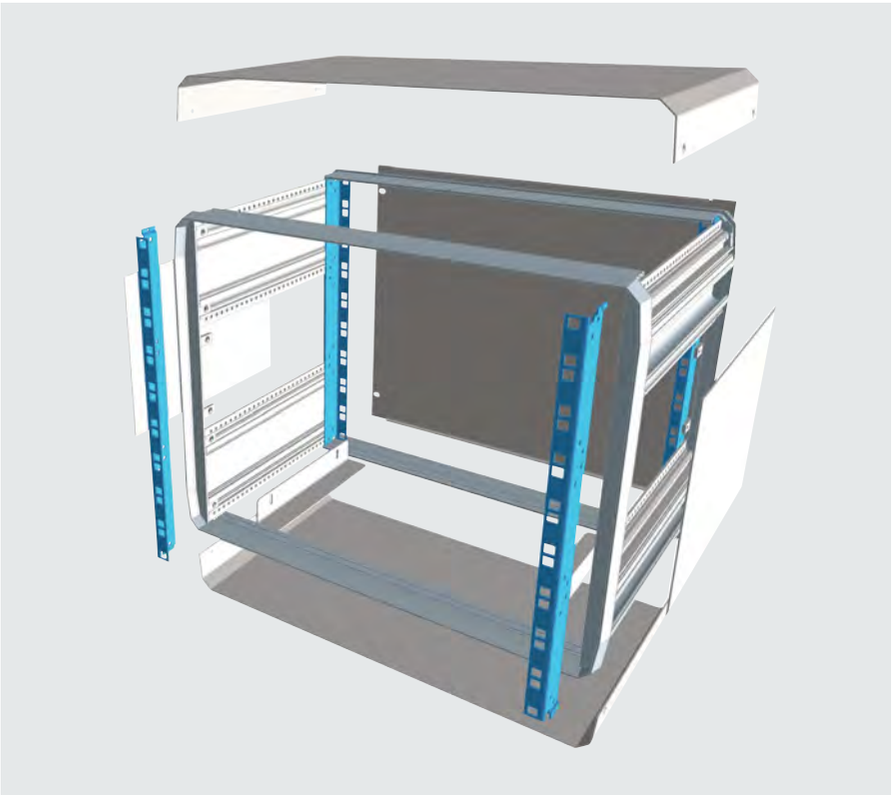


Delivery

Item	Pc.	Description
1	2	Frames front and rear
2	4	Vertical mountings
3	2	Side panels
4	1	Top panel
5	1	Bottom panel (ventilated/not ventilated)
6	1	Rear panel (ventilated/ not ventilated)
7	2	Sliding rails
8		Assembly material

D mm	d mm	Description	Enclosure height H mm	Order no.
262	222	not ventilated	372	140-801
262	222	ventilated in rear and bottom panel	372	140-851
302	262	not ventilated	372	140-811
302	262	ventilated in rear and bottom panel	372	140-861
342	302	not ventilated	372	140-821
342	302	ventilated in rear and bottom panel	372	140-871
382	342	not ventilated	372	140-831
382	342	ventilated in rear and bottom panel	372	140-881
482	442	not ventilated	372	140-841
482	442	ventilated in rear and bottom panel	372	140-891

19" enclosure 9 U



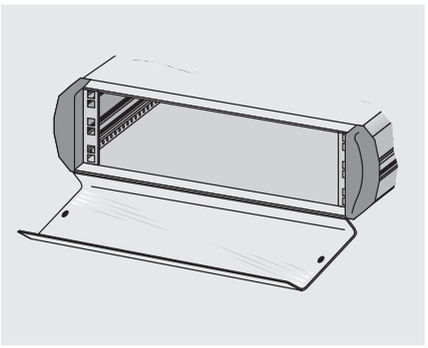
Delivery

Item	Pc.	Description
1	2	Frames front and rear
2	4	Vertical mountings
3	2	Side panels
4	1	Top panel
5	1	Bottom panel (ventilated/not ventilated)
6	1	Rear panel (ventilated/ not ventilated)
7	2	Sliding rails
8		Assembly material

D mm	d mm	Description	Enclosure height H mm	Order no.
262	222	not ventilated	416,50	140-901
262	222	ventilated in rear and bottom panel	416,50	140-951
302	262	not ventilated	416,50	140-911
302	262	ventilated in rear and bottom panel	416,50	140-961
342	302	not ventilated	416,50	140-921
342	302	ventilated in rear and bottom panel	416,50	140-971
382	342	not ventilated	416,50	140-931
382	342	ventilated in rear and bottom panel	416,50	140-981
482	442	not ventilated	416,50	140-941
482	442	ventilated in rear and bottom panel	416,50	140-991

www.apra.de

Plexiglas front door, hinged

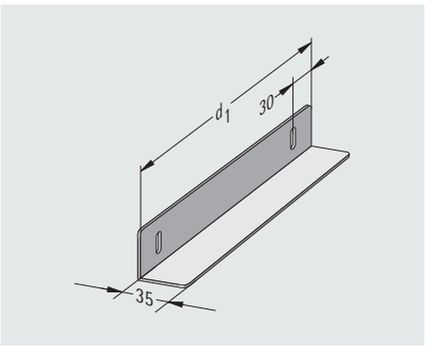


- with 2 quick-release locks

Delivery:
mounted to the enclosure

Installation height U	Order no.
3	140-300
4	140-400
6	140-600

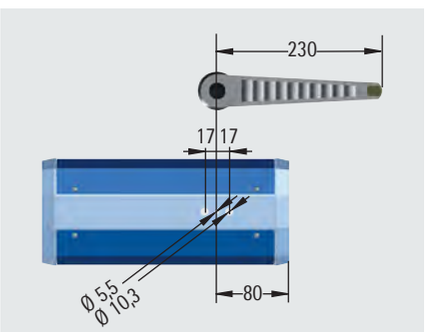
Sliding rails



for 8 U-high enclosures: please specify order no. followed by -01 when ordering (for example, 140-020-01)

Description	Install. depth d1 mm	Order no.
for D=262 mm	140	140-020
for D=342 mm	220	140-022
for D=482 mm	360	140-024

Prop-up and carrying handle



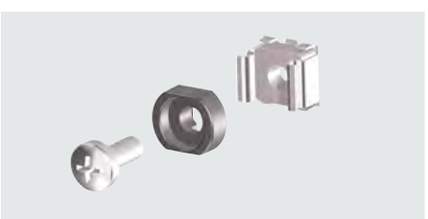
Hole pattern for handle mounting

- handle can be set in 30° steps by pressing a button to snap it into place

Finish: RAL 9011 graphite black
Load capacity: 50 kg
Delivery: mounted to the enclosure

Order no.
140-100-84

Screw set M 5 (50-fold)



- necessary for mounting of 19" components into enclosures
- included in delivery:
  - 50 oval head screws M 5 x 12
  - 50 cage nuts M 5 - 8
  - 50 decorative washers M 5 with collar, flattened

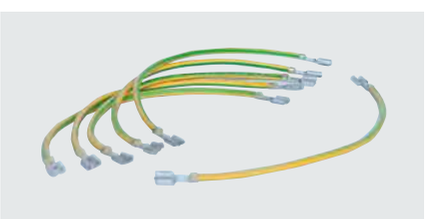
Order no.
630-991

Front panel fixing (50-fold)

- no cage nuts required
- to mount lightweight 19" components such as dummy or front panels
- clamping range (front panel + grid): 4 – 6 mm
- consisting of:
  - 50 lens head screws M 5 x 12
  - 50 washers for screws M 5, flattened

Order no.
630-991-10

Earthing kit



- for earthing of all enclosure parts in compliance with VDE

Installation height U	Order no.
2	140-032
3	140-033
4	140-034
6	140-036
7	140-037
8	140-038
9	140-039

Reliable quality – optimum protection

apraTEK

19" enclosure system apraTEK

- high functionality
- perfect for mechanical engineering applications
- practical flip-up handles
- protection system IP20
- can either be used as 19" enclosure or 19" stand-alone enclosure
- skid-proof feet
- high stability
- ventilated rear and bottom panel
- installation dimensions acc. to IEC 60297-3-100

An optimised combination of functionality and economy characterise this enclosure system apraTEK.

Designed for high loads, the enclosure's construction with welded 19" mountings makes the apraTEK perfect for the use in rough industrial environments, either as enclosure or as a cabinet system (up to 20 U).

Matching 19" plug-in units page 65

Matching 19" subracks page 79

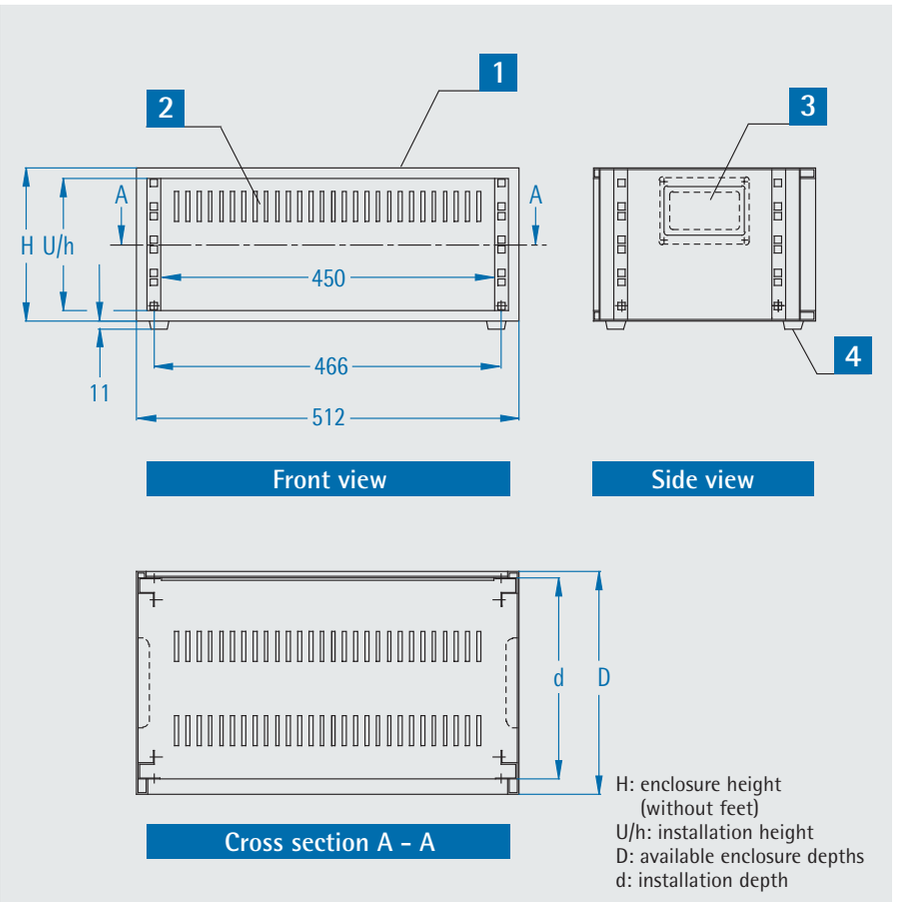
www.apra.de

19" enclosure system apraTek

Application:
19" plug-in units, shelves and 19" sub-racks can be installed in the enclosure. Because the enclosure is available in different sizes up to 20 U, it can also be used as a heavy-duty cabinet system in rough environments.

Construction:
the enclosure has a solid, welded sheet steel covering.

Finish: RAL 7035 light grey
Protection system: IP 20
Standard: installation dimensions acc. to IEC 60297-3-100



Delivery

Item	Pc.	Description
1	1	Base with 4 welded 19" mountings
2	1	Rear panel, ventilated
3	2	Flip-up handle
4	4	Hinged feet
		Assembly material

Installation height U	h mm	Enclosure height H mm	19" enclosure, ventilated in rear and bottom panel d = 270 mm, D = 298 mm	d = 370 mm, D = 398 mm	d = 470 mm, D = 498 mm
3	132,50	160,50	180-223	180-323	-
4	177,00	205,00	180-224	180-324	180-424
5	221,50	249,50	180-225	180-325	180-425
6	266,00	294,00	180-226	180-326	180-426
7	310,50	338,50	180-227	180-327	-
8	354,50	382,50	-	180-328	180-428
9	399,00	427,00	-	180-329	180-429
10	444,50	472,00	-	181-350	181-450
12	533,50	561,50	-	181-352	181-452
14	622,00	650,00	-	181-354	181-454
16	711,00	739,00	-	181-356	181-456
18	800,00	828,00	-	181-358	181-458
20	889,00	917,00	-	181-360	181-460
Sliding rail, 1 Paar (Load capacity: ca. 20 kg)			180-002	180-003	180-004

www.apra.de

The enclosure for mobile application

apraLITE

19" enclosure system apraLITE

- light, practical aluminium enclosure
- side flip-up handles standard
- protection system IP 30/20
- 1/2 19" version available
- dismountable
- quick assembly using few screws
- installation dimensions acc. to IEC 60297-3-100

19" enclosure system 179 apraLITE is ideal for mobile use.
The light construction and built-in flip-up handles allow easy transportion of this enclosure. Only a few screws are used so, it can be assembled and dismantled quickly.

Matching 19" plug-in units page 65

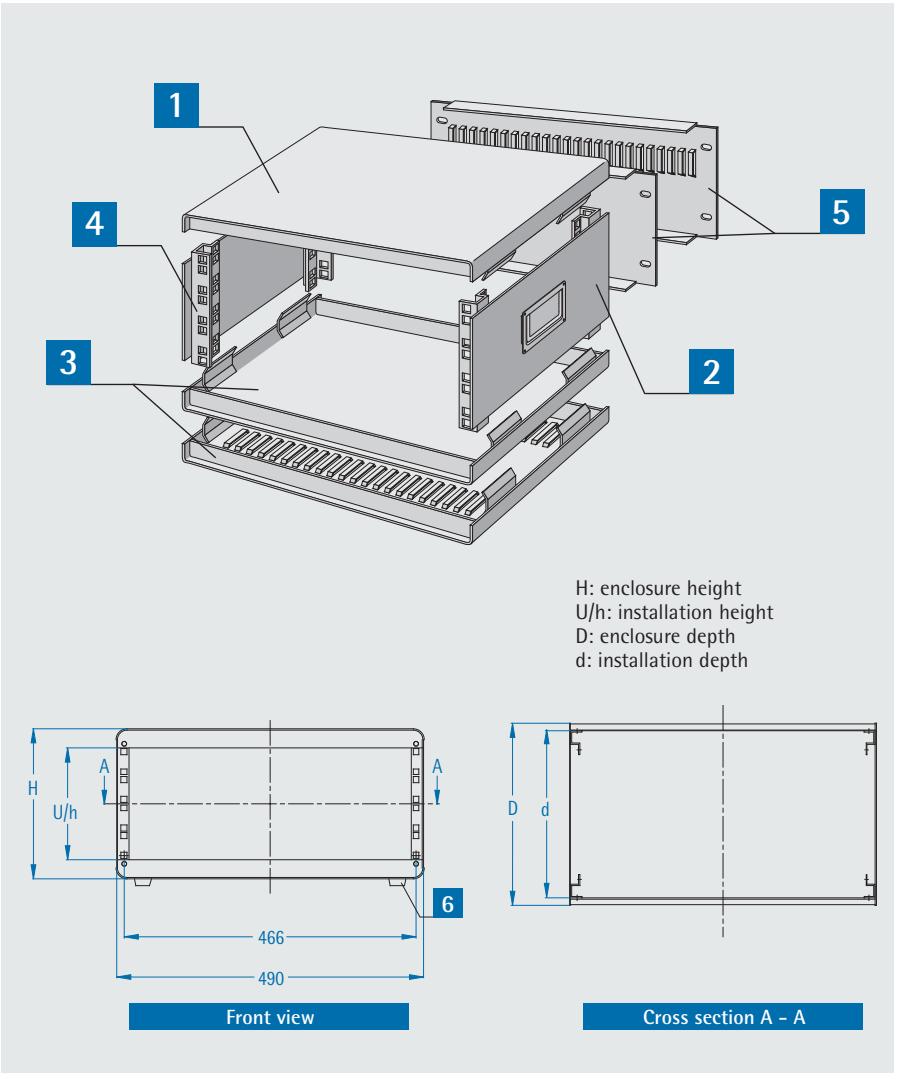
Matching 19" subracks page 79

www.apra.de

19" enclosure system apraLITE

Application:
19" plug-in units, shelves and 19" sub-racks can be installed in the enclosure.
Construction:
the enclosure has a simple construction based on side panels with built-in vertical mountings and top and bottom covers that can be assembled quickly.

Finish: RAL 7035 light grey
Protection system:
IP 30: not ventilated
IP 20: ventilated
Delivery: not assembled
Standard:
installation dimensions acc. to IEC 60297-3-100



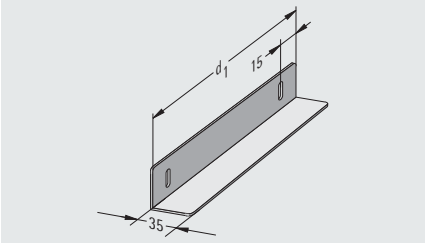
Delivery

Item	Pc.	Description
1	1	Top panel
2	2	Side panels with handle
3	1	Bottom panel (ventilated/not ventilated)
4	4	Vertical mountings (integrated in side panel)
5	1	Rear panel (ventilated/not ventilated)
6	4	Enclosure feet
7		Assembly material

Installation height		Enclosure height	19" enclosure, ventilated in rear and bottom panel			19" enclosure, not ventilated			½ 19" enclosure, not ventilated	
U	h mm	H mm	d=270 mm D=290 mm	d=370 mm D=390 mm	d=470 mm D=490 mm	d=270 mm D=290 mm	d=370 mm D=390 mm	d=470 mm D=490 mm	d=270 mm D=290 mm	d=370 mm D=390 mm
3	132,5	194,5	179-283	179-383	179-483	179-223	179-323	179-423	179-823	179-923
4	177	239	179-284	179-384	179-484	179-224	179-324	179-424	179-824	179-924
5	221,5	283,5	179-285	179-385	179-485	179-225	179-325	179-425	179-825	179-925
6	266	328	179-286	179-386	179-486	179-226	179-326	179-426	179-826	179-926
9	399	461	179-289	179-389	179-489	179-229	179-329	179-429	179-829	179-929
12	534	596	179-292	179-392	179-492	179-232	179-332	179-432	-	-
15	668	730	179-295	179-395	179-495	179-235	179-335	179-435	-	-
18	801	863	179-298	179-398	179-498	179-238	179-338	179-438	-	-

Sliding rails

Description	Installation depth d1	Order no.
for D=290 mm	240 mm	179-006
for D=390 mm	340 mm	179-007
for D=490 mm	440 mm	179-008



Screw set M 5 (50-fold)

- 50 screws, M5 x 12
- 50 captive nuts, M5-8
- 50 decorative washers, M5 with collar

Order no.
630-991

Other 19" enclosure systems

www.apra.de

Tamago

- stylish design
- integrated handle bar
- easy handling
- patented **"apra-lock"** locking system
- clip-on trim pieces for custom design
- also available as desktop enclosure

BERLIN

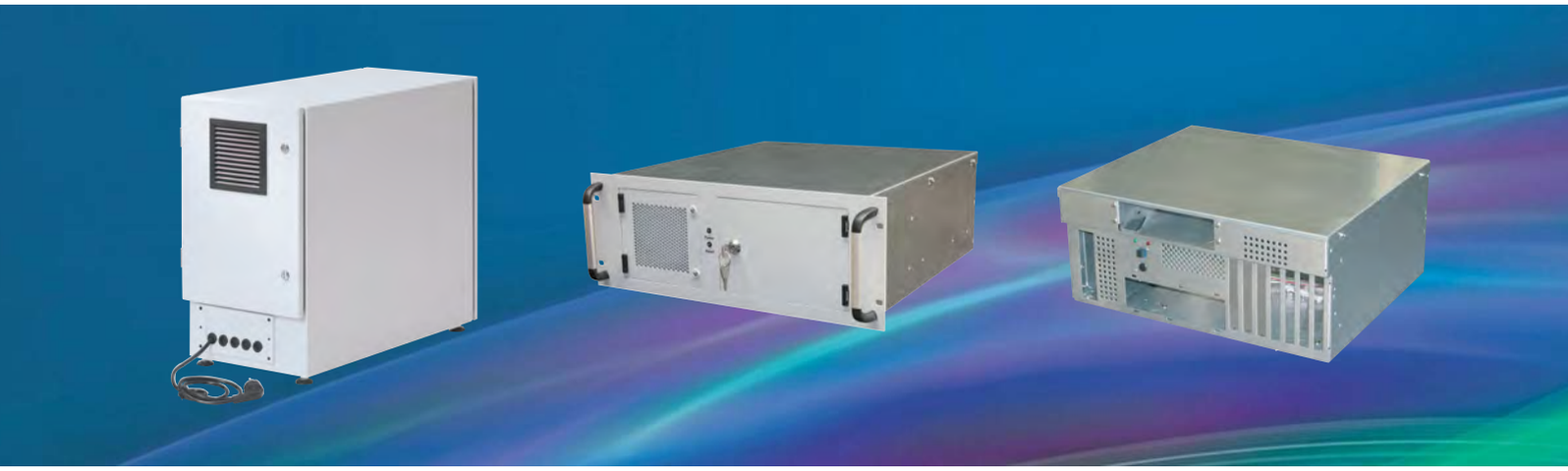
- modern design
- light construction
- stackable
- integrated handle bar
- mounting system with adjustable depth

You can find other cabinet systems and enclosures here:

Enclosures for Industrial PC

... the perfect shell for valuable electronics

Enclosures for Industrial PC



PC protection enclosure

page 54

- protection system IP 54
- applicable as standing or wall mounted enclosure
- up to 5 external cords can be lead without removal of plugs due to separable cable entry
- mounting of 19" plug-in units up to 4 U possible

19" plug-in unit 4U „EVO 2.0"

page 56

- quick mounting/ dismounting of device fixings
- fan my be assembled / disassembled without tooling
- EMC compatible construction
- protection against access for devices and control panel
- high stability
- all ATX form factors

"Hard Box" industrial PC enclosure

page 60

- for ATX applications
- for installing:
  1x 5 ¼" disk drive
  1x 3 ½" floppy drive
  1x 3 ½" hard drive
- cut-out for PS/2 power supply
- 19" installation, wall mounting or mounting on doors or mounting plates possible

Embedded PC enclosure

page 62

- Mini-ITX form factor
- suitable for TQ main boards
- ruggedized embedded PC enclosure
- economic design
- EMC compatible construction
- VESA 100 fixing at bottom

19" keyboard tray, 1 U

page 63

- requires little vertical space
- extractable
- with integrated fold-out mousepad

Industrial PC Enclosure

page 61

- Mini-ITX form factors
- EMC compatible construction
- without fan
- vibration damped hard drive bracket
- 1x PCI-Slot by risercard
- 1x drive bracket for 3 ½"-hard drive

19" keyboard tray, 2 U

page 64

- keyboard plug-in unit with fold-down front panel
- front-mounted, large, extractable mouse rest

www.apra.de

PC protection enclosure

Computer systems are used for controlling in dusty and humid surroundings. The apra PC protection enclosure allows using standard computers within an industrial environment.

- protection system IP 54
- applicable as standing or wall mounted enclosure (with feet or wall fixing - please see accessories)
- up to 5 external cords can be lead without removal of plugs due to separable cable entry (IP 54)
- mounting of 19" plug-in units up to 4 U possible by means of screwable mountings and sliding rails (please see accessories)

Construction:
robust sheet steel design with front and rear door
Material:
sheet steel
Finish:
RAL 7035 light grey
Dimensions (H x W x D):
570 mm x 320 mm x 670 mm
Delivery:
assembled

Other colours on request!

Front view Rear view

Description	Order no.
PC protection enclosure	190-000-10
PC protection enclosure, lockable	190-000-20

www.apra.de

Multiple socket strip 3x

- with connecting cable (l= 3 m)
- incl. assembly material

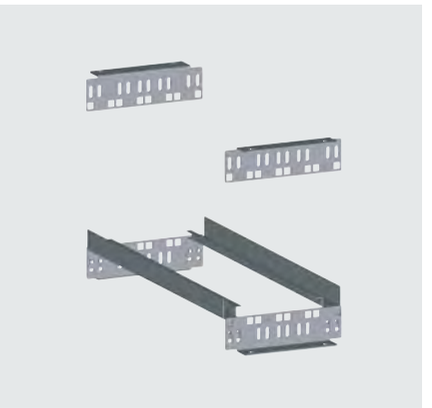
Order no.
190-000-30

Adjusting feet set

- set = 4 pieces
- incl. assembly material

Order no.
190-000-50

Expansion kit for 19" plug-in units

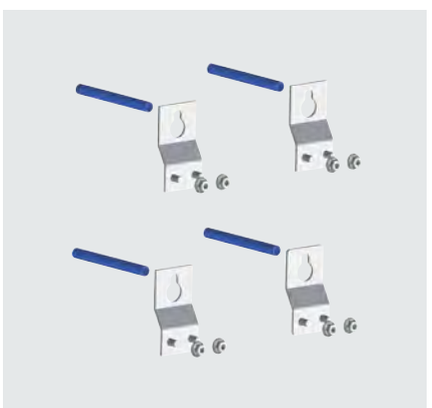


- included in delivery:
  - sliding rails and vertical mountings 4 U
  - mounting material

Material:
sliding rails: sheet steel 1.5 mm
vertical mountings: sheet steel 2.5 mm
Finish: galvanised

Order no.
190-000-60

Wall mounting kit



incl. mounting pin

Material:
sheet steel 2.0 mm

Order no.
190-000-70

Plug & play module

- with integrated, temperature regulated fan unit (temperature range: 0-60° C with thermostat)
- multiple socket 3-fold with overvoltage protection and connecting cable
- incl. mounting material

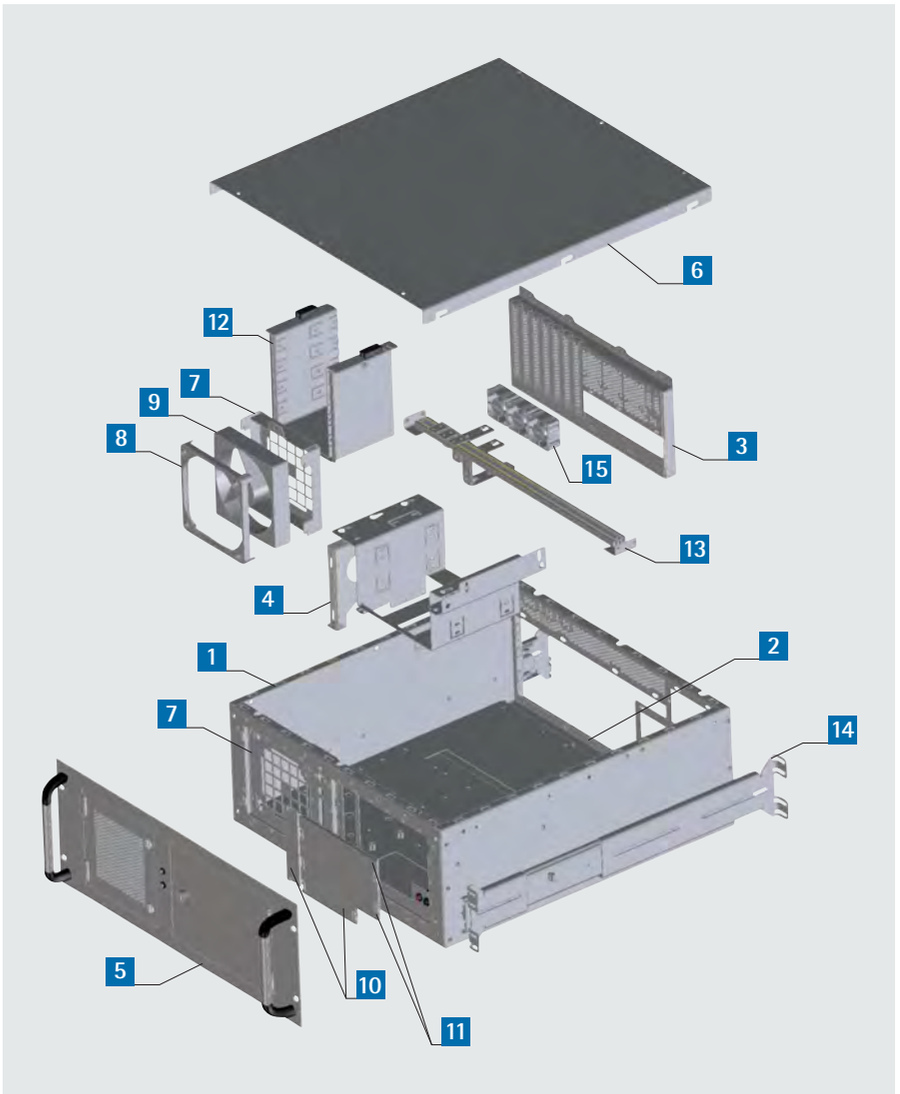
Order no.
190-000-40

19" Computer plug-in unit 4 U „EVO 2.0"

- vibration-cushioned fixing of device
- quick mounting/ dismounting of device fixings
- fan my be assembled / disassembled without tooling
- filter pad can be exchanged from the front
- optimised ventilation
- maximum ventilation capacity
- EMC compatible construction
- protection against access for devices and control panel
- high stability
- all ATX form factors

Application:
suitable for mounting of:
- telescopic rails
- HUB's (card readers, USB connectors,etc.)
- fan by means of a boot or fixing device
- an internal fixing of device (not in connection with an extended ATX mainboard)
- PS/2 or redundant power supply
- 3 additional fans (40 x 40 mm) to the slot insert at the rear panel

Material:
sheet steel 1.0 mm
Finish:
chassis: galvanised
front: RAL 7035 light grey
Dimensions (H x W x D):
177 x 482,6 x 466 mm (without handles)
Delivery:
assembled, in single cardboard box
Standard
19" installation dimensions acc. to IEC 60297-3-100, ATX specification 2.03



Delivery: standard version

Item	Description
1	Chassis
2	Integrated boardchassis
3	Slot inlet
4	Drive holder
5	Front panel
6	Cover plate

Order no.
206-460-00

www.apra.de

Components list of the standard model 206-460-00

1 Chassis

- EMC compatible basic design

2 Board chassis

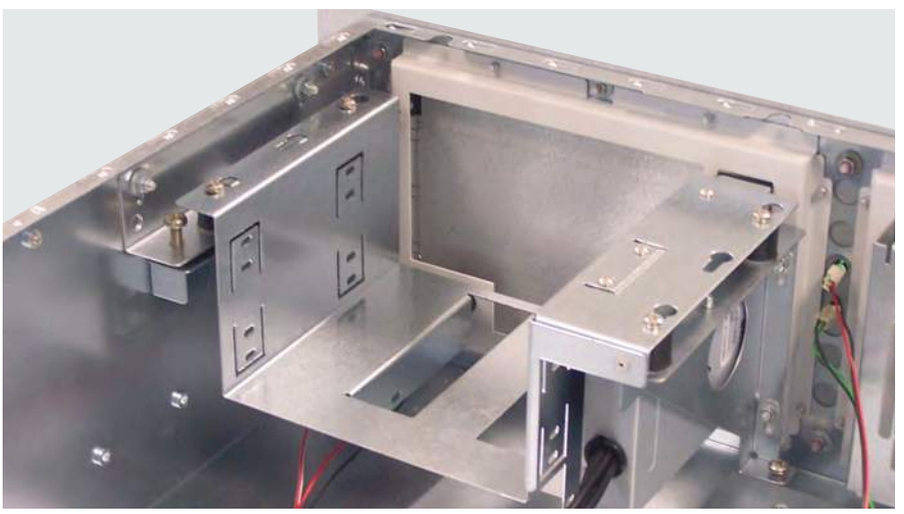
- integrated, to protect the PC board against torsional stress

3 Slot insert

- ATX 7-fold with slot covers and 3 x SUB-D for break out
- optimised ventilation capacity
- 3 fans 40 x 40 mm can be installed

4 Drive slot

- can be assembled externally
- mounting of 2x 5 ¼" and 2x 3 ½" drives
- safe and quick adjustment while mounted



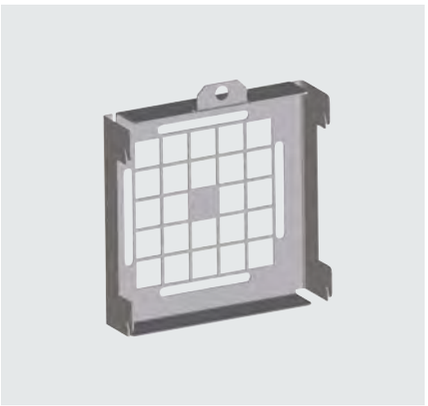
5 Front cover

- incl. fan door, Filter pad and drive-units door
- incl. handles
- incl. - 2 x LED
  - 1 x Reset button
  - 1 x Power button
- lockable doors with rapid fastenings and sash fastener

6 Cover plate

- easy mounting due to "apra-fix" mounting system

7 Fan clamp



- fixing for fans size 119 x 119 x 25 mm
- can be mounted without any tools
- suitable for fan Item 9

Material:
sheet steel 1.0 mm

Finish:
galvanised

Order no.
205-459-11

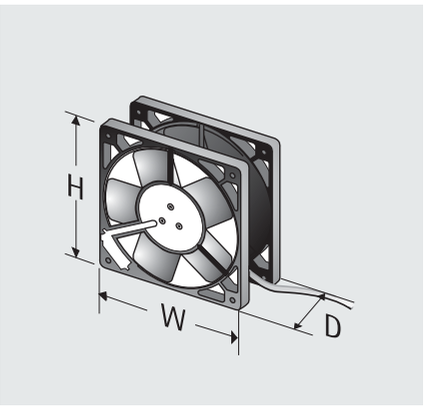
8 Fan boot

- fixing for fans size 119 x 119 x 25 mm
- reduces fan noise
- suitable for fan Item 9

Material:
thermoplastic elastomer

Order no.
206-460-31

9 Fan 12 V 119 x 119 mm



- high-quality **PAPST**-fan
- incl. connector plug for power supply or speed-monitored on the motherboard

Dimensions (H x W x D):
119 x 119 x 25

Description	Air flow rate/ Noise level	Order no.
Connected to power suppy	140 m^3/h / 38 dB(A)	230-815
Connected to motherboard, speed-monitored	94 m^3/h / 26 dB(A)	230-824
Replacement filter mat		671-200-51

10 Blind cover for drive slot 3 ½"

- snap-in from front side
- mounting/ dismounting without tool

Material:
polystyrene PS, flammability tested acc. to UL94-HB

Finish:
similar to RAL 7035 light grey

Order no.
206-460-42

11 Blind cover for drive slot 5 ¼"

- snap-in from front side
- mounting/ dismounting without tool

Material:
polystyrene PS, flammability tested acc. to UL94-HB

Finish:
similar to RAL 7035 light grey

Order no.
206-460-41

12 Internal hard drive cage

- for up to 4 hard drives 3 ½ "
- vibration covered
- fast removing / change of hard drive cage with quick-fastener system

Not suitable for extended ATX Mainboards

Order no.
205-460-16

www.apra.de

13 Card holder set

- steplessly adjustable in height by card fixing brackets
- horizontal regulation of card fixing bracket by threaded strips
- please order card fixing brackets separately (see below)

Material: sheet steel 1.0 mm
Finish: card holder: galvanised
mounting rail: chromated

Description	Order no.
Card holder	206-460-50
Card fixing bracket for card height 100 – 88 mm	206-460-61
Card fixing bracket for card height 88 – 65 mm	206-460-62
Card fixing bracket for card height 64 – 40 mm	206-460-63

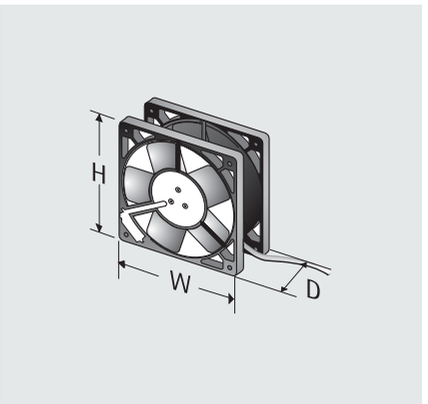
14 Telescopic rails extension set

- patent pending "aprafix" mounting system
- for cabinet depth 600 and 800 mm
- high-class telescopic rails with
  - full extension
  - separable
  - interlocking when extended
- complete with 2 telescopic rails and mounting material

Load capacity:
66 kg per pair

Order no.
680-075-00

15 Fan 12 V 40 x 40 mm



- for speed-monitored connection to motherboard
- dimensions (W x H x D):
  40 x 40 x 25 mm

Order no.
230-865

USB Hub

- 2 x USB 2.0
- 2 x USB 3.0
- suitable for mounting into a 3 ½" drive

Order no.
206-460-45

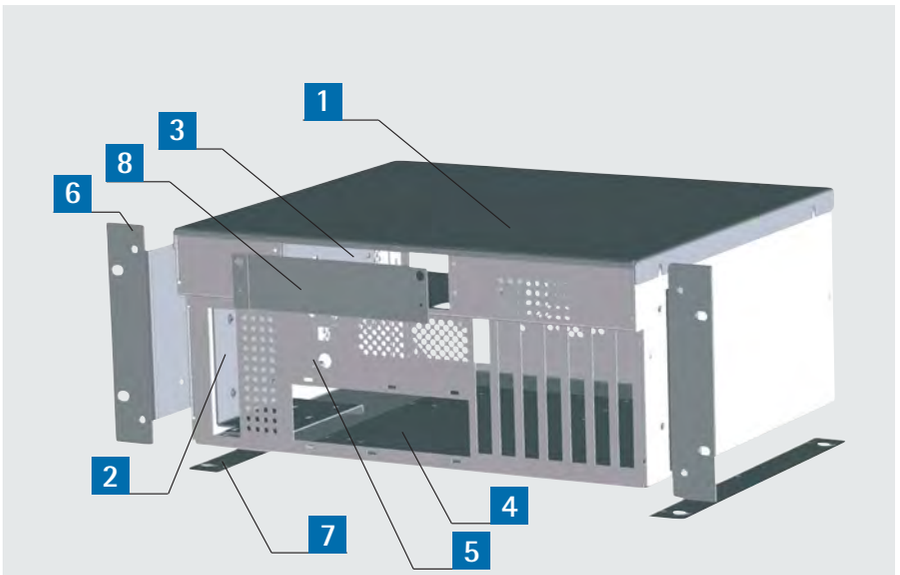
205 • "Hard Box" industrial PC enclosure

www.apra.de

"Hard Box" industrial PC enclosure

- for ATX applications
- for installing:
  1x 5 ¼" disk drive
  1x 3 ½" floppy drive
  1x 3 ½" hard drive
- cut-out for PS/2 power supply
- fans can be installed at the rear
- board chassis for holding the mother-board
- can be customised for your specific applications
- numerous assembly options:
  - 19" installation (optional)
  - wall mounting
  - mounting on doors or mounting plates

Application:
compact, universal IPC enclosure
Construction:
clinched sheet metal design
Material:
sheet steel 1.0 mm
Finish:
galvanised
Dimensions (H x W x D):
177 mm x 405 mm x 362,5 mm
Delivery:
assembled

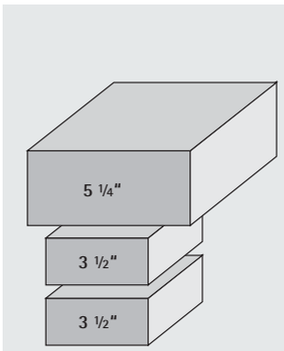


Sample configuration

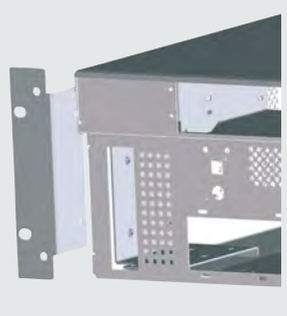
Delivery

Item	Pc.	Description
1	1	Enclosure chassis with top panel
2	1	Drive cage 3 ½"
3	1	Drive cage 5 ¼"
4	1	Board chassis
5	1	Board with LED, reset button and piezo speakers
6		Optional: 19" front brackets (see p. 61, please order separately)
7		Optional: mounting angle (see p. 61, please order separately)
8		Optional: panel for "Hard Box" (see p. 61, please order separately)

Order no.
205-880-00



3 drives may be installed



19" mounting

Wall / bench mounting

"Hard Box" industrial PC enclosure / Industrial PC Enclosure

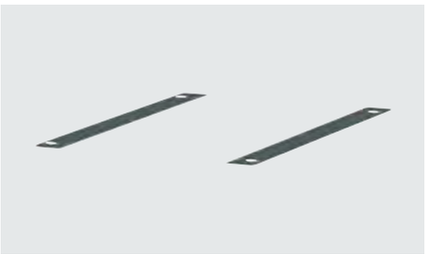
6 19" brackets, 4 U

- incl. assembly material

Material:
sheet steel 2.0 mm
Finish:
galvanised

Order no.
205-880-10

7 Set of mounting brackets

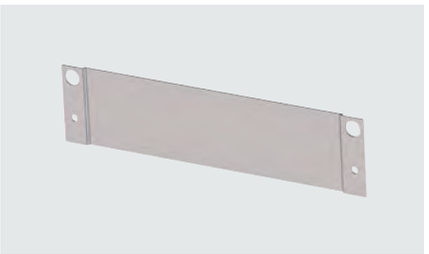


- incl. assembly material

Material:
sheet steel 1.0 mm
Finish:
galvanised

Order no.
205-880-12

8 5 ¼" cover



- for covering the 5 ¼" drive

Material:
cover: sheet steel 1.5 mm
cover EMC: sheet steel 1.0 mm
Finish:
cover: galvanised
cover EMC: RAL 7035 light grey

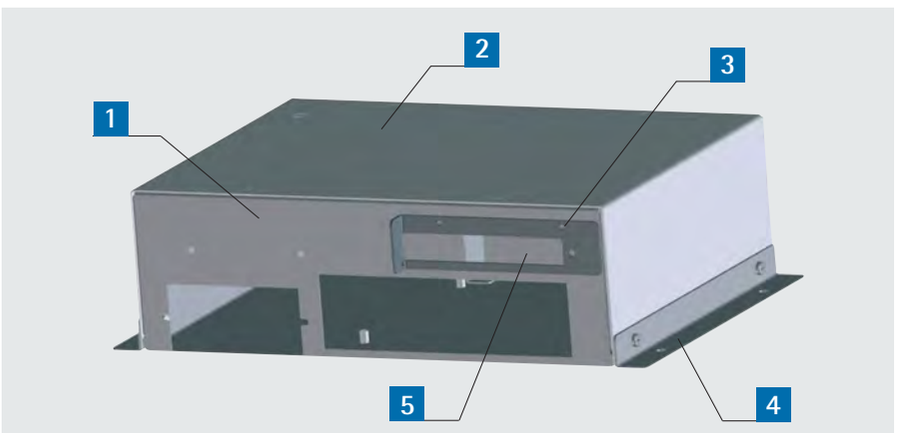
Description	Order no.
Panel for Hard Box	205-880-11
Panel for Hard Box EMC	202-800-26

Industrial PC Enclosure

- Mini-ITX form factors
- EMC compliant construction
- without fan
- vibration damped hard drive bracket
- 1x PCI-Slot by risercard
- 1x drive bracket for 3 ½"-hard drive

Application:
compact, universal IPC enclosure
Material:
sheet steel 1.0 mm
Finish:
RAL 7035 light grey / galvanised
Dimensions (H x W x D):
96 mm x 303 mm x 221 mm
Delivery:
assembled

Other form factors and configuration levels on request.



Order no.
205-820-00

Delivery

Item	Pc.	Description
1	1	Chassis
2	1	Top
3	1	Slot cover
4	2	Wall mounting bracket
5	1	Internal drive holder 3,5"

Embedded PC enclosure

This embedded PC enclosure has been especially designed for scalable platforms, for application in extreme industrial environments or directly use at machinery. Direct connection of the enclosure to the cooling elements of the board is possible by connecting the board mechanically to the top cover.

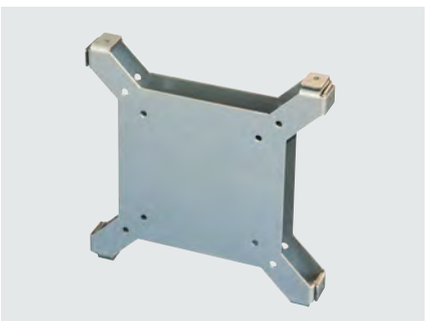
- Mini-ITX form factor
- suitable for TQ main boards
- ruggedized embedded PC enclosure
- economic design
- EMC compatible construction
- VESA 100 fixing at bottom
- customised adaption possible

Material:
enclosure: aluminium
front panel, rear panel: plastics
Finish:
enclosure: powder coated RAL 7035 light grey or RAL 9005 deep black
front panel, rear panel: black or RAL 7035 light grey
Dimensions (H x W x D):
61,5 mm x 203 mm x 213 mm
Delivery:
unmounted, mounting material included

Further types on request please ask us!

Description	Colour	Order no.
not ventilated	RAL 7035 / black	205-400-00
ventilated	RAL 7035 / black	205-400-20
not ventilated	RAL 9005 / RAL 7035	205-400-30

VESA fixing



Material:
sheet steel 1.5 mm
Finish:
galvanised
Delivery:
unmounted, mounting material included

Order no.
205-400-07

Top hat rail fixing

Material:
holder: sheet steel 1.5 mm
top hat rail bracket: aluminium
Finish:
holder: galvanised
top hat rail bracket: anodised
Delivery:
unmounted, mounting material included

Order no.
205-400-08

Wall holder

Material:
sheet steel 1.5 mm
Finish:
RAL 7035 light grey
Delivery:
unmounted, mounting material included

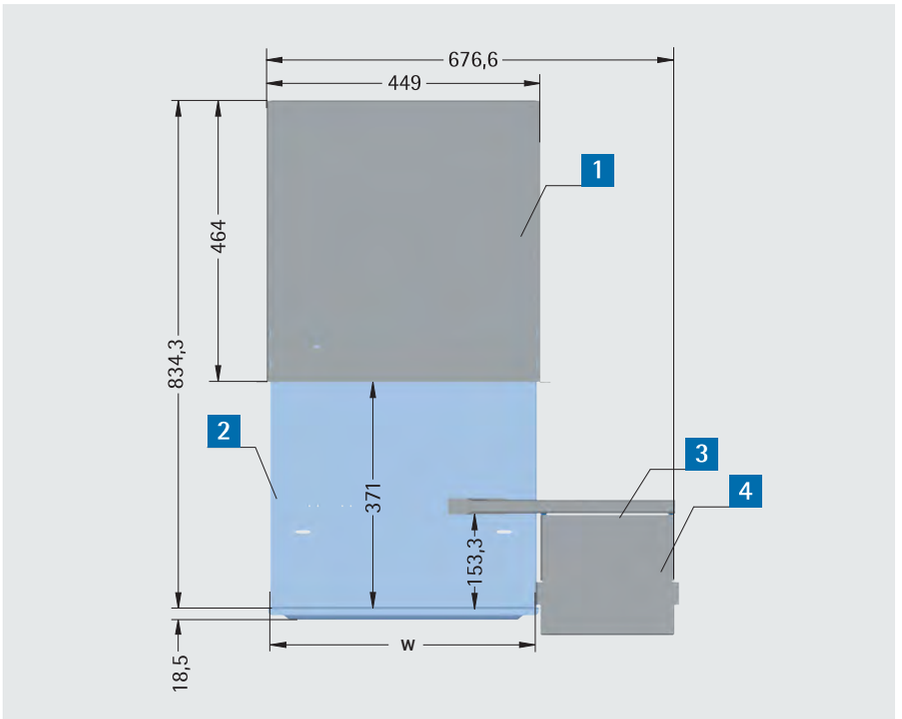
Order no.
205-400-26

www.apra.de

19" keyboard tray, 1 U

- requires little vertical space
- extractable
- with integrated fold-out mousepad
- mouse pad can be installed on the right or left
- for keyboards up to 433 mm wide and 36 mm high

Application:
input console in 19" cabinets or control panels
Material:
sheet steel
Finish:
RAL 7035 light grey
Dimensions (H x W x D):
44 mm x 482.6 mm x 470 mm
Delivery:
assembled



Top view

- Mouse and keyboard not included in delivery.
- Maximum keyboard/mouse height is 36 mm.
- We recommend installing tray on guide rails.

Delivery

Item	Pc.	Description
1	1	Chassis
2	1	Drawer
3	1	Mouse support
4	1	Mouse pad
5		Assembly material
6	(1)	Keyboard (optional)

Description	Order no.
Plug-in unit without keyboard	202-870-50
Plug-in unit with German keyboard, QWERTZ-type	202-870-00
Keyboard, German, QWERTZ-type	202-870-09

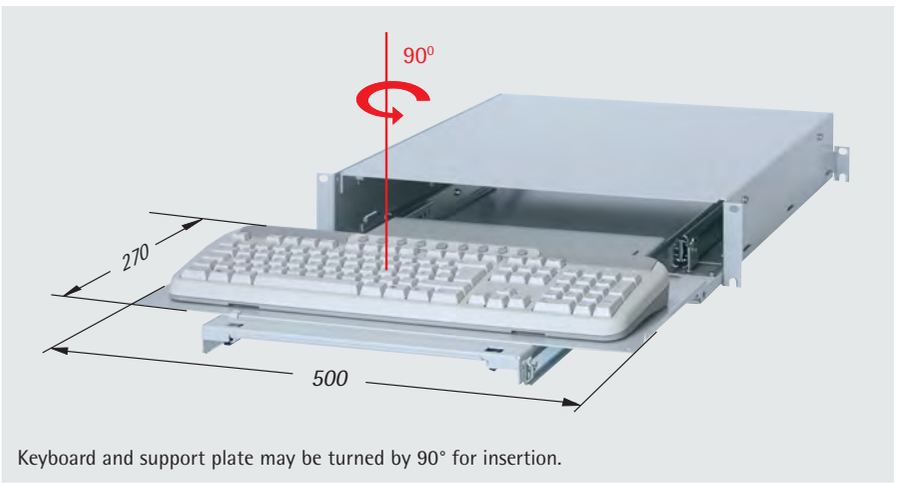
202 • 19" keyboard tray, 2 U

www.apra.de

19" keyboard tray, 2 U

- keyboard plug-in unit with fold-down front panel
- accommodates all standard keyboards
- existing keyboards can be integrated in to the 19" rack, even if they are not 19"-compatible
- front-mounted, large, extractable mouse rest
- mounting on front and rear 19" level, whereby the clearance to the front/rear level can be individually adjusted from 445 mm up to 845 mm.

Application:
input console in 19" cabinets or control panels
Material:
sheet steel
Finish:
RAL 7035 light grey
Dimensions (H x W x D):
2 U (88 mm) x 19" (482.6 mm) x 550 mm
Delivery:
assembled



Keyboard and support plate may be turned by 90° for insertion.

- Keyboard not included in delivery
- The maximum height of the keyboard/mouse is 36 mm

Delivery

Pc.	Description
1	Chassis top cover
1	Drawer
1	Keyboard support plate, rotat.
1	Mouse rest
2	Telescopic rails
1	Front panel
	Mounting material

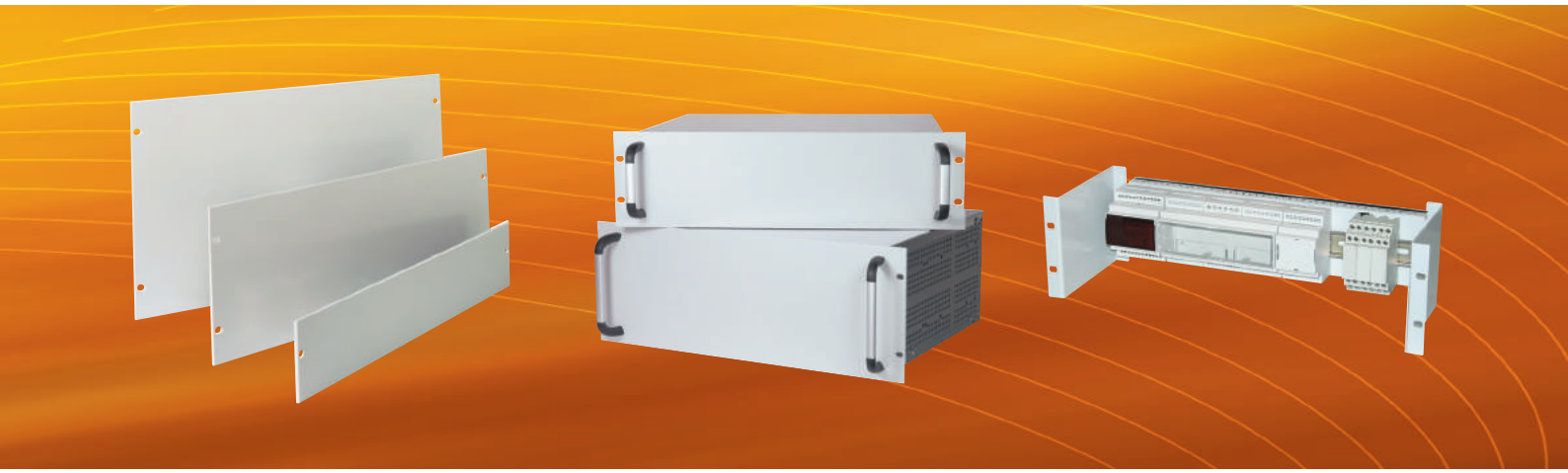
Description	Order no.
19" keyboard tray 2 U	202-868-30

19" plug-in units

apra gruppe

... the perfect shell for valuable electronics

19" plug-in units



19" front panels

page 67

- natural colour anodised or painted
- ventilated / not ventilated
- available from 1 U up to 9 U
- customised treatment like screen print, digital print, milling, front foils, embossing, punched or lasered hole patterns available on request
- acc. to IEC 60297-3-100

19" universal plug-in unit

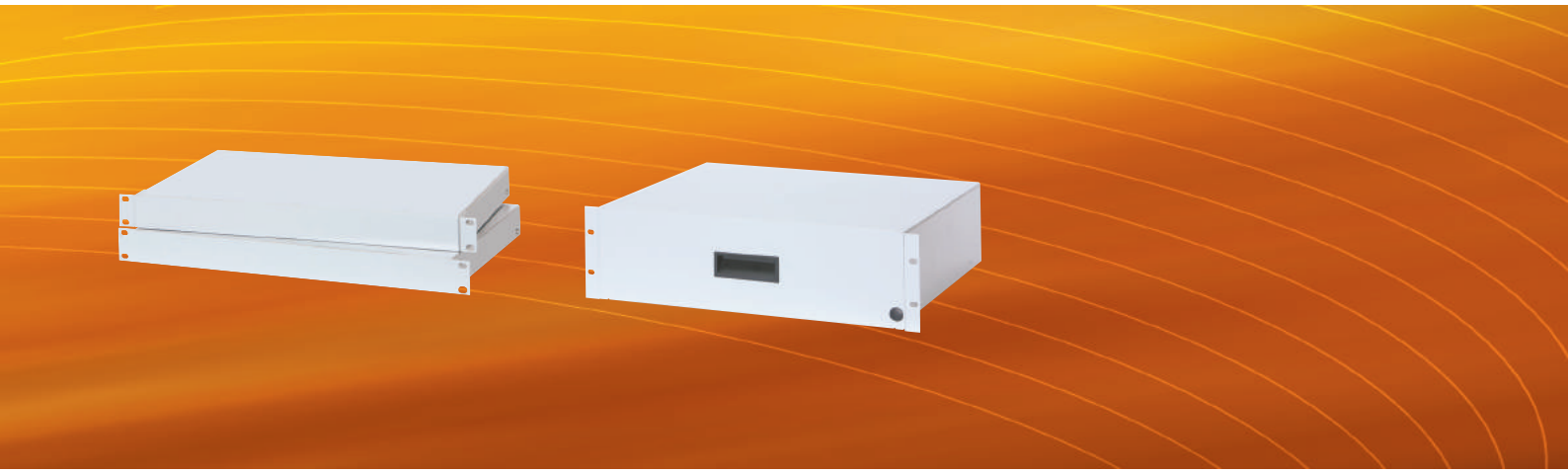
page 69

- available from 2 U up to 6 U
- suitable for telescoping rails
- customised configuration
- customised front panel treatment with with free front panel download
- acc. to IEC 60297-3-100

19" top hat rail support

page 75

- for a recessed mounting of top hat rail enclosures at 19" levels of cabinets, racks or enclosures
- standard fitted with top hat rail TS 35 (width 425 mm)
- perfect to mount our top hat rail enclosures apraRail



19" flat module, 1-3 U

page 76

- 2 versions and 3 heights available
- economic sheet metal design
- sturdy construction
- customised treatment possible
- EMC-compliant basic construction
- design cover panels available on request
- acc. to IEC 60297-3-100

19" drawers

page 78

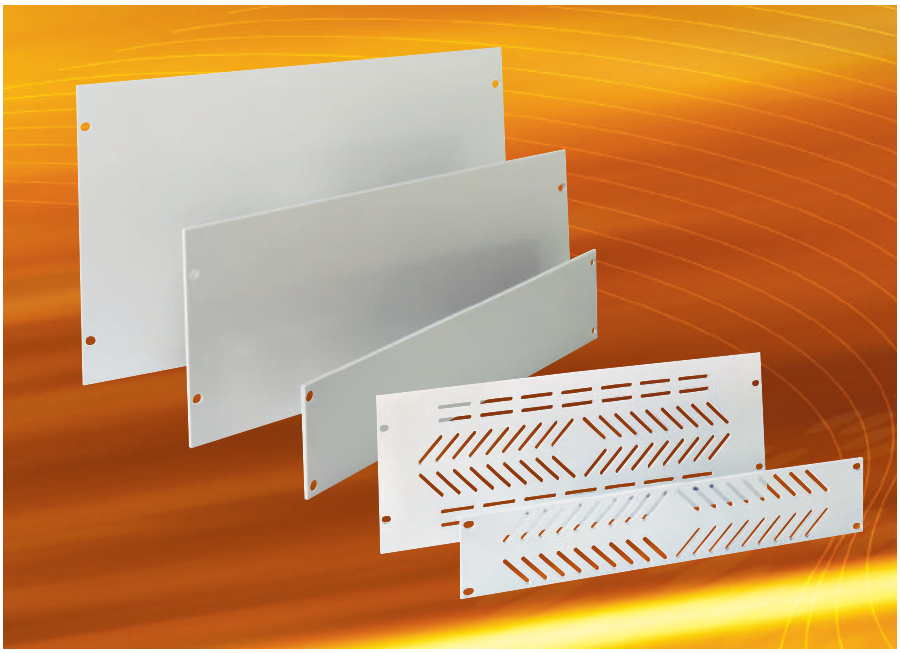
- available as 1 U, 2 U and 3 U
- extractable
- optionally available with lock
- acc. to IEC 60297-3-100

www.apra.de

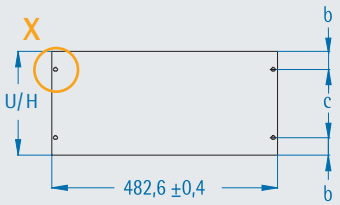
19" front panels

- without holes for handles
- fit all 19" cabinets and enclosures
- with standardised mounting holes

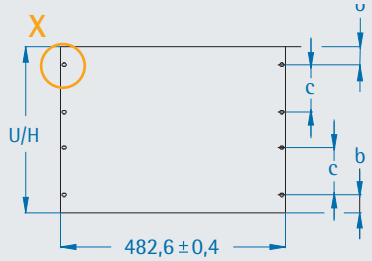
Material:
aluminium 2.5mm or 4mm (AlMg1)
Finish:
painted RAL 7035 light grey or
natural colour anodised*
Standard:
acc. to IEC 60297-3-100



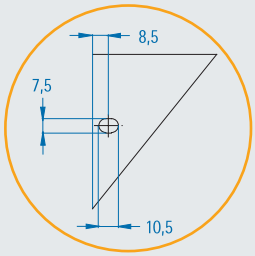
Customised blanking plates with printing, stamping and embossing available on request



Dimensions mounting height 1-6 U



Dimensions mounting height 7-9 U



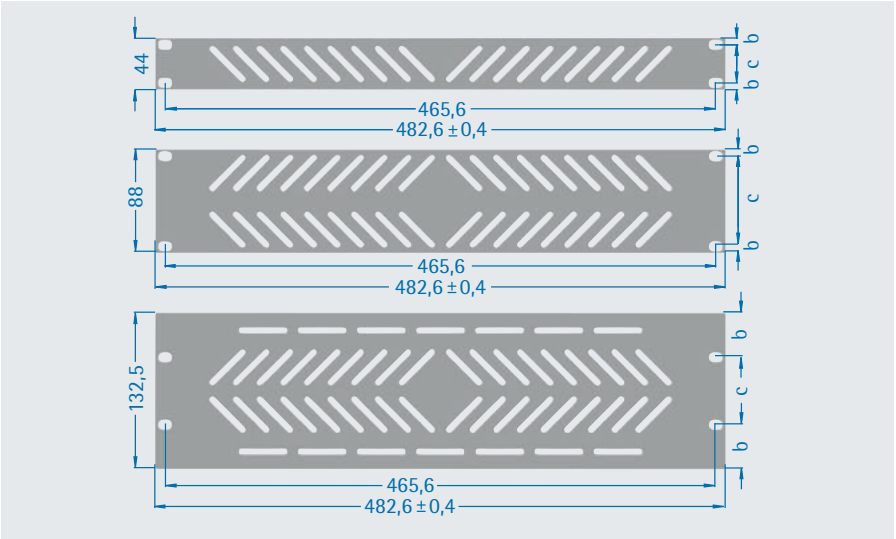
Detail X

Material				AlMg1 - EQ; 2,5 mm	AlMg1 - EQ; 4 mm	
Edges				cut edges	cut edges	milled edges
Finish				natural colour anodised*	painted RAL 7035 light grey	natural colour anodised*
Installation height U	Installation height H mm	b mm	c mm	Order no.	Order no.	Order no.
1	44	5,90	32,2	-	200-021-20	200-201
2	88	5,90	76,2	200-122	200-022-20	200-202
3	132,5	37,75	57	200-123	200-023-20	200-203
4	177	37,75	101,5	200-124	200-024-20	200-204
5	221,5	37,75	146	200-125	200-025-20	200-205
6	266	37,75	190,5	200-126	200-026-20	200-206
7	310,5	37,75	88,9	-	200-027-20	200-207
8	354,5	37,75	101,6	-	200-028-20	200-208
9	399	37,75	101,6	-	200-029-20	200-209

* Due to the material used, anodised front panels may be slightly different in colour. This variation is permitted within existing resource standards. Fissures at the anodised coating may occur.

19" ventilating front panels

Material:
aluminium 2.5mm or 4mm (AlMg 1)
Finish:
natural colour anodised*
Standard
acc. to IEC 60297-3-100



Installation height U	b mm	c	Material	Order no.
1	5,90	32,20	aluminium 2,5 mm	200-141
2	5,90	76,20		200-142
3	37,75	57,00		200-143
1	5,90	32,20	aluminium 4 mm	200-151
2	37,75	76,20		200-152
3	37,75	57,00		200-153

Customised hole patterns on request!

* Due to the material used, anodised front panels may be slightly different in colour. This variation is permitted within existing resource standards. Fissures at the anodised coating may occur.

19" blindpanel 1 U

- air separation function: cost-saving and very effective option for reducing energy costs in data centres
- visual upgrade of the rack by concealing free 19" surfaces
- stylish design due to rounded front surface of the panel
- short assembly time: the blind panel is easily clipped into the 19" grid without tools
- can be removed and reinserted at any time without wear and tear and without tools
- protection against dust entry
- fire protection classification to UL94 V-0
- weigth-saving in comparison to traditional metal panels

RAL 7016 anthracite grey RAL 7035 light grey

Material:
Lexan 920, listed acc. to UL 94 V-0, RoHS-conform
Finish:
RAL 7016 anthracite grey or
RAL 7035 light grey
Delivery:
set = 10 pieces
set = 136 pieces

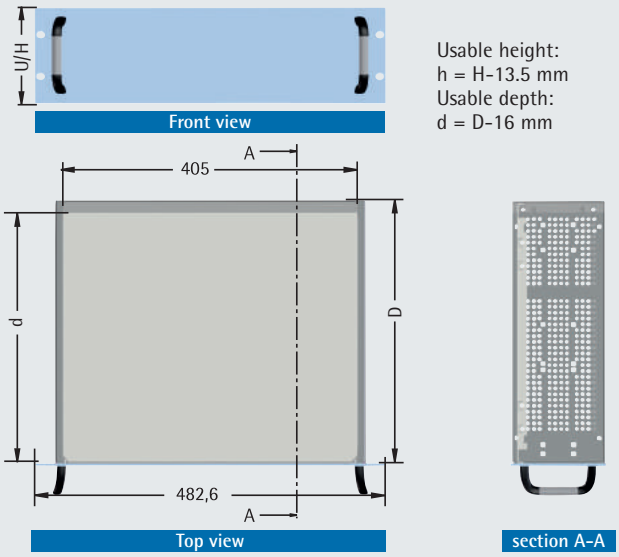
Colour	Delivery	Order no.
RAL 7016	Set = 10 pieces	213-156-25
RAL 7035		213-156-30
RAL 7016	Set = 136 pieces	213-156-40
RAL 7035		213-156-45

www.apra.de

19" universal plug-in unit

- suitable for telescoping rails
- multiple dimensions
- can be customised to your needs
- sturdy construction
- variable construction due to perforated grind in side panels
- 19" installation dimensions acc. to IEC 60297-3-100
- standard versions or customised versions available
- IP 20
- max. load capacity on sliding rails: 50 kg

Application:
all-purpose, sturdy plug-in unit
Material:
front panel: aluminium 4 mm
side panel/chassis: sheet steel 1.5 mm
cover panel: sheet steel 1,0 mm
Finish:
front panel: RAL 7035 light grey
enclosure parts: galvanised
Delivery:
not assembled



Installation height H mm	Installation height U	D mm	Order no.
88	2	260	205-526-20
		360	205-536-20
		460	205-546-20
132	3	260	205-526-30
		360	205-536-30
		460	205-546-30
177	4	260	205-526-40
		360	205-536-40
		460	205-546-40
222	5	260	205-526-50
		360	205-536-50
		460	205-546-50
266	6	260	205-526-60
		360	205-536-60
		460	205-546-60

Delivery

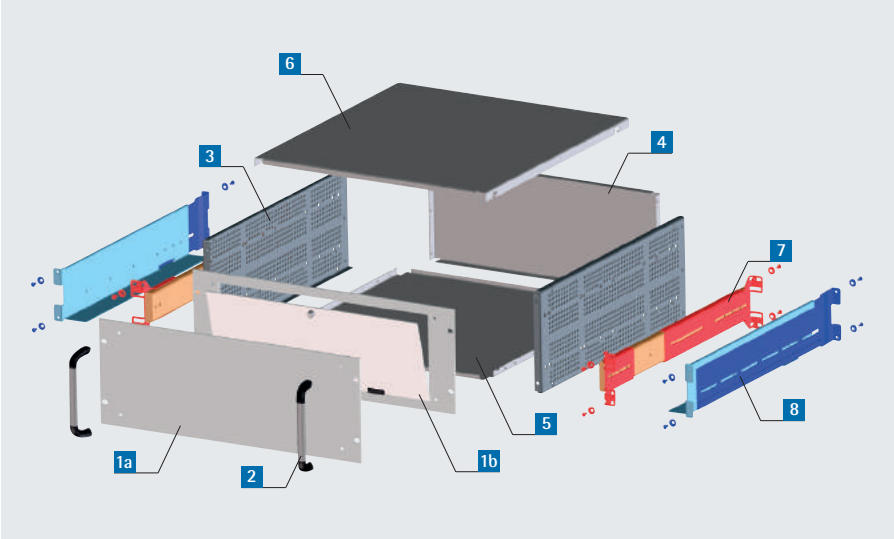
Item	Pc.	Description
1	1	Front panel, 4mm
2	2	Handles
3	2	Side panel
4	1	Rear panel
5	1	Chassis plate
6	1	Top panel, not vetilated
		Assembly material

Components

Design your own customised universal plug-in unit.

Available components

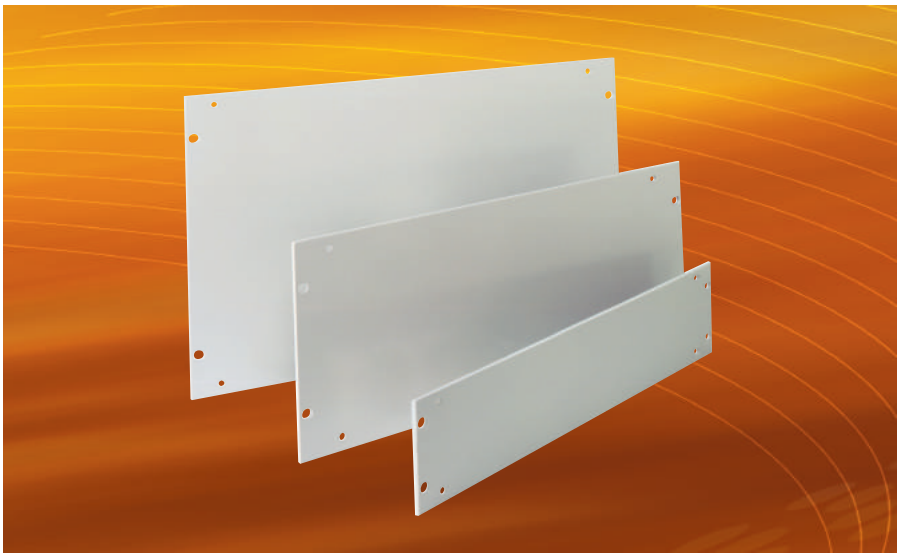
Item	Description
1a	Front panel
1b	Front panel, hinged
2	Handles
3	Side panel
4	Rear panel
5	Bottom cover
6	Top cover
7	Telescopic rail set
8	Set of sliding rails, depth-adjustable

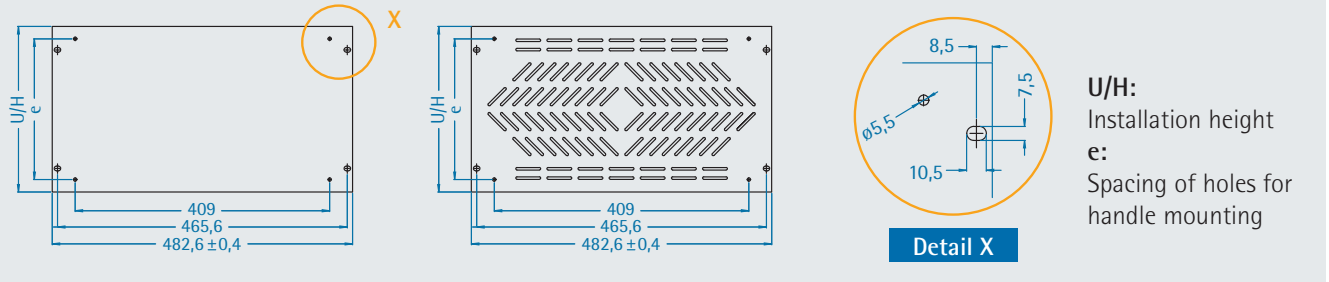


1a Front panel

- with standardised mounting holes
- with holes for mounting handles and plug-in unit side walls
- customised front panels with printing, stamping and embossing available on request
- internet front panel service: www.apra.de
- 19" installation dimensions acc. to IEC 60297-3-100

Material:
aluminium 2.5 mm resp. 4 mm (AlMg1)
Finish: RAL 7035 light grey, rear conductive
Edges: cut edges





U/H:
Installation height
e:
Spacing of holes for handle mounting

Material			AlMg1 - EQ; 2,5 mm		AlMg1 - EQ; 4 mm
Ventilation			ventilated	not ventilated	not ventilated
Installation height U	Installation height H mm	Spacing of holes e mm	Order no.	Order no.	Order no.
2	88	72	205-002-52	205-002-42	205-000-42
3	132,5	92,5	205-002-53	205-002-43	205-000-43
4	177	137	205-002-54	205-002-44	205-000-44
5	221,5	181,5	205-002-55	205-002-45	205-000-45
6	266	226	205-002-56	205-002-46	205-000-46

www.apra.de

1b Fold-up front panel

- with fastener
- with holes for handle mounting

Material:
frame: sheet steel 3.0 mm
front panel: sheet steel 2.5 mm
Finish:
RAL 7035 light grey

Installation height U	Installation height H mm	Spacing of holes e	Order no.
3	132,5	92	205-002-73
4	177	137	205-002-74
5	221,5	182	205-002-75
6	266	226	205-002-76

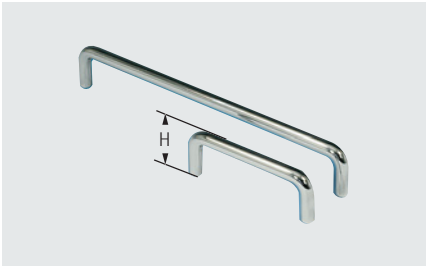
apra handle

Height H = 40 mm

Material:
head parts: plastic, black
middle part: aluminium extrusion, anodised

U	Spacing of holes e	Order no.
2	72 mm	611-302-00
3	92 mm	611-303-00
4	137 mm	611-304-00
5	182 mm	611-305-00
6	226 mm	611-306-00

Bow-type handle



Height H = 38 mm

Material:
steel, chrome plated

U	Spacing of holes e	Order no.
2	72 mm	610-002
3	92 mm	610-003
4	137 mm	610-004
5	182 mm	610-005
6	226 mm	610-006

Oval head screws M 5 x 12

- for apra handle and bow-type handle
- Set = 100 pieces

Front panel	Size	Order no.
d = 2,5 mm	M 5 x 12	630-097
d = 4 mm	M 5 x 16	630-098

Decorative washers

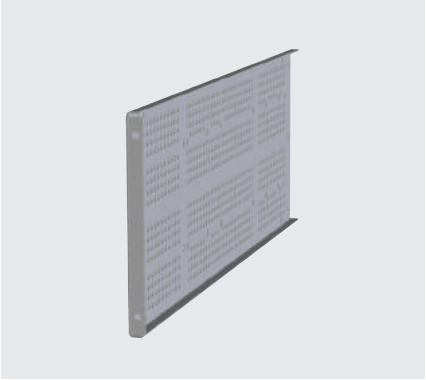
- for bow-type handle only
- Set = 100 pieces

chromated	black
610-092	610-094

3 Side panel

- with mounting grid for various assembly possibilities, for example chassis panel

Material:
sheet steel 1.5 mm
Finish:
zinc-coated

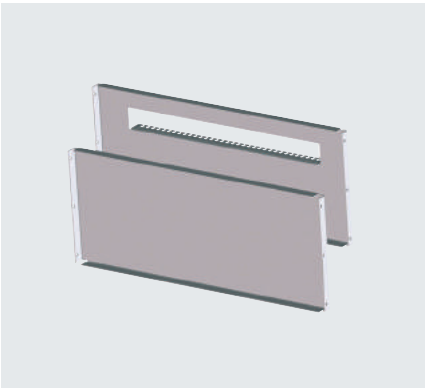


Install. height U	D mm	Order no.
2	260	205-526-22
3		205-526-32
4		205-526-42
5		205-526-52
6		205-526-62
2	360	205-536-22
3		205-536-32
4		205-536-42
5		205-536-52
6		205-536-62
2	460	205-546-22
3		205-546-32
4		205-546-42
5		205-546-52
6		205-546-62
2	560	205-556-22
3		205-556-32
4		205-556-42
5		205-556-52
6		205-556-62

4 Rear panel

- can also be installed horizontally as a shelf
- available: closed or with cable clamping
- can be customised to your needs

Material:
sheet steel 1.5 mm
Finish:
zinc-coated

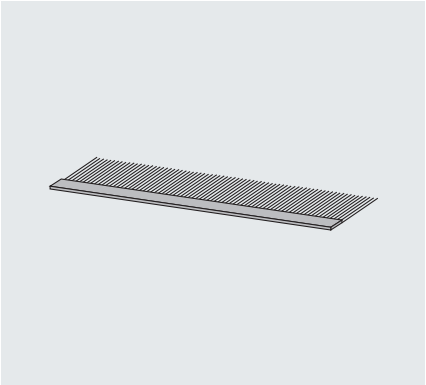


Install. height U	Feature	Order no.
2	closed	205-056-02
3		205-056-03
4		205-056-04
5		205-056-05
6		205-056-06
4	with cable clamping	205-056-14
6		205-056-16

Brush seal

- suitable for rear panel with cable clamping [4]

Material:
PA 6, black

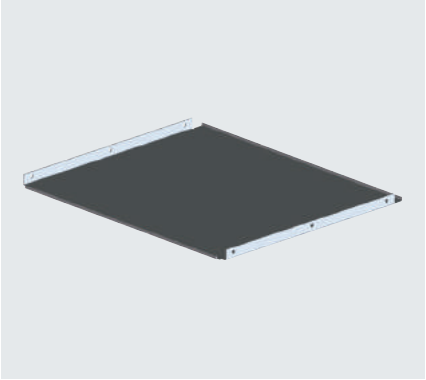


Order no.
671-040-10

5 Chassis plate

- can be installed at different heights
- can be customised to your needs
- assembly material included

Material:
sheet steel 1.5 mm
Finish:
zinc-coated

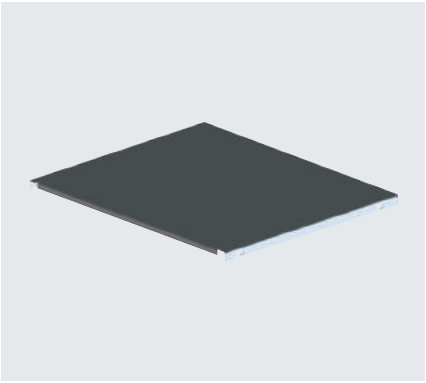


D mm	Feature	Order no.
260	ventilated	205-526-35
360		205-536-35
460		205-546-35
560		205-556-35
260	not ventilated	205-526-33
360		205-536-33
460		205-546-33
560		205-556-33

6 Cover plate

- ventilated/not ventilated

Material:
sheet steel 1.0 mm
Finish:
zinc-coated



D mm	Feature	Order no.
260	ventilated	205-526-36
360		205-536-36
460		205-546-36
560		205-556-36
260	not ventilated	205-526-34
360		205-536-34
460		205-546-34
560		205-556-34

Screw set "Uni 205"

- includes all screws necessary for assembling an entire universal plug-in unit

Delivery

Pc.	Description
4	Oval-head screw M 5 x 12
4	Oval-head screw M 5 x 16
14	Oval-head screw M 4 x 8

Order no.
630-405

7 Telescopic rail set

- with aprafix assembly system
- high-quality telescopic rails
- ideal for installation in 600 to 800mm-deep cabinets with rear 19" mounting
- includes 2 telescopic rails and assembly material
- can be locked when pulled out
- detachable

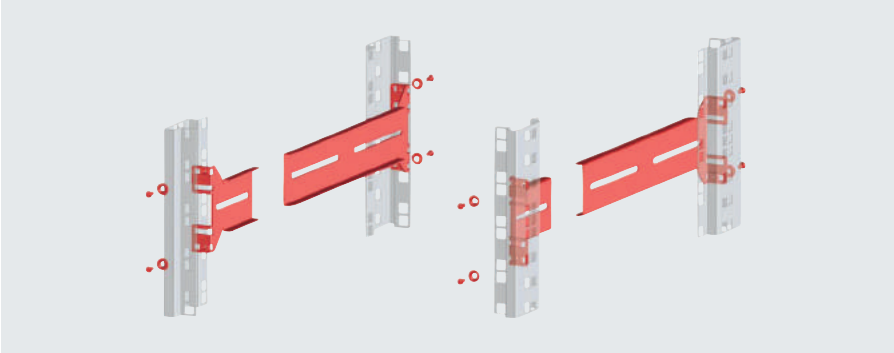
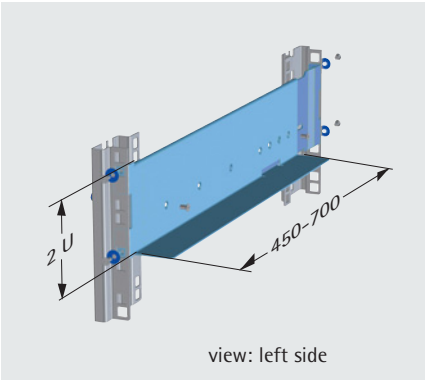


Fig. without telescopic rails

D mm	Description	Feature	Load capacity	Order no.
260	Type 0204	Partial extension (cost-effective)	51-59 kg	680-077-00
360	Type 0204			680-077-00
460	Type 0204			680-078-00
560	Type 0204			680-079-00
260	Type 3307	100% extension **(not suitable for 2 U 19" plug-in units)**	64-66 kg	680-075-00
360	Type 3307			680-075-00
460	Type 3307			680-075-00
560	Type 3307			680-076-00

www.apra.de

8 Sliding rail set, depth-adjustable



view: left side

- with patented 19" assembly system aprafix
- ideal for installation in 600 mm to 800 mm deep cabinets
- including assembly material
- pulls out from 450 mm to 700 mm

Material:
sheet steel 1.5 mm
Finish:
zinc-coated
Load capacity:
60 kg

This sliding rail cannot be used for 2U plug-in units! Use is only possible for 3U or bigger!

Order no.
205-200-00

M5 screw set (50-fold)

- required for installing 19" components in cabinets or enclosures
- 50 screws, M5 x 12
- 50 captive nuts, M4-8
- 50 rosettes for screw M5, flattened

Order no.
630-991

Front panel fixing (50-fold)

- no cage nuts required
- to mount lightweight 19" components such as dummy or front panels
- clamping range (front panel + grid): 4 – 6 mm
- consisting of:
  - 50 lens head screws M 5 x 12
  - 50 washers for screws M 5, flattened

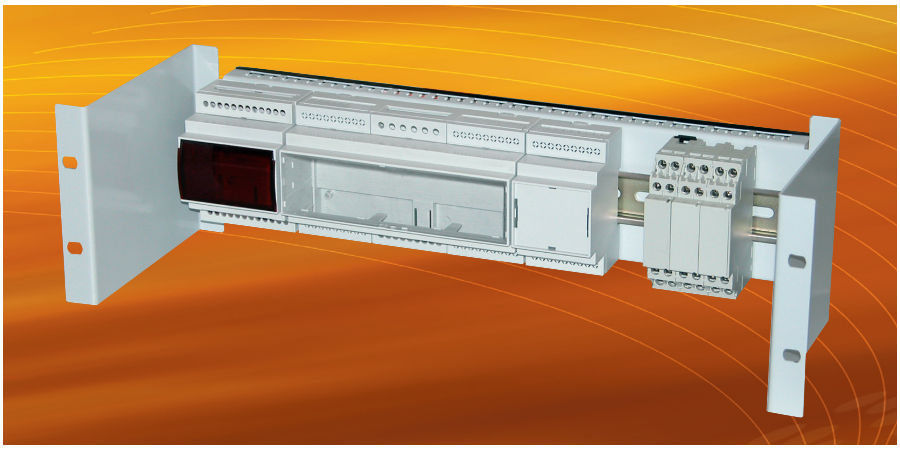
Order no.
630-991-10

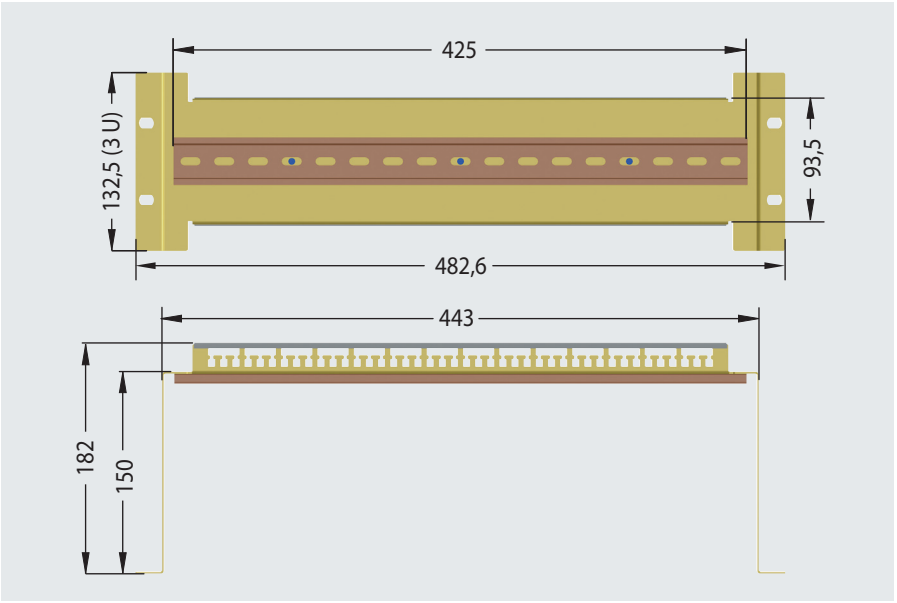
www.apra.de

19“ top hat rail support 3 U

- for a recessed mounting of top hat rail enclosures at 19“ levels of cabinets, racks or enclosures
- standard fitted with top hat rail TS 35 (width 425 mm)
- perfect to mount our top hat rail enclosures apraRail
- integrated cable guarding and strain-relief by cable clip bar

Material:
sheet steel 1.5 mm
Finish:
galvanised or
RAL 7035 light grey/
RAL 9005 deep black
Delivery:
not assembled, with mounting material

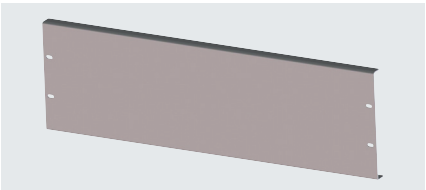




Finish	Order no.
galvanised	205-420-00
RAL 7035	205-420-10
RAL 9005	205-420-40

Other top hat rail types, installation widths, heights or depths available on request!

Cover (protection against contact)



for 19" top hat rail support 3 U

Finish	Order no.
galvanised	205-420-20
RAL 7035	205-420-25
RAL 9005	205-420-41

ETSI on 19 " adapter plate	
galvanised	**RAL 7035**
213-900-94	-

DIN rail fixling clamp (set)

- quick, safe and sturdy fixing of small enclosures, pc boards and components to rails and support rails (TS35)
- can be easily fixed from inside or outside to the rear panel

Material: PA6 GF 30, black, flammability rating acc. to UL 94 V-0

Description	Order no. (1 Set = 10 pieces)
45 mm wide with through-bore hole	442-311-20
45 mm wide with threaded inserts	442-311-25
18 mm wide with through-bore hole	442-311-30
18 mm wide with threaded inserts	442-311-35

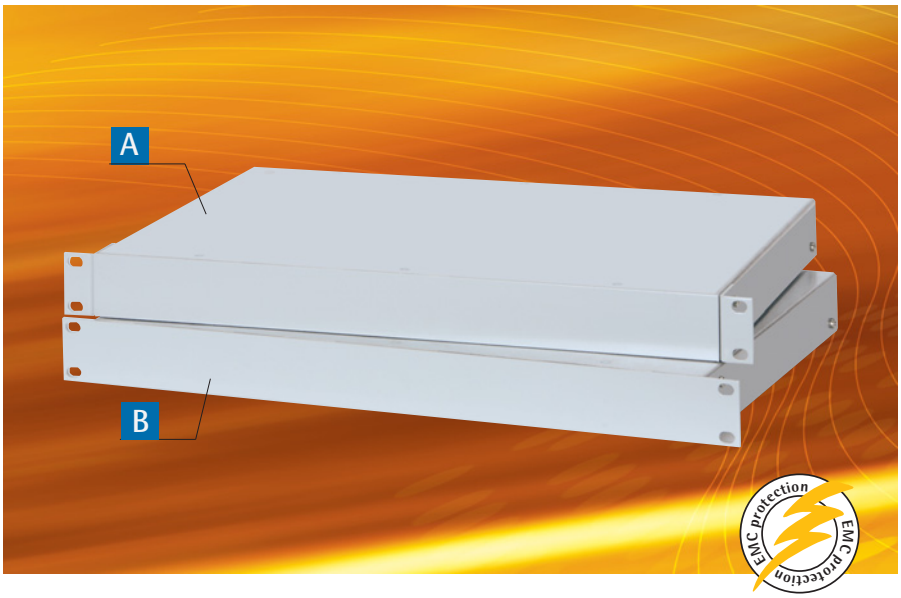
19" flat module, 1-3 U

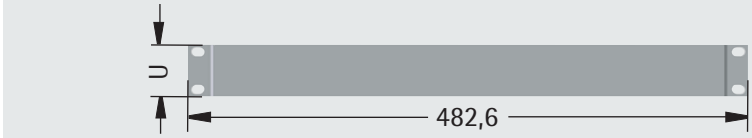
- EMC-compatible basic construction
- economic sheet metal design
- sturdy construction
- customised treatment possible
- design panels on request
- 19" installation dimensions acc. to IEC 60297-3-100
- 2 versions and 3 heights available

This 19" flat module features high rigidity, modularity, large internal dimensions as well as a cost-efficient sheet metal design. The modules may be versatilely used in the fields of telecommunication, networking, industry or audio and video. Its excellent EMC compatible basic construction allows for a reliable EMC shielding of more than 50 dB in the range of 40 to 900 MHz.
Another important feature is the user-friendly easy to install locking top cover.

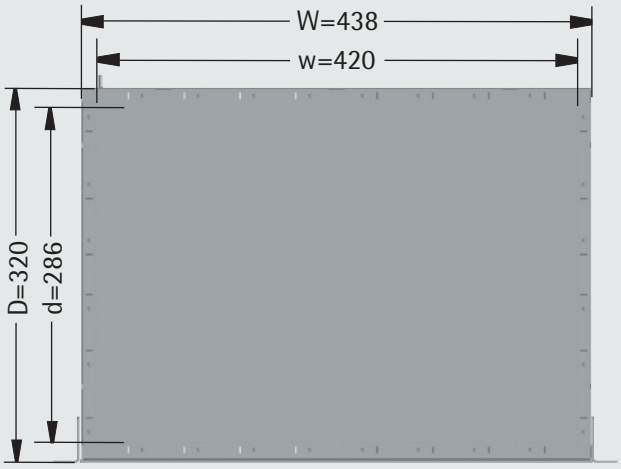
On request the flat modules may be retrofitted with design cover panels from metal, plastics or even from wood.
Of course, individual machining like silk screening, digital printing, cut-outs, foil keypads, plexiglas inserts, etc. are possible.

Application:
universal use in tight spaces in telecommunications, network technology, broadcast and more
Material:
front panel: aluminium 3.0 mm
chassis/top panel: sheet steel 1.0 mm
Finish:
top panel/front panel/bracket (optional): RAL 7035 light grey
chassis: zinc-coated
Delivery:
not assembled





Front view



Top view

Delivery

Item	Pc.	Description
1	1	Enclosure chassis
2	1	Enclosure cover
3	1	Front panel
4	(2)	Front brackets (only type A)
5		Assembly material

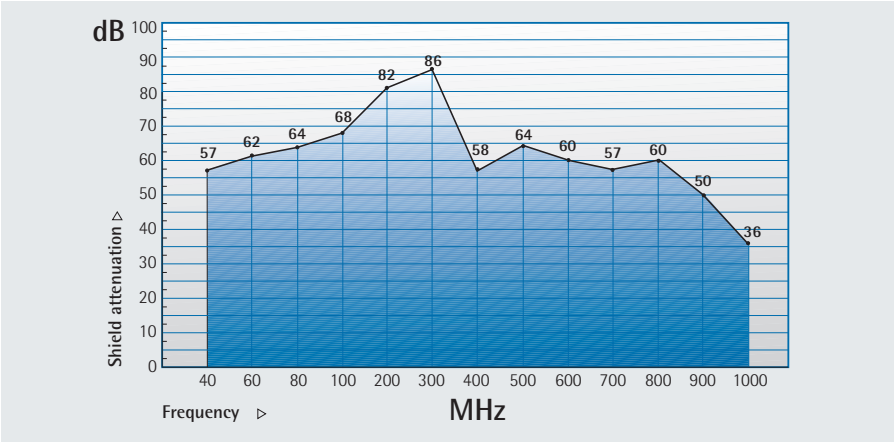
U	D mm	Description	Order no.
1	320	Type A: with removable 19" front brackets	269-201-00
		Type B: with continuous 19" front panel	269-201-10
2		Type A: with removable 19" front brackets	269-202-00
		Type B: with continuous 19" front panel	269-202-10
3		Type A: with removable 19" front brackets	269-203-00
		Type B: with continuous 19" front panel	269-203-10

www.apra.de

Shielding effectiveness

Average values, calculated from measurement results of an indipendent institution.

Testing specifications:
The shielding effectiveness of the empty plug-in unit was measured according to VG 95373 part 15 in a frequency range of 40 to 1000 MHz.



Customised 19" plug-in systems

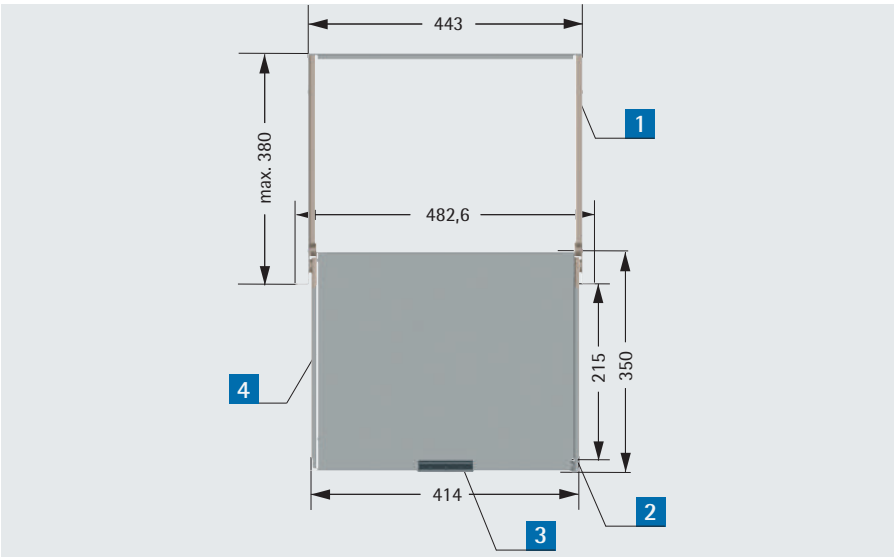
19" flat modules 1 U

- for use as tuner or effects unit for music purposes

19" drawers

- extractable
- optionally available with lock
- 19" installation dimensions acc. to IEC 60297-3-100

Application:
for secure storage of documents in 19" cabinets or enclosures
Material:
frame: sheet steel 1.5 mm
drawer: sheet steel 1.0 mm
Finish:
RAL 7035 light grey
Delivery:
assembled



Delivery

Item	Pc.	Description
1	1	Installation frame
2	1	Drawer with front panel
3	1	Recess handle, black
4	1 pair	Sliding rails
5		Assembly material

U	Description	Order no.
1	without lock	202-219-50
2		202-219-53
3		202-219-56
1	with lock	202-219-60
2		202-219-63
3		202-219-66

19" electronic packaging

apra gruppe

... the perfect shell for valuable electronics

19" electronic packaging

www.apra.de

3 U subrack 245

page 82

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

6 U subrack 245

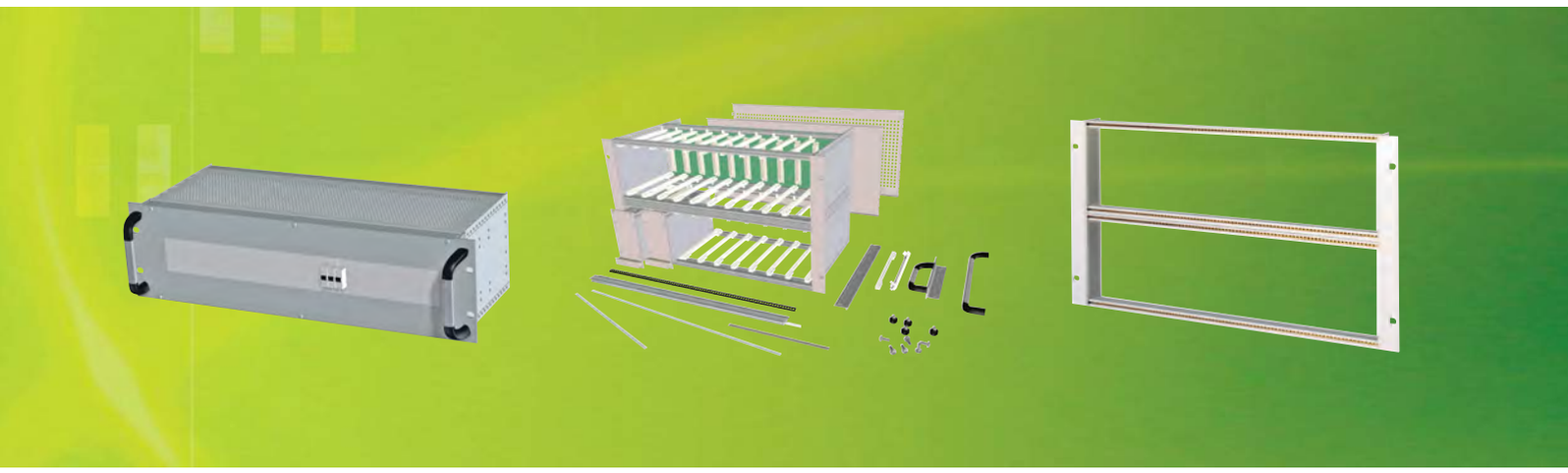
page 89

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

2 U subrack 245

page 92

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



19" power distribution subrack 3 U

page 97

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

Individual Configuration 245

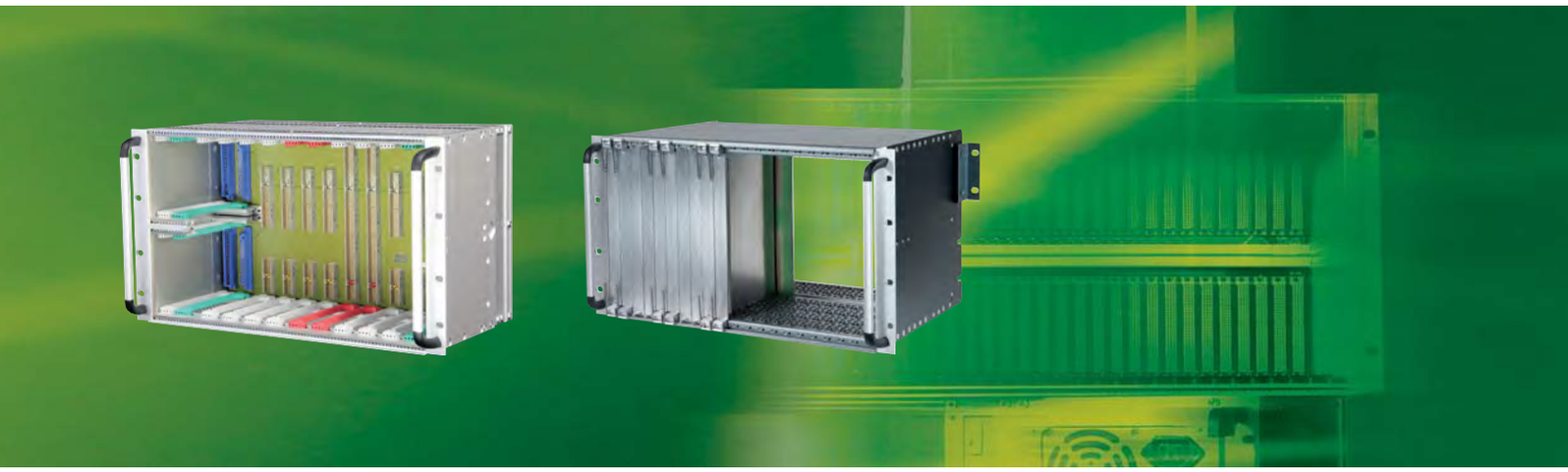
page 99

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

Frames / brackets

page 123

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



Subrack „Heavy Load“

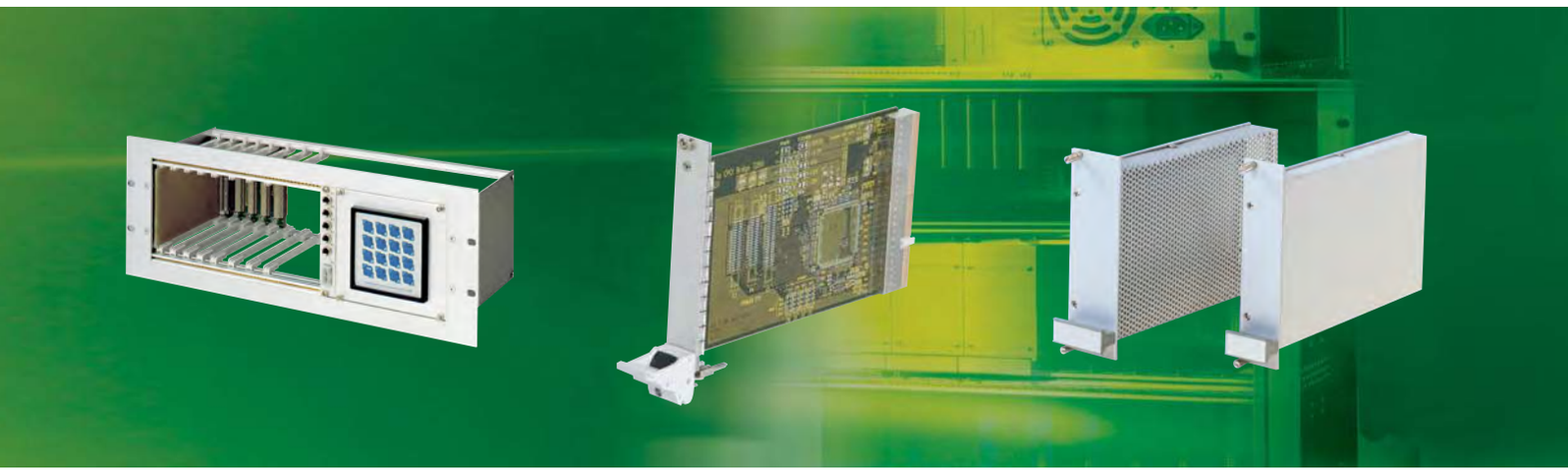
page 94

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

Subrack „apra R-TYPE“

page 95

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



19" frame 4 U

page 124

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

Front panels, plug-in units

page 125

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

Sub-units, cassettes

page 138

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

Reference analyses

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

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

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

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

19" subrack 245

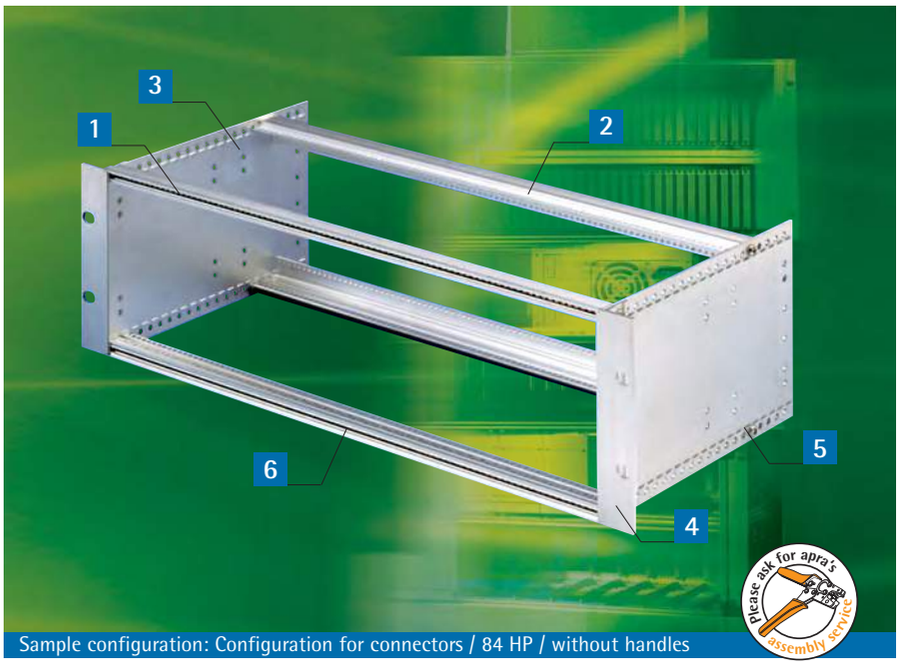
- for plug-in modules acc. to IEC 60297-3-101/-102/-103 and IEEE 1101.10/1101.11
- EMC-compliant design
- wide range of standard products
- individual configurations available
- also available as VME bus or CompactPCI system
- wide range of accessories
- on request: complete solutions with integrated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

www.apra.de

19" subrack 3 U

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

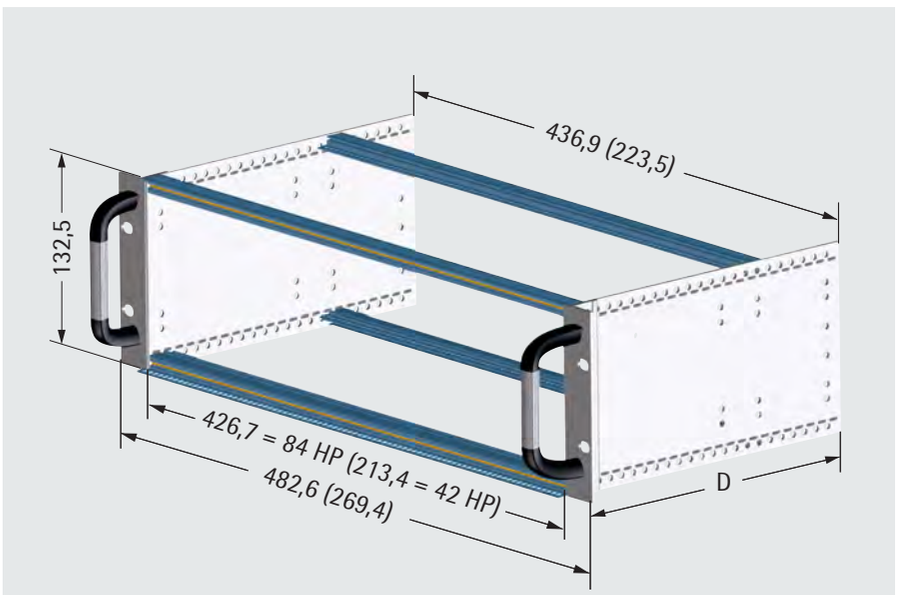
Application:
for plug-in modules acc. to IEC 60297-3-101/-102/-103 and IEEE 1101.10/1101.11
Material:
side panels: aluminium 2,5 mm
module rails: aluminium extrusion
front brackets: aluminium extrusion
Delivery:
kit form



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

Delivery

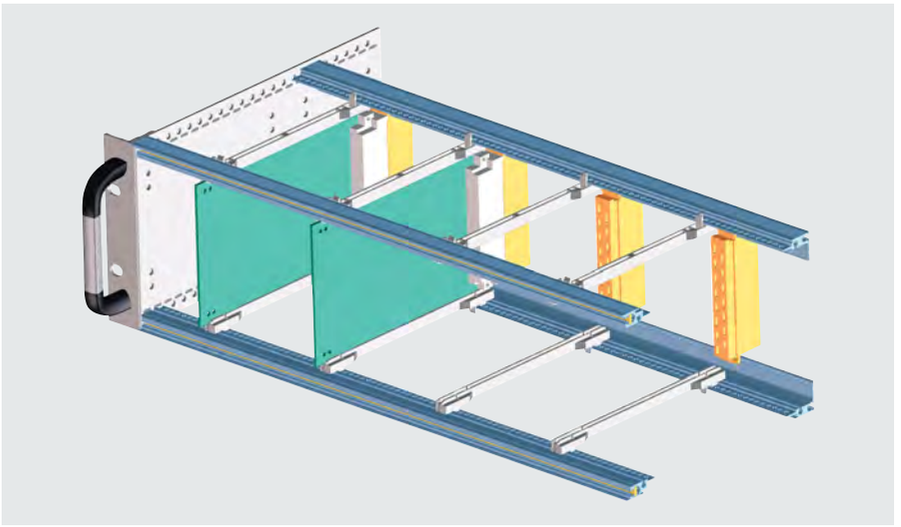
Item	Pc.	Description
1	2	Module rails, front
2	2	Module rails, rear
3	2	Side panels
4	2	Front fixing bracket with or without handle
5	8	Oval head screws, M 4 x 12, toothed head
6	2	Threaded inserts M 2,5 7 mm x 2 mm
7	2	Threaded inserts M 2,5 5 mm x 1,5 mm (only for rear BUS module rails)
8		Assembly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



Configuration for injector / extractor handle and backplane / with handles

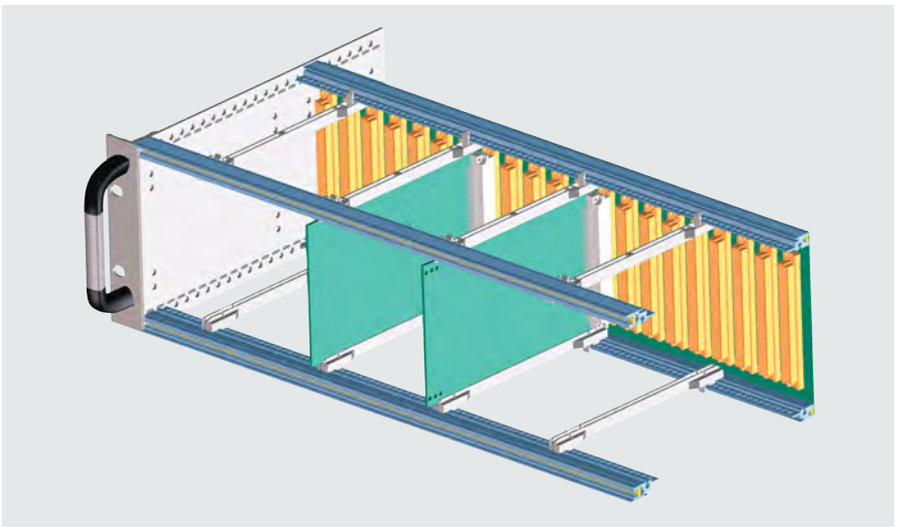
Configuration for connectors according to IEC 60603-2

front
standard module rails 241-022
threaded inserts M 2,5
rear
narrow module rails 241-019
with integrated mounting rails for plug-in connections acc. to IEC 60603-2



Configuration for backplane

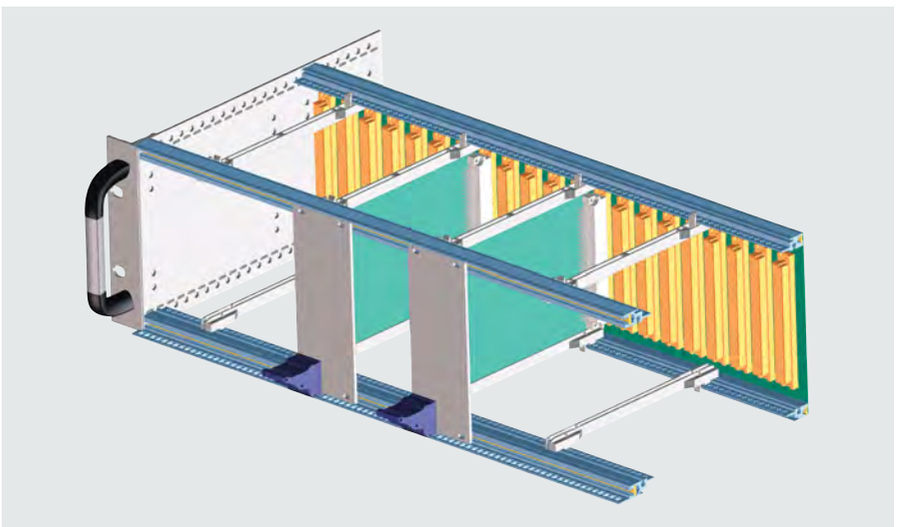
front
standard module rails 241-022
threaded inserts M 2,5
rear
BUS module rails 241-013
threaded inserts M 2,5



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

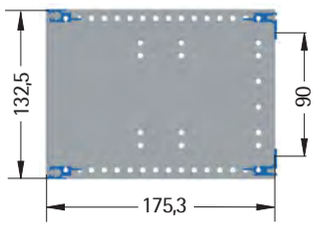
Configuration for injector / extractor handle and backplane for CPCI acc. to IEEE

front
standard module rails 241-022,
standard module rails 241-049
with 10 mm clearance for insertion/ extraction handle
threaded inserts M 2,5
rear
BUS module rails 241-013
threaded inserts M 2,5



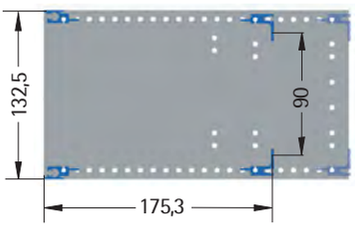
Please order insulating strips or contact strips separately (see p.115).

Depth 176 mm



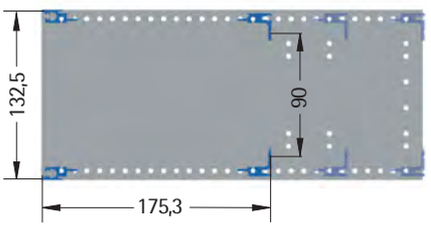
Description	Order no.
84 HP, with handle	245-314-11
84 HP, without handle	245-311-11
42 HP, with handle	245-334-11
42 HP, without handle	245-331-11

Depth 236 mm



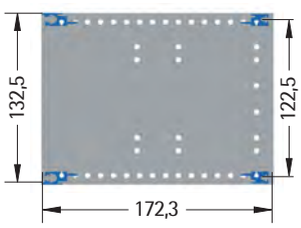
Description	Order no.
84 HP, with handle	245-315-11
84 HP, without handle	245-312-11
42 HP, with handle	245-335-11
42 HP, without handle	245-332-11

Depth 296 mm



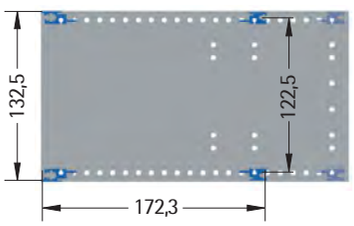
Description	Order no.
84 HP, with handle	245-316-11
84 HP, without handle	245-313-11
42 HP, with handle	245-336-11
42 HP, without handle	245-333-11

Depth 176 mm



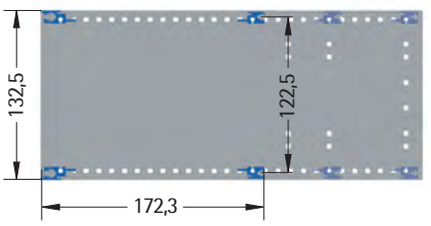
Description	Order no.
84 HP, with handle	245-314-21
84 HP, without handle	245-311-21
42 HP, with handle	245-334-21
42 HP, without handle	245-331-21

Depth 236 mm



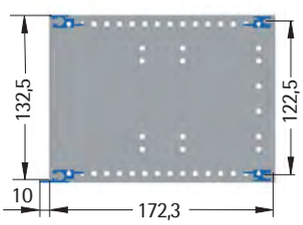
Description	Order no.
84 HP, with handle	245-315-21
84 HP, without handle	245-312-21
42 HP, with handle	245-335-21
42 HP, without handle	245-332-21

Depth 296 mm



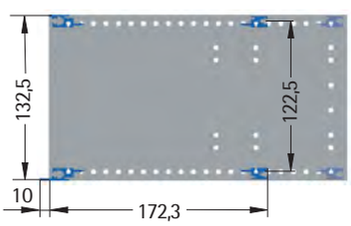
Description	Order no.
84 HP, with handle	245-316-21
84 HP, without handle	245-313-21
42 HP, with handle	245-336-21
42 HP, without handle	245-333-21

Depth 176 mm



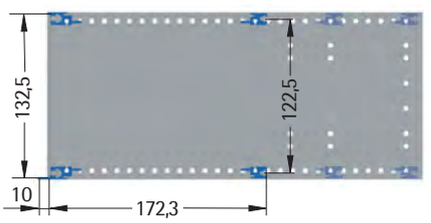
Description	Order no.
84 HP, with handle	245-314-31
84 HP, without handle	245-311-31
42 HP, with handle	245-334-31
42 HP, without handle	245-331-31

Depth 236 mm



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

Depth 296 mm



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

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

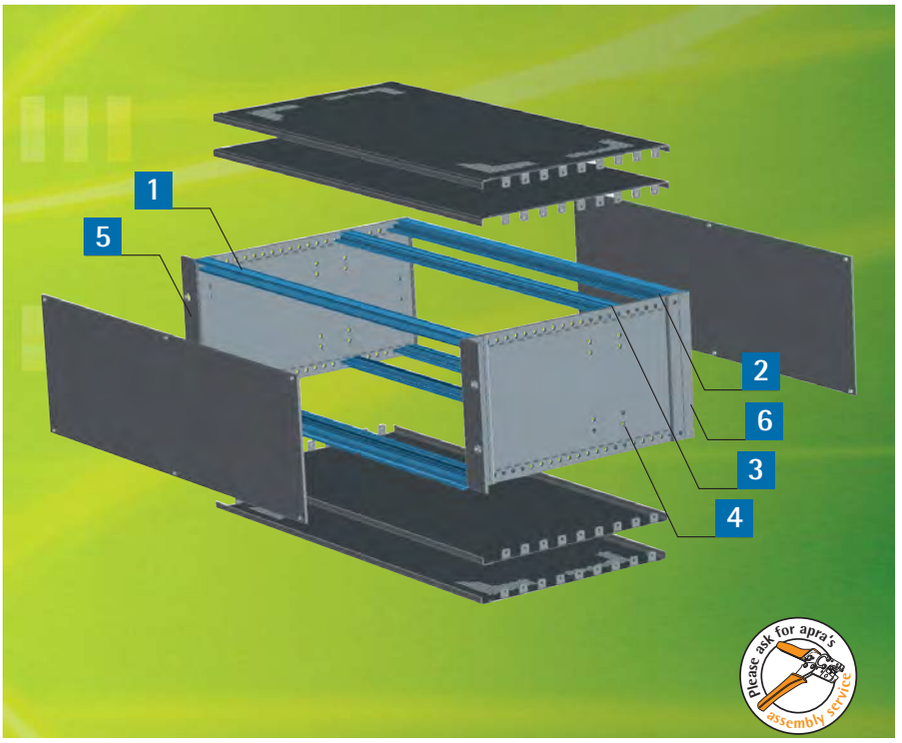
245 • 19" subrack 3 U, EMC

www.apra.de

19" subrack 3 U, EMC

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

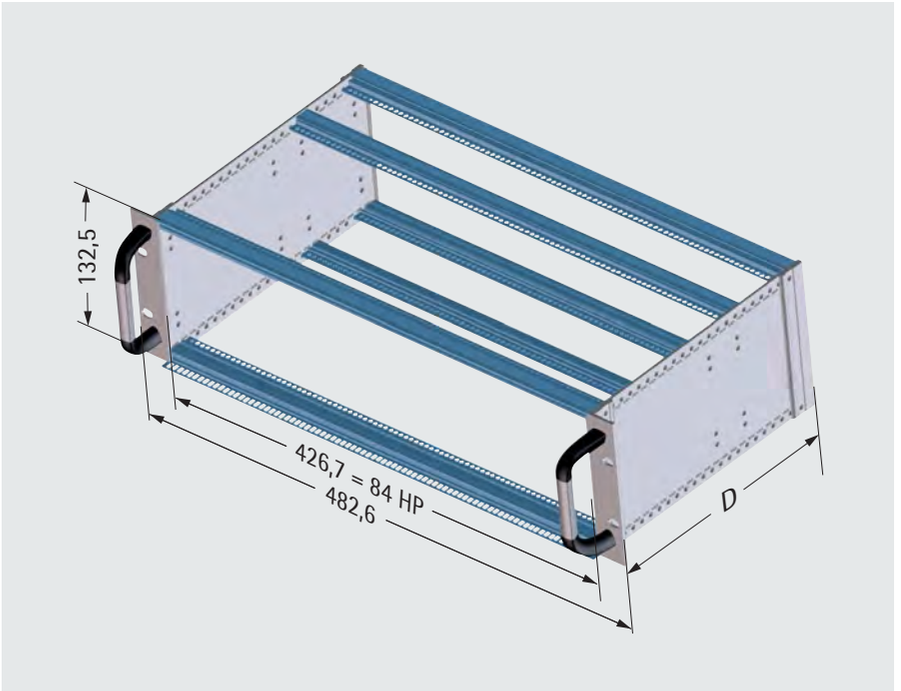
Application:
for plug-in modules acc. to IEC 60297-3-101/-102/-103 and IEEE 1101.10/1101.11
Material:
side panels: aluminium 2,5 mm
module rails: aluminium extrusion
front brackets: aluminium extrusion
Delivery:
kit form



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

Delivery

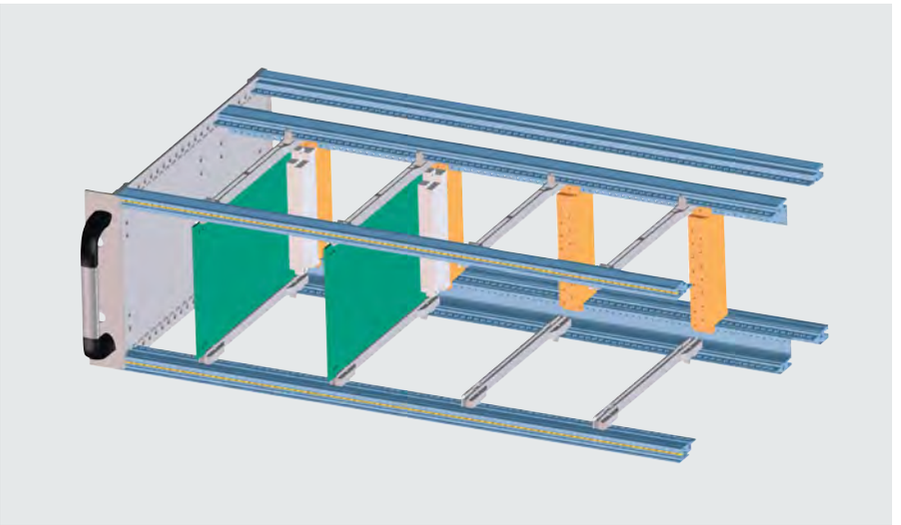
Item	Pc.	Description
1	2	Module rails, front
2	2	Module rails, rear
3	2	Module rails, middle
4	2	Side panels
5	2	Front angle bracket with or without handle
6	2	Cover bracket
7	4	Threaded inserts M 2,5 7 mm x 2 mm
8	2	Threaded inserts M 2,5 5 mm x 1,5 mm (only for middle BUS module rail)
9	12	Oval head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



www.apra.de

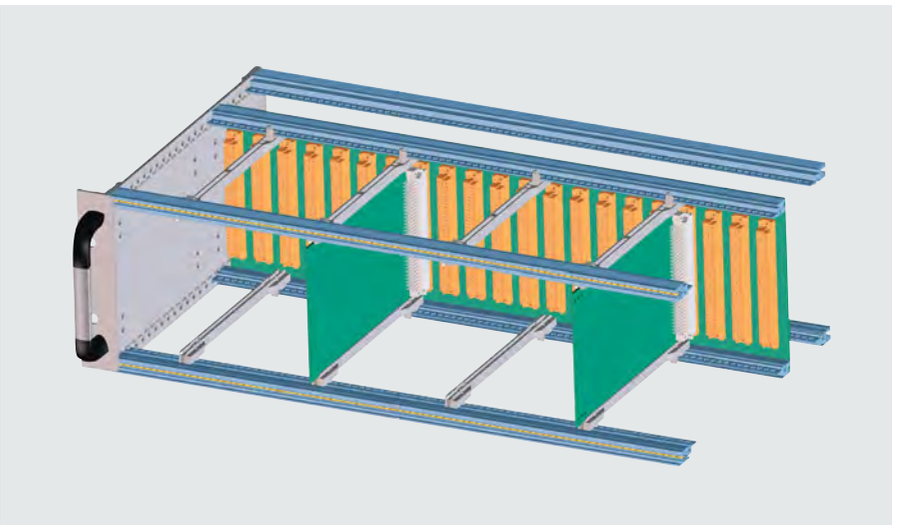
Configuration for connectors according to IEC 60603-2

front
standard module rails 241-022
threaded inserts M 2,5
middle
narrow module rails 241-019
with integrated mounting rails for plug-in connections acc. to IEC 60603-2
rear
standard module rails 241-022
threaded inserts M 2,5



Configuration for backplane

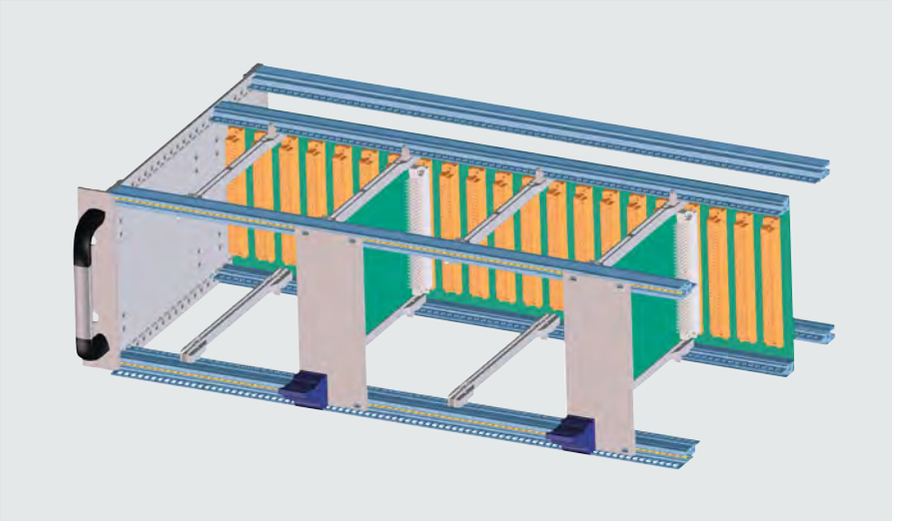
front
standard module rails 241-022
threaded inserts
middle
BUS module rails 241-013
threaded inserts M 2,5
rear
standard module rails 241-022
threaded inserts M 2,5



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

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

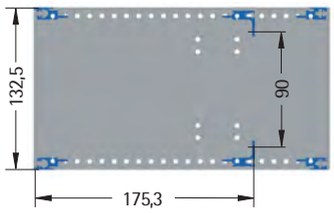
front
standard module rails 241-022,
standard module rails 241-049
with 10 mm clearance for insertion/ extraction handle
threaded inserts M 2,5
middle
BUS module rails 241-013
threaded inserts M 2,5
rear
standard module rails 241-022
threaded inserts M 2,5



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

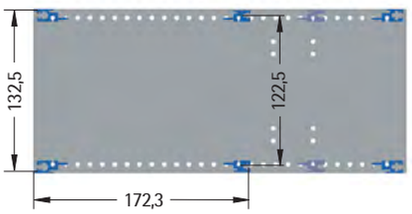
Configuration for connectors according to IEC 60603-2

Depth 236 mm



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

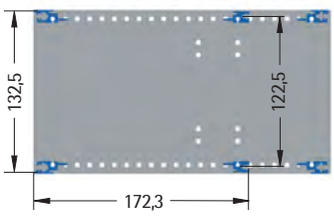
Depth 296 mm



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

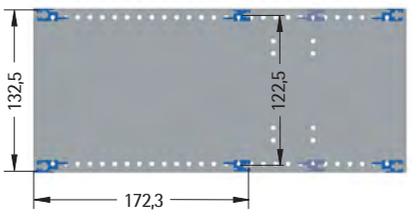
Configuration for backplane

Depth 236 mm



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

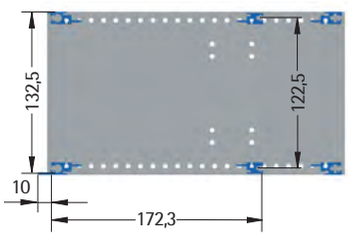
Depth 296 mm



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

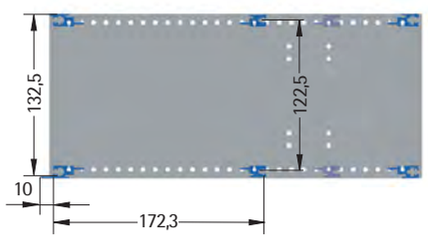
Configuration for injector / extractor handle and backplane

Depth 236 mm



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

Depth 296 mm



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

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

www.apra.de

19" subrack, 6 U, single row

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

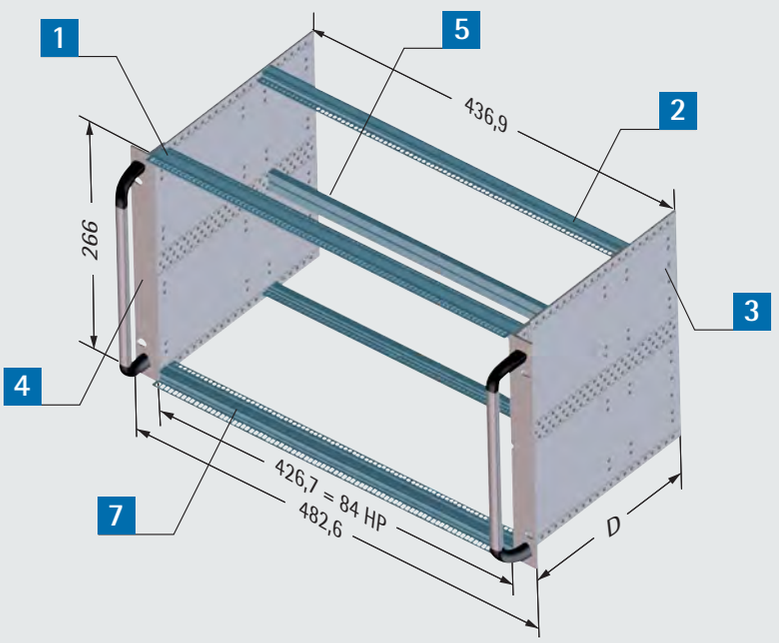
Application:
for plug-in modules acc. to
IEC 297-3 and IEEE 1101.10/1101.11
Material:
side panels: aluminium 2.5 mm
module rail: aluminium extrusion
front brackets: aluminium extrusion
Delivery:
kit form

Sample configuration

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

Delivery

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

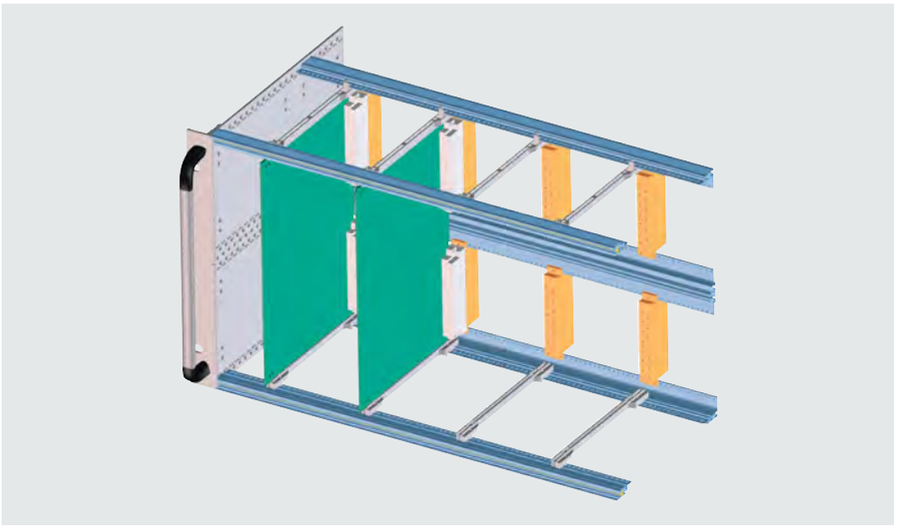


Configuration for injector / extractor handle and backplane / 84 HP / with handles

245 • 19" subrack 6 U, single-row

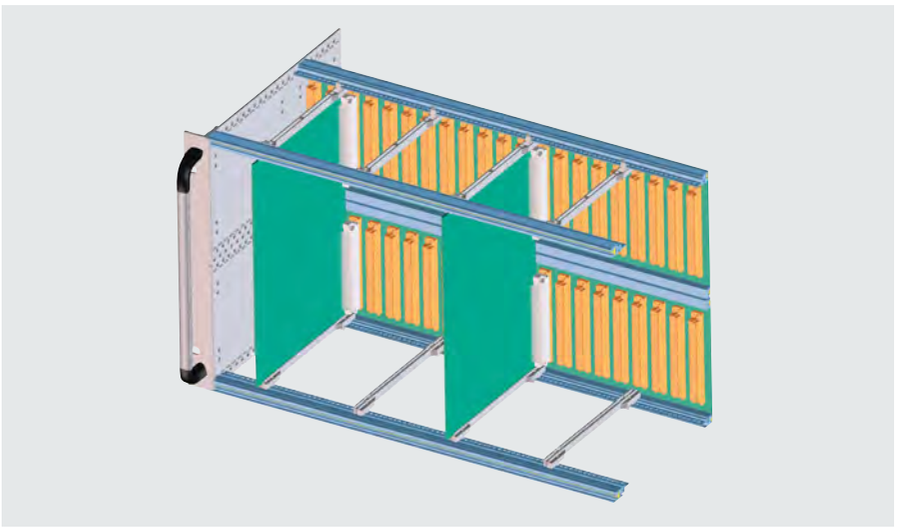
Configuration for connectors according to IEC 60603-2

front
standard module rails 241-022
threaded inserts M 2,5
rear
narrow module rails 241-019
and support rail with integrated mounting rails for plug-in connections acc. to IEC 60603-2



Configuration for backplane

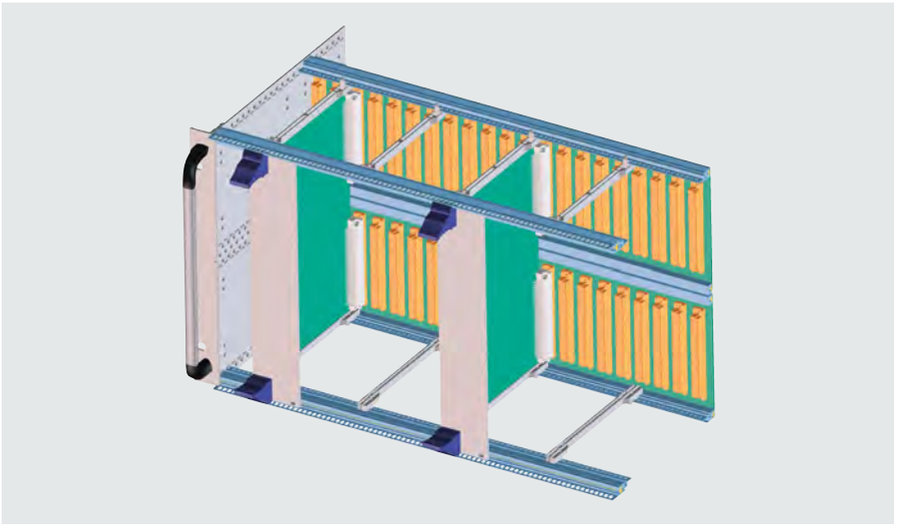
front
standard module rails 241-022
with threaded inserts, M 2.5
rear
BUS module rails 241-013
with threaded inserts, M 2.5
and BUS support rail 241-020
with threaded inserts, M 2.5



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

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

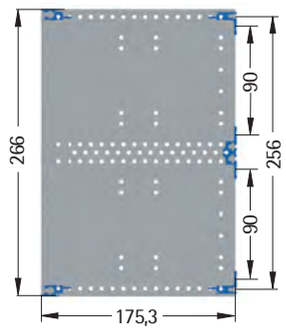
front
standard module rails 241-049
with 10 mm clearance for insertion/ extraction handle
threaded inserts M 2,5
rear
BUS module rails 241-013
with threaded inserts, M 2.5
and BUS support rail 241-020
with threaded inserts, M 2.5



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

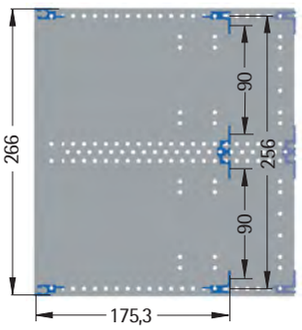
www.apra.de

Depth 176 mm



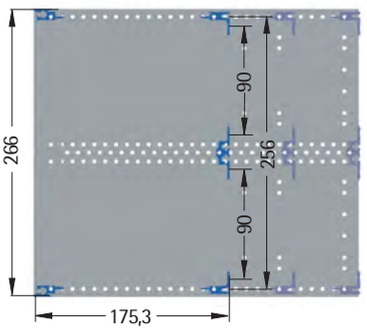
Description	Order no.
84 HP, with handle	245-614-11
84 HP, without handle	245-611-11

Depth 236 mm



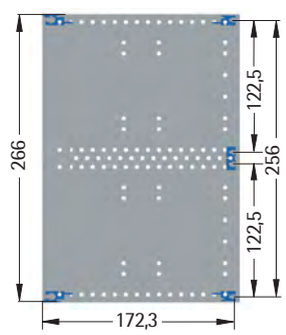
Description	Order no.
84 HP, with handle	245-615-11
84 HP, without handle	245-612-11

Depth 296 mm



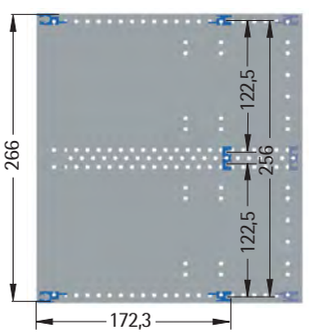
Description	Order no.
84 HP, with handle	245-616-11
84 HP, without handle	245-613-11

Depth 176 mm



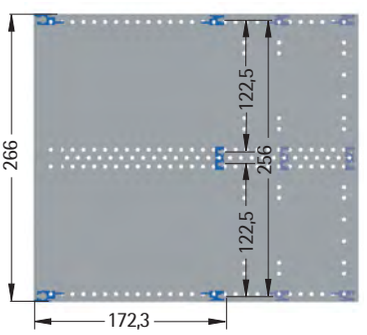
Description	Order no.
84 HP, with handle	245-614-21
84 HP, without handle	245-611-21

Depth 236 mm



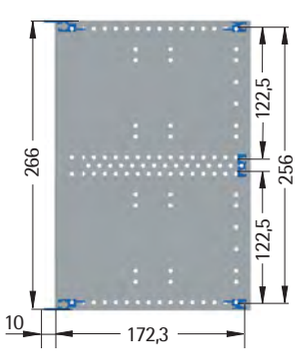
Description	Order no.
84 HP, with handle	245-615-21
84 HP, without handle	245-612-21

Depth 296 mm



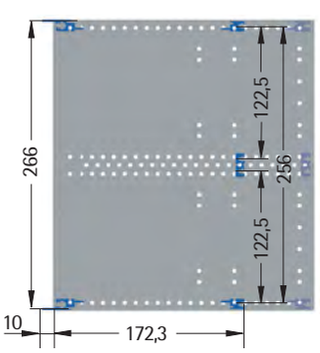
Description	Order no.
84 HP, with handle	245-616-21
84 HP, without handle	245-613-21

Depth 176 mm



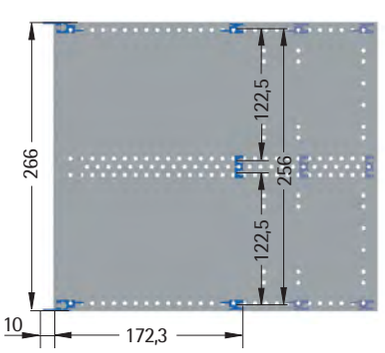
Description	Order no.
84 HP, with handle	245-614-31
84 HP, without handle	245-611-31

Depth 236 mm



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

Depth 296 mm



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

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

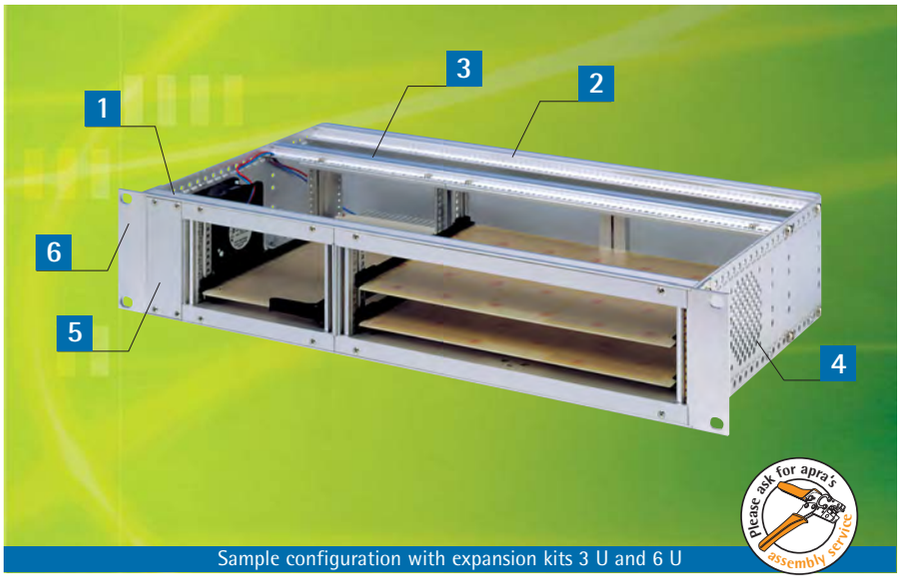
245 • 19“ subrack 2 U

www.apra.de

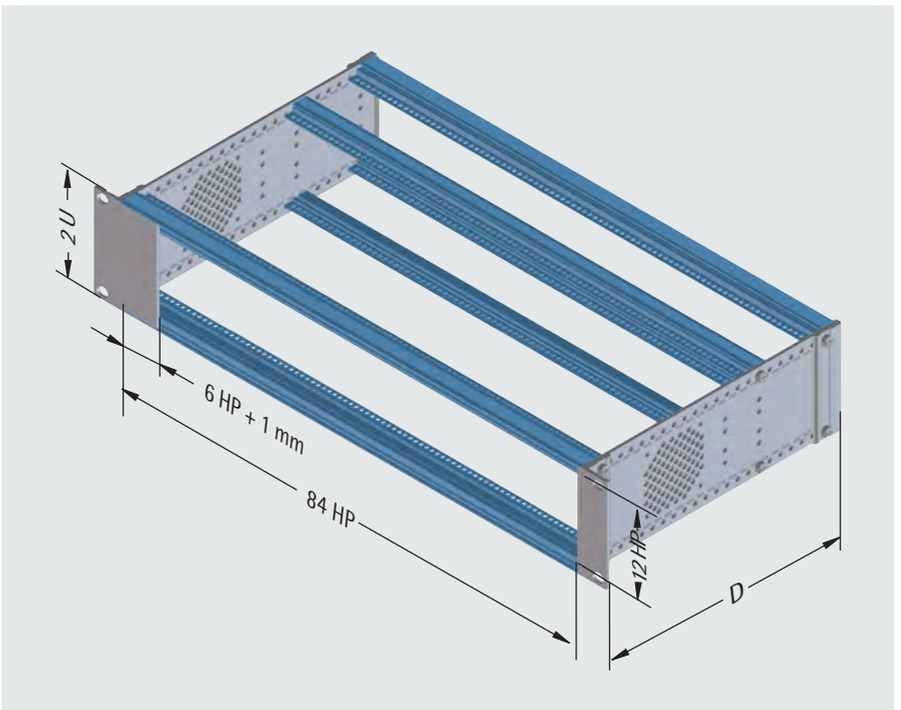
19“ subrack 2 U

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

Application:
for plug-in modules acc. to IEC 60297-3-101/-102/-103 and IEEE 1101.10/1101.11
Material:
side panels: aluminium 2,5 mm
module rails: aluminium extrusion
front brackets: aluminium extrusion
Delivery:
kit form



Sample configuration with expansion kits 3 U and 6 U



Delivery

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

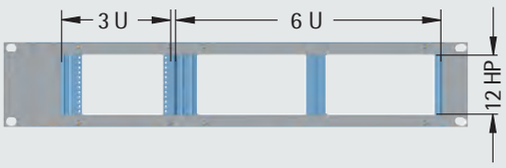
Description	Order no.
D=236 mm	245-212-28
D=296 mm	245-213-28

www.apra.de

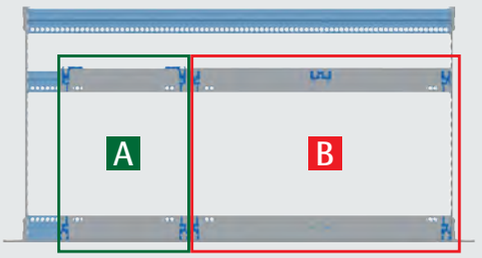
Expansion kits

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

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

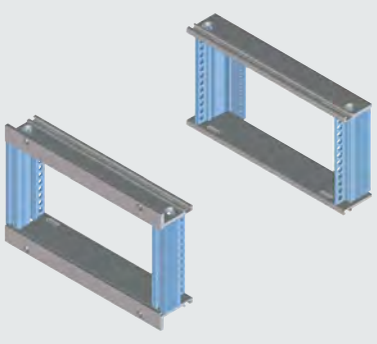


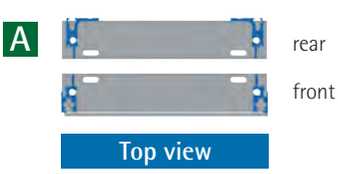
Sample configuration with expansion kit 3 U and 6 U



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

Expansion kit 3 U / 12 HP

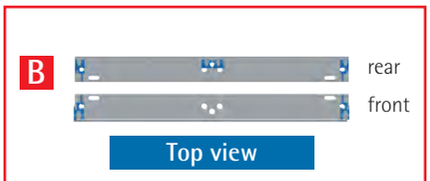




- for installing eurocards horizontally
- front: standard module rails 241-022
- rear: narrow module rails 241-019 with integrated mounting rail for plug-in connectors acc. to IEC 60603-2

Order no.
245-312-61

Expansion kit 6 U / 12 HP



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

Order no.
245-612-62

19" subrack 246 "Heavy Load"

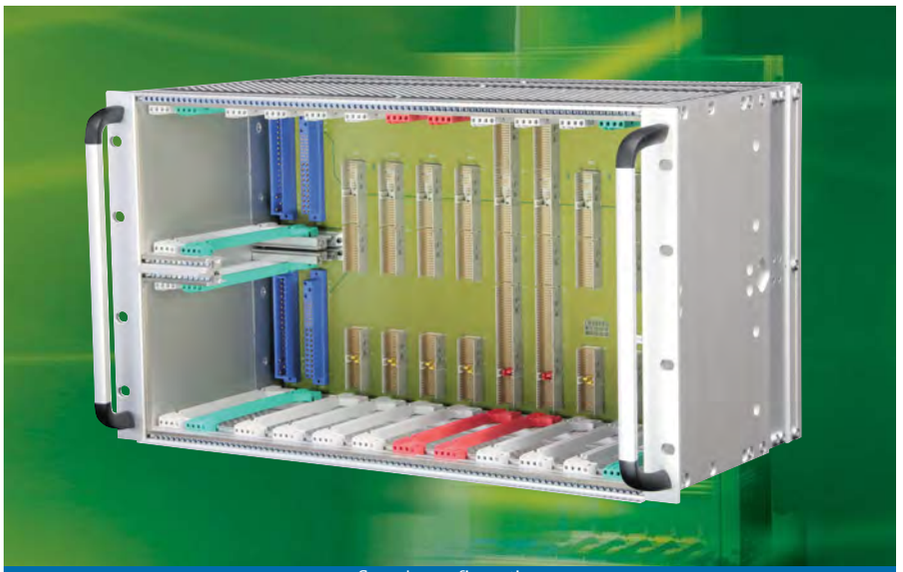
This heavy load subrack was especially designed for rough environments to ensure efficient electronics such as railway technology, energy and power stations, for strongly vibrating machineries or defence industry.

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

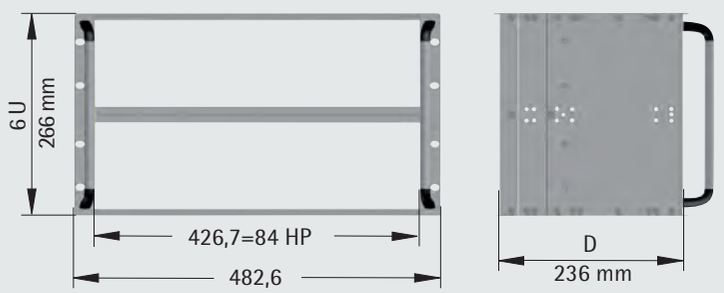
Its EMC compatible design has been approved by test acc. to VG95373, part 15, with a high interference resistance within a frequency range of 30 MHz up to 2 GHz.

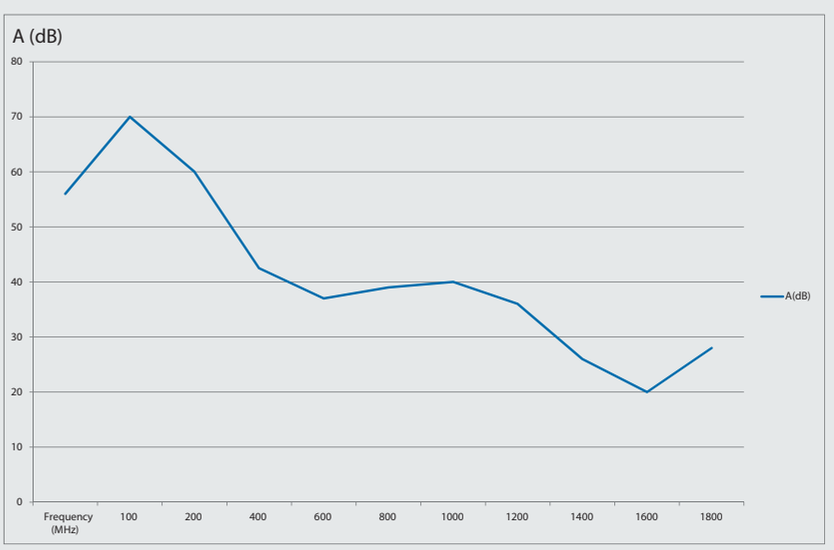
All accessory components like card guides, handles, etc. of the standard series 245 can be used.

Material:
aluminium anodised
Delivery:
unmounted, kit form (without backplane and expansion kit)



Sample configuration





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

Order no.
246-660-00

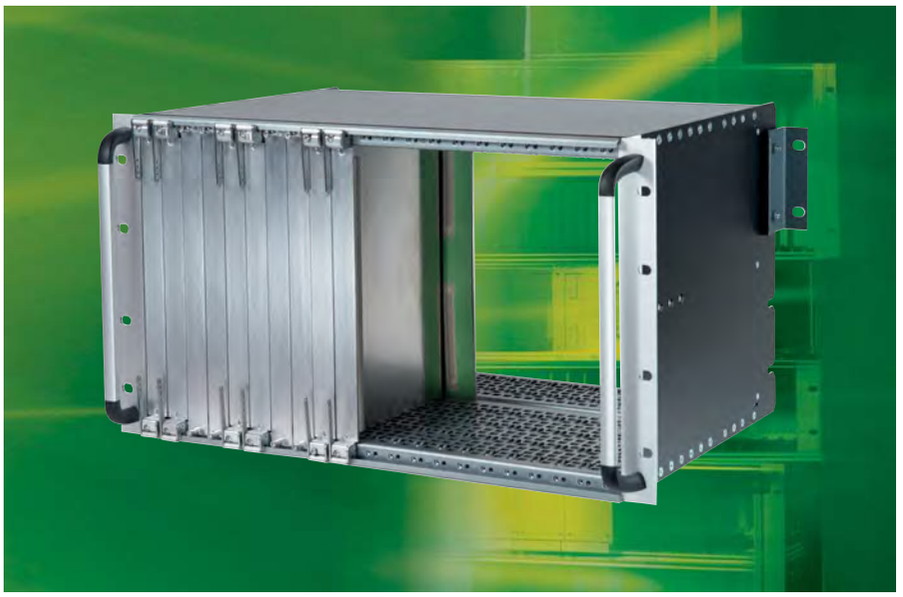
Please ask for preassembly, cabling, ventilation, power control or backplane.

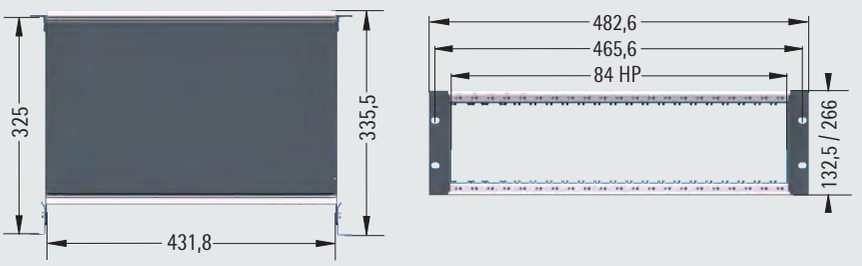
Ruggedized subrack „apra R-TYPE“ • 245

Ruggedized subrack „apra R-TYPE“

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

Application:
for plug-in components acc. to
IEC 60297-3-108,
but no cassettes or sub units possible
Material:
sheet steel / aluminium
Finish:
RAL 9010 / zinced
Delivery:
kit form, unmounted

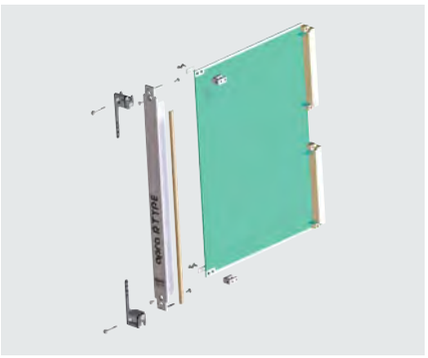




HP	U	Order no.
84	3	245-318-00
84	6	245-618-00

Other configurations on request!

Plug-in module R-Type



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

Blind panel 4 HP

Delivery

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

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

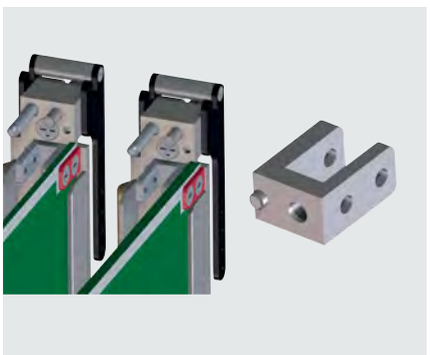
Front panel 4 HP

Delivery

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

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

PCB mounting bracket



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

Application:
for PCB acc. to IEC 60297-3-108
Material:
aluminum
Finish:
conductive
Delivery:
kit form, unmounted

www.apra.de

19“ power distribution subrack 3 U for automatic circuit breakers

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

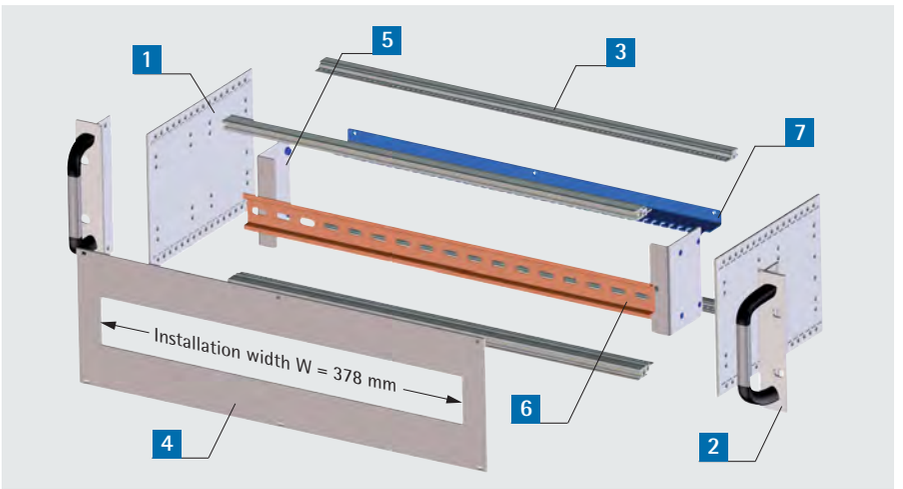
Material:
side panels: aluminium 2.5 mm
module rail: aluminium profile
front bracket: aluminium profile
Finish:
transparent, chromated
Delivery:
assembly set

Sample configuration with cover strips

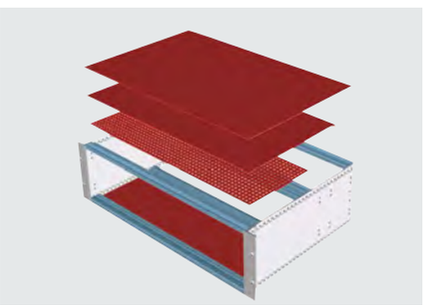
Delivery

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

Order no.
245-311-80



Cover panel, solid



- for top and bottom mounting

Material:
aluminium 1 mm

HP	Order no.
84	240-662-85

Cover strip S 35 G

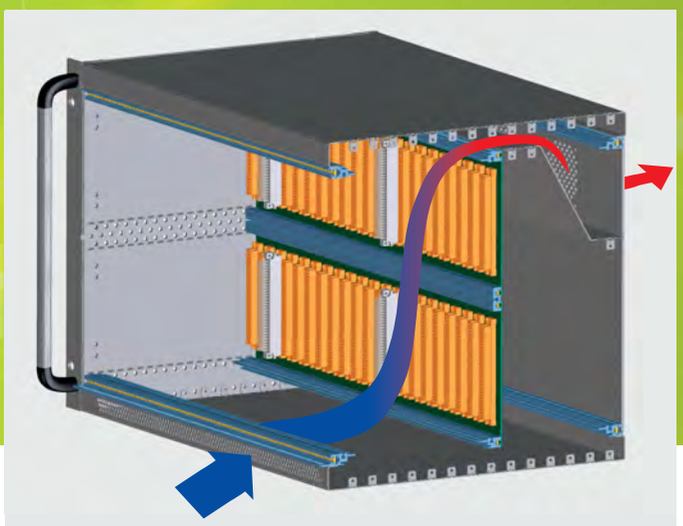
- to conceal the front panel openings
- length: 219 mm, pre-punched in 9 mm increments for easy removal

Material: plastics
Finish: similar to RAL 9010

Order no.
640-222-00

Customised subracks

www.apra.de



Subrack 7 U

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

Compact PCI 7 U

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

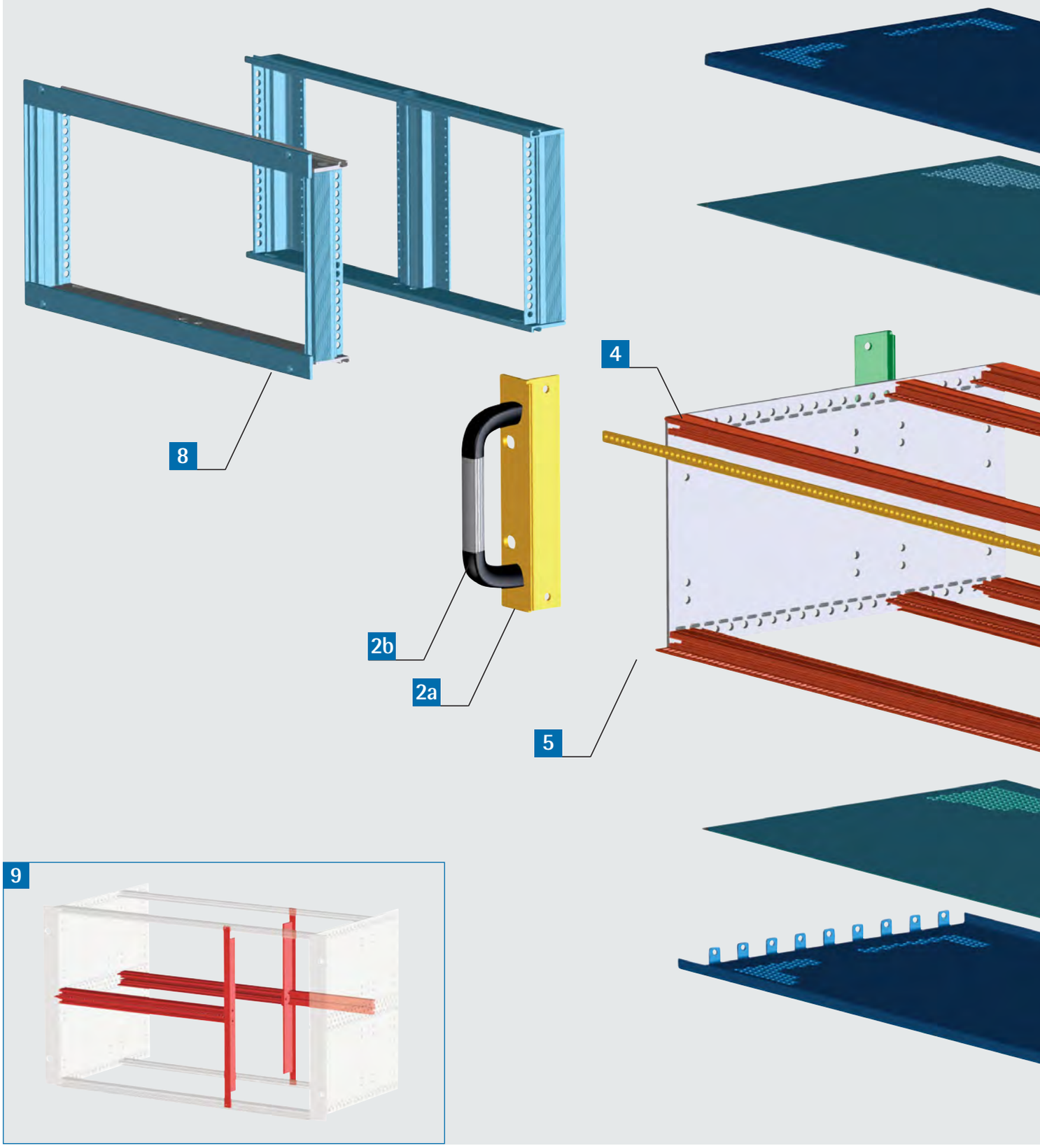
Compact PCI 8 U

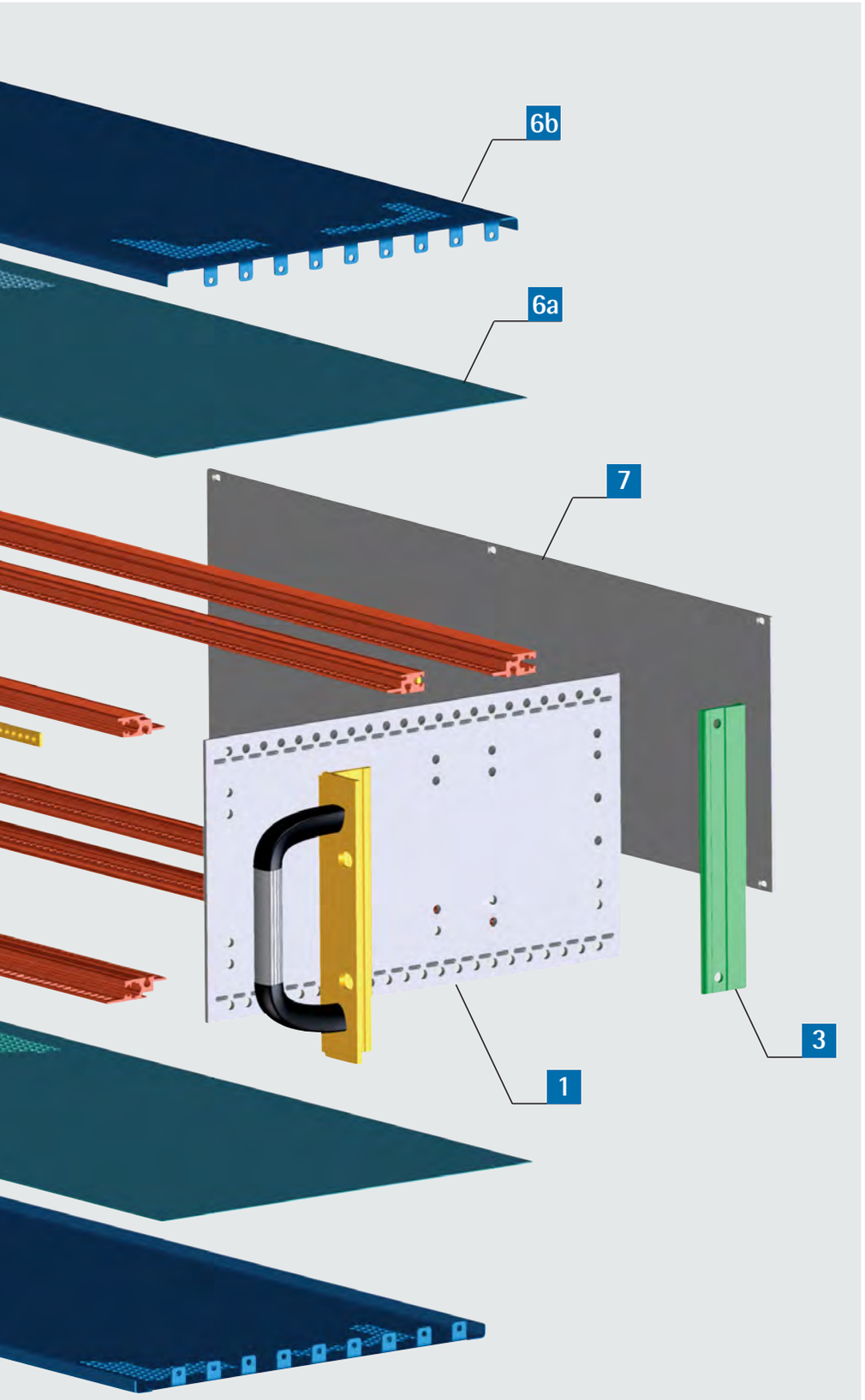
- EMC-shielded CompactPCI system integrated in a 19"-subrack
- designed for board assembly with up to eight CompactPCI boards 6 U, 160mm depth at the front
- 6 U, 8 Slot CompactPCI backplane Rev. 3.0, 64 bit, 66 MHz, system slot on the left

Individual configuration 245

... the perfect shell for valuable electronics

Individual configuration: Design your customised subrack 245.





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

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

Other dimensions and electromechanical components on request!

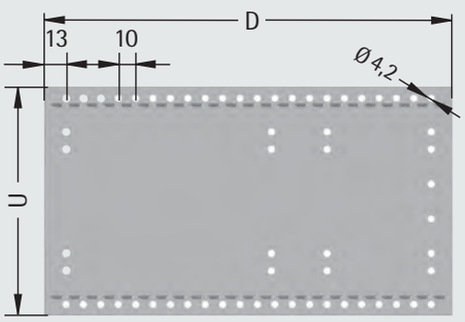
Customised front panels including print, foils, input systems or keyboards –

please ask for our front panel express!

1a Side panel, not ventilated

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

Material:
aluminium 2,5 mm



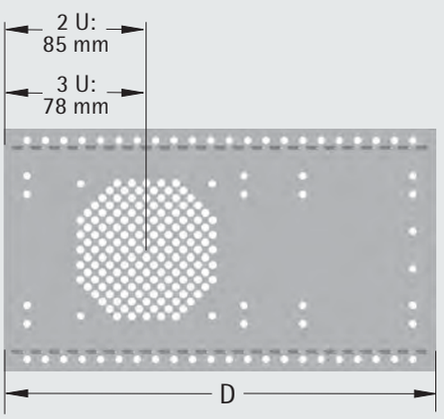
U	H mm	D mm	Order no.
3	132,5	176	245-301-50
		236	245-302-50
		296	245-303-50
		336	245-309-53
		356	245-304-50
4 (3+2 x 1/2)	177	296	245-403-50
		356	245-404-50
4	177	296	245-943-50
6	266	176	245-601-50
		236	245-602-50
		296	245-603-50
		336	245-609-53
		356	245-604-50
7 (6+2x 1/2)	310,5	296	245-703-50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

Other dimensions on request!

1b Side panel, perforated

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

Material: aluminium 2,5 mm



Fan 2 U

Fan 3 U

Matching fan 2 U

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

Order no.
230-825

Matching fan 3 U

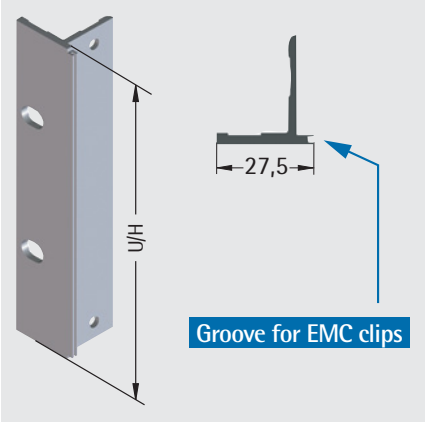
- dimensions: 80 x 80 x 25 mm
- voltage: 12 V
- fan output: 58 m³/h

Order no.
230-828

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

www.apra.de

2a Front bracket without holes for handle

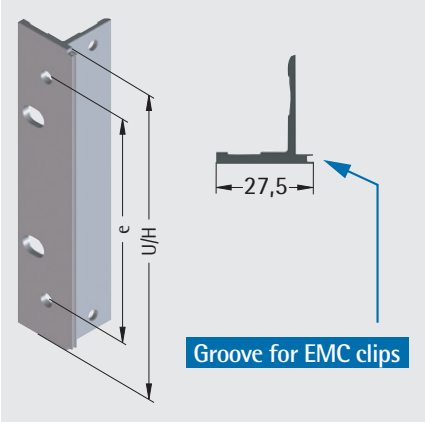


- with integrated groove for inserting EMC contact springs [11] (see p. 113)

Material:
aluminium
Surface:
visible surface anodised, contact surfaces partially chromated

U	H mm	Order no.
2	88	240-038-12
3	132,5	240-038-13
4	177	240-038-14
4 (3+2x 1/2)	177	240-038-54
6	266	240-038-16
7	310,5	240-038-17

2a Front bracket with holes for handle



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

Material:
aluminium
Surface:
visible surface anodised, contact surfaces partially chromated

U	H mm	e	Order no.
3	132,5	98	240-038-03
4	177	142	240-038-04
4 (3+2x 1/2)	177	142	240-038-44
6	266	232	240-038-06
7	310,5	276	240-038-07

2b Front panel handles

- fits 19" subracks

Material:
end pieces: plastic, black (with M 5)
handle extrusion: anodised aluminium
Delivery:
assembled

Delivery

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

U	e mm	Order no. (1 piece)
3	98	611-336-00
4	142	611-334-00
6	231,5	611-337-00
7	276	611-337-10

Countersunk screw M5 x 12 for handle mounting

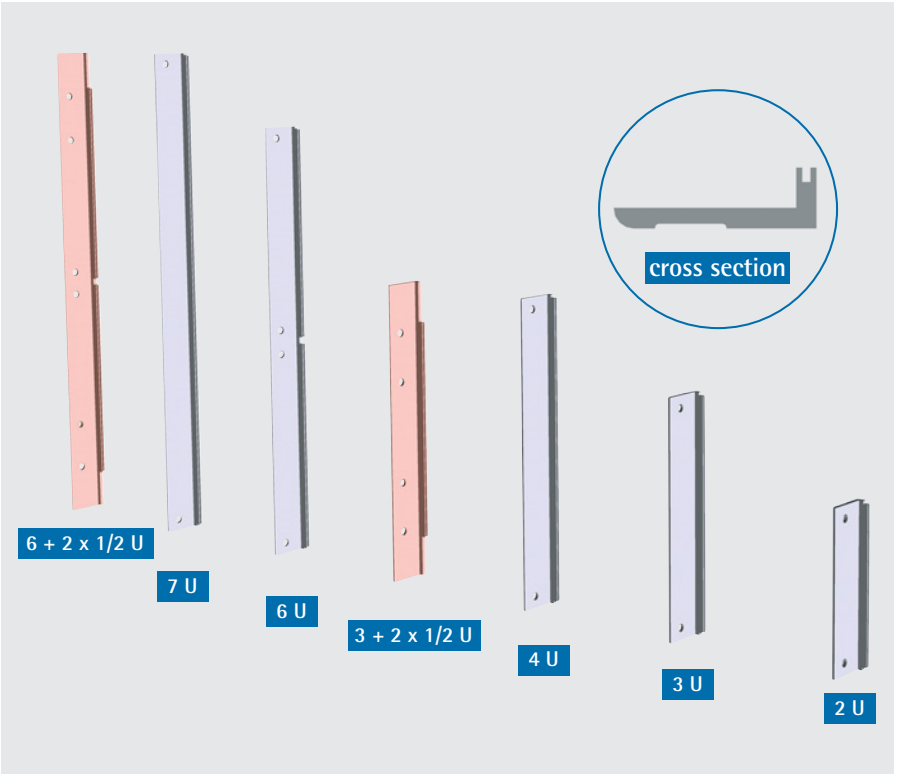
- Set = 100 pieces

Order no.
630-121

3 Cover bracket

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

Material:
aluminium
Surface:
visible surface anodised, contact surfaces partially chromated



U	H mm	Order no.
2	88	240-037-52
3	132,5	240-037-53
4	177	240-037-54
4 (3 + 2 x 1/2)	177	240-037-64
6	266	240-037-56
7	310,5	240-037-57

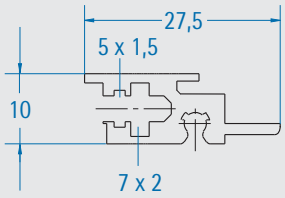
www.apra.de

4 Module rails

The following module rails are available:

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

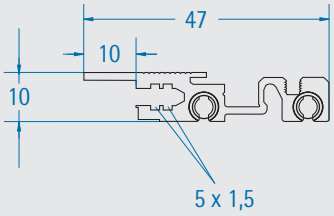
Standard module rail



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

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

Reinforced module rail with 10 mm clearance



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

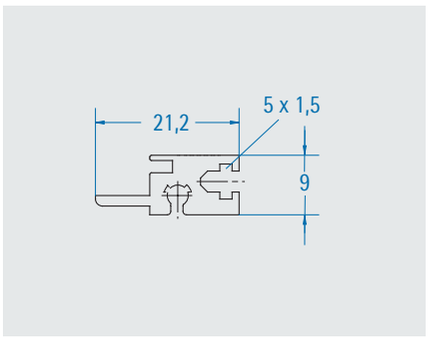
See p. 137 for matching IEEE handles!

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

245 • 19" subrack, individual configuration

www.apra.de

BUS module rail

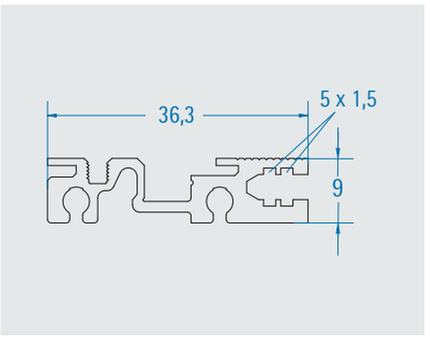


- for mounting BUS cards and backplanes **using EMC springs or insulating strips** (see section beginning on p. 115)
- with grooves for threaded inserts
- mounting in upper or lower position

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

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

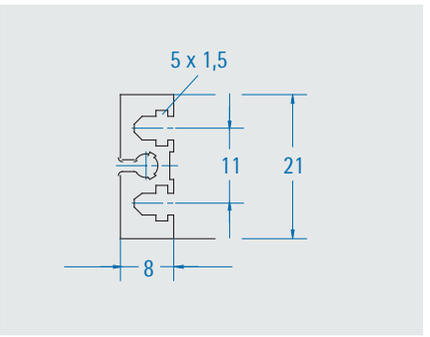
Reinforced BUS module rail



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

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

BUS support rail

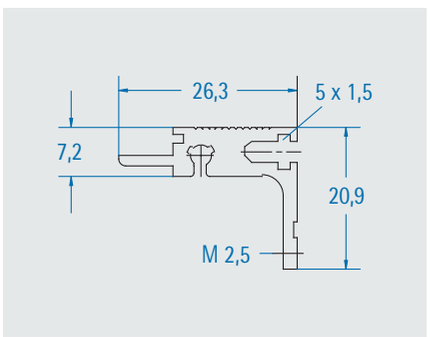


- for mounting BUS cards and backplanes **using EMC springs or insulating strips** (see section beginning on p. 115)
- with grooves for threaded inserts
- mounting in middle position

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

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

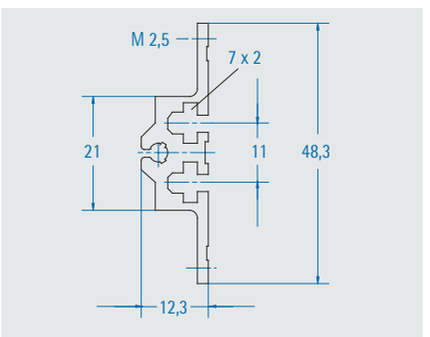
Narrow module rail, integrated



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

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

Support rail



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

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

www.apra.de

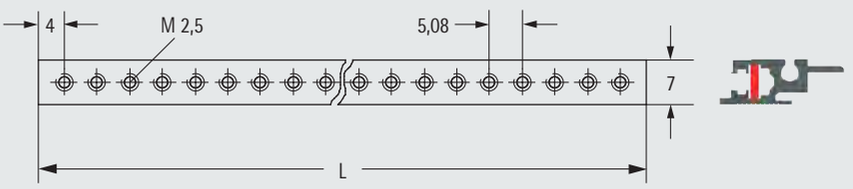
5 Threaded inserts

M 2,5 threaded insert 7 x 2 mm

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

Finish: galvanised

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

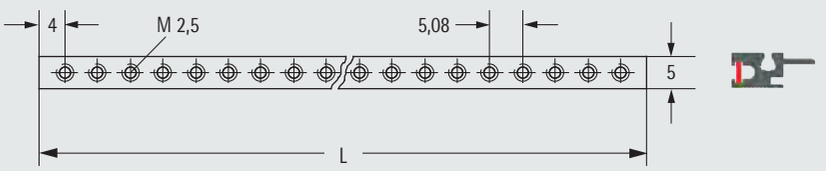


M 2,5 threaded insert 5 x 1.5 mm

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

Finish: galvanised

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

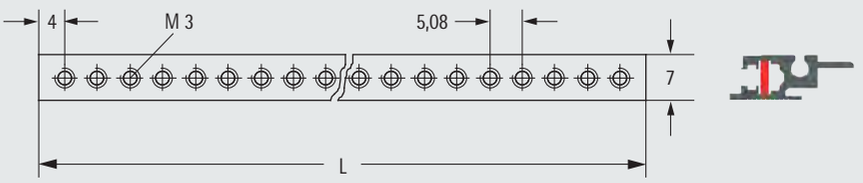


M 3 threaded insert 7 x 2mm

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

Finish: galvanised

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

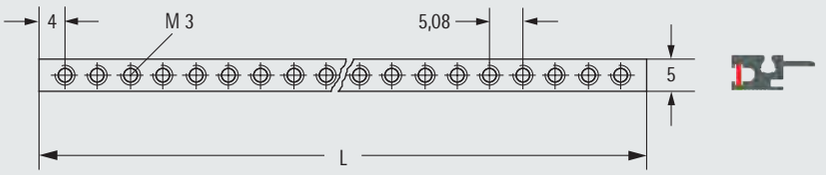


M3 threaded insert 5 x 1.5mm

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

Finish: galvanised

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

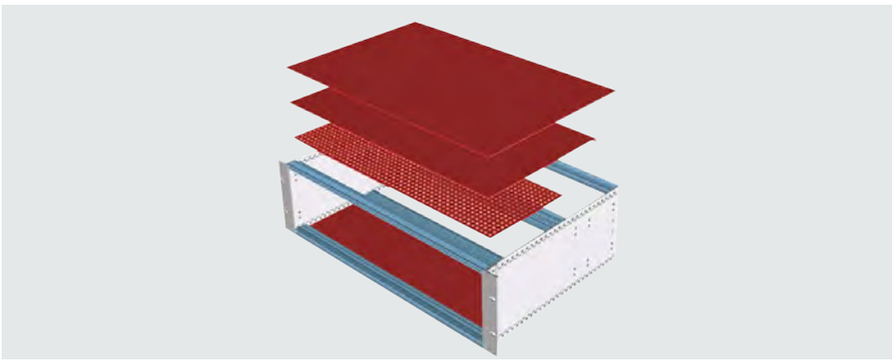


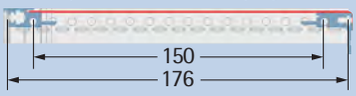
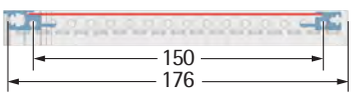
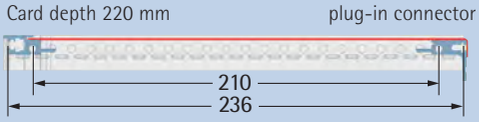
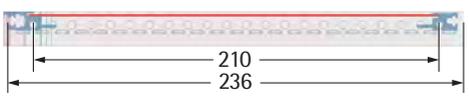
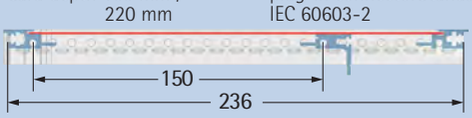
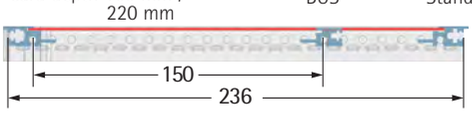
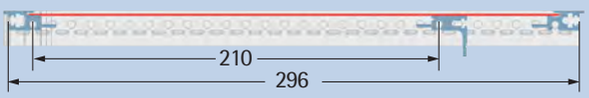
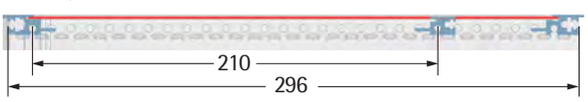
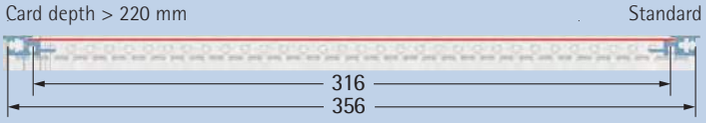
6a Cover panel

- for mechanical shielding of subracks
- perforated or closed

Material:
aluminium panel or perforated aluminium panel 1,0 mm

Degree of protection:
IP 30: closed
IP 20: perforated



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

www.apra.de

6b EMC cover panel

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

Material:
aluminium

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

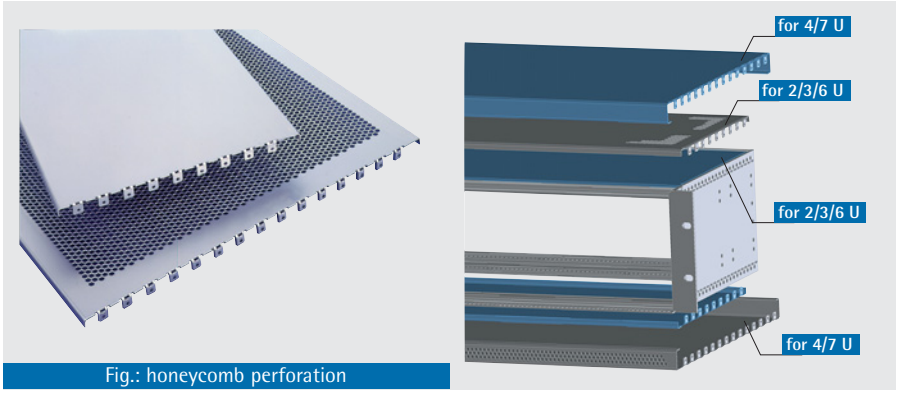


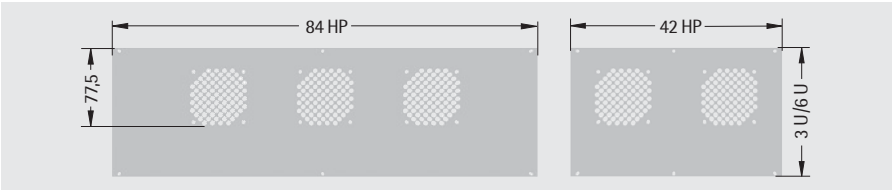
Fig.: honeycomb perforation

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

7 Rear panel

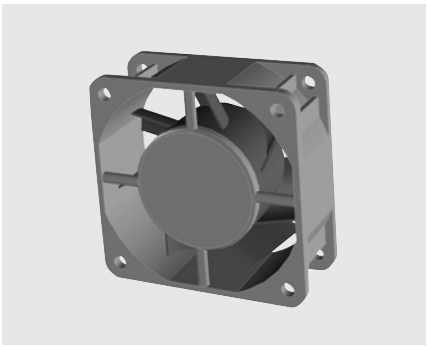
- up to 3 fans can be installed in 84 HP subracks and 2 fans in 42 HP (perforated version)
- including assembly material

Material: aluminium 2.5 mm
Finish: front side: anodised, rear side: conductive



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

Fan, 12 V



- for installation in the rear panel
- high-power [PAPST] fan
- flow rate: 40 m^3/h
- noise level: 40 dB(A)
- W x H x D: 60 x 60 x 25 mm
- connection: stranded wire L=310 mm
- incl. assembly material

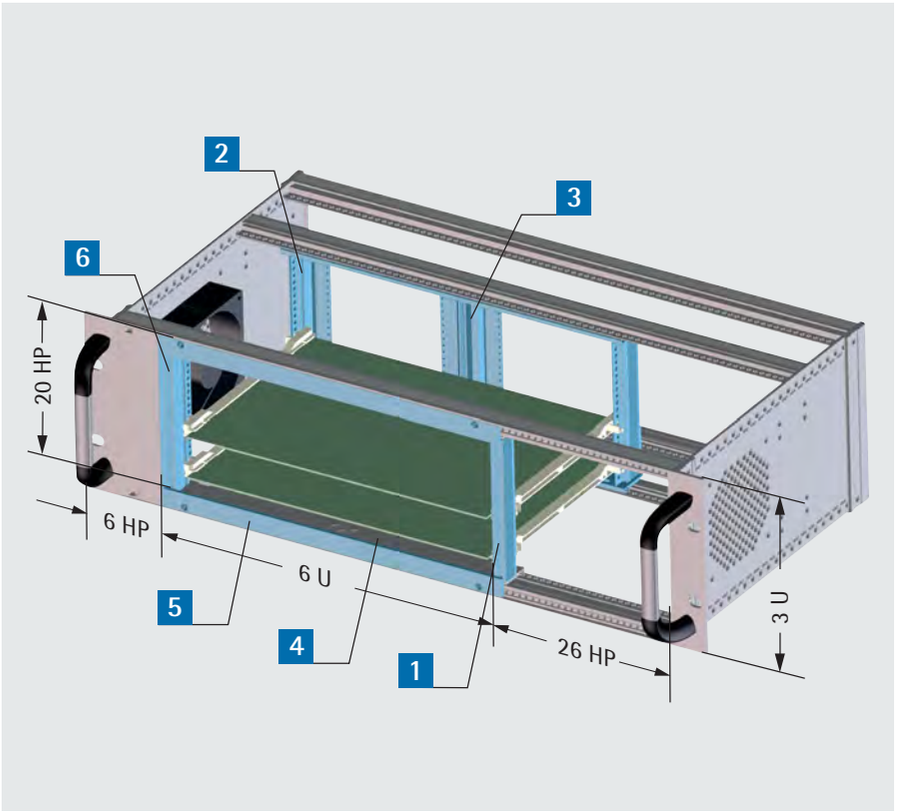
Order no.
230-825-00

www.apra.de

9 Horizontal expansion kit 6 U/20 HP

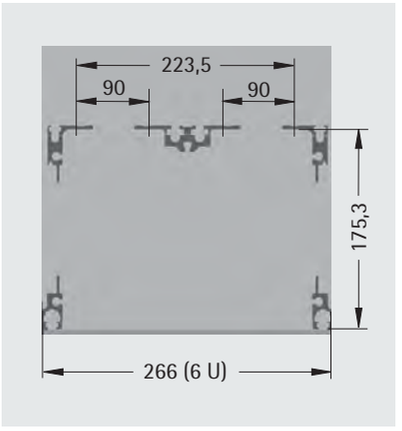
- for installation in 3 U subracks with BUS module rail
- for installing double eurocards horizontally
- PCB's cooled optimally when installed in a subrack with perforated side panels (see fig.)

Application:
for plug-in modules acc. to IEC 60297-3-101/-102/-103 and IEEE 1101.10/1101.11
Delivery:
kit form



Sample configuration: expansion kit 6 U

Expansion kit model 1



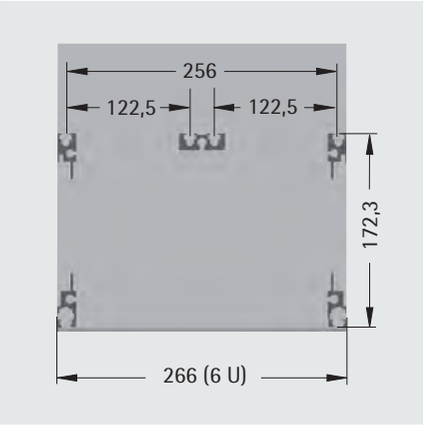
- depth: 236 mm

front:
- standard module rails, profile no. 241-022

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

Order no.
245-620-61

Expansion kit model 2



- depth: 236 mm

front:
- standard module rails, profile no. 241-022

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

Order no.
245-620-62

Delivery

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

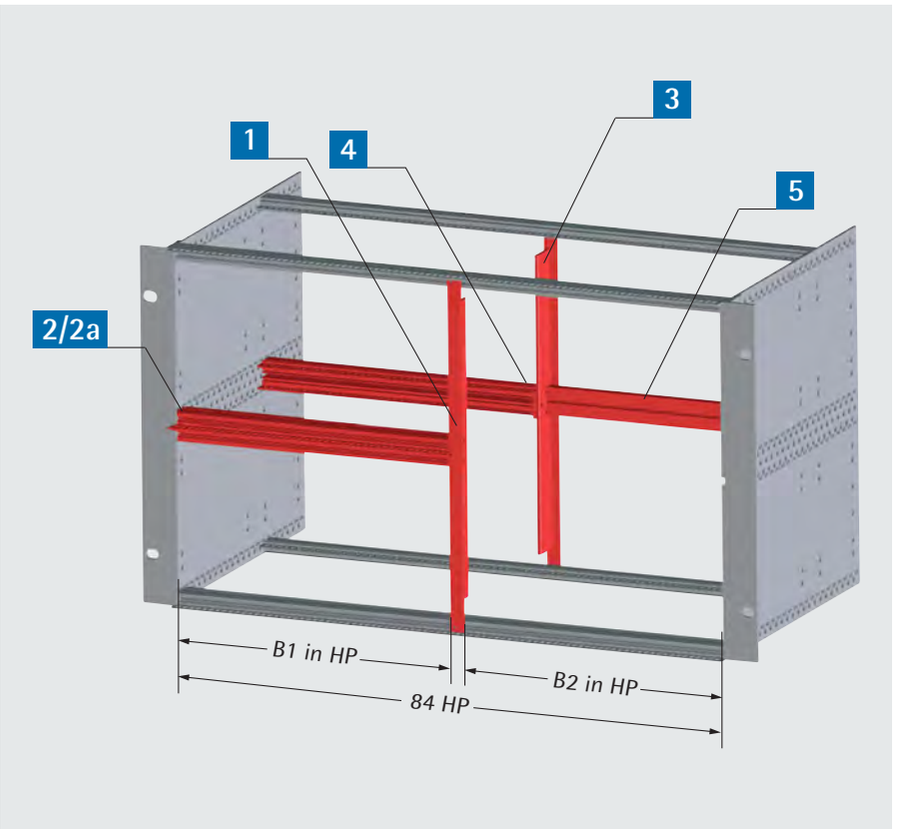
www.apra.de

10 Vertical expansion kit 2 x 3 U

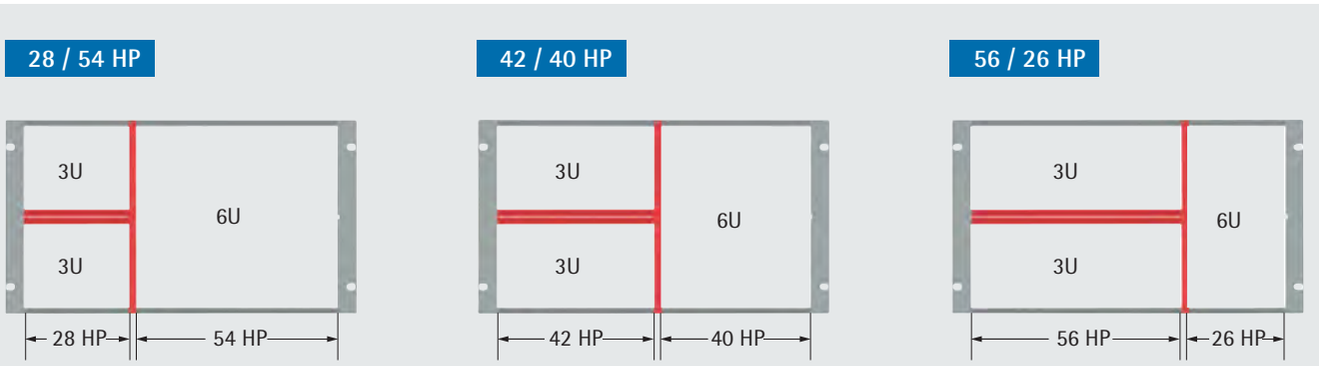
- for the separation of the 6 U installation space into 2 x 3 U and 1x 6 U

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

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



Versions



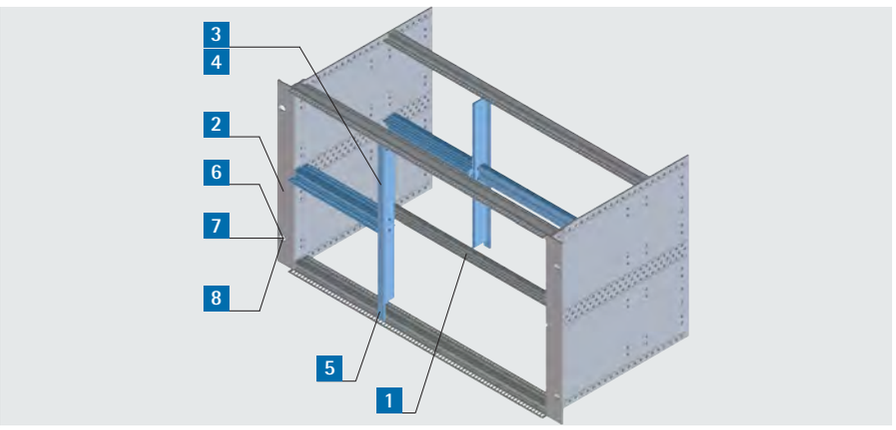
Basic design for plug-in components acc. to IEC 60297-3-101/-102/-103				
Item	Description	Installation space B1 2 x 3 U	Installation space B2 6 U	Order no.
1	Front mounting strut	-	-	241-087
2	Standard module rails	28 HP	54 HP	241-022-04
		42 HP	40 HP	241-022-03
		56 HP	26 HP	241-022-02
2a	Threaded inserts M 2,5	28 HP	54 HP	240-054
		42 HP	40 HP	240-053
		56 HP	26 HP	240-052

Components combinable with type A for plug-in connector acc. to IEC 60603-2				
Item	**Description**	**Installation space B1 2 x 3 U**	**Installation space B2 6 U**	**Order no.**
3	Rear mounting strut for narrow module rail with integrated mounting rail	-	-	241-088
4	Narrow module rail with integrated mounting rail	28 HP	54 HP	267-919-04
		42 HP	40 HP	267-919-03
		56 HP	26 HP	267-919-02
5	Mounting rail, integrated	28 HP	54 HP	241-108-02
		42 HP	40 HP	241-108-03
		56 HP	26 HP	241-108-04
Components combinable with type B for BUS cards				
Item	**Description**	**Installation space B1 2 x 3 U**	**Installation space B2 6 U**	**Order no.**
3	Rear mounting strut for BUS module rail	-	-	241-089
4	BUS module rail	28 HP	54 HP	241-013-04
		42 HP	40 HP	241-013-03
		56 HP	26 HP	241-013-02
4	Threaded inserts M 2,5	28 HP	54 HP	240-064
		42 HP	40 HP	240-063
		56 HP	26 HP	240-062
5	Mounting rail BUS	28 HP	54 HP	241-020-02
		42 HP	40 HP	241-020-03
		56 HP	26 HP	241-020-04
5	Threaded inserts M 2,5	28 HP	54 HP	250-060-54
		42 HP	40 HP	250-060-40
		56 HP	26 HP	250-060-26

11 Mounting screws for subracks

- Packaging unit: 100 pieces

Material:
nickel-plated/galvanised (Item 1, 3, 6)
galvanised (Item 2, 4, 5, 8)
plastic, black (Item 7)



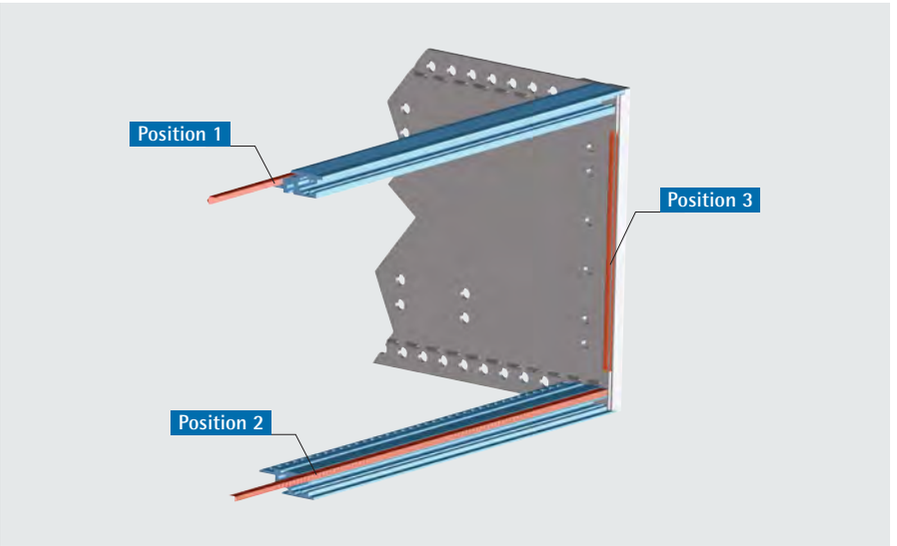
Item	Description	Order no.
1	Oval head screw M 4 x 12 with serration for screw retention	630-096
2	Countersunk screw M 5 x 12 (for mounting of handles)	630-121
3	Oval head screw M 2,5 x 10	630-094
4	Washers ø 2,6	630-152
5	Countersunk screw M 4 x 10	630-119
6	Oval head screw M 5 x 16	630-098
7	Decorative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

www.apra.de

EMC contact springs

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

Material:
copper beryllium
Finish:
tin-plated



Position 1

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

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

Position 2

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

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

Position 3

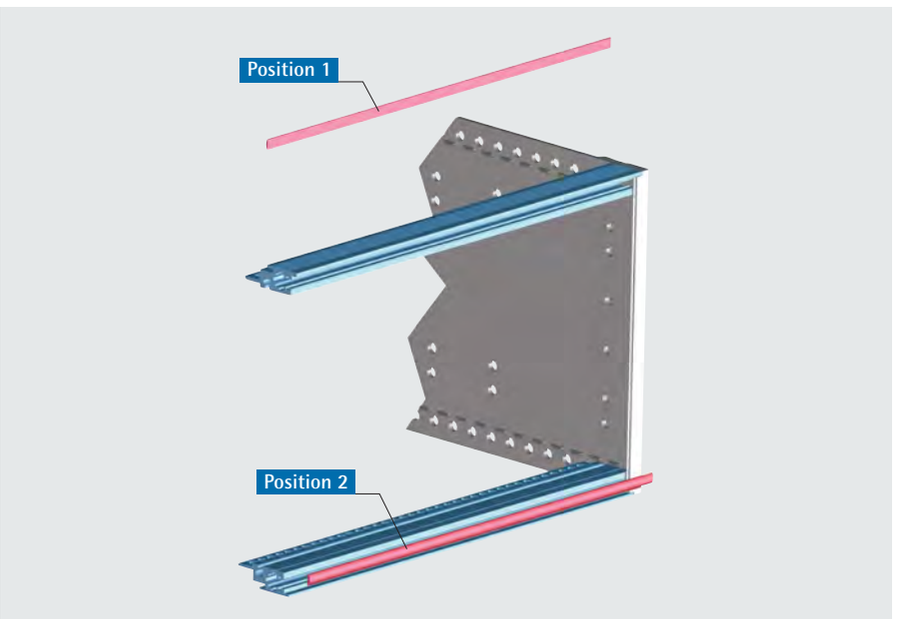
Vertical EMC contact gasket for connecting all front panels with each other and with the front or rear brackets.

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

EMC fabric gasket

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

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



Position 1

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

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

Position 2

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

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

www.apra.de

Z-rail, version 1

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

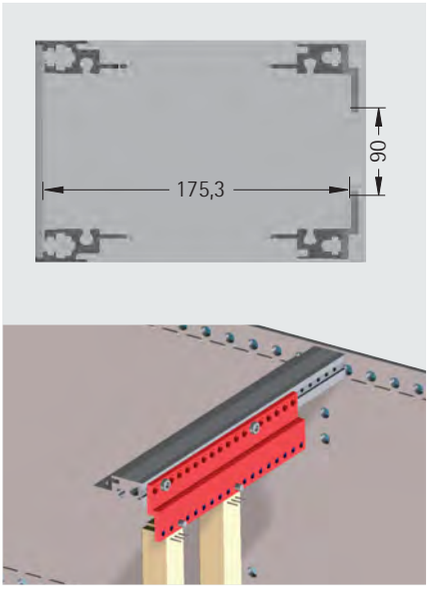
Material:
aluminium

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

Assembly material

Order no.
630-092

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



Z-rail, version 2

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

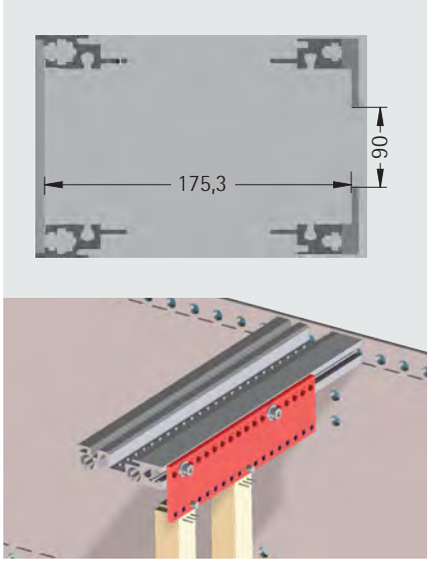
Material:
aluminium

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

Assembly material

Order no.
630-092

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



www.apra.de

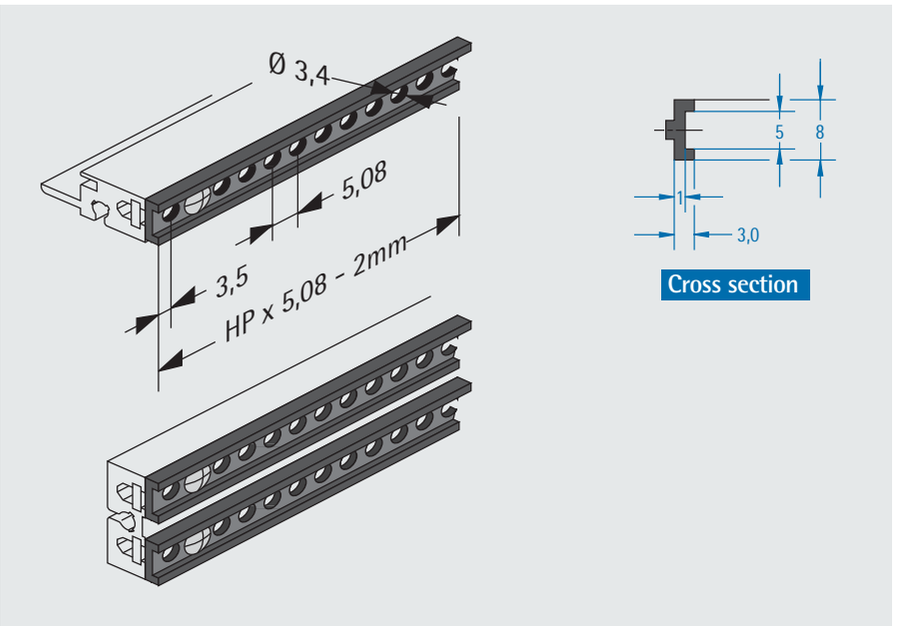
Insulating strips

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

Material:
plastic, Noryl UL 94 V-0
Finish:
black

Other lengths available on request.

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



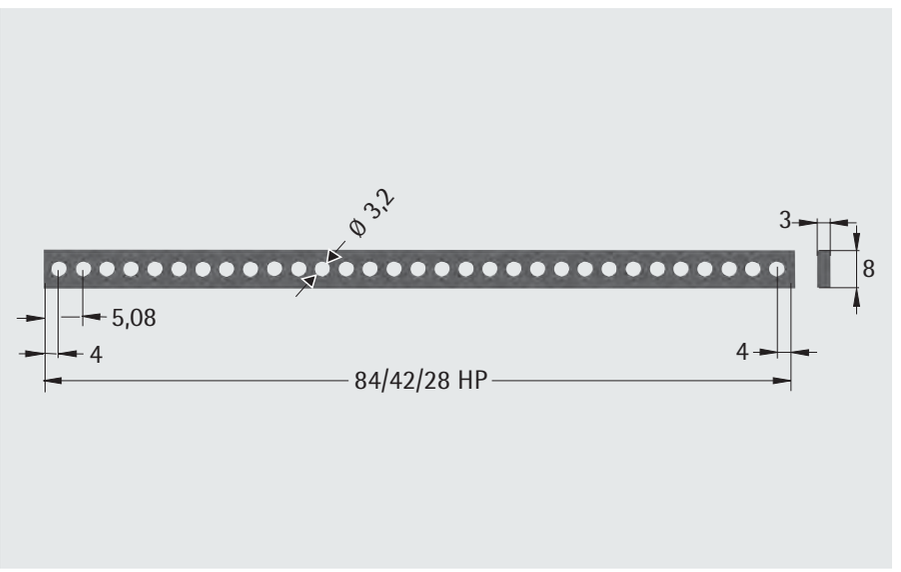
Contact strip

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

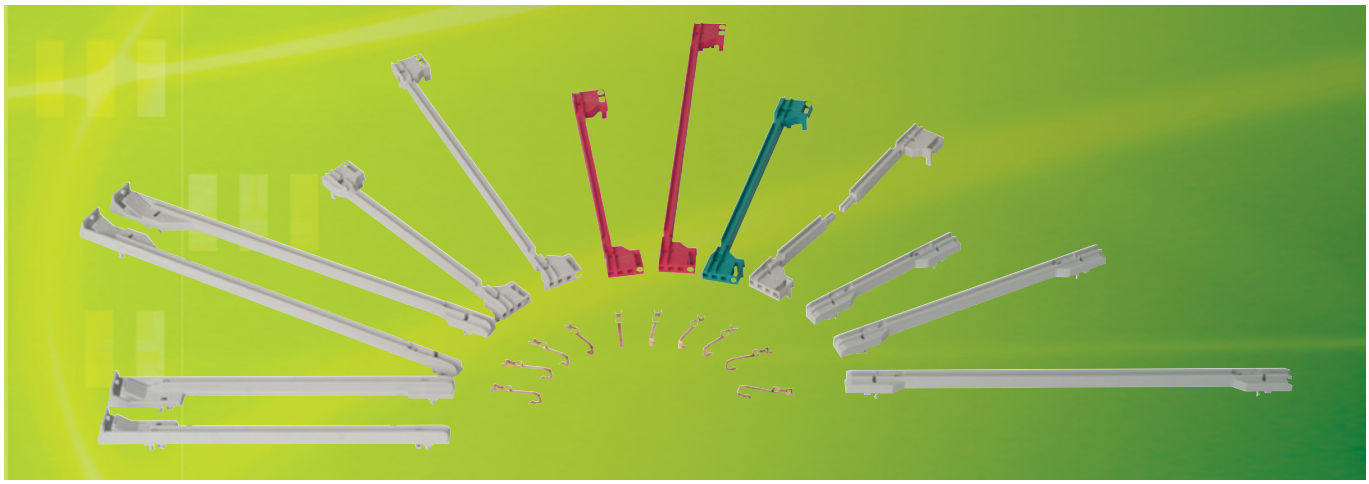
Material:
aluminium 3,0 mm
Finish:
transparent chromated

Other lengths available on request.

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

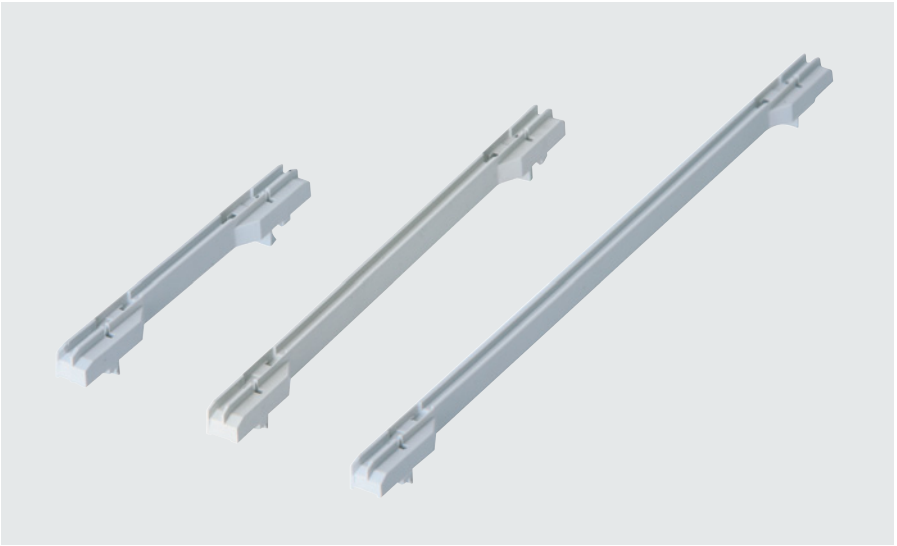


Card guides



Available card guides:

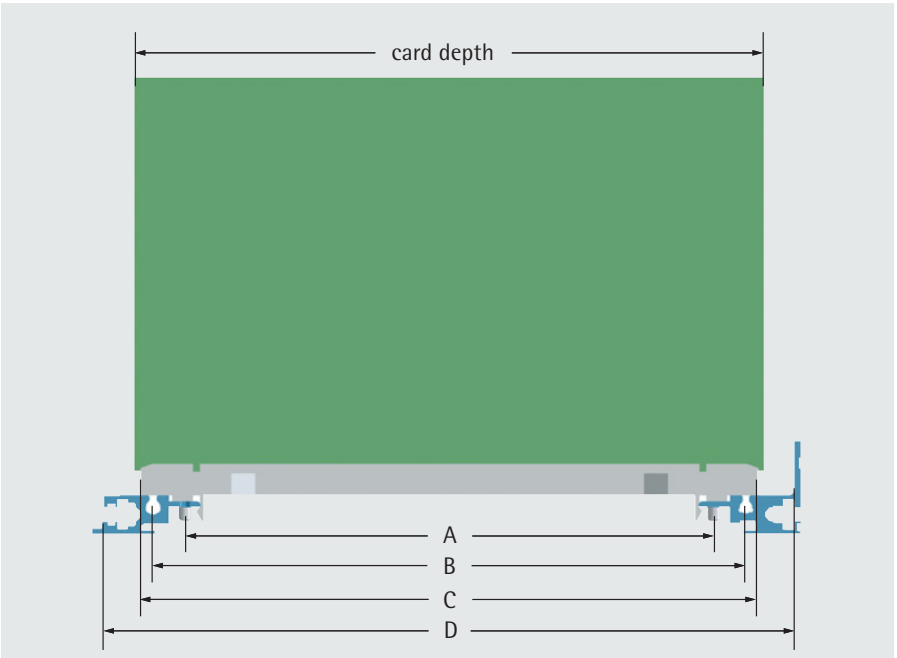
- standard card guide
- integrated card guide
- card guide with IEEE coding
- divided card guide



Standard card guide

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

Material:
plastic, classified acc. to UL 94-V 0
Finish:
similar RAL 7035 light grey

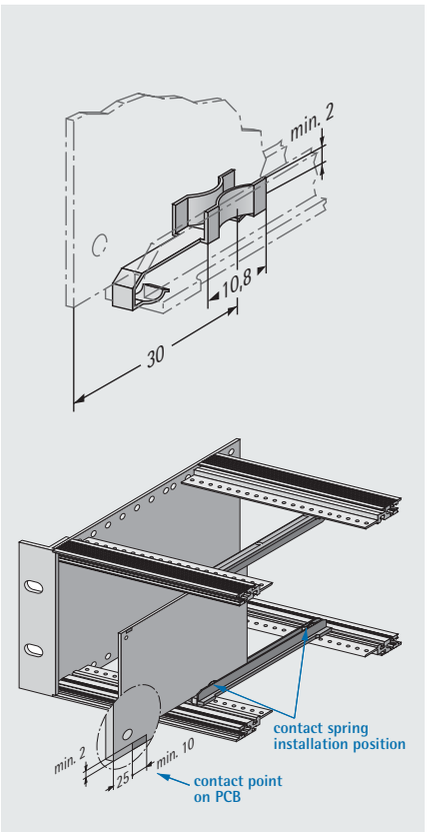


Card depth d mm	Order no.
220	240-406-00
160	240-401-00
100	240-402-00

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

www.apra.de

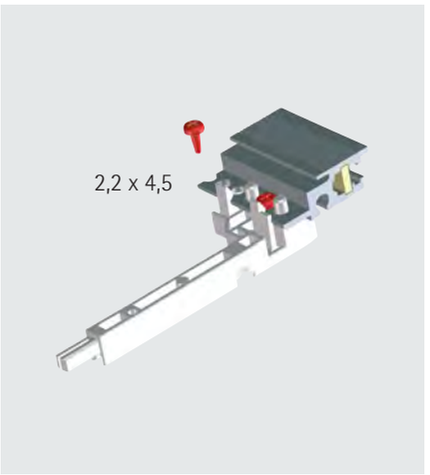
ESD clips for standard card guide



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

Order no.
240-400-30

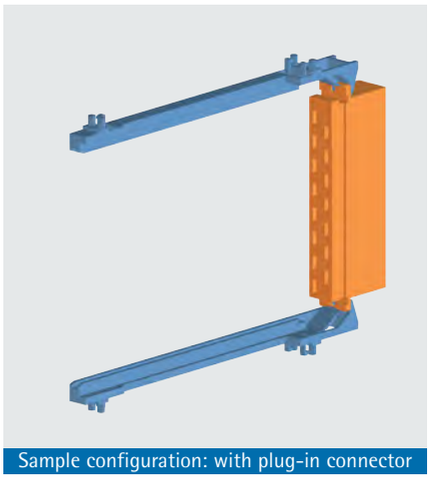
Fixing screw



- for fixing the IEEE card guide

Order no.
631-200

Card guide, integrated



Sample configuration: with plug-in connector

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

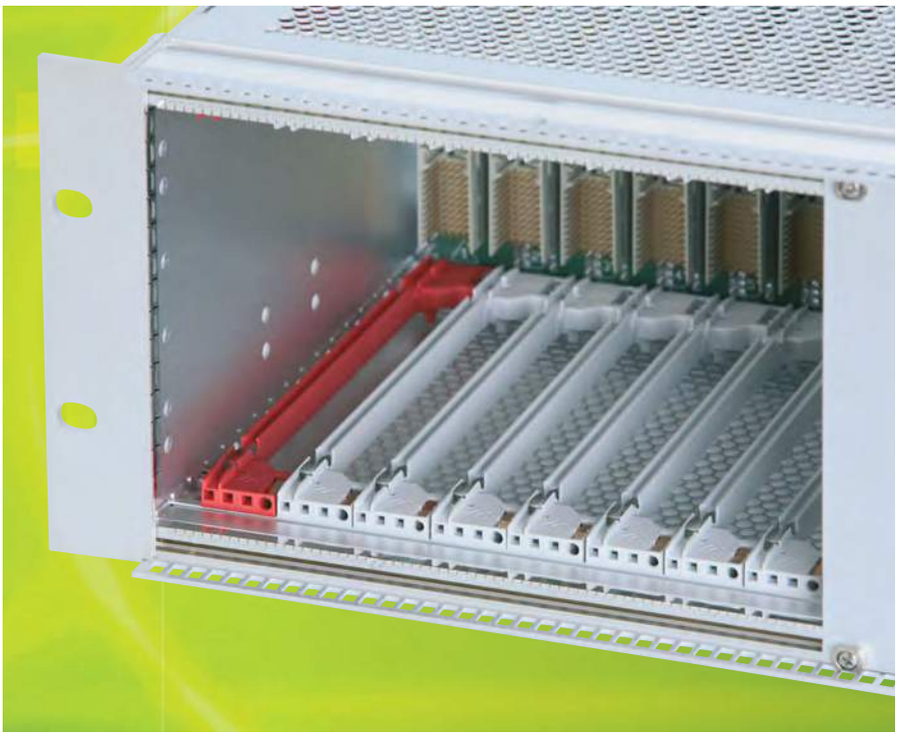
Material:
plastic, classified acc. to UL 94V-0
Finish:
similar RAL 7035 light grey

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

Card guide with IEEE coding

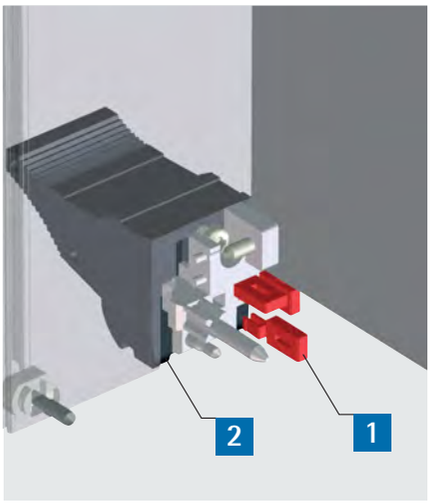
- with pin-chambers for reception of coding pins
- groove width 2.6 mm for PCB thickness 1.6 - 2.0 mm
- can be fitted with 2 ESD clips for discharge of electrostatic charges (recommended: 1x per card guide)
- can be used with ESD clip for contacting the alignment pin of the insertion / extraction handels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

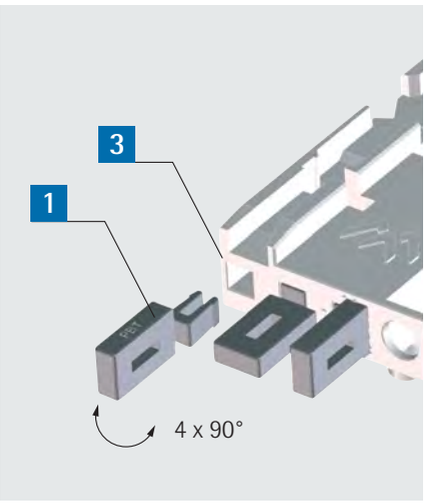
Material:
plastic, classified acc. to UL 94V-0

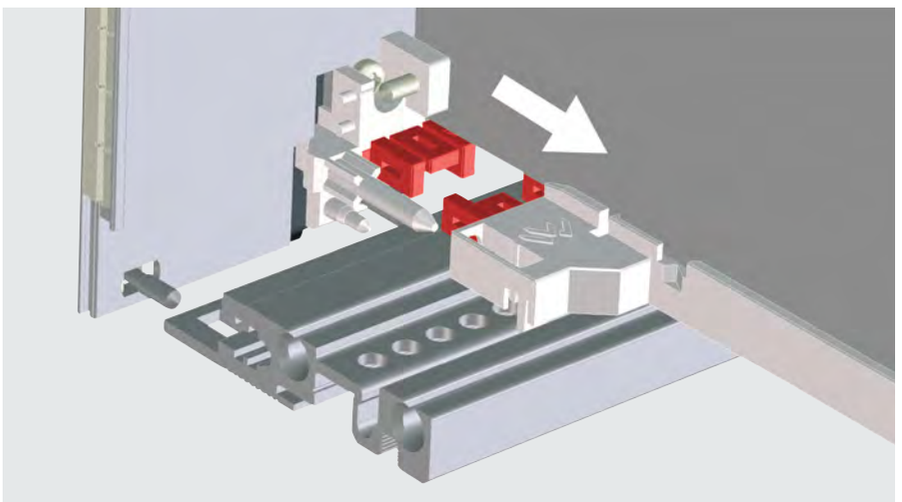


Application

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







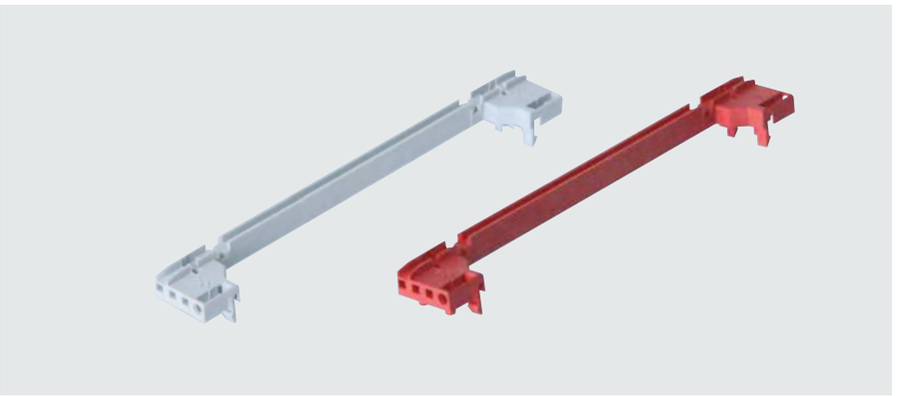
www.apra.de

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

- red colour for system slot / CPU-boards

Finish:
similar RAL 7035 light grey or RAL 3001 signal red

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

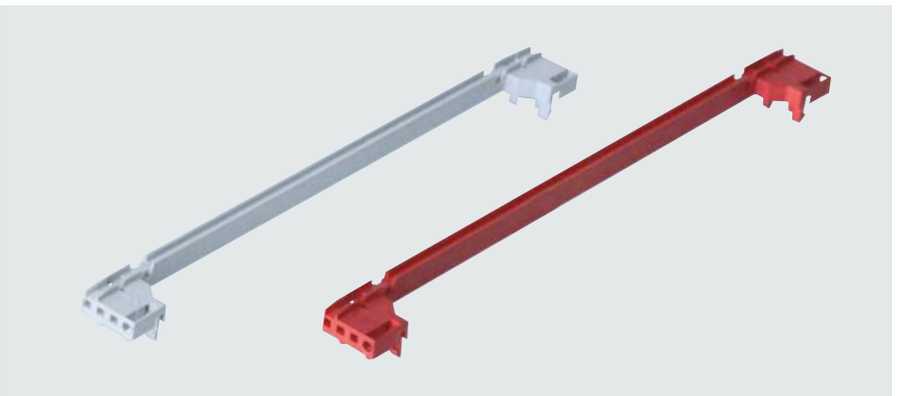


Card guide with IEEE coding 4 HP for card depths of 220 mm

- red colour for system slot / CPU-boards

Finish:
similar RAL 7035 light grey or RAL 3001 signal red

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



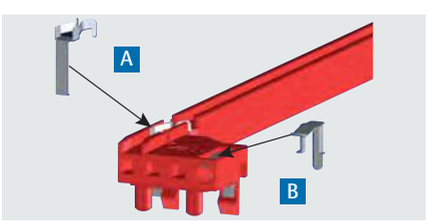
Card guide with IEEE coding, offset 1/2 HP • for card depths of 160 mm

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

Finish:
green

Order no.
240-160-50

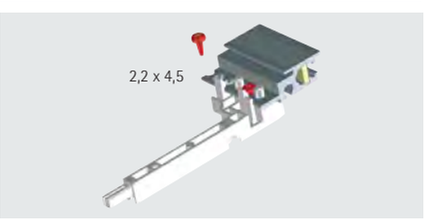
ESD clip



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

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

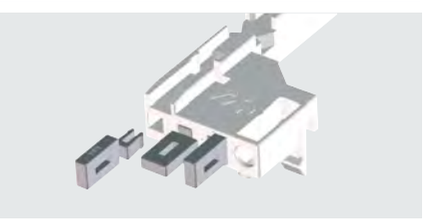
Fixing screw



- for fixing the IEEE card guide

Order no.
631-200

Coding pin

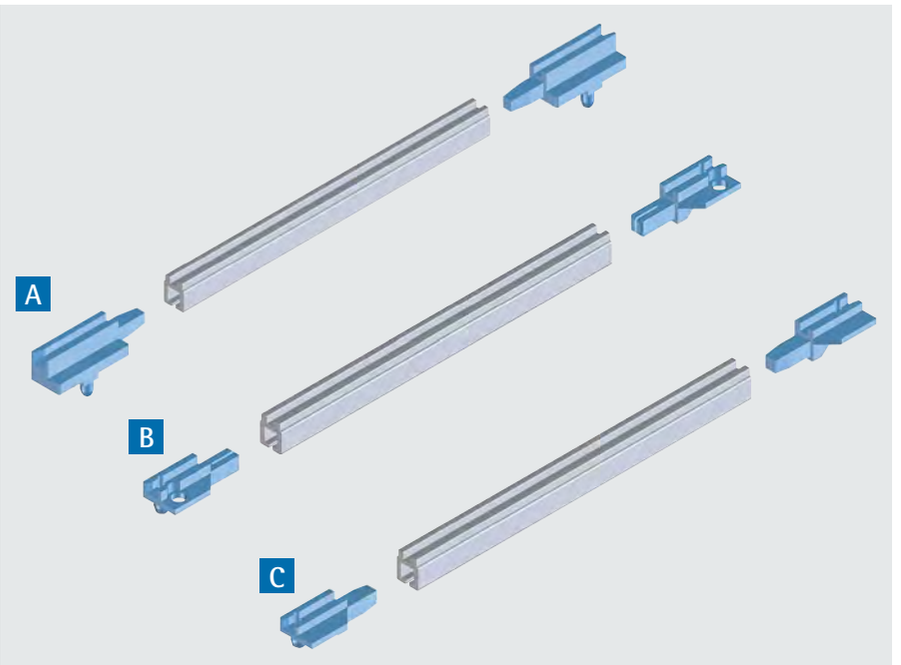


Material:
polycarbonate, classified acc.to UL 94-V 0
Finish:
grey

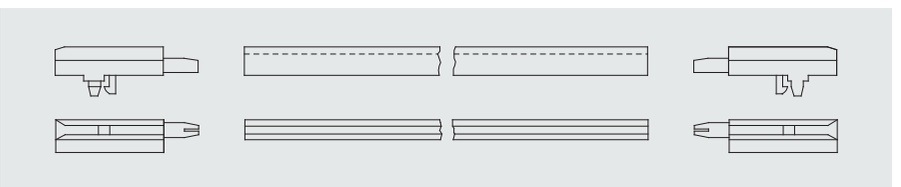
Order no.
240-163-50

Divided card guides

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



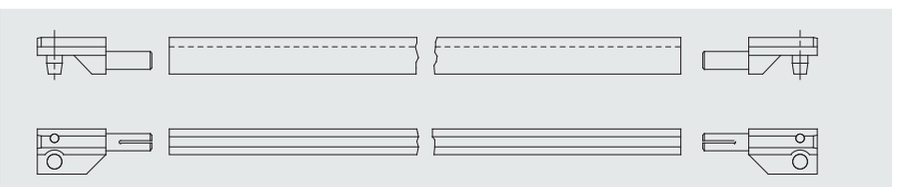
A Divided card guide (standard) for any card depth



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

B Card guide for ISEP PCBs

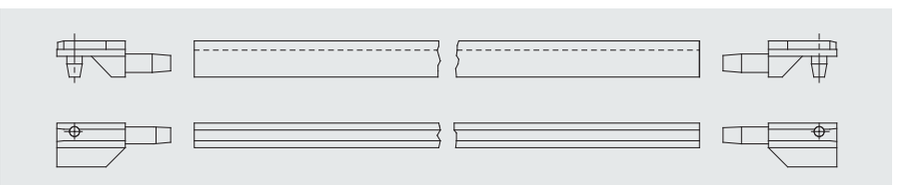
- PCB height in 3 U subracks is 110.49 mm



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

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

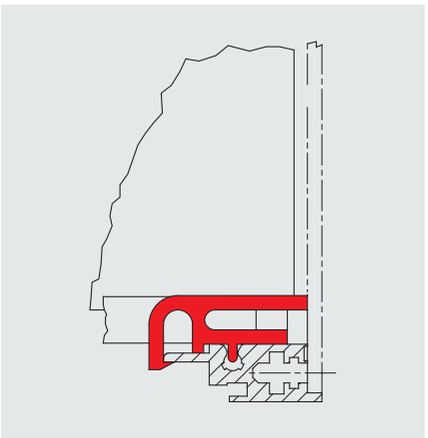
Minimum order quantity 500 pairs!



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

www.apra.de

PCB lock

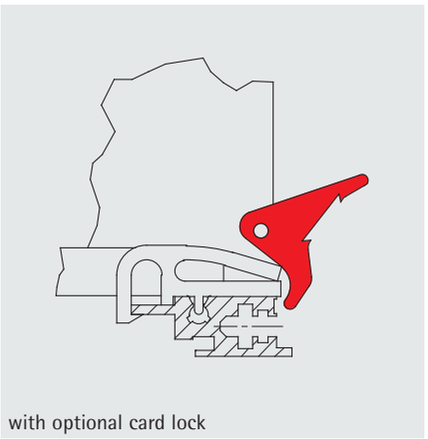


- for fastening PCB's to prevent them from falling out
- can be used with front panels
- snaps into place easily

Material:
plastics, classified acc. to UL 94-V 0
Finish:
similar RAL 7035 light grey

Order no.
250-716

Extraction handle



with optional card lock

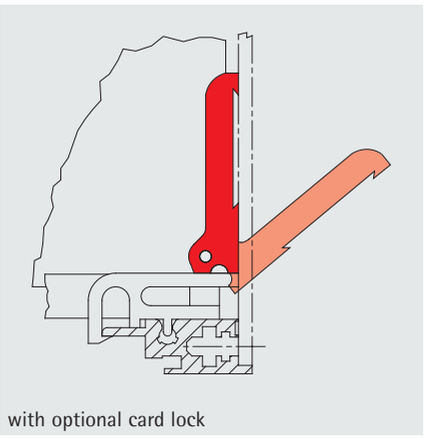
- for extracting PCB's
- the optional PCB lock is opened automatically
- with space for attaching designation strips

Material:
plastics
Finish:
matt black

Cannot be used in combination with a front panel.

Order no.
250-715

Extraction handle, flat version



with optional card lock

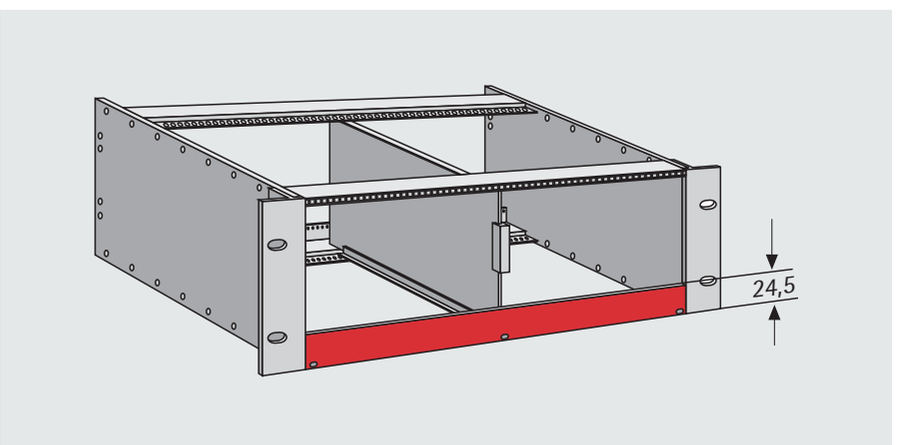
- can be used with front panels
- the optional PCB lock is opened automatically

Material:
plastics, classified acc. to UL 94-V 0
Finish:
similar RAL 7035 light grey

Order no.
250-717

Group lock extrusion

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



Delivery

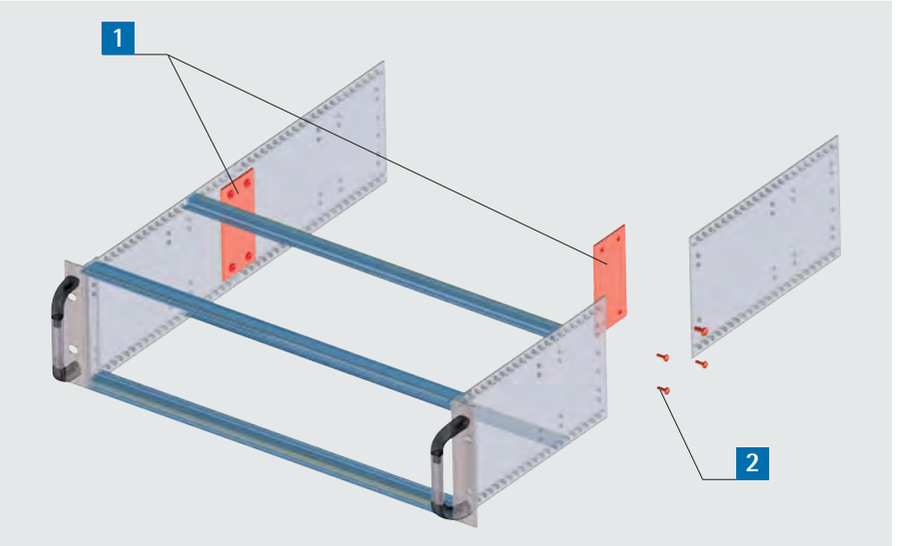
Pc.	Description
1	Group lock extrusion, anodised
1	Rubber seal
3/4	Knurled screw
3/4	Screw holder

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

Extension kit

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

Material:
aluminium 2,0 mm



Delivery

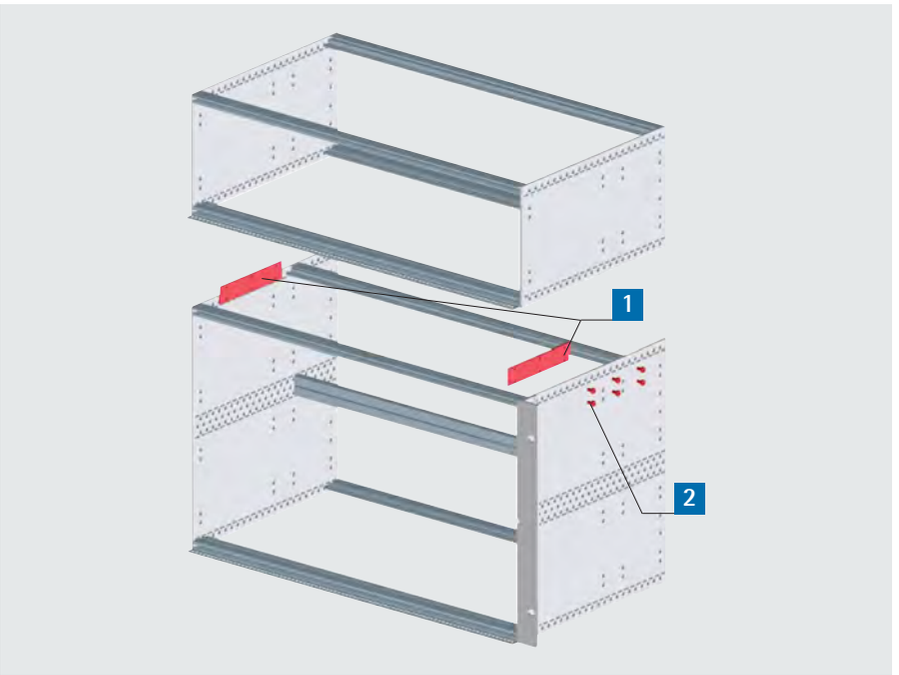
Item	Pc.	Description
1	2	Extension plates
2	8	Oval-head screws M 4 x 5

Order no.
245-000-70

Connecting kit

- for connecting individual subracks to a module subrack

Material:
aluminium 1,5 mm



Delivery

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

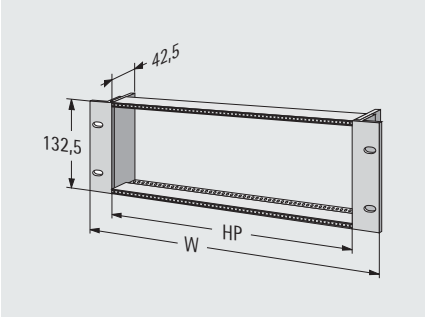
Order no.
245-000-80

Other accessory parts

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

www.apra.de

Frame, 3 U



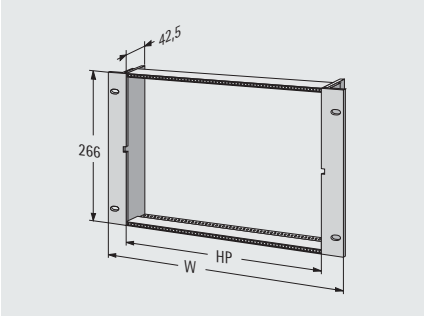
- single row with 2 threaded inserts

Delivery

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

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

Frame, 6 U

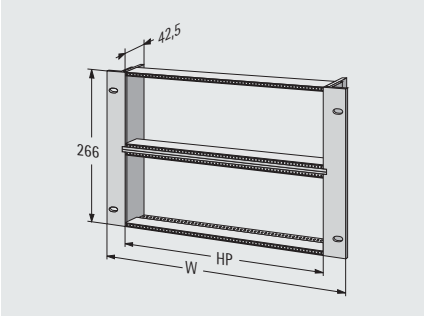


- with 2 threaded inserts

Delivery

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

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



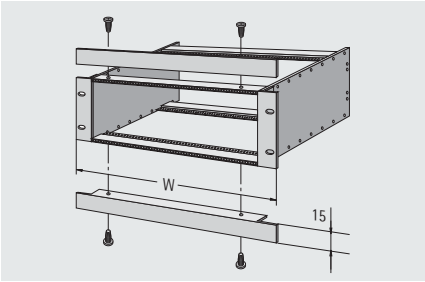
- double row with 4 threaded inserts

Delivery

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

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

Cover bracket



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

Delivery: unmounted

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

Delivery

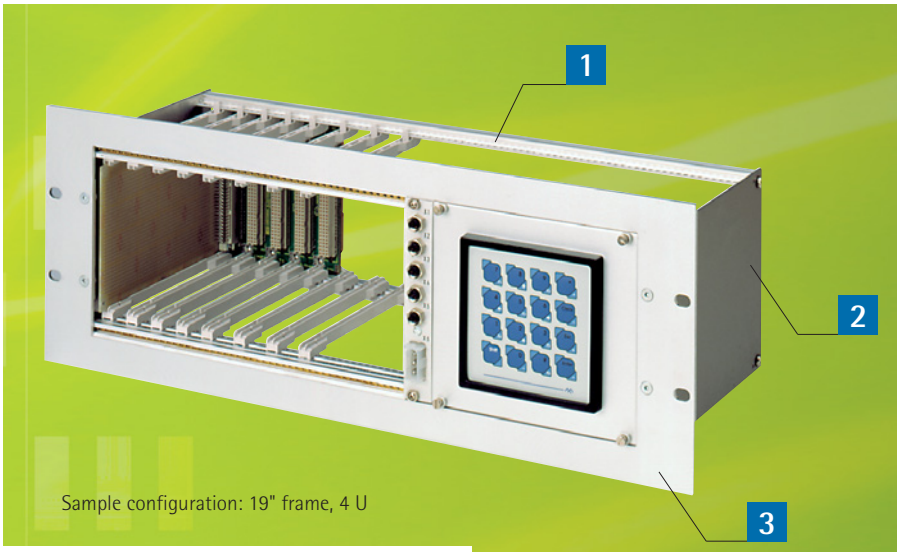
Item	Pc.	Description
1	1	Bracket
2	2	Countersunk screw M 3 x 8

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

19" frame, 4 U

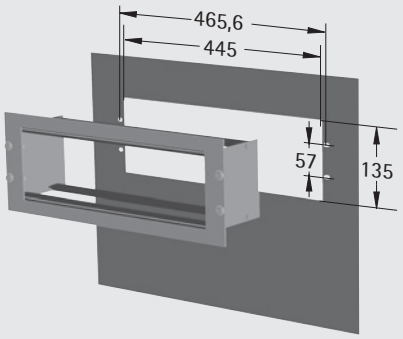
- this frame is the ideal supplement for control panel enclosures
- can be installed in switch cabinet doors or similar applications
- depth: 126 mm
- for installing active components and/or 100 mm x 100 mm eurocards
- installed in a 445 mm x 135 mm cut-out and attached on the front using four screws

Delivery: kit form



Sample configuration: 19" frame, 4 U

Control panel cut-out and hole pattern

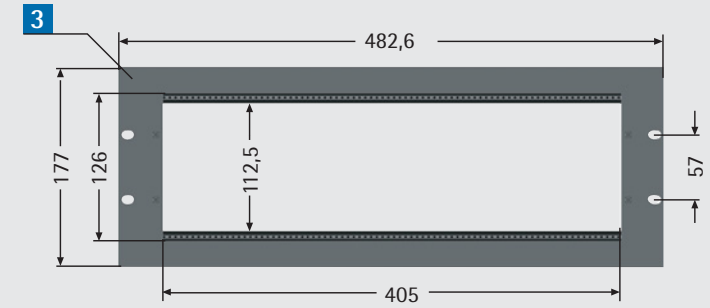


Delivery

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

Order no.
201-075-00

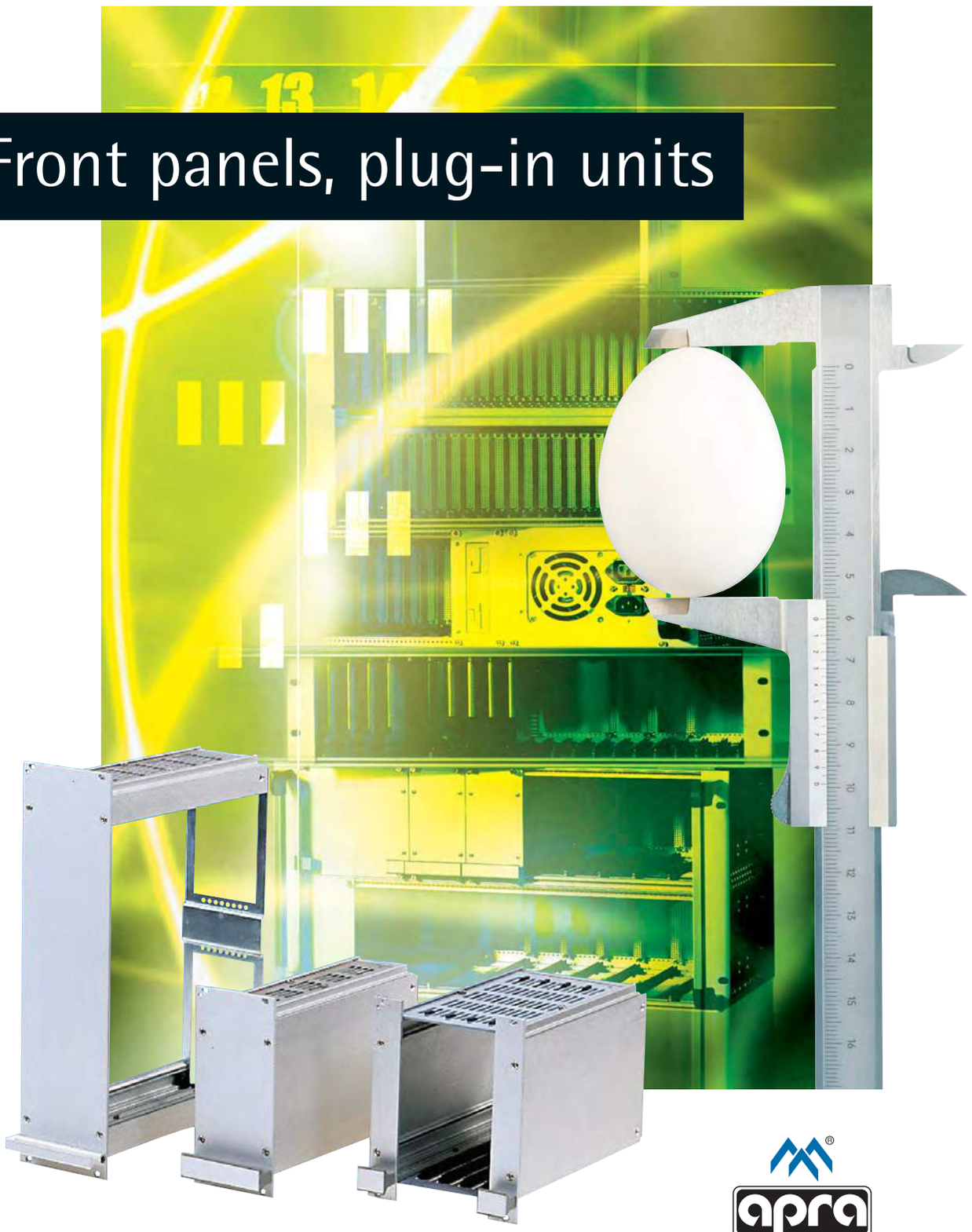
Other sizes available on request!



Front view

Top view

Front panels, plug-in units



... the perfect shell for valuable electronics

Online front panel service from apra-norm

Create your customised front panel online

(without software download):

www.frontpanel-online.com

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

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

2 ... and if you want more

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

  Printing data as vector data in formats DXF, DWG, PDF, AI or CDR can be used.
  Please transfer all scripts to vector graphics and indicate colour precise.

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

www.apra.de

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

Punching, laser cutting

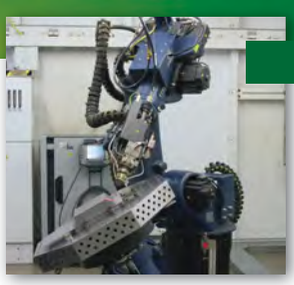
- laser cutting
- punching
- embossing
- marking

Bending

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

Milling / chamfering

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



Welding

- laser welding
- stud welding
- customary welding

Insertion

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

Surface technology

- powder coating
- wet painting
- chromating

Production possibilities for plastic parts and enclosures

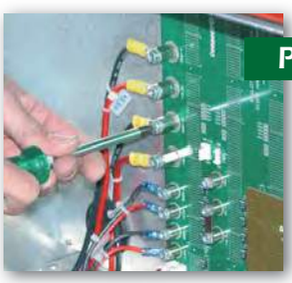
- milling and bending technology
- injection moulding

Prototyping for plastic parts

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

Printing/foils

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



Preassembly / tailoring

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

243 • Front panel

www.apra.de

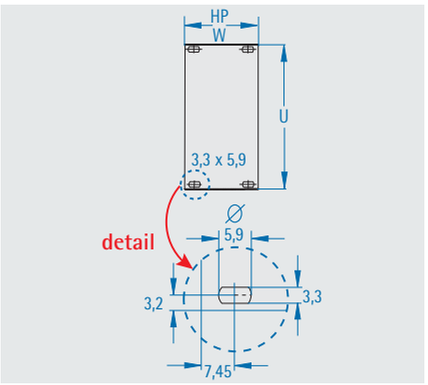
Front panel

- anodised front
- conductive rear

Material:
aluminium 2,5 mm
Delivery:
unmounted

See page 131 for matching screw holder and neck screws.

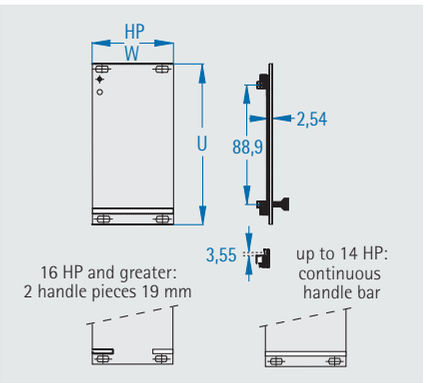
Type A



Delivery

Item	Pc.	Description
1	1	Front panel

Type C



- plastic handle bar
- plastic PCB mounting plate

Delivery

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

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

www.apra.de

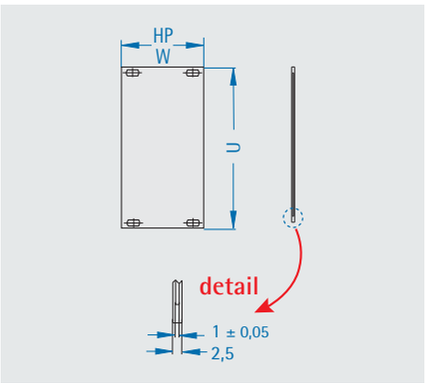
EMC front panel

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

Material:
aluminium 2,5 mm
Delivery:
unmounted

See page 131 for matching screw holder and neck screws.

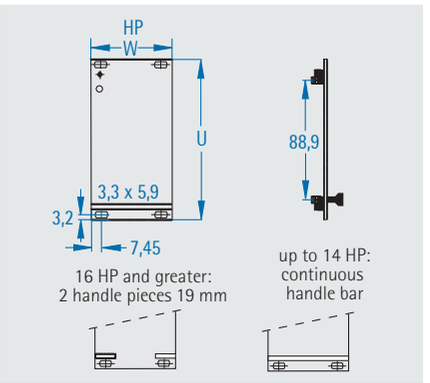
Type A - EMC



Delivery

Item	Pc.	Description
1	1	Front panel

Type C - EMC



- plastic handle bar
- plastic PCB mounting plate

Delivery

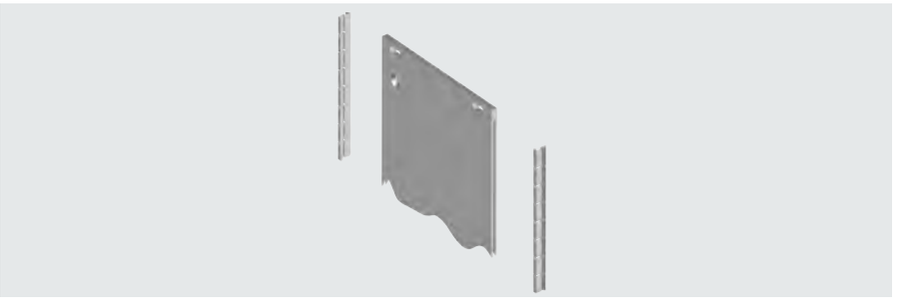
Item	Pc.	Description
1	1	Front panel
2	1/2	Plastic handle
3	1/2	Identification plates
4	2/4	PCB mounting bracket
5		Assembly material

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

EMC contact springs

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

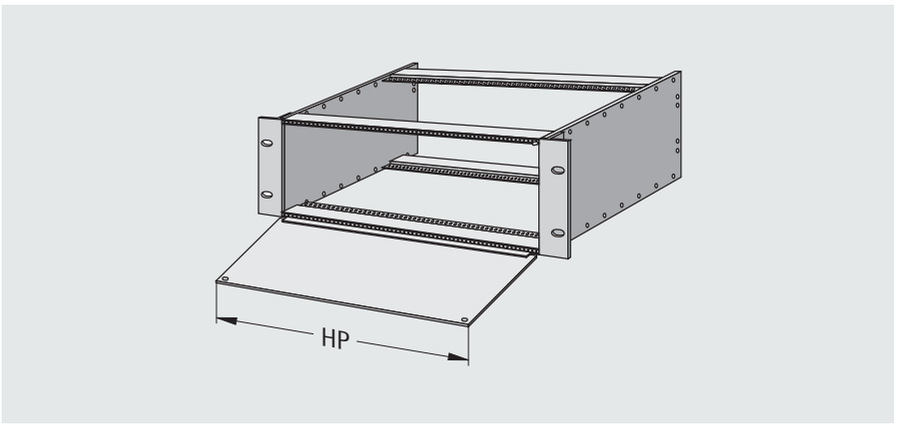
U	L mm	Order no.
3	97	671-184
6	232	671-185



Front panel, bottom-hinged

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

Finish:
anodised front, conductive rear

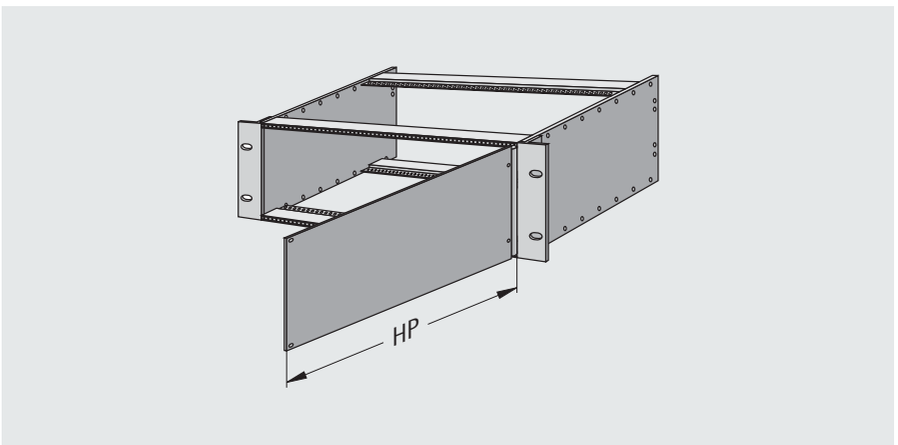


U	HP	Order no.
3	42	244-342-13
3	84	244-384-13
6	42	244-742-16
6	84	244-784-16

Front panels, pivoted

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

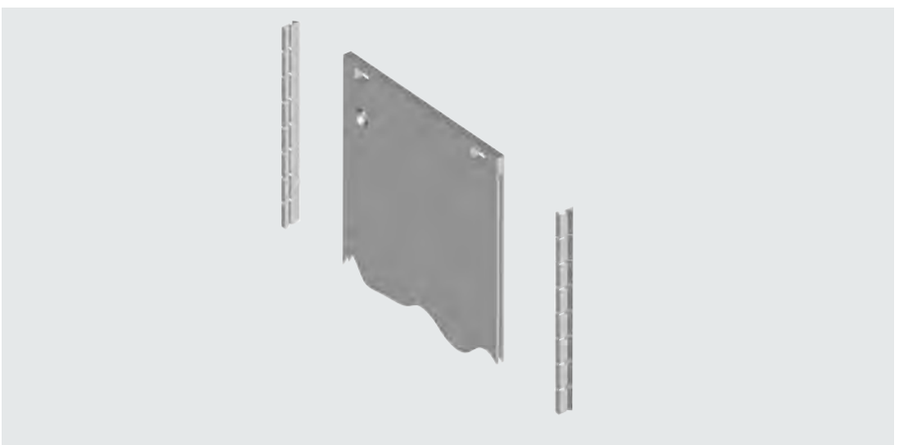
Finish:
anodised front, conductive rear



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

EMC contact springs

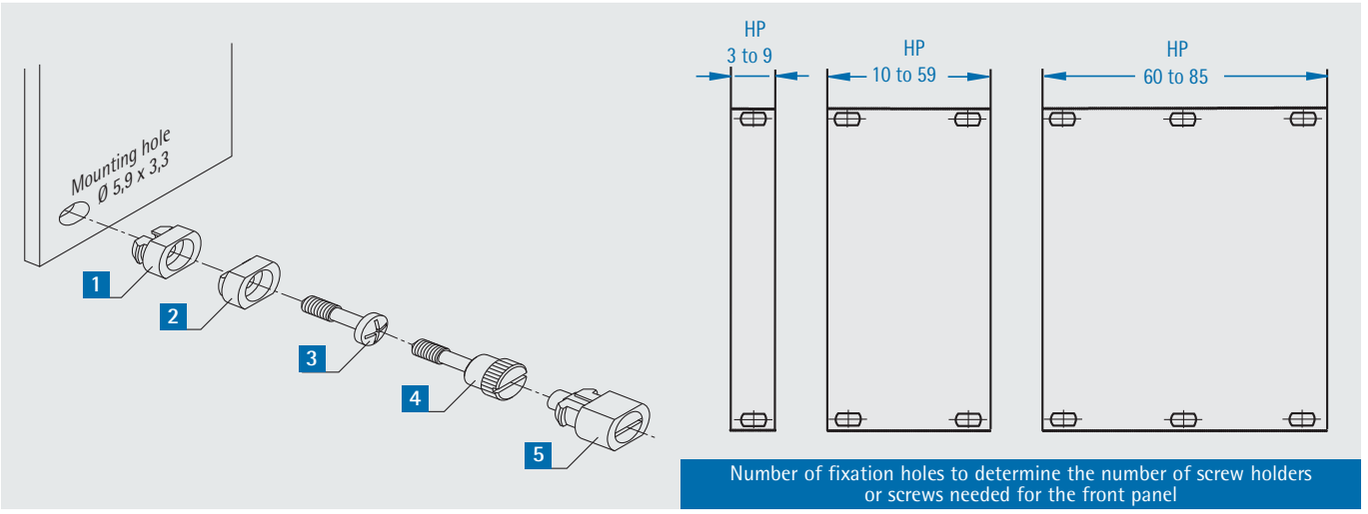
The contact springs are clipped onto the side grooves so that the front panels contact one another.



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

www.apra.de

Fastening front panels



Number of fixation holes to determine the number of screw holders or screws needed for the front panel

1 Screw holder, plastic

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

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

2 Screw holder, brass

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

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

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

3 Neck screw, M 2.5 x 12

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

Order no.
250-602

4 Knurled screw M 2.5 x 12,2

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

Order no.
250-611-02

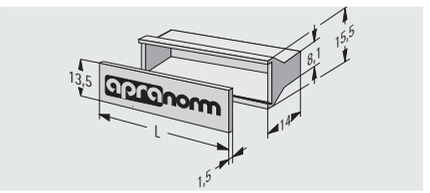
5 Quick closure

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

Finish:
similar to RAL 7035 light grey

Order no.
250-607-00

Handle bar, plastics



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

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

250 • Aluminium handle bar / PCB mounting bracket

Aluminium handle bar

Finish:
naturally coloured anodised

Please order assembly material separately.

Assembly material

Square nut M 2,5
630-192

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

PCB fixing

1 PCB fixing

- plastics, single piece

Order no.
250-701

2 PCB fixing

- plastics, divided

Order no. (pair)
250-700

3 PCB fixing

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

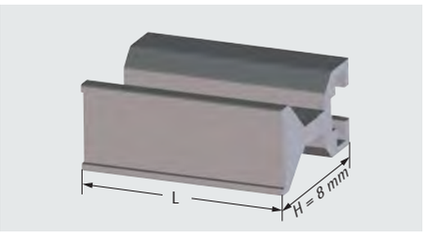
Can only be used with handle bar 250-750-XX (see page 131)

Order no.
250-698

Assembly material for Item 1-3

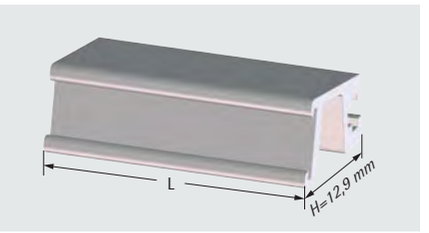
Order no.
250-707

Aluminium handle bar "trapezoidal"

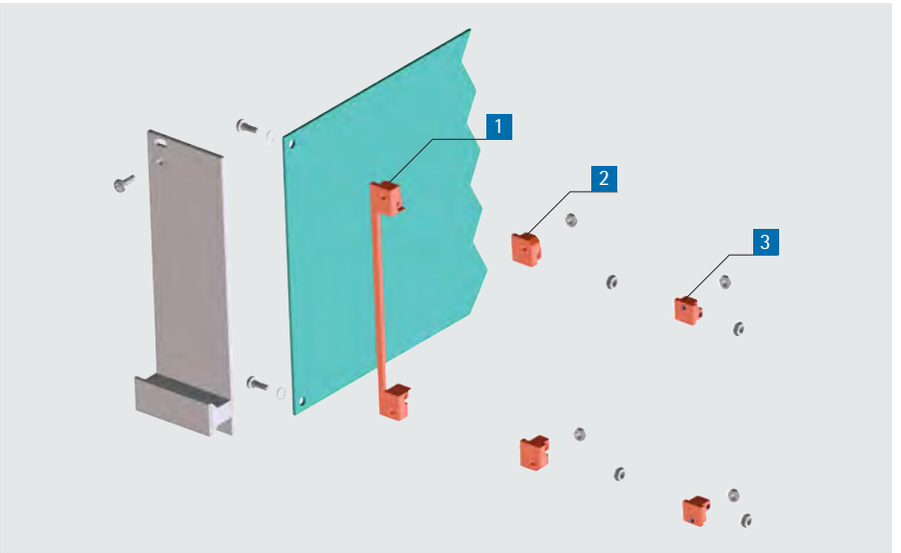


HP	L mm	Order no.
3	14,00	250-653
4	19,10	250-654
5	24,10	250-655
6	29,20	250-656
7	34,20	250-657
8	39,30	250-658
10	49,40	250-660
12	59,60	250-662
14	69,80	250-664

Aluminium handle bar "sloped"



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



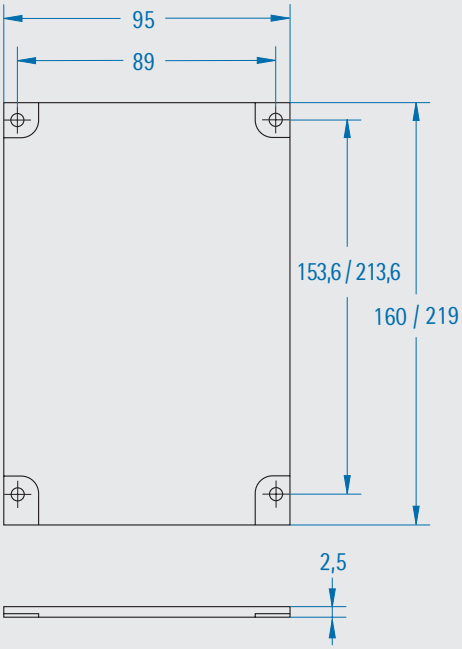
Please order mounting material separately.

www.apra.de

PCB cover

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

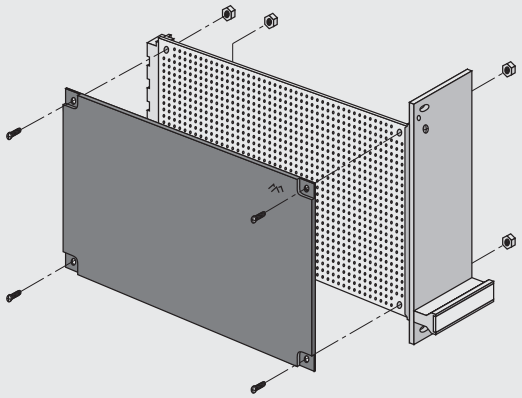
Material:
plastics, flammability rating acc. to UL 94 V-0
Finish:
black



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

PCB cover, shortened model

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



Description	Order no.
PCB cover, shortened	258-199

Mounting material

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

Plug-in components with IEEE insertion and extraction handle

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

- two types of front panels are available:

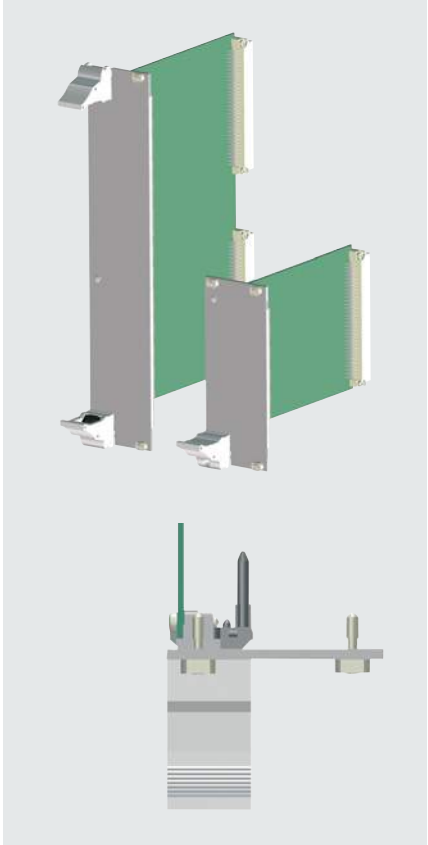
A Front panel IEEE with side groove for EMC contact springs

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

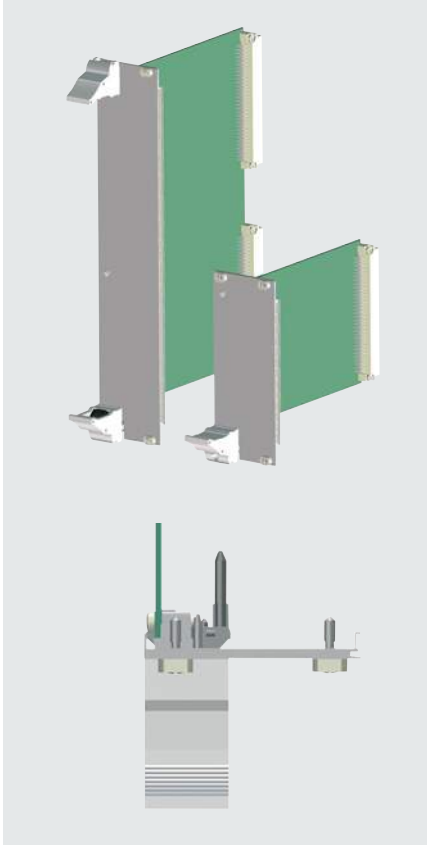
B Profiled front panel IEEE

Material: aluminium profile extrusion
Surface: chromated

A Front panel IEEE



B Profiled front panel IEEE

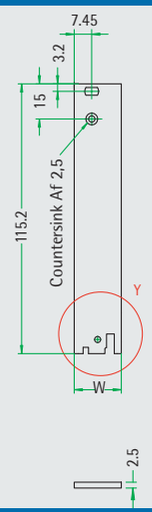


www.apra.de

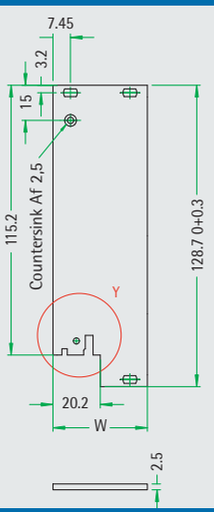
Front panel IEEE with side groove for EMC contact springs

3 U

4 HP

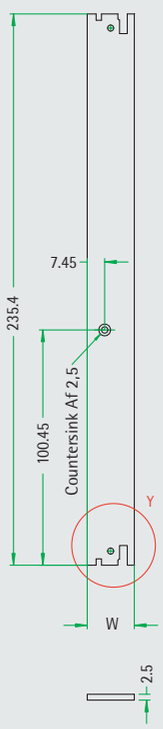


≥ 5 HP

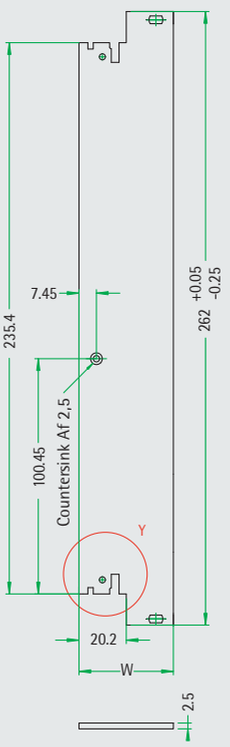


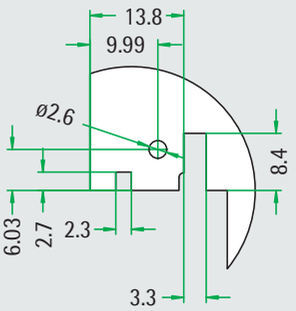
6 U

4 HP



≥ 5 HP





Detail Y

Delivery

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

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

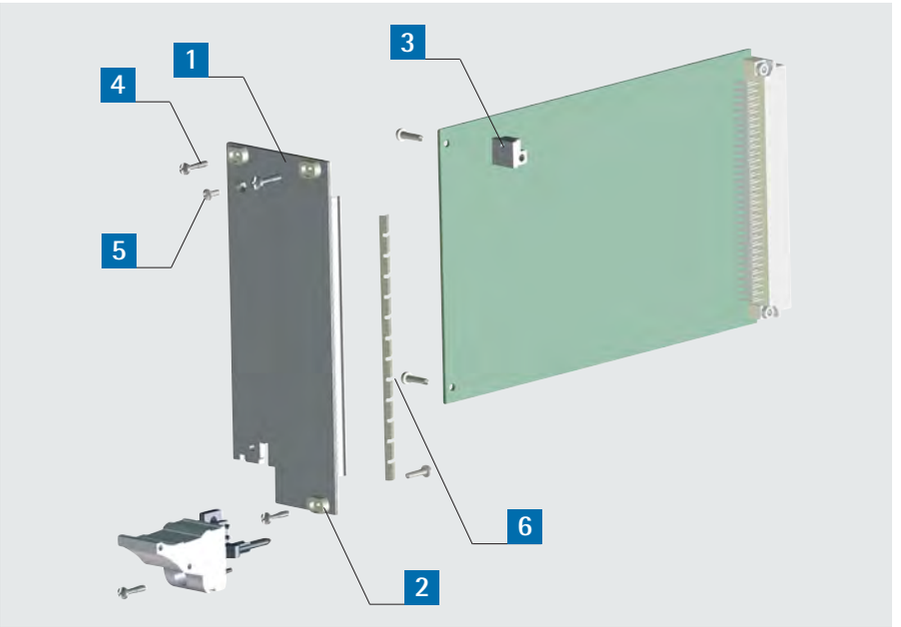
HP	W mm	3 U	6 U
4	20,10	244-604-13	244-604-16
5	25,10	244-605-13	244-605-16
6	30,20	244-606-13	244-606-16
7	35,20	244-607-13	244-607-16
8	40,30	244-608-13	244-608-16
10	50,40	244-610-13	244-610-16
12	60,60	244-612-13	244-612-16

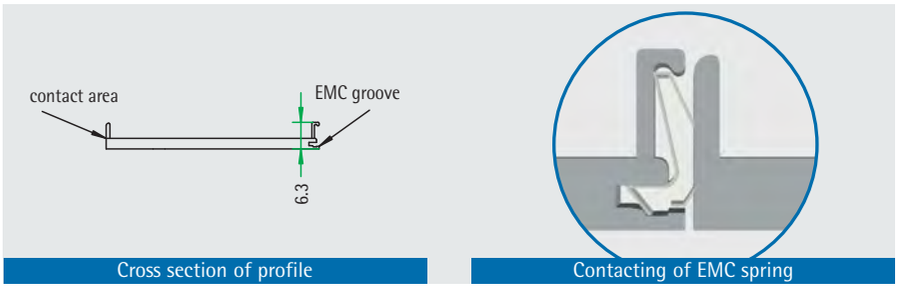
EMC contact springs

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

Profiled front panel IEEE

Material:
aluminium extrusion





Cross section of profile

Contacting of EMC spring

Other dimensions on request!

Delivery

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

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

www.apra.de

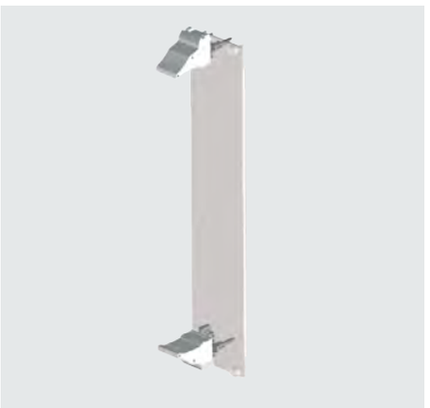
IEEE injection / extraction handle

- the following two versions are available:

1

2

1 Injection / extraction handle without locking function



Colour:
RAL 7035 light grey

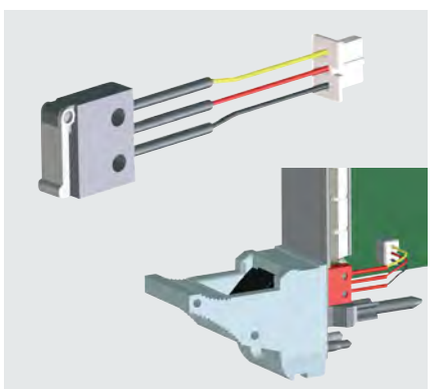
Position on front panel	Order no.
Bottom	611-615
Top	611-616

2 Injection / extraction handle with locking function

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

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

Micro switch



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

The adequate plugs are not included in the delivery.

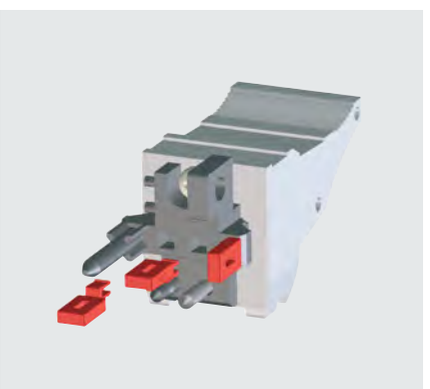
Order no. (1 piece)
230-245

PCB fixing set for 3U

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

Order no. (Set)
250-713

Coding pins



- packing unit = 100 pieces

Colour:
similar to RAL 7035

Order no.
240-163-50

www.apra.de

EMC compact sub-unit, 3 U

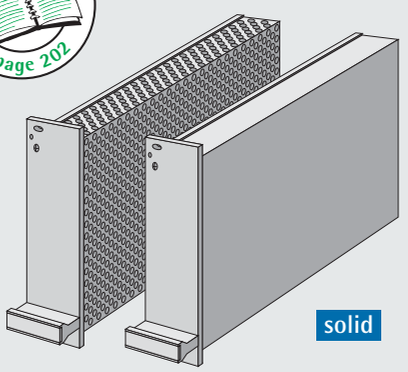
- fits all desktop enclosures and subracks (except ruggedized subrack)
- EMC compliant design
- with side grooves for EMC contact springs
- rear plug-in connection for contact acc. to IEC 60603-2

Application:
for **one** PCB 100 x 160 mm
Material:
front panel: aluminium 2.5 mm
side section: aluminium extrusion
cover panel: aluminium 1.5 mm
handle: plastics with aluminium strip
Finish:
front panel:
anodised front, conductive rear
side section: transparent chromated
cover hood: transparent chromated
Delivery:
unmounted

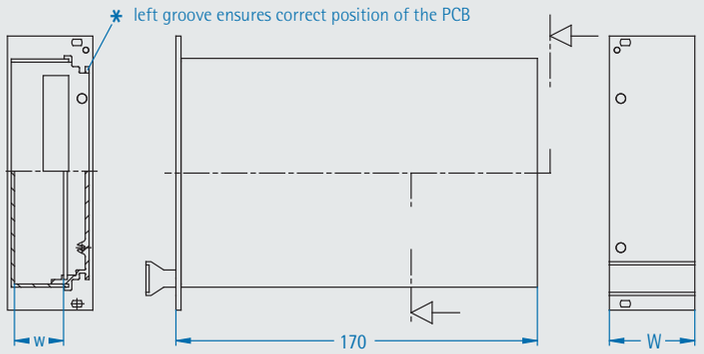
Please ask for apra's assembly service

further information: page 202

perforated



solid



Rear view (cross section) | Side view | Front view

See page 113 for matching contact springs.

Delivery

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

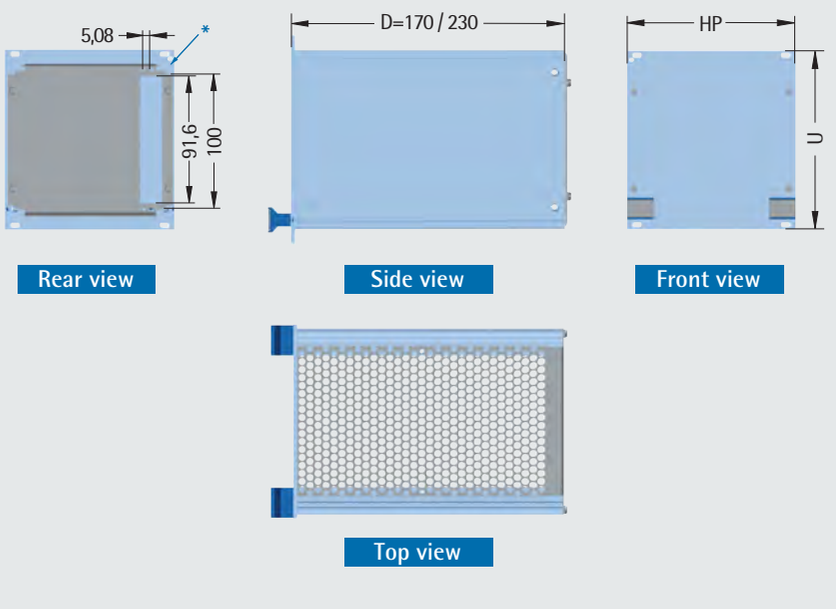
HP	W mm	w mm	Feature	Order no.
6	30,20	12,30	solid	247-921-55
8	40,30	22,50	solid	247-923-55
10	50,40	32,60	solid	247-925-55
6	30,20	12,30	perforated	247-931-55
8	40,30	22,50	perforated	247-933-55
10	50,40	32,60	perforated	247-935-55

www.apra.de

EMC sub-unit 3 U / 6 U

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

Application:
for **one** PCB
3 U: 100 x 160 mm or 100 x 220 mm
6 U: 233.35 x 160 mm or 233.35 x 220 mm with plug-in connector acc. to IEC 60603-2
Material:
front panel: aluminium 2.5 mm
side section: aluminium extrusion
rear panel: aluminium 1.5 mm
handle: plastics with aluminium strip
cover panels: aluminium 1.0 mm
Finish:
front panel:
anodised front, conductive rear
side section: transparent chromated
rear panel: transparent chromated
cover panels: transparent chromated
Delivery:
unmounted



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

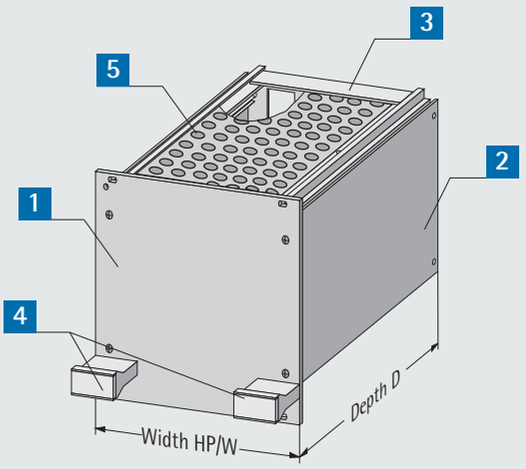
247 • EMC sub-unit 3 U / 6 U

www.apra.de

Delivery

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

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



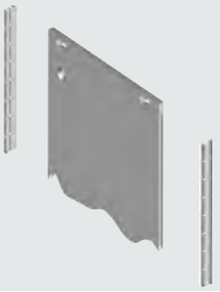
EMC sub-unit 3 U

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

EMC contact springs

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

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



www.apra.de

Sub-unit 3 U

- with closed or open sides

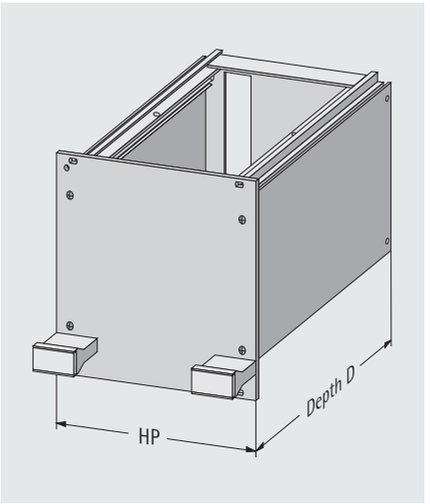
Application:
for **one** PCB 100 x 160 mm or
100 x 220 mm with connector
acc. to IEC 60603-2

Material:
front panel: aluminium 2.5 mm
side section: aluminium extrusion
rear panel: aluminium 1.5 mm
handle: plastics with aluminium strip
Finish:
front panel: anodised
side extrusion: anodised
rear panel: conductive
Delivery:
not assembled

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

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

Sub-unit 3 U with closed sides

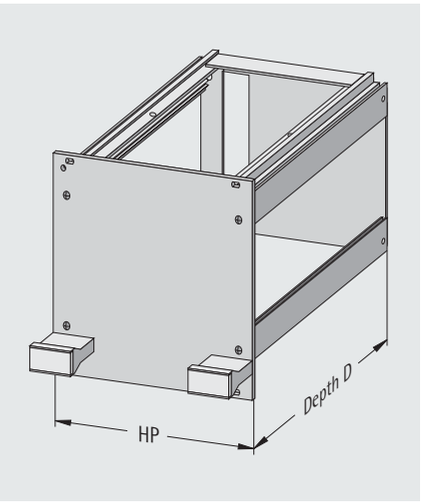


Delivery

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

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

Sub-unit 3 U with open sides



Delivery

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

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

www.apra.de

Sub-unit 6 U

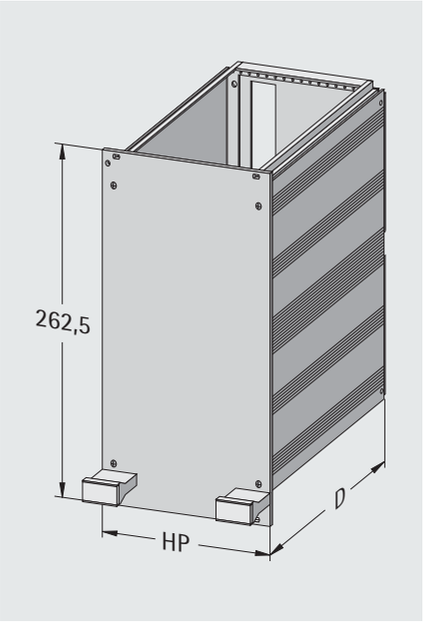
- with closed or open sides

Application:
for **one** PCB 233.35 x 160 mm or 233.35 x 220 mm with connector acc. to IEC 60603-2
Material:
front panel: aluminium 2.5 mm
side section: aluminium extrusion
rear panel: aluminium 1.5 mm
handle: plastics with aluminium strip
Finish:
front panel:
anodised front, conductive rear
side section: anodised
rear panel: conductive
Delivery:
not assembled

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

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

Sub-unit 6 U with closed sides

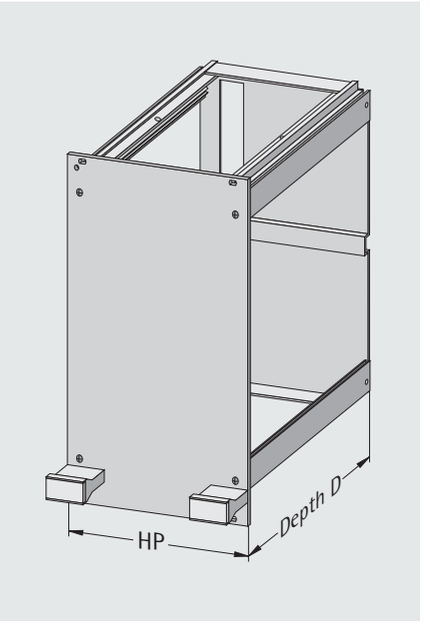


Delivery

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

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

Sub-unit 6 U with open sides



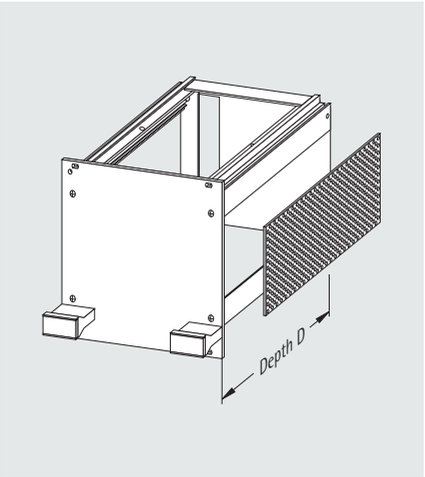
Delivery

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

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

www.apra.de

Side panel 3 U, perforated



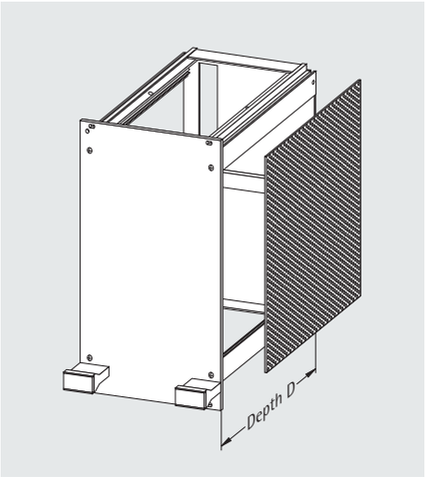
Material:
perforated aluminium panel 1.0 mm
Finish:
transparent chromated

Delivery

Item	Pc.	Description
1	1	Side panel

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

Side panel 6 U, perforated



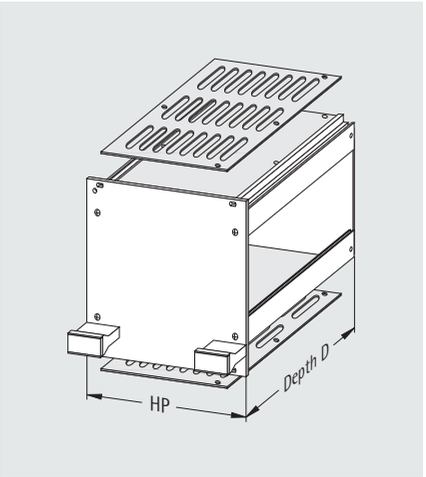
Material:
perforated aluminium panel 1.0 mm
Finish:
transparent chromated

Delivery

Item	Pc.	Description
1	1	Side panel

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

Top or bottom panel



Material:
aluminium 1.5 mm
Finish:
transparent chromated

Delivery

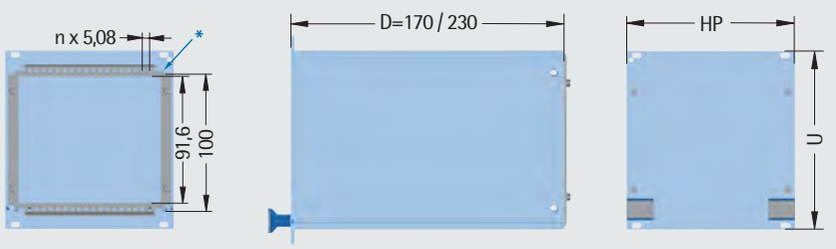
Item	Pc.	Description
1	1	Top or bottom panel

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

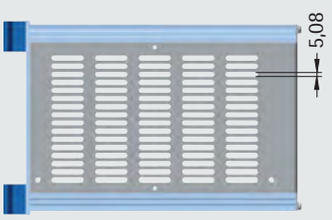
EMC cassette 3 U / 6 U

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

Application:
for **several** PCB's
3 U: 100 x 160 mm or 100 x 220 mm
6 U: 233.35 x 160 mm or 233.35 x 220 mm with connector acc. to IEC 60603-2
Material:
front panel: aluminium, 2.5 mm
side section: aluminium extrusion
rear panel: aluminium, 1.5 mm
handle: plastics with aluminium strip
cover panels: aluminium, 1.5 mm
Finish:
front panel:
anodised front, conductive rear
side section: transparent chromated
rear panel: transparent chromated
cover panels: transparent chromated
Delivery:
not assembled



Rear view | Side view | Front view

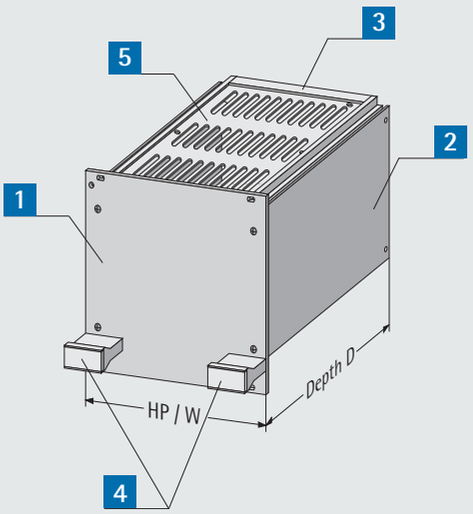


Top view

* Left groove ensures that the PCB is in the correct position.
** The handle is divided in units of 2 x 4 HP at 16 HP and bigger.

Delivery

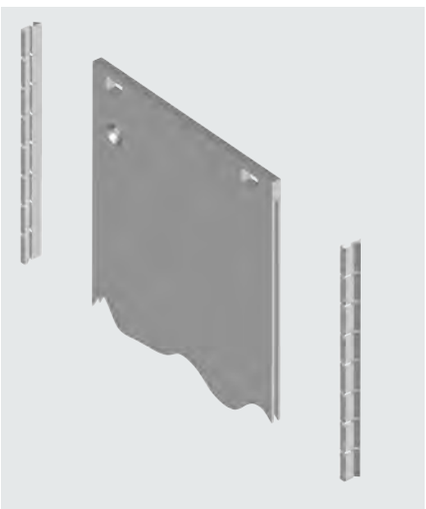
Item	Pc.	Description
1	1	Front panel with groove for EMC contact springs
2	2	Side extrusion
3	1	Rear panel
4	1/2	Handle*
5	2	Cover panels, perforated
6	1 set	Assembly material



EMC cassette 3 U

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

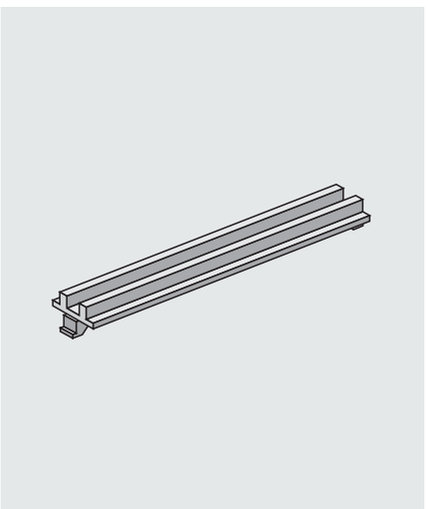
EMC contact spring



- fits in the side groove of the cassette front panel

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

Internal card guide



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

Order no.
250-712

Cassette 3 U

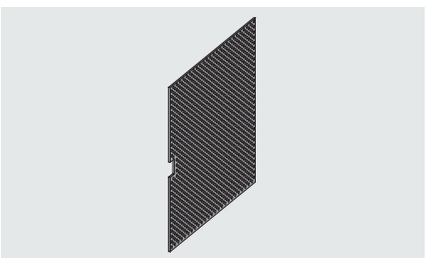
- 2 models are available
  - with open sides
  - with divided front panel
- with 1 HP mounting grid for internal card guide

Material:
front panel: aluminium 2.5 mm
side section: aluminium extrusion
rear panel: aluminium 1.5 mm
cover panels: aluminium 1.5 mm
handle: plastics with aluminium strip
Finish:
front panel:
anodised front, conductive rear
side section: anodised
rear panel: transparent chromated
cover panels: transparent chromated
Delivery: unmounted

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

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

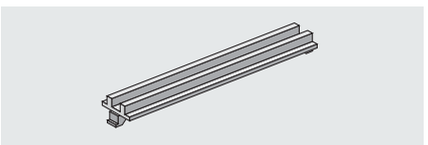
Side panel, perforated



Material:
perforated aluminium panel 1.0 mm
Finish:
transparent chromated

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

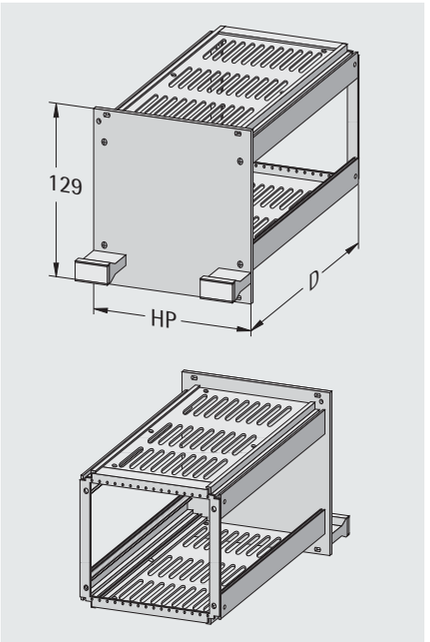
Internal card guide



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

Order no.
250-712

Cassette 3 U with open sides

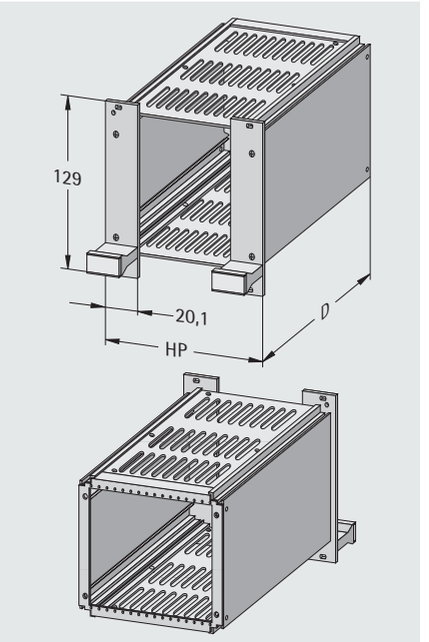


Delivery

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

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

Cassette 3 U with divided front panel



Delivery

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

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

www.apra.de

Cassette 6 U

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

Material:
front panel: aluminium 2.5 mm
side section: aluminium extrusion
rear panel : aluminium 1.5 mm
cover panels: aluminium 1.5 mm

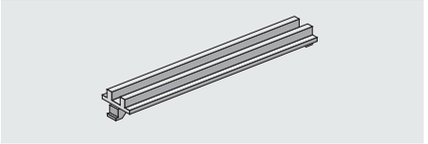
Finish:
front panel:
anodised front, conductive rear
side section: anodised
rear panel: transparent chromated
cover panels: transparent chromated

Delivery: not assembled

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

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

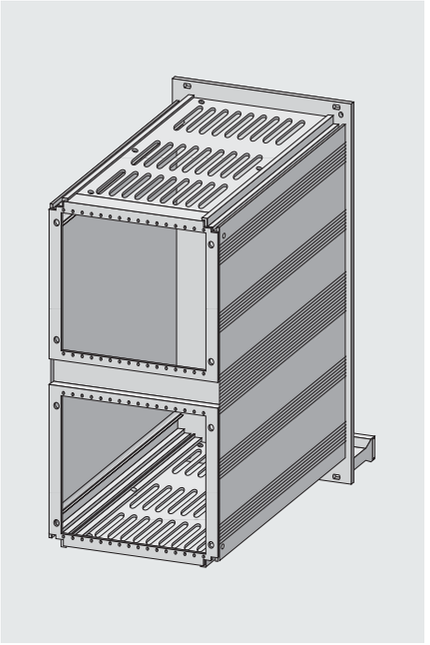
Internal card guide



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

Order no.
250-712

Cassette 6 U with closed sides

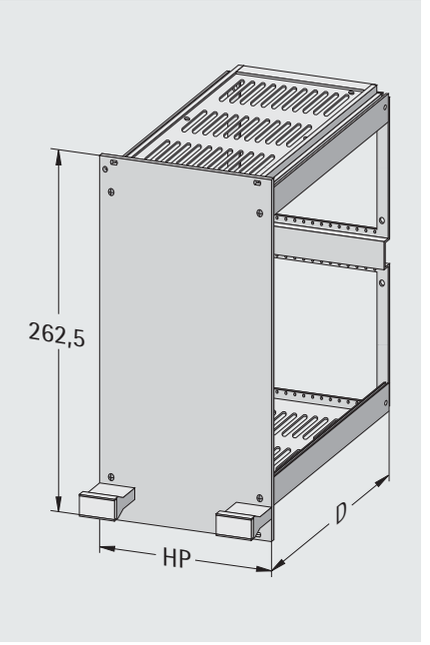


Delivery

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

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

Cassette 6 U with open sides



Delivery

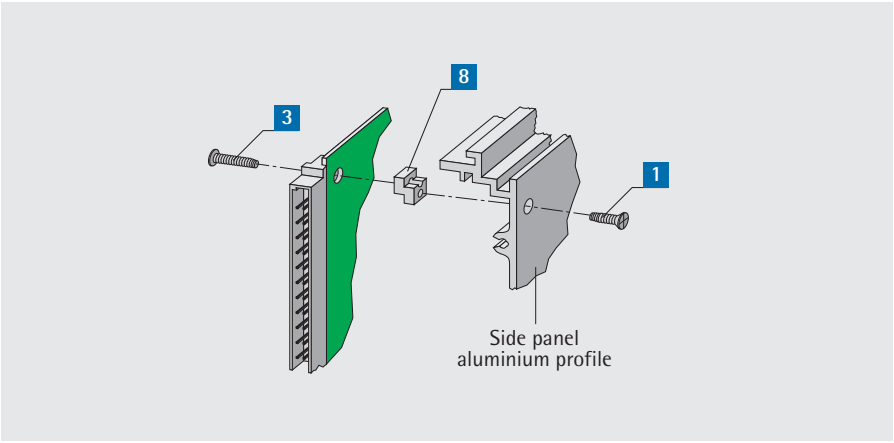
Item	Pc.	Description
1	1	Front panel with plastic handle bar*
2	1	Rear panel
3	4	Aluminium extrusions
4	2	Top / bottom panel, perforated
5		Assembly material

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

Model A

PCB is attached to the side of the cassette

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

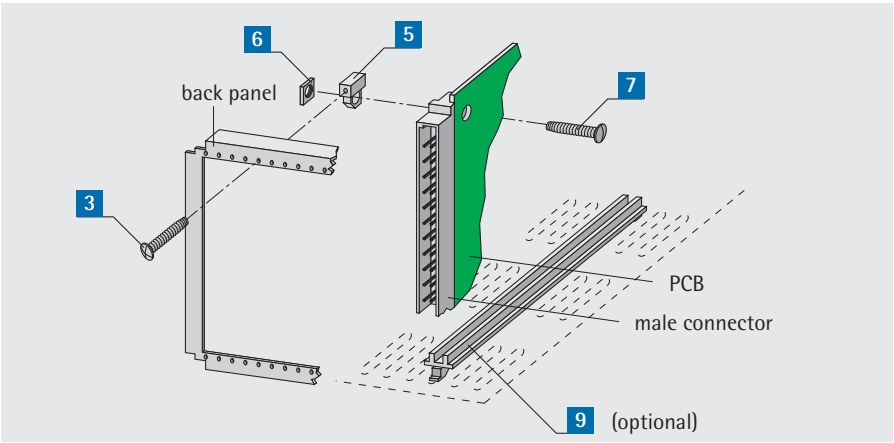


Model B

PCB is attached to the rear of the cassette

- external wiring

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

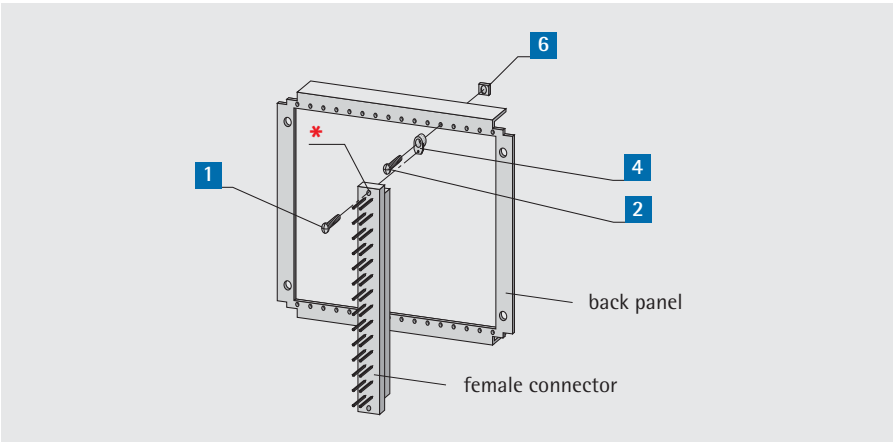


Model C

Plug-in connector is attached to the rear of the cassette

- internal wiring

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



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

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

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

Desktop enclosures

... the perfect shell for valuable electronics

Desktop enclosures

profi set 264

page 151

- universal enclosure system, usable as
  - desktop enclosure
  - 19" plug-in unit
  - 19" subrack (upon request)
- compact size with maximum space at minimal exterior dimensions
- protection system IP 40/20

apra line

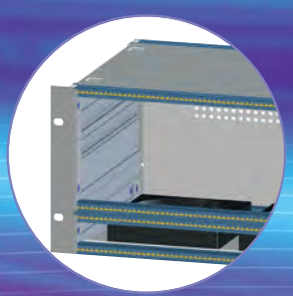
page 163

- proven quality
- integrated recessed handle
- removable cover panels
- also available as 19" enclosure
- protection system IP 30/20

www.apra.de

Variable in shape, colour and function!

profi set 264

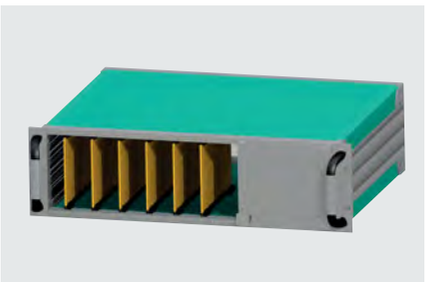


We configure your individual system solution like for ex. a 4 U enclosure with 3+1 U assembling and active ventilation!

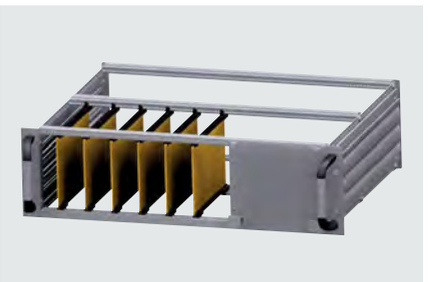
profi set 264 enclosure system

- universal enclosure system usable as
  - desktop enclosure
  - 19" plug-in unit
  - 19" subrack(on request)
- compact construction with maximum space at minimal exterior dimensions
- decorative side panels of aluminium-extruded profiles
- stackable
- easy detachable top and bottom panels in case of maintain intervention or electronic installation
- module rails with depth grids of 10 mm adjustable
- ventilated or closed type
- EMC version on request
- protection system IP 40/20
- installation dimensions acc. to IEC 60297-3-101
- exterior dimensions acc. to IEC 60297-3-100 (plug-in unit and subrack)

desktop enclosure profi-set 264



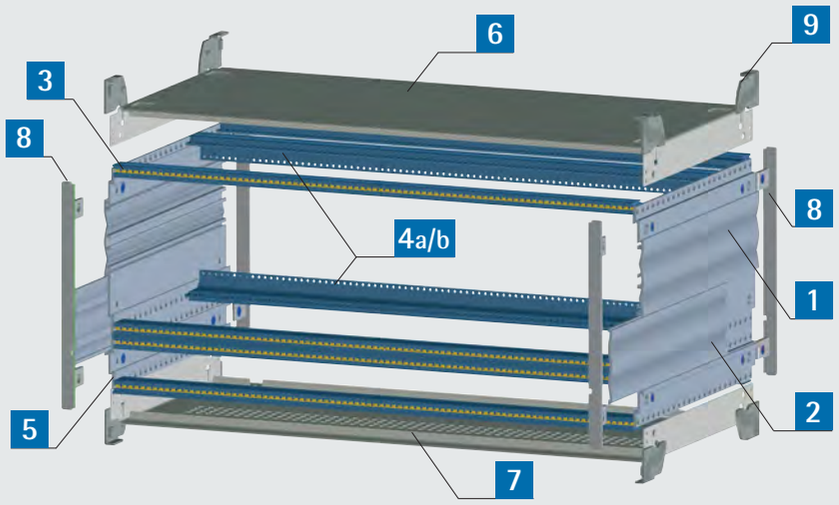
19" plug-in unit profi-set 264



19" subrack profi-set 264 (on request)

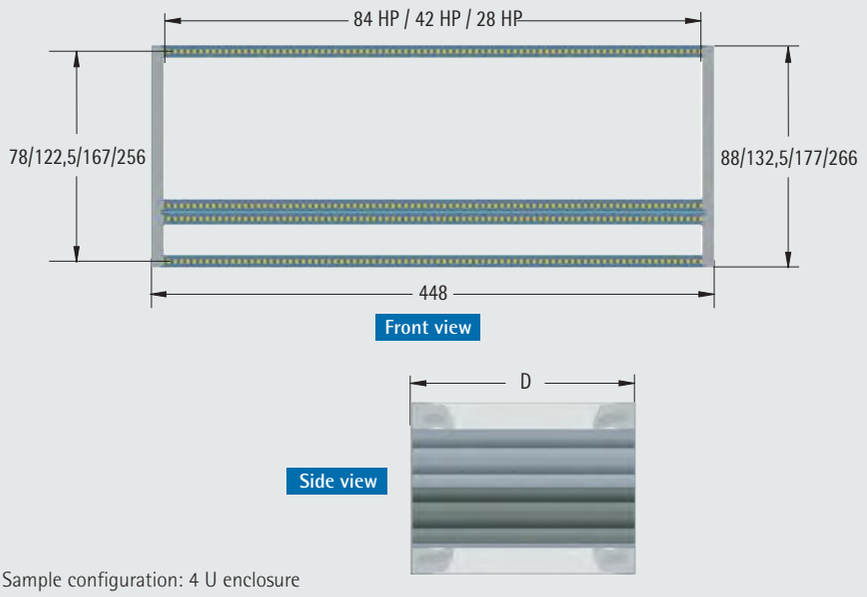
Desktop enclosure profi set 264

Application:
takes plug-in devices acc. to IEC 60297-3-101, PCB and individually composed electronic components
Finish:
top/ bottom shell:
RAL 7035 light grey
side panels:
RAL 7001 silver grey, inside chromated
Degree of protection:
IP 40: closed type
IP 20: ventilated type
Delivery:
kit form, unmounted



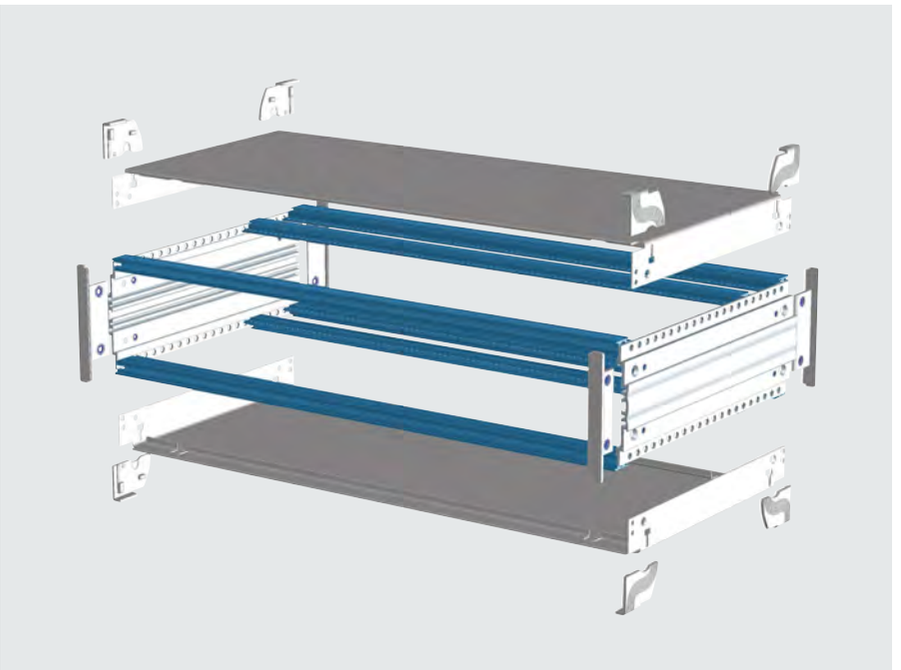
Exploded view:
4 U enclosure with ventilated bottom shell

	Description	3 U	4 U	3 U BUS
1	Side panel	2	2	2
2	Cover panel	-	2	-
3	Module rail	4	6	4
4a	Module rail with integrated installation rail	2	2	-
4b	BUS module rail	-	-	2
5	Threaded strips	2	4	2+2
6	Top shell without ventilation	1	1	1
7	Bottom shell with or without ventilation	1	1	1
8	Cover bracket	4	4	4
9	Cover	8	8	8
10	Assembly material incl. 4 enclosure feet	1 Set	1 Set	1 Set



Sample configuration: 4 U enclosure

Desktop enclosure profi set 264 2 U

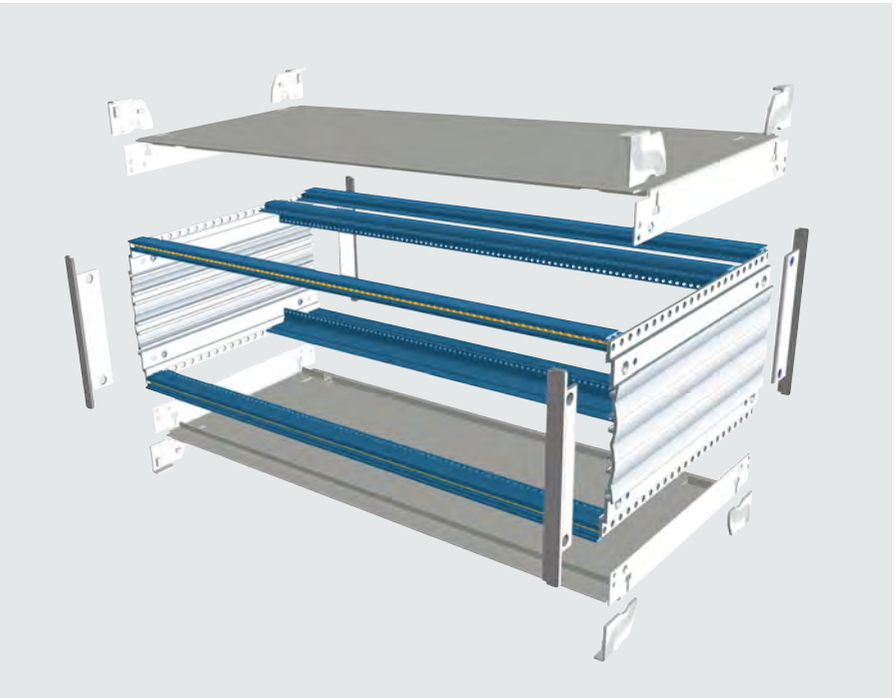


Delivery

Item	Pc.	Description
1	2	Side panel
2	4	Module rail
3	2	BUS module rail
4	2+2	Threaded strips
5	1	Top shell without ventilation
6	1	Bottom shell with or without ventilation
7	4	Cover bracket
8	8	Cover
9	1 Set	Assembly material incl. 4 enclosure feet

HP	D mm	Feature	Order no.
84	231	without ventilation	264-211-10
42			264-231-10
28			264-241-10
84		with ventilated bottom shell	264-211-20
42			264-231-20
28			264-241-20
84	271	without ventilation	264-212-10
42			264-232-10
28			264-242-10
84		with ventilated bottom shell	264-212-20
42			264-232-20
28			264-242-20
84	311	without ventilation	264-213-10
42			264-233-10
28			264-243-10
84		with ventilated bottom shell	264-213-20
42			264-233-20
28			264-243-20
84	351	without ventilation	264-214-10
42			264-234-10
28			264-244-10
84		with ventilated bottom shell	264-214-20
42			264-234-20
28			264-244-20

Desktop enclosure profi set 264 3 U



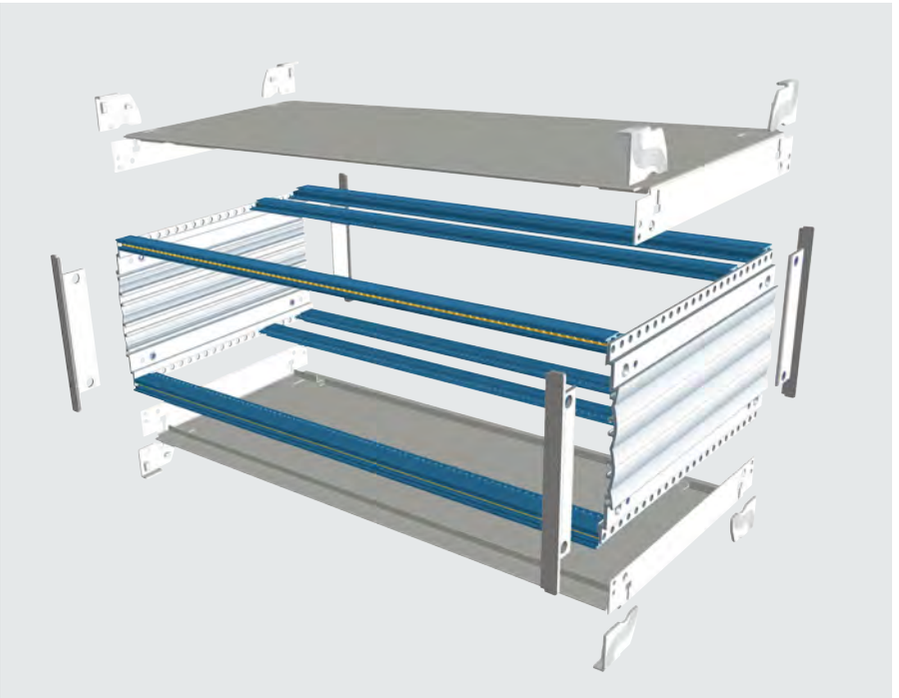
Delivery

Item	Pc.	Description
1	2	Side panel
2	4	Module rail
3	2	Module rail with integrated installation rail
4	2+2	Threaded strips M 2,5
5	1	Top shell without ventilation
6	1	Bottom shell with or without ventilation
7	4	Cover bracket
8	8	Cover
9	1 Set	Assembly material incl. 4 enclosure feet

HP	D mm	Feature	Order no.
84	231	without ventilation	264-311-10
42			264-331-10
28			264-341-10
84		with ventilated bottom shell	264-311-20
42			264-331-20
28			264-341-20
84	271	without ventilation	264-312-10
42			264-332-10
28			264-342-10
84		with ventilated bottom shell	264-312-20
42			264-332-20
28			264-342-20
84	311	without ventilation	264-313-10
42			264-333-10
28			264-343-10
84		with ventilated bottom shell	264-313-20
42			264-333-20
28			264-343-20
84	351	without ventilation	264-314-10
42			264-334-10
84		with ventilated bottom shell	264-314-20
42			264-334-20

www.apra.de

Desktop enclosure profi set 264 3 U BUS



Delivery

Item	Pc.	Description
1	2	Side panel
2	4	Module rail
3	2	BUS module rail
4	2+2	Threaded strips M 2,5
5	1	Top shell without ventilation
6	1	Bottom shell with or without ventilation
7	4	Cover bracket
8	8	Cover
9	1 Set	Assembly material incl. 4 enclosure feet

HP	D mm	Feature	Order no.
84	271	without ventilation	264-312-30
		with ventilated bottom shell	264-312-40
	351	without ventilation	264-314-30
		with ventilated bottom shell	264-314-40

Desktop enclosure profi set 264 4 U

Delivery

Item	Pc.	Description
1	2	Side panel
2	2	Cover panel
3	6	Module rail
4	2	Module rail with integrated installation rail
5	4	Threaded strips M 2,5
6	1	Top shell without ventilation
7	1	Bottom shell with or without ventilation
8	4	Cover bracket
9	8	Cover
10	1 Set	Assembly material incl. 4 enclosure feet

HP	D mm	Feature	Order no.
84	231	without ventilation	264-411-10
		with ventilated bottom shell	264-411-20
	271	without ventilation	264-412-10
		with ventilated bottom shell	264-412-20
	311	without ventilation	264-413-10
		with ventilated bottom shell	264-413-20
	351	without ventilation	264-414-10
		with ventilated bottom shell	264-414-20

www.apra.de

Desktop enclosure profi set 264 6 U double-row

Delivery

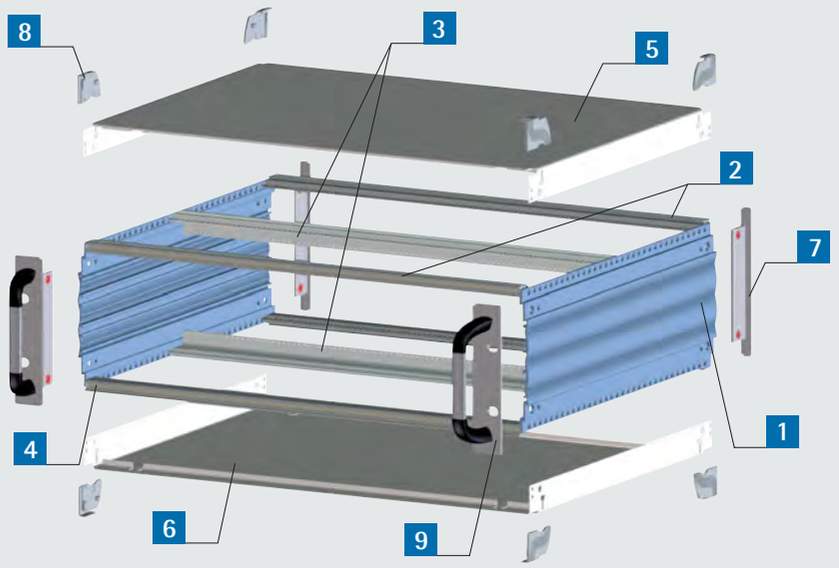
Item	Pc.	Description
1	4	Side panel
2	2	Cover panel
3	6	Module rail
4a	4	Module rail with integrated installation rail
5	4	Threaded strips M 2,5
6	1	Top shell without ventilation
7	1	Bottom shell with or without ventilation
8	4	Cover bracket
9	8	Cover
10	1 Set	Assembly material incl. 4 enclosure feet

HP	D mm	Feature	Order no.
84	231	without ventilation	264-611-10
		with ventilated bottom shell	264-611-20
	271	without ventilation	264-612-10
		with ventilated bottom shell	264-612-20
	311	without ventilation	264-613-10
		with ventilated bottom shell	264-613-20
	351	without ventilation	264-614-10
		with ventilated bottom shell	264-614-20

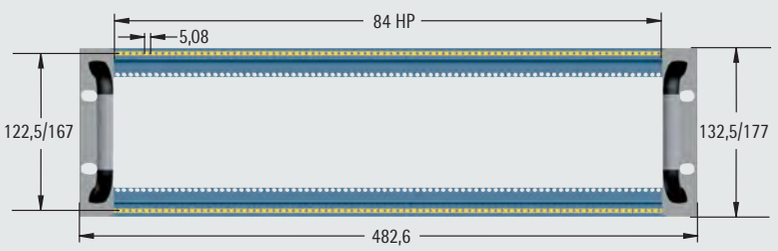
19" plug-in unit profi set 264

Application:
takes plug-in modules acc. to IEC 60297-3-101, further PCB boards and customised electronic components.
Finish:
top/ bottom cover: RAL 7035 light grey
side panels: RAL 7001 silver grey, chromated interior
Degree of protection:
IP 40: not ventilated
IP 20: ventilated
Delivery:
kit, not assembled

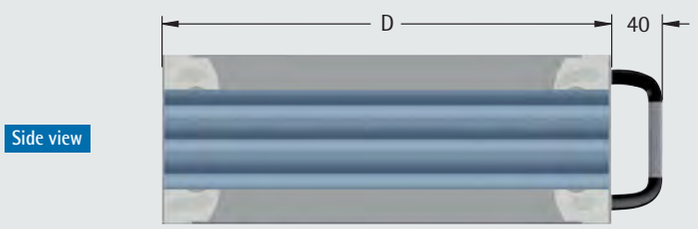
Other dimensions (e.g. 63 HP) and individual colours available on request.



Exploded view:
3 U plug-in unit with unvetilated bottom shell



Front view



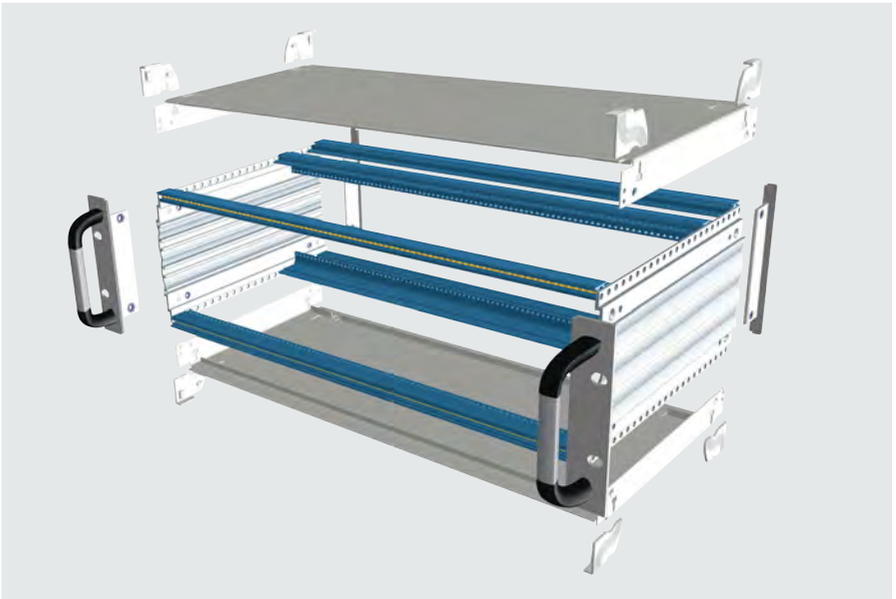
Side view

Sample configuration: 3 U plug-in unit

19" plug-in unit profi set 264 3 U

Delivery

Item	Pc.	Description
1	2	Side panel
2	4	Module rail
3	2	Module rail with integrated installation rail
4	2	Threaded strips M 2,5
5	1	Top shell without ventilation
6	1	Bottom shell with or without ventilation
7	2	Cover bracket
8	8	Cover
9	2	Front bracket with handle
10	1 Set	Assembly material incl. 4 enclosure feet

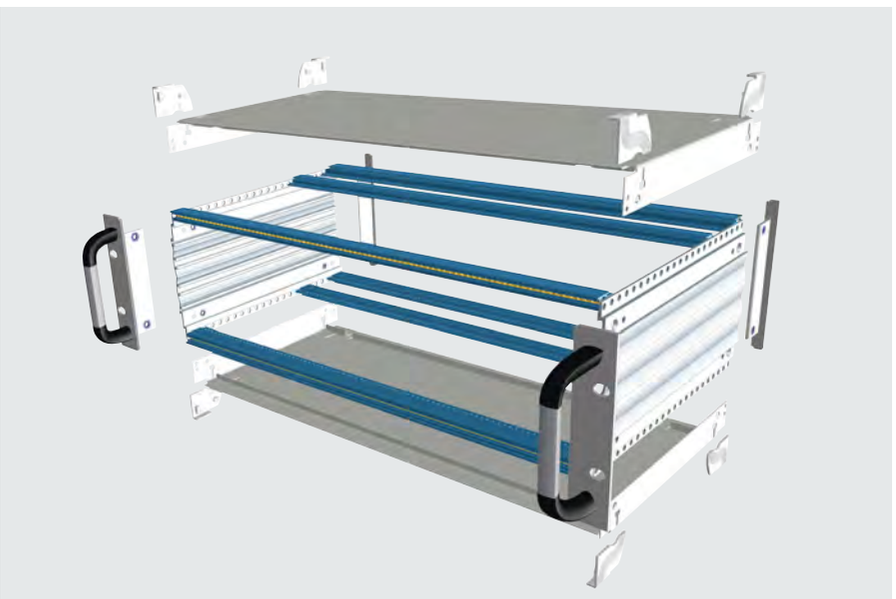


HP	D mm	Feature	Order no.
84	271	without ventilation	264-312-50
		with ventilated bottom shell	264-312-60
	351	without ventilation	264-314-50
		with ventilated bottom shell	264-314-60
	451	without ventilation	264-315-50
		with ventilated bottom shell	264-315-60

19" plug-in unit profi set 264 3 U BUS

Delivery

Item	Pc.	Description
1	2	Side panel
2	4	Module rail
3	2	BUS module rail
4	2+2	Threaded strips M 2,5
5	1	Top shell without ventilation
6	1	Bottom shell with or without ventilation
7	4	Cover bracket
8	8	Cover
9	2	Front bracket with handle
10	1 Set	Assembly material incl. 4 enclosure feet

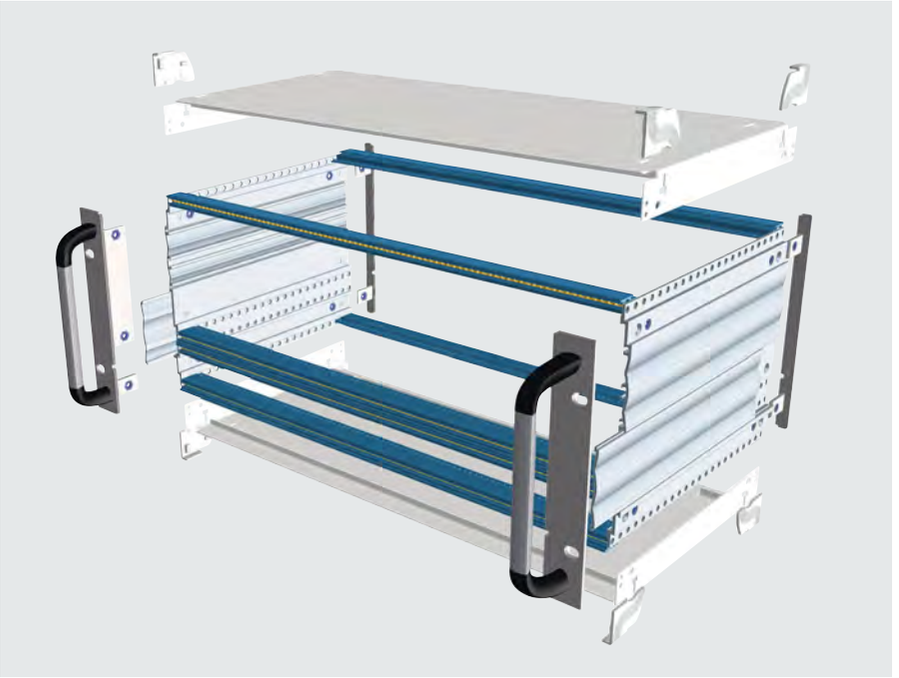


HP	D mm	Feature	Order no.
84	271	without ventilation	264-312-70
		with ventilated bottom shell	264-312-80
	351	without ventilation	264-314-70
		with ventilated bottom shell	264-314-80
	451	without ventilation	264-315-70
		with ventilated bottom shell	264-315-80

19" plug-in unit profi set 264 4 U

Delivery

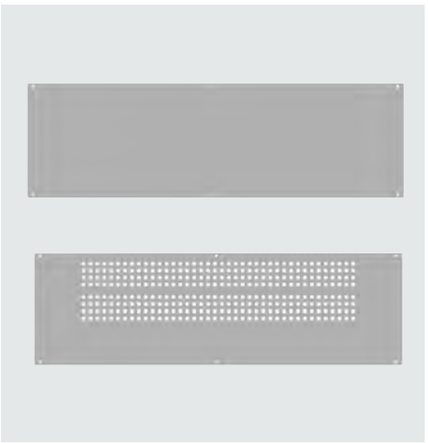
Item	Pc.	Description
1	2	Side panel
2	2	Cover panel
3	6	Module rail
4	2	Module rail with integrated installation rail
5	4	Threaded strips
6	1	Top shell without ventilation
7	1	Bottom shell with or without ventilation
8	4	Cover bracket
9		Cover
10	2	Front bracket with handle
11	1 Set	Assembly material incl. 4 enclosure feet



HP	D mm	Feature	Order no.
84	271	without ventilation	264-412-50
		with ventilated bottom shell	264-412-60
	351	without ventilation	264-414-50
		with ventilated bottom shell	264-414-60
	451	without ventilation	264-415-50
		with ventilated bottom shell	264-415-60

www.apra.de

Rear panels

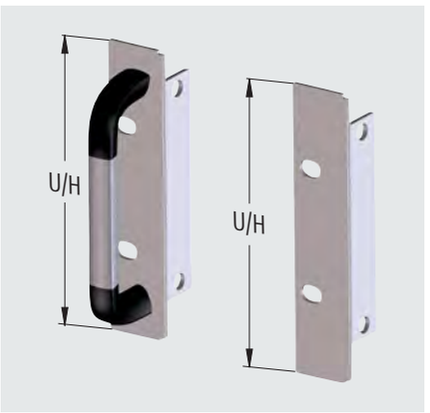


- incl. assembly material

Material:
aluminium, interior chromated
Finish:
RAL 7035 light grey

HP	U	Feature	Order no.
84	2	without ventilation	264-084-42
42			264-042-42
28			264-028-42
84		ventilated	264-084-52
42			264-042-52
28			264-028-52
84	3	without ventilation	264-084-43
42			264-042-43
28			264-028-43
84		ventilated	264-084-53
42			264-042-53
28			264-028-53
84	4	without ventilation	264-084-44
42			264-042-44
28			264-028-44
84		ventilated	264-084-54
42			264-042-54
28			264-028-54
84	6	without ventilation	264-084-46
42			264-042-46
28			264-028-46
84		ventilated	264-084-56
42			264-042-56
28			264-028-56

19" front bracket with / without handle

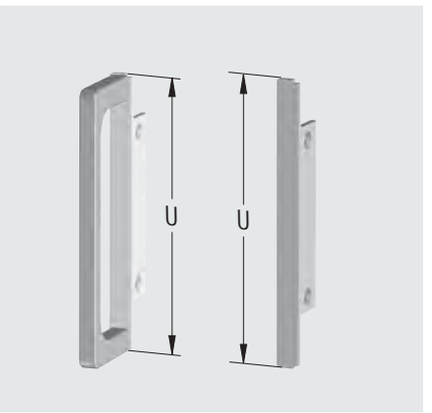


- for expansion as 19" plug-in enclosure or subrack
- incl. assembly material
- packaging unit: 1 pair

Material:
front bracket: aluminium anodised
handle: plastics/aluminium anodised

Description	Order no.
2 U without handle	264-200-32
2 U with handle	264-200-42
3 U without handle	264-300-32
3 U with handle	264-300-42
4 U without handle	264-400-32
4 U with handle	264-400-42
6 U without handle	264-600-32
6 U with handle	264-600-42

Cover bracket with / without handle

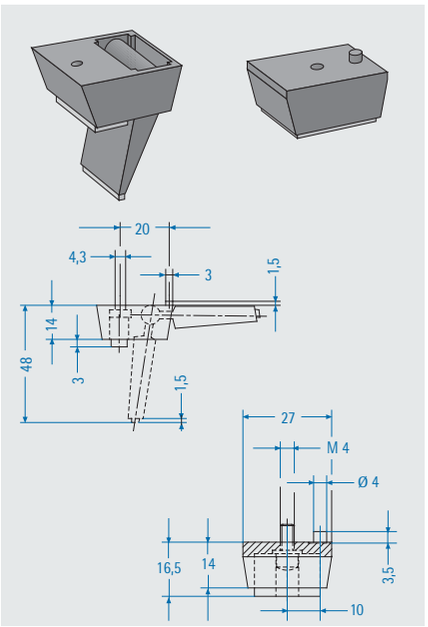


- for the expansion as a desktop enclosure
- incl. assembly material
- packaging unit: 1 pair

Material:
bracket and handle: aluminium anodised

Description	Order no.
2 U without handle	264-200-12
2 U with handle	264-200-22
3 U without handle	264-300-12
3 U with handle	264-300-22
4 U without handle	264-400-12
4 U with handle	264-400-22
6 U without handle	264-600-12
6 U with handle	264-600-22

Prop-up and base feet set



- corresponding bores need to be realised in the bottom shell
- set = 2 pairs

Delivery

Item	Pc.	Description
1	2	Prop-up feet
2	2	Rear base feet
3		Assembly material

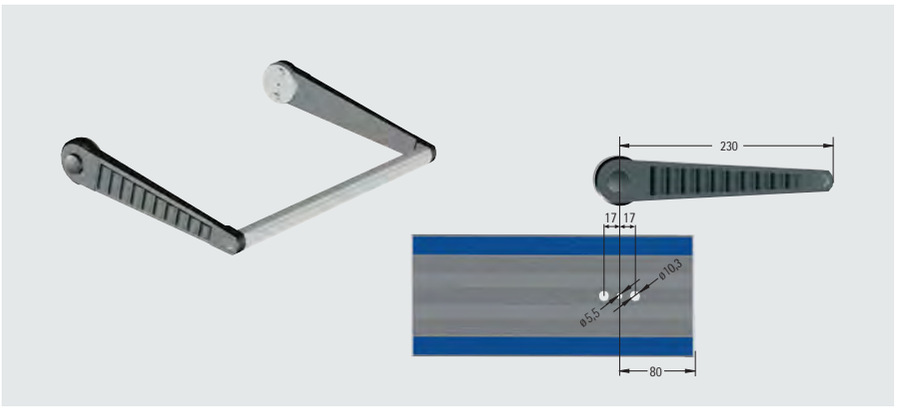
Order no.
615-019

Earth conductor set

- for earth connection acc. to VDE

U	Order no.
2 / 3 / 4	264-000-10
6	264-000-11

Prop-up and carrying handle



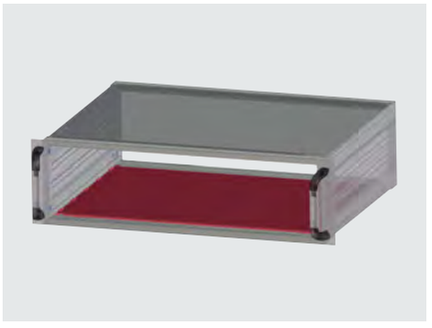
- can be used with following enclosures series: apraLine, profi-set, Zenith, Tamago
- suitable for all 3 U and 4 U enclosures
- handle can be set 30° by pressing a button to snap it into place

Material:
handle extrusion: aluminium extrusion
metal handle, attachments, adapter: die-cast zinc
Finish:
handle extrusion: anodised
metal handle: RAL 9011 deep black
button, screw covers: plastics, black
Load capacity: 50 kg

Other finishes and widths available upon request.

For enclosure width	Order no.
42 HP	264-100-42
63 HP	264-100-63
84 HP	264-100-84

Shelf



- for individual installation of components

HP	D mm	Order no.
84	231	264-311-96
	271	264-311-97
	311	264-311-98
	351	264-311-99

www.apra.de

☑ Universal

apra line

Sample configuration

Desktop enclosure apraLine

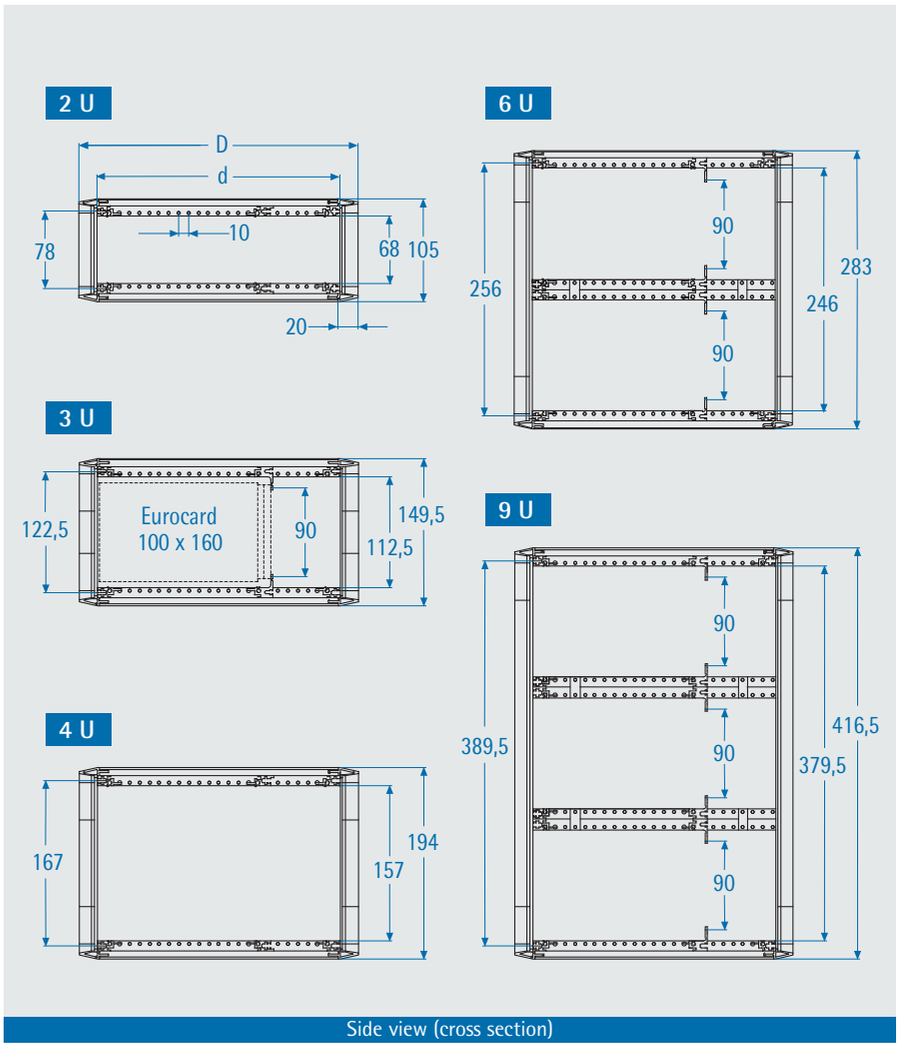
- impressive design with elegant lines and two-tone surface
- ergonomic recessed handles standard
- easy-to-maintain and cost-saving design principle: all cover plates can be easily removed from the assembled enclosure
- also available as 19" enclosure (see Chapter 19" Enclosure Systems, p. 25)
- side panels withuniversal mounting grid of 10 mm create universal mounting combinations for various card depths and additional models of module rails
- optimum heat dissipation through ventilated bottom and rear panels
- IP 20/30 protection system
- installation dimensions acc. to IEC 60297-3-101

Matching front panels see p. 128

Matching plug-in modules see p. 134

Desktop enclosure apraLine

Application:
holds Eurocards and modules acc. to IEC 60297-3-101 as well as customised electronic components.
Construction:
together with the identical front and rear frame the side panels form a sturdy and solid enclosure. Ergonomic recessed handles and grooves for using mounting nuts and universal mounting grids of 10mm are built into the recessed extrusions. Top and bottom shells and rear panel are made of aluminium and are available as ventilated or closed versions.
Finish:
cover panels: RAL 7035 light grey
frame and side panels:
RAL 7001 silver grey
Degree of protection:
IP 30: closed type
IP 20: ventilated type
Delivery:
assembled
Standard
installation dimensions acc. to IEC 60297-3-101



Side view (cross section)

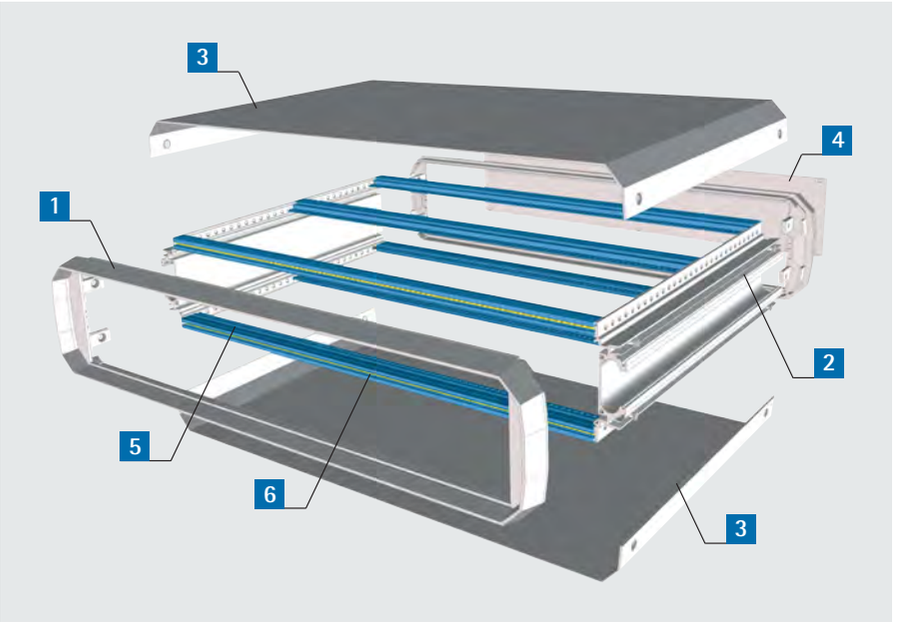
Available enclosure sizes

U	HP	W mm	D_1 mm	D_2 mm	D_3 mm	D_4 mm	D_5 mm
2	84	478	262	302	-	-	-
	63	371					
	42	264					
	28	193					
3	84	478	262	302	342	382	482
	63	371					
	42	264					
	28	193					
4	84	478	262	302	342	382	482
	63	371					
	42	264					
	28	193					
6 double row	84	478	262	302	342	382	482
	63	371					
	42	264					
	28	193					
9	84	478	262	302	342	382	482

U: available height units
HP: available installing width
W: enclosure width
D_{1-5}: available enclosure depths
d_{1-5}: available installing depth
$d_{1-5}=D_{1-5}$ - 40 mm

www.apra.de

Desktop enclosure apraLine 2 U



Delivery

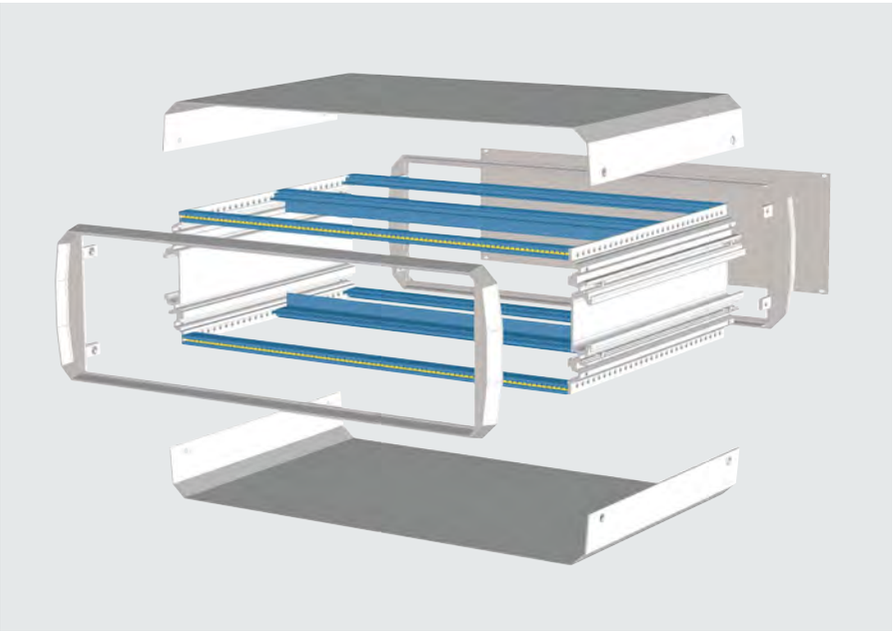
Item	Pc	Description
1	2	Frame
2	2	Side panel
3	2	Top/bottom shell (ventilated/without ventilation)
4	1	Rear panel (ventilated/ without ventilation)
5	6	Module rail without front projection, type 241-030
6	2	Threaded strips M 2,5
7	1 Set	Assembly material incl. 4 enclosure feet

HP	D mm	Feature	Order no.
84	262	without ventilation	280-201
63			280-202
42			280-203
28			280-204
84		ventilated in rear panel and one shell	280-251
63			280-252
42			280-253
28			280-254
84	302	without ventilation	280-211
63			280-212
42			280-213
28			280-214
84		ventilated in rear panel and one shell	280-261
63			280-262
42			280-263
28			280-264

Desktop enclosure apraLine 3 U

Delivery

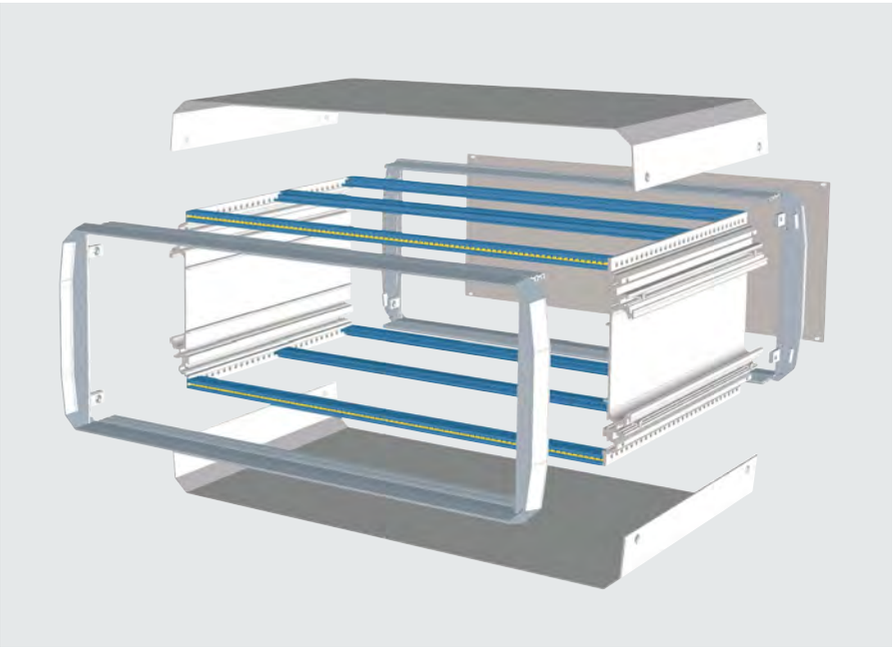
Item	Pc	Description
1	2	Frame
2	2	Side panel
3	2	Top/bottom shell (ventilated/without ventilation)
4	1	Rear panel (ventilated/ without ventilation)
5a	4	Module rail without front projection
5b	2	Module rail with integrated mounting rail and notch, type 266-006
6	2	Threaded strips M 2,5
7	1 Set	Assembly material incl. 4 enclosure feet



Desktop enclosure apra line 3 U • 280

HP	D mm	Feature	Order no.
84	262	without ventilation	280-301
63			280-302
42			280-303
28			280-304
84		ventilated in rear panel and one shell	280-351
63			280-352
42			280-353
28			280-354
84	302	without ventilation	280-311
63			280-312
42			280-313
28			280-314
84		ventilated in rear panel and one shell	280-361
63			280-362
42			280-363
28			280-364
84	342	without ventilation	280-321
63			280-322
42			280-323
28			280-324
84		ventilated in rear panel and one shell	280-371
63			280-372
42			280-373
28			280-374
84	382	without ventilation	280-331
63			280-332
42			280-333
28			280-334
84		ventilated in rear panel and one shell	280-381
63			280-382
42			280-383
28			280-384
84	482	without ventilation	280-341
63			280-342
42			280-343
28			280-344
84		ventilated in rear panel and one shell	280-391
63			280-392
42			280-393
28			280-394

Desktop enclosure apraLine 4 U



Delivery

Item	Pc	Description
1	2	Frame
2	2	Side panel
3	2	Top/bottom shell (ventilated/without ventilation)
4	1	Rear panel (ventilated/ without ventilation)
5a	4	Module rail without front projection, type 241-030
5b	2	Module rail Standard, type 241-022
6	2	Threaded strips M 2,5
7	1 Set	Assembly material incl. 4 enclosure feet

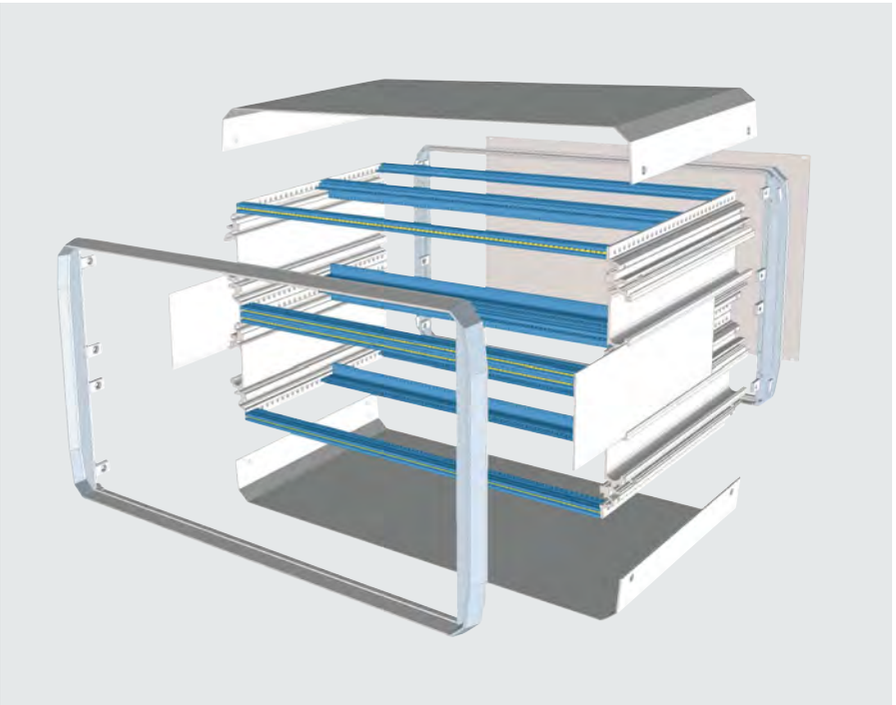
Desktop enclosure apra line 4 U • 280

HP	D mm	Feature	Order no.
84	262	without ventilation	280-401
63			280-402
42			280-403
28			280-404
84		ventilated in rear panel and one shell	280-451
63			280-452
42			280-453
28			280-454
84	302	without ventilation	280-411
63			280-412
42			280-413
28			280-414
84		ventilated in rear panel and one shell	280-461
63			280-462
42			280-463
28			280-464
84	342	without ventilation	280-421
63			280-422
42			280-423
28			280-424
84		ventilated in rear panel and one shell	280-471
63			280-472
42			280-473
28			280-474
84	382	without ventilation	280-431
63			280-432
42			280-433
28			280-434
84		ventilated in rear panel and one shell	280-481
63			280-482
42			280-483
28			280-484
84	482	without ventilation	280-441
63			280-442
42			280-443
28			280-444
84		ventilated in rear panel and one shell	280-491
63			280-492
42			280-493
28			280-494

Desktop enclosure apraLine 6 U double row

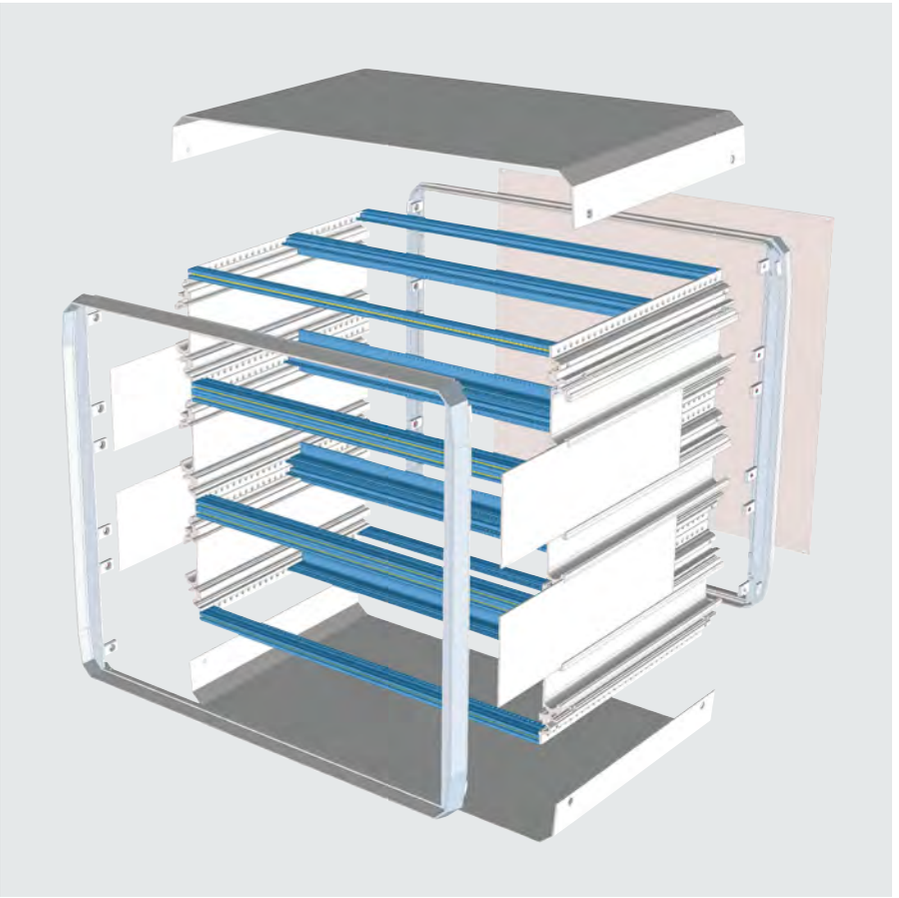
Delivery

Item	Pc	Description
1	2	Frame
2	4	Side panel
3	2	Top/bottom shell (ventilated/without ventilation)
4	1	Rear panel (ventilated/ without ventilation)
5a	4	Module rail without front projection, type 241-030
5b	4	Module rail with integrated mounting rail and notch, type 266-006
5c	2	Module rail, standard with notch, type 280-022
6	4	Threaded strips M 2,5
7	1 Set	Assembly material incl. 4 enclosure feet



HP	D mm	Feature	Order no.
84	262	without ventilation	280-601
63			280-602
42			280-603
28			280-604
84		ventilated in rear panel and one shell	280-651
63			280-652
42			280-653
28			280-654
84	302	without ventilation	280-611
63			280-612
42			280-613
28			280-614
84		ventilated in rear panel and one shell	280-661
63			280-662
42			280-663
28			280-664
84	342	without ventilation	280-621
63			280-622
42			280-623
28			280-624
84		ventilated in rear panel and one shell	280-671
63			280-672
42			280-673
28			280-674
84	382	without ventilation	280-631
63			280-632
42			280-633
28			280-634
84		ventilated in rear panel and one shell	280-681
63			280-682
42			280-683
28			280-684
84	482	without ventilation	280-641
63			280-642
42			280-643
28			280-644
84		ventilated in rear panel and one shell	280-691
63			280-692
42			280-693
28			280-694

Desktop enclosure apraLine 9 U



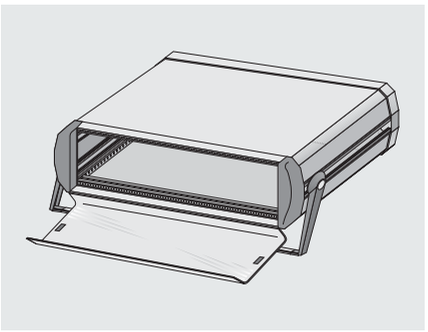
Delivery

Item	Pc	Description
1	2	Frame
2	6	Side panel
3	2	Top/bottom shell (ventilated/without ventilation)
4	1	Rear panel (ventilated/ without ventilation)
5a	4	Module rail without front projection, type 241-030
5b	6	Module rail with integrated mounting rail and notch, type 266-006
5c	4	Module rail, standard with notch, type 280-022
6	6	Threaded strips M 2,5
7	1 Set	Assembly material incl. 4 enclosure feet

HP	D mm	Feature	Order no.
84	262	without ventilation	280-901
		ventilated in rear panel and one shell	280-951
	302	without ventilation	280-911
		ventilated in rear panel and one shell	280-961
	342	without ventilation	280-921
		ventilated in rear panel and one shell	280-971
	382	without ventilation	280-931
		ventilated in rear panel and one shell	280-981
	482	without ventilation	280-941
		ventilated in rear panel and one shell	280-991

www.apra.de

Front door, flip-down

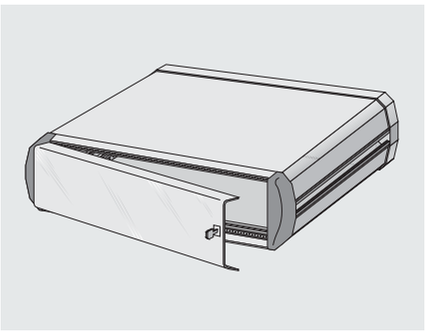


Delivery

Item	Pc.	Description
1	1	Fully assembled door consists of frame, hinges and plexiglass pane
2	2	Sash fasteners

HP	U	Order no.
84	3	280-109
63		280-108
42		280-107
28		280-106
84	4	280-119
63		280-118
42		280-117
28		280-116
84	6	280-179
63		280-178

Front door, hinged



Delivery

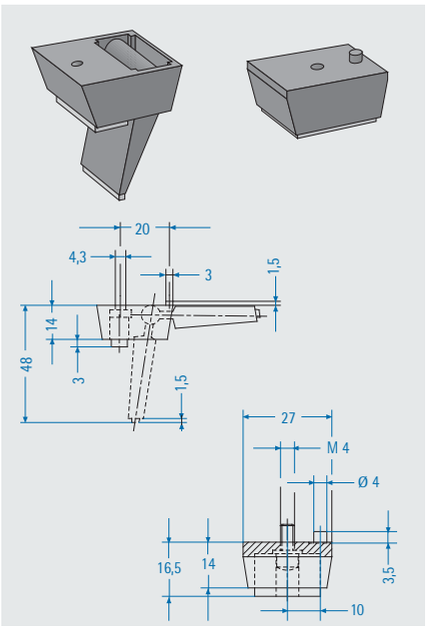
Item	Pc.	Description
1	1	Fully assembled door consists of frame, hinges and plexiglass pane
2	1	Sash fastener

HP	U	Order no.
42	3	280-102
28		280-101
42	4	280-112
28		280-111
42	6	280-172
28		280-171

Lock for hinged front door

Order no.
446-001

Prop-up and base feet set



- corresponding bores need to be realised in the bottom shell
- set = 2 pairs

Delivery

Item	Pc.	Description
1	2	Prop-up feet
2	2	Rear base feet
3		Assembly material

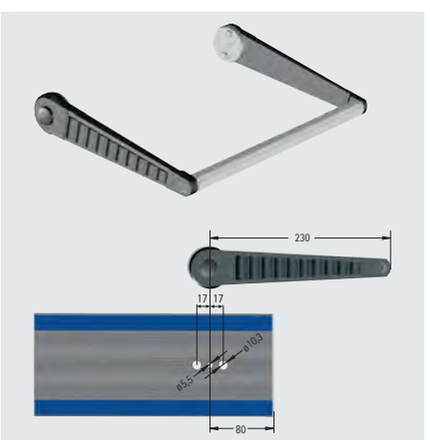
Order no.
615-019

Prop-up and carrying handle

- can be used with following enclosures series: apraLine, profi-set, Zenith, Tamago
- suitable for all 3 U and 4 U enclosures
- handle can be set 30° by pressing a button to snap it into place

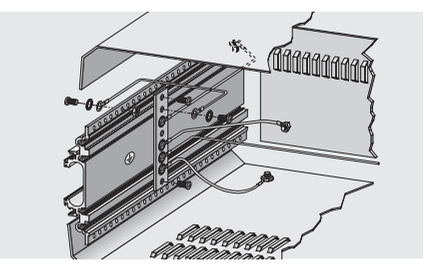
Material:
handle extrusion: aluminium extrusion
metal handle, attachments, adapter: die-cast zinc
Finish:
handle extrusion: anodised
metal handle: RAL 9011 deep black
button, screw covers: plastics, black
Load capacity: 50 kg

Other finishes and widths available upon request.



HP	Order no.
42	264-100-42
63	264-100-63
84	264-100-84

Earth conductor set



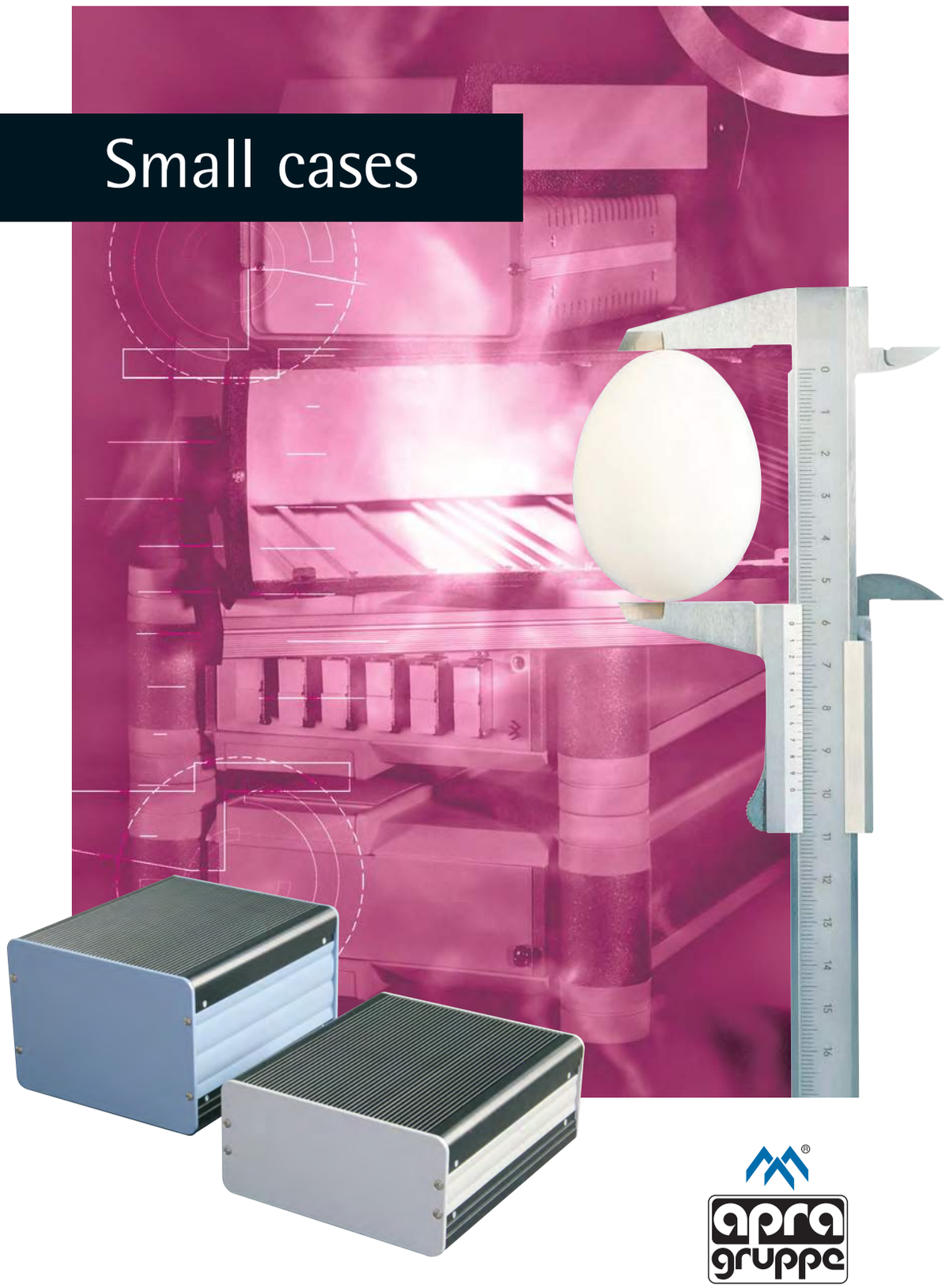
- for earth conducting acc. to VDE

Installation height U	Order no.
3	140-033
4	140-034
6	140-036
9	140-039

Important notes:

Questions to our sales team:

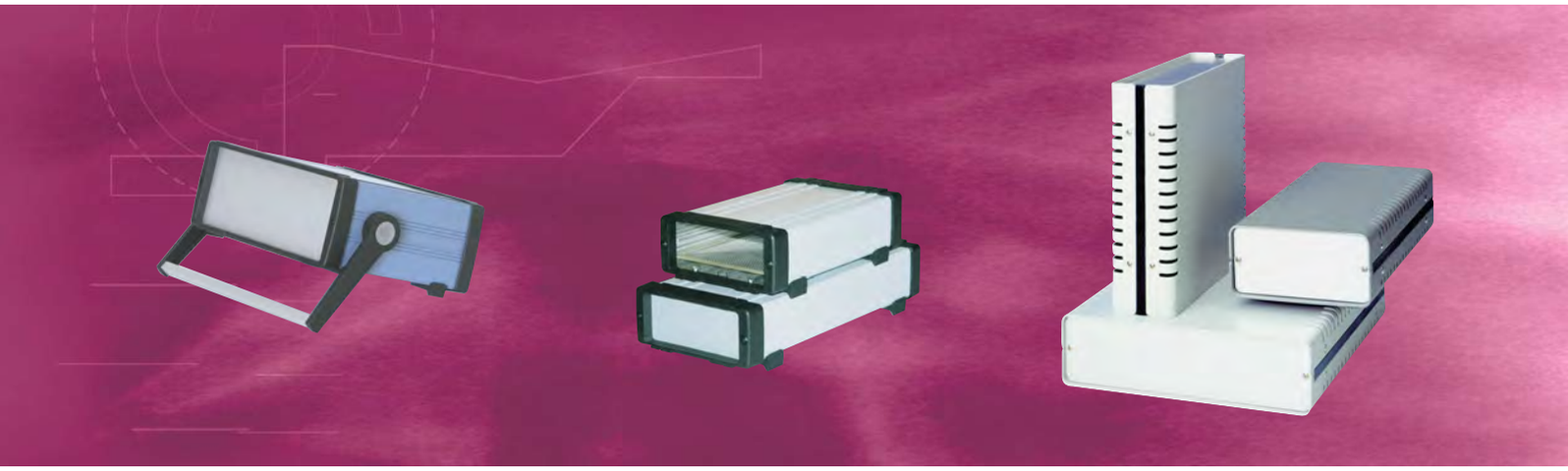
Small cases



apra gruppe

... the perfect shell for valuable electronics

Small cases



Xdream

page 178

- all standard size cards (100, 120, 160, 190 to 233,35 mm) can be installed in one case
- favourable EMC characteristics
- protection system: IP 66

Xdream mini

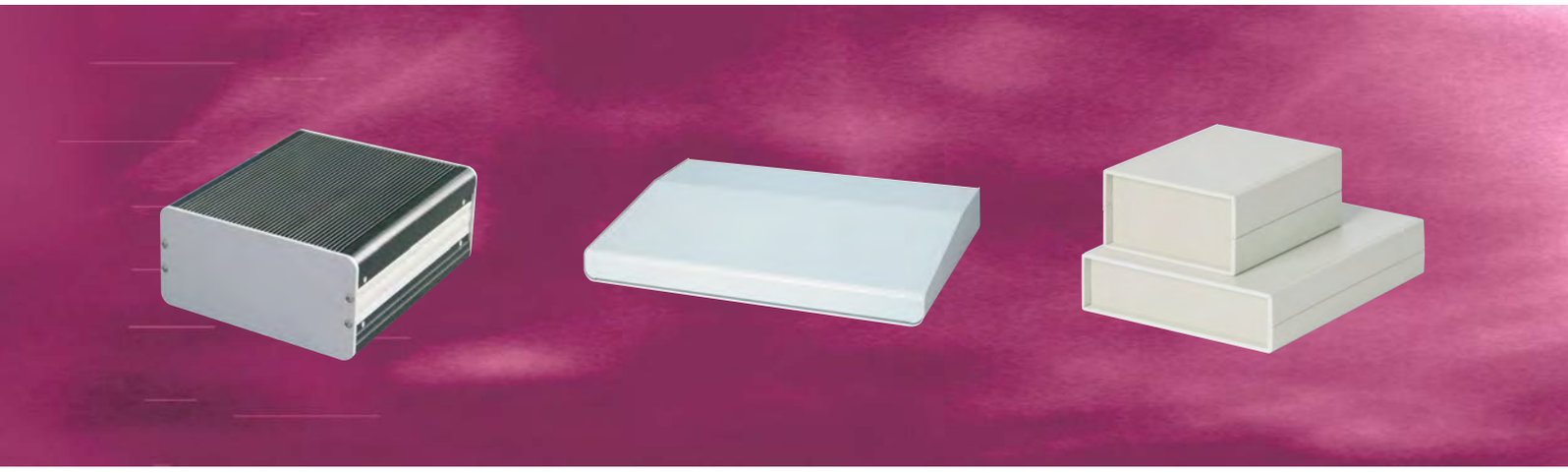
page 181

- for card width 100 mm
- compact dimensions
- sturdy design
- favourable EMC characteristics
- protection system: IP 66

PROFI CASE

page 183

- extremely functional yet simple form
- for eurocards and other electronic components
- various dimensions available
- protection system: IP 30/20



profi set cool

page 189

- sturdy construction
- individual design
- large range of accessories
- many extension possibilities

Desk console 502

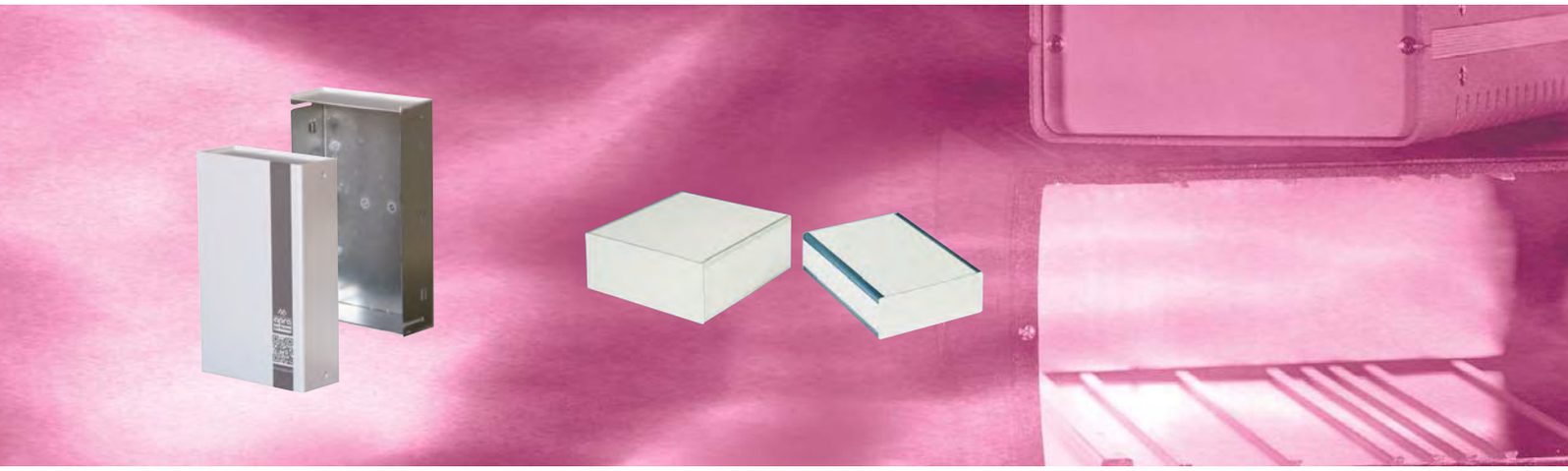
page 190

- simple aluminium case
- individual adaptations available
- protection system: IP 30

Plastic standard case D/DB/N2U

page 191

- snap mechanism for assembly; no screws required
- constructed out of impact-resistant polystyrene
- protection system: IP 54 (DB series)



click-case

page 187

- quick and easy mounting without tools
- optimised EMC features
- closed or with ventilation slots
- individual design at front and rear plate
- special sizes possible

Profile case

page 188

- simple profile construction
- can take Eurocards up to 220 mm
- protection system IP 40

Wall enclosure Flex 310

page 194

- universal wall mounting enclosure
- flexible and compact
- high rigidity
- suitable for industrial application
- other sizes and customisation on request

www.apra.de

Functionality "to the X degree"

The X-dream small case offers maximum functionality. The solid aluminium extrusion case body forms the extremely stable basis of the case.

Sample configuration

This patented construction offers extra space uncommon to most small cases.

Integrated dovetail guides allow the adapter rails to be moved into different positions, which allows standard-format cards or different size electronics to be installed.

When used with seals and front panels (see accessories), the stylish frame provides maximum protection against exterior influences (up to IP 66 degree of protection). Base feet or customised mounting equipment can be fit into the practical mounting grooves on the underside of the case.

The X-dream small case series can also be fit or retrofitted with a prop-up and carrying handle.

Small case Xdream

- **high protection system: IP 66**
- all standard-size cards (100, 120, 160, 190 to 233.35mm) can be installed in one case
- adapter rails allow you to customise your installation
- sturdy design
- adjustable depths
- stackable
- integrated mounting grooves
- functional accessories
- prop-up and carrying handle optional
- favourable EMC characteristics

www.apra.de

Application:
basic case for electronics and other standard-sized cards

Construction:
solid aluminium extrusion enclosed by a plastic frame on the front and rear

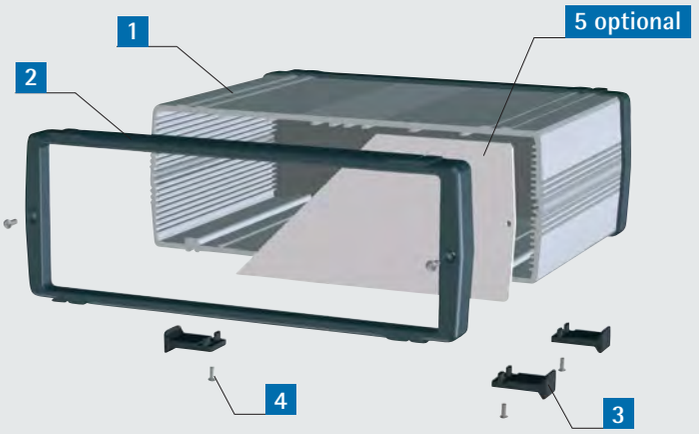
Finish:
RAL 7035 light grey
Frame: black

Material:
aluminium extrusion
frame: plastic, flammability tested acc. to UL 94 V-0

Protection system: IP 66*
(*configuration: solid back and front panel, frame seal IP 66, without handle)

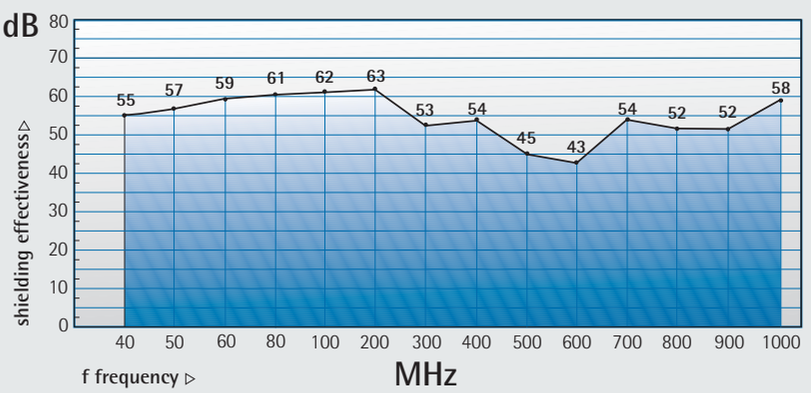
Delivery: not assembled

Profile dimensions



Shielding effectivness of EMC version:

Average values, calculated from measurement results of an indipendent institution



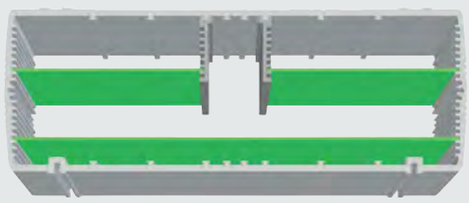
Testing specifications:
The shielding effectiveness of the empty case was measured according to VG 95373 part 15 in a frequency range of 40 to 1000 MHz.

Delivery

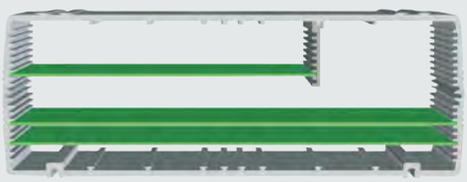
Item	Pc.	Description
1	1	Aluminium extrusion
2	2	Plastic frame
3	4	Stacking feet
4		Assembly material
	(1)	Prop-up and carrying handle (without fig.)

Description	For card depth mm	Order no.
Small case D=180 mm	160	418-001-60
Small case D=180 mm with handle	160	418-001-65
Small case D=240 mm	220	418-002-20
Small case D=240 mm with handle	220	418-002-25

Possible combinations



2 x card width 100 mm; 1 x card width 233,35 mm



1 x card width 160 mm; 2 x card width 233,35 mm

1 x card width 120 mm; 1 x card width 233,35 mm

2 x card width 190 mm

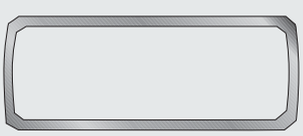
More combinations are possible.

5 Front/ rear panel

Material:
aluminium 2.5 mm
Finish:
anodised front, conductive rear

Order no.
418-004-00

Frame seal IP 66

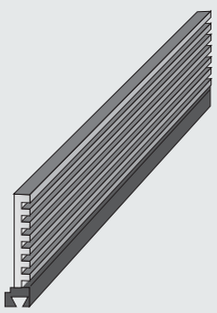


- self-adhesive, for adhering to front or rear panel
- necessary to achieve IP 66

Material:
cellular rubber

Order no.
418-006-02

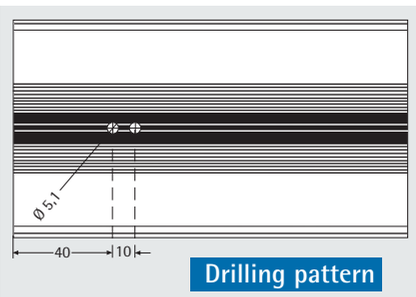
Adapter rail



- for integration of cards in different widths
- fits in the case's dovetail guides
- with special sliding surface

For card depth d mm	Order no.
160	418-003-16
220	418-003-22

Prop-up and carrying handle



Drilling pattern

- for retrofitting
- assembly material included

Order no.
615-060-03

www.apra.de

Maximum space at minimum size

IP protection IP 66

EMC protection

Xdream mini

- **high protection system: IP 66**
- for installation of boards with width of 100 mm
- adjustable depths
- stackable
- integrated mounting grooves (e.g. for wall mounting)
- sturdy design
- compact dimensions
- internal grooves for sliding nuts allow installation of individual components
- favourable EMC characteristics

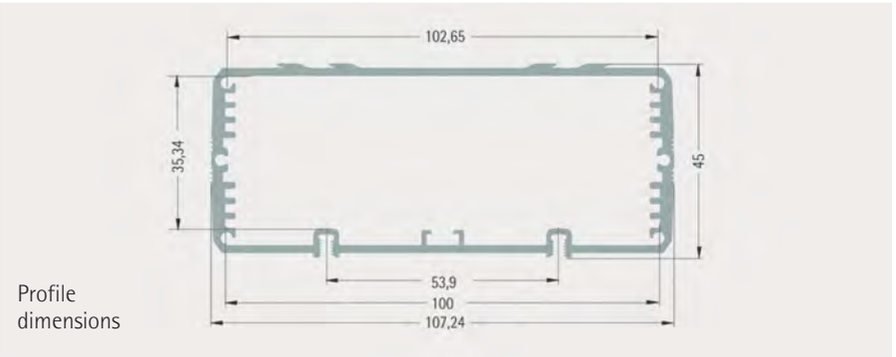
"Little brother" of our well-established enclosure system Xdream

- smaller dimensions
- even more sturdy
- just as convenient

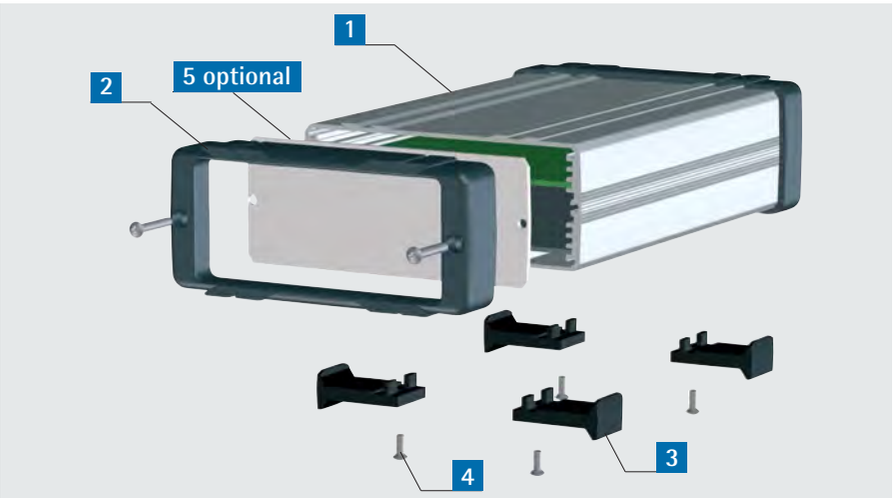
418 • Small case Xdream mini

www.apra.de

Application:
basic case for individual electronic components and eurocards of 100 mm x 160 mm
Construction:
solid aluminium extrusion enclosed by plastic frames in front and rear
Material:
aluminium extrusion
frame: plastics, flammability tested acc. to UL 94 V-0
Finish:
aluminium extrusion: RAL 7035 light grey
frame: black
Degree of protection:
IP 66* (configuration: solid back and front panel, frame seal IP 66, without handle)
Delivery:
unmounted



Profile dimensions



Other case depths are available on request!

Delivery

Item	Pc.	Description
1	1	Aluminium extrusion
2	2	Plastic frame
3	4	Stacking feet
4		Assembly material

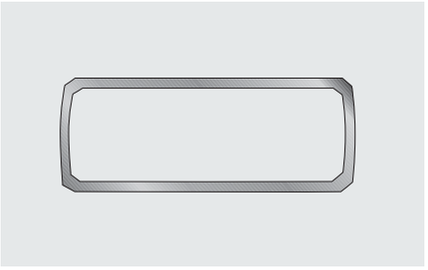
Description	for card depth d mm	Order no.
Small case D=180 mm	160	418-501-60
Small case D=180 mm with handle	160	418-501-65
Small case D=240 mm	220	418-502-20
Small case D=240 mm with handle	220	418-502-25

5 Front / rear panel

Material:
aluminium 2.5 mm
Finish:
anodised front, conductive rear

Order no.
418-004-50

Frame seal IP 66



- self-adhesive, for adhering to front or rear panel
- necessary to achieve IP 66

Material:
cellular rubber

Order no.
418-006-04

Wall-mounting set

- assembly material included

Order no.
418-004-60

www.apra.de

The tailor-made enclosure

The proven PROFI CASE small case series is characterised by its timeless design and simple and functional construction.

PROFI CASE

Small case PROFI CASE

- simple construction
- short assembly time
- available with plastic side piece (series 415) or aluminium extrusion side piece (series 416)
- available as ventilated/partially ventilated or solid models
- special sizes available on request

Truly versatile . . .

www.apra.de

Small case PROFI CASE

Application:
for 2 or 4 PC boards or customised electronic components

Construction:
two aluminium half shells are attached with **plastic side pieces (series 415)** or **aluminium extrusions (series 416)** and screwed together from the outside of the case.
Integrated grooves (width: 2 mm) in the side pieces allow the installation of PCB's (thickness 1,6 mm) or mounting panels.

Finish:
half shells, RAL 7035 light grey
side parts, RAL 9005 deep black

Protection system:
IP 40: solid
IP 20: ventilated

Delivery:
not assembled

Other colours and dimensions on request!

Please order front 7 rear plate [6] and prop-up handle [7] separately.

Delivery

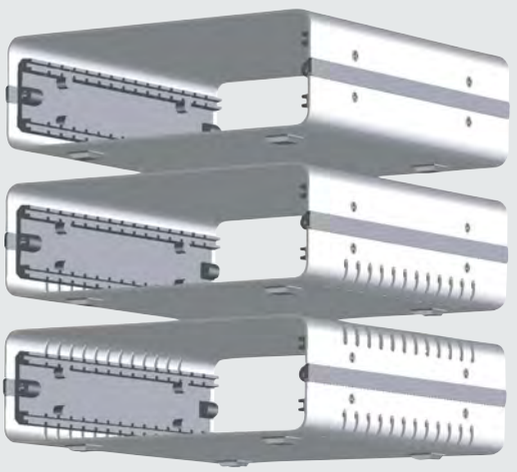
Item	Pc.	Description
1	2	Top/ bottom cover
2	2	Plastic side pieces (series 415, H=55mm)
	4	Plastic side pieces (series 415, H=90mm)
	2	Aluminium extrusion side pieces (series 416)
3	2	Side panels (series 415, H=90mm)
4	4	Adhesive feet
5		Assembly material

PROFI CASE 415 H = 55 mm

solid

one shell ventilated

both shells ventilated

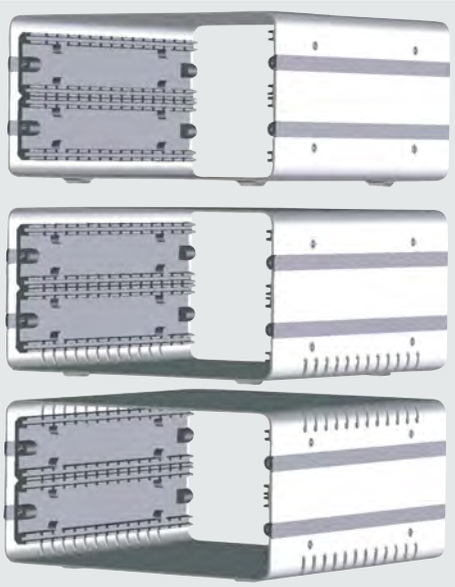


PROFI CASE 415 H = 90 mm

solid

one shell ventilated

both shells ventilated



PROFI CASE 416 H = 55 mm

solid

one shell ventilated

PCB dimensions mm	Case height H mm	Case depth D mm	Usable depth d mm	Case width W mm	Usable width w mm	Order no. solid IP 40	Order no. one shell ventilated IP 20	Order no. both shells ventilated IP 20	6 Front panels / rear panels anodised	6 Front panels / rear panels RAL 7035
100 x 160	55	175	160,5	115	101	415-303	415-323	415-343	415-103	415-123
120 x 160	55	175	160,5	135	121	415-305	415-325	415-345	415-105	415-125
160 x 160	55	175	160,5	175	161	415-302	415-322	415-342	415-102	415-122
190 x 160	55	175	160,5	205	191	415-301	415-321	415-341	415-101	415-121
233,35 x 160	55	175	160,5	248,5	234,5	415-304	415-324	415-344	415-104	415-124
100 x 210	55	225	210,5	115	101	415-003	415-023	415-043	415-103	415-123
160 x 210	55	225	210,5	175	161	415-002	415-022	415-042	415-102	415-122
190 x 210	55	225	210,5	205	191	415-001	415-021	415-041	415-101	415-121
233,35 x 210	55	225	210,5	248,5	234,5	415-004	415-024	415-044	415-104	415-124

PCB dimensions mm	Case height H mm	Case depth D mm	Usable depth d mm	Case width W mm	Usable width w mm	Order no. solid IP 40	Order no. one shell ventilated IP 20	Order no. both shells ventilated IP 20	6 Front panels / rear panels anodised	6 Front panels / rear panels RAL 7035
100 x 160	90	175	160,5	115	101	415-313	415-333	415-353	415-113	415-133
120 x 160	90	175	160,5	135	121	415-315	415-335	415-355	415-115	415-135
160 x 160	90	175	160,5	175	161	415-312	415-332	415-352	415-112	415-132
190 x 160	90	175	160,5	205	191	415-311	415-331	415-351	415-111	415-131
233,35 x 160	90	175	160,5	248,5	234,5	415-314	415-334	415-354	415-114	415-134
100 x 210	90	225	210,5	115	101	415-013	415-033	415-053	415-113	415-133
160 x 210	90	225	210,5	175	161	415-012	415-032	415-052	415-112	415-132
190 x 210	90	225	210,5	205	191	415-011	415-031	415-051	415-111	415-131
233,35 x 210	90	225	210,5	248,5	234,5	415-014	415-034	415-054	415-114	415-134

PCB dimensions mm	Case height H mm	Case depth D mm	Usable depth d mm	Case width W mm	Usable width w mm	Order no. solid IP 40	Order no. one shell ventilated IP 20	6 Front panels / rear panels anodised	6 Front panels / rear panels RAL 7035
100 x 160	55	175	160,5	115	101	416-303	416-323	415-103	415-123
160 x 160	55	175	160,5	175	161	416-302	416-322	415-102	415-122
190 x 160	55	175	160,5	205	191	416-301	416-321	415-101	415-121
100 x 210	55	225	210,5	115	101	416-003	416-023	415-103	415-123
160 x 210	55	225	210,5	175	161	416-002	416-022	415-102	415-122
190 x 210	55	225	210,5	205	191	416-001	416-021	415-101	415-121

7 Prop-up and carrying handle

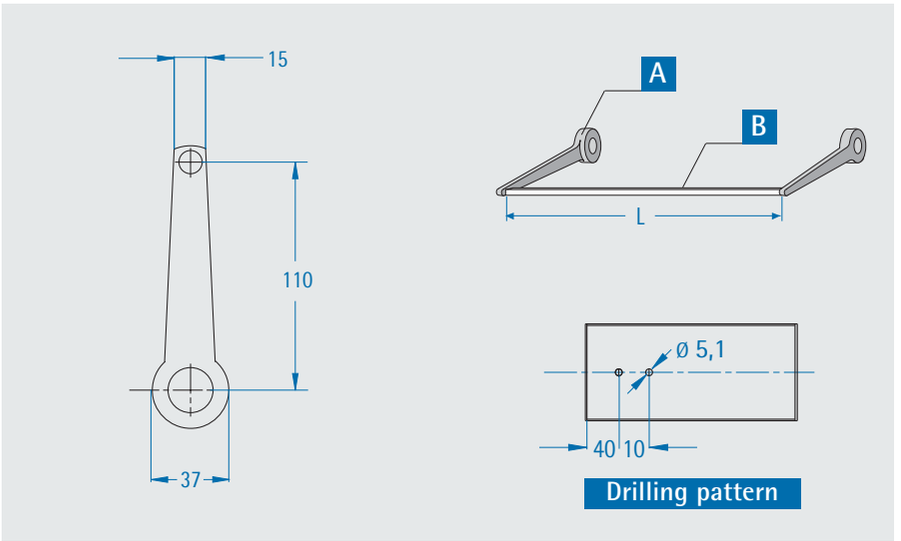
- consists of handle brackets and a handle piece which can be cut to the appropriate length
- handle can be set 30° by pressing a button to snap it into place
- attached by a single hole on both sides

Material:
handle extrusion: anodised aluminium
handle brackets: black polyamide

Load capacity:
25 kg

Determine the length of the handle section you need using the following formula:

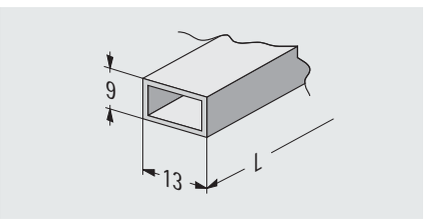
handle section length (L) =
case width (W) + 16mm



A Handle brackets

Order no. (pair)
615-060

B Handle section



- 1m piece to cut to appropriate length

Order no. (1 m)
615-061

Small case “click-case”

Advantages:
- quick and simple assembly without tools through click-fastener-system, optional with screw connection
- optimised EMC-features through EMC-textile gasket (optional)

Individuality:
- individual design of front and rear panel possible
- screen printing with different colours possible
- special sizes and special versions possible
- ventilated and closed version

Application:
suitable to take PCB or individual electronic components

Various possibilities:
- desktop enclosure
- for wall mounting 412-100-60
- with DIN-rail-clamps 412-100-50

Material:
galvanized sheet steel 1.0 mm
Finish:
RAL 7035 light grey
Dimensions (H x W x D):
ca. 170 x 40 x 105 mm
Degree of protection:
IP 30 ventilated
IP 40 closed

Description	Order no.
closed	412-100-00
ventilated	412-100-10

Front panel / rear panel

Material: sheet steel, galvanised 1,5 mm
Finish: RAL 7035 light grey

Order no.
412-100-20

Wall mounting bracket

- W x H x DT: 91 x 20 x 11,5 mm
- Assembly material included

Material: sheet steel, galvanised 1,5 mm
Finish: RAL 7035 light grey

Order no.
412-100-60

Bracket for top hat rail

- quick, safe and sturdy fixing of small enclosures, circiut boards and other components to rails (TS35) and support rails
- can be easily fixed from inside or outside to the enclosure's rear panel

Material: PA6 GF 30 black, classified acc. to UL 94 V-0

Description	Order no. (1 Set = 10 pieces)
Width 45 mm, with through-bore hole	442-311-20
Width 45 mm, with threaded inserts	442-311-25
Width 18 mm, with through-bore hole	442-311-30
Width 18 mm, with threaded inserts	442-311-35

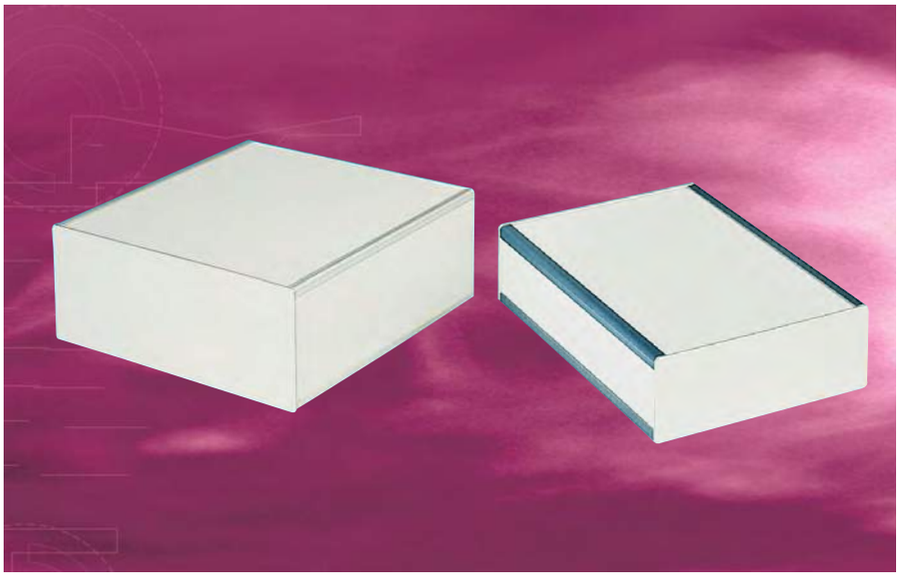
414 • Small profile case

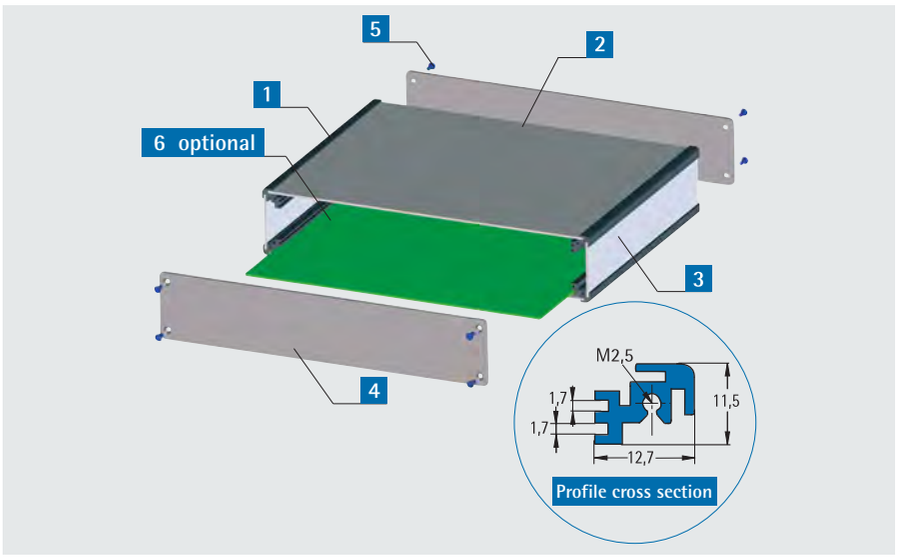
www.apra.de

Small profile case

- cost-effective
- variable width/height/depth

Application:
for 2 PCB or customised electronic components
Construction:
this simply constructed case consists of 4 aluminium extrusions, 4 cover and 2 top panels. The aluminium extrusions have grooves for 2 Europe cards.
Finish:
front/ rear panel and extrusions: anodised aluminium
cover panels: RAL 7035 light grey
Degree of protection:
IP 40
Delivery:
unmounted





Delivery

Item	Pc.	Description
1	4	Extrusions
2	2	Cover panel 1
3	2	Cover panel 2
4	2	Front/ rear panels
5		Assembly material

Front / rear panels can be pre-punched for plugs or cable entry depending on your specifications.

Please order chassis panel [6] separately.

Description	Enclosure width W mm	Enclosure height H mm	D mm	Order no.
Enclosure 197,8 x 162,6 mm	220	44	166,6	414-101
		88	166,6	414-103
		44	226,6	414-111
		88	226,6	414-113
Eurocards of 100 x 160 mm	122	44	166,6	414-105
		88	166,6	414-106
		44	226,6	414-115
		88	226,6	414-116

Chassis plate (6)

Material:
aluminium 1.5 mm
Finish:
untreated

Description	D mm	Order no.
For enclosure 197,8 x 162,6 mm	166,6	414-151
	226,6	414-161
For Eurocards of 100 x 160 mm	166,6	414-153
	226,6	414-163

www.apra.de

Small case profi set cool

The enclosure profi set cool stands out due to its very sturdy construction and individual usability. The corpus exists of shapely aluminium extrusions as well as front and rear panel. These may be custom-made machined and silk screened on request.

Top and bottom extrusions are designed for dissipating the electronics' heat by heat conduction pads or heat pipes. Fixing elements for circuit boards can be individually integrated. The profi set cool series offers different mounting possibilities such as mounting plates or other components.

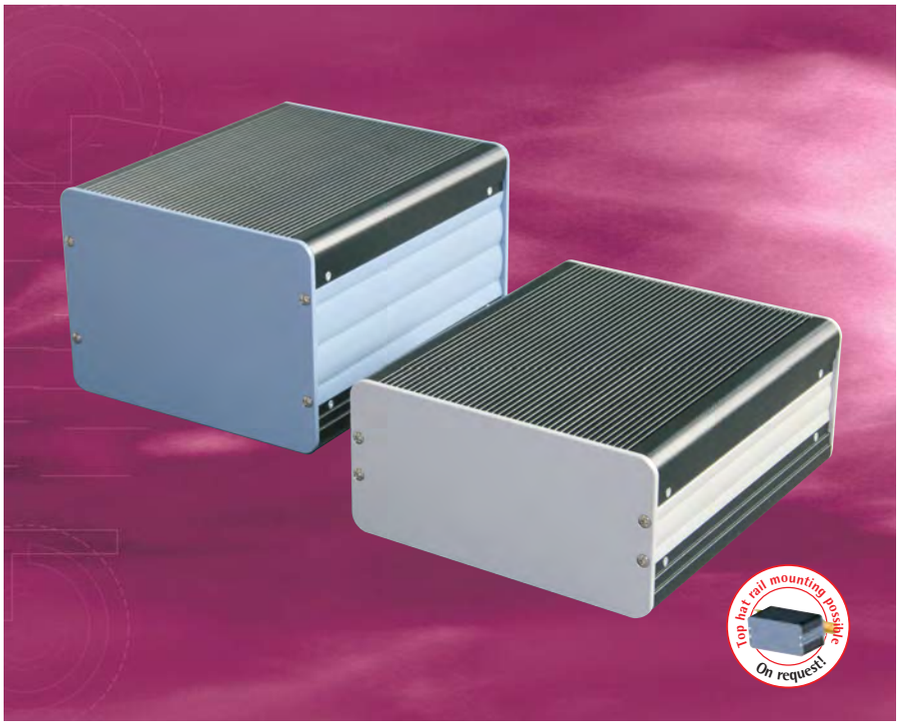
Features:
- sturdy construction
- individual design
- comprehensive range of accessories
- versatile mounting possibilities

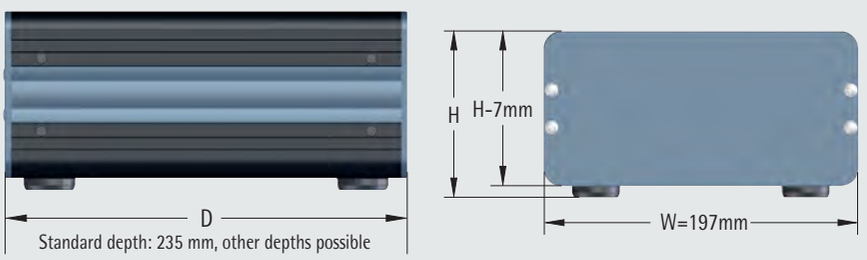
Material:
aluminium

Finish:
Top / bottom shell:
RAL 9005 deep black
front panel / side panel:
RAL 9006 white aluminium

Delivery:
kit form, including mounting material

Accessories on request:
- skid proof enclosure feet
- mounting plate
- prop-up and carrying handle
- handles for front panel
- wall mounting fixing set
- adapter for top hat rail mounting





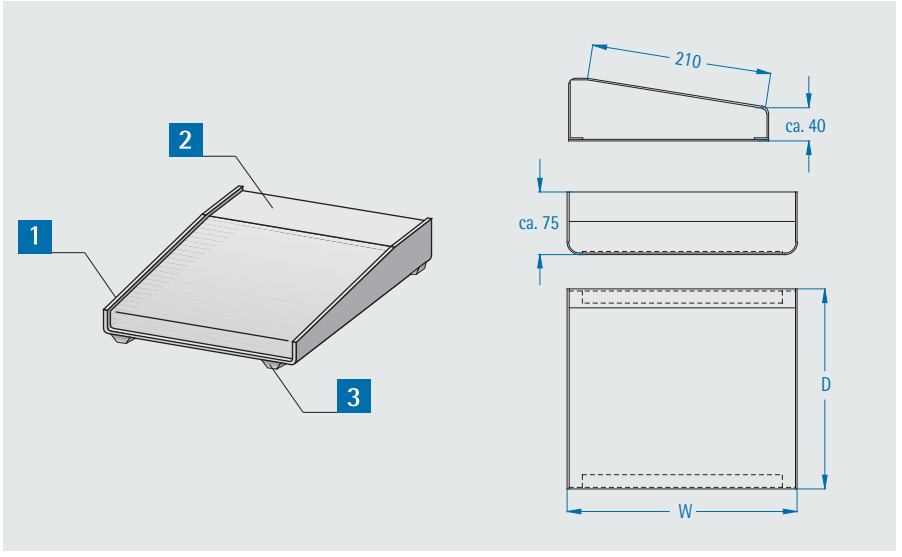
H	Order no.
104 mm (inkl. feet)	264-510-00
148,5 mm (inkl. feet)	264-510-10

www.apra.de

Desk console

- desk console in light aluminium design
- hood fits inside bottom piece and is screwed together from underneath
- perfectly suited for the use of sealed keypads

Application:
for control units such as sealed keypads
Material:
aluminium , 2.0 mm
Finish:
RAL 7035 light grey
Delivery:
not assembled



Additional sizes and customised treatments (e.g. screen printing) on request.

Delivery

Item	Pc.	Description
1	1	Bottom shell
2	1	Cover hood
3	4	Case feet, self-adhesive
4		Assembly material

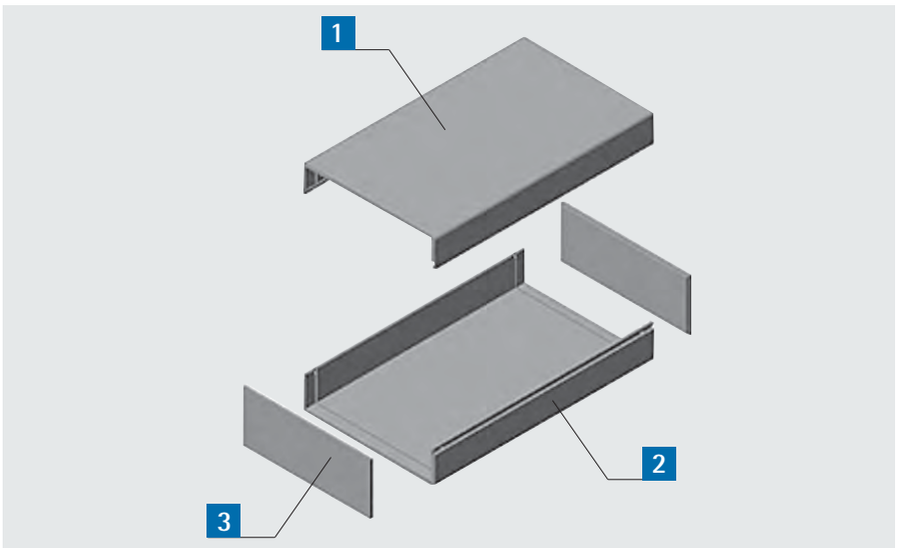
W mm	D mm	Order no.
490	240	502-001
420		502-011
490	340	502-002
420		502-012

www.apra.de

Series D standard case

- plastic case made of impact-resistant polystyrene, 3 mm
- connected by snap locks; no screws required
- front and rear panel with 7 mm offset towards the inside

Application:
case for boards or small modules
Material:
polystyrene, 3 mm
Finish:
grey-white / warm grey
Degree of protection:
IP 42



h mm	w mm	d mm	Order no.
50	100	110	D 10
35	145	170	D 20
40	103	160	D 25 R
40	120	170	D 30
70	110	145	D 40
70	103	160	D 45 R
60	160	170	D 50
100	180	210	D 60
70	200	215	D 70

Additional sizes and customised treatments (e.g. milling, silkscreen printing) on request.

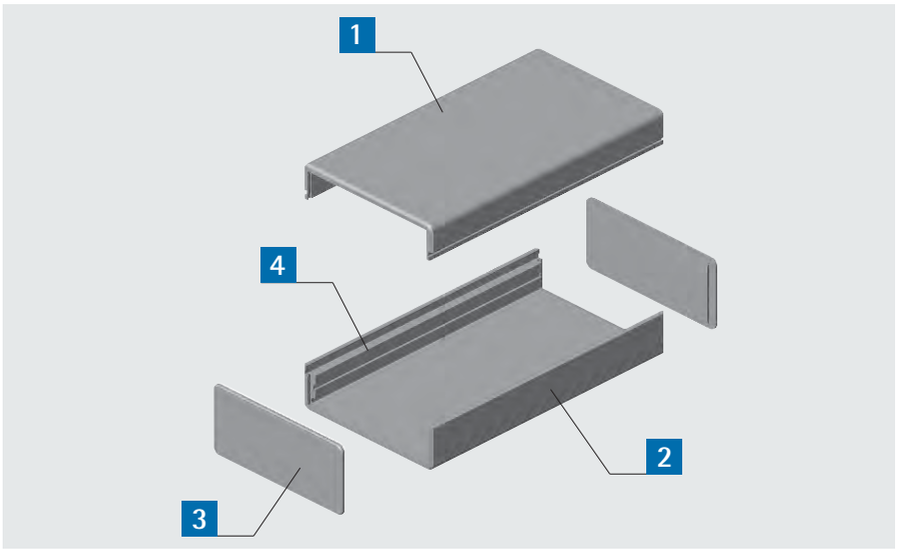
Delivery

Item	Pc.	Description
1	1	Top shell
2	1	Bottom shell
3	2	Front panels

Series DB standard case

- plastic case made of impact-resistant polystyrene, 3 mm
- connected by snap locks; no screws required
- 2 card guides can be glued in
- front and rear panels flush fitting

Application:
case for boards or small modules
Material:
polystyrene, 3 mm
Finish:
grey-white / warm grey
Degree of protection:
IP 54



Additional sizes and customised treatments (e.g. milling, silkscreen printing) available on request.

Delivery

Item	Pc.	Description
1	1	Top shell
2	1	Bottom shell
3	2	Front panels
4	2	Card guides, to be glued in

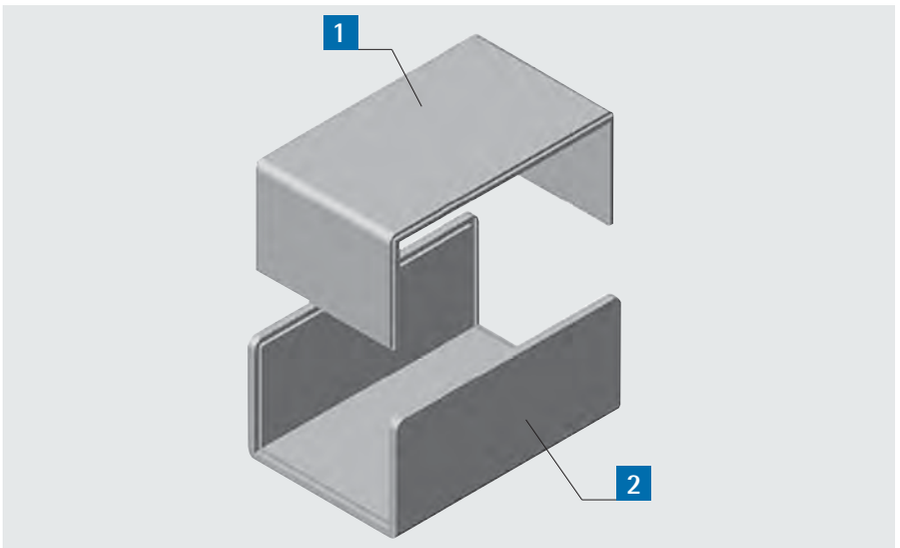
h mm	w mm	d mm	Order no.
25	53	103	DB 1
25	63	125	DB 2
30	83	163	DB 3
30	103	203	DB 4
50	103	203	DB 5
17	38	83	DB 6

www.apra.de

Series N2U standard case

- plastic case made of impact-resistant polystyrene, 3 mm
- locks together with tongue and groove joints
- u-shaped top and bottom pieces
- no screws required

Application:
case for boards or small modules
Material:
polystyrene, 3 mm
Finish:
grey-white
Degree of protection:
IP 42



h mm	w mm	d mm	Order no.
25	40	40	N2U 1
20	90	35	N2U 2
25	53	163	N2U 3
20	53	83	N2U 4
35	53	83	N2U 5
20	103	163	N2U 6
20	163	203	N2U 7

Additional sizes and customised treatments (e.g. milling, silkscreen printing) on request.

Delivery

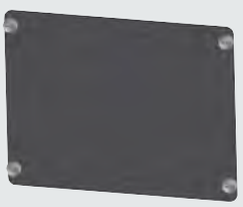
Item	Pc.	Description
1	1	Top shell
2	1	Bottom shell

Wall mounting enclosure „Flex 310“

Basic enclosure consisting of wall mounting part and 2 brackets to take the mounting plate and/or mounting rail inside. Front door with foamed sealing, 180° hinges and locking handle.

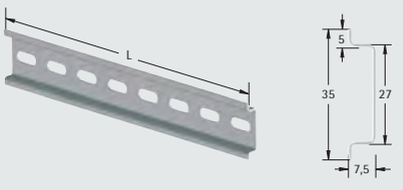
- basic enclosure and front door painted light grey RAL 7035
- mounting plate made of hot-dip galvanised sheet steel
- mounting rail galvanise

Mounting plate

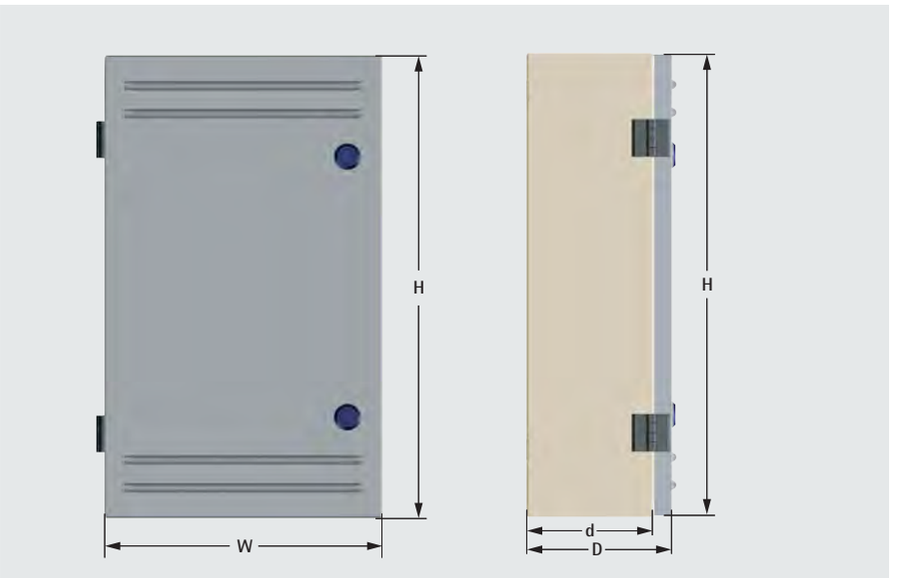


For enclosure height H	Order no.
H=300 mm	310-100-10
H=500 mm	310-200-10
H=700 mm	310-300-10

Mounting rail



For enclosure height H	Order no.
H=300 mm	310-100-20
H=500 mm	310-200-20
H=700 mm	310-300-20



H mm	W mm	D mm	d mm	Order no.
300	200	130	105	310-100-00
500	300	160	135	310-200-00
700	500	210	185	310-300-00

Technical Information

Technical Information

- Overview of standards 196
- 19" modular system 197
- IP degrees of protection 204
- Flammability of plastics 205
- Protective earthing 206
- Certification 207
- Approbations 207
- Terminology 208
- Abbreviations 209
- Index 210
- Standard colours 213
- General terms and conditions 214
- apra worldwide 216

... the perfect shell for valuable electronics

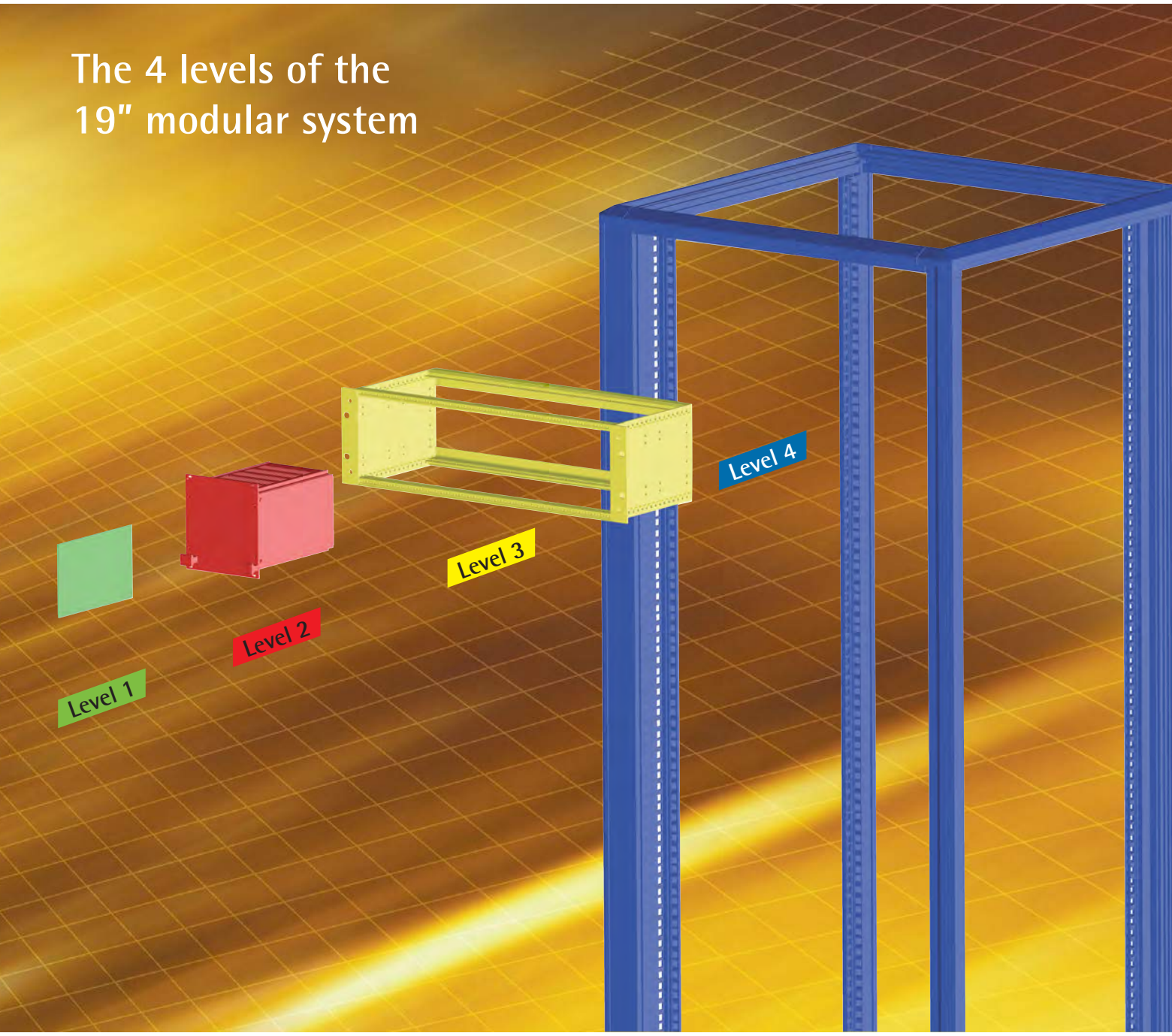
Overview of standards

www.apra.de

Standard	Description
DIN 41494	Mechanical structures of the 482,6 mm (19") series
DIN 43356	Dimensions of metric construction, Multimodul 25mm
DIN 43700	Outer dimensions of panel instruments cases and dimensions of cut-outs in the control panels
DIN 43834	Fastening for measuring and control instruments for panel mounting; fastening component; fastening holes in the instrument
DIN 43835	Fastening for indicating instruments; fastening component, cone-rivets at the case, mounting arrangement
DIN 46008	Flat contact surfaces for earthing screws; rated voltage below 52 kV
DIN EN 50155	Railway uses of electrical equipment on rail vehicles
DIN EN 55022	Limit values and measuring procedures for interference from information technology equipment
DIN EN 60917-2	Interface co-ordination dimensions for metric construction
DIN EN 60917-2-2	Interface co-ordination dimensions for metric construction: dimensions for modules, plug-in units, rear panels, front panels and plug-in modules
DIN EN 60950	Safety of information technology equipment
DIN VDE 0100 Part 410	Protection against electric shock
DIN VDE 0100 Part 540	Earth conductor, earthing
DIN EN 50081-1/-2	Electromagnetic compatibility (EMC) - Generic emission standard Part 1: Residential, commercial and light industry Part 2: industrial environment
DIN EN 50082-1/-2	Electromagnetic interference, basic standard interference Part 1: residential, commercial and light industry Part 2: industrial environment
DIN EN 50091-1/-2	Uninterruptible powersystems (UPS); General and safety requirements Part 2: EMC-Requirements
IEC 60297-3-100	Dimensions of mechanical structures of the 482,6 mm (19") series: basic dimensions of front panels, subracks, chassis, racks and cabinets
IEC 60297-3-101	Dimensions of mechanical structures of the 482,6 mm (19") series: subracks and modules
IEC 60297-3-102	Dimensions of mechanical structures of the 482,6 mm (19") series: injector / extractor handle
IEC 60297-3-103	Dimensions of mechanical structures of the 482,6 mm (19") series: coding and alignment pin
DIN EN 60529	Degrees of protection: protection against shock, foreign objects and water for electrical equipment
IEC 60603-2	Connectors for frequencies below 3 MHz for use with printed boards - part 2: detail specification for two-part connectors with assessed quality, for printed boards, for basic grid of 2,54 mm
IEC 61554	Panel mounted equipment - Electrical measuring instruments - Dimensions for panel mounting
IEC 61643-1	Low-voltage surge protective devices Part 1: surge protective devices connected to low-voltage power systems
IEC 62040-3	Uninterruptible powersystems (UPS) Part 3: method of specifying the performance and test requirements
IEEE 587	Guide for Surge Voltages in Low-Voltage AC Power Circuits
IEEE 1101.10	Additional mechanical specifications for microcomputers using IEEE 1101.1-1991 equipment practice
IEEE 1101.11	Mechanical rear plug-in units specifications for microcomputers using IEEE 1101.1 and IEEE 1101.10 equipment practice
UL 94	Combustibility and flammability of plastics UL94 HB: horizontal burning test UL94 V-2, UL94 V-1, UL94 V-0: vertical burning test
VG 95373 Part 15	Directives on shielding attenuation measurements

www.apra.de

The 4 levels of the 19" modular system



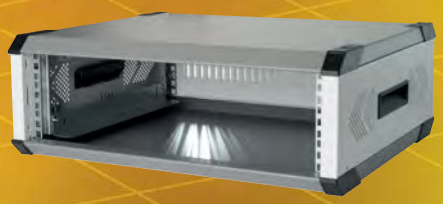
Level 1	components, elements (front panels, plug-in connectors, PCB's)
Level 2	modules (connecting plates, sub-units, cassettes)
Level 3	subracks, plug-in units
Level 4	enclosures (19" enclosures, consoles, racks, cabinets)

www.apra.de

19" components	Standards	apra-norm solutions
LEVEL 4		
19" cabinets	IEC 60297-3-100	aprack®
19" racks	IEC 60297-3-100	
19" enclosures	IEC 60297-3-100	
LEVEL 3		Plug-in unit, Subrack 245
19" front panels	IEC 60297-3-101	
19" subracks	IEC 60297-3-102	
19" plug-in units	IEC 60297-3-103	
	IEEE 1101.1	
	IEEE 1101.10	
	IEEE 1101.11	
LEVEL 2		Sub-unit 247
Sub-units	IEC 60297-3-101	
Cassettes	IEC 60297-3-102	
	IEC 60297-3-103	
	IEEE 1101.1	
	IEEE 1101.10	
	IEEE 1101.11	
LEVEL 1		Front panels 243/246
Front panels	IEC 60297-3-101	
Plug-in connectors	IEC 60297-3-102	
PCB's	IEC 60297-3-103	
	DIN 41494/8	
	IEC 60603-2	
	IEC 60097	

www.apra.de

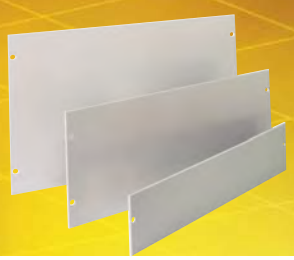
Vitaro®



ZENITH 2.0

Computer plug-in unit **EVO2.0**

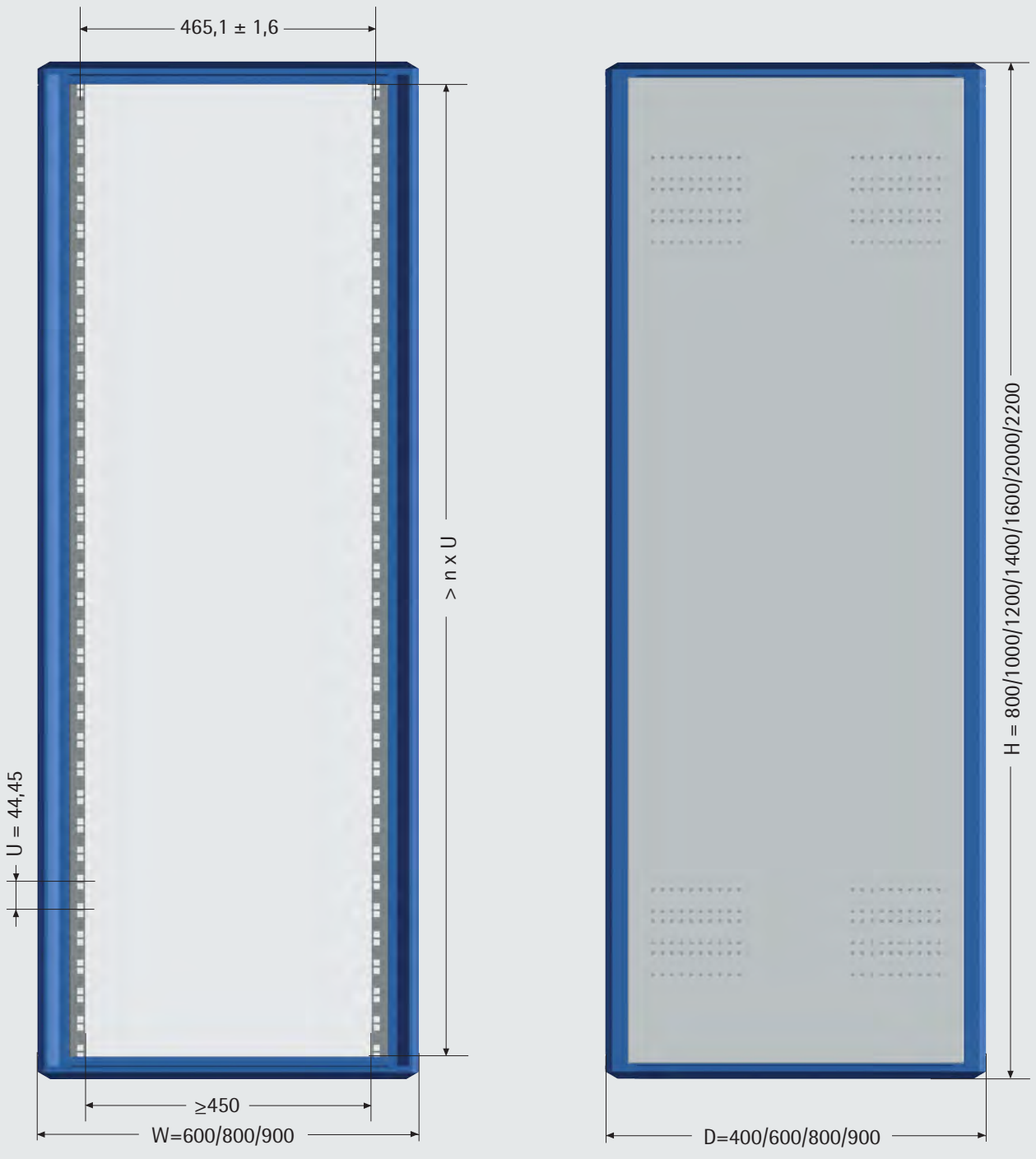
Front panels 200/205



Cassette 248

Front panels 244

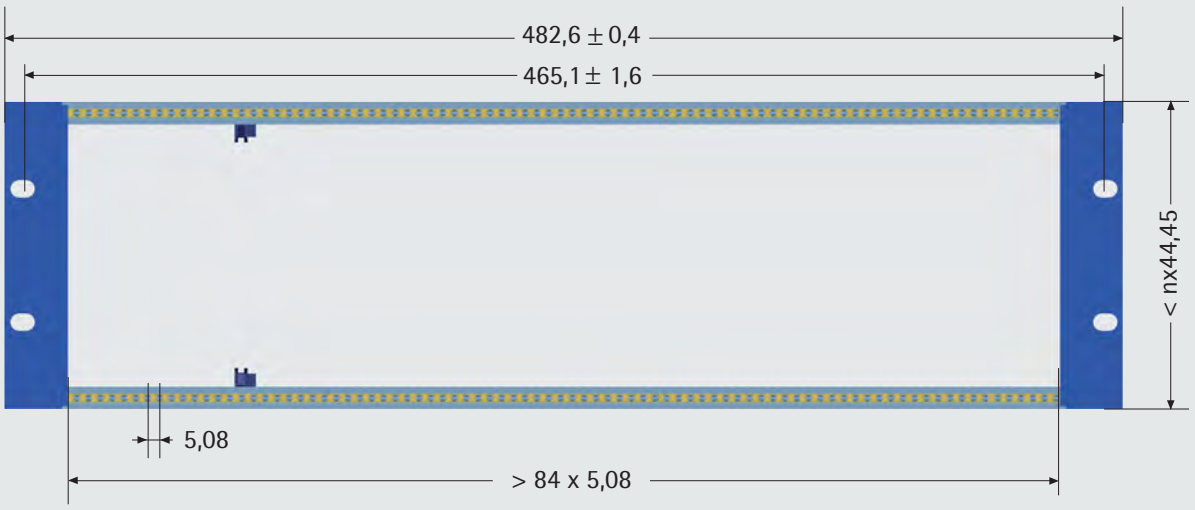
Level 4: 19" cabinets, 19" racks, 19" enclosures

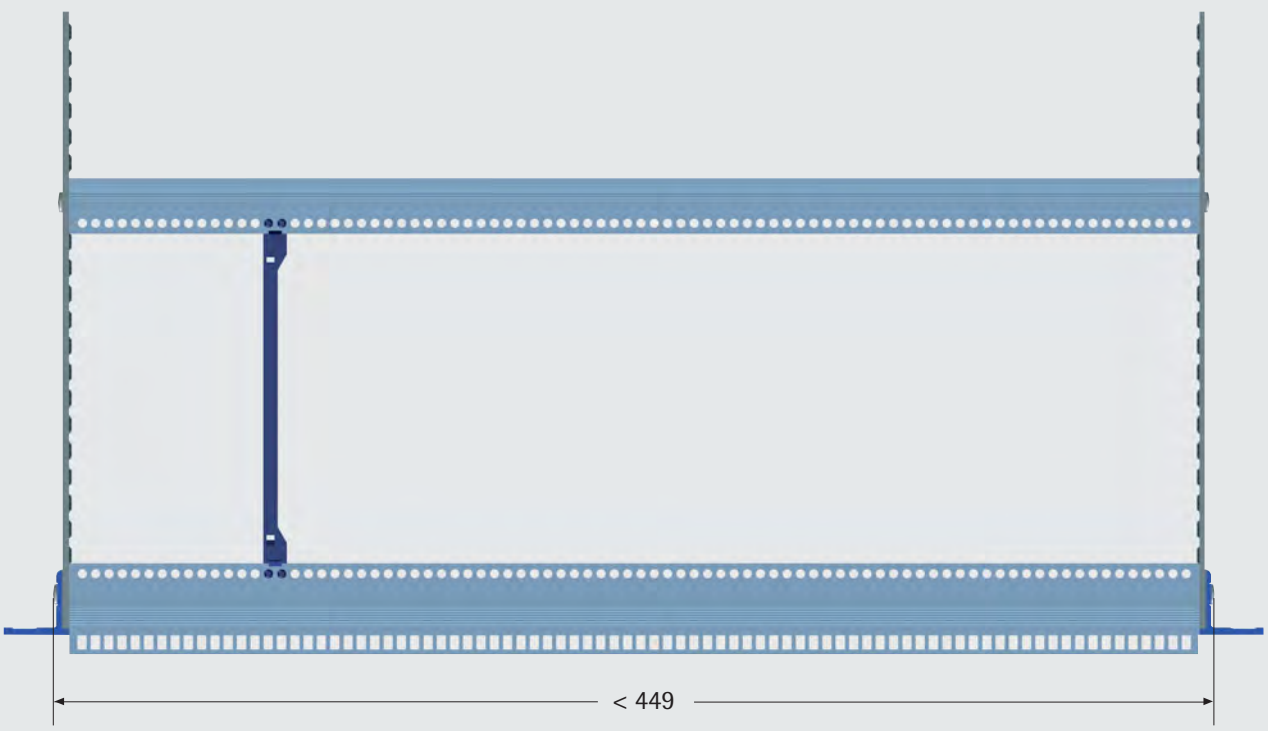


Cabinet system	Height H mm	Installation height n x U	Width W mm	Depth D mm
aprack	600, 800, 1000, 1200, 1600, 1800, 2000	11, 16, 20, 25, 34, 38, 43	600, 800	600, 800

The measures H/W/D in drawing and chart are nominal sizes corresponding to the division. The installation dimensions are marginally smaller.

Level 3: 19" front panels, 19" plug-in units, 19" subracks



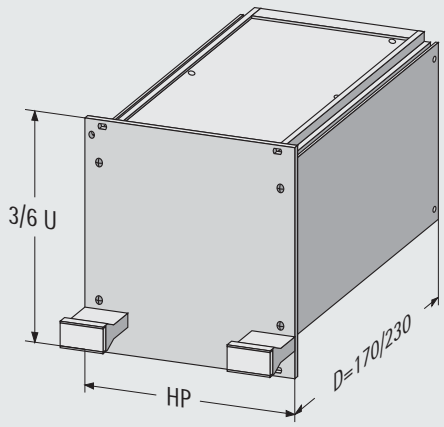


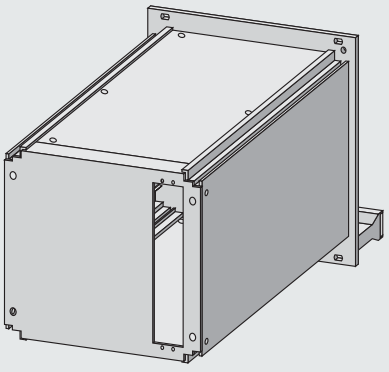
Level 2: Plug-in modules

Sub-units

Insertable component for electrical equipment for example (building blocks), that cannot be mounted to a connecting plate; with or without plug-in connector.

Standardised outer dimensions, freely configurable inner dimensions

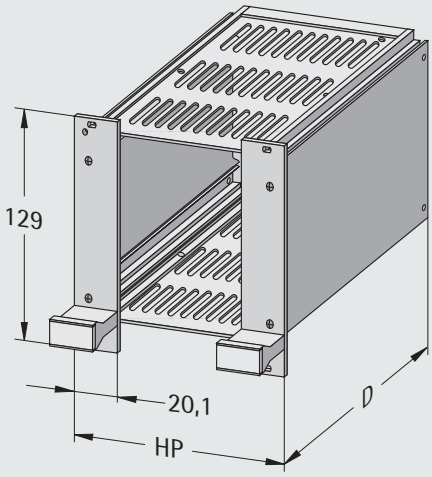


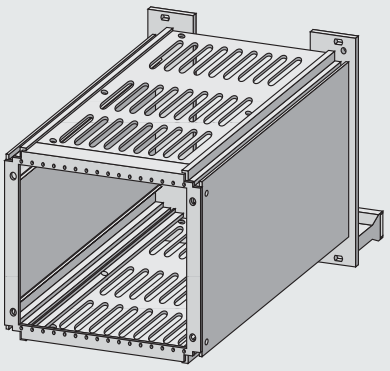


Cassettes

Insertable component for several connecting plates, for example; with or without plug-in connector

Standardised outer dimensions





www.apra.de

Level 1: Front panels, plug-in connectors, PCB's

Front panels 3 U

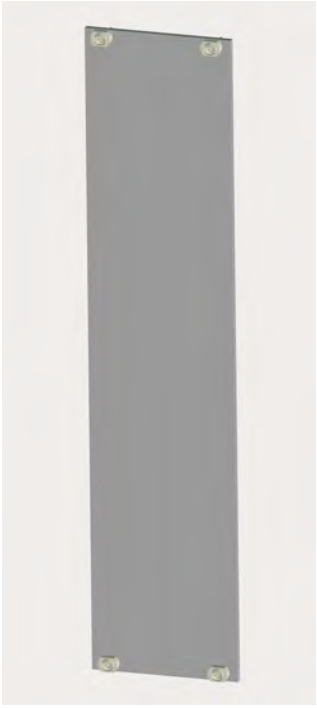
Front panel Type A

Front panel Type C with handle

Front panel IEEE with injector/extractor handle

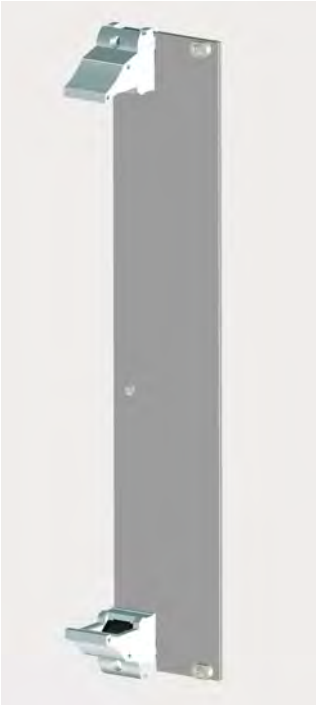
Profile front panel IEEE with injector/extractor handle

Front panels 6 U



Front panel Type A

Front panel Type C with handle



Front panel IEEE with injector/extractor handle

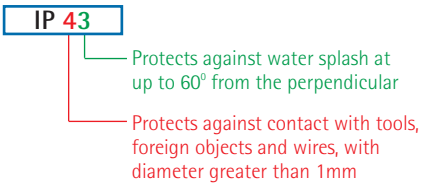
Profile front panel IEEE with injector/extractor handle

IP degrees of protection

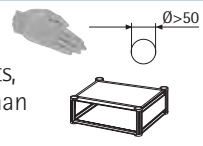
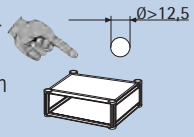
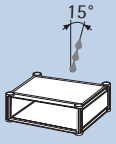
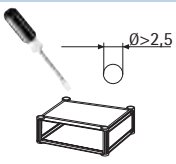
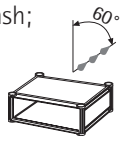
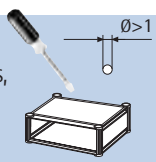
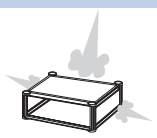
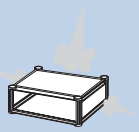
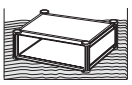
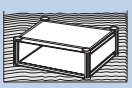
www.apra.de

IP degrees acc. to DIN EN 60529

All electronic devices and equipment must be protected from possible interference to ensure reliable operation. Enclosures and cabinets must therefore comply with certain protection requirements depending on their area of application.
Standard DIN EN 60529 with its IP degrees of protection (IP = international protection) specify these requirements.
Its digits specify the ability of an enclosure to protect integrated components from contact, for example from foreign objects and water. The first digit of the IP degree of protection indicates the degree of protection for shock protection and protection against foreign objects; the second indicates protection against water. See the table below for explanations of the individual digits.



Degree of protection acc. to DIN EN 60529

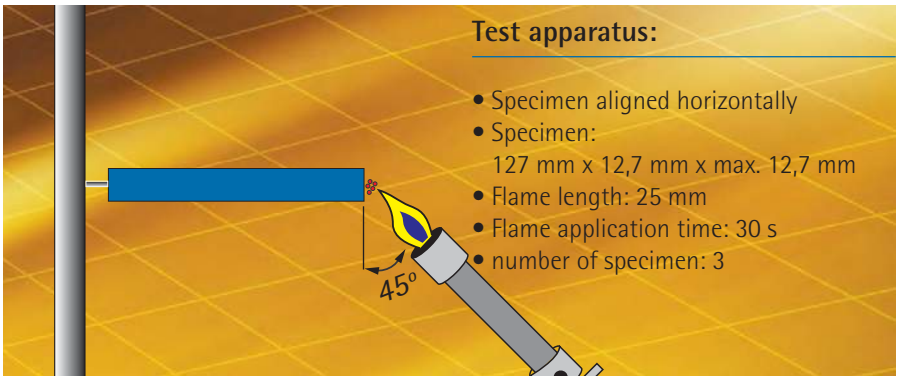
Protection against contact and foreign objects			Protection against water	
First digit	Contact	Foreign object	Second digit	Contact
0	No protection	No protection	0	No protection
1	Protects against contact with large surface area body parts	Protects against large foreign objects, diameter greater than 50mm 	1	Protects against vertical water droplets
2	Protects against finger contact	Protects against mid-sized foreign objects, diameter greater than 12.5mm 	2	Protects against oblique falling water droplets; no more than 15° from the vertical 
3	Protects against contact with tools, foreign objects and wires, with diameter greater than 2.5mm	Protects against small foreign objects, diameter greater than 2.5mm 	3	Protects against water splash; no more than 60° from the vertical 
4	Protects against contact with tools, foreign objects and wires, with diameter greater than 1mm	Protects against granular foreign objects, diameter greater than 1mm 	4	Protects against water spraying on all sides
5	Complete protection	Protects against dust deposits 	5	Protects against water jet on all sides
6	Complete protection	Protects against dust entry at negative pressure of 20mbar inside the enclosure 	6	Protects against flooding
			7	Protects against occasional submersion 
			8	Protects against permanent submersion 

www.apra.de

Flammability test UL94 HB

Classified acc. to UL94 HB if:

- Burning rate ≤ 76 mm/min at specimen thickness of up to 3 mm
  Burning rate ≤ 38 mm/min at specimen thickness higher than 3 mm
- Combustion distance < 102 mm



Test apparatus:

- Specimen aligned horizontally
- Specimen:
  127 mm x 12,7 mm x max. 12,7 mm
- Flame length: 25 mm
- Flame application time: 30 s
- number of specimen: 3

Flammability test UL94 V-2/-1/-0

Classified acc. to UL94 V-2 if:

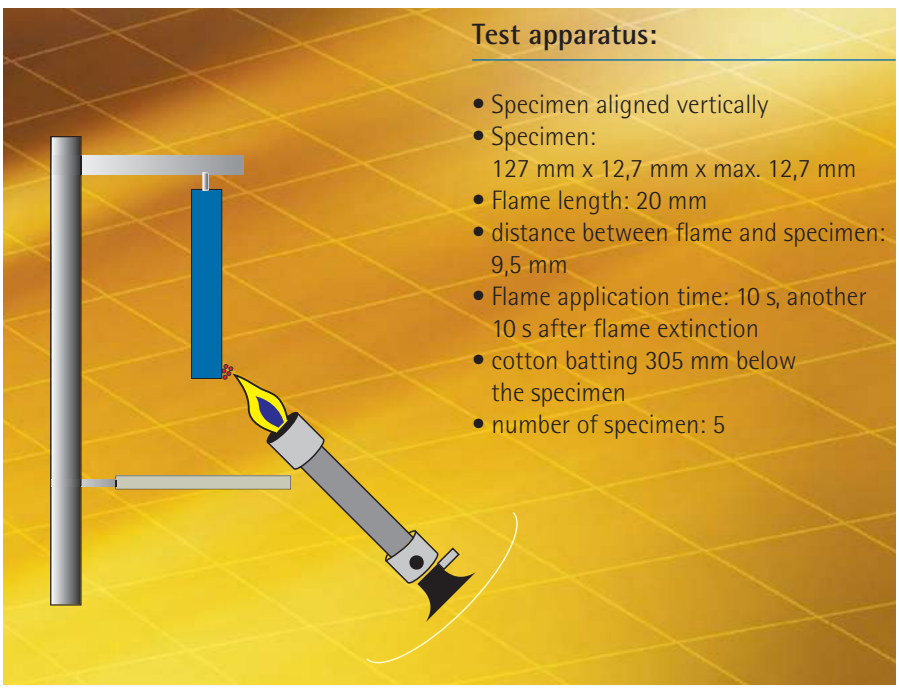
- Afterglow time ≤ 30 s
- Total afterglow time in 10 tests ≤ 250 s

Classified acc. to UL94 V-1 if:

- Afterglow time ≤ 30 s
- No dripping of burning specimens
- Total afterglow time in 10 tests ≤ 250 s

Classified acc. to UL94 V-0 if:

- Afterglow time ≤ 10 s
- No dripping of burning specimens
- Total afterglow time in 10 tests ≤ 50 s



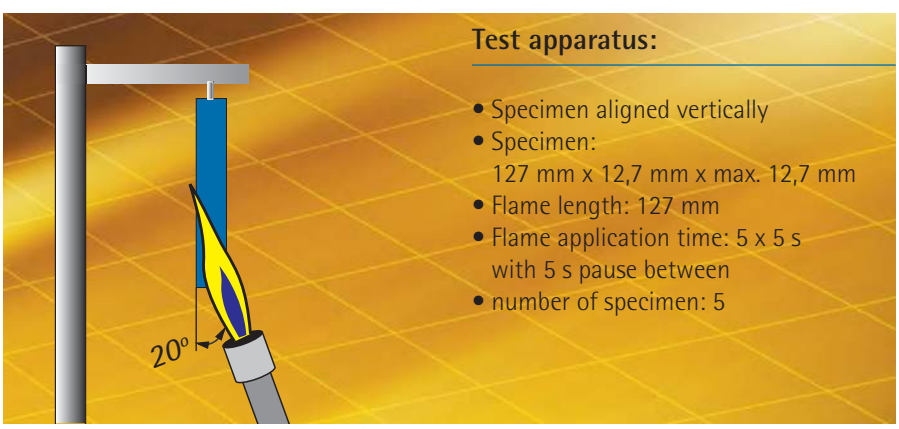
Test apparatus:

- Specimen aligned vertically
- Specimen:
  127 mm x 12,7 mm x max. 12,7 mm
- Flame length: 20 mm
- distance between flame and specimen: 9,5 mm
- Flame application time: 10 s, another 10 s after flame extinction
- cotton batting 305 mm below the specimen
- number of specimen: 5

Flammability test UL94-5V

Classified acc. to UL94-5V if:

- Afterglow time ≤ 60 s
- No dripping of burning specimens



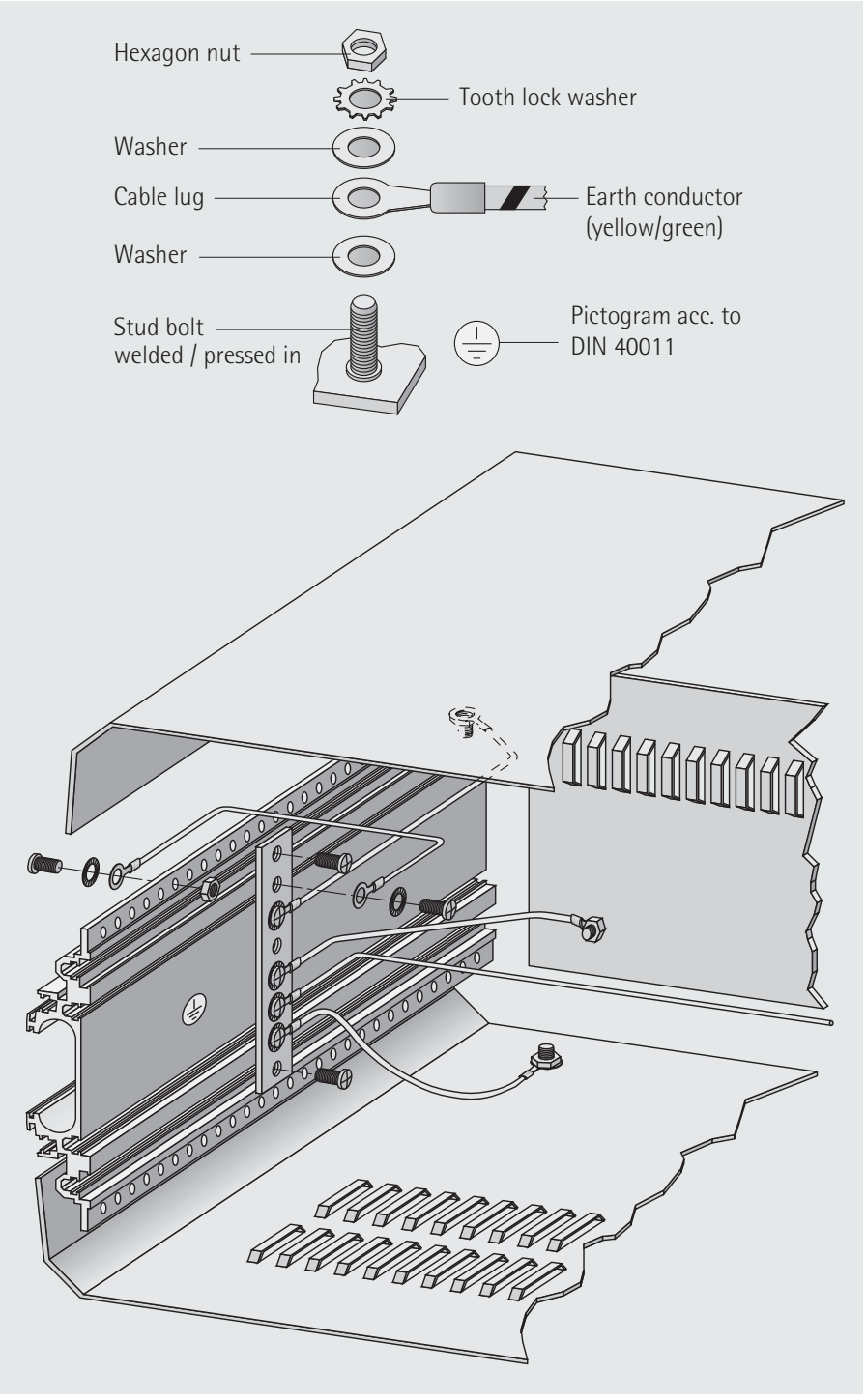
Test apparatus:

- Specimen aligned vertically
- Specimen:
  127 mm x 12,7 mm x max. 12,7 mm
- Flame length: 127 mm
- Flame application time: 5 x 5 s with 5 s pause between
- number of specimen: 5

Protective earthing

Electrical devices that are installed in 19" components (IEC 60297) have many sensitive metal pieces. If malfunctions occur, these inactive components can come into contact with the electrical circuit and can be electrified.
All inactive components must be connected to an earth conductor to prevent operators from being injured. These components must have a contact resistance lower than 0.1 Ohm at their connection points in compliance with DIN EN 61010.

apra-norm solves this problem by using press or welded nuts respectively lugs for receptacles.



The series 140/280 earth conductor set has been tested by the German Technical Committee for Electrical Engineering of the Professional Association of Precision Mechanics and Electrical Engineering, Cologne, and complies with the following standards:

DIN 46008/01.87: contact surfaces for earthing and conductor screws

DIN EN 60204: electrical equipment of machines
Part 1: general provisions

The earth connection must be made by a specialist in compliance with VDE regulation 0100, local regulations and the technical instructions.

The earth conductor screws must not be used for any other purpose, particularly for mechanically attaching structural parts.

The earth conductor system must not be interrupted when structural parts are removed.
The equipment manufacturer must make and check the earth connection from the equipment to the earth connection point. We only ensure the protective measures if the specified provisions are followed and our original parts are used.

www.apra.de

Certifications

Our personal commitment, feel for the requirements of the future market and high quality standard earn apra the trust of even the most demanding clients again and again. Know-how depends on the ability of people; apra-norm backs high-quality innovative products which form the basis for the constantly growing group of companies. A quality and environmental management system that functions well is therefore necessary.

This system is recognised outside of the apra-group through a certificate which is awarded when a company proves by an audit that they meet all DIN requirements.

One of these requirements is that all processes are clearly, transparently and completed documented.

The apra group has received certifications for quality and environmental management systems for all of its sites.

In addition, **DIN EN ISO 9001:2008** is a standard that describes the selection and introduction of a quality management system within a company.

DIN EN ISO 14001:2009 is the environmental standard. It is awarded when a company fulfills all environmental aspects.

The management systems described in a management manual for quality and environment define all organisational measures that ensure all products comply with the provisions and regulations as stipulated in the contract and function according to provisions.

The apra group has agreed for example to observe environmental protection requirements and to continually improve environmental protection measures.

The observance of environmental protection policy is monitored on a regular basis. The TÜV will annually check the validity of awarded certificates.

TÜV PROFI CERT

CERTIFICATE

Management system as per

DIN EN ISO 9001:2008

Evidence of conformity with the above standard(s) has been furnished and is certified in accordance with TÜV PROFICERT procedures for

apra-norm Elektromechanik GmbH
Bei der untersten Mühle 5
D-54552 Mehren
including all plants acc. to annex

scope:

Development, production and selling of 19'' Housings, cabinet systems, modules and installation into control panel housings and passive network components

Certificate registration No. 73 100 3112 — Certificate valid from 2013-04-15 to 2016-04-14
Audit report No. 4258 3716 — First certification 2010-04-15

TÜV PROFI CERT

CERTIFICATE

Management system as per

DIN EN ISO 14001:2009

Evidence of conformity with the above standard(s) has been furnished and is certified in accordance with TÜV PROFICERT procedures for

apra-norm Elektromechanik GmbH
Bei der untersten Mühle 5
D-54552 Mehren
including all plants acc. to annex

scope:

Development, production and selling of 19'' Housings, cabinet systems, modules and installation into control panel housings and passive network components

Certificate registration No. 73 104 3112 — Certificate valid from 2013-04-15 to 2016-04-14
Audit report No. 4258 3716 — First certification 2010-04-15

Approbations

- Verein Deutscher Elektrotechniker
- Underwriters Laboratories
- Conformité Européenne
- Canadian Standards Association
- Geprüfte Sicherheit
- Technischer Überwachungsverein

A

anodizsd:
an oxide layer is applied through electrochemical oxidation to increase protection against corrosion and/or to achieve high-quality finishes (e.g. front panels)

ASA perforation:
additional cut-outs in a 19" mounting bracket centred between the partitions

B

backplane:
multilayer PCB with data, signal and supply lines and plug-in locations for plug-in modules on the rear wall of electronic equipment/enclosures

BUS:
manifold for transferring data and control information between different components or systems. A difference is made between serial and parallel busses.
Examples: serial BUS systems: Ethernet, CAN, Profibus, Interbus
parallel BUS systems: VMEbus, CompactPCI

C

CPCI:
Abbreviation for "**C**ompact **p**eripheral **c**omponent **i**nterconnect". CompactPCI is an extension of the "peripheral component interconnect (PCI)-specification for industrial computers with the requirement of a smaller but more sturdy mechanical form factor compared to a common PC. The CPCI-Bus is based on the PICMG-specification 2.0 (Rev. 3.0) of the PCI Industrial Computer Manufacturer's Group (PICMG).

E

EMC:
abbreviation for **e**lectro**m**agnetic **c**ompatibility.
ability of electronic systems and components to function
a) without being influenced by the electromagnetic environment
b) without harming the environment with impermissible interference.

I

IEC:
abbreviation for **I**nternational **E**lectrotechnical **C**ommission; international body that prepares standards

IEEE:
abbreviation for **I**nstitute of **E**lectrical and **E**lectronic **E**ngineers; American organization for promoting research and standards in the IT sector

M

metric construction:
contrary to the 19" standard the construction defined in standard IEC 61917 uses only metric units like the 25mm increments of fixing holes in cabinet and enclosure mounting brackets.

P

PCI:
abbreviation for **P**eripheral **C**omponent **I**nterconnect; BUS system used independent from the processor; mainly used in expansion cards with high data throughput like hard drive controllers and graphics cards.

plug & play:
describes a system that is already pre-assembled or automatically configured so that the user can begin using the system immediately after it is switched on.

powder coating:
unlike traditional painting processes, powder in the desired colour is applied to the piece electrostatically and then baked in at approx. 200°C resulting in a very tough and resistant coating.

R

riser card:
angular card (angular adapter) for turning a plug-in cards horizontally (up to 3 cards); as a butterfly riser card for plugging in opposite horizontal cards

T

transparent chromating / passivation:
treatment of aluminium with chromic acid and fluoride; the emerging layer of approx. 0,1 to 1 µm improves conductivity of the surface and serves as pre-treatment of painting.

U

UPS:
Uninterruptible **p**ower **s**upply ensures system voltage in case of a blackout either by battery operation or emergency generator. Additionally, any voltage fluctuation within the electric power system is equalised.

V

VME-Bus:
Multi-User Backplane-Bus for mounting in 19" systems with 96-pole connectors acc. to nach DIN 41612 and IEC 60603-2.

www.apra.de

A

AC: Alternating current
Al: Aluminium
AlMg1: Alloying of aluminium and magnesium
ANSI: American National Standard Institute
ASA: American Standards Association (today: ANSI)
ATX: Advanced technology extended

C

CAD: Computer-aided design
CE: Conformité Européenne
CSA: Canadian Standards Association
Cu: Copper

D

dB: Decibel (measurement unit for screening effectiveness)
dB (A): Decibel (measurement unit for noise level)
DC: Direct current
Dim: Dimension
DIN: Deutsche Industrie Norm (German industrial standard)

E

EMC: Electromagnetic compatibility
ESD: Electrostatic discharge

F

Fig.: Figure

G

GHz: Gigahertz (measurement unit for frequency)
GS: Geprüfte Sicherheit (approved security: approval of the German Technischer Überwachungsverein (Technical Control Board)

H

HP: Horizontal pitches (5,08 mm)

I

IEC: International Electrotechnical Commission
IEEE: Institute of electrical and electronic engineers
incl.: included
IP: Internal protection (degree of protection)
IPC: Industrial PC
ISO: International Standards Organisation

K

KVM: Keyboard Video Mouse

L

LCD: Liquid crystal display
LED: Light ermitting diode
LSG: Laminated safety glass

M

MHz: Megahertz (measurement unit for frequency)

P

pc: Piece
PCI: Peripheral component interconnect
PFC: Power factor correction
PICMG: PCI Industrial computers manufacturers group
Pos.: Position
PU: Packaging unit

T

TFT: Thin film transistor
TÜV: Technischer Überwachungsverein (German Technical Control Board)

U

U: Height unit (44,45 mm)
UL: Underwriters Laboratories
UPS: Uninterrupted power supply unit
UTE: Union technique de l'électricité

V

VDE: Verein Deutscher Elektrotechniker (German Electrical Engineering Association)
VdS: Verband der Sachversicherer (German association of insurance providers)
VESA: Video Electronics Standards Association
VME: Versa module Europe

INDEX

A

Adapter rail for X-dream 180
Adjusting feet 14
aprack, 19" cabinet 7
apra-line, 19" enclosure 37
apra-line, desktop enclosure 163
apra-lite, 19" enclosure 48
apra-TEK, 19" enclosure 46

B

Bow-type handle 71

C

Cabinet system aprack 7
Cable duct 30
Cable hoops 23
Cable routing panel 22
Card guide with IEEE coding 118
Card guide, divided 120
Card guide, standard 116
Card holder set 59
Cassette ..... 146 / 147
Castor set for aprack cabinet 14
Castor set for Zenith enclosure 30
Click-case, small enclosure 187
Coding pin 119
Computer plug-in unit 19", EVO 2.0 56
Connecting kit for subracks 122
Contact strip 115
Cover brackets 123
Cover bracket for subracks 104
Cover strips for power distribution subrack 97

D

Desktop enclosure apra-line 163
Desktop enclosure profi set 264 151
DIN rail fixing clamp ..... 75 / 187
Drawers, 19" 78

E

Embedded PC enclosure 62
EMC cassette 144
EMC contact springs 113
EMC fabric gasket 113
EMC front panel 129
EMC sub-unit 138
Enclosure apra-lite 48
Enclosure apra-TEK 46
Enclosure profi set 264 151
Enclosure Vitaro 31
Enclosure Zenith 27
EVO 2.0 computer plug-in unit 19" 56
Expansion kit, horizontal 110
Expansion kit, vertical 111
Extension kit for subracks 122
Extraction handle 121

F

Fan ..... 58 / 59
Fan module 20
Female connector fixing 32-pole 148
Flat module, 19" 76
Flex 310, wall-mounting enclosure 194
Frames for subracks 123
Front panel 128
Front panel, 19" 70
Front panel fastening 131
Front panel, fold-up 71
Front panel handle ..... 71 / 103
Front bracket for subracks 103
Front bracket 19", for desktop enclosure profi set 161

INDEX

G

Group lock extrusion 121

H

Handle ..... 21 / 30 / 71 / 103
Hard drive cage, internal 58
Hard Box 60
Heavy Load subrack 94

I

Industrial PC Enclosure 61
Injector / Extractor handle 137
Insulating strips 115
IPC enclosure Hard-Box 60

K

Keyboard tray 1U, 19" 63
Keyboard tray 2 U, 19" 64

M

Male connector fixing 32-pole 148
Module rails 105
Mounting plate, for aprack cabinet 17
Mounting plate, for wall mounting enclosure Flex 310 194
Multiple socket strips ..... 21 / 55

N

Neck screw 131

P

PC protection enclosure 54
PCB cover 133
PCB fixing 132
PCB lock 121
Plastic standard enclosure, Series D 191
Plastic standard enclosure, Series DB 192
Plastic standard enclosure, Series N2U 193
Plug-in components 134
Plug-in module R-Type 96
Plug-in unit 19" 65
Potential equalisation bar 23
Power distribution subrack, 19" 97
profi-case, small case 183
Profiled front panel IEEE 136
Profile semi-cylinder 12
profi set 264, 19" plug-in unit 158-160
profi set 264, desktop enclosure 152-157
profi set cool, small case 189
Prop-up handle 173
Prop-up and carrying handle ..... 30 / 36 / 45 / 180 / 186

Q

Quick closure for fastening front panels 131

R

Ruggedized subrack 95

S

Screw holder, plastic or brass 131
Screw set M 5 ..... 17 / 30 / 36 / 45 / 49 / 74
Screw set M 6 17
Sealing frame IP66, for *X-Dream* 180
Small case 414 188
Small case profi-case 183
Small case X-Dream 178
Small case X-Dream-mini 181
Small profile case 414 188
Sliding rails ..... 17 / 29 / 34 / 45 / 49 / 74
Spring nut, M5 17

INDEX

Subrack 245 ..... 82 / 89
Subrack EMC 86
Subrack Heavy Load 94
Subrack Ruggedized 95
Sub-units ..... 141 / 142
Support rail ..... 106 / 112 / 194

T

Temperature indicator / regulator module, 19" 21
Telescopic rail set 73
Telescopic rails extension set 59
TFT display bracket 21
Threaded inserts 107
Top hat rail support 75

U

Universal plug-in unit 19" 69
Universal enclosure Vitaro 32
USB Hub 59

V

Velcro strip 24
Ventilating front panel, 19" 68
Vitaro, 19" enclosure 31
Vitaro, universal enclosure 32
Vitaro, wall-mounting enclosure 32

W

Wall-mounting enclosure Flex 310 194
Wall-mounting enclosure Vitaro 32

X

X-Dream, small case 178
X-Dream-mini, small case 181

Z

Zenith, 19" enclosure 27
Z-Rail 114

Standard colours

RAL 3002		Carmine red
RAL 5010		Gentian blue
RAL 5014		Pigeon blue
RAL 7001		Silver grey
RAL 7011		Iron grey
RAL 7032		Pebble grey
RAL 7035		Light grey
RAL 7037		Dusty grey
RAL 9002		Grey white
RAL 9005		Jet black

All painted items are available in the colours (powder coating) indicated above.

The structure of the powder coating is adjusted to the size of the enclosure or cabinet.

If you do not specify another colour when ordering, all cabinets and enclosures will be delivered in the standard colour indicated.

Due to printing reasons, the colours shown here do not match the actual colours 100%!

General Terms and Conditions

www.apra.de

1. Validity

1.1 These General Terms and Conditions of Sale apply to all business relations with our customers. The Terms and Conditions of Sale apply in particular to contracts for the sale and/or delivery of movable goods (goods), irrespective of whether we manufacture the goods ourselves or purchase them from suppliers.

1.2 These terms apply exclusively. Any deviating or conflicting conditions of the customer will not be accepted by us unless we have expressly agreed to them in writing. This consent requirement applies to all cases, even if we have made delivery to the customer without reservation with the knowledge of the customer's general terms and conditions.

1.3 These terms shall also apply to all future transactions between the parties and also if we carry out the delivery of the goods with the knowledge of deviating or conflicting terms and conditions.

1.4 These General Terms and Conditions of Sale shall only apply to companies, legal entities under public law or special funds under public law within the scope of of § 310 para. 1 BGB (German Civil Code).

2. Offer, Acceptance

2.1 Our offers are subject to change without notice. The contract is only concluded upon receipt of our order confirmation or upon execution of the order. Changes in prices and costs (e.g., wage increases under collective bargaining agreements or increases in the cost of materials) entitle us to make price adjustments. Should this occur after the conclusion of the contract, we have the right to withdraw from the contract unless the contractual partner agrees to a price adjustment.

2.2 Orders of the goods by the customer shall be deemed to be a binding contractual offer. Unless otherwise stated in the order, we are entitled to accept this offer within 21 days upon receipt by us.

2.3 Our offers are non-binding and subject to change. This shall also apply if we have provided the customer with catalogues, technical documentation (e.g., drawings, plans, calculations, estimates, references to DIN standards), other product descriptions or documents – also in electronic form – to which we reserve ownership and copyright. The goods shown in these catalogues, documentation and other product descriptions and documents are examples; the goods due under the contract are exclusively based on the respective order and specifications agreed therein, which may differ from the goods shown in catalogues, documentation and product descriptions. This applies in particular to goods that have been specifically adapted for the customer.

3. Prices, Payment

3.1 Unless otherwise stated in the offer or otherwise agreed to in writing, our prices are ex works (EXW according to Incoterms® 2020) plus statutory value added tax. In the case of delivery free carrier (FCA according to Incoterms® 2020), the buyer shall also bear the delivery costs to the destination plus any customs duties, taxes and charges.

3.2 When purchasing goods to be shipped, the customer shall bear the costs of packaging, transport, as well as the costs of any transport insurance requested by the customer, plus statutory value added tax.

3.3 The purchase price is due and payable within 30 days from the date of invoice and delivery or acceptance of the goods. However, we are entitled at any time, even within the framework of an ongoing business relationship, to make a delivery in whole or in part only against advance payment; we have the right to request advance payment no later than with the order confirmation.

3.4 Upon expiry of the above payment period, the customer shall be in default. During the period of default, interest shall be charged on the purchase price at the statutory default interest rate applicable at the time. We reserve the right to assert further default damages. Our entitlement to maturity interest remains unaffected in relation to merchants.

3.5 Initial deliveries to new customers are always made against prepayment. We reserve the right to determine the terms of payment for future deliveries after the customer has completed and submitted the customer master data sheet and a credit check has been carried out. We can change the defined payment terms for all customers, especially if this is necessary due to the customer's economic situation or the general market situation (e.g. suspended obligation to file for insolvency).

4. Set-Off, Retention

The contractual partner shall only be entitled to offset and exercise rights of retention insofar as their counterclaims are undisputed or have been legally established. In the event that the delivered goods are defective and/or damaged, the customer's counter rights shall remain unaffected.

5. Delivery

5.1 Delivery is ex works, which is also the place of fulfillment for the delivery and any subsequent performance. At the request and expense of the customer, the goods will be shipped to another destination (sale by delivery to a place other than the place of performance, EXW according to Incoterms ® 2020 or FCA according to Incoterms ® 2020). Unless otherwise agreed upon, we shall be entitled to determine the type of shipment (in particular transport company, route, packaging) ourselves.

5.2 If the customer is in default of acceptance, fails to cooperate or if our delivery is delayed for other reasons for which the customer is responsible, we are entitled to demand compensation for the resulting damage including additional expenses (e.g., storage costs). For this we charge a flat-rate compensation amounting to 0.5% of the net value of the goods per calendar day, beginning with the delivery period or – in the absence of a delivery period – upon notification that the goods are ready for dispatch or pick-up. The proof of higher damages and our legal claims (in particular compensation for additional expenses, appropriate compensation, termination) remain unaffected; however, the flat-rate compensation is to be offset against further monetary claims. The customer shall be entitled to prove that we have not incurred any damages at all or that the damages incurred by us is significantly lower than the above flat-rate compensation.

5.3 In the event that the financial circumstances of the contractual partner deteriorate significantly (e.g., protest of a bill of exchange, filing of an application for the opening of insolvency proceedings, submission of an affidavit, etc.) and if we are made aware of any lack of creditworthiness, we shall be entitled to demand advance payment or the provision of security or to withdraw from the contract.

6. Transfer of Risk, Shipment

6.1 The risk of accidental loss and accidental deterioration of the goods shall pass to the customer no later than upon delivery. However, in the case of sale to destination, the risk of accidental loss and accidental deterioration of the goods as well as the risk of delay shall pass to the customer upon delivery of the goods to the forwarding agent, carrier or other person or institution designated to carry out the shipment. Agreed-upon or legally required acceptance is decisive for the transfer of risk. The statutory provisions of the law on contracts for work and services shall also apply accordingly to an agreed acceptance. The same applies if the customer is in default.

6.2 The choice of transport route (forwarding agent, parcel service, post office, etc.) is our responsibility. Transport insurance shall only be obtained upon specific request and at the expense of the contractual partner.

6.3 The delivery period shall be deemed met if the subject matter of the contract has left the work within the delivery period or if we have notified the customer that the goods are ready for dispatch.

6.4 Statutory provisions shall apply in the event of our delay in delivery. A reminder from the customer is required in all cases.

7. Custom-Made Products

7.1 If the order refers to custom-made products, we insist on order fulfilment in all cases. Prices which have been offered or confirmed for larger purchase quantities cannot be claimed for smaller quantities.

7.2 The right of termination (freies Kündigungsrecht) by the customer (especially according to §§ 650, 648 BGB) is excluded.

8. Retention of Title

8.1 We reserve title to the goods sold until all our present and future claims arising from the purchase contract have been paid in full. In the event of breach of contract by the contractual partner, including default of payment, we are entitled to withdraw from the contract in accordance with the statutory provisions and to demand the return of the goods.

8.2 The aforementioned retention of title also applies to all present and future claims by the contractual partner, including those from any current account.

8.3 The contractual partner shall treat the goods with care, insure them appropriately and, where necessary, maintain them.

8.4 The goods subject to retention of title may not be pledged to third parties or transferred by way of security before the secured claims have been paid in full. The customer must notify us immediately in writing if an application for the opening of insolvency proceedings is filed or if third parties seize the goods belonging to us (e.g., seizures).

8.5 The customer is authorized until revocation in accordance with (c) below, to resell and/or process the goods subject to retention of title in the ordinary course of business. In this case, the following provisions shall additionally apply. (a) Retention of title extends to the full value of products resulting from any processing, mixing or combining of our goods, whereby we are considered the manufacturer. If, in the event of processing, mixing or combining with goods of third parties, their right of ownership remains and we shall acquire co-ownership in proportion to the invoice values of the processed, mixed or combined goods. In all other respects, the same applies to the resulting product as to the goods delivered under retention of title. (b) The customer

hereby assigns to us by way of security all claims against third parties arising from the resale of the goods or product, either in total or in the amount of our possible co-ownership share in accordance with the preceding paragraph. We accept the assignment. The obligations of the customer mentioned in paragraph 2 shall also apply with regard to the assigned claims. (c) In addition to us, the customer remains authorized to collect the claim. We undertake to not collect the claim as long as the customer fulfils his/her payment obligations to us, there is no deficiency in his/her ability to pay and we do not assert the reservation of title by exercising a right in accordance with paragraph 3. If this is the case, however, we can demand that the customer informs us of the assigned claims and their debtors, provides all information necessary for collection, hands over the relevant documents and informs the debtors (third parties) of the assignment. Furthermore, in this case we are entitled to revoke the customer's authority to further sell and process the goods subject to retention of title.

8.6 Insofar as the above-mentioned securities exceed the claims to be secured by more than 10%, we are obliged to release the securities at our discretion upon request of the contractual partner.

9. Warranty

9.1 The customer's claims for defects or damages presuppose that they have complied with their statutory obligations to inspect and give notice of defects or damages (§§ 377, 381 HGB). In the case of goods intended for installation or other goods intended for further processing, an inspection must in all cases be carried out before processing. If a defect or damages is found, the customer must notify us of this immediately in text form. In all cases, obvious defects or damages must be reported in writing within 5 working days of delivery and defects and damages not detectable during the inspection within the same period of time after their discovery. If the customer fails to carry out the proper inspection and/or fails to report defects/damages, our liability for the defect/damages that is not reported, not reported in time or not reported properly is excluded according to the statutory provisions.

9.2 If the delivered item is defective or damaged, we may choose whether we provide subsequent performance by remedying the defect/damage (rectification) or by delivering a defect/damage-free item (replacement). Our right to refuse subsequent performance under the statutory conditions remains unaffected.

9.3 We are entitled to make the owed subsequent performance dependent on the customer paying the due purchase price. However, the customer shall be entitled to retain a reasonable part of the purchase price in relation to the defect/damage.

9.4 The customer shall give us the time and opportunity necessary for the subsequent performance owed, in particular to hand over the goods complained of for inspection purposes. In the event of delivery of a replacement, the customer shall return the defective item to us in accordance with the statutory provisions. Subsequent performance does not include either the removal of the defective/damaged item or its reinstallation if we were not originally obliged to install it.

9.5 We shall bear or reimburse the expenses necessary for the purpose of inspection and subsequent performance, in particular transport, travel, labor and material costs and, if applicable, dismantling and installation costs, in accordance with the statutory provisions only if a defect is actually present. Otherwise, we may demand reimbursement from the customer of the costs incurred as a result of the unjustified request for rectification of defects/damages (in particular testing and transport costs), unless the lack of defect was not recognizable to the customer.

9.6 If the supplementary performance has failed, or a reasonable period of time set by the customer for the supplementary performance has elapsed without result or is unnecessary according to the statutory provisions, the customer may withdraw from the purchase contract or reduce the purchase price. There is no right to withdraw from the contract in the case of an insignificant defect.

9.7 The customer's claims for damages (Schadensersatz) or compensation for futile expenditure (Ersatz vergeblicher Aufwendungen) shall exist only in accordance with Section 10, even in the case of defects/damages, and shall be excluded in all other respects.

10. Liability

10.1 Unless otherwise provided for in these Terms and Conditions of Sale, we shall be liable for any breach of contractual and non-contractual obligations in accordance with the statutory provisions.

10.2 We shall be liable for damages - irrespective of the legal basis - within the scope of strict liability only in the event of intent and gross negligence. In the case of simple negligence, subject to statutory limitations of liability (e.g., due care in our own affairs, minor breach of duty), we shall only be liable a) for damages resulting from injury to life, body or health; b) for damages resulting from the breach of a material contractual obligation (obligation whose fulfilment is essential to the proper execution of the contract and on whose compliance the contractual partner regularly relies and may rely). In this case, however, our liability shall be limited to compensation for the foreseeable, typically occurring damage.

10.3 The limitations of liability resulting from clause 10.2 shall also apply to breaches of duty by or in favor of persons whose fault we are responsible for according to statutory provisions. They shall not apply if we have fraudulently concealed a defect or have assumed a guarantee for the quality of the goods and for claims of the customer under the Product Liability Act (Produkthaftungsgesetz).

10.4 Due to a breach of duty which does not consist of a defect, the customer may only withdraw or terminate the contract if we are responsible for the breach of duty. In all other respects the statutory requirements and legal consequences shall apply.

11. Limitation Period

11.1 Notwithstanding § 438 para. 1 no. 3 BGB, the general limitation period for claims arising from material defects/damages and defects of title is one year from delivery. If acceptance has been agreed upon or is required by law, the limitation period shall commence upon acceptance.

11.2 If, however, the goods are a building or an object that has been used for a building in accordance with its usual use and has caused its defectiveness (building material), the limitation period in accordance with the statutory regulation shall be 5 years from delivery (§ 438 para. 1 No. 2 BGB). Other statutory special regulations on the statute of limitations (in particular § 438 para. 1 no. 1, para. 3, §§ 444, 445b BGB) shall also remain unaffected.

11.3 The aforementioned limitation periods of the law on sales also apply to contractual and non-contractual claims for damages of the customer which are based on a defect of the goods, unless the application of the regular statutory limitation period (§§ 195, 199 BGB) would lead to a shorter limitation period in individual cases. However, claims for damages of the customer pursuant to No. 10.2 sentence 1 and sentence 2 a) as well as pursuant to the Product Liability Act (Produkthaftungsgesetz) shall be subject to the statutory limitation periods exclusively.

12. Obligations of the Contracting Party

12.1 The contractual partner shall assume the obligation to properly dispose of the delivered goods after termination of use at its own expense in accordance with the statutory provisions. The contractual partner shall release us from the manufacturer's or distributor's obligation to take back the goods in accordance with the German Electrical and Electronic Equipment Act (ElektroG) and any related third-party claims.

12.2 Special tools, devices and programs shall be charged to the contractual partner on a pro rata basis against advance payment without considerations of discounts. These special tools, devices and programs remain our unrestricted property.

13. Final Provisions

13.1 These Terms and Conditions of Sale and the contractual relationship between us and the customer shall be governed by the law of the Federal Republic of Germany, excluding international uniform law, in particular the UN Convention on Contracts for the International Sale of Goods (CISG).

13.2 If the customer is a merchant as defined by the German Commercial Code (HGB), a legal entity under public law or a special fund under public law, the exclusive place of jurisdiction for all disputes arising directly or indirectly from the contractual relationship is our registered office in Daun. The same applies to international disputes if the customer is an entrepreneur as defined by § 14 BGB, In all cases, however, we are also entitled to take legal action at the place of fulfillment of the delivery obligation in accordance with these Terms of Sale, or a prior individual agreement or at the customer's general place of jurisdiction. Prior legal regulations, in particular regarding exclusive jurisdiction, remain unaffected.

13.3 Should individual provisions of a contract be invalid, the validity of the remaining provisions shall not be affected. The contracting parties shall be obliged to replace an invalid provision by a new provision that corresponds as closely as possible in economic terms to the meaning and purpose of the invalid provision.

13.4 In case of doubt, the German version shall be decisive for the interpretation of these General Terms and Conditions.

For your notes

Important notes:

Questions to our sales team:

www.apra.de

apra worldwide

... always at your service!

France Poland Netherlands Belgium Luxemburg Spain Great Britain Italy Turkey

Hungary Finland Czech republic Switzerland Denmark Sweden Austria Greece Israel

USA Canada Japan Brasil Korea

Croatia Serbia Slovakia Russia

The apra group - our companies

www.apra-norm.com

apra-norm Elektromechanik GmbH
Bei der untersten Mühle 5 · D-54552 Mehren/Vulkaneifel
Tel.: +49 (0) 65 92 204-0 · Fax: +49 (0) 65 92 20 4-100
sales@apra.de · www.apra.de

apra-plast Kunststoffgehäuse-Systeme GmbH
Hamsterweg 9 · D-54550 Daun-Pützborn
Tel.: +49 (0) 65 92 95 02-0 · Fax: +49 (0) 65 92 95 02-10
vertrieb@apra-plast.de · www.apra-plast.de

apra-norm Elektromechanik GmbH
- Abteilung radaplast: Spritzguss und Werkzeugbau -
Hamsterweg 7 · D-54550 Daun-Pützborn
Tel.: +49 (0) 65 92 20 4-0 · Fax: +49 (0) 65 92 20 4-100
vertrieb@apra.de · www.apra.de

apra-gerätebau GmbH Chemnitz
Südstraße 15 · Gewerbegebiet Süd · D-09221 Neukirchen
Tel.: +49 (0) 371 28 12 4-0 · Fax: +49 (0) 371 28 12 4-20
vertrieb@apra-geraetebau.de · www.apra.de

apraNET Geschäftsbereich Netzwerktechnik
der apra-norm Elektromechanik GmbH
Bei der untersten Mühle 5 · D-54552 Mehren/Vulkaneifel
Tel.: +49 (0) 65 92 204-200 · Fax: +49 (0) 65 92 204-250
vertrieb@apranet.de · www.apra.de

apra-norm Elektromechanik GmbH
D-54550 Daun-Boverath

apra-norm s.n.c.
ZA de l'aérodrome
4, rue Clément Ader · F-67500 Haguenau
Tel.: +33 (0) 3 88 93 96 96 · Fax: +33 (0) 3 88 93 96 92
commercial@apra-norm.fr · www.apra-norm.fr

Your contact

apra-optinet Sp. z o.o.
ul. Technologiczna 4/6 · PL-45-839 Opole
Tel.: +48 (0) 77 415 0 107 · Fax: +48 (0) 77 415 0 161
sales@apra-optinet.pl · www.apra-optinet.pl

for 45 years - the perfect shell for valuable electronics