



Modular Assembly Systems



Cabinets

1



Housings

2



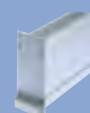
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and Subrack Accessories

3



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4



Industrial PCs

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The "19-inch-Assembly System"

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The "19-inch-Assembly System"

The so-called 19-inch assembly system consists of a wide range of mechanical and electromechanical components matched to each other in terms of their dimensions and can be regarded as a „mechanical construction kit“ for assembling electronic devices and systems.

The "19-inch assembly system" was first presented in 1970 at the Hanover Trade Fair by AEG Telefunken (Intermas Modular Assembly Systems). The first application areas of this revolutionary development were industrial electronics followed by power station control engineering and traffic engineering. Today the system is in use worldwide in almost all areas of industrial electronics such as telecommunications, military technology, medical technology, measurement and control technology etc.

The 19 inches originated in the width of equipment front panels in accordance with the USA standard C83-9. In view of the frequent need to combine European and American equipment in a single system the width and

the height increments of the 19-inch front panel became the starting point for the DIN 41494 and IEC 60 297-1 standards. Although the 19-inch (482.6 mm) dimension is only used once as the width specification for the front panels of plug-in units and sub-racks, it has given its name to the modular assembly system. All system dimensions are defined in mm. The correct designation should therefore more correctly be 482.6 mm technology, a term which is also used in DIN 41 494, the German standard for the 19" assembly system.

All necessary dimensions were defined in the German DIN 41 494 standard, in IEC Publication 60 297 and in the USA standard ANSI/IEEE 1101.

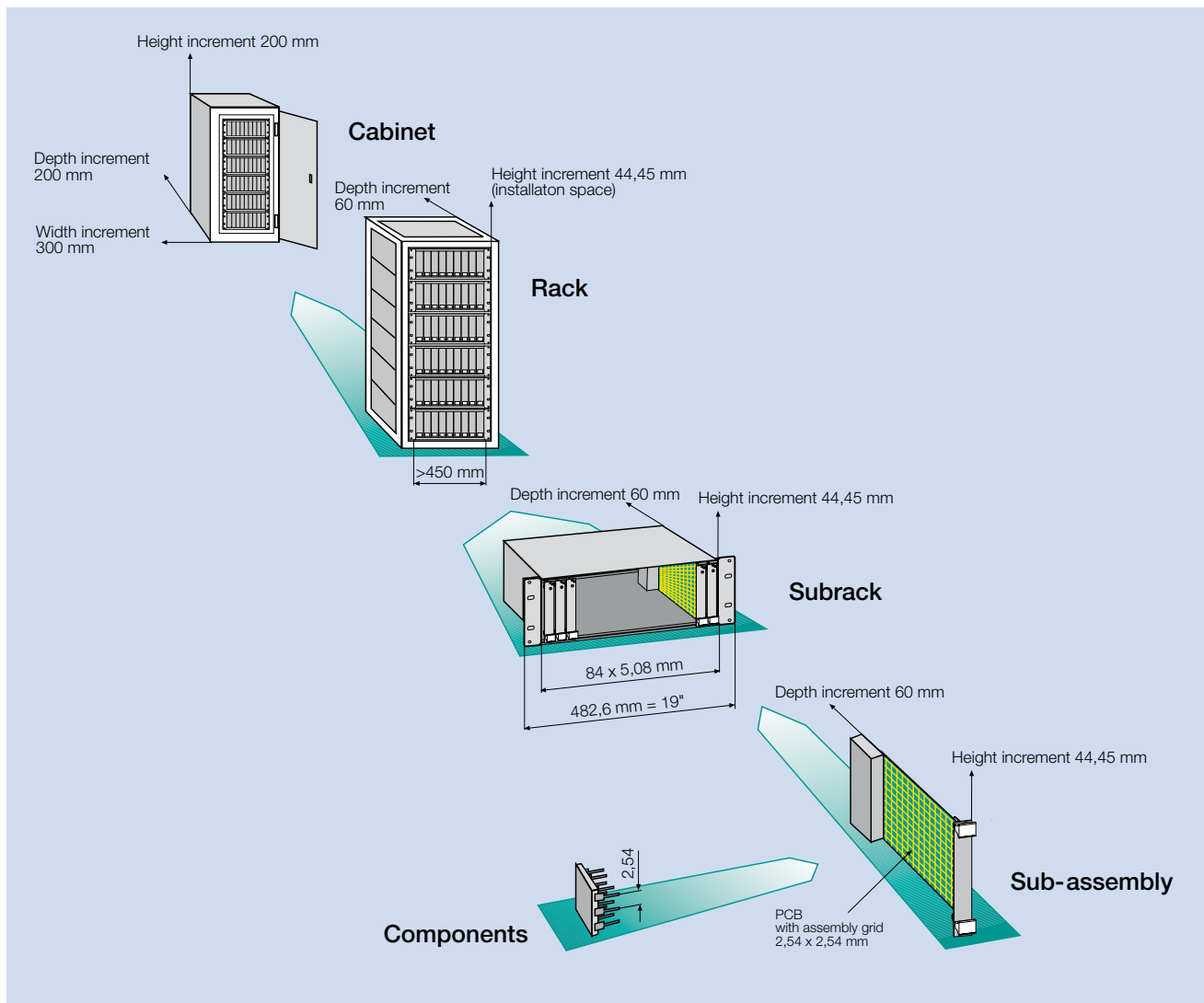
The aim of the standardization was to make it possible to combine different system components without problems and to ensure compatibility between different devices and modules as the basis for the specialization of individual manufacturers which resulted from global division of labor.

DIN standards and IEC publications

System level	DIN-standards	IEC-publications	DIN-standards	IEC-publications	DIN-standards	IEC-publications
Level 4 Racks	Table Top Housings DIN 41494	IEC 60297-1/2	Racks DIN 41494	IEC 60297-1/2	Cabinets DIN 41494	IEC 60297-1/2
Level 3 19"-Front- and rear pane and subracks	19"-front panel DIN 41494	IEC 60297-3	19"-subracks DIN 41494	IEC 60297-3	19"-rear panel DIN 41494	IEC 60297-3
Level 2 Sub-assembly	PCB DIN 41494	IEC 60297-3	Plug in block DIN 41494	IEC 60297-3	Plug- in unit DIN 41494	IEC 60297-3
Level 1 Components	Sub-assemblys at front panel DIN 41494	IEC 60297-3	Cards DIN 41494	IEC 60297-3	Connectors DIN 41494	IEC 60303-3

(cp.: "The Modular 19"-System", Hesse, 1991, side 43)

The "19-inch-Assembly System"



(Cp.: "The Modular 19"-System", Hesse, 1991, side 17)

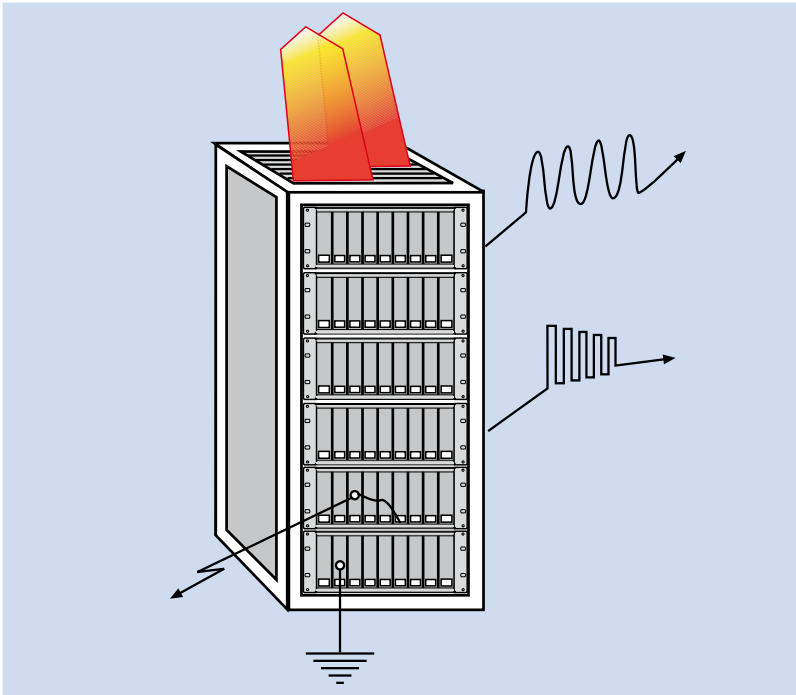
The modular structure

The modular structure of the so-called 19" assembly system allows components of one level to be freely combined with one another without problems and used in assemblies of the next higher level.

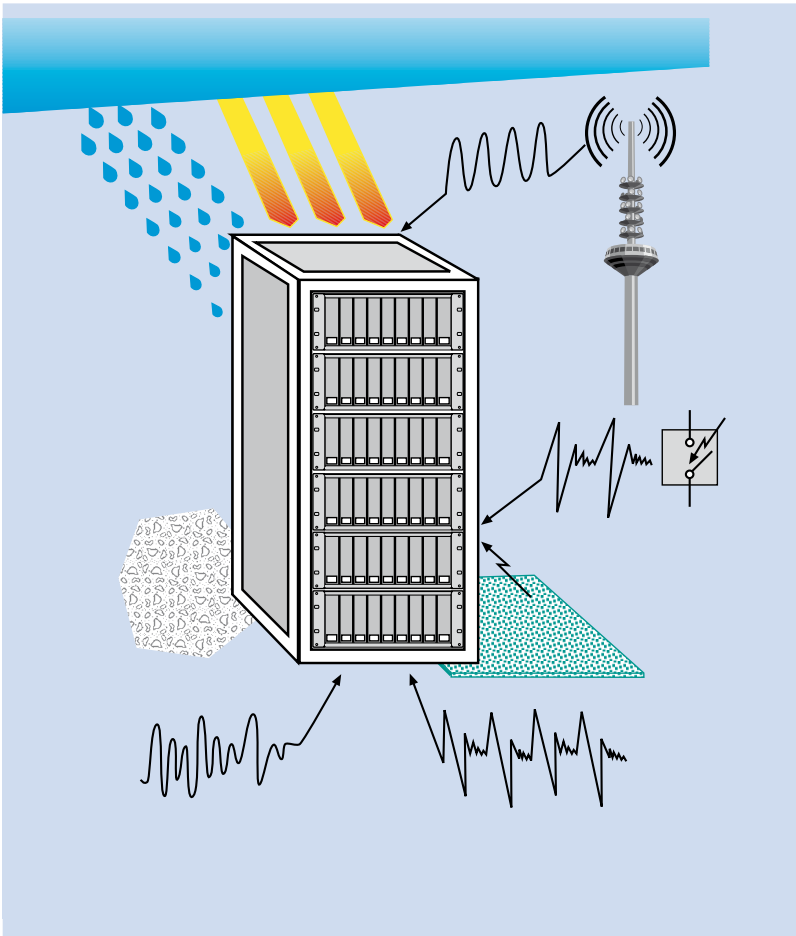
In addition to the 19" front panel, the dimensions of the Euroboard (100 x 160 mm), the component-fitting and wiring grid on the PCB (2.54 mm) and the external dimensions for cabinets formed the initial dimensions for the modular "19" assembly system".

Protection Requirements

The protection requirements depend on sensitivity of the installed electronics and on the interference levels at the installation location.



(Cp.: "The Modular 19"-System", Hesse, 1991, side 127)



(Cp.: "The Modular 19"-System", Hesse, 1991, side 127)

The protection requirements can be divided into:

1. Protection of the surrounding environment against interference, for example RF radiation, emitted by the device or protection against contact with live components.

2. Protection of the modules against external influences such as mechanical stresses as a result of vibration or shock, or infiltration of foreign bodies and humidity and also highfrequency interference signals.

EMI protection

Electromagnetic interference basically results from three different types of signals:

- ✓ sinusoidal permanent signals of fixed frequency
- ✓ broadband permanent signals (fundamental frequency with harmonics)
- ✓ transient signals (short period impulse)

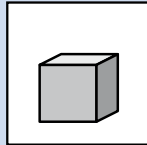
In order to adequately counteract such interference factors the paneling elements are conductively connected to one another or bonded to one another using appropriate RFI gaskets.

IP-Protection Classes (IP-Code) IEC 60 529 / EN 60 529

Protection for contact and foreign bodies

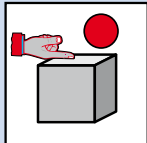
IP 1. Index

0 no special protection



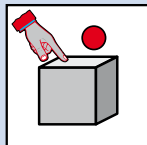
1 against large area
bodies

large foreign bodies
 $\varnothing > 50 \text{ mm (2")}$



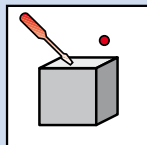
2 against fingers

medium sized
foreign bodies
 $\varnothing > 12 \text{ mm (0.48")}$



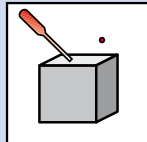
3 against tools, wires
 $> 2,5 \text{ mm (0.10")}$

small foreign bodies
 $\varnothing > 2,5 \text{ mm (0.10")}$



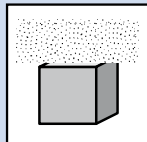
4 against tools, wires
 $> 1 \text{ mm (0.04")}$

granular foreign bodies
 $\varnothing > 1 \text{ mm (0.04")}$



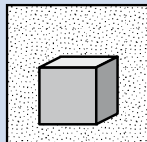
5 complete protection

dust-protected against
dust desposits



6 complete protection

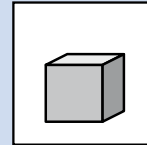
dust-proof



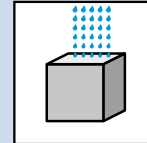
Water protection

IP 2. Index

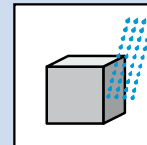
0 no special protection



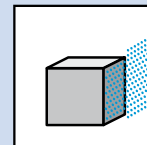
1 against water
dripping vertically



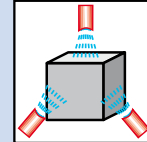
2 against water
dripping at an angle
up to 15° from the
vertical



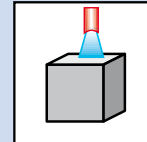
3 against spray water
any direction
up to 60° from the
vertical



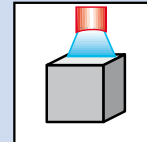
4 against spray water



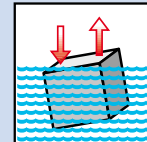
5 against water jets



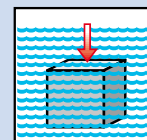
6 against strong
water jets



7 against immersion



8 against submersion



DIN EN ISO 9001:2008



Our ultimate goal is achieving a competitive advantage through competent advisory services combined with high quality and environmental awareness of our employees.

Quality policy

Quality and competitiveness of Intermas products and services are driven by customer requirements and expectations as well as international market standards. Therefore, every Intermas employee is dedicated to fulfil these requirements constantly and entirely.

Customer orientation and customer satisfaction

In order to improve the customer satisfaction consultation services are offered at any stage of the product life cycle. Our management informs customers about technical innovations. Interimas offers expertise in developing technical solutions through a dialogue with customers. A certified quality management system according to DIN EN ISO 9001 is in place.

System Cabinet *InterRack*

A sophisticated, systematically constructed cabinet system for electrical engineering applications, e.g. as:

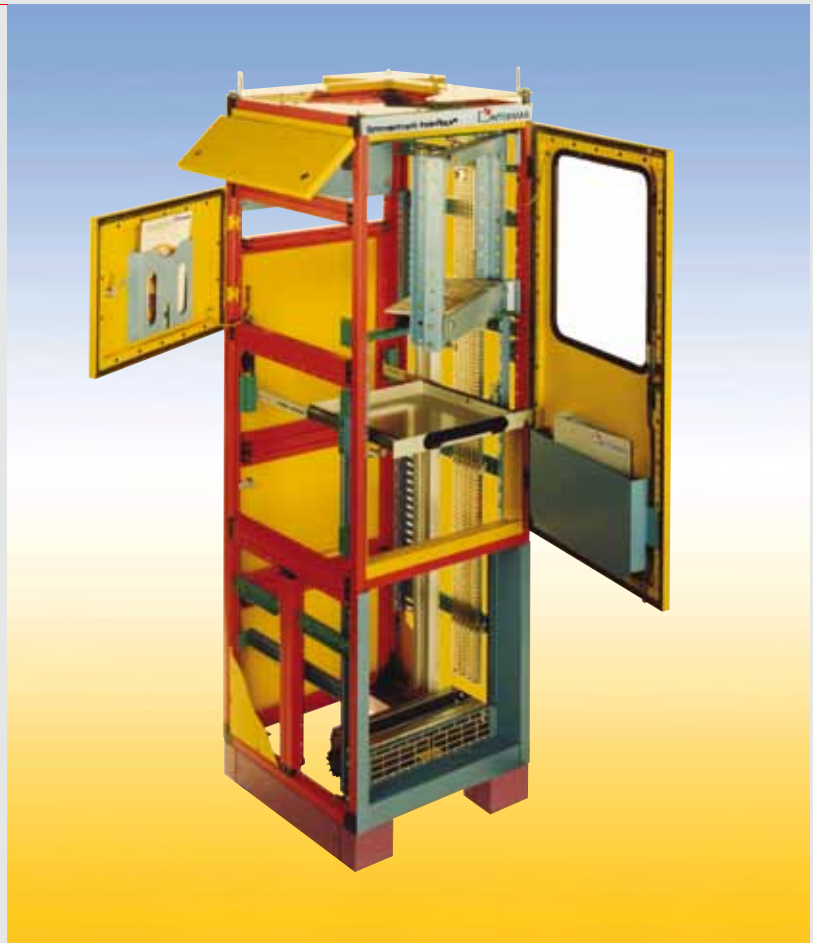
- ✓ a universal 19" cabinet
- ✓ a low-voltage cabinet
- ✓ a data and network cabinet

Also excellently suitable for your own designs or special solutions, e.g. as:

- ✓ a training cabinet
 - ✓ for patch panels
- or in
- ✓ maintenance and control engineering
 - ✓ military technology
 - ✓ traffic engineering

In short:

This cabinet meets all your requirements and desires.



System Cabinet *InterRack*®



Description

The InterRack system cabinet is made of steel and is easy to assemble using screws. Profiles and paneling elements are galvanized. The customer can choose between two colors of paint finish. The rack variants and assembly elements provide the capability for individual configuration. Protection classes IP 40 and IP 54 are achieved thanks to the use of silicon-free seals.

This cabinet stands out due to its enormous flexibility of the configuration and extension options.

- ✓ Consistent assembly in the 25-mm-space grid enables appropriate graduation in terms of width, height and depth.
- ✓ Easily incorporated into CAE and CAD-supported development projects.
- ✓ Each level can be used for assembly using only a few system elements.
- ✓ Self-tapping screws allow simple and fast assembly and dismantling and ensure tight and electrically conductive connections.
- ✓ Conducting surfaces and the replaceable system elements ensure excellent EMC characteristics.

Delivery

As a completely assembled and painted cabinet. Unassembled components on request.

Technical Data

Standards	compliant with DIN 41 488, IEC 60 297-1 and 2, IEC 60917
Width grid	assembly in a 25 mm grid
Depth grid	assembly in a 25 mm grid
Material	loading profiles and corner connectors: aluminum other parts: galvanized steel
Finish	standard: RAL 7032 or as required by the customer
Protection class	compliant with DIN 40050 IP 40 and IP 54 contact protection in accordance with VDE 0160
Utilization category	-25 °C, +70 °C, 75% relative humidity
Protective grounding	all metal parts are electrically bonded to one another following assembly in accordance with VDE 100/12.65, § 6 Nb

Sytem Cabinet *InterRack*®



Cabinet example

- ✓ Rack A
- ✓ Mounting plate
- ✓ Frontdoor, right opening
- ✓ Rear panel
- ✓ Base panel
- ✓ Top panel closed
- ✓ Swing handle
- ✓ 130° hinges
- ✓ With side panel protection class IP 40



Sealing of the door



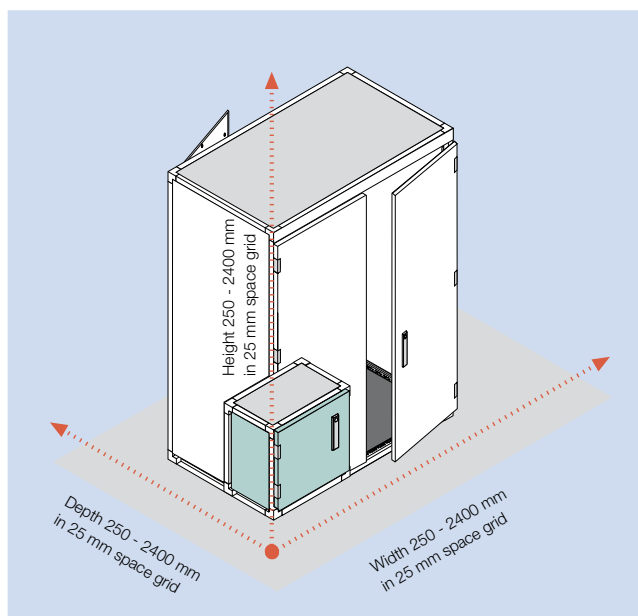
Sealing of the paneling parts

Sealing of the system cabinet *InterRack* to protection class IP 54



RFI-shielding of the door of the system cabinet *InterRack*

Configuration



Configuration System Cabinet *InterRack*

Cabinet	pieces _____						
Rack	☐ version A ☐ version B ☐ version C ☐ version D height: _____ mm width: _____ mm depth: _____ mm						
Color rack	RAL _____						
Color paneling parts	RAL _____						
Side panel	☐ adding: <table border="0"> <tr> <td>☐ left</td> <td>☐ right</td> </tr> <tr> <td>☐ left</td> <td>☐ right</td> </tr> </table>	☐ left	☐ right	☐ left	☐ right		
☐ left	☐ right						
☐ left	☐ right						
Rear panel	☐						
Door opening	<table border="0"> <tr> <td>☐ front</td> <td>☐ left</td> <td>☐ right</td> </tr> <tr> <td>☐ rear</td> <td>☐ left</td> <td>☐ right</td> </tr> </table>	☐ front	☐ left	☐ right	☐ rear	☐ left	☐ right
☐ front	☐ left	☐ right					
☐ rear	☐ left	☐ right					
Double door	☐ front ☐ rear						
Hinges	☐ 130 degree ☐ 180 degree						

Door lock	☐ swing handle ☐ key plate	☐ dummy element ☐ square ☐ double bit 3 mm ☐ double bit 5 mm ☐ short cylinder keyed alike
Top panel	☐ closed	☐ labyrinth ☐ perforated ☐ raised
Base panel	☐ closed	☐ divided -
Mounting plate	☐ galvanized	☐ color RAL _____
Hinged frame	opening: ☐ left ☐ right ☐ 130 degree ☐ 180 degree	
19" unit support	☐ front ☐ rear	
Protection class	☐ IP _____	
RFI-shielded	☐	
Accessories	☐ Adaptor ☐ Document box ☐ U-strut piece _____	☐ Logo strip ☐ Universal angle piece _____ ☐ Lifting eye (kit with 4 pieces)
Base	☐	
Notes	_____ _____ _____ _____	

Please ask your local representative for your
individual configuration.
 You find your contact person on our homepage:
www.intermas-el.com

Rack construction

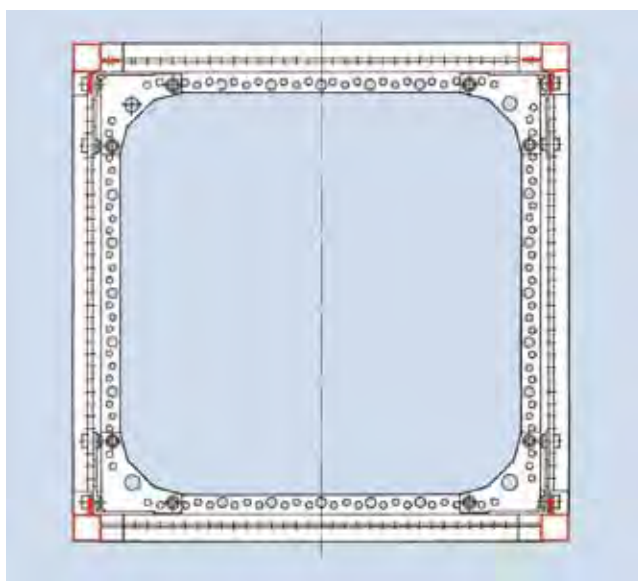
The rail profiles are rolled from galvanized sheet steel. This ensures optimal corrosion protection, including the cut edges.

Two versions of rail profiles are available, rail profile W and rail profile V.

Plug-in corner connectors made of die-cast aluminum ensure stable connection in all three axes.

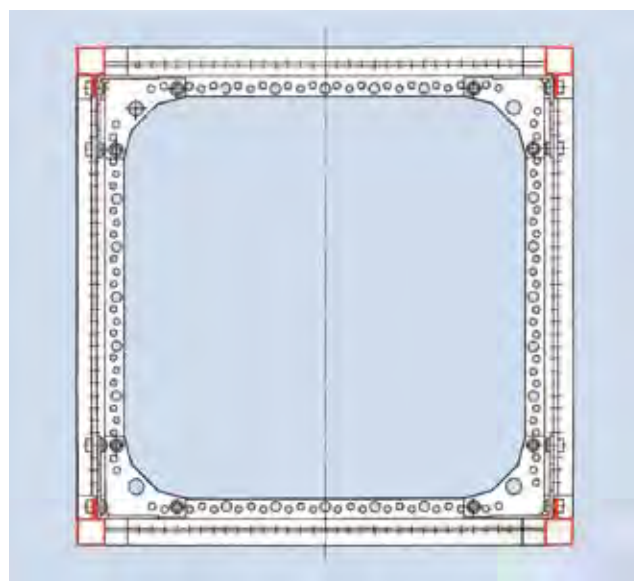
The rail profiles are then screwed to the gusset plate.

This method of construction allows assembly of any cabinet rack with an edge length of 250 to 2400 mm. Individual switch racks or patch panels can also be constructed just as easily.



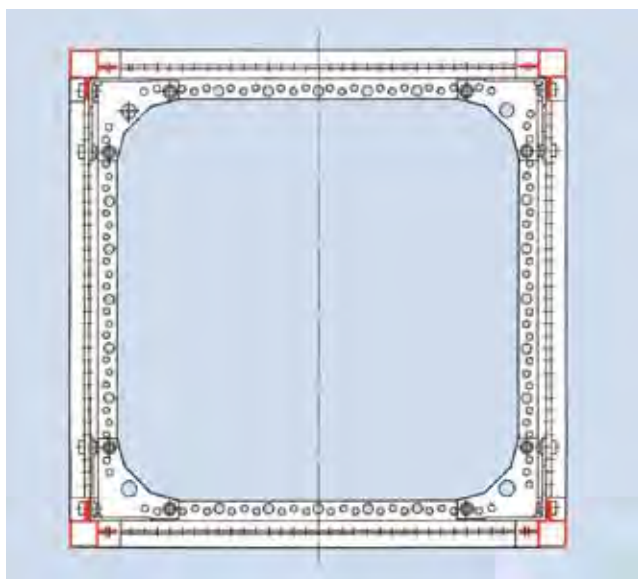
Rack version A

for stand alone cabinets with front door.



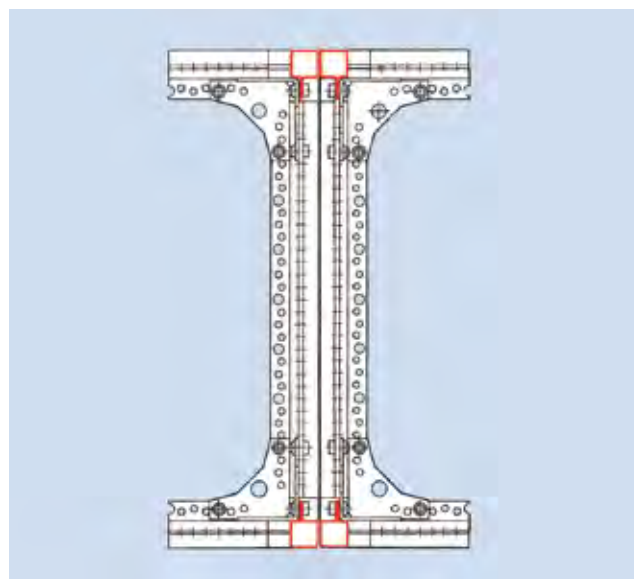
Rack version B

for stand alone cabinets with front and rear door.



Rack version C

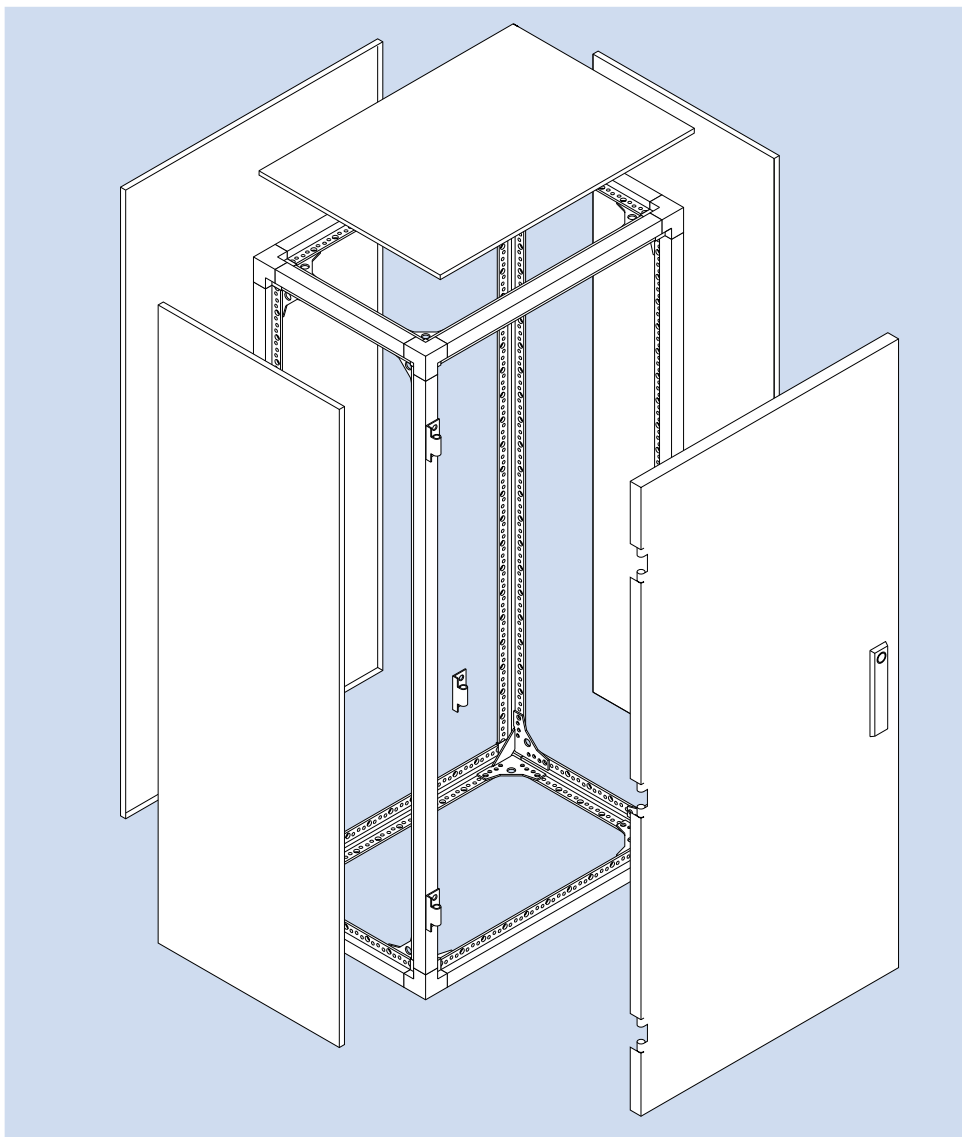
for protected and separated regions, all sides prepared for covering panels.



Rack version D

for frame type switchboards and distribution jumper rings.

System Cabinet *InterRack*®



Ordering details system cabinet

	height [mm]	width [mm]	depth [mm]	1 front door order no. 409.	1 front door 1 rear door order no. 409.	double door order no. 409.
<i>InterRack</i> 1200 x 1000 x 400	1200	1000	400	-	-	166 261
<i>InterRack</i> 2000 x 600 x 500	2000	600	500	166 262	166 263	166 264
<i>InterRack</i> 2200 x 900 x 600	2200	900	600	166 265	-	166 266

Delivery

	quantity per kit 1 door	quantity per kit 2 doors	quantity per kit double door
Rack	1	1	1
Door front/rear (130°) Hinges 130°, left opening	1	2	1
Side panels	2	2	2
Rear panel	1	-	1
Top panel closed	1	1	1
Swing handle	1	2	2

Rail Profiles

Rail Profiles

The rail profiles are rolled from galvanized sheet steel. This ensures optimal protection against corrosion including the cut edges. Two Versions of rail profiles are available.

Rail profile V

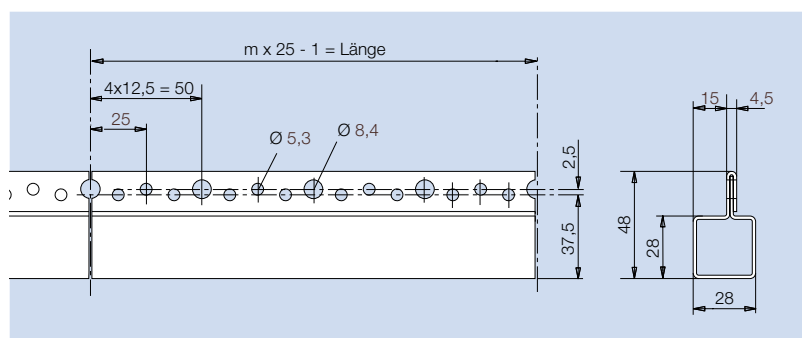
Rail profile W

Material: steel

Finish: galvanized

Finished length for rail profiles

rack-nom. width [mm]	length [mm]	m = number space grid
400	299	12
500	399	16
600	499	20
900	799	32
1000	899	36
1200	1099	44
2000	1899	76
2200	2099	84

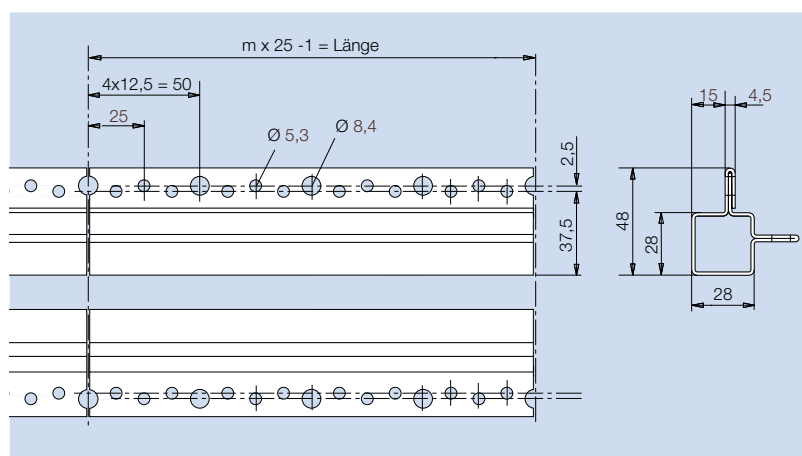


Rail Profile V

For use as height profile and dividing profile.

Length: 6360 mm

order no.: **409. 074 056**



Rail Profile W

For use as height, depth, width profile and dividing profile.

Length: 6360 mm

order no.: **409. 074 057**

Corner Connector, Gusset Plate A and B, 19"-Unit Support



Corner Connector

For connecting the rear profiles.

Material: aluminum die casting

Finish: untreated

order no.: **409. 050 688**



Gusset Plate A

For fastening the rack corner.

Material: steel

Finish: galvanized, colorless chromated

order no.: **409. 131 354**

Accessories

Cylinder head screw M 8 x 14

(Torx T40) DIN 7500

Minimum order quantity: 10 pieces

order no.: **409. 132 778**



Gusset Plate B

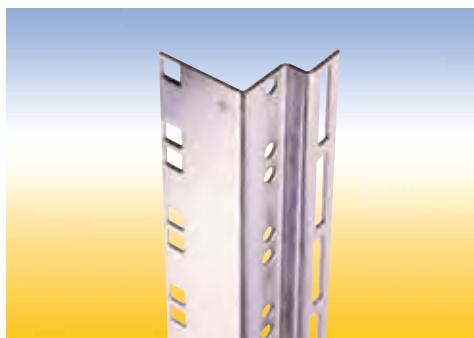
For fastening the rack corner.

To get maximum free space for assemblies and for fastening with screws M 8.

Material: steel

Finish: galvanized, colorless chromated

order no.: **409. 167 416**



19"-Unit Support

Are mounted vertically, depth variable in 25-mm-space grid.

For mounting of 19"-equipment.

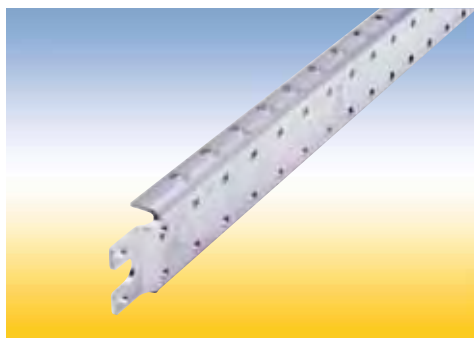
Material: steel

Finish: galvanized, colorless chromated

Ordering details

	for cabinet-height [mm]	length [mm]	order no. 409.
19"-unit support 2000	2000	1866.45	078 641
19"-unit support 2200	2200	2044.70	078 646

U-Strut, Universal Angle, Door Hinge 180°



U-Strut

As support for unit support and fixtures in 25-mm-space grid.

2 versions are available:

1. For mounting from outside the cabinet.
2. For mounting from inside the cabinet.

This version is especially suitable for later installations.

Material: steel, 3 mm thick

Finish: galvanized, colorless chromated

Ordering details

	for cabinet- depth/width [mm]	outside order no. 409.	inside order no. 409.
U-Strut 400	400	049 677	132 601
U-Strut 500	500	049 679	132 603
U-Strut 600	600	049 680	132 604
U-Strut 800	800	049 681	132 605
U-Strut 900	900	049 682	132 606

Accessories

Hexagon Head Screw M 6 x 12

Minimum order quantity: 10 pieces

order no.: **409. 050 567**



Universal Angle

To fastening of 19"-unit support and accessories.

Material: steel, 3 mm thick

Finish: galvanized, colorless chromated

order no.: **409. 132 240**

Accessory

Hexagon Head Screw M 6 x 12

Minimum order quantity: 10 Pieces

order no.: **409. 131 550**



Door Hinge 180°

For fixing all types of cabinet doors with a 180° opening angle.

Material: aluminum

Finish: black anodized

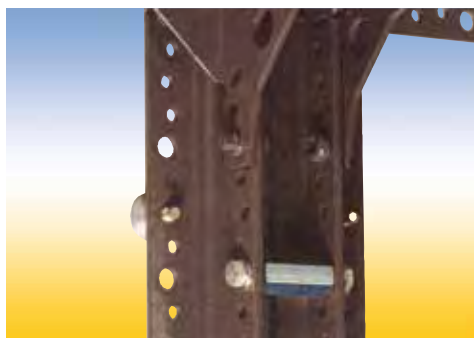
Delivery:

3 hinges, 3 hinge pins

Mounting parts

order no.: **409. 069 369**

Standard Adaptor, Lifting Eye, Document Box, Custom Logo Strip for Cabinets



Standard Adaptor Kit

To bolt together additional cabinets.

Material: steel
Finish: galvanized, colorless chromated
Delivery: 8 threaded spacers
 Mounting parts

order no.: **409. 132 464**



Lifting Eye Kit

Material: steel
Finish: galvanized, colorless chromated
Delivery: 4 lifting eyes
 Mounting parts

order no.: **409. 132 735**

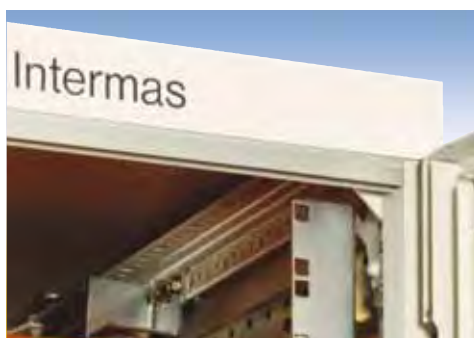


Document Box

DIN A4, upright, self adhesive

Material: Polystyrene, shock resistant
Finish: RAL 9002

order no.: **409. 068 760**



Custom Logo Strip

For the rack above the door.

Self adhesive

Material: aluminum 2 mm thick
Finish: anodized (paintable and printable)

Ordering details

	length [mm]	order no. 409.
Custom logo strip 600	594	049 668
Custom logo strip 900	894	049 670
Custom logo strip 1000	994	069 302

InterMeZo Housing

- ✓ Design front
- ✓ Functional front
- ✓ Variable in three dimensions
- ✓ Can be RFI-shielded
- ✓ Mechanical protection up to IP 54



InterCase Desktop Housing

- ✓ Easy construction
- ✓ Service friendly
- ✓ Variable dimensions
- ✓ Can be RFI-shielded



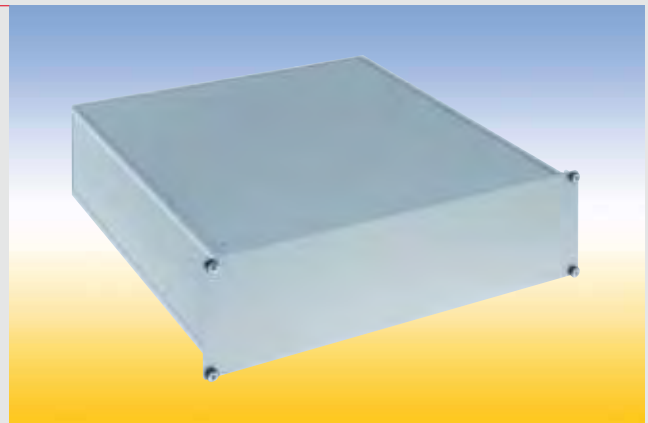
InterLock Housing

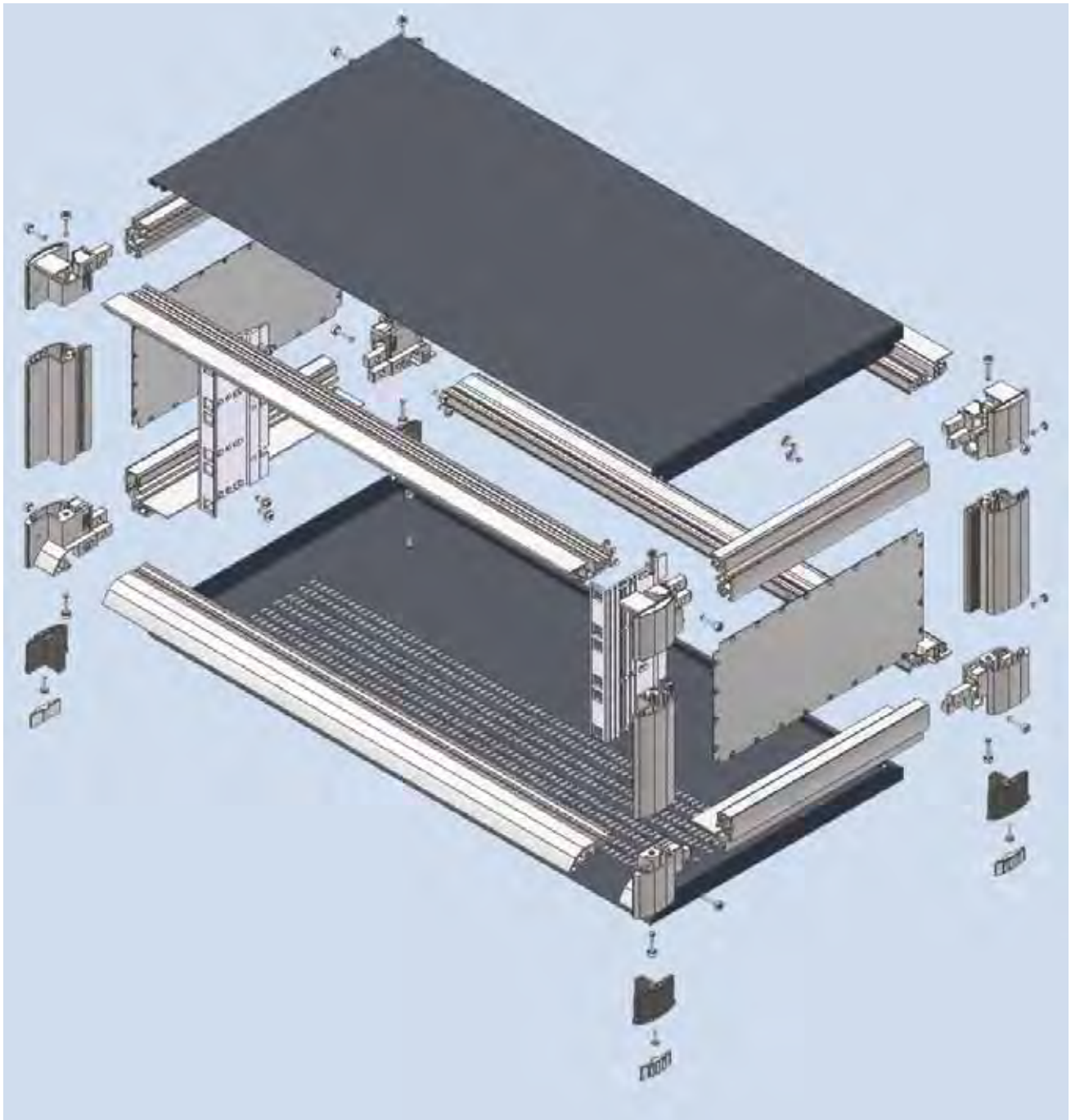
- ✓ Covering of subracks
- ✓ Easy mounting without screws



DiVar Housing

- ✓ 19" rack mounted for customized housing
- ✓ Unrestricted configuration and installation
- ✓ Cover plates removable





Requirements

A modern housing flexible in its applications, with a modular design, can be RFI-shielded and ventilated, in an attractive design and at a reasonable price: InterMeZo

Construction

1. Housing frame

The InterMeZo housing is based on a framework construction consisting of profiles and corner connectors. This flexible design also enables fast and cost-effective assembly of individual housing sizes

2. Easy to access

For quick access to the installed electronics the cover plates are pressed into profiled grooves and secured with two screws.

3. RFI shielding

The side walls are pressed into profile grooves; contact elements ensure RFI-shielded bonding. To achieve effective protection of the housing against dust and water the cover panels, the rear wall and the door can all be fitted with seals.

4. Mechanical sealing

To achieve effective protection of the housing against dust and water the cover panels, the rear wall and the door can all be fitted with seals.

5. Recessed grips

Grips for easy transportation are formed by the recessed mounting of the side walls.

6. Equipment supports

Subracks can be installed variably as the housing depth permits.

7. Chassis panels

The depth profiles are provided with grooves in which chassis panels or similar can be fitted at any depth with the aid of spring nuts.

Summary

The InterMeZo housing from InterMas is a modular and cost-effective housing solution for high-quality industrial electronics in a visually attractive design, developed for the highest possible flexibility and simplest possible assembly, with expansion capabilities for more demanding needs, compliant with stringent EMI/ESD protection specifications, and with extensive configuration options to fulfil application-specific requirements.

Technical data

Materials	casing: aluminum profiles
	corner connectors: die-cast zinc
Finish	feet: ABS
	other parts: 0.8 mm galvanized sheet steel
Finish	standard for rear wall and cover panels: painted dark gray (RAL DS 5500)
	standard for casing and side walls: painted light gray (RAL DS 7000)
	feet: dark gray

Versions

The *InterMeZo housings* are available to assembly 19"- or metric subracks. Alternatively, any dimensions for variable applications are possible.

For all versions the possibility exists to choose between the following types.



1. Design front

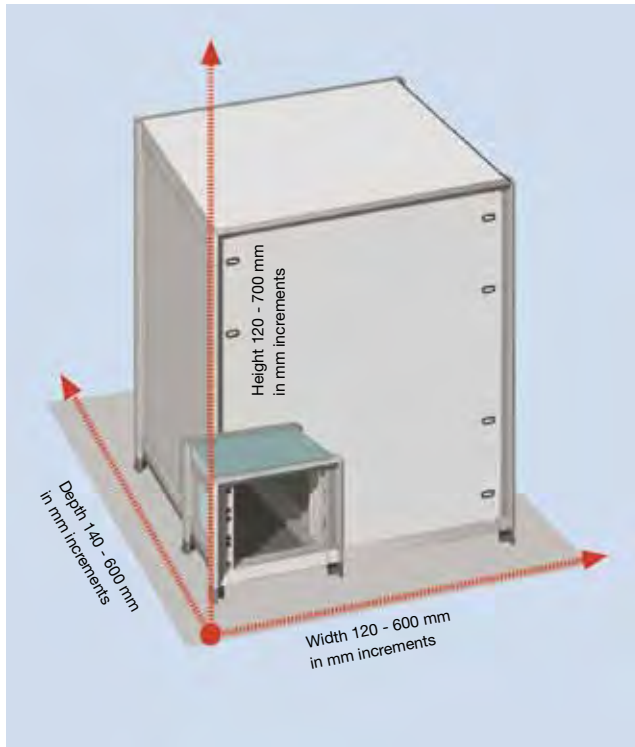
This version has been constructed in terms of a harmonic front design for use with a wide range of applications.



2. Functional front

For higher protection against dust and water as well as EMC shielding.

InterMeZo Housing Configuration

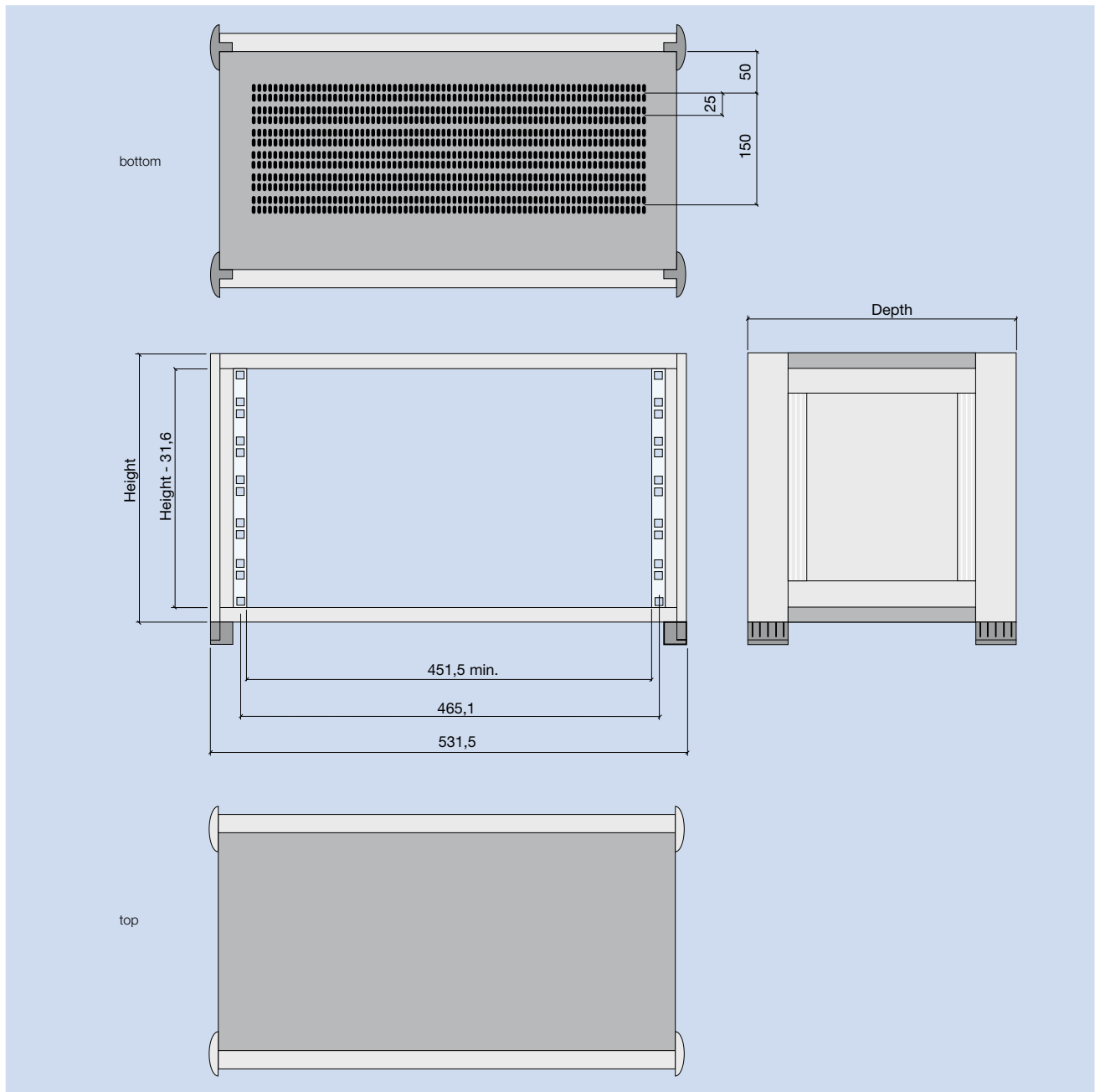


Configuration *InterMeZo* Housing

Housing	pieces _____
Dimension	height: ☐ 3 U ☐ 6 U width: ☐ 84 HP ☐ 42 HP depth: ☐ 300 mm ☐ 400 mm ☐ 500 mm ☐ other: height: _____ U or _____ mm width: _____ HP or _____ mm depth: _____ mm
Design	☐ design front ☐ front ☐ rear ☐ functional front ☐ front ☐ rear
Color casing, side wall	☐ RAL DS 7000 ☐ RAL _____
Color rear wall, panels	☐ RAL DS 5500 ☐ RAL _____
Louvers in	☐ bottom panel ☐ top panel ☐ rear panel

Front	☐ Casing door ☐ Plexiglass door ☐ Front panel	☐ anodized ☐ RAL _____
19" unit support	☐ front ☐ rear	
Protection class	☐ IP _____	
RFI-shielding	☐	
Accessories	☐ Rear panel ☐ Wheels ☐ Carry handles ☐ Side bars ☐ Subplate ☐ Mounting material for subrack and front panels kit _____ pieces	
Notes	_____ _____ _____	

Please ask your local representative for your
individual system configuration.
 You find your contact person on our homepage:
www.intermas-el.com



Ordering details for assembled *InterMeZo* housings

nom. height [U]	height [mm]	width [mm]	depth [mm]	design- front order no. 409.	functional- front order no. 409.
3	165.60	531.50	300	166 208	-
3	165.60	531.50	400	166 209	166 217
4	210.05	531.50	400	166 210	-
6	298.95	531.50	400	166 211	166 218
6	298.95	531.50	500	166 212	-
7	343.40	531.50	400	166 213	-
9	432.30	531.50	400	166 214	166 219
9	432.30	531.50	500	166 215	-
12	565.65	531.50	500	166 216	166 220

Delivery:

Housing frame with side panels,
top closed,
bottom panel with louvers
4 feet,
2 unit supports

Delivery:

The housing is delivered
assembled and painted.

InterMeZo Housing Accessories



19" Front Panels

Material: aluminum 3 mm thick
Finish: anodized

Ordering details for 19" front panels

nom. height [U]	order no. 409.
3	086 513
4	086 514
6	086 516
7	086 517
9	086 519
12	086 522



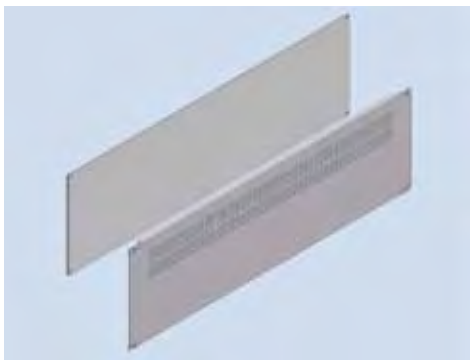
19" Casing Door

Kit consists of:
1 casing door with plexiglass pane
1 lock
2 hinges
Installation hardware

Delivery:
As complete assembled casing door.

Ordering details for 19" casing door

nom. height [U]	order no. 409.
3	110 452
4	110 453
6	110 454
7	110 455
9	110 456
12	110 457



Rear Panel, closed

Material: aluminum 2.5 mm thick
Finish: front side anodized, rear side conductive

Rear Panel with Louvers

Material: steel 0.8 mm thick
Finish: front side RAL DS 5500, rear side conductive

Ordering details rear panel

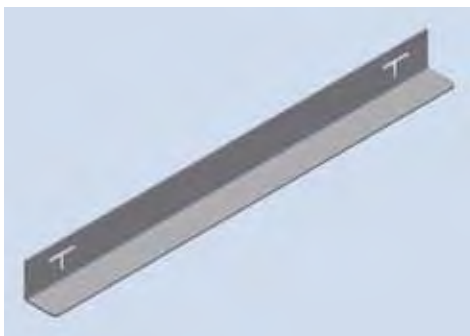
nom. height [U]	closed order no. 409.	with louvers order no. 409.
3	109 984	111 556
4	109 985	111 557
6	109 986	111 559
7	109 987	111 560
9	109 988	111 561
12	110 392	111 562

Accessories

Taptite screw M4x10

Minimum order quantity 100 pieces

order-no.: 409. 110 395



Slide Bars

Kit consists of:
2 slide bars
Installation hardware

Material: 1.5 mm galvanized sheet steel

Finish: colorless chromated

Ordering details kit

	for housing-depth [mm]	order no. 409.
slide bar	300	111 285
slide bar	400	111 286
slide bar	500	111 287



RFI-Shielding

Material: stainless steel

Ordering details RFI-shielding-kit for rear/front panel

nom. height [U]	order no. 409.
3	110 360
6	110 361
9	110 366
12	110 367

Ordering details RFI-shielding-kit for cover plates

depth [mm]	order no. 409.
300	110 368
400	110 370
500	110 372



Unit Support

Kit consists of:
2 unit supports and
Installation hardware

Ordering details for unit support kit

nom. height [U]	order no. 409.
3	110 375
4	110 376
6	110 378
7	110 379
9	110 381
12	110 382



Mounting material for subracks and front panels in housing

Screw Locking M6

Color: black

Material: POM

Minimum order quantity 10 pieces

order no.: 409. 074 387

Oval Head Screw

M6 x 16 DIN 7985

steel, nickel plated

Minimum order quantity 10 pieces

order no.: 409. 013 919

Cage Nut

steel, galvanized

Minimum order quantity 10 pieces

order no.: 409. 131 652



Castors

Kit consists of:
2 mounting angles
4 castors
Installation hardware

Ordering details for castor kit

	housing- depth [mm]	order no. 409.
castors 300	300	112 092
castors 400	400	112 093
castors 500	500	112 094

Castors are not retrofit.
Please order with housing.



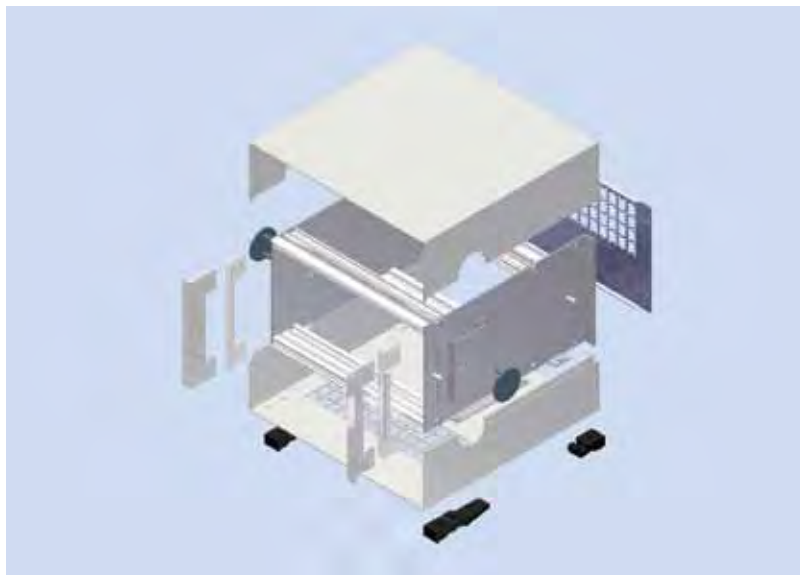
Carry Handles

Kit consists of:
2 handles
Installation hardware

Color: RAL DS 7000

order no.: 409. 112 507

InterCase Desktop Housing



Description

The special design features of the *InterCase* desktop housing:

- ✓ A desktop housing with a simple design for standardized plug-in units and individual assemblies.
- ✓ The easy to access design allows all covering parts to be removed at any time.
- ✓ The bottom cover and the rear panel are provided with louvers.
- ✓ The side plates include perforations for attaching profile rails at different board depths.
- ✓ The comprehensive range of Internas subrack accessories allows individual configuration of the desktop housing.
- ✓ Can be RFI-shielded.

Technical Data

Material	Aluminum feet: plastic
Finish	side plates: blank side panels and rear panel: painted feet: black

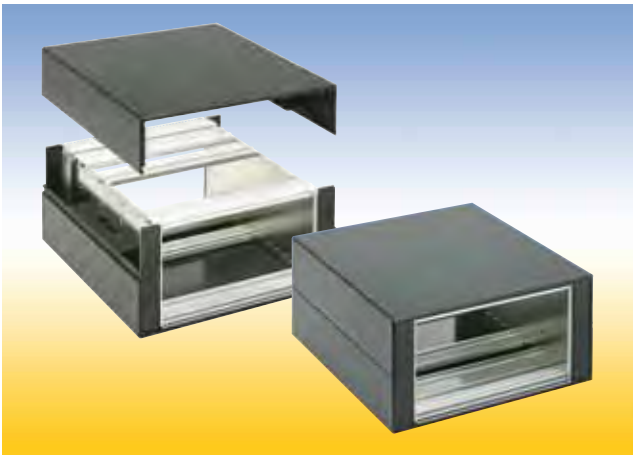
Delivery:

2 top/bottom panels
2 side plates
2 side panels
4 profile rails front/rear
1 profile rail rear middle
(only for 6 U)
1 rear panel
2 covers
2 mounting angles
4 threaded strips
(6 for 6 U)
1 foot kit
(1 carrying handle)
Installation hardware

Ordering details *InterCase* desktop housing

nom. height [U]	width [HP]	nom. depth [mm]	total depth [mm]	order no. 409.	with carry- ing handle- order no. 409.
3	42	160	260	172 610	172 548
3	42	220	320	172 620	172 621
3	84	160	260	172 630	172 631
3	84	220	320	172 640	172 641
6	84	160	260	172 650	172 651
6	84	220	320	172 660	172 661

InterLock Desktop Housing



Material: Polystyrene 6 mm thick
Color: black

Delivery:

The *InterLock* desktop housing is delivered in single parts.

Set consists of:

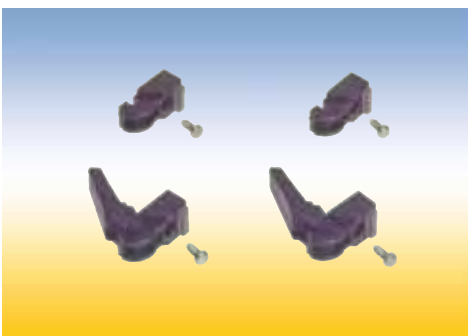
- 1 top-shell
- 1 bottom-shell

Ordering details kit - *InterLock* desktop housing

nom. height [U]	width [HP]	nom. depth [mm]	order no. 409.
3	42	220	168 935
3	84	220	168 936
6	84	220	168 937

Ordering details for compatible subrack kits

	nom. height [HE]	width [HP]	PCB depth/ nom. depth [mm]	order no. 409.
Subrack <i>FLEXIBLE Fi-alpha</i> prepared for RFI	3	42	160/220	133 306
Subrack <i>FLEXIBLE Fi-alpha</i> prepared for RFI	3	84	160/220	133 307
Subrack <i>FLEXIBLE Fi-alpha</i> prepared for RFI	6	84	160/220	133 308



Accessories *InterLock*

Foot kit:

- 2 feet without tip-up
- 2 feet with tip-up
- 4 lens head screws with nut

Material: Ultramid

Color: black

Foot kit

order-no.: **409. 133 305**

Accessories other housings

Foot kit:

- 2 feet without tip-up
- 2 feet with tip-up
- 4 self-tapping screws

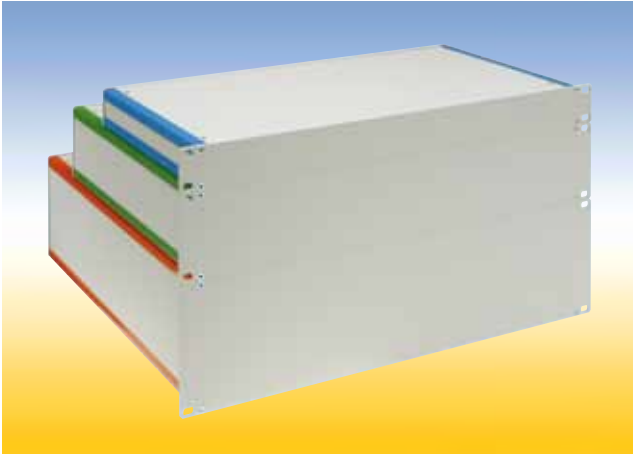
Material: Ultramid

Color: black

Foot kit

order-no.: **409. 059 640**

DiVar Housing



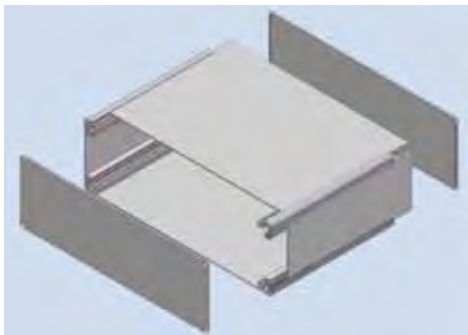
Painting examples of the DiVar housing

Technical Data

Material	aluminum
Finish	profiles: blank cover plates, front panel and side plates: front: anodized, rear: conductive

Delivery

The *DiVar* housing is delivered unassembled as individual parts or as a kit



DiVar housing as individual housing

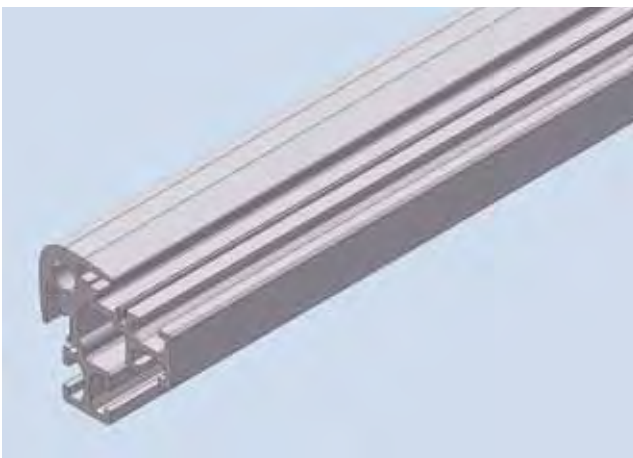
Description

The special design features of the *DiVar* housing:

- ✓ It consists of profiles into which aluminum, sheet steel, stainless steel or plastic panels with a thickness of 1.5 to 2.5 mm are inserted and, if desired, secured with screws. A wall panel at the rear and a panel at the front are screwed to the profiles.
- ✓ The flexible design allows variable configuration of the housing geometry in all three axes, this allowing adaptation of the housing to customer-specific requirements.
- ✓ Different surfaces can be selected for an individual appearance.
- ✓ The proven RFI contact spring concept ensures optimum RFI shielding.
- ✓ Rails with threaded holes can be pressed into the profile grooves, for example to screw in PCBs or mounting plates.
- ✓ The extensive range of Intermas accessories allows unrestricted configuration and installation of both standardized and non-standard components.

The housing can be supplied in 4 versions:

1. Customized housing
2. 19" rack mounted
3. Desktop housing with a keyboard area
4. Desktop housing with a continuous slanting surface



Multifunctional Profile *DiVar*

Material: aluminum
Finish: blank

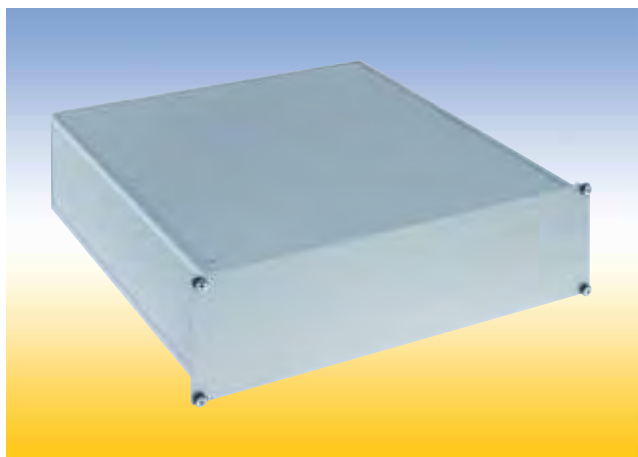
Length: 1000 mm

order no.: 409. 121 808

Accessories

RFI-spring F3
Length: 399.64 mm

order no.: 409. 111 774



DiVar Housing as rack mounted version

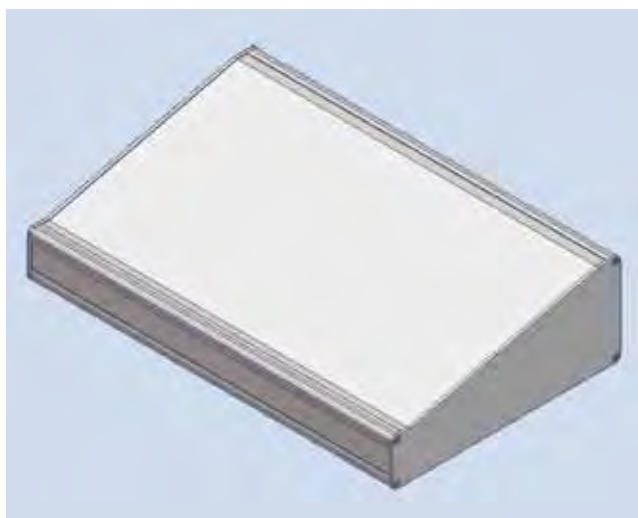
Delivery

4 profiles
4 cover plates
1 19" front panel
1 rear panel
Assembly hardware

Ordering details

DiVar housing as rack mounted version

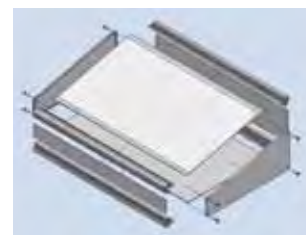
nom. height [U]	width [HP]	depth [mm]	order no. 409.
1	84	250	122 356
2	84	350	122 357
3	84	450	122 358



DiVar Desktop Housing

Delivery

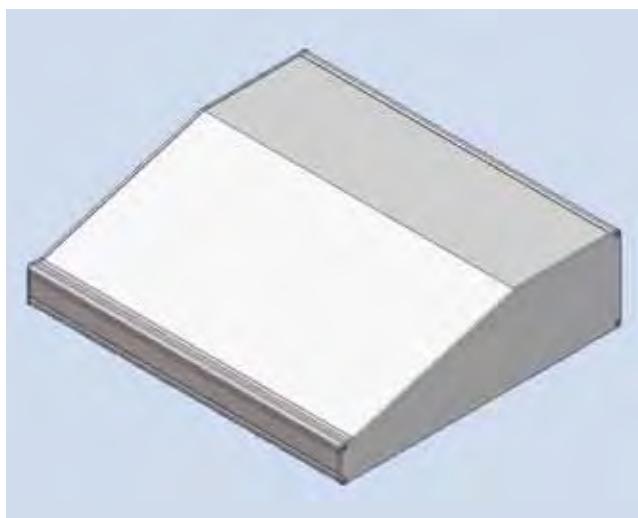
4 profiles
4 cover plates
2 side plates
Assembly hardware



Ordering details

DiVar desktop housing

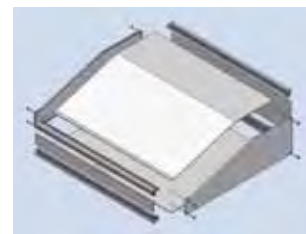
height [mm]	width [mm]	depth [mm]	order no. 409.
50/100	400	250	122 359



DiVar Desktop Housing with keyboard area

Delivery

4 profiles
4 cover plates
2 side plates
Assembly hardware



Ordering details

DiVar desktop housing with keyboard area

height [mm]	width [mm]	depth [mm]	order no. 409.
50/120	450	250/150	122 360

DiVar Housing Examples



DiVar housing as covered subrack 3 U - 84 HP - 160 mm depth



DiVar housing as covered cassette 3 U - 8 HP - 160 mm depth



DiVar housing for instrumentation

Please ask your local representative for your
individual configuration.
You find your contact person on our homepage:
www.intermas-el.com

Subrack *FLEXIBLE*

- ✓ Simple and fast assembly
- ✓ All-purpose
- ✓ RFI shielding can be added later



Subrack *RFI-SHIELDED*

- ✓ High shielding effectiveness
- ✓ Individual internal layout
- ✓ Complies with the latest IEEE standards
- ✓ For VME / VME64x



Subrack *InterRail®*

- ✓ For tough physical demands
- ✓ Vibration-proof
- ✓ For use e.g. in railway engineering, traffic engineering, power station engineering

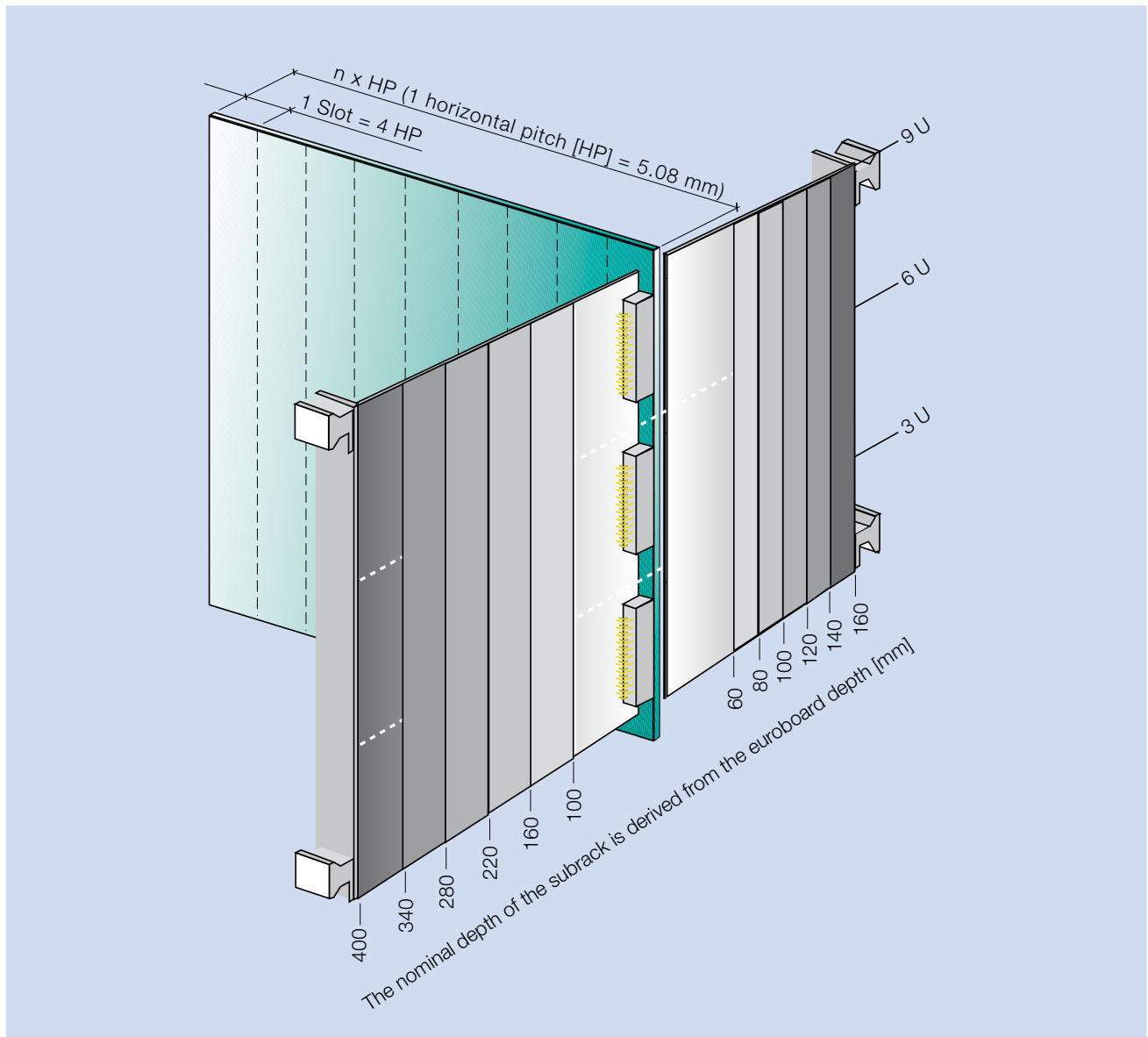


System-Modules *CompactPCI*

- ✓ Integrated bus board
- ✓ Integrated power supply unit
- ✓ Wired and tested
- ✓ Optionally with active cooling



Systematics of the Intermas Subracks



Systematics

The illustration shows the systematics of the height, depth and width pitches of the Intermas-subracks.

The height of the subracks are in Units [U].
1 U is equivalent to 44.45 mm.

The nominal depth of the subracks is derived from the euroboard depth. Front inserted PCB's are generally specified in 60 mm-steps and for rear stuck PCB's in 20 mm-steps.
 For Intermas subracks depths in 10 mm-steps can be realized.

The width pitch is stated in horizontal pitches [HP].
1 HP is equivalent to 5.08 mm.

Busboards are specified in slots.
1 Slot is equivalent to 4 HP = 20.32 mm.

Structual Shapes of Subracks

There are three structural shapes, different in the wiring field.



1. Type *alpha*

The rear profiles are suitable for mounting any appropriate wiring carrier, e. g. bus and connector securing devices, used with insulation strips or Z-rails for mounting connectors according to DIN 41 612.



2. Type *beta*

The rear profiles with integral Z-rail are suitable for the direct mounting of connectors to DIN 41 612.



3. Type *delta*

The rear profiles are 2.6 mm deeper than in the type alpha, permitting direct mounting of multilayer backplanes and/or connector securing devices for mounting of DIN-connectors.

Please ask your local representative for your
individual system configuration.
You can find your contact person at our homepage:
www.intermas-el.com

Subrack *FLEXIBLE*



Description

The special design features of the subrack *FLEXIBLE*:

- ✓ For mounting of the profile rails the side wall is perforated with a grid of 10 mm to allow installation of modules in depth steps of 10 mm. This results in a flexible amount of free space behind the wiring level or in front of the operating level.
- ✓ The profile rails are connected to the side wall at the front using a special screw which ensures electrical bonding of the parts via a ring cutter under the head.
- ✓ The front and rear profile rails can be interchanged such that the wiring level which is normally at the rear can be implemented at the front of the subrack.
- ✓ The extensive range of accessories allows individual configuration.
- ✓ Fast and simple assembly:
Easy positioning of the profile rails thanks to raised embossing on the side wall.
- ✓ There are 2 versions of this subrack:
 1. The *FLEXIBLE Fi* subrack (with an integrated flange)
The combination of the side wall and mounting flange form a single unit. This is the simple and cost-effective version. This standard version can not be shielded.
 2. The *FLEXIBLE Fs* subrack (with a separate flange)
The side wall and flange are separate components so the flange can be screwed to the side panel at the front or the rear.

Advantages:

- Even if the flange is detached and repositioned from the front to the rear the subrack remains a physical unit and is thus also suitable for direct wall mounting.
- This version can be converted to an RFI-shielded subrack with little effort.

Mixed forms

For vertical mounting PCB's of varying heights, divider kits are available.

Delivery

Supplied as unassembled kits.

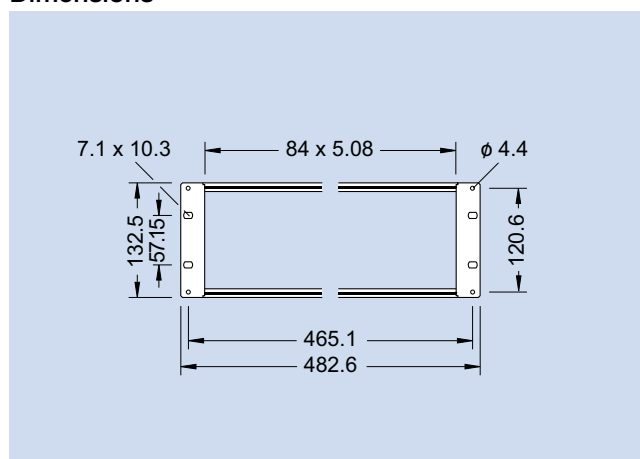
These are either packed as a kit of parts for one unit or as individual components, whereby parts of similar type are packed together.

On request, delivered as assembled and wired subrack according your requirements.

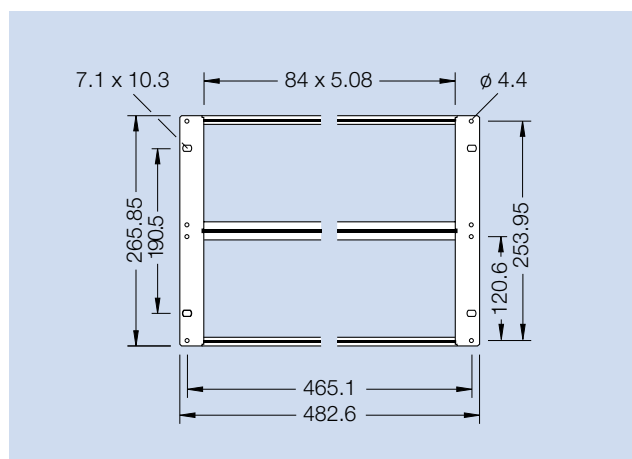
Technical data

Standards	compliant with DIN 41 494 D IEC 60297
width / horizontal pitch	84 usable HP / 5.08 mm
Depth of the inserted board	160, 220, 280 mm (nom. depth)
Depth increment-side panel	10 mm
Connector mounting	M 2.5 in increments of 5.08 mm for DIN 41 612, VG 95 324 and EC 60 603-2 connectors
Materials	screws: steel other parts: aluminum
Finish	screws: galvanized and chromated subrack Fi: colorless anodized; cut areas: blank subrack Fs: colorless chromated
Protection class	DIN 40050 IP 00, IP 20 with cover panels contact protection in accordance with VDE 0160
Utilization category	-25 °C, +70 °C, 75% relative humidity
Protective grounding	all metal parts are electrically bonded to one another following assembly in accordance with VDE 100 D 12.65, § 6 Nb.

Dimensions



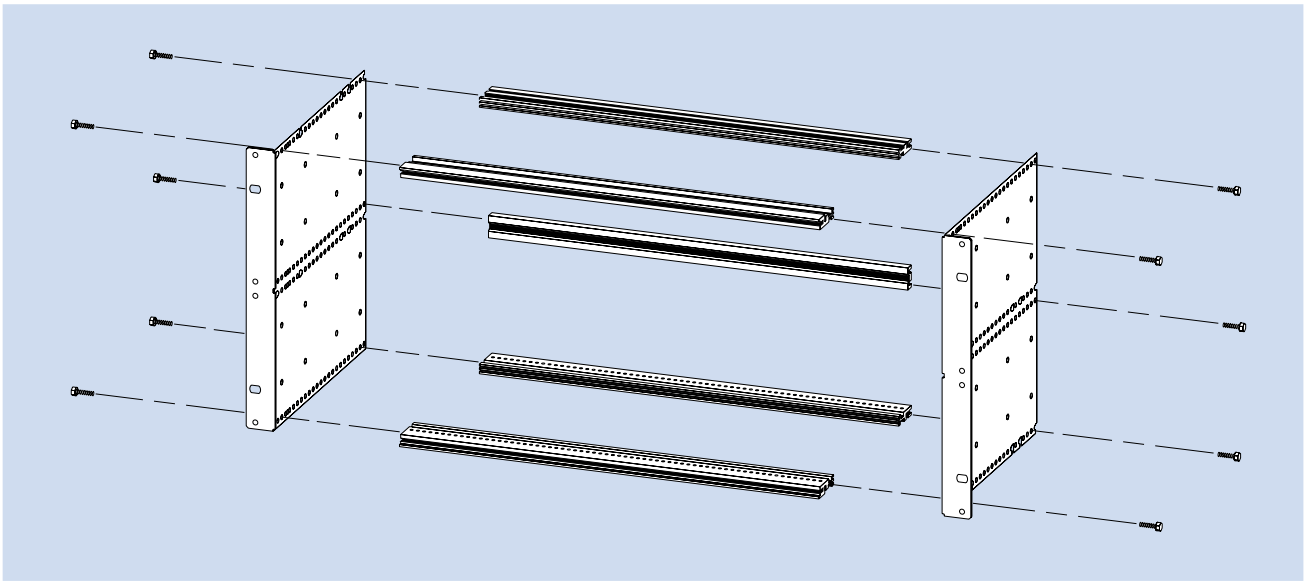
Front of subrack 3 U



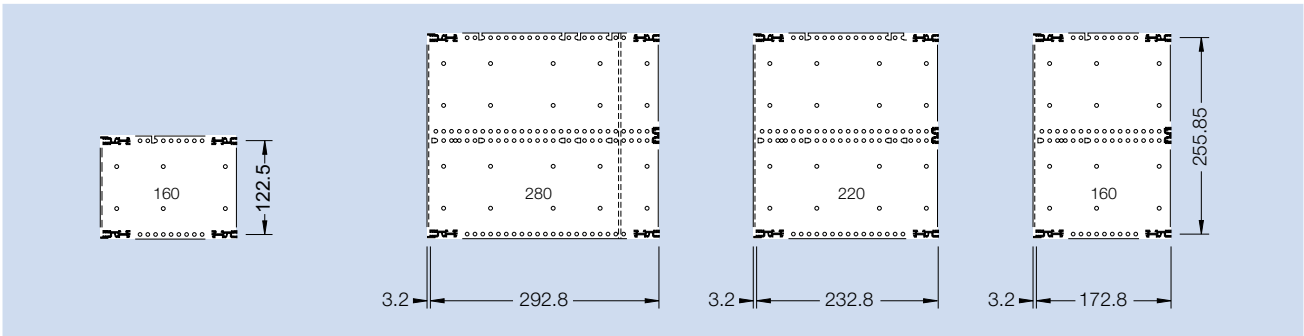
Front of subrack 6 U

Subrack FLEXIBLE Fi

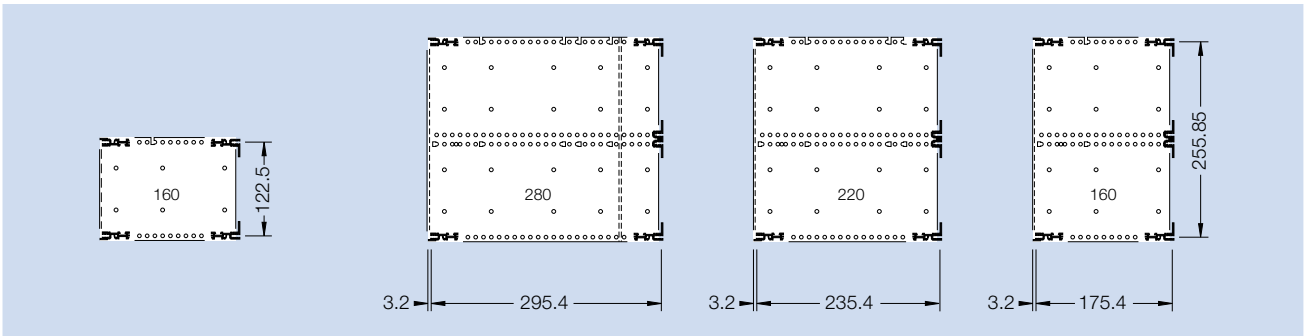
Subracks



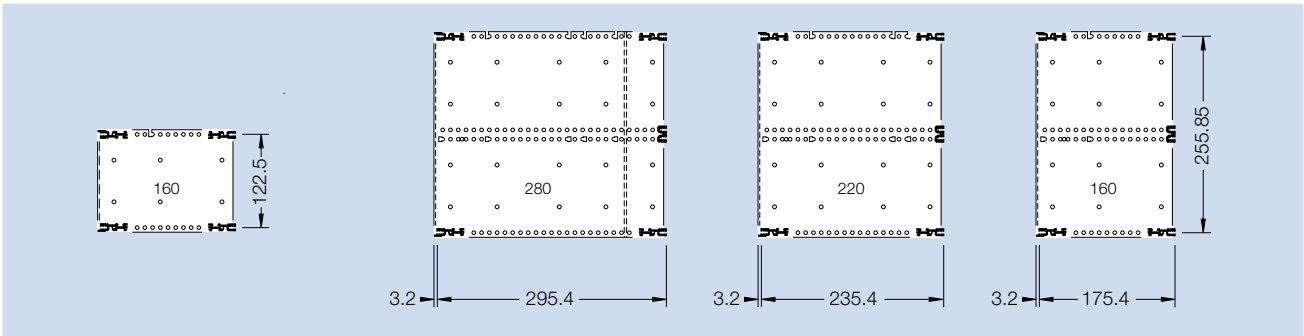
Subrack FLEXIBLE Fi



Depth dimensions type alpha 3 U and 6 U



Depth dimensions type beta 3 U and 6 U



Depth dimensions type delta 3 U and 6 U

Ordering details for kits

	nom. depth [mm]	type <i>alpha</i> order no. 409.	type <i>beta</i> order no. 409.	type <i>delta</i> order no. 409.
3 U - subrack				
<i>FLEXIBLE Fi</i> - 84-3-160	160	087 340	087 440	087 388
<i>FLEXIBLE Fi</i> - 84-3-220	220	087 341	087 441	087 389
<i>FLEXIBLE Fi</i> - 84-3-280	280	087 342	087 442	087 390
6 U - subrack				
<i>FLEXIBLE Fi</i> - 84-6-160	160	087 364	087 446	087 462
<i>FLEXIBLE Fi</i> - 84-6-220	220	087 365	087 447	087 463
<i>FLEXIBLE Fi</i> - 84-6-280	280	087 366	087 448	087 464

Delivery

	pieces per kit <i>alpha</i> 3 HE	pieces per kit <i>alpha</i> 6 HE	pieces per kit <i>beta</i> 3 HE	pieces per kit <i>beta</i> 6 HE	pieces per kit <i>delta</i> 3 HE	pieces per kit <i>delta</i> 6 HE
Side panel Fi, anodized	2	2	2	2	2	2
Front profile VE1-85	2	2	2	2	2	2
Rear profile HE1-85	2	2	-	-	-	-
Rear profile HZE-85	-	-	2	2	-	-
Rear profile HE2-85	-	-	-	-	2	2
Center profile ME1-85	-	1	-	-	-	-
Center profile MZE-85	-	-	-	1	-	-
Center profile ME2-85	-	-	-	-	-	1
Mounting parts kit	1	1	1	1	1	1
Threaded strip	2	2	2	2	2	2

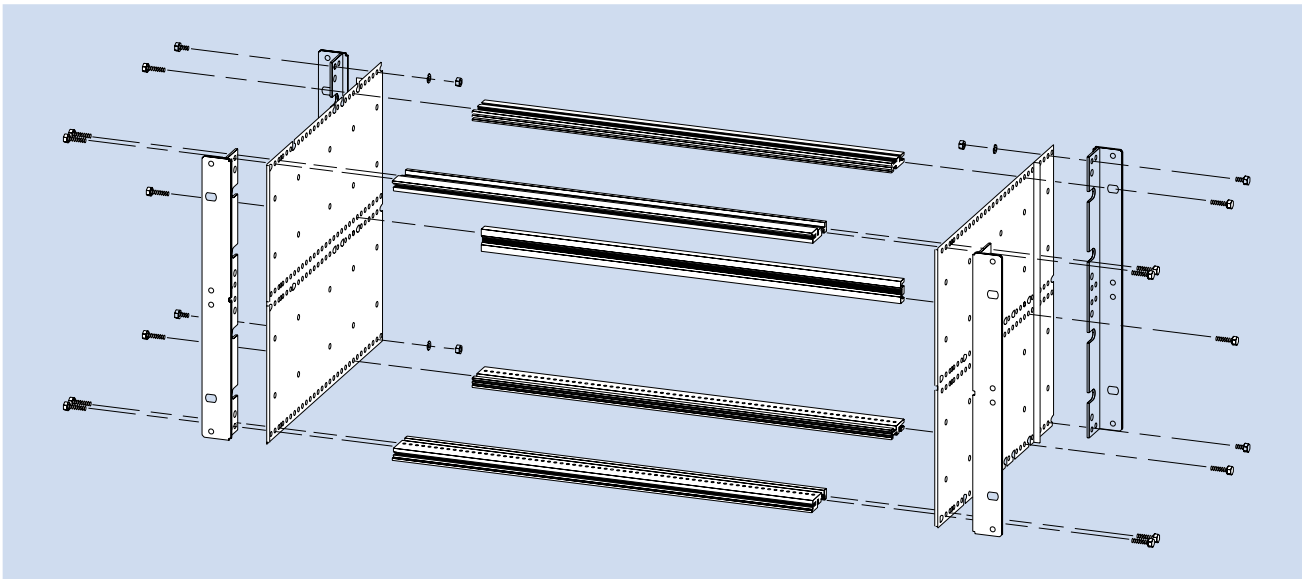
Accessories

	order no. 409.
Threaded strip 84 x M 2.5	091 255
Insulating strip 84 HP	051 981
Kits with 2 cover plate ø 8.5 mm and mounting parts	
Cover plates kit slide-in 160	162 700
Cover plates kit slide-in 220	162 701
Cover plates kit screw-on 160	162 703
Cover plates kit screw-on 220	162 704
Cover plates kit screw-on 280	162 705

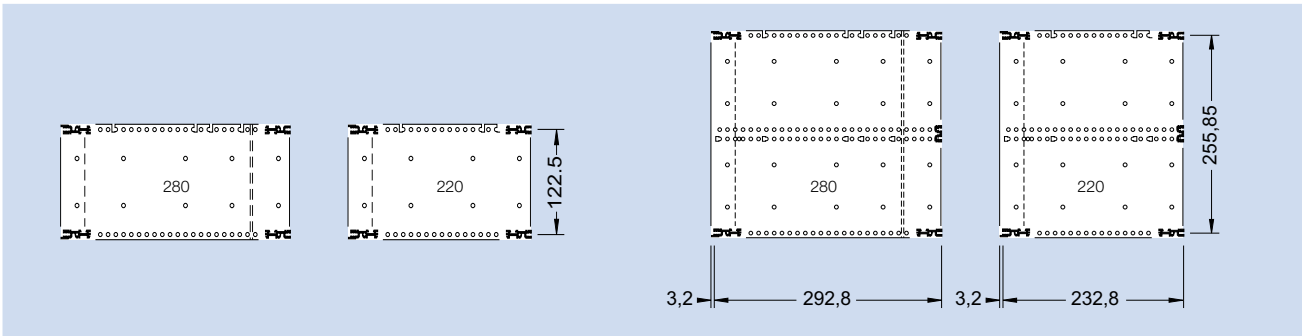
Further details and possibilities of other applications are in the chapter Subrack-Accessories.

Subrack *FLEXIBLE* Fs

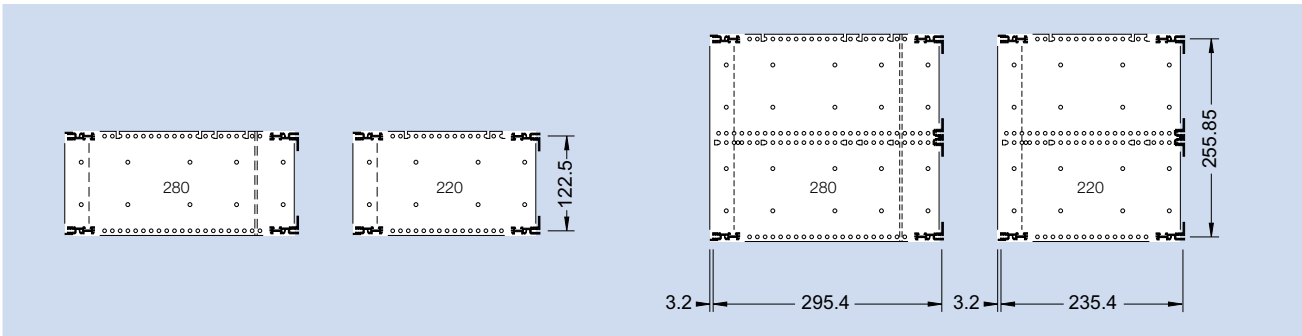
Subracks



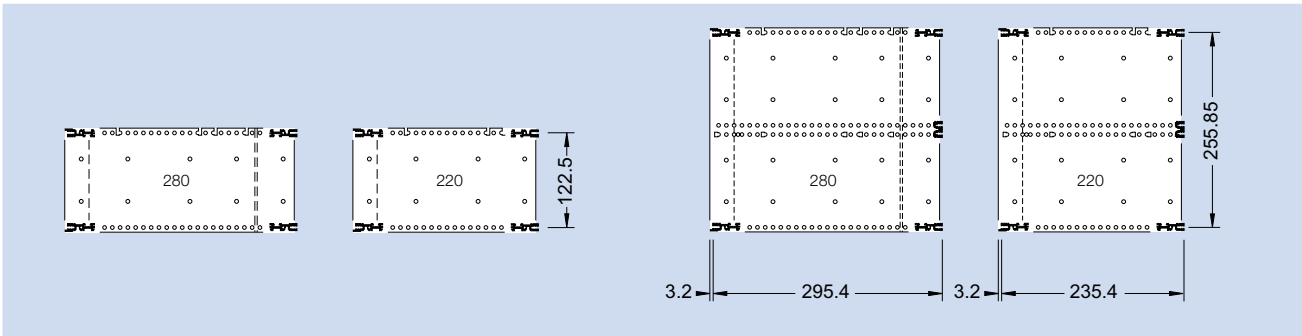
Subrack *FLEXIBLE* Fs



Depth dimensions *Fs* type alpha 3 U and 6 U



Depth dimensions *Fs* type beta 3 U and 6 U



Depth dimensions *Fs* type delta 3 U and 6 U

Ordering details for kits

	nom. depth [mm]	type <i>alpha</i> order no. 409.	type <i>beta</i> order no. 409.	type <i>delta</i> order no. 409.
3 U - subrack				
<i>FLEXIBLE Fs</i> - 84-3-220	220	094 700	094 704	094 708
<i>FLEXIBLE Fs</i> - 84-3-280	280	094 701	094 705	094 709
6 U - subrack				
<i>FLEXIBLE Fs</i> - 84-6-220	220	094 702	094 706	094 710
<i>FLEXIBLE Fs</i> - 84-6-280	280	094 703	094 707	094 711

Delivery

	pieces per kit <i>alpha</i> 3 U	pieces per kit <i>alpha</i> 6 U	pieces per kit <i>beta</i> 3 U	pieces per kit <i>beta</i> 6 U	pieces per kit <i>delta</i> 3 U	pieces per kit <i>delta</i> 6 U
Side panel Fs, chromated	2	2	2	2	2	2
Flange separated, anodized	2	2	2	2	2	2
Front profile VE12-85	2	2	2	2	2	2
Rear profile HE1-85	2	2	-	-	-	-
Rear profile HZE-85	-	-	2	2	-	-
Rear profile HE2-85	-	-	-	-	2	2
Center profile ME1-85	-	1	-	-	-	-
Center profile MZE-85	-	-	-	1	-	-
Center profile ME2-85	-	-	-	-	-	1
Mounting parts kit	1	1	1	1	1	1
Threaded strip	2	2	2	2	2	2

Accessories

	order no. 409.
Threaded strip 84 x M 2.5	091 255
Insulating strip 84 HP	051 981
Kits with 2 cover plates ø 8.5 mm and mounting parts	
Cover plates kit screw-on 220	162 704
Cover plates kit screw-on 280	162 705

Further details and possibilities of other applications
are in the chapter Subrack-Accessories.

Subrack *RFI-SHIELDED*



Description

The system dimensions of the *RFI-SHIELDED* subrack are based on those of the *FLEXIBLE* subrack as a logical further development to produce the perfectly shielded subrack. This allows unrestricted use of the extensive and complete range of accessories.

The special design features of the *RFI-SHIELDED* subrack:

- ✓ The refined RFI shielding concept enables high shielding effectiveness.
- ✓ The stable stainless steel contact springs ensure permanent and reliable bonding, even after a large number of plug-in cycles.
- ✓ The perforated RFI cover plates guarantee optimal air flow for improved heat dissipation.
- ✓ The use of high-quality, seawater-resistant aluminum alloys and stainless steel materials removes, for the most part, the need for unnecessary, environmentally harmful surface treatment.
- ✓ There are three versions of this subrack:

1. Subrack *RFI-SHIELDED*
The standard RFI-shielded version.

2. Subrack *RFI-SHIELDED IEEE*
The front is in accordance with IEEE 1101.10. The special profile rail is designed for the use of insertion and removal handles (optionally with a hot-swap function) for overcoming high insertion and removal resistance.

The card guides are fitted with mechanical coding systems and special bonding for electrostatic discharge.

3. Subrack *RFI-SHIELDED IEEE / Rear I/O*

The front and the rear are in accordance with IEEE 1101.10/11. This enables insertion and removal of modules with a front panel from both the front and the rear of the subrack.

Mixed forms

For vertical mounting PCB's of varying heights, divider kits are available.

Delivery

Supplied as unassembled kits.

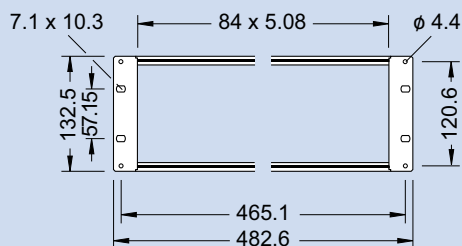
These are either packed as a kit of parts for one unit or as individual components, whereby parts of similar type are packed together.

On request, delivered as assembled and wired subrack according your requirements.

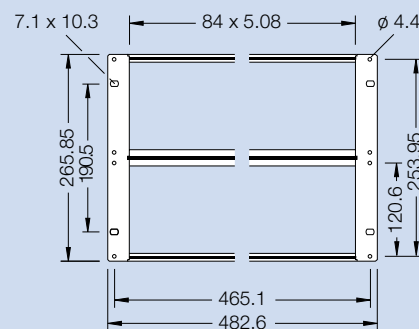
Technical data

Standards	compliant with DIN 41 494 D IEC 60297-3, IEEE 1101.10
Width / horizontal pitch	84 usable HP / 5.08 mm
Depth of the inserted board	160, 220, 280 mm (nom. depth), 80 mm at the rear
Depth increment-side panel	10 mm
Connector mounting	M 2.5 in increments of 5.08 mm for DIN 41 612, VG 95 324 and EC 60603-2 connectors
Materials	screws: steel contact springs: stainless steel other parts: aluminum
Finish	screws: galvanized und chromated side panels and cover plates: blank (seawater-resistant) other parts: chromated
Protection class	DIN 40050 IP 00, IP 20 with cover panels contact protection in accordance with VDE 0160
Utilization category	-25 °C, +70 °C, 75% relative humidity
Protective grounding	all metal parts are electrically bonded to one another following assembly in accordance with VDE 100 D 12.65, § 6 Nb.

Dimensions

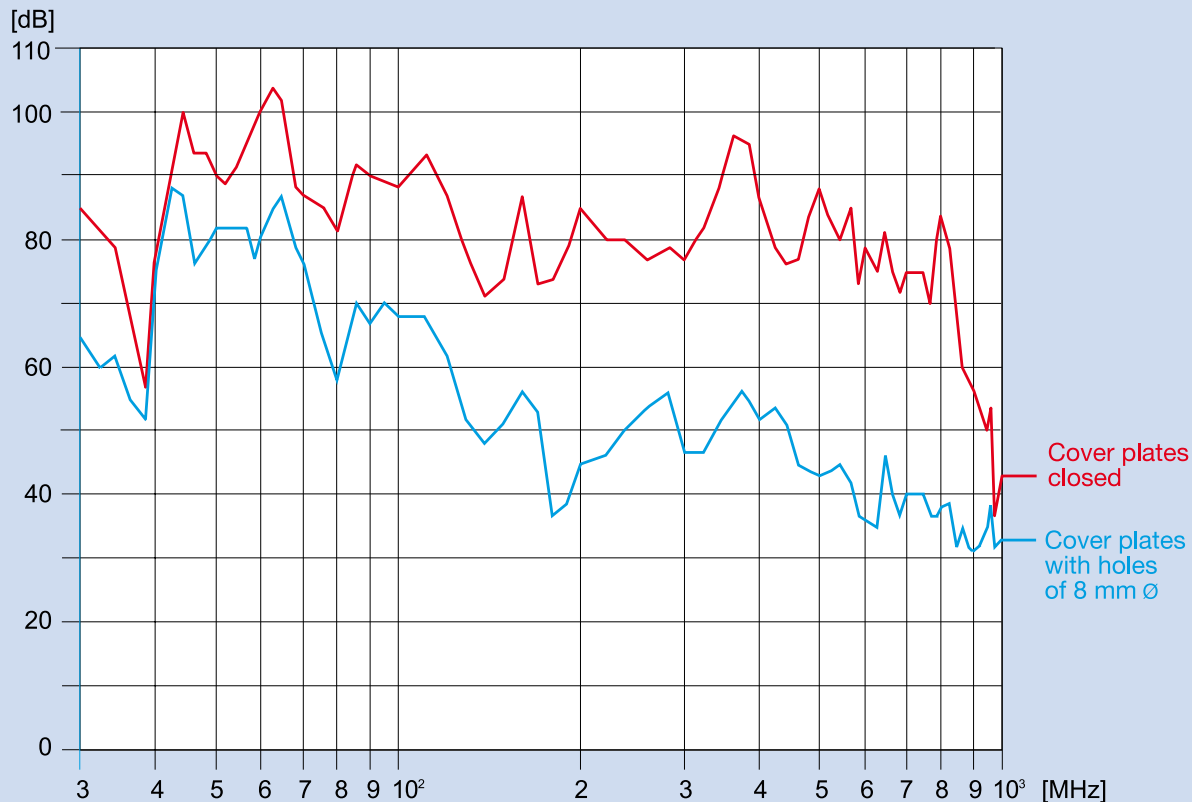


Front of subrack 3 U



Front of subrack 6 U

Measurement Configuration, Tests, Measurement Results



Shielding efficiency as function of grade of perforation of the covers

1. Measurement configuration

The measurement configuration fundamentally complied with the requirements of VG 95 373, Part 15, measurement method KS 04 G.

The subrack stood in the middle of a shielded anechoic chamber. The receiver antenna was in the center of the subrack and the transmitter antenna was mounted at a distance of 1 m from it.

The subrack was positioned such that the perforated cover panel faced the transmitter antenna.

The measurement receiver was located inside the measurement chamber, approximately 2 m from the test object; the measurement transmitter and amplifier were outside the chamber.

2. Tests

All measurements were performed at a constant transmitter output of -5 dBm at 50 V. The first series of measurements was performed with a free-standing receiver antenna. The next measurements were then performed with the receiver antenna inside the subrack. The shielding effectiveness SE [dB] is the difference between the measurement levels obtained. Two subrack types were tested, one with a perforated cover panel and one with a solid cover panel. Perforation diameters of 3-8 mm essentially lead to the same result:

The two related measurement curves can be seen in the diagram above.

Frequency steps

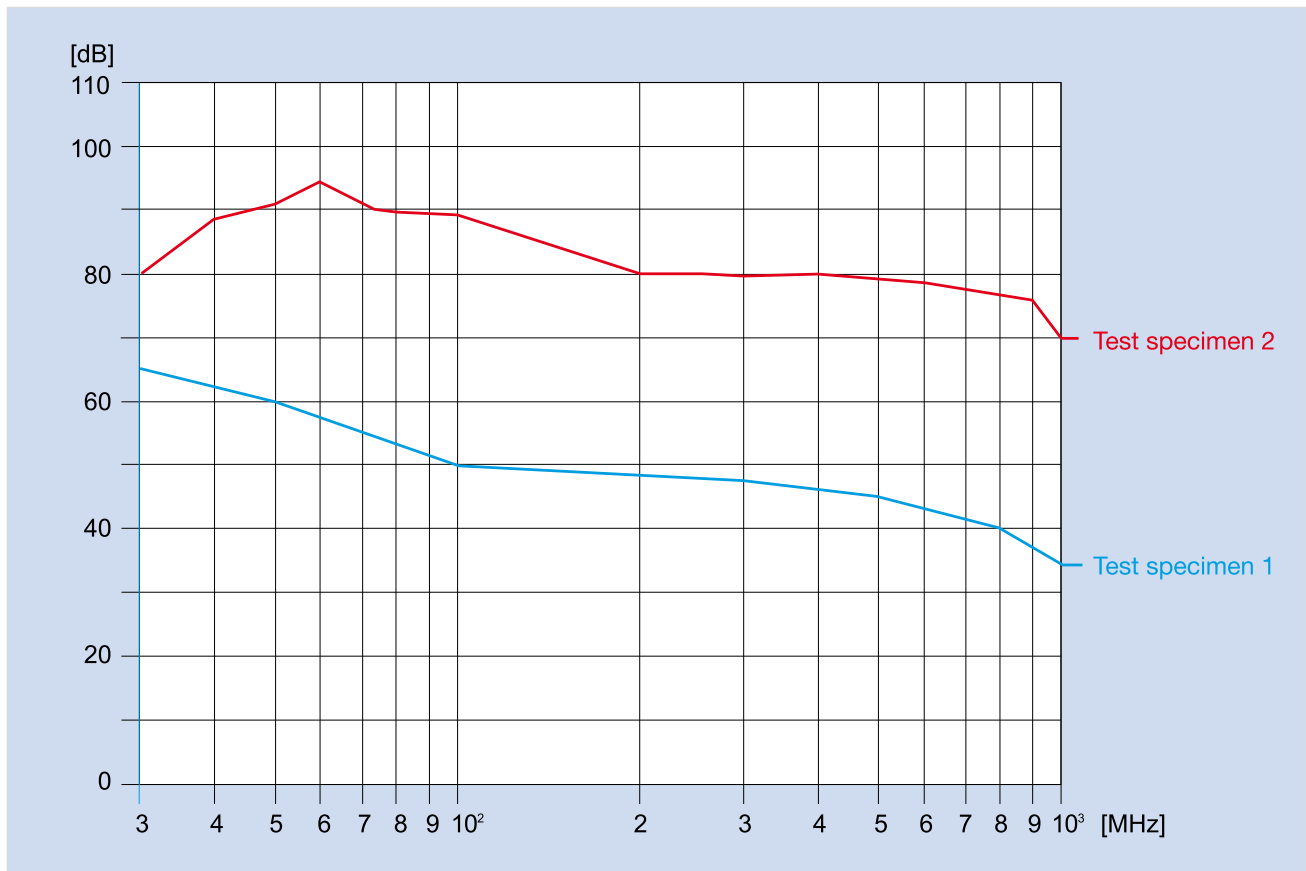
Frequency range [MHz]	Measurement step [MHz]
30 - 70	2
70 - 100	5
100 - 200	10
200 - 1000	20

3. Measurement results, summary

Compared to the subrack with a perforated cover panel the subrack with a solid cover panel exhibits a significantly higher level of shielding effectiveness, on average 20 dB higher in the lower frequency range (30 - 180 MHz) and on average 40 dB higher in the upper range (180 MHz - 1 GHz).

Above approximately 800 MHz the shielding effectiveness is determined by the distances between the contact points between the subrack and the front panels.

For subracks in accordance with IEEE P 1101.10 this boundary frequency lies at 1.2 to 1.5 GHz depending on the subrack design.



Shielding effectiveness

Shielding effectiveness

The shielding effectiveness of the empty subrack was determined in accordance with VG 95 373, Part 15.

Testing organisation

The measurements were performed in the Siemens Institute for Quality Engineering, Testing and Certification in Munich, Germany.

Test object

Two subracks with a height of 6 U, a width of 84 HP and a depth of 320 mm were tested:

Test specimen 1

Subrack 1 was closed at the top and bottom with perforated cover panels (Ø 4/5 x 4 mm), at the rear with an 85 HP front panel and at the front with twenty-one 4 HP profile front panels. The elements were bonded to each other via stainless steel RFI gaskets.

Test specimen 2

Subrack 2 was closed at the top and bottom with solid cover panels and at the front and the rear with an 85 HP front panel. The elements were bonded to each other via stainless steel RFI gaskets.

Advice on use

To achieve optimal shielding the subrack must be closed at all sides using RFI gaskets, i.e. it must be fitted at the front and the rear with front panels or sub-assemblies.

Implementation of the Shielding

The RFI-SHIELDED subrack is fitted with stainless steel springs on all sides for defined bonding of all individual elements to each other. The only exceptions are the transitions of the cover plates to the side panel. In this case the bonding is performed using multiple screw connections at short distances from one another. The use of RFI front panels with bonding points at the side and bonding areas in the case of the extruded profile front panel results in a shielded subrack with shielding effectiveness levels as shown in the diagram below.

The details of the technical implementation using stainless steel springs:

1. Bonding of the cover panel to the profile channel via the RFI spring A2 which is inserted into the groove of the profile.
2. The RFI spring P2 is snapped onto the profile channel at both the front and the rear and at its front face creates the bonding to the front panels and the rear wall.

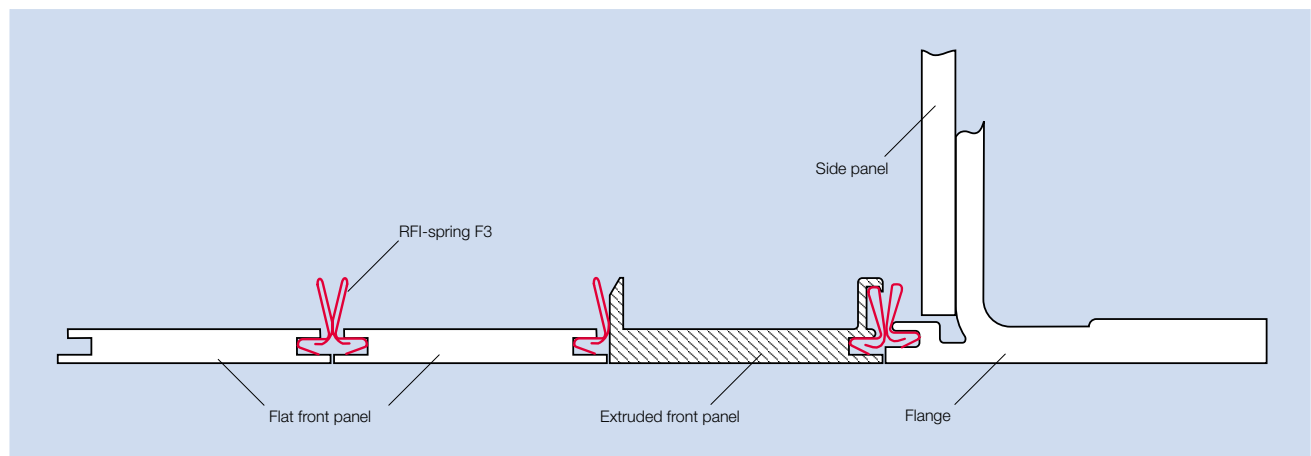
3. The RFI spring F3 is used in the subrack flange. This spring is also used at the sides of the RFI front panels and creates the bonding between the front panels and between the front panel and the flange or side panel.

4. The cover panel is screwed directly to the side panel; springs are thus not necessary here.

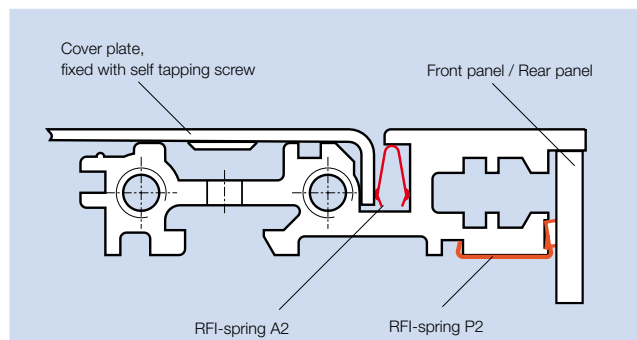
The subrack, its paneling elements and the cover panels are made of high-quality seawater-resistant aluminum alloys.

The spring strips are made of stainless steel.

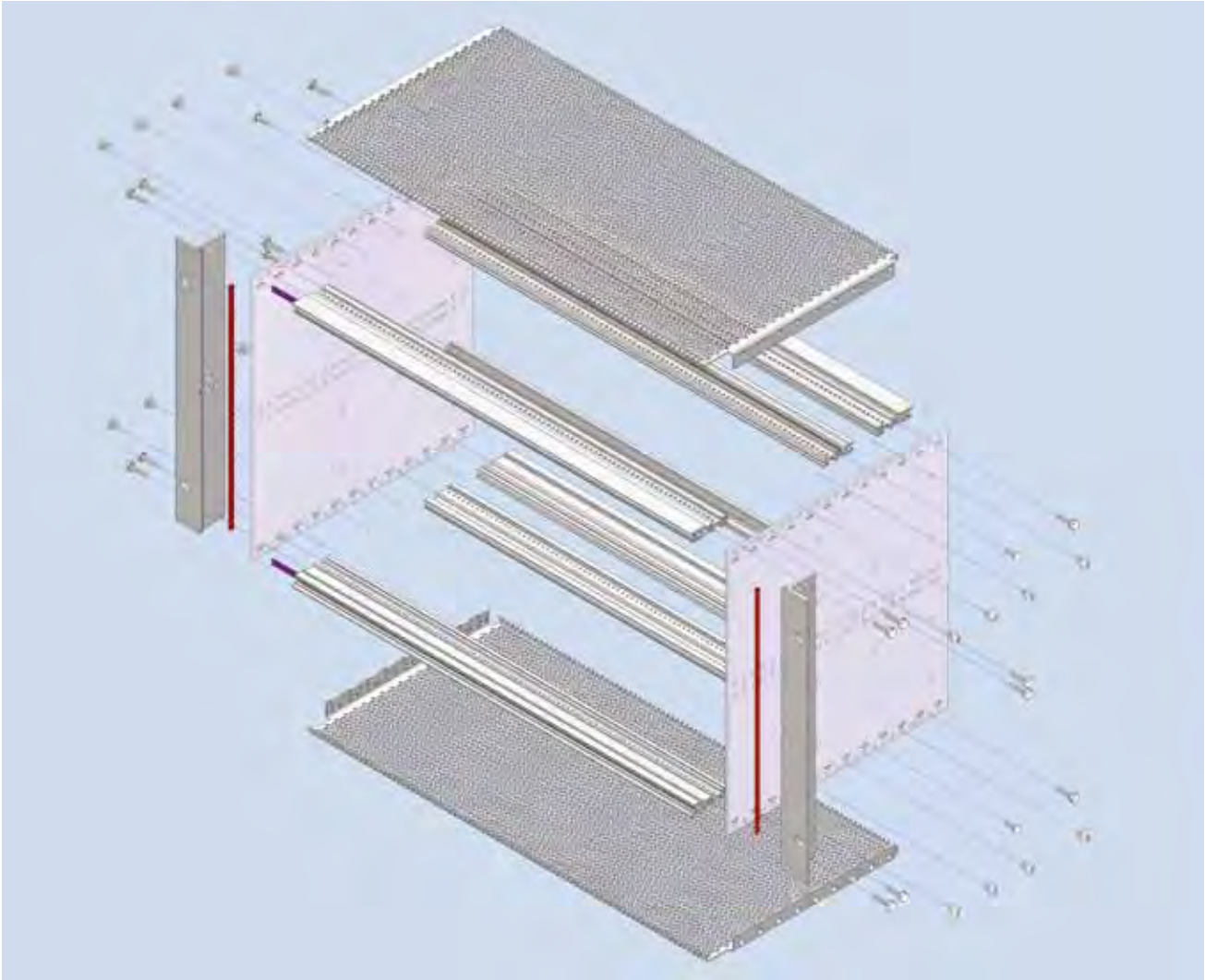
This well-balanced combination of materials and surface treatment ensures high corrosion and ageing resistance and achievement of the necessary low contact resistance between the individual elements.



Sealing of the vertical splices between the front panels and between front panel und flange



Bonding with RFI-springs

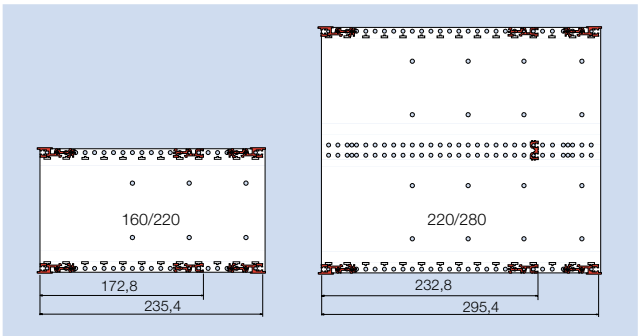


Assembling example

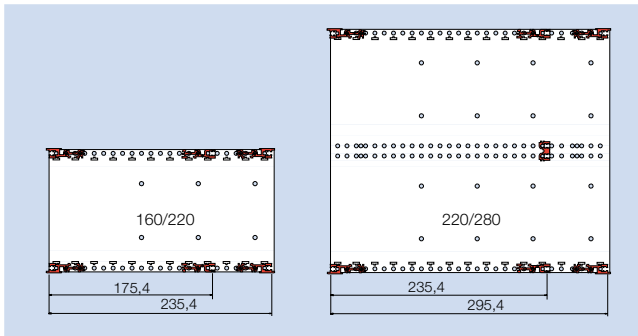
Delivery example

	pieces
	6 U
Side panel	2
Flange	2
RFI-spring F3 (flange/front panel)	2
Threaded strip (front only)	2
Cover plates punched holes Ø 4 / 5.2x4 mm	2
RFI-spring A2 (cover plate/profile)	4
Mounting parts	1
Front profile	2
Rear profile	2
Inside profile	2
Center profile	1

Subrack *RFI-SHIELDED*



Depth dimensions type alpha 3 U and 6 U



Depth dimensions type delta 3 U and 6 U

Ordering details for kits

	PCB depth/ nom. depth [mm]	type <i>alpha</i> order no. 409.	type <i>delta</i> order no. 409.
3 U - subrack			
<i>RFI-SHIELDED</i> - 84-3-220	160/220	162 708	162 710
<i>RFI-SHIELDED</i> - 84-3-280	220/280	162 709	162 711
6 U - subrack			
<i>RFI-SHIELDED</i> - 84-6-220	160/220	162 712	162 714
<i>RFI-SHIELDED</i> - 84-6-280	220/280	162 713	162 715

Delivery

	pieces per kit <i>alpha</i> 3 U	pieces per kit <i>alpha</i> 6 U	pieces per kit <i>delta</i> 3 U	pieces per kit <i>delta</i> 6 U
Side panel	2	2	2	2
Flange	2	2	2	2
RFI-spring F3 (flange/front panel)	2	2	2	2
Threaded strip (front only)	2	2	2	2
For your custom subrack: please order threaded strips separately.				
Cover plate punched holes Ø 4 / 5.2 x 4 mm	2	2	2	2
RFI-spring A2 (cover plate/profile)	4	4	4	4
Mounting parts kit	1	1	1	1
Front profile/rear V12-RFI-85	4	4	4	4
Inside profile-HE1-85	2	2	-	-
Center profile ME1-85	-	1	-	-
Inside profile-HE2-85	-	-	2	2
Center profile ME2-85	-	-	-	1

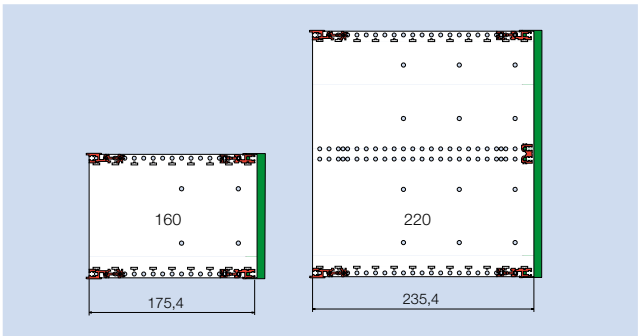
Accessories

	order no. 409.
Threaded strip 84 x M 2.5	091 255
Insulating strip 84 HP	051 981
RFI-spring P2 - 84 (profile/front panel)	106 547

Further details and possibilities of other applications are in the chapter Subrack-Accessories.

Subrack *RFI-SHIELDED* with Rear Cover

Subracks



Depth dimensions type delta 3 U and 6 U

Ordering details for kits

	PCB depth [mm]	type <i>delta</i> order no. 409.
3 U - subrack		
<i>RFI-SHIELDED</i> - 84-3-160	160	162 716
<i>RFI-SHIELDED</i> - 84-3-220	220	162 717
6 U - subrack		
<i>RFI-SHIELDED</i> - 84-6-160	160	162 718
<i>RFI-SHIELDED</i> - 84-6-220	220	162 719

Delivery

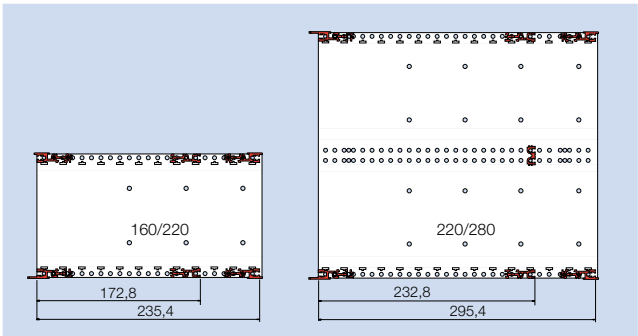
	pieces per kit <i>delta</i> 3 U	pieces per kit <i>delta</i> 6 U
Side panel	2	2
Flange	2	2
Cover	1	1
RFI-spring F3 (flange/front panel)	2	2
Threaded strip (front only)	2	2
For your custom subrack please order threaded strips separately.		
Cover plates punched holes Ø 4 / 5.2 x 4 mm	2	2
RFI-spring A2 (cover plate/profile)	4	4
Mounting parts kit	1	1
Front profile V12-RFI-85	2	2
Rear profile H22-RFI-85 for screw on cover	2	2
Center profile ME2-85	-	1

Accessories

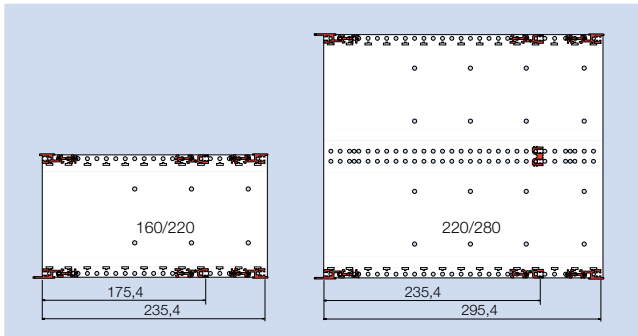
	order no. 409.
Threaded strip 84 x M 2.5	091 255
Insulating strip 84 HP	051 981
RFI-spring P2 - 84 (profile/front panel)	106 547

Further details and possibilities of other applications are in the chapter Subrack-Accessories.

Subrack *RFI-SHIELDED IEEE*



Depth dimensions IEEE type alpha 3 U and 6 U



Depth dimensions IEEE type delta 3 U and 6 U

Ordering details for kits

	PCB depth/ nom. depth [mm]	type <i>alpha</i> order no. 409.	type <i>delta</i> order no. 409.
3 U - subrack			
<i>RFI-SHIELDED - IEEE - 84-3-220</i>	160/220	162 720	162 722
<i>RFI-SHIELDED - IEEE - 84-3-280</i>	220/280	162 721	162 723
6 U - subrack			
<i>RFI-SHIELDED - IEEE - 84-6-220</i>	160/220	162 724	162 726
<i>RFI-SHIELDED - IEEE - 84-6-280</i>	220/280	162 725	162 727

Delivery

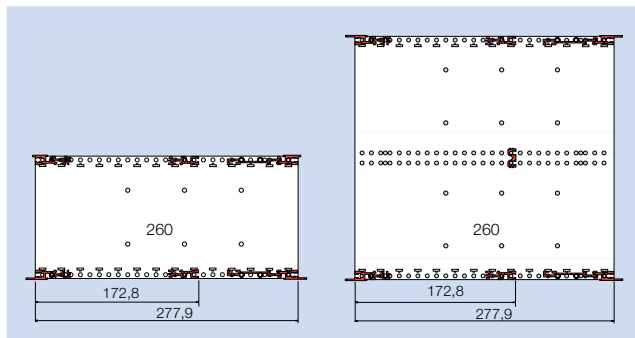
	pieces per kit <i>alpha</i> 3 U	pieces per kit <i>alpha</i> 6 U	pieces per kit <i>delta</i> 3 U	pieces per kit <i>delta</i> 6 U
Side panel	2	2	2	2
Flange	2	2	2	2
RFI-spring F3 (flange/front panel)	2	2	2	2
Threaded strip (front only)	2	2	2	2
For your custom subrack please order threaded strips separately.				
Cover plates punched holes $\varnothing 4 / 5.2 \times 4\text{mm}$	2	2	2	2
RFI-spring A2 (cover plate/profile)	4	4	4	4
Mounting parts kit	1	1	1	1
Front profile/rear V12-IEEE-85	1	2	1	2
Front profile/rear V12-RFI-85	3	2	3	2
Inside profile-HE1-85	2	2	-	-
Center profile inside ME1-85	-	1	-	-
Inside profile-HE2-85	-	-	2	2
Center profile inside ME2-85	-	-	-	1

Accessories

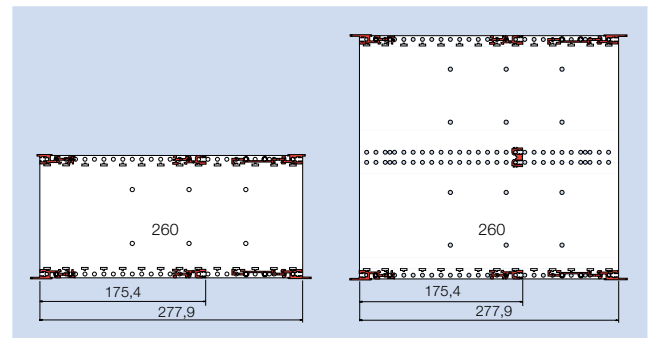
	order no. 409.
Threaded strip 84 x M 2.5	091 255
Insulating strip 84 HP	051 981
RFI-spring P2 - 84 (profile/front panel)	106 547

Further details and possibilities of other applications are in the chapter Subrack-Accessories.

Subrack *RFI-SHIELDED* Rear I/O



Depth dimensions Rear I/O type alpha 3 U and 6 U



Depth dimensions Rear I/O type delta 3 U and 6 U

Ordering details for kits

	nom. depth [mm]	type <i>alpha</i> order no. 409.	type <i>delta</i> order no. 409.
3 U - subrack			
<i>RFI-SHIELDED</i> Rear I/O-84-3-160+80	260	162 728	162 729
6 U - subrack			
<i>RFI-SHIELDED</i> Rear I/O-84-6-160+80	260	116 484	161 034

Delivery

	pieces per kit <i>alpha</i> 3 U	pieces per kit <i>alpha</i> 6 U	pieces per kit <i>delta</i> 3 U	pieces per kit <i>delta</i> 6 U
Side panel	2	2	2	2
Flange	2	2	2	2
RFI-spring F3 (flange/front panel)	2	2	2	2
Threaded strip (front only)	2	2	2	2
For your custom subrack please order threaded strips separately.				
Cover plates punched holes $\varnothing 4 / 5.2 \times 4\text{mm}$	2	2	2	2
RFI-spring A2 (cover plate/profile)	4	4	4	4
Mounting parts kit	1	1	1	1
Front profile V12-IEEE-85	1	2	1	2
Front profile V12-RFI-85	1	-	1	-
Rear profile-V1HUCK-IEEE-85	1	2	1	2
Rear profile-V1HUCK-85	1	-	1	-
Inside profile-HE1-85	2	2	-	-
Inside profile-HE2-85	-	-	2	2
Support profile for card guide	2	2	2	2

Accessories

	order no. 409.
Threaded strip 84 x M 2.5	091 255
Insulating strip 84 HP	051 981
RFI-spring P2 - 84 (profile/front panel)	106 547

Further details and possibilities of other applications are in the chapter Subrack-Accessories.



Description

The system dimensions of the InterRail subrack are based on those of the *FLEXIBLE Fi* as a logical further development to produce a subrack for heavy-duty use. This allows unrestricted use of the extensive range of accessories.

The special design features of the InterRail subrack:

- ✓ Profile rails with a high section modulus guarantee resistance to vibrations.
- ✓ The refined RFI-shielding concept enables high shielding effectiveness (see the RFI-SHIELDED chapter).
- ✓ There are four versions of this subrack:

1. Subrack *InterRail*

Shielding is not possible for the unsealed version.

2. Subrack *InterRail RFI*

The RFI-shielded version.

3. Subrack *InterRail RFI - IEEE*

The front is in accordance with IEEE 1101.10. The special profile rail is designed for the use of insertion and removal handles (optionally with a hot-swap function) for overcoming high insertion and removal resistance. The card guides are fitted with mechanical coding systems and special bonding for electrostatic discharge.

4. Subrack *InterRail SNCF*

The special subrack with certification from the French Railways.

Mixed forms

For vertical mounting PCB's of varying heights, divider kits are available.

Delivery

Supplied as unassembled kits.

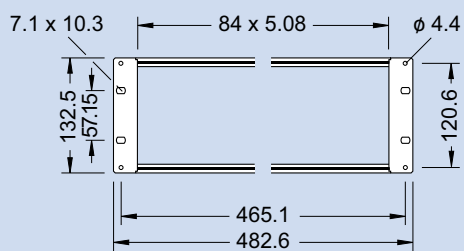
These are either packed as a kit of parts for one unit or as individual components, whereby parts of similar type are packed together.

On request, delivered as assembled and wired subrack according your requirements.

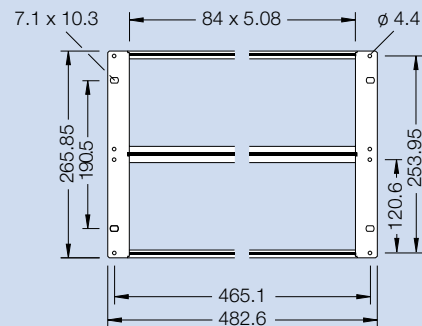
Technical data

Standards	IEC 60297, DIN 41 494, IEEE 1101.10, DIN EN 50 155 NF F 60-002, NF F 61-012, NF F 67-012
Width / horizontal pitch	84 usable HP / 5.08 mm (36 HP at SNCF)
Depth of the inserted board	160, 220, 280 mm (nom. depth)
Connector mounting	M 2.5 in increments of 5.08 mm for connectors, DIN 41 612, VG 95 324 and EC 60603-2
Materials	screws: steel contact springs: stainless steel or tin-plated other parts: aluminum
Finish	screws: galvanized und chromated other parts: chromated
Protection class	DIN 40 050 IP 20 (with cover plates) contact protection in accordance to VDE 0160
Utilization category	-25 °C, +70 °C, 75% relative humidity
Protective grounding	all metal parts are electrically bonded to one another following assembly in accordance with VDE 100 D 12.65, § 6 Nb.

Dimensions



Front of subrack 3 U



Front of subrack 6 U

■ Testing in accordance with DIN EN 50 155

The tests are passed if no damage or malfunctions are determined.
The tests are performed from 5 to 150 Hz with the assigned accelerations and amplitudes.

■ Tests in accordance with SNCF NF standards

The tests are passed if the maximum resonance sharpness of ca. 10 g is not exceeded in any axis.

Certification

Based on development and manufacture certified in accordance with DIN ISO 9001 this SNCF-tested subrack complies with the SNCF standards NF F 60-002 (testing standard), NF F 61-005 (dimensions standard), NF F 67-012 (test boards) and DIN EN 50 155.

In addition to being certified for railway applications the InterRail subrack is also approved for use with the French National Railways.

Test specimen

Subrack with dimensions H = 6 U, W = 84 HP, D = 220 mm

Test sequence

The following tests were performed in the 3 axes X, Y and Z on the subrack with the PCB configurations listed below:

- Determination of the critical resonance frequency
 - An endurance test at the resonance frequency
- The vibration excitation was performed between 7 and 70 Hz at a constant acceleration of 1 g in 12 cycles each lasting 10 minutes.

In total the subrack was vibrated for eight hours, 2 hours each with the following alternating board configuration:

- In the X-axis
21 x 420 g boards
- In the Z-axis
21 x 420 g boards
- In the Y-axis
21 x 240 g boards
- In the Z-axis
4 x 420 g boards plus a 6.22 kg cassette installed in the center.



Measurement results with non-stiffened boards

Excerpt from the results of the measurements in the Y-axis, measurement on the front profile rail:
Maximum resonance sharpness 10.8 g at 52.5 Hz.
Measurement at the rear on the side panel extension:
Maximum resonance sharpness 9.6 g at 52.5 Hz (see the measurement curve).

Measurement results with stiffened boards

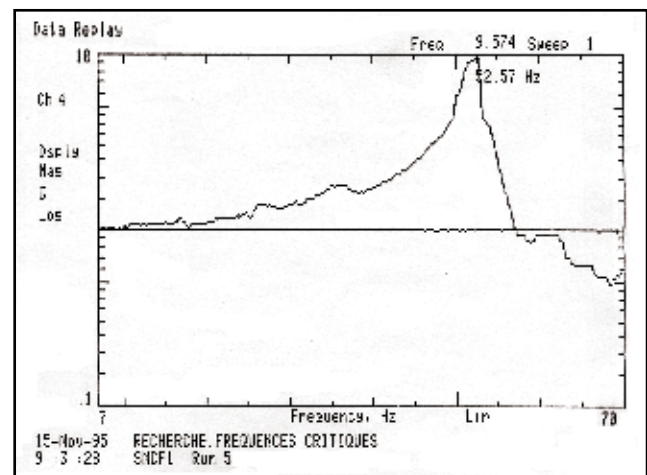
These measurements are not demanded by the testing standard but were nonetheless also performed.
Excerpt from the results of the measurement in the Y-axis, measured on the front profile rail:
Maximum resonance sharpness 7.6 g at 47.1 Hz.

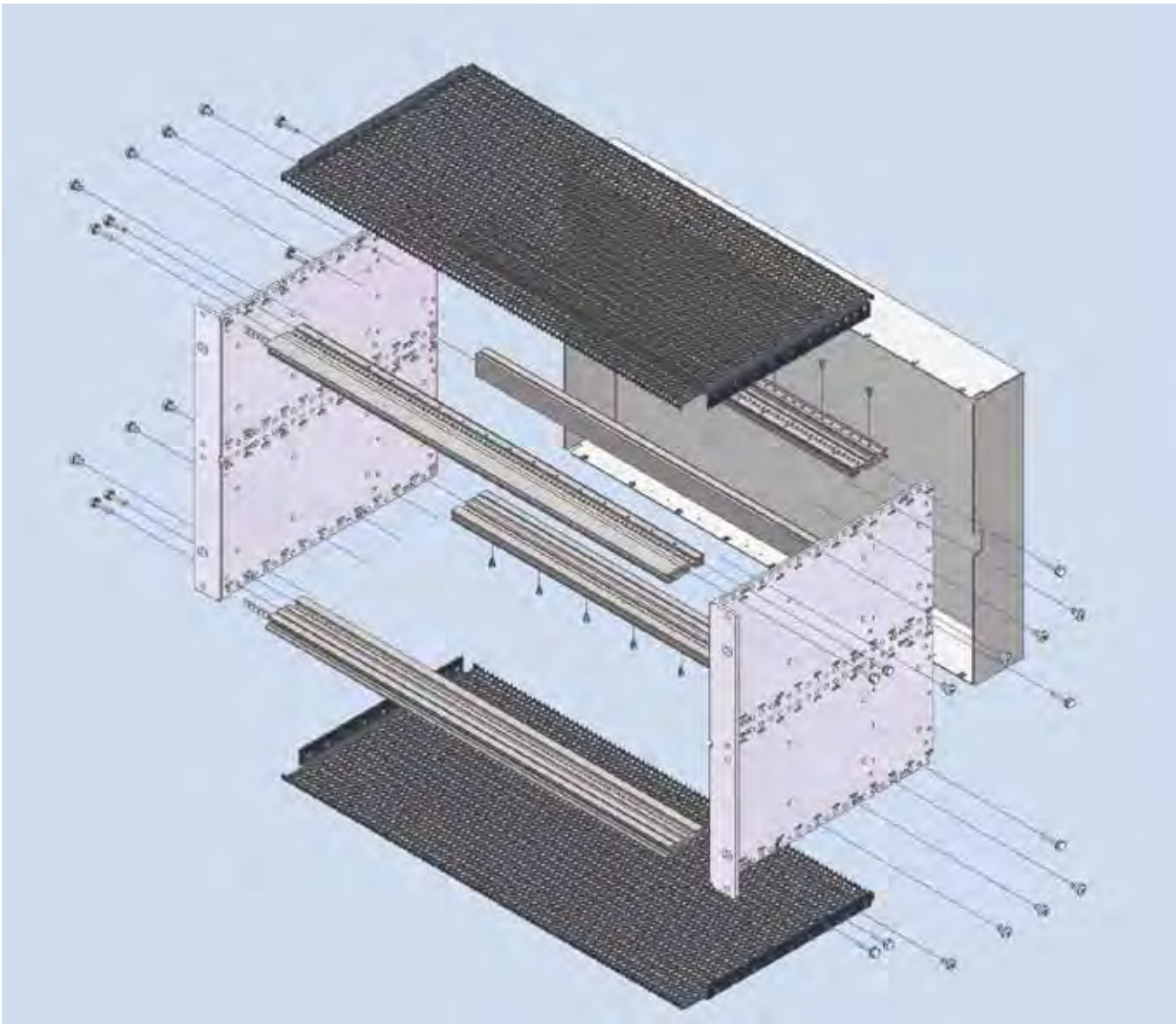
Measurement at the rear on the side panel extension:

Maximum resonance sharpness 6.5 g at 47.1 Hz.

Test result

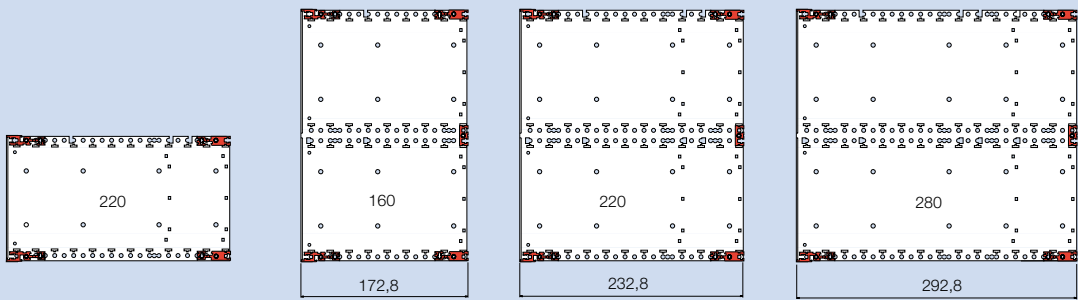
Following vibration for a total of 8 hours the test specimen showed no signs of damage.





Delivery example

	pieces
	6 U
Side panel	2
Cover	1
Threaded strip (front only)	2
Cover plates punched holes Ø 4 / 5.2x4 mm	2
RFI-spring A2 (cover plate/profile)	4
Mounting parts	1
Front profile	2
Rear profile	2
Inside profile	2
Center profile	1



Depth dimensions type alpha 3 U and 6 U

Subracks

Ordering details for kits

	nom. depth [mm]	type <i>alpha</i> order no. 409.
3 U - subrack		
<i>InterRail</i> - 84-3-160	160	162 610
<i>InterRail</i> - 84-3-220	220	162 611
<i>InterRail</i> - 84-3-280	280	162 612
6 U - subrack		
<i>InterRail</i> - 84-6-160	160	162 613
<i>InterRail</i> - 84-6-220	220	162 614

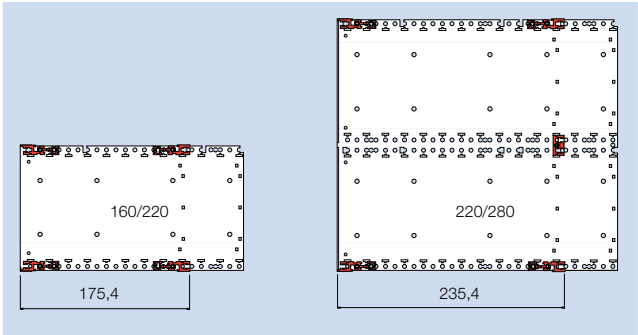
Delivery

	pieces per kit <i>alpha</i> 3 U	pieces per kit <i>alpha</i> 6 U
Side panel	2	2
Threaded strip (front only) For your custom subrack please order threaded strips separately.	2	2
Mounting parts kit	1	1
Front profile V12S-RFI-85	2	2
Rear profile H12S-85	2	2
Center profile M1S-85	-	1

Accessories

	order no. 409.
Threaded strip 84 x M 2.5	091 255
Insulating strip 84 HP	051 981

Further details and possibilities of other applications are in the chapter Subrack-Accessories.



Depth dimensions type delta 3 U and 6 U

Ordering details for kits

	PCB depth/ nom. depth [mm]	type <i>delta</i> order no. 409.
3 U - subrack		
<i>InterRail RFI-84-3-220</i>	160/220	162 730
<i>InterRail RFI-84-3-280</i>	220/280	162 731
6 U - subrack		
<i>InterRail RFI - 84-6-220</i>	160/220	162 732
<i>InterRail RFI - 84-6-280</i>	220/280	162 733

Delivery

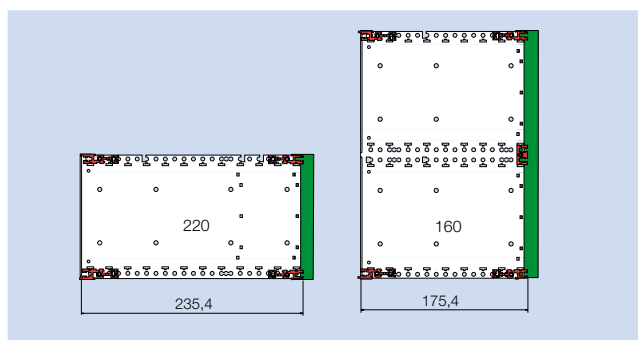
	pieces per kit <i>delta</i> 3 U	pieces per kit <i>delta</i> 6 U
Side panel with flange	2	2
Threaded strip (front only) For your custom subrack please order threaded strips separately.	2	2
Cover plates punched holes $\varnothing$ 4 / 5.2 x 4mm	2	2
RFI-spring A2 (cover plate/profile)	4	4
Mounting parts kit	1	1
Front profile V12S-RFI-85	2	2
Rear profile H22S-RFI-85	2	2
Center profile M2S-85	-	1

Accessories

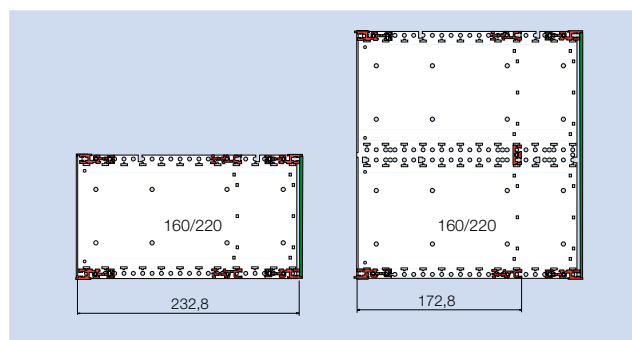
	order no. 409.
Threaded strip 84 x M 2.5	091 255
RFI-spring P2 - 84 (profile/front panel)	106 547
Shielding kit F1 3 U (side panel/front panel)	093 605
Shielding kit F1 6 U (side panel/front panel)	093 606
Shielding kit 3 U (side panel/backplane)	108 274
Shielding kit 6 U (side panel/backplane)	108 275

Further details and possibilities of other applications are in the chapter Subrack-Accessories.

Subrack *InterRail® RFI* with Rear Cover or for Front Panel in the Rear



Depth dimensions type delta 3 U and 6 U with cover



Depth dimensions type alpha 3 U and 6 U for front panel

Ordering details for kits

	nom. depth [mm]	type <i>delta</i> with cover order no. 409.	f. front panel PCB depth/ nom. depth [mm]	type <i>alpha</i> f. front panel order no. 409.
3 U - subrack				
<i>InterRail RFI</i> 84-3-160	160	162 734	-	-
<i>InterRail RFI</i> 84-3-220	220	162 735	160/220	162 738
6 U - subrack				
<i>InterRail RFI</i> 84-6-160	160	162 736	-	-
<i>InterRail RFI</i> 84-6-220	220	162 737	160/220	162 739

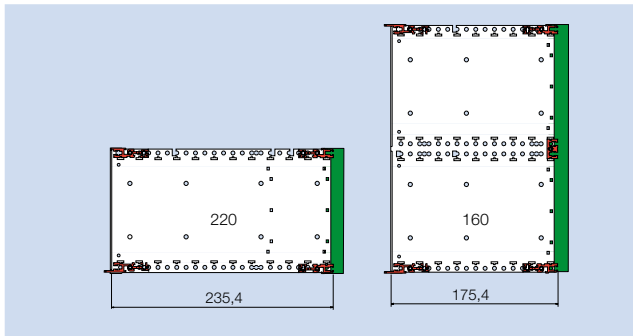
Delivery

	pieces per kit <i>alpha</i> 3 U	pieces per kit <i>alpha</i> 6 U	pieces per kit <i>delta</i> 3 U	pieces per kit <i>delta</i> 6 U
Side panel with flange	2	2	2	2
Threaded strip (front only)	2	2	2	2
For your custom subrack please order threaded strips separately.				
Cover plates punched holes $\varnothing 4 / 5.2 \times 4\text{mm}$	2	2	2	2
RFI-spring A2 (cover plate/profile)	4	4	4	4
Mounting parts kit	1	1	1	1
Cover	1	1	-	-
Front profile/rear V12S-85	2	2	4	4
Rear profile H22RFI-85 screw on cover	2	2	-	-
Center profile M2S-85	-	1	-	-
Rear profile H12S-85	-	-	2	2
Center profile M1S-85	-	-	-	1

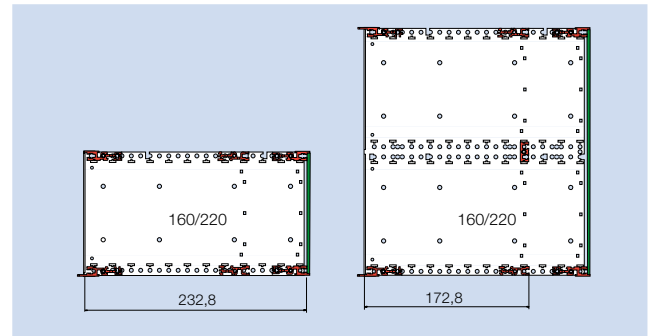
Accessories

	order no. 409.
Threaded strip 84 x M 2.5	091 255
Insulating strip 84 HP	051 981
RFI-spring P2 - 84 (profile/front panel)	106 547
Shielding kit F1 3 U (side panel/front panel)	093 605
Shielding kit F1 6 U (side panel/front panel)	093 606

Further details and possibilities of other applications are in the chapter Subrack-Accessories.



Depth dimensions IEEE type delta 3 U and 6 U with cover



Depth dimensions IEEE type alpha 3 U and 6 U for front panel

Ordering details for kits

	nom. depth [mm]	type <i>delta</i> with cover order no. 409.	f. front panel PCB depth/ nom. depth [mm]	type <i>alpha</i> f. front panel order no. 409.
3 U - subrack				
<i>InterRail RFI 84-3-160</i>	160	162 740	-	-
<i>InterRail RFI 84-3-220</i>	220	162 741	160/220	162 744
6 U - subrack				
<i>InterRail RFI 84-6-160</i>	160	162 742	-	-
<i>InterRail RFI 84-6-220</i>	220	162 743	160/220	162 745

Delivery

	pieces per kit <i>with cover</i> 3 U	pieces per kit <i>with cover</i> 6 U	pieces per kit <i>f. front panel</i> 3 U	pieces per kit <i>f. front panel</i> 6 U
Side panel with flange	2	2	2	2
Threaded strip (front only) For your custom subrack please order threaded strips separately.	2	2	2	2
Cover plates punched holes $\varnothing 4 / 5.2 \times 4\text{mm}$	2	2	2	2
RFI-spring A2 (cover plate/profile)	4	4	4	4
Mounting parts kit	1	1	1	1
Cover	1	1	-	-
Front profile V12-IEEE-85	1	2	1	2
Front profile/rear V12S-85	1	-	3	2
Rear profile H22-RFI f. Cover 85	2	2	-	-
Center profile M2S-85	-	1	-	-
Inside profile H12S-85	-	-	2	2
Center profile inside M1S-85	-	-	-	1

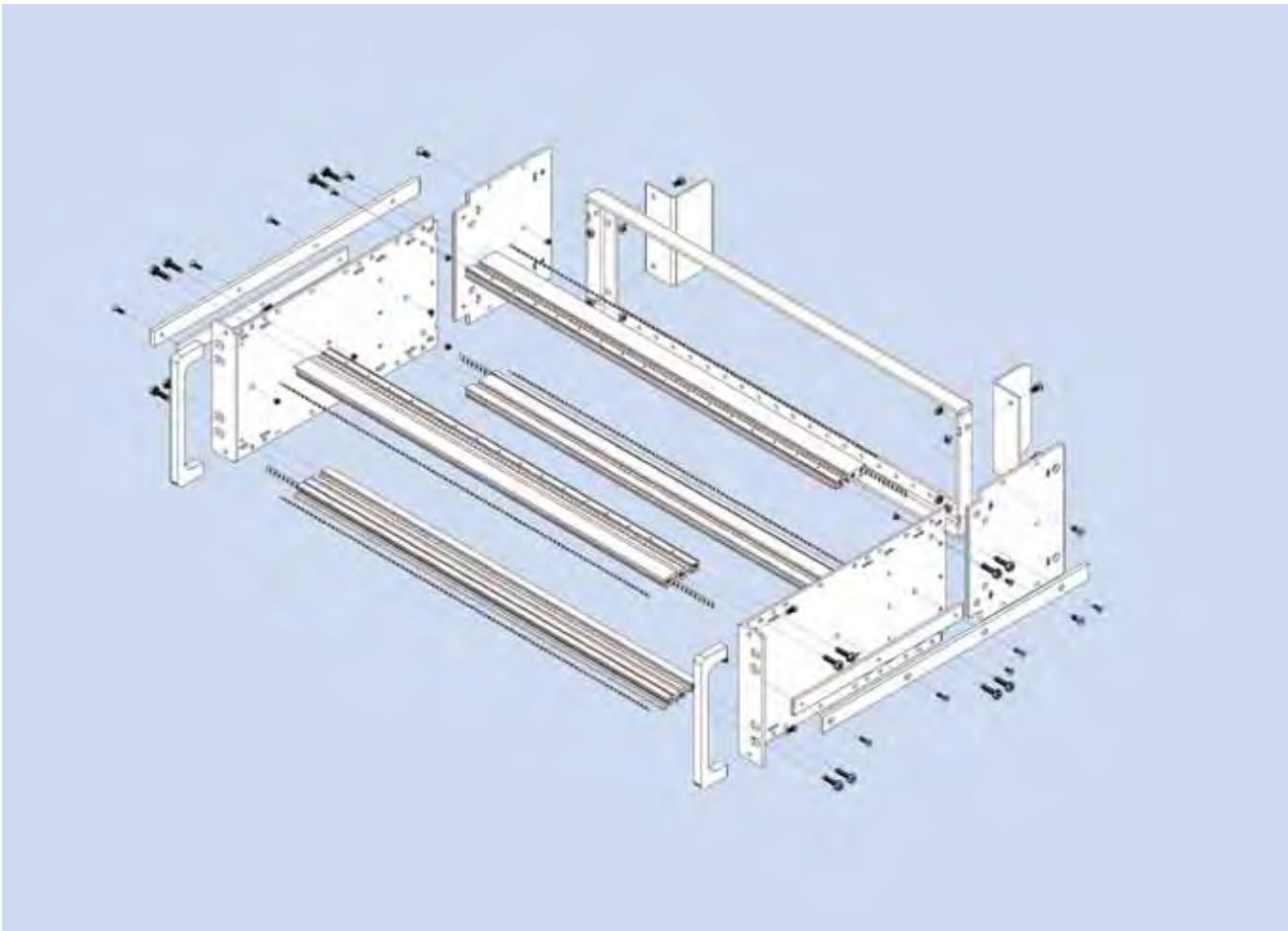
Accessories

	order no. 409.
Threaded strip 84 x M 2.5	091 255
Insulating strip 84 HP	051 981
RFI-spring P2 - 84 (profile/front panel)	106 547
Shielding kit F1 3 U (side panel/front panel)	093 605
Shielding kit F1 6 U (side panel/front panel)	093 606

Further details and possibilities of other applications are in the chapter Subrack-Accessories.

Subrack *InterRail*® - SNCF

Subracks



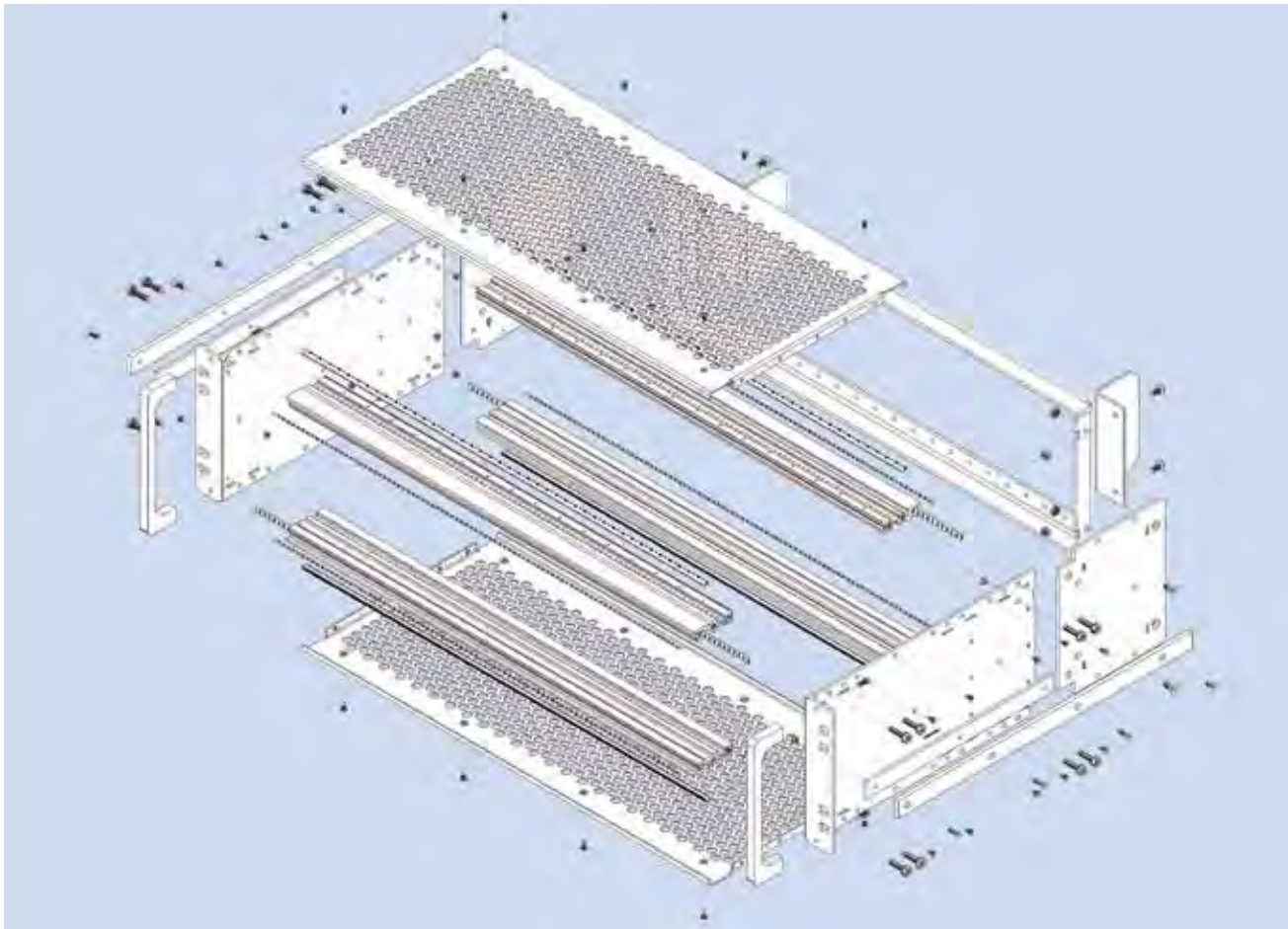
Delivery

	pieces per kit <i>alpha</i> 3 U	pieces per kit <i>alpha</i> 6 U
Side panel with flange	2	2
Side panel extender	2	2
Wiring frame	1	2
Wiring protection angle	2	4
Guide bar short	2	2
Guide bar long	2	2
Front profile V12S	2	2
Rear profile H12S	2	2
Center profile M1S	-	1
Handle	2	2
Label strip	4	4
Mounting parts kit	1	1
Threaded strip	4	6

Ordering details for kits

	nom. width/ nom. depth [mm]	type <i>alpha</i> order no. 409.
3 U - subrack		
<i>InterRail SNCF-36-3-220</i>	36 - 220	108 251
<i>InterRail SNCF-84-3-220</i>	84 - 220	108 250
6 U - subrack		
<i>InterRail SNCF-36-6-220</i>	36 - 220	107 716
<i>InterRail SNCF-84-6-220</i>	84 - 220	102 822

Further details and possibilities of other applications are in the chapter Subrack-Accessories.



Delivery

	pieces per kit <i>delta</i> 3 U	pieces per kit <i>delta</i> 6 U
Side panel with flange	2	2
Side panel extender	2	2
Wiring frame	1	2
Wiring protection angle	2	4
Guide bar short	2	2
Guide bar long	2	2
Front profile V12S	2	2
Rear profile H22S	2	2
Center profile M2S	-	1
Cover plates with punched holes ø 8 mm	2	2
RFI-springn A2 (cover plates/profile)	4	4
Handle	2	2
Label strip	4	4
Mounting parts kit	1	1
Threaded strip	4	6

Ordering details for kits

	nom. width/ nom. depth [mm]	type <i>delta</i> order no. 409.
3 U - subrack		
<i>InterRail SNCF RFI-36-3-220</i>	36 - 220	108 255
<i>InterRail SNCF RFI-84-3-220</i>	84 - 220	108 254
6 U - subrack		
<i>InterRail SNCF RFI-36-6-220</i>	36 - 220	108 253
<i>InterRail SNCF RFI-84-6-220</i>	84 - 220	108 252

Accessories

	order no. 409.
Card guide VIB 1.6-220 without nut	058 944
Screw M 3.2 x 12 for card guide SNCF	102 432
RFI-spring P2 - 84 (profile/front panel)	106 547
Shielding kit F1 3 U (side panel/front panel)	093 605
Shielding kit F1 6 U (side panel/front panel)	093 606

Further details and possibilities of other applications are in the chapter Subrack-Accessories.

System-Module CompactPCI



Description

The special design features of the CompactPCI system modules:

✓ The refined RFI-shielding concept enables high shielding effectiveness (see the RFI-SHIELDED chapter).

✓ The construction offers additional space for drives and hard disks.

✓ They are fitted with an ATX 300 W power supply unit with a wide-range input and PFC.

✓ CPCI backplane in accordance with specification 2.0 Rev. 3.0, with or without rear I/O

✓ Convection or active ventilation

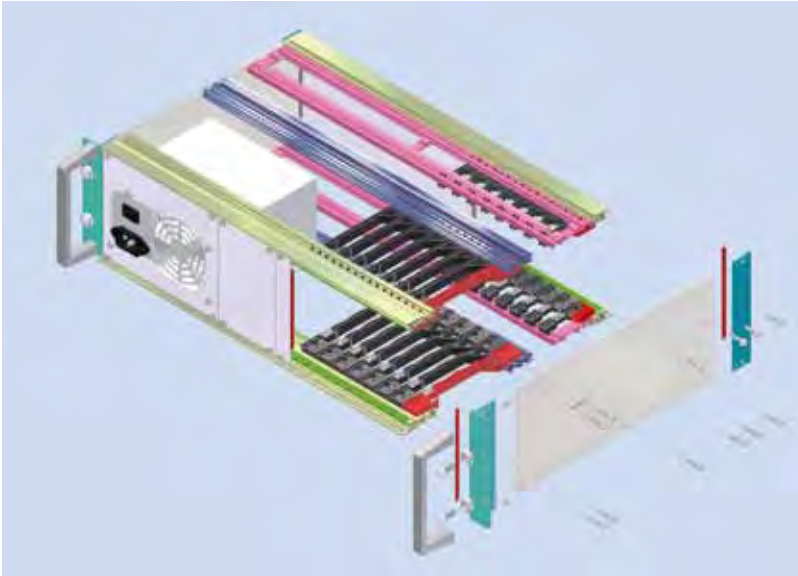
Delivery

The subrack is delivered assembled.

Other systems on request.

Technical data

Standards	compliant with DIN 41 494, IEC 60 297-3, IEEE 1101.10 IEC 61 076-4-101, CPCI Specification 2.0, Revision 3.0	
Width / horizontal pitch	84 usable HP/ 5.08 mm	
Depth of the inserted board	160 mm at the front, 80 mm at the rear	
Depth increment side panel	10 mm	
Materials	screws:	steel
	contact springs:	stainless steel
	card guide:	plastic
	other parts:	aluminum
Finish	screws:	galvanized und chromated
	side panels and cover plates:	blank (seawater resistance)
	other parts:	chromated
Protection class	DIN 40 050 IP 20 (with cover plates) contact protection in accordance with VDE 0160	
Utilization category	-25 °C, +70 °C, 75% relative humidity	
Protective grounding	all metal parts are electrically bonded to one another following assembly in accordance with VDE 100 D 12.65, § 6 Nb.	



Consists of:

- 1 Subrack *RFI-SHIELDED CPCI / REAR I/O* 84 HP,
260 mm nom. depth
(160 mm at the front, 80 mm at the rear)
- 1 Backplane 8 Slot, 3 U, 32 Bit, system slot right
- 1 ATX 300W power supply unit with a wide-range input
and PFC, with assembled front panel.
- 1 Blind front panel 16 HP at the front.
- 1 Blind front panel 4 HP at the front.
- 1 Blind front panel 48 HP at the rear.
- 1 Blind front panel 8 HP at the rear.
- 1 Pair of card guides red 160 mm (CPU)
including IEEE-coding and ESD-spring in the bottom card guide.
- 1 Pair of card guides red 80 mm (CPU)
including IEEE-coding and
- 7 Pair of card guides black 160 mm (CPU)
including IEEE-coding and ESD-spring in the bottom card guide.
- 7 Pair of card guides black 80 mm (CPU)
including IEEE-coding and ESD-spring in the bottom card guide.

System-Module CompactPCI- 3 U-Rear I/O and 6 U-Rear I/O



System-Module CompactPCI-3 U-Rear I/O

order no.: 409. 122 295

Consists of:

- 1 Subrack *RFI-SHIELDED CPCI / REAR I/O*
84 HP, 260 mm nom. depth
(160 mm at the front, 80 mm at the rear)
- 1 Backplane 8 Slot, 3 U, 32 Bit, system slot right
- 1 ATX 300W power supply unit with a wide-range
input and PFC, with assembled front panel.
- 1 Blind front panel 16 HP at the front.
- 1 Blind front panel 4 HP at the front.
- 1 Blind front panel 48 HP at the rear.
- 1 Blind front panel 8 HP at the rear.
- 1 Pair of card guides red 160 mm (CPU)
including IEEE-coding and
ESD-spring in the bottom card guide.
- 1 Pair of card guides red 160 mm (CPU)
including IEEE-coding and
ESD-spring in the bottom card guide.
- 7 Pair of card guides black 160 mm (CPU)
including IEEE-coding and
ESD-spring in the bottom card guide.
- 7 Pair of card guides black 80 mm (CPU)
including IEEE-coding and
ESD-spring in the bottom card guide.



System-Module CompactPCI-6 U-Rear I/O

order no.: 409. 122 297

Consists of:

- 1 Subrack *RFI-SHIELDED CPCI / REAR I/O*
84 HP, 260 mm nom. depth
(160 mm at the front, 80 mm at the rear)
- 1 Backplane 8 Slot, 6 U, 64 Bit, system slot right
- 1 ATX 300W power supply unit with a wide-range
input and PFC, with assembled front panel.
(optional front panel for a drive over the power supply).
- 1 Blind front panel 16 HP at the front.
- 1 Blind front panel 4 HP at the front.
- 1 Blind front panel 48 HP at the rear.
- 1 Blind front panel 8 HP at the rear.
- 1 Pair of card guides red 160 mm (CPU)
including IEEE-coding and
ESD-spring in the bottom card guide.
- 1 Pair of card guides red 80 mm (CPU)
including IEEE-coding and
ESD-spring in the bottom card guide.
- 7 Pair of card guides black 160 mm (CPU)
including IEEE-coding and
ESD-spring in the bottom card guide.
- 7 Pair of card guides black 80 mm (CPU)
including IEEE-coding and
ESD-spring in the bottom card guide.

System-Module CompactPCI - 6+3 U-Rear I/O and 4 U-Rear I/O



System-Module CompactPCI-6+1U-Rear I/O

order no.: **409. 122 301**

Consists of:

- 1 subrack *RFI-SHIELDED CPCI / REAR I/O*
84 HP, 260 mm nom. depth
(160 mm at the front, 80 mm at the rear)
- 1 Backplane 8 Slot, 6U, 64 Bit, system slot right
- 1 ATX 300W power supply unit with a wide-range
input and PFC, with assembled front panel.
(optional front panel for a drive over the power supply).
- 1 Blind front panel 16 HP at the front.
- 1 Blind front panel 4 HP at the front.
- 1 Blind front panel 48 HP at the rear.
- 1 Blind front panel 8 HP at the rear.
- 1 Fan drawer with integrated fan.
- 1 Pair of card guides red 160 mm (CPU)
including IEEE-coding and ESD-spring
in the bottom card guide.
- 1 Pair of card guides red 80 mm (CPU)
including IEEE-coding and
ESD-spring in the bottom card guide.
- 7 Pair of card guides black 160 mm (CPU)
including IEEE-coding and ESD-spring
in the bottom card guide.
- 7 Pair of card guides black 80 mm (CPU)
including IEEE-coding and ESD-spring
in the bottom card guide.



System-Module CompactPCI-4U-Rear I/O

order no.: **409. 122 300**

Consists of:

- 1 subrack *RFI-SHIELDED CPCI / REAR I/O*
84 HP, 260 mm nom. depth
(160 mm at the front, 80 mm at the rear)
for horizontal embedded 6 U PCB's
- 1 Backplane 4 Slot, 6U, 64 Bit, system slot right
(1 Slot free e. g. for hard disk or driver)
- 2 Front panels 6U - 4 HP (1 at the front, 1 at the rear)
- 1 ATX 300W power supply unit with a wide-range
input and PFC, with integrated 32 HP Front panel
at the front.
- 1 Fan
- 1 Pair of card guides red 160 mm (CPU)
including IEEE-coding
and ESD-spring in the bottom card guide.
- 1 Pair of card guides red 80 mm (CPU)
including IEEE-coding and
ESD-spring in the bottom card guide.
- 4 Pair of card guides black 160 mm (CPU)
including IEEE-coding and
ESD-spring in the bottom card guide.
- 4 Pair of card guides black 80 mm (CPU)
including IEEE-coding and
ESD-spring in the bottom card guide.

System-Module Configuration

Configuration System-Module CompactPCI

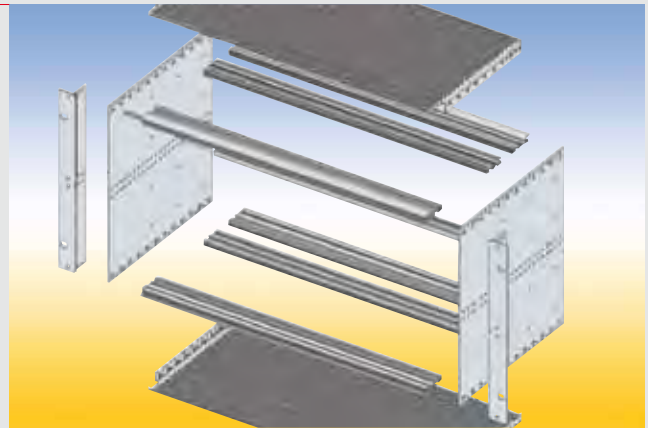
☐ Housing ☐ Subrack	pieces _____ pieces _____		
Dimensions	height: ☐ 3 U width: ☐ 84 HP depth: ☐ 260 mm	☐ 6 U ☐ 42 HP	☐ other _____ U ☐ other _____ HP ☐ other _____ mm
Backplane	☐ CPU number of slots _____ ☐ J1 VME number of slots _____ ☐ J1/J2 Monolithic VME number of slots _____ ☐ VME64x number of slots _____ Rear I/O: ☐ 80 mm ☐ other _____ mm ☐ CPCI number of slots _____ System slot: ☐ right ☐ left Width system slot: ☐ 4 HP ☐ 8 HP Rear I/O : ☐ 80 mm ☐ other _____ mm		
Mounting position PCB	☐ horizontal ☐ vertical		
Depth of the PCB	☐ 160 mm ☐ other _____ mm		
Power supply / PSU	☐ AC / DC ☐ DC / DC ☐ ATX ☐ 300 Watt ☐ 400 Watt ☐ 19" ☐ 300 Watt ☐ 400 Watt ☐ other Watt _____ ☐ active ventilation of the system		
Accessories	☐ Harddisc ☐ CD-ROM ☐ Keypad		
Notes	_____ _____ _____ _____		

Please ask your local representative for your
individual system-module-configuration.
 You find your contact person on our homepage:
www.intermas-el.com

Subrack Accessories

Single Parts

- ✓ Side Panels
- ✓ Flanges
- ✓ Closing Profiles
- ✓ Handle
- ✓ Side Panel Extender
- ✓ Side Panel Connector
- ✓ Horizontal Rails
- ✓ Cover Plates
- ✓ Rear Covers



Configurations

- ✓ Subrack Divider
- ✓ Partition Wall
- ✓ Labelling Rail, Locking Rail, Label Strip
- ✓ Threaded Strips
- ✓ Z-Rail A, Mounting Rail B
- ✓ Card Guide and Accessories

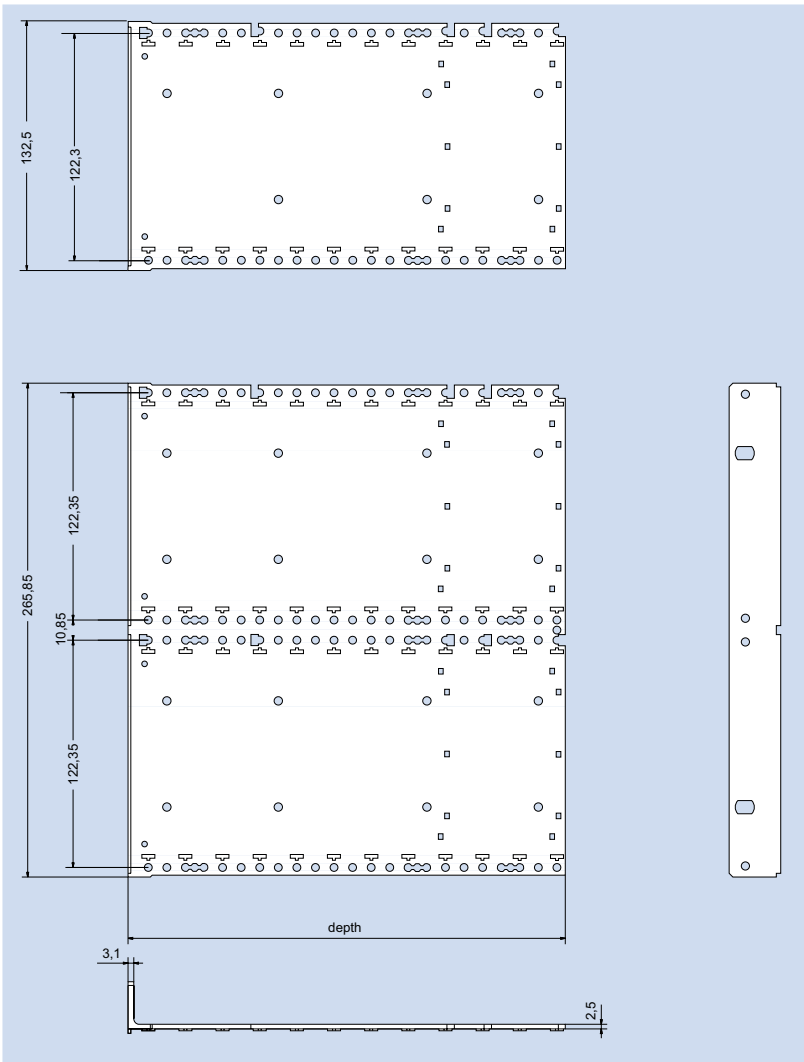


Front Panels and Handles

- ✓ Blind Front Panels
- ✓ Front Panels with Handle
- ✓ Front Panels with Ejector Handle
- ✓ Front Panels with IEEE-Handle
- ✓ Plastic Front Panels



Side Panel Fi



for subrack *FLEXIBLE Fi* and *InterRail*
(not for *InterRail SNCF*)

Side Panel Fi (flange integrated)
The side panel and the flange are extruded in one piece.

Material: aluminum, extruded
Finish: colorless anodized
or colorless chromated

Ordering details

	nom. height [U]	nom. depth [mm]	depth [mm]	anodized order no. 409.	chromated order no. 409.
Side panel Fi - 3 - 160	3	160	175.4	085 001	110 248
Side panel Fi - 3 - 220	3	220	235.4	085 002	110 234
Side panel Fi - 3 - 280	3	280	295.4	085 003	110 249
Side panel Fi - 6 - 160	6	160	175.4	085 095	110 201
Side panel Fi - 6 - 220	6	220	235.4	085 096	110 238
Side panel Fi - 6 - 280	6	280	295.4	085 097	110 202

Accessories

Hexagonal cupped point head screw M 4 x 16, Torx T 20

For assembly of the side panel to the horizontal rails.

Minimumm order quantity 100 pieces

order no.: 409. 052 156

Self tapping hexagonal cupped point head screw M 4 x 16, Torx T 20

For assembly of the side panel to the horizontal rails for subrack InterRail.

Minimumm order quantity 100 pieces

order no.: 409. 078 693

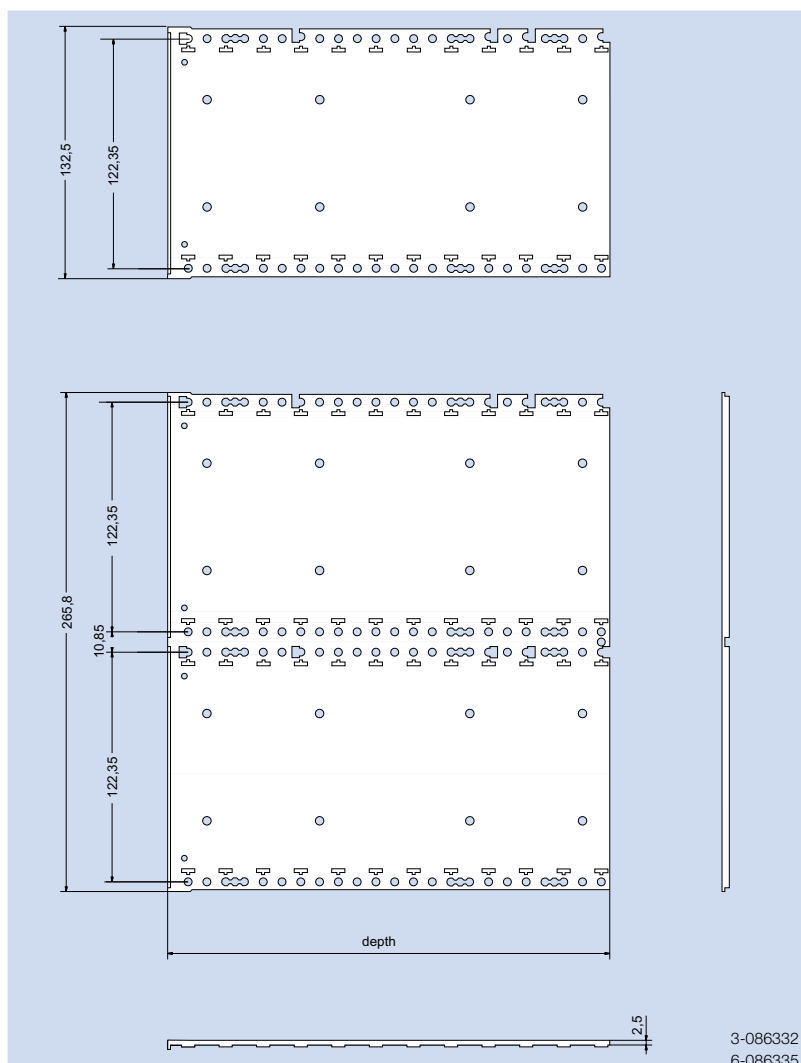
Side Panel Fs

for subrack *FLEXIBLE Fs*

Side Panel Fs (flange separate)

Material: aluminum, extruded

Finish: colorless chromated



Ordering details

	nom. height [U]	nom. depth [mm]	depth [mm]	order no. 409.
Side panel Fs - 3 - 160	3	160	174.2	106 750
Side panel Fs - 3 - 220	3	220	234.2	086 333
Side panel Fs - 3 - 280	3	280	294.2	086 334
Side panel Fs - 6 - 160	6	160	174.2	097 286
Side panel Fs - 6 - 220	6	220	234.2	086 336
Side panel Fs - 6 - 280	6	280	294.2	086 337

Accessories

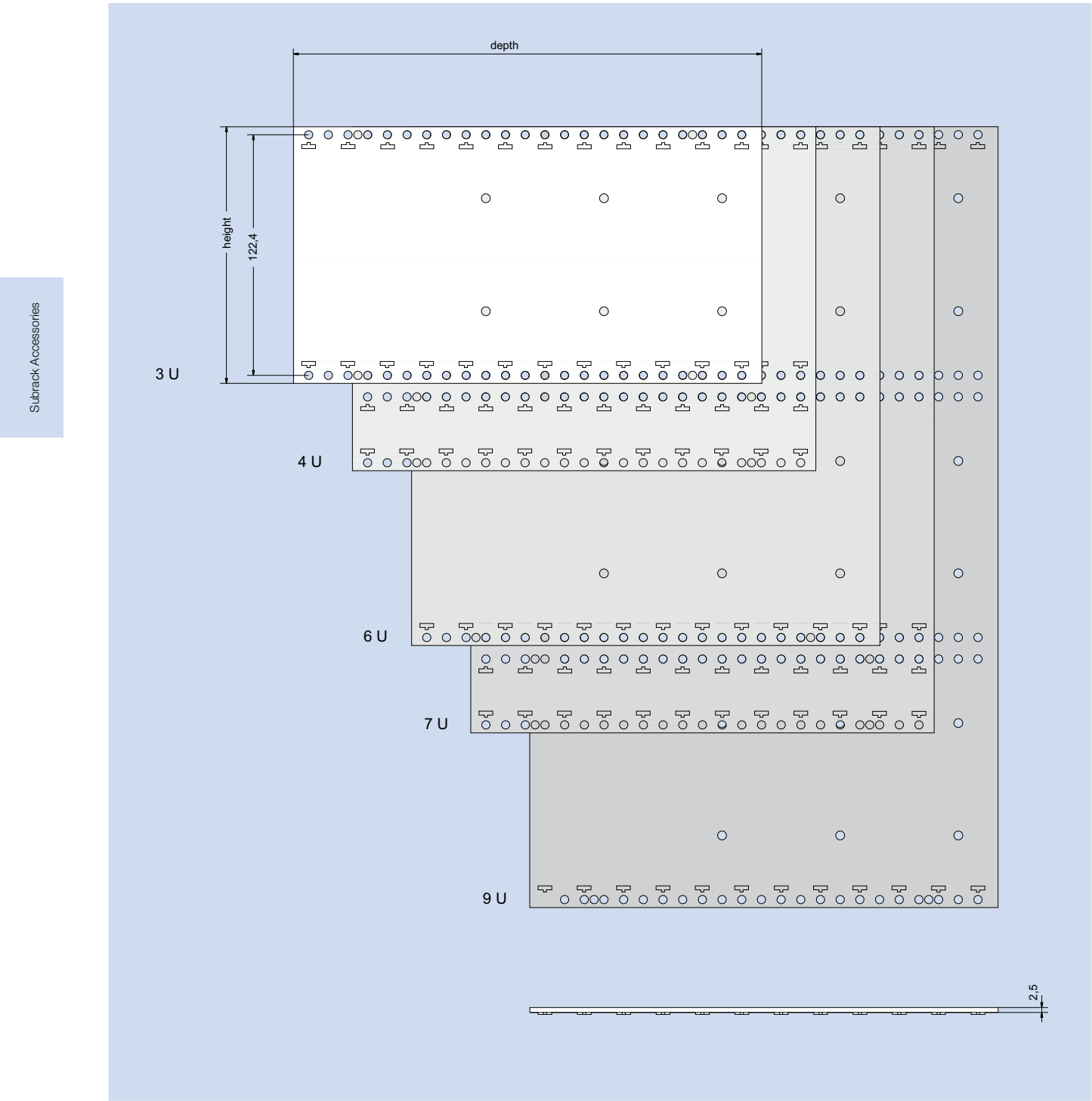
Hexagonal cupped point head screw M 4 x 16, Torx T 20

For assembly of the side panel to the horizontal rails.

Minimum order quantity 100 pieces

order no.: 409. 052 156

Side Panel RFI without Flange



Side Panel RFI without Flange

for subrack **RFI-SHIELDED**

Side Panel RFI without flange

Material: aluminum, 2.5 mm thick

Finish: blank, seawater resistant

Ordering details

	nom. height [U]	height [mm]	nom. depth [mm]	depth [mm]	order no. 409.
Side panel RFI - 3 - 160	3	130.50	160	177.9	114 240
Side panel RFI - 3 - 220	3	130.50	220	237.9	114 241
Side panel RFI - 3 - 240	3	130.50	240	257.9	161 173
Side panel RFI - 3 - 260	3	130.50	260	277.9	161 174
Side panel RFI - 3 - 280	3	130.50	280	297.9	114 242
Side panel RFI - 3 - 340	3	130.50	340	357.9	114 243
Side panel RFI - 4 - 280	4	174.95	280	297.9	112 872
Side panel RFI - 4 - 460	4	174.95	460	477.9	112 876
Side panel RFI - 6 - 160	6	263.85	160	177.9	114 758
Side panel RFI - 6 - 220	6	263.85	220	237.9	114 759
Side panel RFI - 6 - 240	6	263.85	240	257.9	161 188
Side panel RFI - 6 - 260	6	263.85	260	277.9	161 189
Side panel RFI - 6 - 280	6	263.85	280	297.9	114 760
Side panel RFI - 6 - 340	6	263.85	340	357.9	114 762
Side panel RFI - 6 - 460	6	263.85	460	477.9	114 766
Side panel RFI - 7 - 240	7	308.30	240	257.9	161 193
Side panel RFI - 9 - 220	9	397.20	220	237.9	161 155
Side panel RFI - 9 - 280	9	397.20	280	297.9	161 156
Side panel RFI - 9 - 340	9	397.20	340	357.9	161 157
Side panel RFI - 9 - 460	9	397.20	460	477.9	161 160

Accessories

	order no. 409.
For assembly of the side panel to the profiled rail. Minimum order quantity 100 pieces	
Hexagon cupped point head screw M 4 x 16 Torx T 20	052 156
For assembly of the middle profiled rail by using an outside fixed cover plate. Minimum order quantity 10 pieces	
Hexagon head screw M 4 x 12 (flat head)	026 068

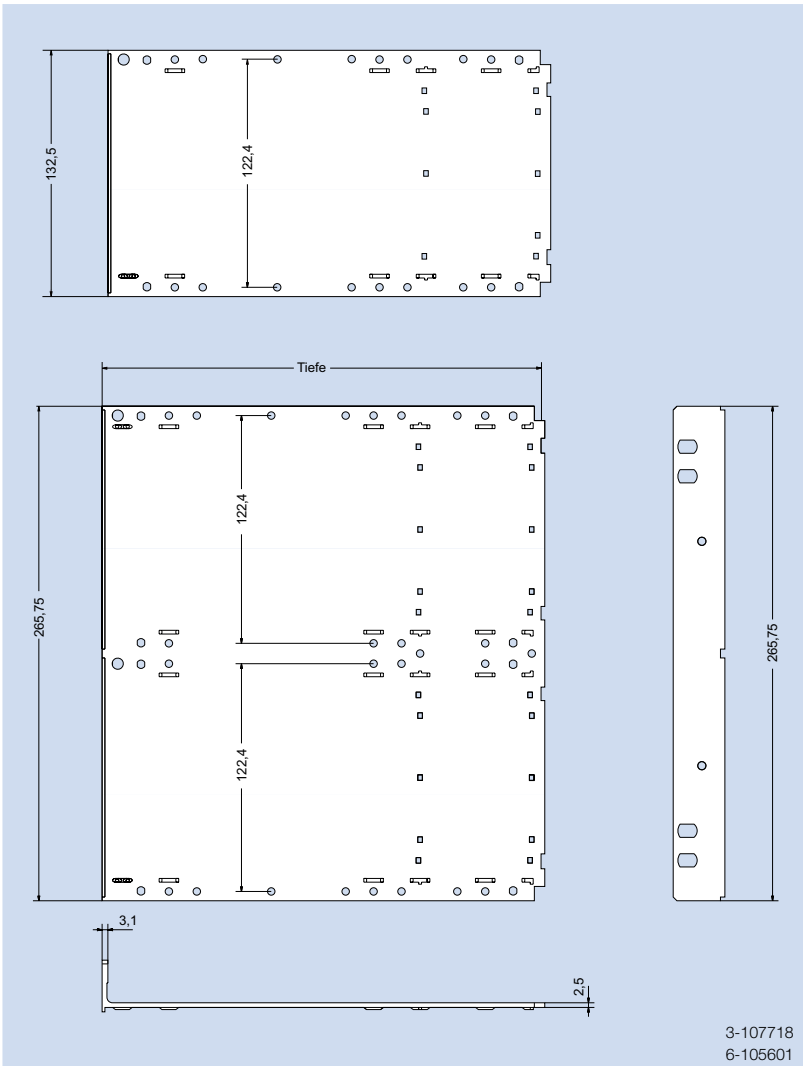
Side Panel *InterRail*® SNCF

for subrack *InterRail* SNCF

Side Panel *InterRail* SNCF

Material: aluminum, extruded
Finish: colorless chromated

Subrack Accessories



Ordering details

	nom. height [U]	nom. depth [mm]	depth [mm]	order no. 409.
Side panel <i>InterRail</i> - SNCF - 3 - 220	3	220	237.9	107 719
Side panel <i>InterRail</i> - SNCF - 6 - 220	6	220	237.9	105 602

Accessories

Self tapping hexagonal cupped point head screw M 4 x 16, Torx T 20

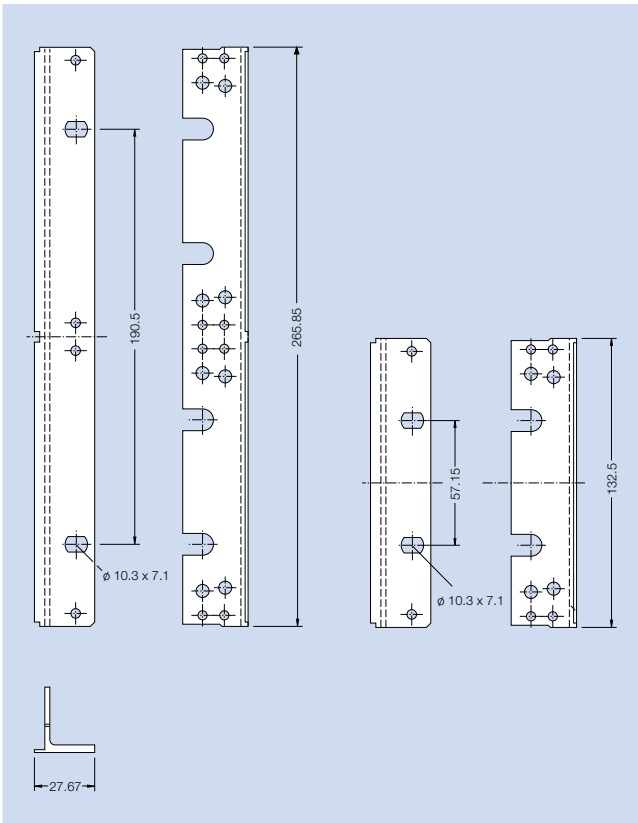
For assembly of the side panel to the horizontal rails.

Minimum order quantity 100 pieces

order no.: 409. 087 639

Flange F

Flange without Nose



for subrack *FLEXIBLE Fs*

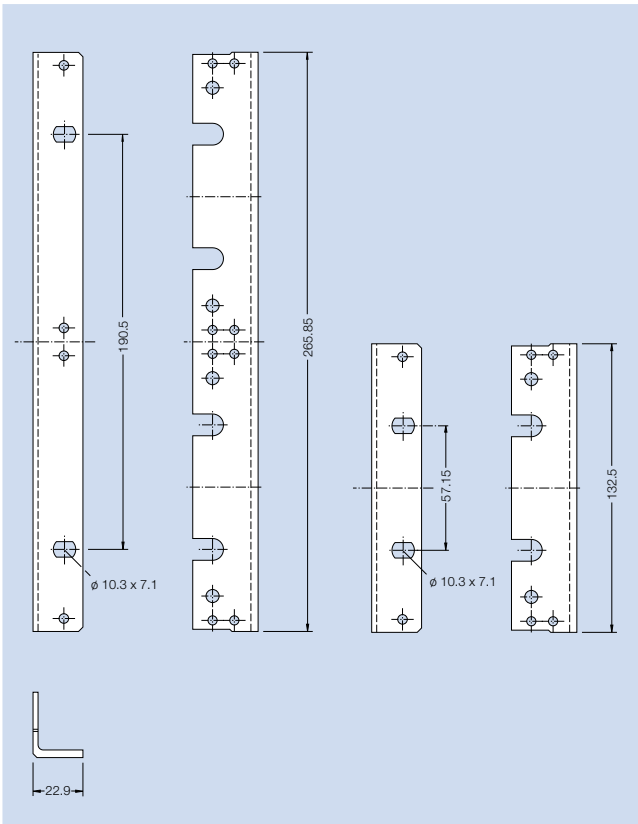
Flange F

The flange can be mounted to the side panel by means of the mounting screws for the horizontal rails.

Material: aluminum, extruded
Finish: anodized

Ordering details

	order no. 409.
Flange F - 3 U	086 787
Flange F - 6 U	086 791



Flange without Nose

This flange can be mounted at various depth on the side panel grid.

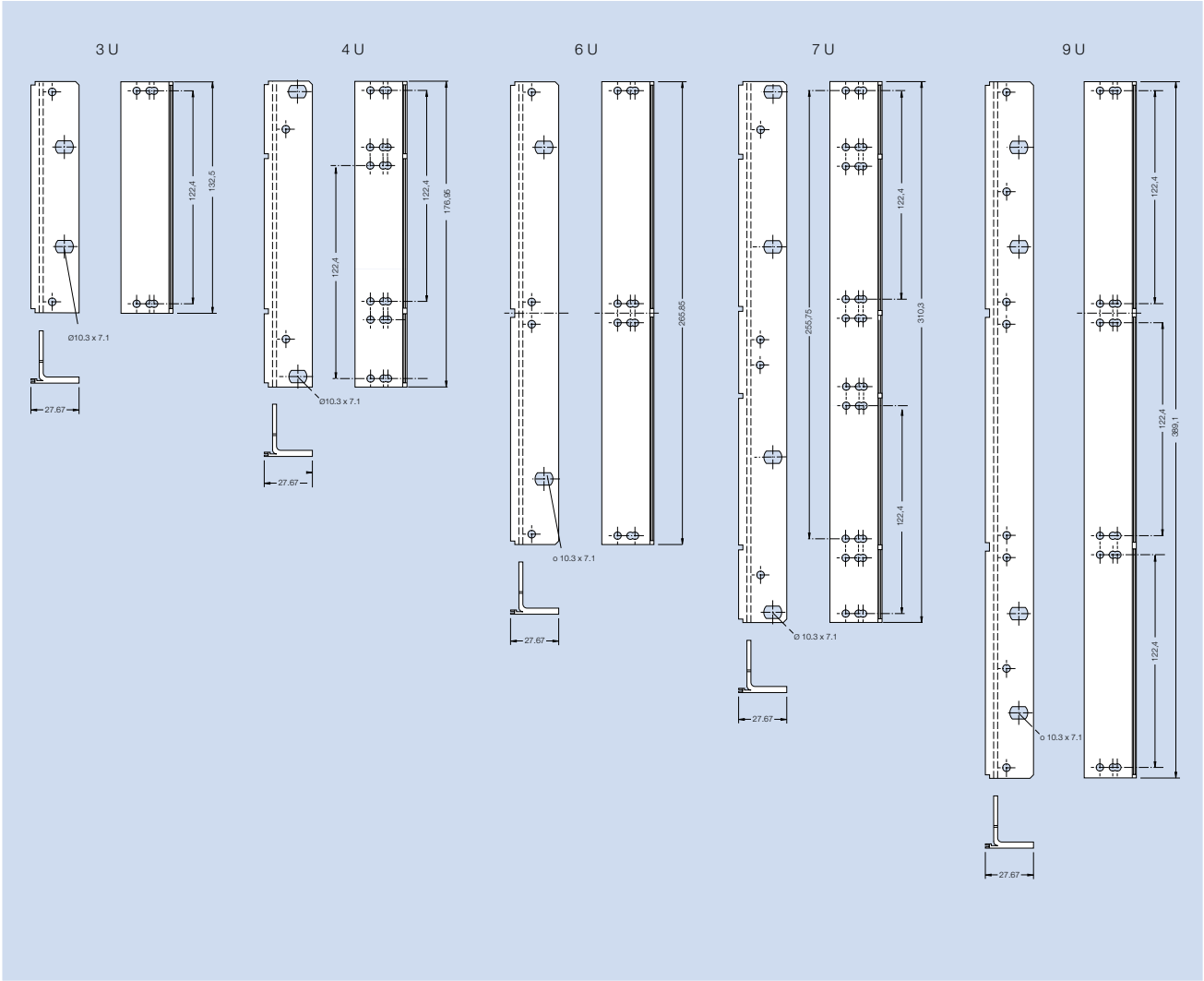
Material: aluminum, extruded
Finish: anodized

Ordering details

	order no. 409.
Flange without nose - 3 U	087 802
Flange without nose - 6 U	087 824

Flange RFI

Subrack Accessories



for subrack *RFI-SHIELDED*

Flange RFI

The flange can be mounted to the side panel by means of the mounting screws for the horizontal rails. With slits in the side edges for insertion of RFI springs.

Material: aluminum, extruded
Finish: colorless chromated

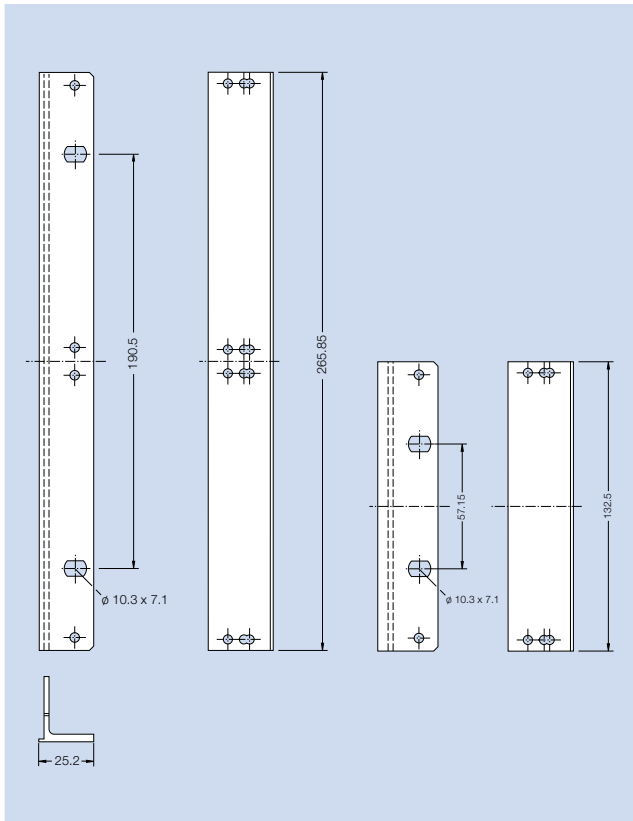
Ordering details

	nom. height [U]	order no. 409.
Flange RFI - 3	3	112 202
Flange RFI - 4	4	114 612
Flange RFI - 6	6	112 205
Flange RFI - 7	7	114 618
Flange RFI - 9	9	112 234

Accessories

	order no. 409.
RFI-spring F3 - 2 U	112 386
RFI-spring F3 - 3 U	111 636
RFI-spring F3 - 4 U	112 387
RFI-spring F3 - 6 U	111 637

Flange RFI - FP, Flange for Wall Mounting



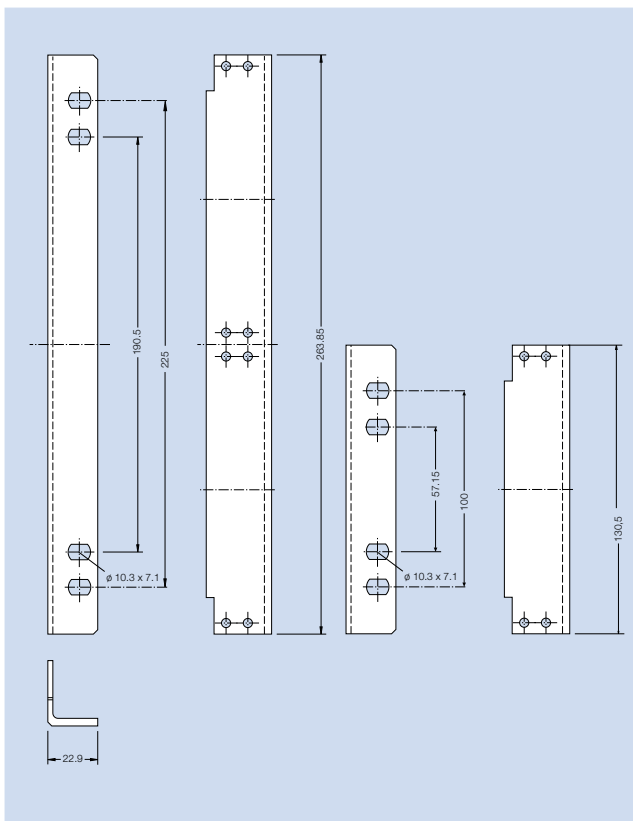
Flange RFI - FP

This flange is suitable for mounting of a continuous front panel of 85 HP and a hinged front panel of 85 HP in a subrack. The flange will be mounted to the side panel by means of the mounting screws for the horizontal rails.

Material: aluminum, extruded
Finish: colorless chromated

Ordering details

	order no. 409.
Flange RFI - FP - 3 U	114 708
Flange RFI - FP - 6 U	114 715



Flange for Wall Mounting

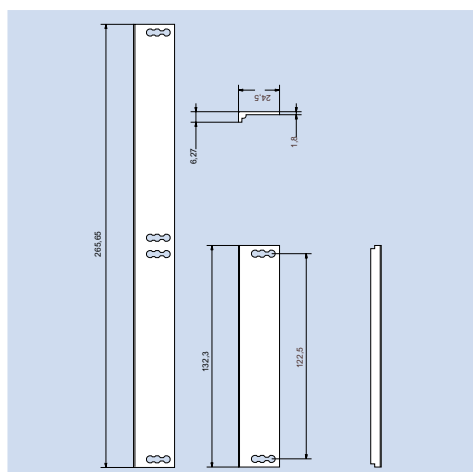
For mounting of a subrack on a wall.

Material: aluminum
Finish: blank, seawater resistant

Ordering details

	order no. 409.
Flange for wall mounting - 3 U	161 110
Flange for wall mounting - 6 U	161 113

Closing Profiles F and RFI - F3, Handle



Closing Profile F

For covering the slit between front panel and side panel.

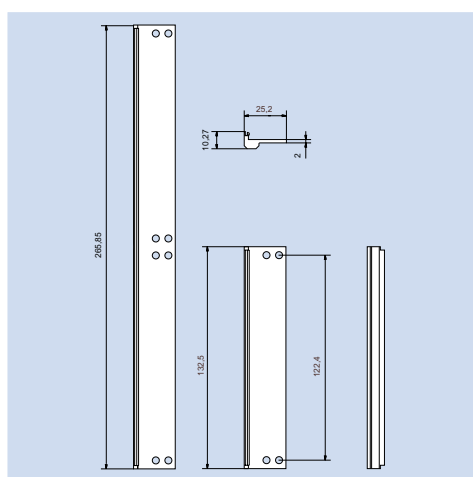
The closing profile will be mounted to the side panel by means of the mounting screws for the horizontal rails.

Material: aluminum, extruded

Finish: anodized

Ordering details

	order no. 409.
Closing profile F - 3 U	085 695
Closing profile F - 6 U	085 696



Closing Profile RFI - F3

For covering the slit between front panel and side panel.

The closing profile will be mounted to the side panel by means of the mounting screws for the horizontal rails.

With slits for insertion of RFI-springs.

Material: aluminum, extruded

Finish: colorless chromated

Ordering details

	order no. 409.
Closing profile RFI - F3 - 3 U	122 131
Closing profile RFI - F3 - 6 U	118 374

Accessories

	order no. 409.
RFI-spring F3 - 3 U	111 636
RFI-spring F3 - 6 U	111 637



Handle

Material: aluminum

Finish: anodized

Ordering details

	order no. 409.
Handle -3 U	040 419
Handle -6 U	040 420

Accessories

Counter sunk screw M4 x 10, Torx

Minimum order quantity 100 pieces

order no.: **409. 105 789**



Mounting parts for fastening a subrack into a housing

Screw retractor M6

Color: black

Material: POM

Minimum order quantity 10 pieces

order no.: **409. 074 387**

Oval head screw

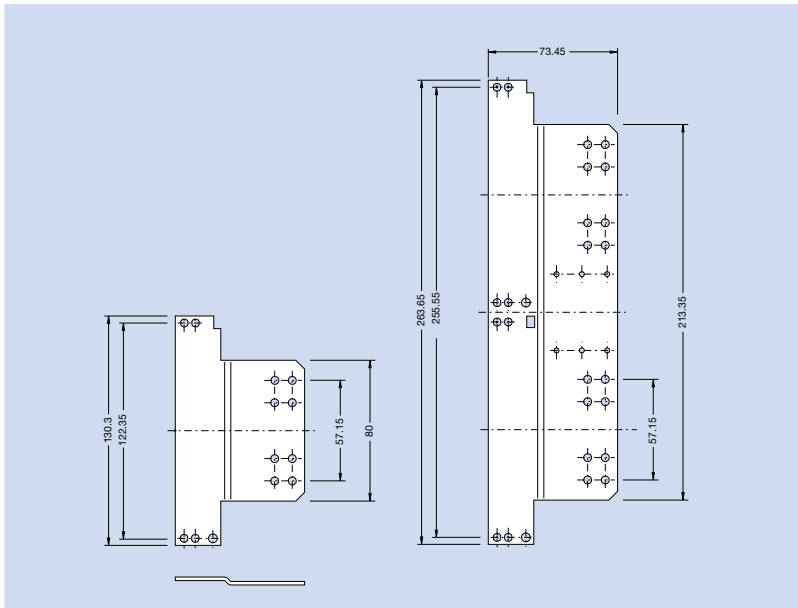
M6 x 16 DIN 7985

steel, nickel plated

Minimum order quantity 10 pieces

order no.: **409. 013 919**

Side Panel Extender, Side Panel Connector



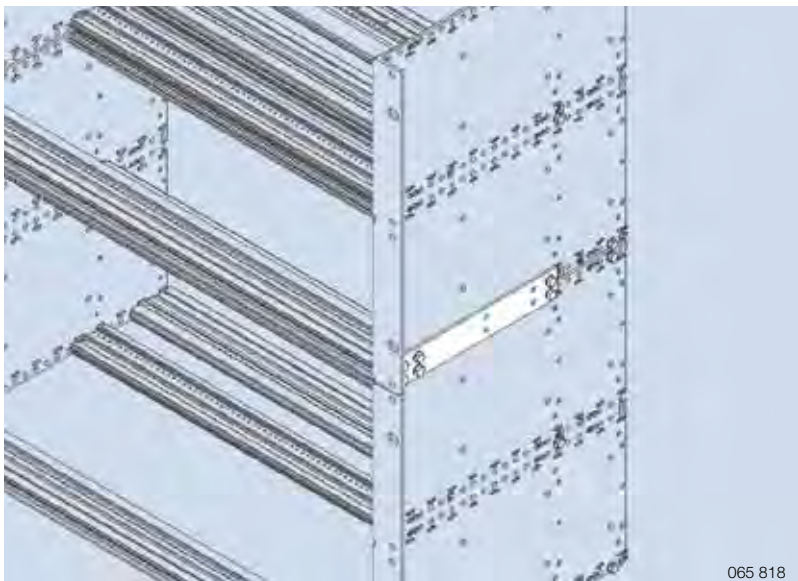
Side Panel Extender

Elongate a side panel about 60 mm to obtain a larger cabling space. The side panel extender is mounted to the side panel by means of the mounting screws for the horizontal rails.

Material: aluminum, 2 mm thick
Finish: colorless chromated

Ordering details

	order no. 409.
Side panel extender 3 U	087 820
Side panel extender 6 U	087 821



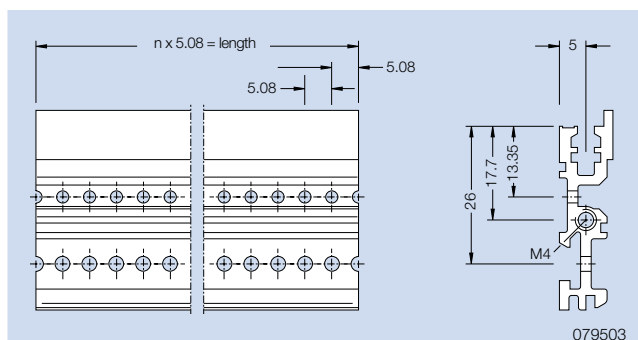
Side Panel Connector

Join two subracks, one above the other. The side panel connector is mounted to the side panels by means of the mounting screws for the horizontal rails. (nom. depth 160 mm).

Material: aluminum, 2 mm thick
Finish: blank

order no.: **409. 065 819**

Horizontal Rails



for subrack *FLEXIBLE Fi*

Front Profile VE1

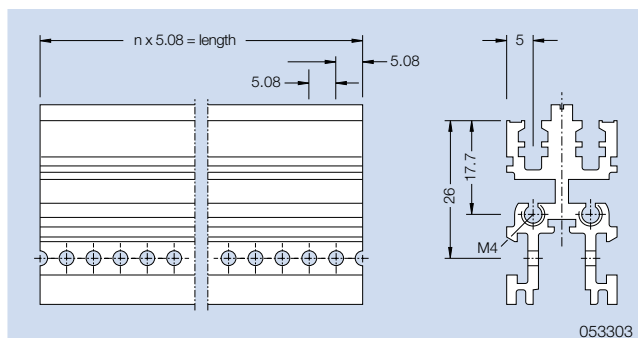
(also rear profile by using of a front panel on the rear).

Material: aluminum

Finish: anodized

Ordering details

	nom. width [HP]	length [mm]	order no.
Front profile VE1	21	106.68	079 521
Front profile VE1	43	218.44	079 543
Front profile VE1	85	431.80	079 585



for subrack *FLEXIBLE, RFI-SHIELDED and InterRail*

Front Profile 2xVE1

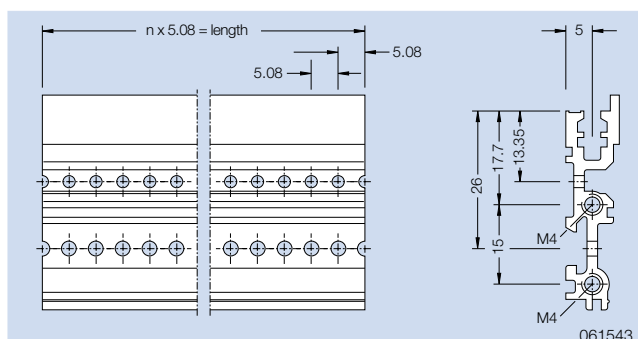
For partition e. g. 6 U subracks into two fields of 3 U.

Material: aluminum

Finish: colorless chromated

Ordering details

	nom. width [HP]	length [mm]	order no.
Front profile 2xVE1	21	106.68	053 321
Front profile 2xVE1	29	147.32	053 329
Front profile 2xVE1	43	218.44	053 343
Front profile 2xVE1	85	431.80	053 385



for subrack *FLEXIBLE*

Front Profile VE12

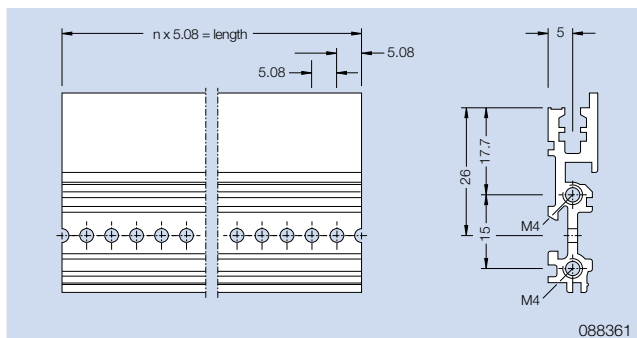
With 2 tapped holes.

Material: aluminum

Finish: colorless chromated

Ordering details

	nom. width [HP]	length [mm]	order no.
Front profile VE12	43	218.44	062 043
Front profile VE12	85	431.80	062 085



for subrack *RFI-SHIELDED*

Front Profile V12-RFI

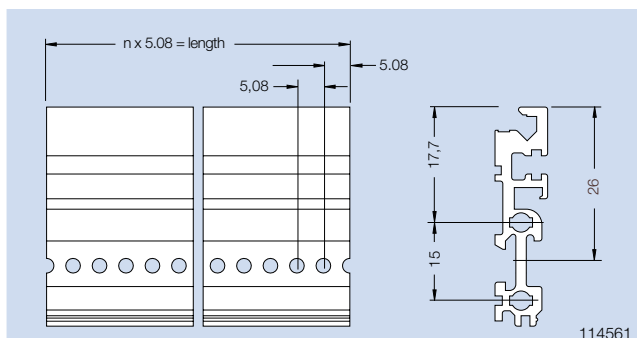
(also rear profile by using a front panel on the rear).
With retainer for RFI-spring A2

Material: aluminum

Finish: colorless chromated

Ordering details

	nom. width [HP]	length [mm]	order no.
Front profile V12-RFI	43	218.44	090 799
Front profile V12-RFI	85	431.80	088 365



for subrack *RFI-SHIELDED*

Front Profile V12-SFP-RFI

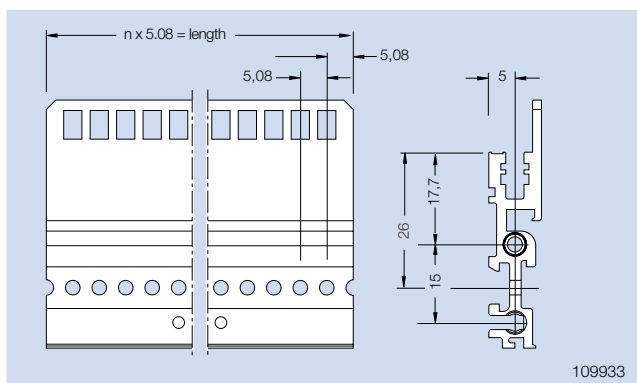
For adapting a plug in front panel.

Material: aluminum

Finish: colorless chromated

Ordering details

	nom. width [HP]	length [mm]	order no.
Front profile V12-SFP-RFI	85	431.80	114 562



for subrack *RFI-SHIELDED* and *InterRail*

Front Profile V12-IEEE

With grid holes for IEEE handle.

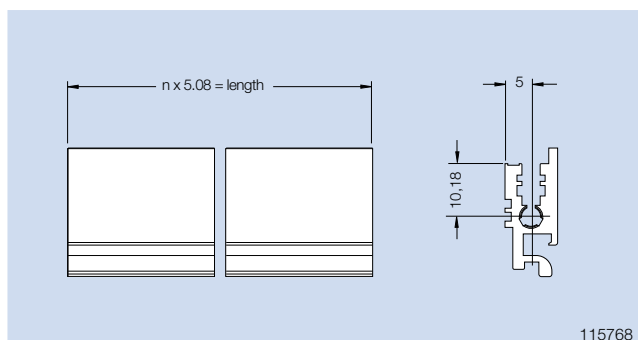
Material: aluminum

Finish: colorless chromated

Ordering details

	nom. width [HP]	length [mm]	order no.
Front profile V12-IEEE-RFI	43	218.44	111 182
Front profile V12-IEEE-RFI	85	431.80	109 934

Horizontal Rails



for subrack *InterRail*

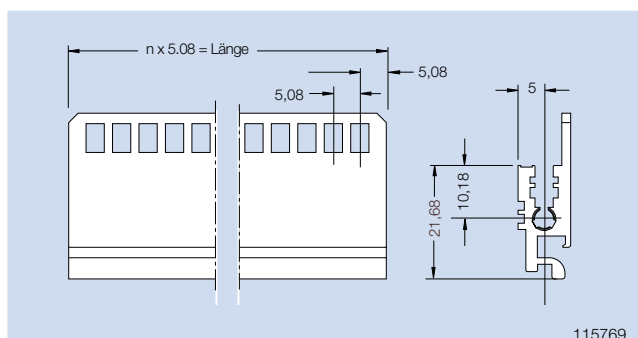
Front Profile V1-HUCK

For subrack Rear I/O.

Material: aluminum
Finish: colorless chromated

Ordering details

	nom. width [HP]	length [mm]	order no. 409.
Front profile V1-HUCK	43	218.44	116 588
Front profile V1-HUCK	85	431.80	115 823



for subrack *RFI-SHIELDED* and *InterRail*

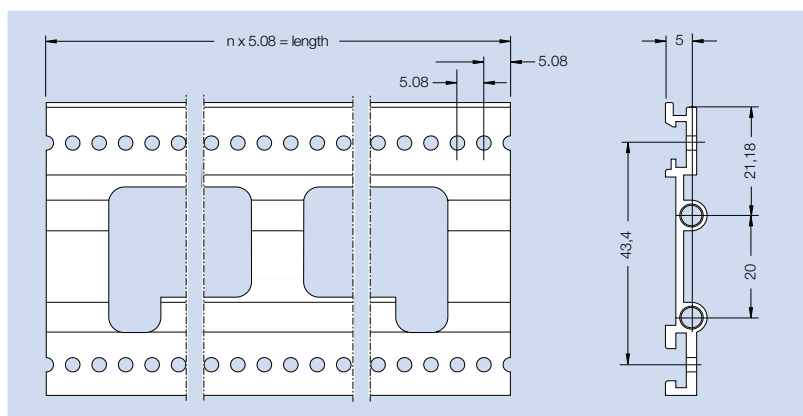
Front Profile V1-HUCK-IEEE

For subrack Rear I/O subrack. With grid holes for IEEE handle. Strengthened version.

Material: aluminum
Finish: colorless chromated

Ordering details

	nom. width [HP]	length [mm]	order no. 409.
Front profile V1-HUCK-IEEE	43	218.44	116 507
Front profile V1-HUCK-IEEE	85	431.80	115 824



for subrack *RFI-SHIELDED* and *InterRail*

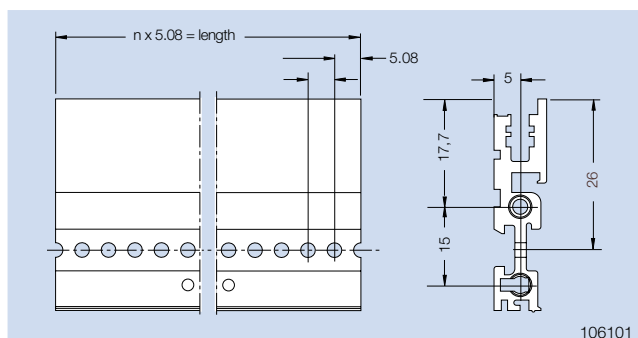
Support Profile

For insertion of card guides in subrack Rear I/O.

Material: aluminum
Finish: blank

Ordering details

	nom. width [HP]	length [mm]	order no. 409.
Support profile	43	218.44	122 421
Support profile	85	431.80	115 771



for subrack *RFI-SHIELDED* and *InterRail*

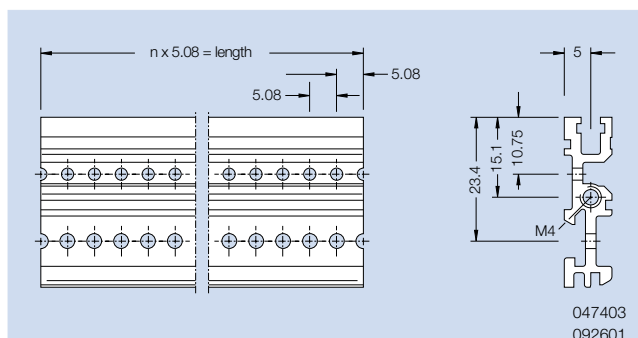
Front Profile V12-S-RFI

(also rear profile by using a front panel on the rear).
Strengthened version.

Material: aluminum
Finish: colorless chromated

Ordering details

	nom. width [HP]	length [mm]	order no.
Front profile V12-S-RFI	37	187.96	106 102
Front profile V12-S-RFI	43	218.44	116 586
Front profile V12-S-RFI	85	431.80	106 103



for subrack *FLEXIBLE* and *RFI-SHIELDED*

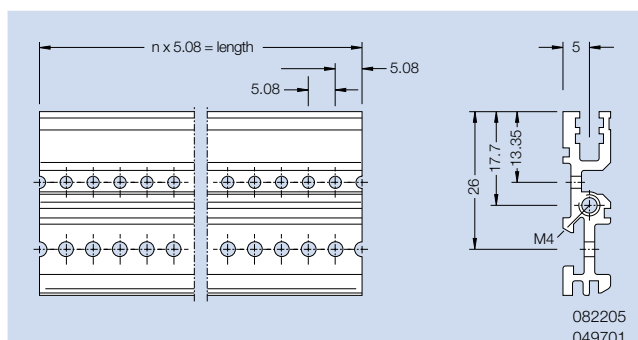
Rear Profile HE1

(type *alpha*).

Material: aluminum
Finish: anodized or colorless chromated

Ordering details

	nom. width [HP]	length [mm]	anodized order no.	chromated order no.
Rear profile HE1	21	106.68	047 421	161 245
Rear profile HE1	43	218.44	047 443	104 994
Rear profile HE1	85	431.80	047 485	092 602



for subrack *FLEXIBLE* and *RFI-SHIELDED*

Rear Profile HE2

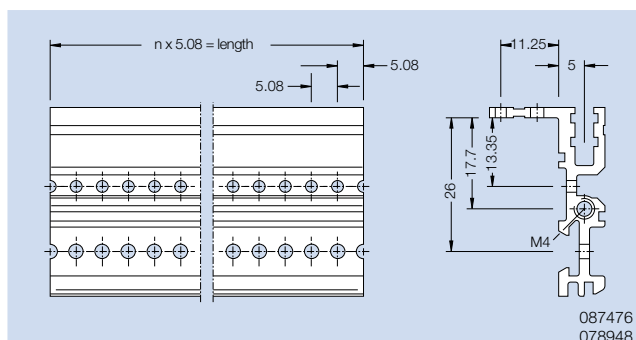
(type *delta*).

Material: aluminum
Finish: anodized or colorless chromated

Ordering details

	nom. width [HP]	length [mm]	anodized order no.	chromated order no.
Rear profile HE2	21	106.68	049 721	082 121
Rear profile HE2	43	218.44	049 743	082 143
Rear profile HE2	85	431.80	049 785	082 185

Horizontal Rails



for subrack **FLEXIBLE**

Rear Profile HZE

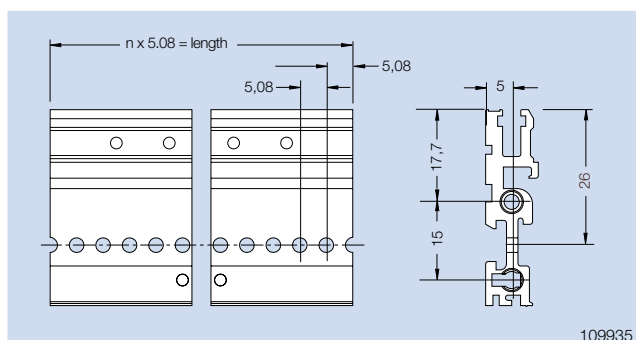
(type *beta*) with integrated connector attachment.

Material: aluminum

Finish: anodized or colorless chromated

Ordering details

	nom. width [HP]	length [mm]	anodized order no. 409.	chromated order no. 409.
Rear profile HZE	21	106.68	047 221	108 061
Rear profile HZE	43	218.44	047 243	104 030
Rear profile HZE	85	431.80	047 285	087 475



for subrack **RFI-SHIELDED** and **InterRail**

Rear Profile H22-RFI for screw on rear cover

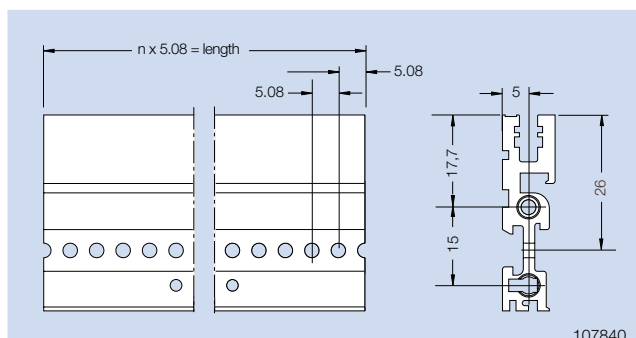
(type *delta*) For use with a rear cover.

Material: aluminum

Finish: colorless chromated

Ordering details

	nom. width [HP]	length [mm]	order no. 409.
Rear profile H22-RFI for screw on rear cover	43	218.44	109 937
Rear profile H22-RFI for screw on rear cover	85	431.80	108 246



for subrack **InterRail**

Rear Profile H22-S-RFI

(type *delta*).

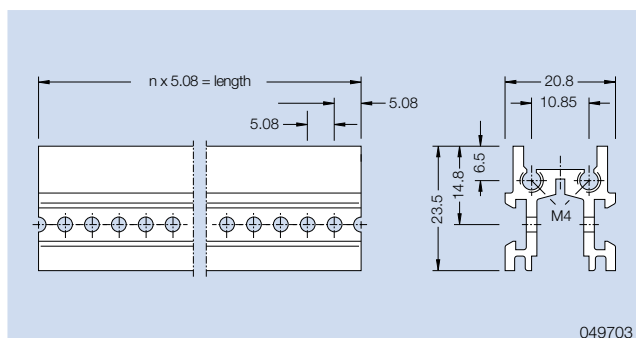
Strengthened version.

Material: aluminum

Finish: colorless chromated

Ordering details

	nom. width [HP]	length [mm]	order no. 409.
Rear profile H22-S-RFI	37	187,95	107 721
Rear profile H22-S-RFI	43	218.44	107 841
Rear profile H22-S-RFI	85	431.80	107 842



for subrack **FLEXIBLE** and **RFI-SHIELDED**

Rear Profile 2xHK

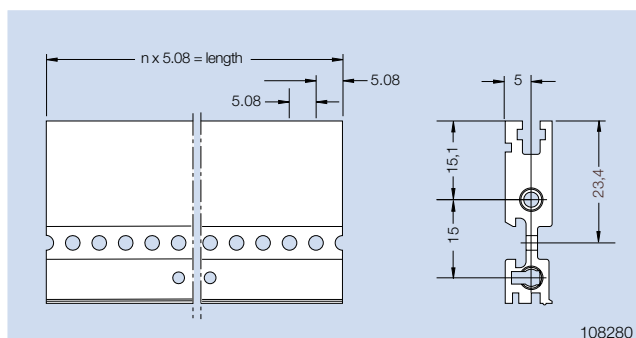
For partition e. g. 6 U subracks into two fields of 3 U.

Material: aluminum

Finish: anodized

Ordering details

	nom. width [HP]	length [mm]	order no. 409.
Rear profile 2xHK	21	106.68	050 121
Rear profile 2xHK	29	147.32	050 129
Rear profile 2xHK	43	218.44	050 143
Rear profile 2xHK	85	431.80	050 185



for subrack **InterRail**

Rear Profile H12-S

(type *alpha*).

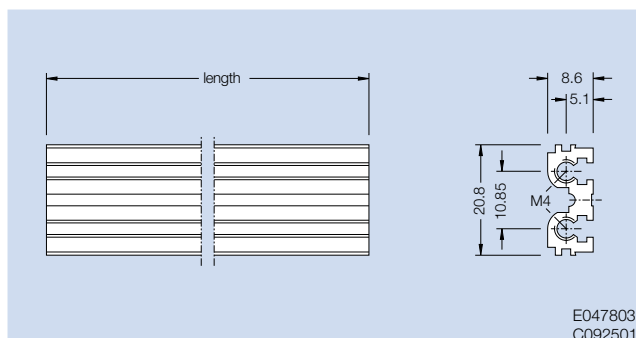
Strengthened version.

Material: aluminum

Finish: colorless chromated

Ordering details

	nom. width [HP]	length [mm]	order no. 409.
Rear profile H12-S	37	187.96	108 987
Rear profile H12-S	43	218.44	121 519
Rear profile H12-S	85	431.80	108 988



for subrack **FLEXIBLE** and **RFI-SHIELDED**

Center Profile ME1

Mounted in the rear of a 6 U subrack (type *alpha*).

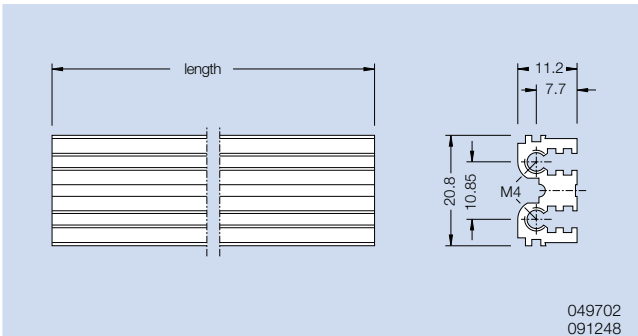
Material: aluminum

Finish: anodized or colorless chromated

Ordering details

	nom. width [HP]	length [mm]	anodized order no. 409.	chromated order no. 409.
Center profile ME1	21	106.68	047 821	161 059
Center profile ME1	43	218.44	047 843	115 042
Center profile ME1	85	431.80	047 885	092 502

Horizontal Rails



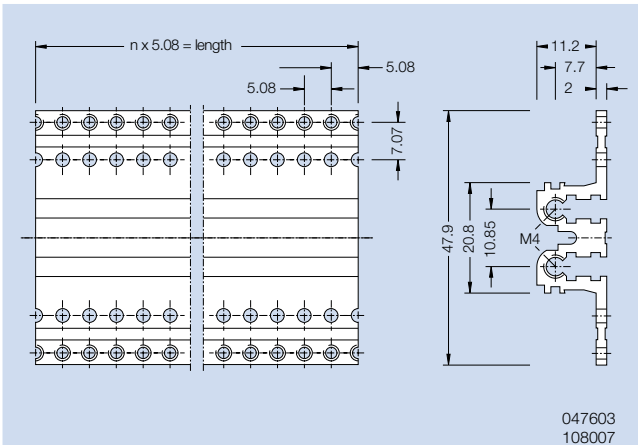
for subrack *FLEXIBLE* and *RFI-SHIELDED*

Center Profile ME2
Mounted in the rear of a 6 U subrack (type *delta*).

Material: aluminum
Finish: anodized or colorless chromated

Ordering details

	nom. width [HP]	length [mm]	anodized order no. 409.	chromated order no. 409.
Center profile ME2	21	106.68	049 921	115 701
Center profile ME2	43	218.44	049 943	111 199
Center profile ME2	85	431.80	049 985	093 548



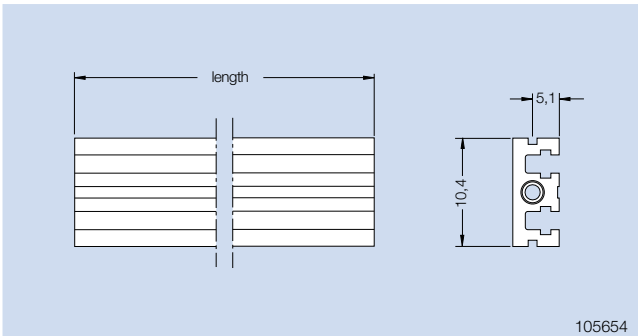
for subrack *FLEXIBLE* and *RFI-SHIELDED*

Center Profile MZE
Mounted in the rear of a 6 U subrack (type *beta*),
With integrated connector attachment.

Material: aluminum
Finish: anodized or colorless chromated

Ordering details

	nom. width [HP]	length [mm]	anodized order no. 409.	chromated order no. 409.
Center profile MZE	21	106.68	047 621	122 377
Center profile MZE	43	218.44	047 643	122 378
Center profile MZE	85	431.80	047 685	108 008



for subrack *InterRail*

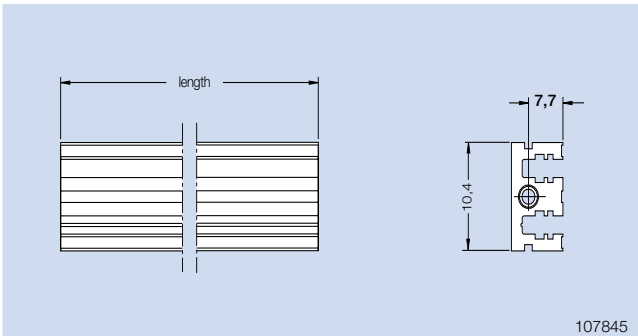
Center Profile M1-S

Mounted in the rear of a 6 U subrack (type *alpha*).
Strengthened version.

Material: aluminum
Finish: colorless chromated

Ordering details

	nom. width [HP]	length [mm]	order no. 409.
Center profile M1-S	37	187.96	105 655
Center profile M1-S	43	218.44	122 379
Center profile M1-S	85	431.80	105 656



for subrack *InterRail*

Center Profile M2-S

Mounted in the rear of a 6 U subrack (type *delta*).
Strengthened version.

Material: aluminum
Finish: colorless chromated

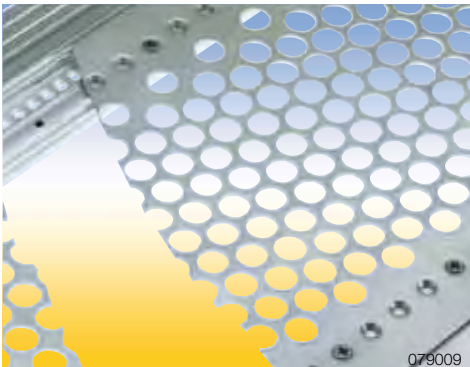
Ordering details

	nom. width [HP]	length [mm]	order no. 409.
Center profile M2-S	37	187.96	107 722
Center profile M2-S	43	218.44	107 846
Center profile M2-S	85	431.80	107 847

Accessories

	order no. 409.
For contact between profile rail and Front panel	
RFI-spring P2 - 42 HP	106 546
RFI-spring P2 - 84 HP	106 547
For contact between profile rail and cover plate	
RFI-spring A2 - 42 HP	090 800
RFI-spring A2 - 84 HP	085 011

Cover Plates



Accessories

Self tapping counter sunk screw M 2.5x10

Minimum order quantity 100 pieces

order no.: 409. 105 790

for subrack *FLEXIBLE*

Cover Plate F, screw on

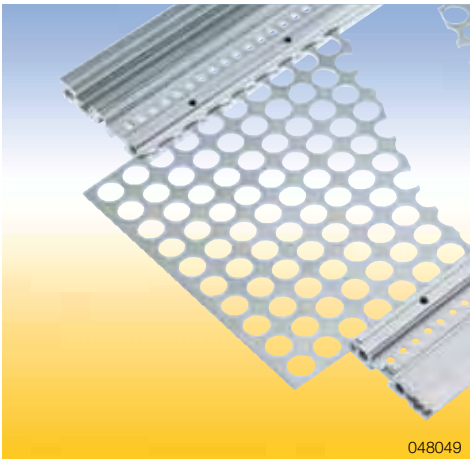
Hole diameter 8.0 mm.

The cover plate is mounted on the horizontal rails with self tapping countersunk screws at special holes

Material: aluminum, 1 mm thick
Finish: blank, seawater resistant

Ordering details

	nom. width [HP]	nom. depth [mm]	order no. 409.
Cover plate F, screw on	84	160	079 184
Cover plate F, screw on	84	220	079 284
Cover plate F, screw on	84	280	079 384



for subrack *FLEXIBLE Fi*

Cover Plate Fi, slide-in

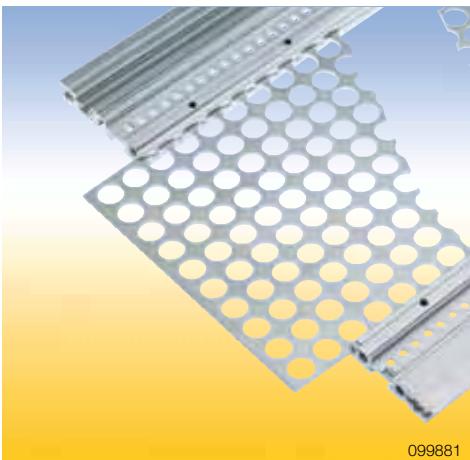
Hole diameter 8.5 mm

The cover plate slides in special slots in the profiles.

Material: aluminum, 1.5 mm thick
Finish: blank, seawater resistant

Ordering details

	nom. width [HP]	length [mm]	order no. 409.
Cover plate Fi, slide-in	84	160	048 684
Cover plate Fi, slide-in	84	220	048 784



for subrack *FLEXIBLE Fs*

Cover Plate Fs, slide-in

Hole diameter 8.5 mm.

The cover plate slides in special slots in the profiles.

Material: aluminum, 1.5 mm thick
Finish: blank, seawater resistant

Ordering details

	nom. width [HP]	length [mm]	order no. 409.
Cover plate Fs, slide-in	84	160	099 883



for subrack *RFI-SHIELDED* and *InterRail*

Cover Plate, inside

Hole diameter 4 / 5.2 x 4 mm. The cover plate is mounted with self tapping counter sunk screws on the inside of the side panels. Additionally the cover plate is secured to the horizontal rails by clips.

Material: aluminum, 1 mm thick

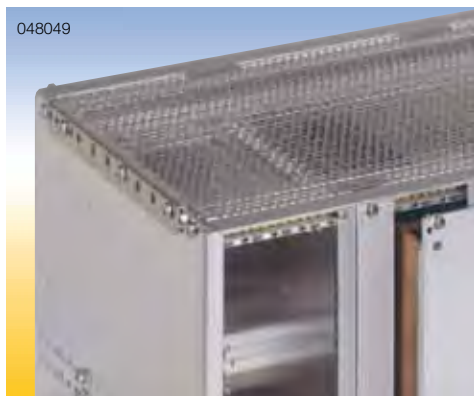
Finish: colorless chromated, seawater resistant

Ordering details

	nom. width [HP]	nom. depth [mm]	order no. 409.
Cover plate, inside	84	160	115 270
Cover plate, inside	84	220	116 603
	nom. width [HP]	PCB depth/ nom. depth [mm]	order no. 409.
Cover plate, inside	84	160 / 220	121 329
Cover plate, inside	84	160 / 280	122 549
Cover plate, inside	84	220 / 280	122 550

Accessories

	order no. 409.
For assembling the cover plate to the side panel. Minimum order quantity 100 pieces	
Self tapping counter sunk screw M 2.5 x 6	067 624
For assembling the cover plate to the horizontal rails. Minimum order quantity 10 pieces	
Clip	115 224



for subrack *RFI-SHIELDED*

Cover Plate, outside

Hole diameter 4 / 5.2 x 4 mm. The cover plate will be mounted with self tapping counter sunk screws outside of the side panels. Additionally the cover plate is secured to the horizontal rails by clips.

Material: aluminum, 1 mm thick

Finish: blank, seawater resistant

Ordering details

	nom. width [HP]	nom. depth [mm]	order no. 409.
Cover plate, outside	84	240	161 104
Cover plate, outside	84	260	161 105
Cover plate, outside	84	340	115 540
Cover plate, outside	84	460	115 542

Accessories

	order no. 409.
For assembling the cover plate to the side panel. Minimum order quantity 100 pieces	
Self tapping counter sunk screw M 4.7 x 6.5	111 184
For assembling the cover plate to the horizontal rails. Minimum order quantity 10 pieces	
Clip	115 224

Cover Plates, Rear Cover



for subrack *InterRail*

Cover Plate *InterRail*

Hole diameter 8.0 mm.

The cover plate is mounted with self tapping counter sunk screws at the side panels and at the horizontal rails.

Material: aluminum, 1 mm thick
Finish: blank, seawater resistant

Ordering details

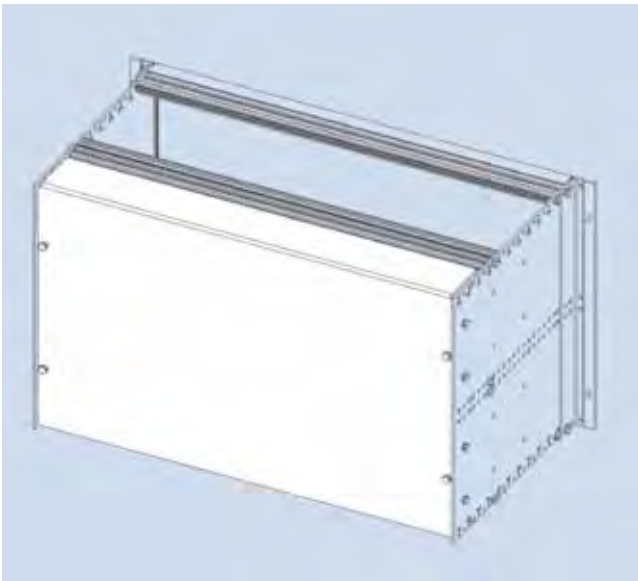
	nom. width [HP]	nom. depth [mm]	order no. 409.
Cover plate <i>InterRail</i>	84	160	107 906
Cover plate <i>InterRail</i>	84	220	107 905
Cover plate <i>InterRail</i>	36	220	107 723

Accessories

Self tapping counter sunk screw M 2.5 x 6

Minimumm order quantity 100 pieces

order no.: 409. 067 624



for subrack *FLEXIBLE*

Rear Cover F 84 HP

For covering the wiring field of the subrack

Technische Daten

Material	Rear cover: aluminum: Holding angle: steel
Finish	Rear cover: colorless chromated Holding angle: galvanized, colorless chromated

Delivery:

Unassembled as single parts or as kit.

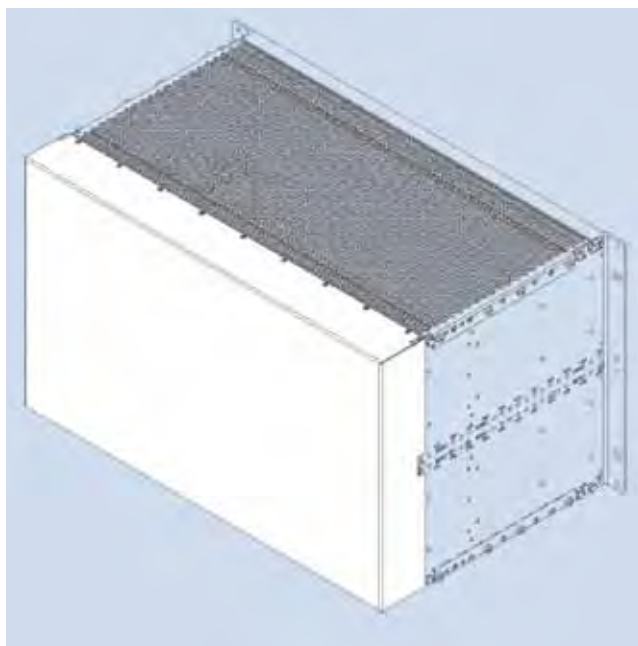
Ordering details

	nom. height [U]	height [mm]	order no. 409.
Rear cover F	3	125.0	088 190
Rear cover F	6	258.5	089 244

Delivery kit rear cover F 84 HP

	3 U Stück	6 U Stück
Rear cover 84 HP	1	1
Holding angle	2	4
Mounting parts	1	1

Rear Cover



Rear Cover RFI 84 HP

Protective wiring rear cover for RFI shielded enclosure.

Material: aluminum, 1 mm thick

Finish: colorless chromated

Delivery:

Unassembled as single parts or as kit.

Delivery:

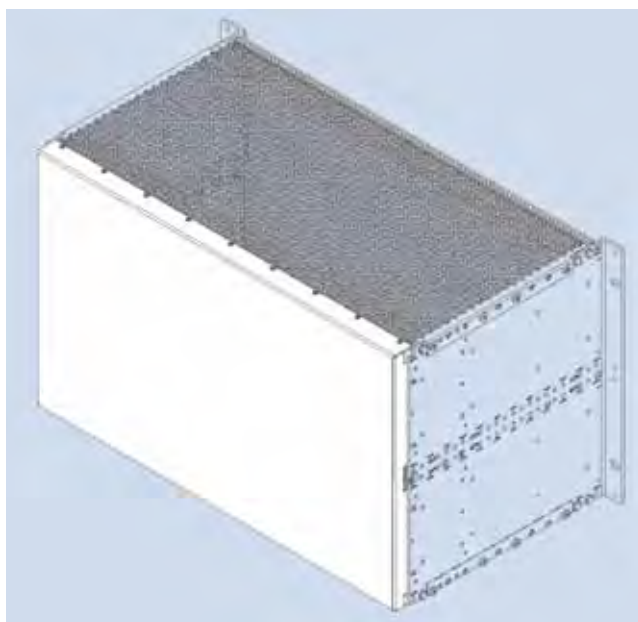
1 rear cover 84 HP

2 RFI-spring U2 (4 for 6 U)

Mounting parts

Ordering details kit rear cover RFI 84 HP

	nom. height [U]	height [mm]	order no. 409.
Rear Cover RFI	3	125.0	115 898
Rear Cover RFI	6	258.5	115 899



Rear Cover RFI 84 HP, inside

Protective wiring rear cover for RFI shielded enclosure.

Material: aluminum, 1 mm thick

Finish: colorless chromated

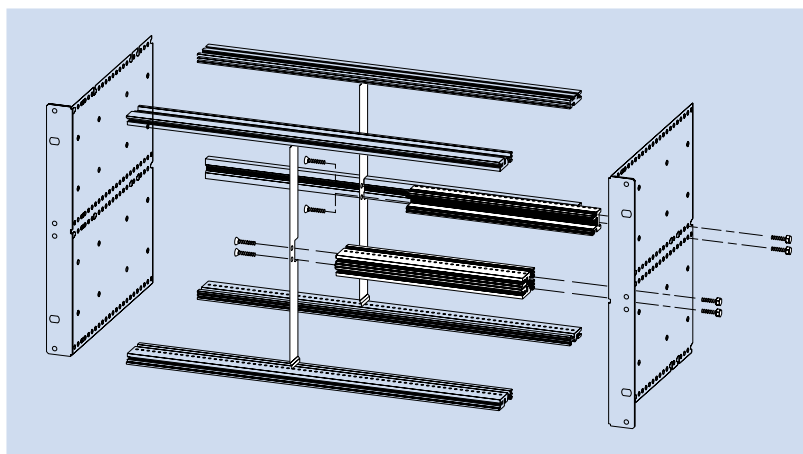
Ordering details rear cover RFI 84 HP, inside

	nom. height [U]	height [mm]	order no. 409.
Rear Cover RFI	3	133.15	108 875
Rear Cover RFI	6	266.5	108 876

Accessories

	order no. 409.
For assembling the rear cover to the profiled rail. Minimum order quantity 100 pieces	
Counter sunk screw M 2.5 x 6	067 624
For assembling the rear cover to the side panel. Minimum order quantity 100 pieces	
Self tapping Taptite screw M 2.5 x 6	082 239

Subrack Divider



Assembly:

The short horizontal rails are assembled to the side panel. The dividing strip is inserted into the horizontal rail groove, fixed with a rotating motion and mounted on the short horizontal rails.

Positioning note:

For optimum use of available space in the subrack, PCB's of 6 U should be mounted left, and the 3 U on the right. In this case the dividing strip requires only 1 HP, otherwise 2 HP for the necessary air and leakage paths.

for subrack **FLEXIBLE** and **RFI-SHIELDED**

Subrack Divider Kit

2 x 3 U - 42 HP and 6 U - 40 HP

The divider separates a 6 U subrack into a field for 6U PCB's and 2 fields of 3U.

Finish: colorless chromated

Delivery:

- 1 double front profile
- 2xVE1-43 HP chromated
- 1 double rear profile
- 2xHK-43 HP anodized
- 2 divider strips
- Mounting parts

order no.: **409. 082 063**

Single Parts

Blind Front Panel for Subrack Divider

For covering of the divider strip.
Optional with RFI-springs for a RFI shielded front.

Material: aluminum
Finish: colorless chromated
Dimensions: 2 HP x 6 U

order no.: **409. 116 319**

Accessories

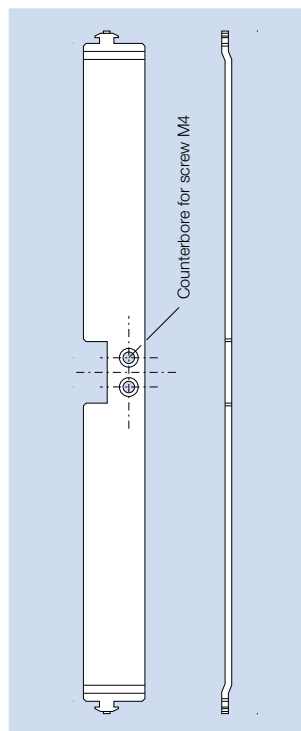
	order no.
	409.
RFI-spring F3 - 3U	111 112
RFI-spring F3 - 6U	111 116

Needed 1 x 6 U and 2 x 3 U RFI-springs

For assembly of the front panel to the horizontal rail

Minimum order quantity 100 pieces

Oval head screw M 2.5 x 11.3	101 917
---------------------------------	---------



Divider Strip

Material: aluminum
finish: chromated
Dimensions: 6 U

order no.: **409. 078 942**

Accessories

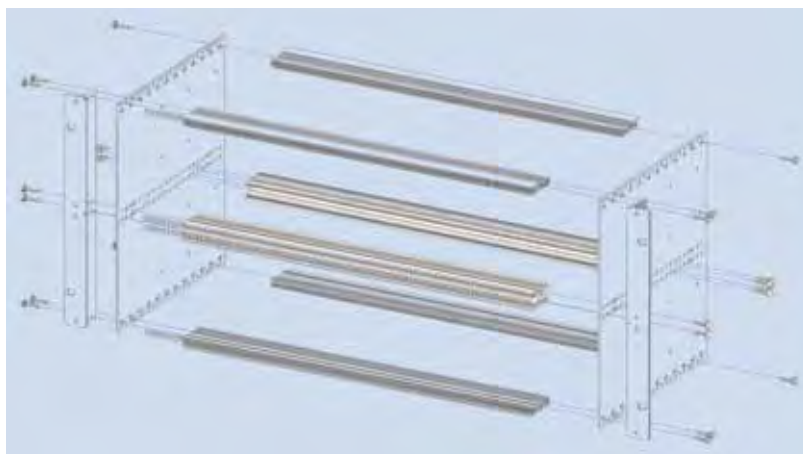
**Counter sunk screw
M 4 x 16**

For assembly of the divider strip to the horizontal rail:

Minimum order quantity 100 pieces

order no.: **409. 107 342**

Subrack Divider, Horizontal Mounting Frame



for subrack *FLEXIBLE* and
RFI-SHIELDED

Subrack Divider Kit 2 x 3 U - 84 HP

For partitioning a 6 U subrack in 2x3U.

Delivery:

- 1 double front profile
- 2xVE1 - 85HP colorless chromated
- 1 double rear profile
- 2xHK - 85HP anodized
- Mounting parts

order no.: 409. 166 270



Horizontal Mounting Frame

20 HP for horizontal mounting of 6 U
PCB's in 3U subracks.

The horizontal mounting frame needs
52 HP in the width.

For 84 HP subracks are available

Placed right:

52 HP for horizontal mounting frame,
32 HP for 3 U-PCB's

Placed left:

52 HP for horizontal mounting frame,
1 HP for air and leakage paths,
31 HP for 3 U-PCB's.

Ordering details for horizontal mounting frame kits

	finish	nom. depth [mm]	type <i>alpha</i> order no. 409.	type <i>beta</i> order no. 409.	type <i>delta</i> order no. 409
6 U	anodized	user-defined	069 047	064 947	064 687
6 U RFI	chromated	160	161 161	-	161 165
6 U RFI	chromated	220	161 162	-	161 166

Accessories

Threaded strip 20 x M 2.5

order no.: 409. 072 533

Partition Wall, Separating Wall Wall and Door Installation Profiles



Partition Wall

For partitioning of a subrack part.

The partition wall 6 U can also be used as a RFI shielded subrack divider in 6 U and 2x3 U parts.

Delivery:

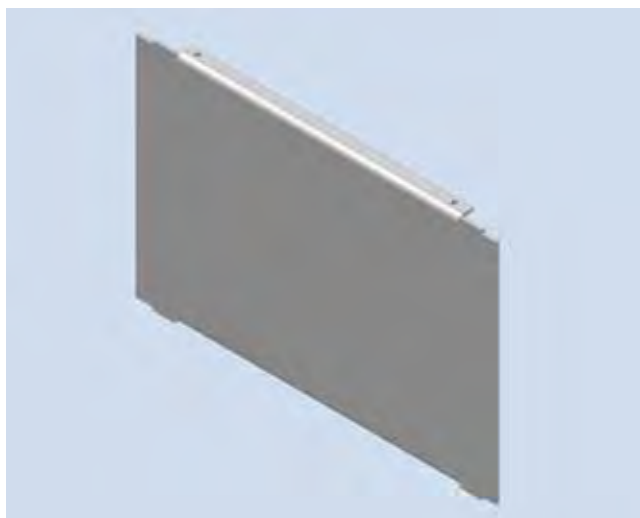
1 partition wall
1 front panel 2 HP
Mounting parts

Accessories

	3 U order no. 409.	6 U order no. 409.
Shielding kit	116 416	116 418
consists of:	pieces	pieces
RFI-spring F3 - 3 U	2	2
RFI-spring F3 - 6 U	-	1
RFI-spring M - P1	1	2
Clamping plate	1	2
Mounting parts	1	1

Ordering details kit

	nom. depth 160 mm order no. 409.	nom. depth 220 mm order no. 409.
Partition wall 3 U	116 333	116 334
Partition wall 6 U	116 335	116 336



Separating Wall

For separating a subrack into two fields.

Material: aluminum

Finish: blank

Delivery: 1 separating wall
Mounting parts

Ordering details kit

	nom. depth 160 mm order no. 409.	nom. depth 220 mm order no. 409.
Separating wall 3 U	122 648	122 649
Separating wall 6 U	122 650	122 651



for subrack *FLEXIBLE Fs*, *RFI-SHIELDED* and *InterRail*

Wall and Door Installation Profile Kit

For mounting subracks in a door, switch panel etc.

The installation profiles are mounted to the side panel by means of the mounting screws to the horizontal rails.

Material: aluminum

Finish: anodized

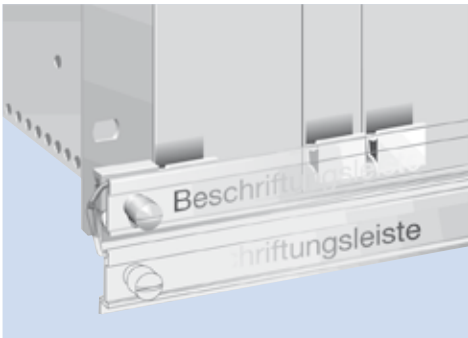
Delivery:

2 wall installation profiles

Ordering details kit

	order no. 409.
Wall installation profile 42 HP	108 045
Wall installation profile 84 HP	108 012

Labelling Rail, Locking Rail Label Strip



for subrack *FLEXIBLE Fs*, *RFI-SHIELDED*, *InterRail*

Labelling Rail 84 HP

This hinged labelling rail is mounted on the subrack flanges. Normally it is placed in front of the front panels. For ejecting a PCB, the rail is turned down.

order no.: **409. 121 941**

Delivery:

1 labelling rail
2 mounting flanges
2 hinge bracket
Mounting parts



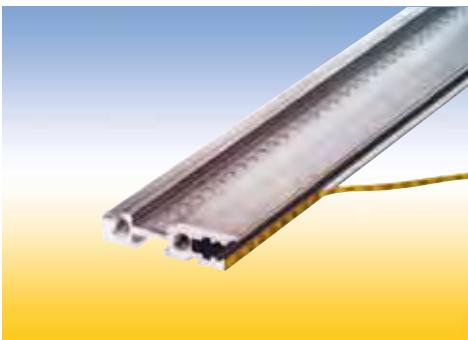
Locking Rail 84 HP

For locking of PCB's without front panels. The locking rail is mounted at the horizontal rail in front of the PCB's. A labeling strip can be insert into a groove.

order no.: **409. 120 790**

Delivery:

1 locking rail
1 rubber
Mounting parts



Label Strip

Self adhesive. For identifying PCB slots in the subrack. The PCB slot number can be read thru the hole in the front panel.

Note:

The label strip cannot be read while using the RFI spring P2.

Material: PC/PE-foil

Color: yellow/black

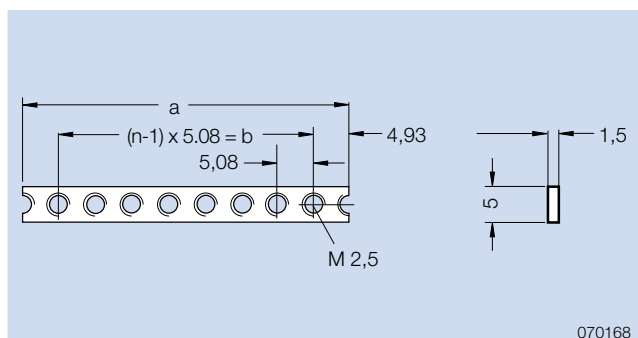
Delivery

Minimum purchase: 18 pieces on a papersheet.

Ordering details kit

	order no. 409.
Label strip 01 - 84	024 738
Label strip 84 - 01	024 740

Threaded Strips



Threaded Strip M 2.5

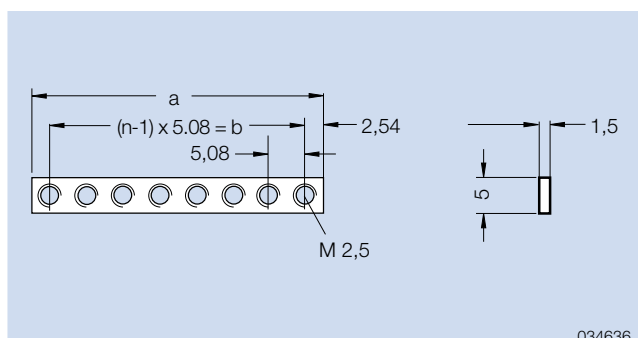
For attaching the front panels and assembly parts at the wiring field.

Material: steel

Finish: galvanized, chromated

Ordering details threaded strip M 2.5

n = number of threads	a [mm]	b [mm]	order no. 409.
20	106.38	96.52	131 688
21	111.46	101.60	130 883
28	147.02	137.16	131 701
32	167.34	157.48	131 548
36	187.66	177.80	103 777
42	218.14	207.28	100 843
84	431.50	421.64	091 255



Threaded Strip M 2.5 addable

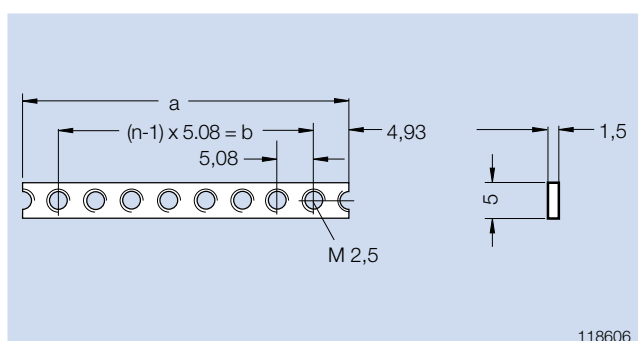
This threaded strip could be added to other strips and the space between the holes always adds up 5.08 mm.

Material: steel

Finish: galvanized, chromated

Ordering details threaded strip M 2.5 addable

n = number of threads	a [mm]	b [mm]	order no. 409.
10	50.80	45.72	131 836
20	101.60	96.52	131 845
28	142.24	137.16	106 751
42	213.36	207.28	131 813
84	426.72	421.64	131 478



Threaded Strip M 2.5 - stainless steel

For attaching the front panels and assembly parts at the wiring field.

This threaded strip is for nonmagnetic applications.

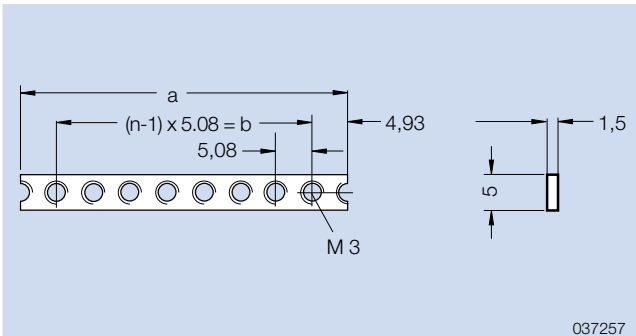
Material: stainless steel

Finish: blank

Ordering details threaded strip M 2.5 - stainless steel

n = number of threads	a [mm]	b [mm]	order no. 409.
84	431.50	421.64	118 608

Threaded Strips

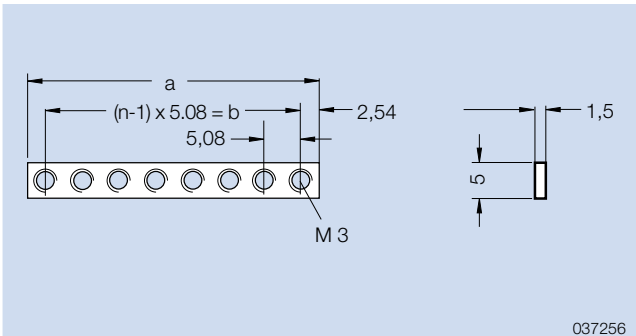


Threaded Strip M 3

Material: steel
Finish: galvanized, chromated

Ordering details threaded strip M 3

n = number of threads	a [mm]	b [mm]	order no.
84	431.50	421.64	409. 130 890



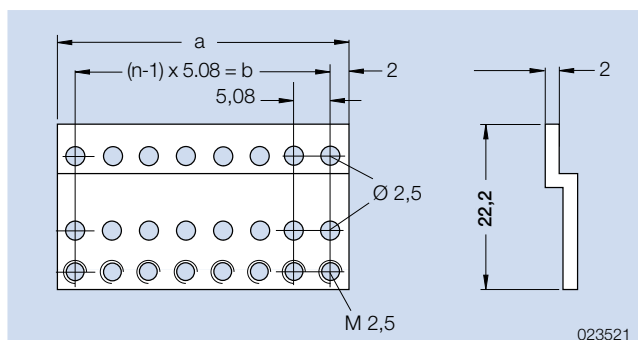
Threaded Strip M 3 addable

Material: steel
Finish: galvanized, chromated

Ordering details threaded strip M 3 addable

n = number of threads	a [mm]	b [mm]	order no.
84	426.72	421.64	409. 132 038

Z-Rail A, Mounting Rail B



Z-Rail A tapped M 2.5

For mounting connectors in accordance to IEC 60 603/ DIN 41 612 in subracks type *alpha*.
Mounted on the rear profile.

Material: aluminum

Finish: colorless chromated

Ordering details Z-rail A tapped M 2.5

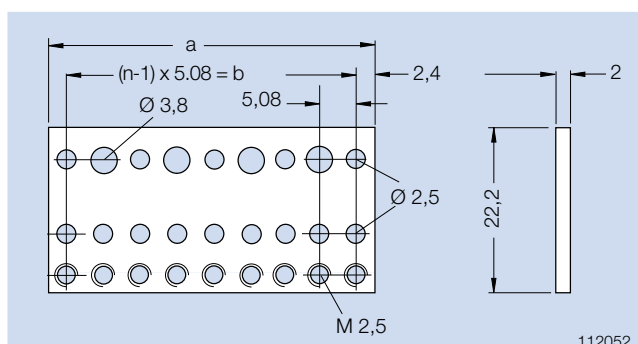
n [HP]	a [mm]	b [mm]	Order no. 409.
22	110.68	106.68	024 361
42	212.28	208.28	024 380
84	426.44	421.64	026 586

Accessories

Mounting parts for assembling the Z-rail A:
for 84 HP Z-rail, 5 places suggested.

Minimum order quantity 100 pieces

	order no. 409.
Oval head screw M 2.5 x 8 ISO 7045	094 602
Washer 2.7	013 911
Fitting bolt M 2.5 x 6.5 (for connectors)	032 708



Mounting Rail B tapped M 2.5

For mounting connectors in accordance to IEC 60 603/ DIN 41 612.

For mounting at the rear profile on subracks type *alpha* with insulating strip and insulating bushings.

For mounting at the rear profile on subracks type *delta*.

Material: aluminum

Finish: blank

Ordering details mounting rail B tapped M 2.5

n [HP]	a [mm]	b [mm]	order no. 409.
42	212.28	208.28	112 054
84	426.44	421.64	112 055

Accessories

Mounting parts for assembling the mounting rail B:
for 84 HP Z-rail, 5 places suggested.

Minimum order quantity 100 pieces

	order no. 409.
Washer 2.7	013 911
Fitting bolt M 2.5 x 6.5 (for connectors)	032 708
for type <i>alpha</i>	
Oval head screw M 2.5 x 12 ISO 7045	094 604
for type <i>delta</i>	
Oval head screw M 2.5 x 8 ISO 7045	094 602



Insulating Strip

For insulated mounting of wiring supports, e. g. of the mounting rail B. Mounted between horizontal rail and wiring support.

Technical data

Material	PPO, fiber glass reinforced
Continuous temperature	– 40 °C up to + 105 °C
Fire protection class	UL 94 V–1
Color	gray

Ordering details

	length [HP]	order no. 409.
Insulating strip-40	40	061 541
Insulating strip-84	84	051 981

Subrack Accessories



Insulating Bushing 2.6

For use together with mounting rail B and insulating strip.

Technical data

Material	PC
Continuous temperature	– 40 °C up to + 115 °C
Fire protection class	UL 94 V–0
Color	transparent

order no.: **409. 018 055**

Card Guide ECONOMY



for subrack *FLEXIBLE*

Card Guide ECONOMY

An inexpensive snap-in card guide that can also be secured to the horizontal rails with self tapping screws.

Technical data

Material	Lexan 500
Color	gray
Continuous temperature	– 40 °C up to + 115 °C
Fire protection class	UL 94 V–0

Ordering details

	nom. length [mm]	PCB thickness [mm]	order no.
Card guide ECONOMY	160	1.6	108 173
Card guide ECONOMY	220	1.6	047 601

Accessories

Self tapping oval head screw M 2.5 x 5

For assembling the card guides to the horizontal rails

Minimum order quantity 100 pieces

order no.: 409. 039 691

Card Guide UNIVERSAL



Card Guide UNIVERSAL

This is an all-purpose card guide with provision for a spring to contact front panels.

Technical data

Material	Lexan 500
Color	gray
Continuous temperature	– 40 °C up to + 115 °C
Fire protection class	UL 94 V–0

Ordering details

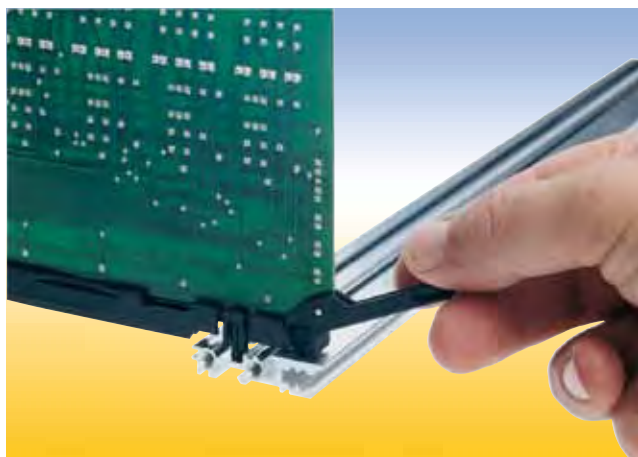
	nom. length [mm]	PCB thickness [mm]	order no. 409.
Card guide UNIVERSAL	160	1.6 - 2.0	061 468
Card guide UNIVERSAL	220	1.6 - 2.0	061 469
Card guide UNIVERSAL	280	1.6 - 2.0	061 526

Accessories

Grounding contact for front panels

order no.: 409. 058 102

Card Guide with integrated push and pull assist



Card Guide with integrated push and pull assist

This special card guide with an integral small lever aids in the handling of PCB's with high pin plug in connectors.

The lever is supported by the walls of a special guide chamber when the board is pulled out or pushed in. It is suitable for a spring to contact a track near the PCB edge.

This card guides are snap-in and can be secured with screws.

Delivery:

- 1 card guide top
- 1 card guide bottom

Technical data

Material	card guide: Polyester, fiber glass reinforced lever: Polyphenylenoxid grooved pin: steel, blank
Color	black
Continuous temperature	- 40 °C up to + 130 °C
Fire protection class	UL 94 V-0



Ordering details kit

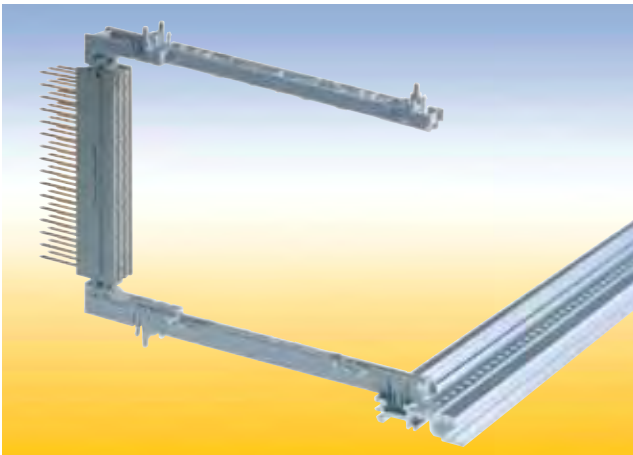
card guide with integrated push and pull assist

	nom. length [mm]	PCB thickness [mm]	order no. 409.
Card guide 160	160	1.6	112 453
Card guide 220	220	1.6	112 454
Lever with grooved pin	-	1.6	111 157

For a card guide kit needed 2 levers

Accessories

	Order no. 409.
PCB track contact PROFIL	103 358
For assembling the card guides to the horizontal rails. Minimum order quantity 100 pieces	
Oval head screw M 2.5 x 12	094 604
Hexagonal nut M 2.5	013 938
Washer 2.7	013 911



Card Guide CONN

For easy screwless snap-on mounting of connectors accordance to IEC 60 603/ DIN 41 612.

With a provision for a spring to contact front panels and for contacting a track near the PCB edge.

This snap-in card guides can also be secured with screws.

Delivery:

- 1 card guide CONN top
- 1 card guide CONN bottom

Technical data

Material	nom. length 160: Lexan 500 nom. length 220: PBT
Color	gray
Continuous temperature	Lexan: - 40 °C up to + 115 °C PBT: - 40 °C up to + 130 °C
Fire protection class	UL 94 V-0

Ordering details kit card guide CONN

	nom. length [mm]	PCB thickness [mm]	order no. 409.
Card guide CONN	160	1.6	083 091
Card guide CONN	220	1.6 - 2.4	116 200

Accessories

	order no. 409.
Grounding contact for front panels	058 102
PCB track contact PROFIL	103 358
For assembling the card guides to the horizontal rails. Minimum order quantity 100 pieces	
Oval head screw M 2.5 x 12	094 604
Hexagonal nut M 2.5	013 938
Washer 2.7	013 911

Card Guide VIB



Technical data

Material	Lexan 500
Color	nom. length 80 mm: black nom. length 100 mm: black others: gray
Continuous temperature	- 40 °C up to + 115 °C
Fire protection class	UL 94 V-0

Card Guide VIB

Lattice construction for heavy mechanical loads.

With a provision for a spring to contact front panels and for contacting a track near the PCB edge.

This card guides can be snapped in and/or secured with screws.

Two versions:

1. With pressed-in nut M 2.5 for assembly to the horizontal rail with oval head screws M 2.5 x 12
2. Without a nut, but one can be added in the existing hexagonal molding.

Ordering details card guide VIB

	nom. length [mm]	PCB thickness [mm]	snap-in	secured with screws	order no. 409.
bottom	80	1.6 - 2.4	yes	-	115 171
top	80	1.6 - 2.4	yes	-	115 236
with nut M 2.5	100	1.6	yes	yes	108 157
without nut	100	1.6	yes	yes	108 101
with nut M 2.5	160	1.6	-	yes	059 632
without nut	160	1.6	yes	yes	109 058
without nut	160	2.0	yes	yes	069 774
without nut	160	2.4	yes	yes	080 068
without nut	180	1.6	yes	yes	085 010
with nut M 2.5	220	1.6	-	yes	059 634
without nut	220	1.6	yes	yes	108 120
without nut	220	2.4	yes	yes	101 276
with nut M 2.5	280	1.6	-	yes	059 636

Accessories

	order no. 409.
Grounding contact for front panels	058 102
PCB track contact PROFIL	103 358
For assembling the card guides to the horizontal rails. Minimum order quantity 100 pieces	
Oval head screw M 2.5 x 12	094 604
Hexagonal nut M 2.5	013 938
Washer 2.7	013 911



Card Guide VARIO

This is a length variable card guide constructed from 3 pieces. The center piece can be cut to any length. With a provision for a spring to contact front panels. These snap-in end pieces can also be secured with screws.

Two versions:

1. With pressed-in nut M 2.5
for assembly to the horizontal rail with oval head screws M 2.5 x 12
2. Without a nut, but one can be added in the existing hexagonal molding.

Technical data

Material	end pieces: Noryl SE1 center piece: aluminum or Noryl ENV 125
Color	end pieces: black center piece: black, silver
Continuous temperature	– 40 °C up to + 105 °C
Fire protection class	UL 94 V–1

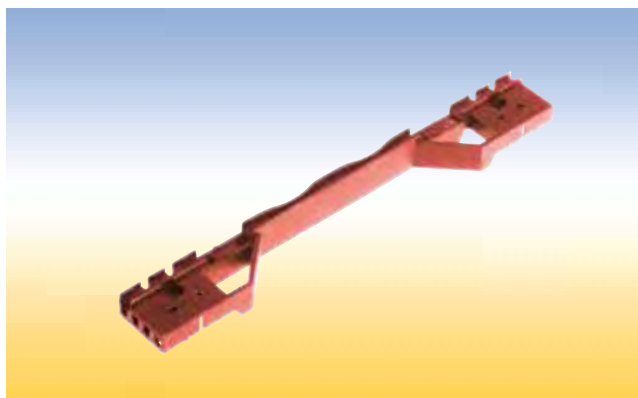
Ordering details card guide VARIO

	length [mm]	PCB thickness [mm]	order no. 409.
Pair of end pieces			
with nut M 2.5	-	1.6	061 086
without nut	-	1.6	061 051
with nut M 2.5	-	2.4	061 088
without nut	-	2.4	061 052
center piece			
plastic	1000	1.6	061 061
aluminum	1000	1.6	061 059
plastic	1000	2.4	061 062
aluminum	1000	2.4	061 060

Accessories

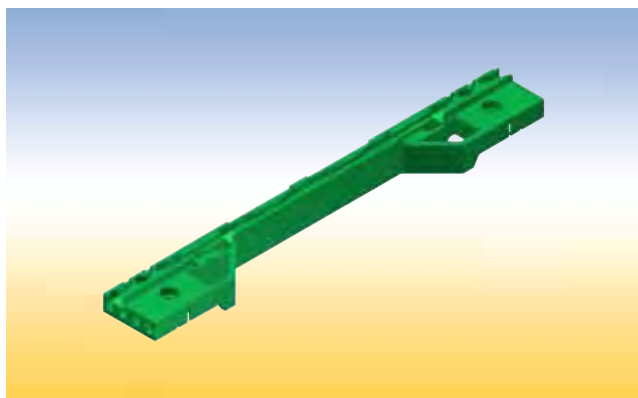
	order no. 409.
Grounding contact for front panels	058 102
For assembling the card guides to the horizontal rails. Minimum order quantity 100 pieces	
Oval head screw M 2.5 x 12	094 604
Hexagonal nut M 2.5	013 938
Washer 2.7	013 911

Card Guide IEEE and Card Guide IEEE with 1/2 HP lateral offset



Technical data

Material	PBT
Color	black or red
Continuous temperature	– 40 °C up to + 115 °C
Fire protection class	UL 94 V-0



Technical data

Material	PBT / VALOX 467
Color	green
Continuous temperature	– 40 °C up to + 115 °C
Fire protection class	UL 94 V-0

Accessories for Card Guide IEEE

	order no. 409.
contact spring IEEE	113 450
coding pin IEEE gray	113 713
coding pin IEEE red	116 442
PCB track contact PROFIL	103 358
For assembling the card guides to the horizontal rails. Minimum order quantity 100 pieces	
Lens head screw M 2.5 x 12	094 604
Hexagonal nut M 2.5	013 938
Washer 2.7	013 911

Card Guide IEEE

This card guide is in accordance to specification IEEE 1101.10.

The required coding of the IEEE is integrated in the card guide head.

With provision for the IEEE contact spring for grounding of the alignment-pins of the PCB's front panel. Also with a provision for contacting a track near the PCB edge.

This snap-in card guides can be secured with screws.

Ordering details for card guide IEEE

color	nom. length [mm]	PCB thickness [mm]	order no. 409.
black	160	1.6 - 2.4	113 400
black	220	1.6 - 2.4	131 973
red	160	1.6 - 2.4	116 440

Card Guide IEEE with 1/2 HP lateral offset

This card guide is also in accordance to specification IEEE 1101.10.

For CompactPCI-power supplies and for Plug-in units fitted with SMD.

With provision for the IEEE contact spring for grounding of the alignment-pins of the PCB's front panel. Also with a provision for contacting a track near the PCB edge.

This card guide is secured with screws.

Ordering details for card guide IEEE with 1/2 HP lateral offset

color	nom. length [mm]	PCB thickness [mm]	order no. 409.
green	160	1.6 - 2.4	130 889



for card guide UNIVERSAL, CONN, VIB and VARIO

Coding Head IEEE

Snapped on the head of standard card guides to comply to the requirements of the specification IEEE 1101.10

Functions:

- 1. Holding the IEEE contact spring for grounding the alignment pins of the front panel.
- 2. Adapting the IEEE coding pin.
- 3. Guiding the 1.6 to 2.4 mm thick PCB.

Technical data

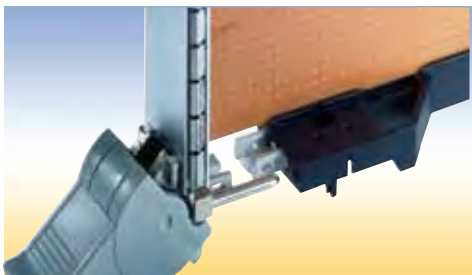
Material	Lexan 500
Color	black, red
Fire protection class	UL 94 V-0

Ordering details kit

	order no. 409.
coding head IEEE - black	113 905
coding head IEEE - red	116 441

Delivery:

- 1 coding head IEEE top
- 1 coding head IEEE bottom



Contact Spring IEEE

Snapped into the IEEE card guide or IEEE coding head to ground the alignment pin of the front panel.

Material: tin-bronze

order no.: **409. 113 450**

Coding Pin IEEE

Snapped into the IEEE card guide or IEEE coding head.

Technical data

Material	PC
Fire protection class	UL 94 V-0

Ordering details

	order no. 409.
coding pin IEEE - gray	113 713
coding pin IEEE - red	116 442

Accessories for Card Guides



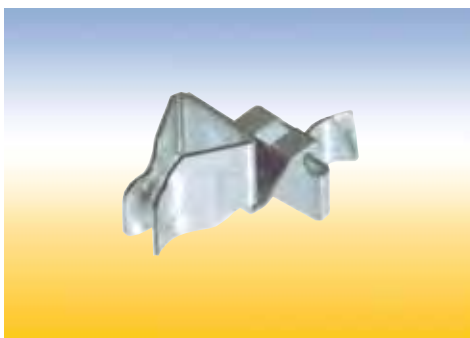
PCB Track Contact PROFIL

Snapped into a card guide, connecting a PCB's edge to the horizontal rail of a subrack.

Technical data

Material	tin-bronze
Finish	tin-plated
Fire protection class	UL 94 V-0

order no.: **409. 103 358**



Grounding Contact for Front Panels

For pre-mating grounding. In connection with front connector with male contact.

Material: tin-bronze
finish: tin-plated

order no.: **409. 058 102**

Accessories

Front connector with male contact

	order no. 409.
top	107 728
bottom	107 727



Cover for Ventilation Openings

Snapping into the horizontal rails. Covers the ventilation openings between card guides.

Material: plastic
Fire protection class: UL 94 V-0

Ordering details

	nom. length [mm]	order no. 409.
Front connector with male contact 4 HP	160	106 530
Front connector with male contact 4 HP	220	106 531



PCB Lead-In

For easy lead-in of the PCB into the card guide.

Technical data

Material	Polycarbonat, 10% fiber glass reinforced
Color	gray, similar RAL 7044
Fire protection class	UL 94 V-0

Delivery:

1 PCB lead-in top
1 PCB lead-in bottom

order no.: **409. 092 785**



PCB Locking Spring, plastic

Secures PCB without front panels.

Technical data

Material	Lexan 500
Color	black
Fire protection class	UL 94 V-0

order no.: **409. 052 720**



PCB Locking Device Kit

Secures PCB's without front panels. Used for easy locking and ejecting of PCB's

Technical data

Material	handle: PBT pin: steel
Color	black
Fire protection class	UL 94 V-0

Delivery

Kit, unassembled

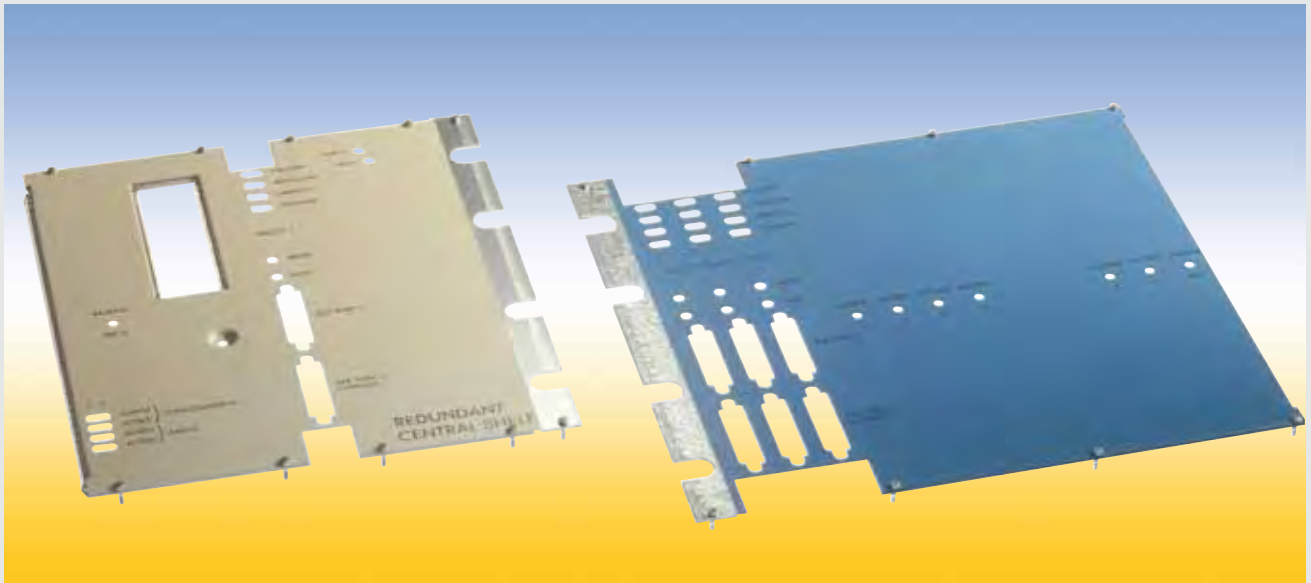
Delivery:

2 handles
2 pins
2 PCB locking springs

Ordering details kit

	order no. 409.
PCB locking device 1.6	068 698
PCB locking device 2.4	102 297

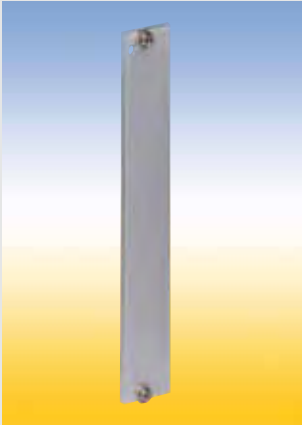
Front Panels



In addition to the wide range of standard front panels we also provide on request individual customer specific custom front panels with punching, surface finish and silk screening. Textured or smooth painted in all relevant RAL-colors, abrasion-resistant silk-screen printing as well as color coordinated engraving gives your front panel an individual appearance.

Please ask your local representative for your
individual front panel design.
You find your contact person on our home-page
www.intermas-el.com

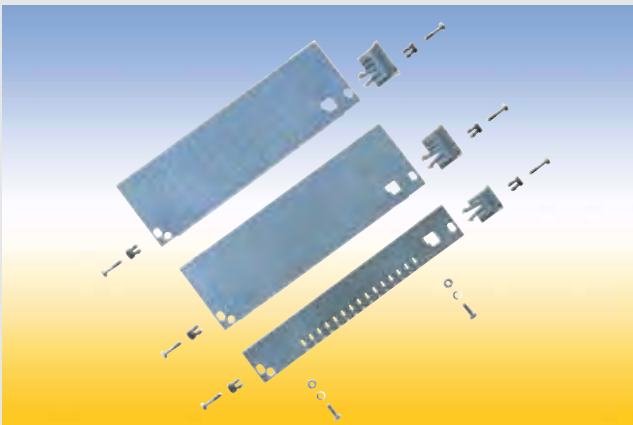
Front Panels and Handles



- ✓ Blind Front Panels

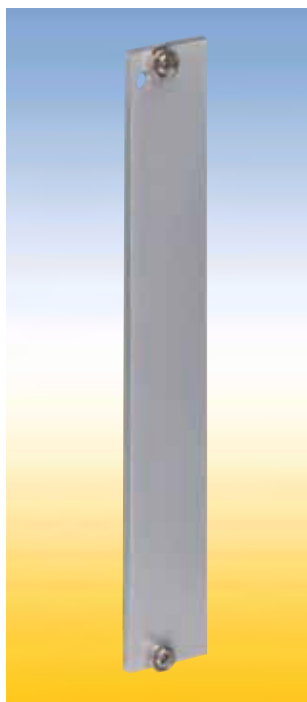


- ✓ Front Panels with Handle
- ✓ Handles
- ✓ Front Panels with Ejector Handle
- ✓ Ejector Handles
- ✓ Front Panels with IEEE Handle
- ✓ IEEE-Handles



- ✓ Plastic Front Panels

Blind Front Panels



Blind Front Panels

For covering empty sections or to carry various components in subracks.

Four versions are available:

1. Flat front panel blank

The front side is covered with a removable transparent foil.

2. Flat front panel anodized

Front anodized, rear conductive.

3. Flat front panel RFI

Front anodized, rear conductive, with slits in the side edges for insertion of RFI springs.

4. Extruded front panel RFI

Made of extruded aluminum alloy, with slits in the side edges for insertion of RFI springs for contact.

Surface finish is colorless chromated.

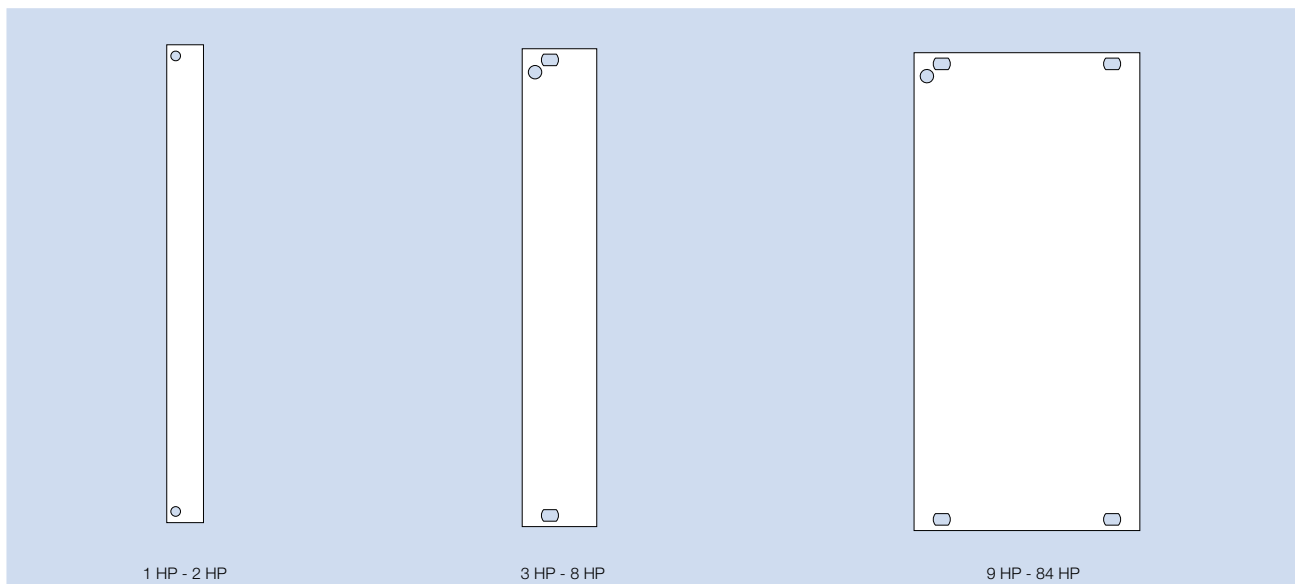
Material

Flat front panel: aluminum 2.5 mm thick

Extruded front panel: aluminum

Delivery

Front panels are delivered unassembled as single parts or as a kit.



Blind Front Panels

Ordering details blind front panels (flat front panel)

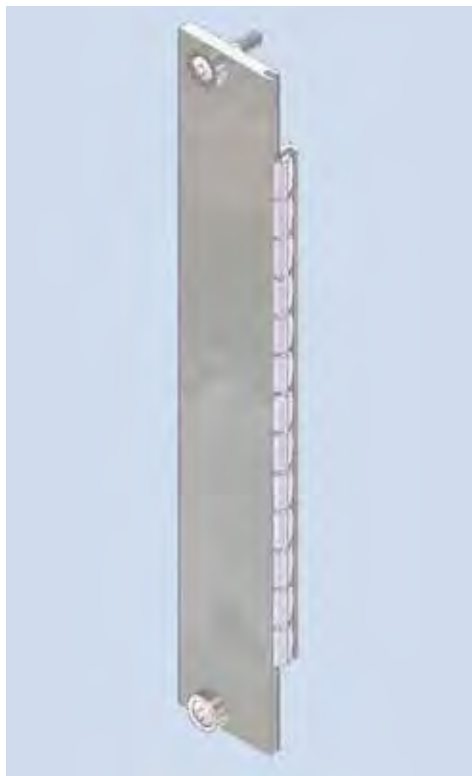
		3 U	3 U	6 U	6 U
	nom. width [HP]	blank order no. 409.	anodized/ conductive order no. 409.	blank order no. 409.	anodized/ conductive order no. 409.
Blind front panel	1	097 201	-	097 601	-
Blind front panel	2	097 202	-	097 602	-
Blind front panel	3	097 203	-	097 603	-
Blind front panel	4	097 204	097 404	097 604	097 804
Blind front panel	5	097 205	-	097 605	-
Blind front panel	6	097 206	097 406	097 606	097 806
Blind front panel	7	097 207	-	097 607	-
Blind front panel	8	097 208	097 408	097 608	097 808
Blind front panel	10	097 210	-	097 610	-
Blind front panel	12	097 212	097 412	097 612	097 812
Blind front panel	14	097 214	097 414	097 614	097 814
Blind front panel	21	097 221	097 421	097 621	097 821
Blind front panel	28	097 228	097 428	097 628	097 828
Blind front panel	42	097 242	097 442	097 642	097 842
Blind front panel	84	097 284	097 484	097 684	097 884

Accessories

Minimum order quantity 100 pieces

	pieces for 1-2 HP	pieces for 3-8 HP	pieces for 9-85 HP	order no. 409.
Screw retainer M2.5 gray	-	2	4	100 539
Screw retainer M2.5 black	-	2	4	100 538
Cross-head screw M 2.5 x 11.3	2	2	4	101 917

Blind Front Panels RFI



Ordering details kit - blind front panel RFI

nom. width [HP]	3 U extruded order no. 409.	3 U flat order no. 409.	6 U extruded order no. 409.	6 U flat order no. 409.
1	114 453	-	114 464	-
2	114 454	-	114 465	-
3	114 455	-	114 466	-
4	114 361	113 583	114 387	-
5	114 362	-	114 388	-
6	114 363	113 586	114 389	-
7	114 365	-	114 390	-
8	114 366	-	114 391	-
9	114 367	-	114 392	-
10	114 368	-	114 393	-
12	-	113 589	-	113 608
14	-	113 590	-	113 609
21	-	113 592	-	113 611
28	-	113 593	-	113 612
42	-	113 594	-	113 613
43	-	114 487	-	-
84	-	113 595	-	113 614
85	-	113 596	-	-

Finish: flat front panel: front side anodized, rear side conductive
extruded front panel: colorless chromated

Delivery kit - blind front panel RFI:

	pieces for 1-2 HP	pieces for 3-8 HP	pieces for 9-43 HP	pieces for 44-85 HP
Front panel	1	1	1	1
RFI spring F3 extruded/flat	1 / 2	1 / 2	1 / 2	1 / 2
Grounding bushing M2.5	-	2	4	6
Mounting parts-kit	1	1	1	1

Accessories

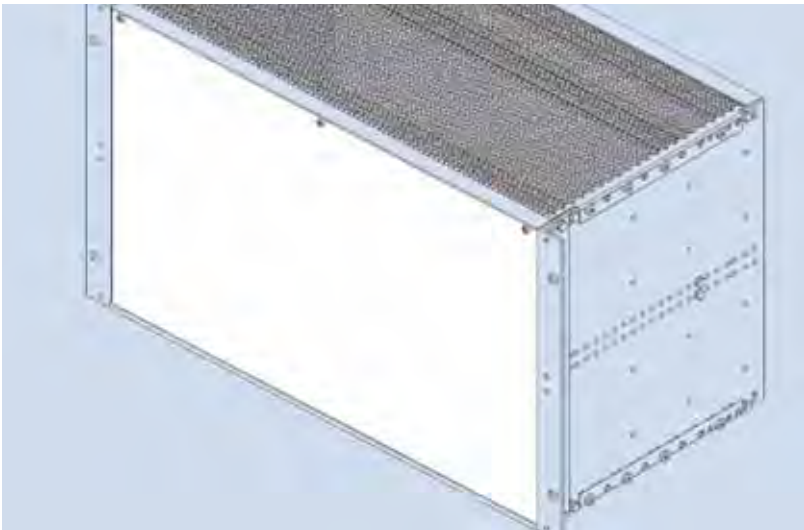
Roller cutter to assemble
the RFI spring F3

order no.: 409. 118 433

Ordering details single part blind front panel RFI

nom. width [HP]	3 U extruded order no. 409.	3 U flat order no. 409.	6 U extruded order no. 409.	6 U flat order no. 409.
1	114 458	-	114 469	-
2	114 459	-	114 470	-
3	113 027	-	114 476	-
4	111 608	112 252	111 618	-
5	113 028	-	114 384	-
6	111 609	112 258	111 619	-
7	111 610	-	111 620	-
8	111 611	-	111 621	-
9	113 029	-	114 385	-
10	113 030	-	114 386	-
12	-	112 551	-	112 611
14	-	112 557	-	112 617
21	-	112 578	-	112 638
28	-	112 821	-	112 943
42	-	112 581	-	112 641
43	-	114 082	-	-
84	-	113 598	-	113 617
85	-	113 599	-	-

Front Panels plug-in, hinged



Plug-in Front Panel 85 HP

The front panel bottom edge is inserted in the groove of a specially profiled rail. With slits in the side edges for insertion of RFI springs. To be used in combination with below mentioned flanges only.

Finish:
front side anodized, rear side conductive

Delivery:
1 front panel
3 grounding bushing M 2.5
3 cross-head screw M 2.5 x 11.3

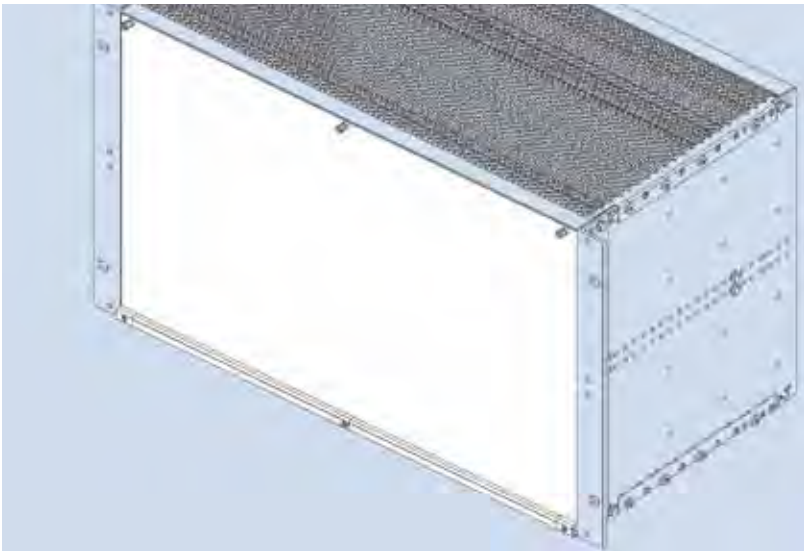
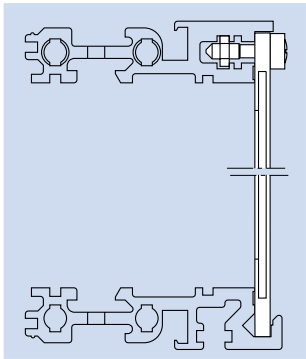
Ordering details for kit

	order no. 409.
Plug-in front panel 3 U	113 948
Plug-in front panel 6 U	113 950

Accessories

	order no. 409.
Profiled rail VE12SFP-RFI-85	114 562
Flange RFI - FP - 3 U	114 708
Flange RFI - FP - 6 U	114 715
RFI spring F3 - 3U	111 112
RFI spring F3 - 6U	111 116

For one flat front panel 2 RFI springs are needed.



Hinged Front Panel 85 HP

With slits in the side edges for insertion of RFI springs. The hinge is screwed to the profiled rail of the subrack. An 84 HP threaded strip is needed. To be used in combination with below mentioned flanges only.

Finish:
front side anodized, rear side conductive

Delivery:
1 front panel
1 hinge
3 grounding bushings
Mounting parts

Delivery: as unassembled kit.
Assembled kits on request.

Ordering details for kit

	order no. 409.
Hinged front panel 3 U	113 705
Hinged front panel 6 U	113 706

Accessories

	order no. 409.
Threaded strip 84 HP	078 428
Flange RFI - FP - 3 U	114 708
Flange RFI - FP - 6 U	114 715
RFI spring F3 - 3U	111 112
RFI spring F3 - 6U	111 116

For one flat front panel 2 RFI springs are needed.

Front Panels with Handle



Front Panels with Handle

For assembly on a PCB.

Handle and front connector are screwed on the front panel.

The plain front panel is easy to modify.

Four versions are available:

1. Flat front panel blank

The front side is covered with a removable transparent foil.

2. Flat front panel anodized

Front anodized, rear conductive.

3. Flat front panel RFI

Front anodized, rear conductive.

With slits in the side edges for insertion of RFI springs.

4. Extruded front panel RFI

Made of extruded aluminum alloy, with slits in the side edges for insertion of RFI springs for contact.

Surface finish is colorless chromated.

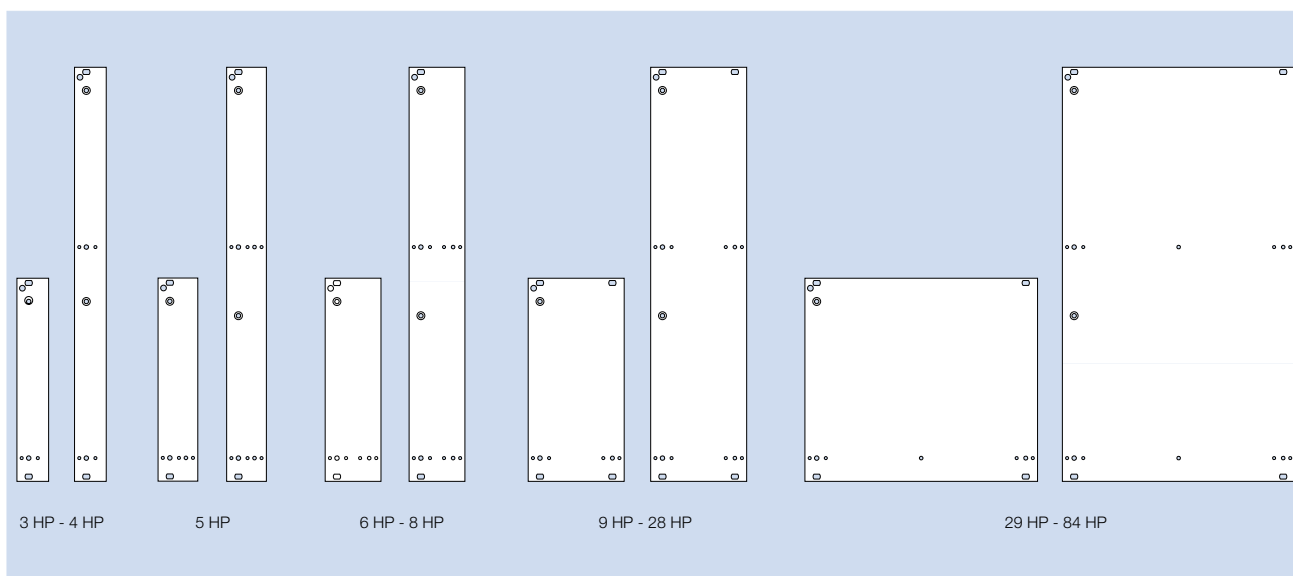
Material

Flat front panel: aluminum 2.5 mm thick

Extruded front panel: aluminum

Delivery

Front panels are delivered unassembled as single parts or as a kit.



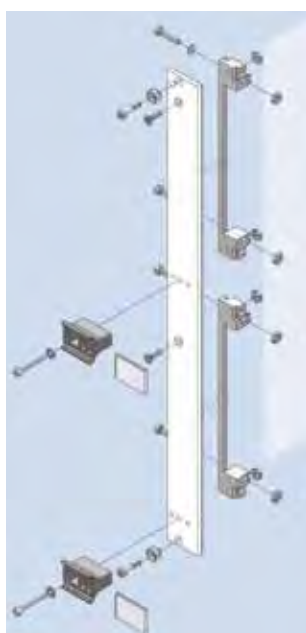
Hole pattern of the front panels

Front Panels with Handle



Ordering details kit - front panel with handle (flat front panels)

nom. width [HP]	3 U anodized/ conductive order no. 409.	6 U anodized/ conductive order no. 409.
4	107 518	122 624
6	122 622	122 625
8	107 520	122 626
10	107 521	122 627
12	107 522	122 628



Delivery kit - front panel with handle

	3 U pieces for 3-8 HP	3 U pieces for 9-12 HP	6 U pieces for 3-8 HP	6 U pieces for 9-12 HP
Front panel	1	1	1	1
Handle gray	1	1	2	2
Ident-plate aluminum	1	1	2	2
Front connector FEE	1	1	2	2
Screw retainer M 2.5	2	4	2	4
Mounting parts	1	1	1	1

Ordering details - single part front panel for handle (flat front panel)

nom. width [HP]	3 U blank order no. 409.	3 U anodized/ conductive order no. 409.	6 U blank order no. 409.	6 U anodized/ conductive order no. 409.
3	096 403	-	096 703	-
4	096 404	096 604	096 704	096 904
5	096 405	096 605	096 705	096 905
6	096 406	096 606	096 706	096 906
7	096 407	-	096 707	-
8	096 408	096 608	096 708	096 908
10	096 410	096 610	096 710	096 910
12	096 412	096 612	096 712	096 912
16	096 416	-	096 716	-
21	096 421	-	096 721	-

Front Panels RFI with Handle

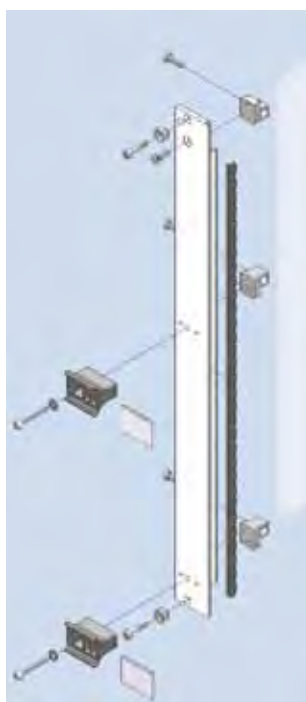


Ordering details kit - front panel RFI with handle

nom. width [HP]	3 U extruded order no. 409.	3 U flat order no. 409.	6 U extruded order no. 409.	6 U flat order no. 409.
3	114 537	-	114 541	-
4	114 377	-	114 404	-
5	114 378	-	114 405	-
6	114 379	-	114 406	-
7	114 380	-	114 407	-
8	114 381	-	114 408	-
10	114 383	-	114 410	-
12	-	113 685	-	113 693

Finish:

Flat front panel: front side anodized, rear side conductive
Extruded front panel: colorless chromated



Delivery kit - front panel RFI with handle

	3 U pieces for 3-8 HP	3 U pieces for 9-12 HP	6 U pieces for 3-8 HP	6 U pieces for 9-12 HP
Front panel	1	1	1	1
Handle gray	1	1	2	2
Ident-plate aluminum	1	1	2	2
Front connector metal	2	2	3	3
Grounding bushing M 2.5	2	4	2	4
Mounting parts	1	1	1	1

Accessories

	order no. 409.
For one flat front panel 2 RFI-springs are needed.	
RFI spring F3 - 3U	111 112
RFI spring F3 - 6U	111 116
For assemble the RFI spring F3	
Roller cutter	118 433

Ordering details single part front panel RFI for handle

nom. width [HP]	3 U extruded order no. 409.	3 U flat order no. 409.	6 U extruded order no. 409.	6 U flat order no. 409.
3	114 538	-	114 540	-
4	114 370	113 711	114 396	-
5	114 371	-	114 397	-
6	114 372	113 723	114 399	-
7	114 373	-	114 400	-
8	114 374	113 725	114 401	-
10	114 376	-	114 403	-
12	-	113 729	-	113 762

Handle and Handle Strip

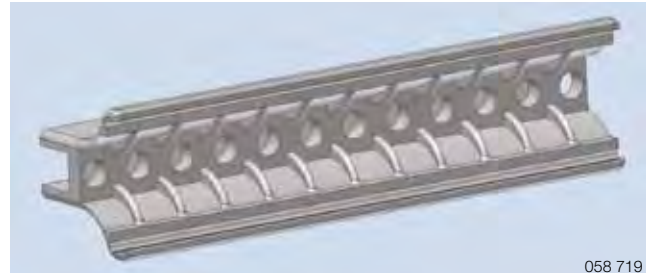


Handle FP

Assembled with M2.5 screws and with 1 additional self tapping screw from 6 HP. The handle is held against torsion by means of two nipples.

Technical data

Material	Polycarbonate, 10% fiber-glass reinforced
Color	gray RAL 7032, black
Continuous temperature	- 40 °C to + 100 °C
Fire protection class	UL 94 V-0



058 719

Ordering details handle FP

width [HP]	length [mm]	gray order no. 409.	black order no. 409.
3	13.80	102 115	041 657
4	18.88	102 114	100 667
5	23.96	103 005	103 205
6	29.04	103 006	103 206
7	34.12	103 007	103 207
8	39.20	103 008	103 208

Ordering details handle strip FP

width [HP]	length [mm]	gray order no. 409.	black order no. 409.
10	49.36	103 810	058 910
12	59.52	103 812	058 912
16	79.84	103 816	058 916
21	105.24	103 821	058 921
42	211.92	103 842	058 942

Accessories handles:

Minimum order quantity each 100 pieces

	order no. 409.
Pan head screw M 2.5 x 16	094 605
Washer 2.7	013 911
Hexagonal nut M 2.5 DIN 439	013 938
Self tapping screw M 2.5 x 10	040 401



Ident Plate

for handle FP.
The ident plate is markable and printable, snapped in after mounting the handle to the front panel.

Ordering details ident-plate

width [HP]	length [mm]	aluminum order no. 409.	crystal clear order no. 409.
3	13.80	017 929	089 238
4	18.88	017 956	089 240
5	23.96	022 791	-
6	29.04	022 792	-
7	34.12	022 793	-
8	39.20	022 794	-
10	49.36	022 796	-
12	59.52	022 798	-
16	79.84	022 802	-
21	105.24	022 807	-
42	211.92	040 652	-

Technical data

Material	aluminum or Polycarbonate, crystal clear
Finish	Alu: silver silk-anodized
Continuous temperature	PC: - 40 °C to + 115 °C
Fire protection class	PC: UL 94 V-2

Front Panels with Ejector Handle



Front Panels with Ejector Handle

For easy release of PCB's with high pin connections. The ejector handle is extends through the front panel and is screwed together with the bearing bushing at the front connector.

Four versions are available:

1. Flat front panel blank.
The front side is covered with a removable transparent foil.
2. Flat front panel anodized.
Front anodized, rear conductive.
3. Flat front panel RFI
Front anodized, rear conductive. With slits in the side edges for insertion of RFI springs.
4. Extruded front panel RFI
Made of extruded aluminum alloy, with slits in the side edges for insertion of RFI springs for contact. Surface finish is colorless chromated.

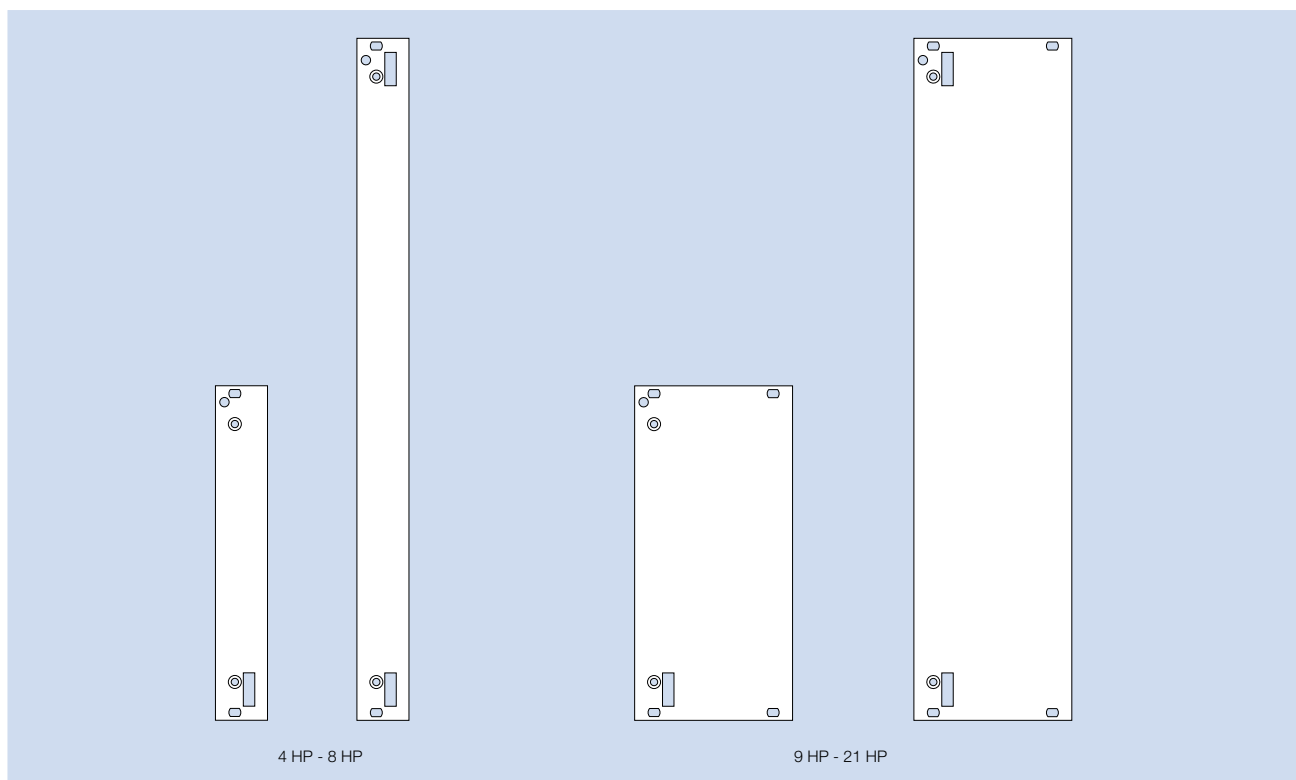
Material

Flat front panel: aluminum 2.5 mm thick

Extruded front panel: aluminum

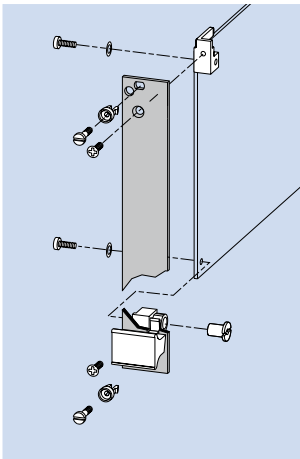
Delivery

Front panels are delivered unassembled as single parts or as a kit.



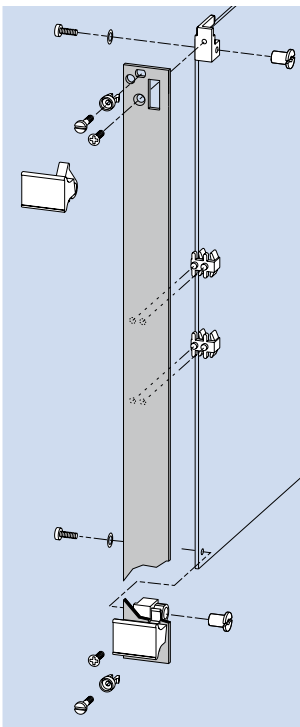
Hole pattern of the front panels

Front Panels with Ejector Handle



Ordering details kit - front panel with ejector handle (flat front panels)

	3 U	3 U	6 U	6 U
nom. width [HP]	blank order no. 409.	anodized/ conductive order no. 409.	blank order no. 409.	anodized/ conductive order no. 409.
4	168 913	168 919	122 639	122 645
5	168 914	-	122 640	-
6	168 915	-	122 641	-
8	168 916	168 920	122 642	122 646
10	168 917	-	122 643	-
12	168 918	168 921	122 644	122 647



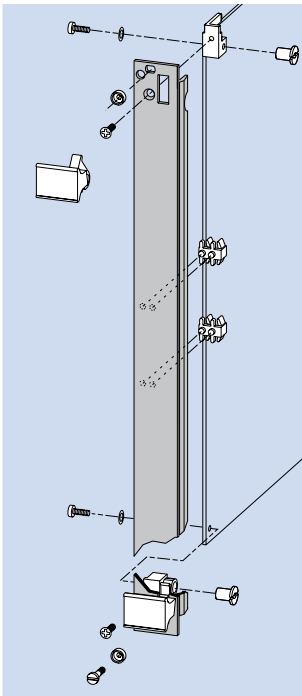
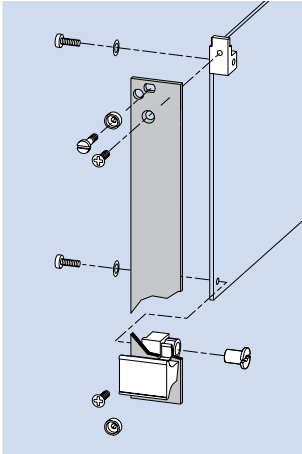
Delivery kit - front panel with ejector handle

	3 U pieces for 4-8 HP	3 U pieces for 9-12 HP	6 U pieces for 4-8 HP	6 U pieces for 9-12 HP
Front panel	1	1	1	1
Ejector handle top, gray	-	-	1	1
Ejector handle bottom, gray	1	1	1	1
Bearing bushing	1	1	2	2
Front connector metal	2	2	2	2
Front panel support plug-in	-	-	2	2
Screw retainer M 2.5	2	4	2	4
Mounting parts	1	1	1	1

Ordering details single part front panel for ejector handle (flat front panels)

	3 U blank	3 U anodized/ conductive	6 U for support plugged-in blank	6 U for support plugged-in anodized/ conductive	6 U for support screwed blank	6 U for support screwed anodized/ conductive
nom. width [HP]	order no. 409.	order no. 409.	order no. 409.	order no. 409.	order no. 409.	order no. 409.
4	168 900	168 908	102 404	102 344	102 454	102 384
5	168 901	-	102 405	-	-	-
6	168 902	-	102 406	-	-	-
8	168 903	168 909	102 408	102 348	102 458	102 388
10	168 904	-	102 410	-	-	-
12	168 905	168 910	102 412	102 352	102 462	102 392
16	168 906	168 911	102 416	102 356	-	-
21	168 907	168 912	102 421	102 361	-	-

Front Panels RFI with Ejector Handle



Ordering details - kit front panel RFI with ejector handle

nom. width [HP]	3 U extruded order no. 409.	3 U flat order no. 409.	6 U extruded order no. 409.	6 U flat order no. 409.
4	113 655	113 620	113 662	-
5	113 656	-	113 663	-
6	113 657	113 622	113 665	-
7	113 658	-	113 667	-
8	113 659	-	113 668	-
9	113 660	-	113 669	-
10	113 661	-	113 670	-
12	-	113 626	-	113 640

Finish:

Flat front panel: front side anodized, rear side conductive
Extruded front panel: colorless chromated

Delivery kit - front panel RFI with ejector handle

	3 U pieces for 4-8 HP	3 U pieces for 9-12 HP	6 U pieces for 4-8 HP	6 U pieces for 9-12 HP
Front panel	1	1	1	1
ejector handle top, gray	-	-	1	1
ejector handle bottom, gray	1	1	1	1
Bearing bushing	1	1	2	2
Front connector metal	2	2	2	2
Front panel support plug-in	-	-	2	2
Grounding bushing M 2.5	2	4	2	4
Mounting parts	1	1	1	1

Accessories

	order no. 409.
For one flat front panel 2 RFI-springs are needed.	
RFI spring F3 - 3U	111 112
RFI spring F3 - 6U	111 116
For assemble the RFI spring F3	
Roller cutter	118 433

Ordering details single part front panel RFI for ejector handle

nom. width [HP]	3 U extruded order no. 409.	3 U flat order no. 409.	6 U extruded order no. 409.	6 U flat order no. 409.
4	111 847	112 644	111 613	-
5	113 170	-	113 147	-
6	111 604	112 650	111 614	-
7	111 605	-	111 615	-
8	111 606	-	111 616	-
9	113 171	-	113 148	-
10	113 172	-	113 149	-
12	-	112 668	-	112 725

Ejector Handle 4 HP

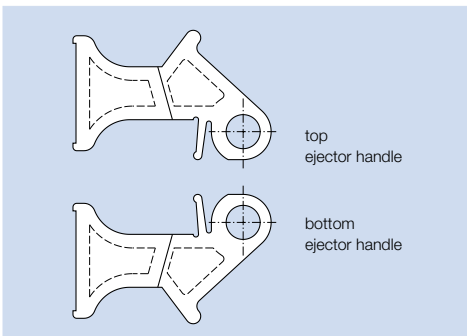


Ejector Handle

The ejector handle extends through the front panel and is screwed together with the bearing bushing at the front connector.

Technical data

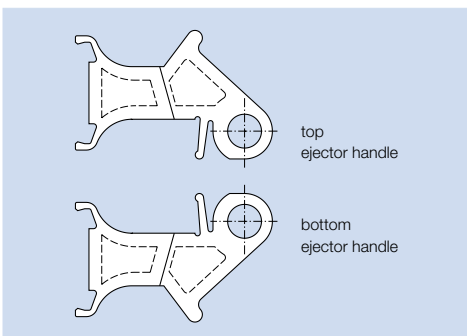
Material	Polycarbonate, 10% fiber-glass reinforced
Color	gray, black
Continuous temperature	– 40 °C to + 100 °C
Fire protection class	UL 94 V-0



Ordering details ejector handle 4 HP

version	gray order no. 409.	black order no. 409.
top	101 923	094 458
bottom	101 924	094 459

Mounting parts see front connectors



Ejector handle 4 HP

Front side open, for assembly with a ident-plate.

Ordering details ejector handle 4 HP

version	gray order no. 409.	black order no. 409.
top	102 117	101 843
bottom	102 118	101 844

Mounting parts see front connectors



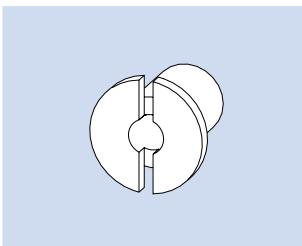
Ident-plate 4 HP

The ident-plate is markable and printable. Snapped in after mounting the handle at the front panel.

Material: aluminum

Finish: silver silk-matt anodized

order no.: **409. 017 956**



Bearing Bushing 4

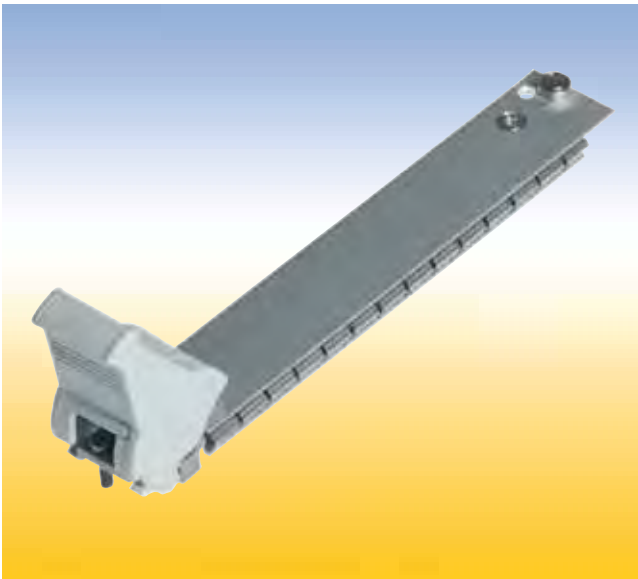
for handle 4 HP

Material: steel, galvanized

Finish: colorless chromated

order no.: **409. 065 888**

Front Panels RFI with IEEE Handle



Front Panels with IEEE Handle

For easy pull of PCB's with high density connectors accordance specification IEEE 1101.10. The assambled handle kit is stuck in the milled space of the front panel and is secured with a clamped spring. Afterwards the PCB are screwed on the intergrated front connector.

Two versions with IEEE handle are available:

1. Flat front panel RFI

Front anodized, rear conductive. With slits in the side edges for insertion of RFI springs.

2. Extruded front panel RFI

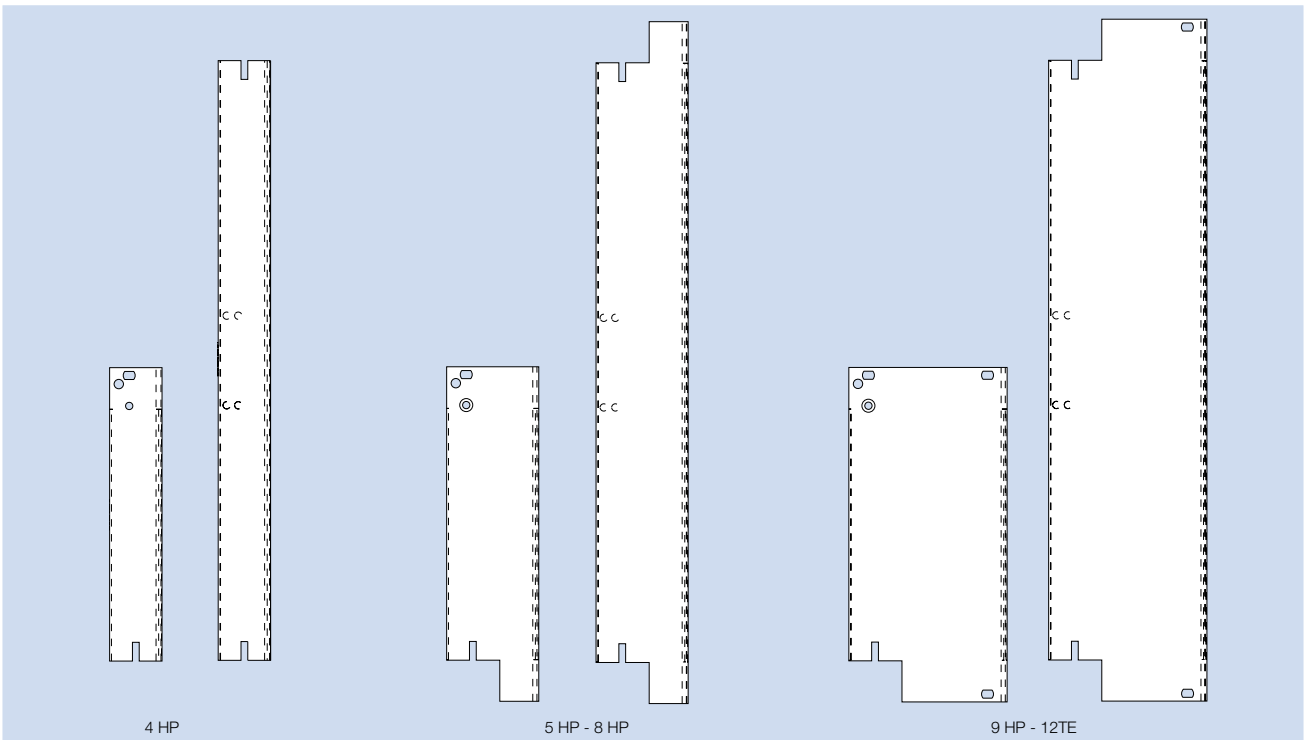
Made of extruded aluminum alloy, with slits in the side edges for insertion of RFI springs or for contacting. Surface finish is colorless chromated.

Delivery

Front panels are delivered with the assambled IEEE handle as single parts or as a kit.

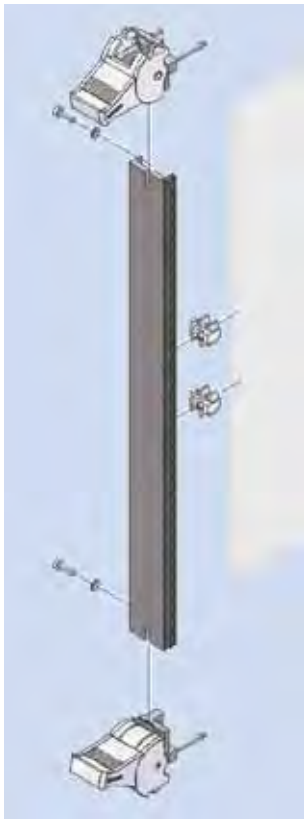
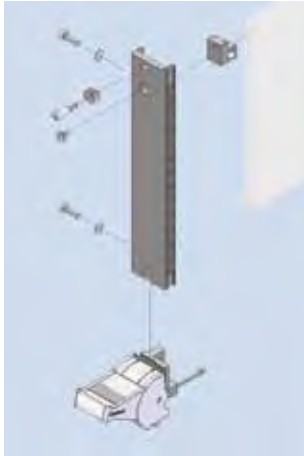
Technical data

Material	Front panel: aluminum Handle: Polycarbonate
Finish	Front panel: <i>flat</i> : front side anodized, rear side conductive <i>extruded</i> : colorless chromated
Color	handle: RAL 7035 or black
Continous temperature	- 40 °C to + 100 °C
Fire protection class	UL 94 V-0



Hole pattern of the front panels

Front Panels RFI with IEEE Handle gray without hot-swap



Ordering details kit - front panel RFI with IEEE-handle, gray, without hot-swap

nom. width [HP]	3 U extruded order no. 409.	3 U flat order no. 409.	6 U extruded order no. 409.	6 U flat order no. 409.
4	113 671	113 641	113 674	-
6	113 672	-	113 675	-
8	113 673	-	113 676	-
10	114 463	-	114 475	-
12	-	113 647	-	113 654

Delivery kit front panel RFI with IEEE-Handle without hot-swap

	3 U pieces for 4-8 HP	3 U pieces for 9-12 HP	6 U pieces for 4-8 HP	6 U pieces for 9-12 HP
Front panel	1	1	1	1
IEEE-handle top gray	-	-	1	1
IEEE-handle bottom gray	1	1	1	1
Front connector metal	1	1	-	-
Front panel support plug-in	-	-	2	2
Grounding bushing M 2.5	1	3	-	2
Mounting parts	1	1	1	1

Accessories

	order no. 409.
For one flat front panel 2 RFI-springs are needed.	
RFI spring F3 - 3U	111 112
RFI spring F3 - 6U	111 116
For assemble the RFI spring F3	
Roller cutter	118 433

Ordering details single part front panel RFI for IEEE handle

nom. width [HP]	3 U extruded order no. 409.	3 U flat order no. 409.	6 U extruded order no. 409.	6 U flat order no. 409.
4	112 152	113 079	112 154	-
5	112 408	-	112 400	-
6	112 409	112 778	112 401	-
7	112 410	-	112 402	-
8	112 411	-	112 403	-
9	112 412	-	112 404	-
10	112 413	-	112 405	-
12	-	112 790	-	112 773

IEEE Handle 4 HP without hot-swap

Color: gray, RAL 7035

Delivery:

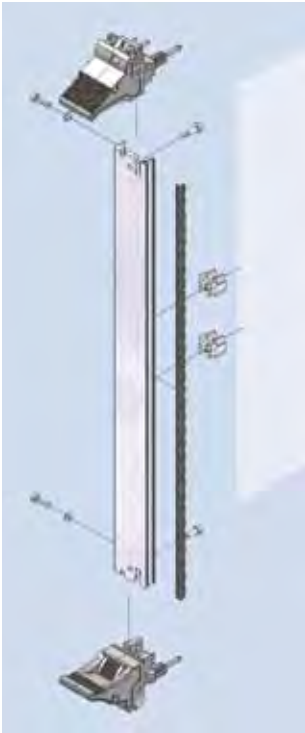
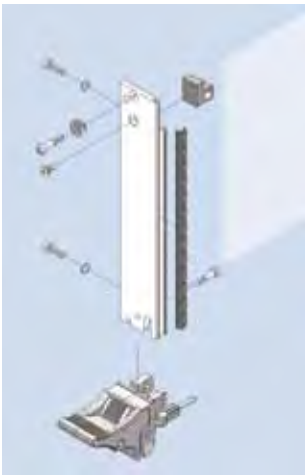
Assembled handle with mounting parts.

Ordering details

	order no. 409.
IEEE handle 4HP bottom	114 413
IEEE handle 4HP top	114 415

Front Panels RFI with IEEE Handle black with hot-swap

Subrack Accessories



Ordering details kit - extruded front panel RFI with IEEE handle, black, hot-swap in the bottom handle

nom. width [HP]	3 U order no. 409.	6 U order no. 409.
4	122 607	122 610
6	122 608	122 611
8	122 609	122 612

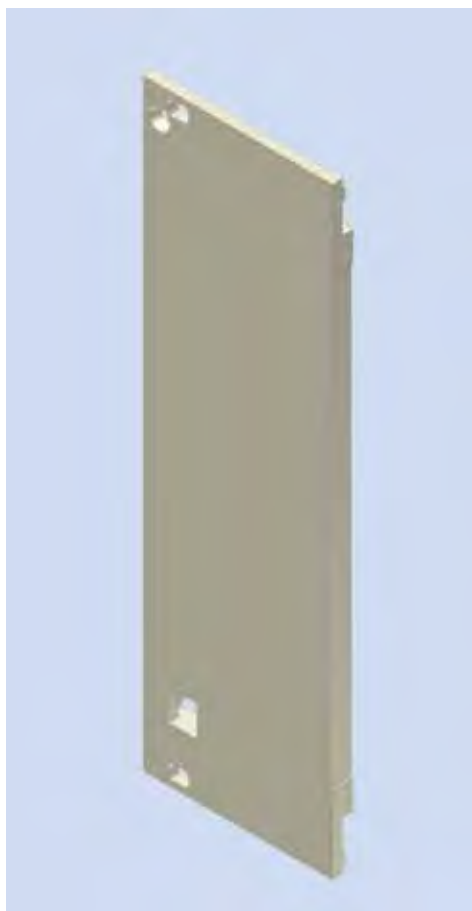
Delivery kit

	3 U pieces for 4-8 HP	6 U pieces for 4-8 HP
Front panel	1	1
IEEE handle topblack	-	1
IEEE handle bottom black	1	1
Micro switch	1	1
Front connector metal	1	-
Front panel support plug-in	-	2
Grounding bushing M 2.5	1	-
Mounting parts	1	1

Accessories

	order no. 409.
For one flat front panel 2 RFI-springs are needed.	
RFI spring F3 - 3U	111 112
RFI spring F3 - 6U	111 116
For assemble the RFI spring F3	
Roller cutter	118 433

Plastic Front Panel, Snap-in Handle



Plastic Front Panels

On the rear side of the 2 mm thick front panel is an integrated front connector for attaching 1.6 mm thickness 3 U PCBs.

The handle snaps in into the front panel, therefore the front panel can be modified easily.

Delivery

As single part

Technical data

Material	Polycarbonate, 10% fiber-glass reinforced
Color	RAL 7032, pearl gray or black
Continuous temperature	– 40 °C to + 115 °C
Fire protection class	UL 94 V-0

Ordering details plastic front panel

nom. width [HP]	3 U pearl gray order no. 409.	3 U black order no. 409.
3	035 004	-
4	-	-
8	035 665	040 387

Accessories

Minimum order quantity 100 pieces

	order no. 409.
Screw retainer 2 - M 2.5, gray	085 689
Cross-head screw M 2.5 x 10. 8	056 135



Snap-in Handle

For use with 2 mm thick front panels of plastic. The handle snaps in into the front panel.

Front panels aluminum on request

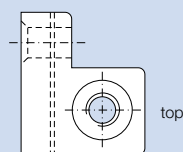
Technical data

Material	Polycarbonate, 10% fiber-glass reinforced
Color	RAL 7032, pearl gray or black
Continuous temperature	– 40 °C to + 105 °C
Fire protection class	UL 94 V-0

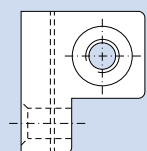
Ordering details snap-in handle

nom. width [HP]	RAL 7032 order no. 409.	pearl gray order no. 409.	black order no. 409.
3	043 035	035 528	040 385
4	043 036	035 529	040 386

Front Connector



top



bottom

Front Connector

Material: zinc die-cast
Finish: untreated

Ordering details

Front connector top	
Front connector bottom	

order no.
409.

099 731

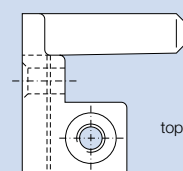
099 730

Accessories

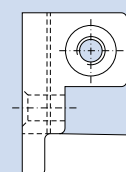
Counter sunk screw M 2.5 x 6
self tapping

Minimum order quantity 100 pieces

order no.: 409. 067 624



top



bottom

Front Connector with Male Contact

For pre-mating front panel grounding.

Material: zinc die-cast
Finish: tin-plated

Ordering details

Front connector top	
Front connector bottom	

order no.
409.

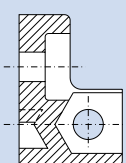
107 728

107 727

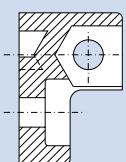
Accessories

	order no. 409.
Front panel grounding contact	058 102
Self tapping counter sunk screw M 2.5 x 6	067 624

Minimum order quantity 100 pieces



top



bottom

Plastic Front Connector

Technical data

Material	Polycarbonate, 10% fiber-glass reinforced
Color	gray
Continuous temperature	- 40 °C to + 100 °C
Fire protection class	UL 94 V-0

Ordering details

Front connector top	
Front connector bottom	

order no.
409.

065 883

065 882

Accessories

Minimum order quantity 100 pieces

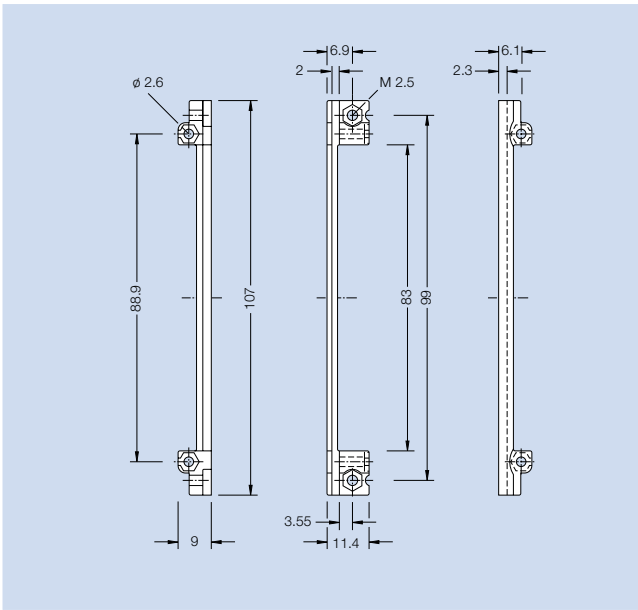
Hexagonal nut M 2.5	
Counter sunk screw M 2.5 x 6	

order no.
409.

013 938

067 624

Front Connector FEE, Front Panel Support



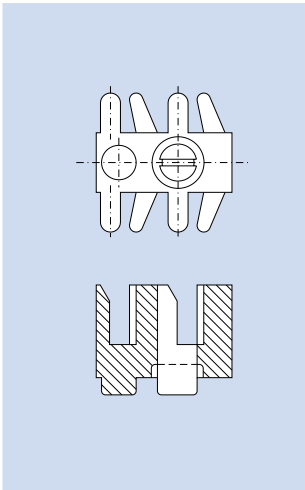
Front Connector FEE

With inserted nut M 2.5 for fastening to the front panel.
Also for use with front mounted Elements (FEE).

Technical data

Material	Polycarbonate, 10% fiber-glass reinforced nut: steel, galvanized and chromated
Color	gray
Continous temperature	– 40 °C to + 115 °C
Fire protection class	UL 94 V–0

order no.: 409. 024 830



Front Panel Support

For PCB's with a height over 3 U used with two-piece front connector.
Prevents deflection of the front panel when inserting the PCB.

Technical data

Material	Polycarbonate, 10% fiber-glass reinforced
Color	gray
Continous temperature	– 40 °C to + 100 °C
Fire protection class	UL 94 V–0

order no.: 409. 092 786

Screw Retainer, Grounding Bushing, Quick Lock E



Screw retainer, Grounding bushing and Screw

Subrack Accessories

Screw Retainer 2.5 - M2.5

For 2.5 mm thick front panels, for plugging in the screw

Technical data

Material	POM
Color	gray or black
Continuous temperature	- 40 °C to + 100 °C

Ordering details

Minimum order quantity 100 pieces

	Color	order no. 409.
Screw retainer 2.5 - M 2.5	gray	100 539
Screw retainer 2.5 - M 2.5	black	100 538

Grounding Bushing M 2.5

Pressed into the front panel. Secures the screw M 2.5 and provides electrical bonding between the screw and front panel and subrack; even when the front panel is anodized.

Material: brass, nickel plated

Minimum order quantity 10 pieces

order no.: **409. 082 594**

Screw M2.5 x 11.3

for 2.5 mm thick front panels

Material: knurled head screw: steel, nickel plated
others: stainless steel

Ordering details

Minimum order quantity 100 pieces

	head form	order no. 409.
Pan head screw	slotted	100 540
Oval head screw	cross slot	101 917
Knurled head screw	knurled	101 918



Quick Lock E

for 2.5 mm thick front panels.
Slot head.

Minimum order quantity 10 pieces

order no.: **409. 097 957**

Technical data

Material	sleeve: POM bolt: steel, galvanized
Color	gray
Continuous temperature	- 40 °C to + 100 °C

Cassettes

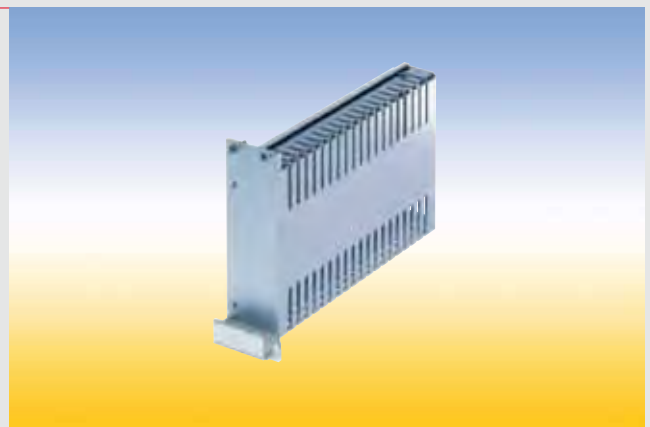
Cassette with Extruded Side Walls



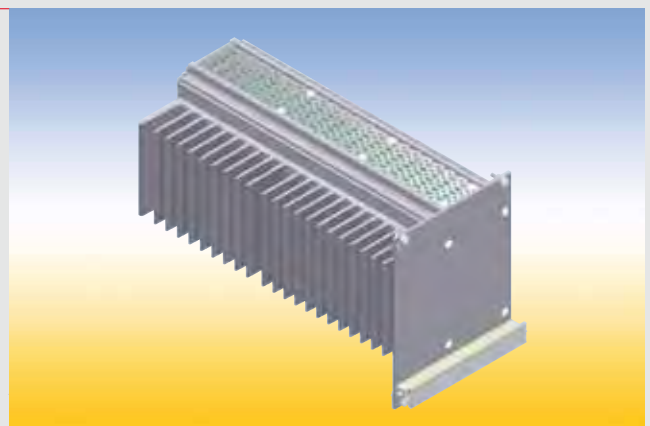
Cassette with four Depth Profiles



Cassette with Cover Hood



Cassette with Heat Sink



Cassettes



Description

The cassette has two functions:
It can be inserted into a subrack just like a PCB and it can accommodate plug-in boards.

Three cassette versions are available:

1. A cassette with extruded side walls
Extruded side walls in combination with a front panel and a rear panel make up the basic cassette which is then fitted with top and bottom plates.
2. A cassette with four depth profiles
Four identical depth profiles in combination with a front panel and a rear panel make up the basic cassette which is then fitted with top and bottom plates.
Two side service apertures are created which make the interior of the cassette easily accessible for inspection purposes. These apertures can be closed off using slide-in panels.
3. Cassette with cover hood
This version consists of a extruded side wall at the left to which the protective cover with an integrated rear wall is attached. The rear has a 4 HP aperture for installing an IEC 60 603-2 type B, C, D or F connector.

The special design features of the cassettes:

- ✓ The side edges of the front panel are slit for insertion of RFI gaskets which harmonically blend into the front panel grid and which require no additional space.
- ✓ The cassettes fit into all IEC 60 297 subracks.
- ✓ The cassette is fitted in the subrack using PCB guide mounts. For the right side of the cassette the guide mount is installed rotated by 180°.

- ✓ Suitable for accommodating Euroboards (3U, 6U) in accordance with IEC 60 297.
- ✓ The side walls and depth profiles have guide channels for insertion of 3U or 6U boards; only installation at the left is standardized.
- ✓ Additional guide mounts can be snapped into the top and bottom cover panels to accommodate internal boards.
- ✓ When used in a subrack the distance between the cassette and the PCB to the right of it is 2.47 mm.

Rear panel:

Three different rear panels are available:

1. Cassette „RG“ (rear panel closed):
This cassette is particularly suitable for any installation.
2. Cassette „RT“ (rear panel with partial aperture):
The rear panel has a 4HP aperture for installation of a connector.
3. Cassette „RV“ (rear panel with full aperture):
The rear panel has an aperture across its full width and is perforated for installation of connectors.

Dimensions

The cassette design is based on the following grid:

Horizontal pitch 5.08 mm
Height pitch 44.45 mm
Depth pitch 10.00 mm

Technical data

Standards	IEC 60297, Part 3
Material	„RV“ rear panel, top and bottom panels: sheet steel mounting parts: steel handles: plastic other parts: aluminum
Finish	side panel, covers, „RV“ rear panel: untreated front panel: front anodized, rear and edges untreated other parts: colorless chromated
Protection class	IP 30
Utilization category	-25 °C to 70 °C, =< 75 % relative humidity, condensation possible
Electrical requirements	all parts are electrically bonded to one another following assembly in accordance with VDE 100 § 8 Nb.

RFI shielding of Cassettes.

The Cassettes are manufactured from electrically conductive materials and screwed together. The RFI shielding can be further enhanced by increasing the number of screws used in vulnerable areas to obtain a superior RFI seal:

1. Top and bottom plates/ front panels
Additional mounting blocks can be used between the top and bottom covers and the front plate. The top and bottom covers are pierced every 5.08 mm and by drilling extra holes in the front plane, additional contact points can be made.
2. Top and bottom plates/ rear panels
Additional mounting blocks can be used between the top and bottom plates and the rear panels. The top and bottom plates are pierced every 5.08 mm

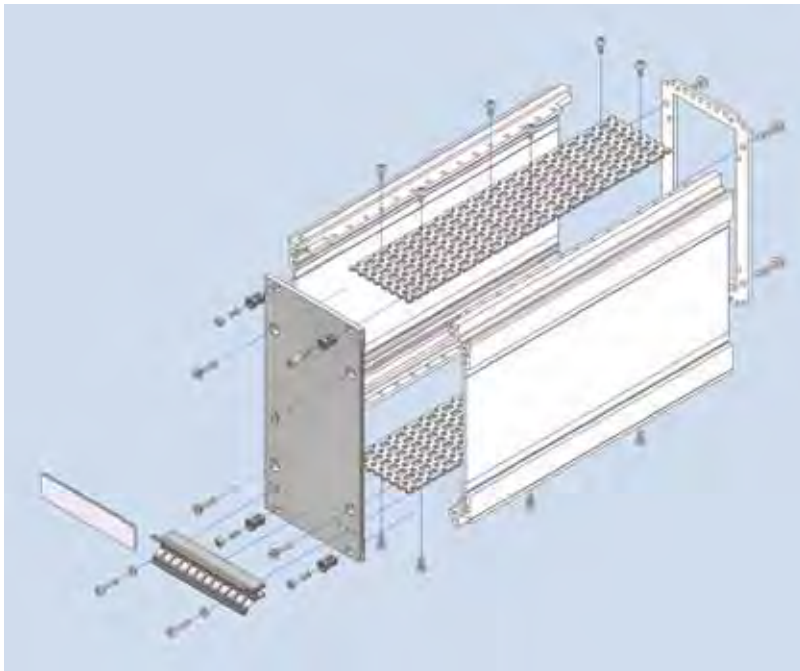
and by drilling extra holes in the rear panel types “R” and “RT”, additional contact points can be made. Rear panel type “RV” are pre-punched at 5.08 mm as standard and require no further modification.

3. 6 U Side wall / front panel
Two additional screws can be used in the front panel (one each side) to gain extra contact points to the side extrusion. Both the front panel and the extrusion require additional drilling.

Intermas Cassettes have excellent RFI Shielding properties as standard. But should you wish to enhance the RFI shielding, then please contact one of our specialists for further assistance.

Please ask your local representative for your
personal assistance.
You find your contact person on our homepage:
www.intermas-el.com

Cassette with Extruded Side Walls



Cassette with Extruded Side Walls

The cassette kits includes following rear panels:

1. Rear panel closed (RG)
2. Rear panel with partial aperture (RT)
3. Rear panel with full aperture (RV).

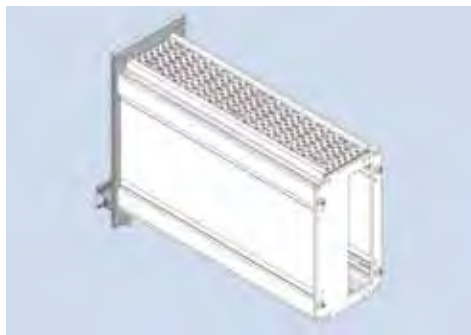
Kit consists of:

- 2 extruded side walls
- 1 rear panel
- 2 top/bottom plate
- 1 front panel, with slits in the side edges for insertion of RFI gaskets
- 1 handle
- 1 aluminum ident-plate
- Mounting parts

Delivery

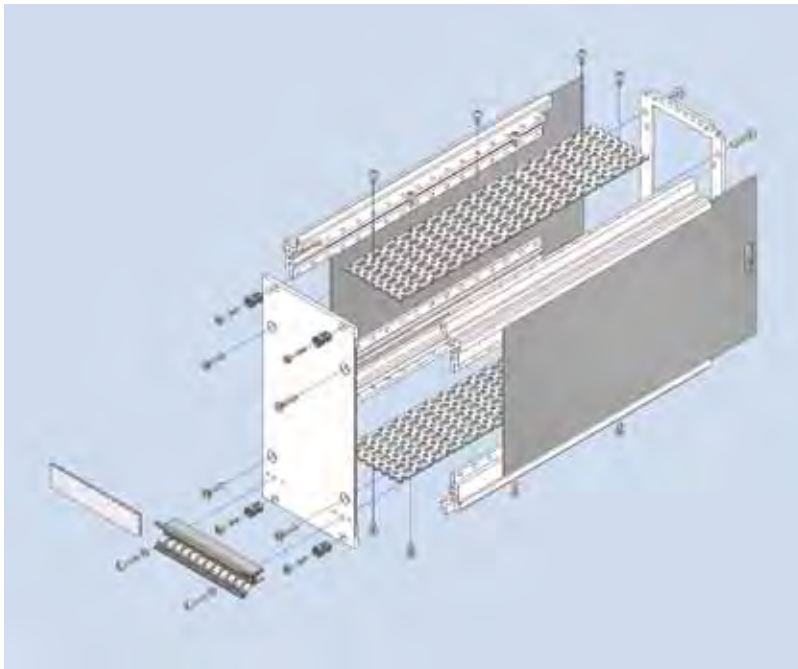
The cassette is delivered unassembled as individual parts or as a kit.

Ordering details kit cassette with extruded side walls



	nom. height [U]	nom. width [HP]	nom. depth 160 mm order no. 409.	nom. depth 220 mm order no. 409.
RT	3	08	165 617	165 625
RG	3	10	165 602	165 610
RG	3	12	165 603	165 611
RG	3	14	165 604	165 612
RG	3	21	165 605	165 613
RG	3	28	165 606	165 614
RG	3	42	165 607	165 615
RV	3	10	165 634	165 642
RV	3	12	165 635	165 643
RV	3	14	165 636	165 644
RV	3	21	165 637	165 645
RV	3	28	165 638	165 646
RV	3	42	165 639	165 647

Cassette with four Depth Profiles



Cassette with four Depth Profiles

The cassette kits includes following rear panels:

1. Rear panel closed (RG)
2. Rear panel with partial aperture (RT)
3. Rear panel with full aperture (RV).

Kit consists of:

- 4 depth profiles
- 2 struts
- 2 side plates
- 1 rear panel 3 U / 2 rear panels 6 U
- 2 top/bottom plate
- 1 front panel, with slits in the side edges for insertion of RFI gaskets
- 1 handle
- 1 aluminum ident-plate
- Mounting parts

Delivery

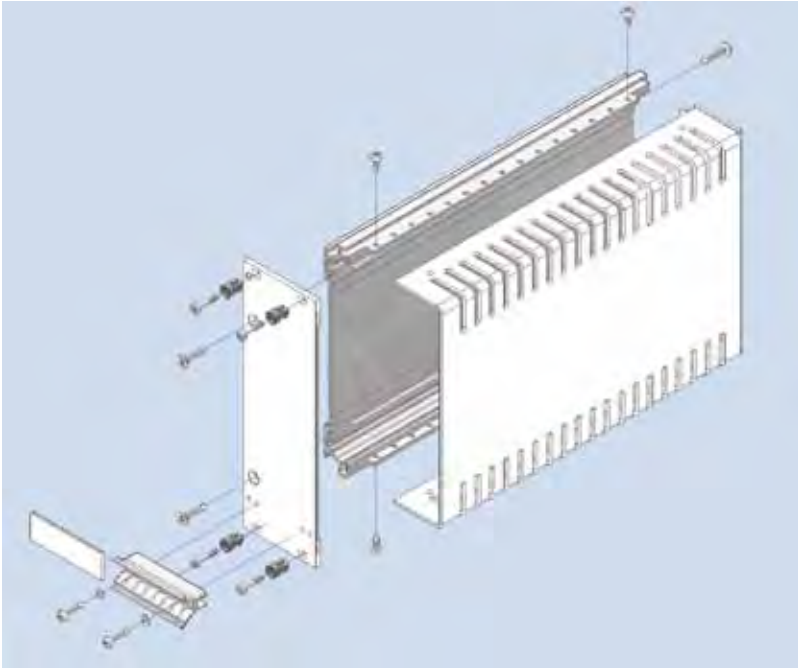
The cassette is delivered unassembled as individual parts or as a kit.

Ordering details kit cassette with four depth profiles



	nom. height [U]	nom. width [HP]	nom. depth 160 mm order no. 409.	nom. depth 220 mm order no. 409.
RT	3	08	165 713	165 721
RG	3	10	165 698	165 706
RG	3	12	165 699	165 707
RG	3	14	165 700	165 708
RG	3	21	165 701	165 709
RG	3	28	165 702	165 710
RG	3	42	165 703	165 711
RV	3	10	165 730	165 738
RV	3	12	165 731	165 739
RV	3	14	165 732	165 740
RV	3	21	165 733	165 741
RV	3	28	165 734	165 742
RV	3	42	165 735	165 743
RT	6	08	165 873	165 881
RG	6	10	165 842	165 850
RG	6	12	165 843	165 851
RG	6	14	165 844	165 852
RG	6	21	165 845	165 853
RG	6	28	165 846	165 854
RG	6	42	165 847	165 855
RV	6	10	165 858	165 866
RV	6	12	165 859	165 867
RV	6	14	165 860	165 868
RV	6	21	165 861	165 869
RV	6	28	165 862	165 870
RV	6	42	165 863	165 871

Cassette with Cover Hood



Cassette with Cover Hood

Kit consists of:

- 1 extruded side wall
- 1 cover hood
- 1 front panel, with slits in the side edges for insertion of RFI gaskets
- 1 handle
- 1 aluminum ident-plate
- Mounting parts

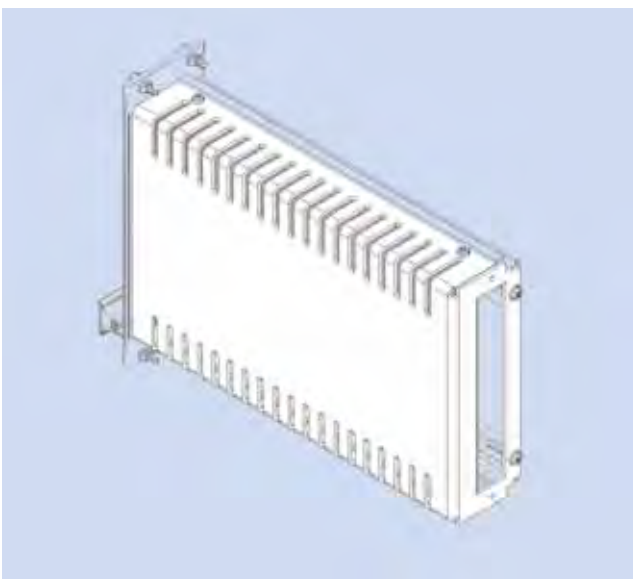
Delivery

The cassette is delivered unassembled as individual parts or as a kit.

Ordering details kit cassette with cover hood

nom. height [U]	nom. width [HP]	nom. depth 160 mm order no. 409.	nom. depth 220 mm order no. 409.
3	6	166 112	166 116
3	7	166 113	166 117
3	8	166 114	166 118

Individual parts of the cassettes



Cover Hood

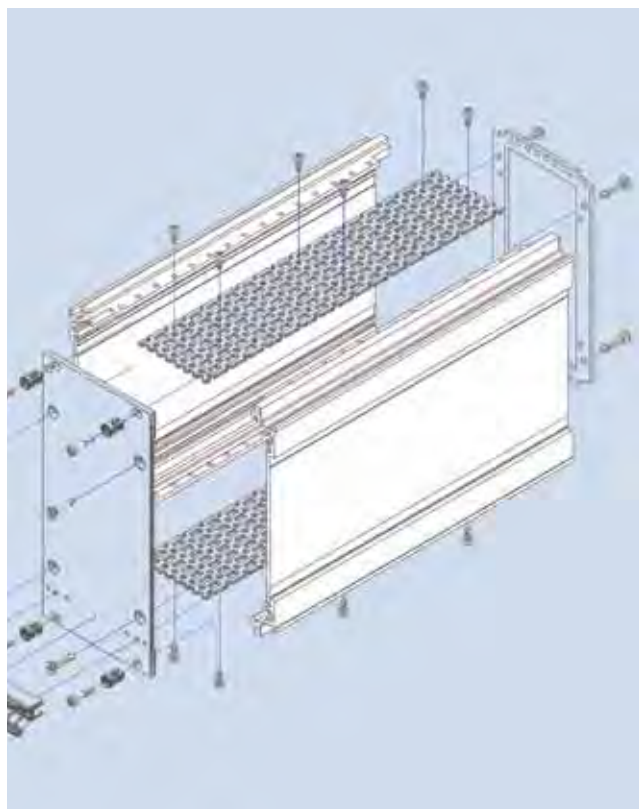
Material: aluminum

Finish: blank

Ordering details cover hood

nom. height [U]	nom. width [HP]	nom. depth 160 mm order no. 409.	nom. depth 220 mm order no. 409.
3	6	165 896	166 100
3	7	165 897	166 101
3	8	165 898	166 102

Individual Parts of the Cassette

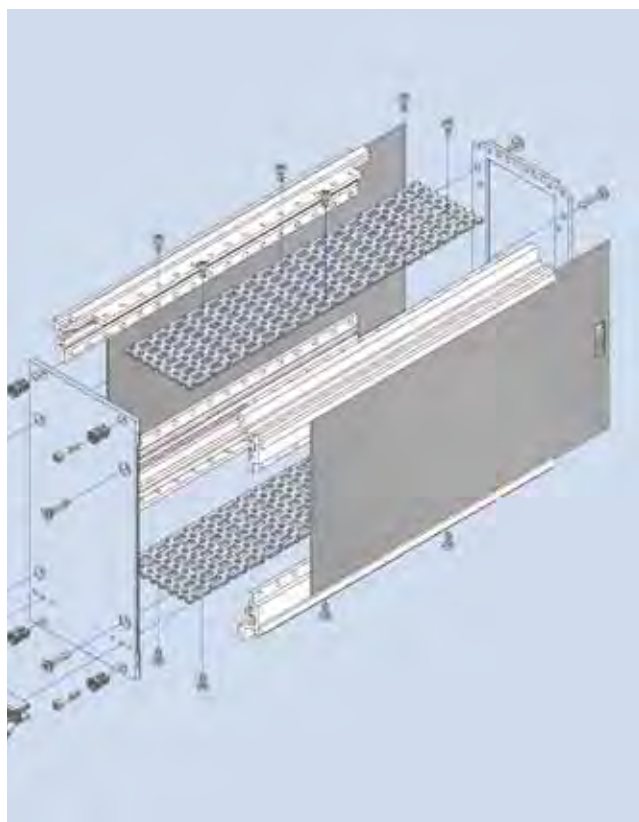


Extruded Side Wall

Material: aluminum
Finish: colorless chromated

Ordering details extruded side walls

nom. depth [mm]	3 U order no. 409.
160	079 202
220	079 203



Depth Profiles

Material: aluminum
Finish: colorless chromated

Ordering details depth profiles

nom. depth [mm]	order no. 409.
160	039 603
220	039 604

Side Plates

Material: aluminum
Finish: blank

Ordering details side plates

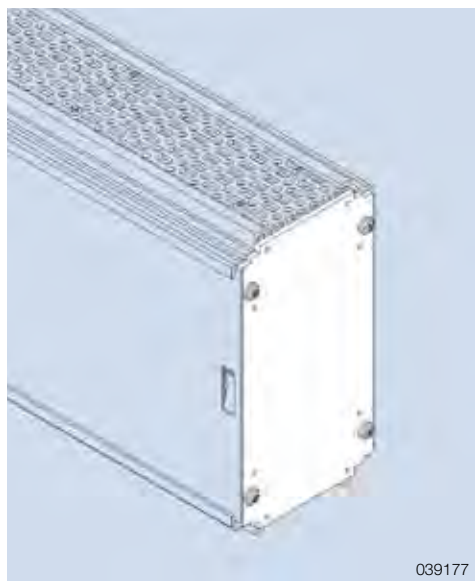
nom. depth [mm]	3 U order no. 409.	6 U order no. 409.
	order no.	order no.
160	039 542	039 546
220	039 543	039 547

Strut 6 U

Material: aluminum
Finish: colorless chromated

order no.: 409. 039 540

Individual Parts of the Cassettes



Rear Panel RG

3 U panel wall closed. 6 U cassettes require two 3 U rear panels.

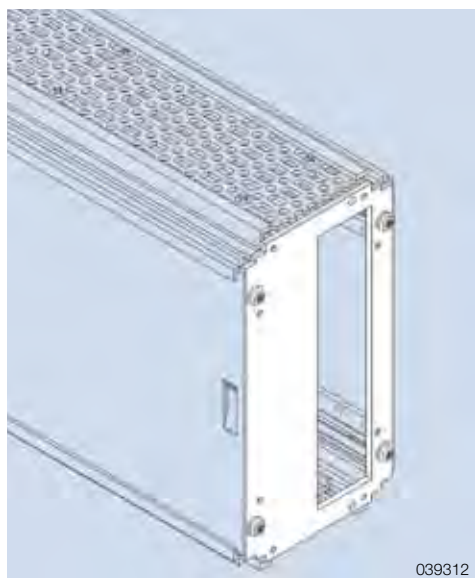
Material: aluminum

Finish: blank

Ordering details

rear panel RG

nom. width [HP]	order no. 409.
8	-
10	166 237
12	166 238
14	166 239
21	166 240
28	166 241
42	166 242



Rear Panel RT

3 U rear panel with partial aperture. 6 U cassettes require two 3 U rear panels.

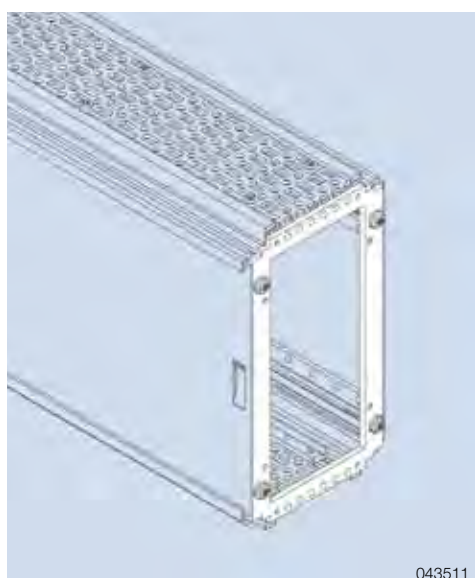
Material: aluminum

Finish: blank

Ordering details

rear panel RT

nom. width [HP]	order no. 409.
8	166 243
10	-
12	-
14	-
21	-
28	-
42	-



Rear Panel RV

3 U Rear panel with full aperture. 6 U cassettes require two 3 U rear panels.

Material: steel

Finish: galvanized und colorless chromated

Ordering details

rear panel RV

nom. width [HP]	order no. 409.
8	-
10	043 514
12	043 516
14	043 518
21	043 525
28	043 532
42	043 546

Individual Parts of the Cassettes



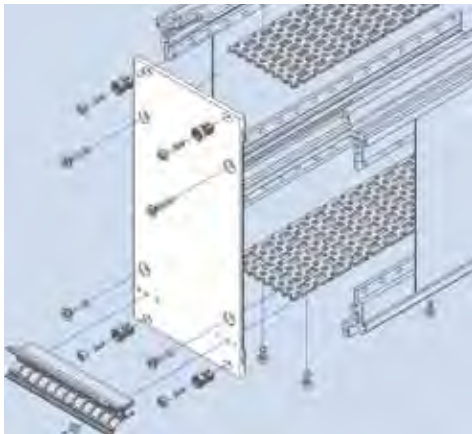
040145

Top/Bottom Plate

Material: steel
Finish: galvanized and colorless chromated

Ordering details top/bottom plate

nom. width [HP]	nom. depth 160 mm order no. 409.	nom. depth 220 mm order no. 409.
8	038 687	038 763
10	038 689	038 765
12	038 691	038 767
14	038 693	038 769
21	038 700	038 776
28	038 707	038 783
42	038 721	038 797



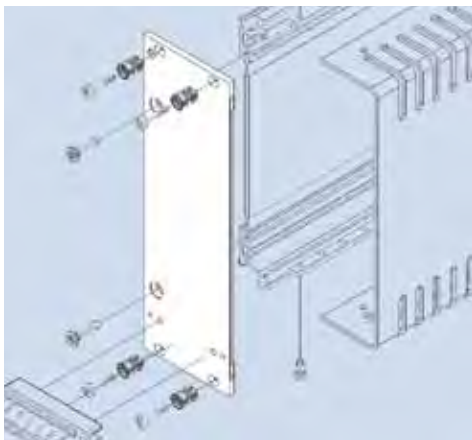
Front Panel

For cassette with extruded side panel or depth profiles.

Material: aluminum
Finish: front anodized, rear and edges blank

Ordering details front panel for cassette

nom. width [HP]	3 U order no. 409.	6 U order no. 409.
8	115 005	119 024
10	115 007	119 026
12	115 009	119 028
14	115 011	119 030
21	115 018	119 037
28	115 025	119 044
42	115 039	119 058



Front Panel

For cassette with cover hood.

Material: aluminum
Finish: front anodized,
 rear and edges blank

Ordering details front panel for cassette cover hood

nom. width [HP]	3 U order no. 409.
6	122 380
7	120 282
8	120 283

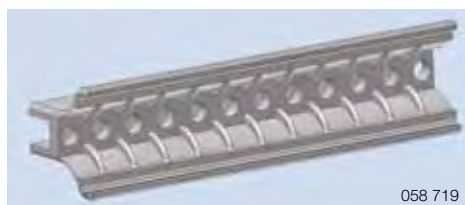
Individual Parts of the Cassettes

Handle FP for Front Panels

Assembled with M 2.5 screws and with 1 additional self tapping screw from 6 HP. The handle is held against torsion by means of two nipples.

Technical data

Material	Polycarbonate, colored 10% fiber-glass reinforced
Color	gray RAL 7032, black
Continuous temperature	– 40 °C to + 100 °C)
Fire protection class	UL 94 V-0



058 719

Ordering details handle FP

width [HP]	length [mm]	gray order no. 409.	black order no. 409.
6	29.04	103 006	103 206
7	34.12	103 007	103 207
8	39.20	103 008	103 208

Ordering details handle strip FP

width [HP]	length [mm]	gray order no. 409.	black order no. 409.
10	49.36	103 810	058 910
12	59.52	103 812	058 912
14	69.68	103 814	058 914
21	105.24	103 821	058 921
28	150.80	103 828	058 928
42	211.92	103 842	058 942



022 722

Ident-Plate

for handle FP.

The ident-plate is markable and printable, snapped in after mounting the handle to the front panel.

Material: aluminum
Finish: anodized

Ordering details ident-plate

width [HP]	length [mm]	order no. 409.
6	29.04	022 792
7	34.12	022 793
8	39.20	022 794
10	49.36	022 796
12	59.52	022 798
14	69.86	022 800
21	105.24	022 807
28	150.80	022 814
42	211.92	040 652

Mounting parts of the cassette

Minimum order quantity each 100 pieces

	order no. 409.
To assemble the strut and the top/bottom plates to the profiles	
Oval head screw M 2.5 x 5	039 691
To assemble the rear plate to the profiles	
Oval head screw M 3 x 12	108 963
Spring washer A 3	040 969
To assemble the front panel to the profiles	
Counter sunk screw M 3 x 12	108 962
To assemble the cassette into the subrack	
Screw retainer 2.5, gray	100 539
Screw M 2.5 x 11.3	101 917

Mounting parts for handles:

Minimum order quantity each 100 pieces

	order no. 409.
Washer 2.7	013 911
Self tapping screw M 2.5 x 10	040 401



Accessories

Pan head screw M2,2 x 6,5

Minimum order quantity 100 pieces

order no.: 409. 022 672

Card Guide for Cassette

This card guide is snap-in and screw-on type.

Technical data

Material	Noryl
Color	RAL 7035
Continuous temperature	- 40 °C to + 115 °C
Fire protection class	UL 94 V-0

Ordering details

	nom. length [mm]	PCB thickness [mm]	order no. 409.
Card guide for cassette	100	1.6	041 012
Card guide for cassette	160	1.6	041 008



PCB Retainer

To secure PCB's inside the cassette.
Assembled together with the card guide.

Technical data

Material	Noryl
Color	RAL 7035
Continuous temperature	- 40 °C to + 115 °C
Fire protection class	UL 94 V-0

order no.: **409. 043 488**



Male Connector Assembly Kit

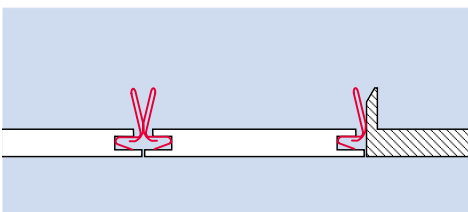
To assemble male connectors of type B, C, D, E, F, G, or H
reg. DIN EN 60603 in rear panels.

Material: steel

Finish: galvanized und colorless chromated

Delivery: 1 male connector bracket top
1 male connector bracket bottom
Mounting parts

order no.: **409. 046 098**



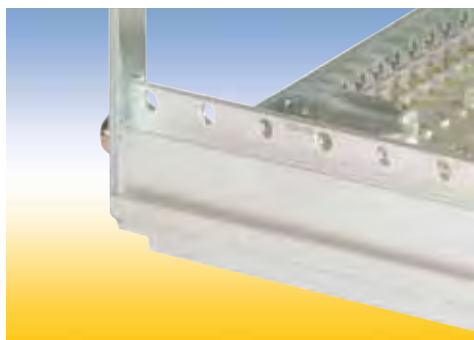
RFI-Spring F3

The RFI-contact spring for inserting into the side edges of the front panel.

Ordering details

	order no. 409.
For one flat front panel 2 RFI-springs are needed.	
RFI spring F3 - 3U	111 112
RFI spring F3 - 6U	111 116
For assemble the RFI spring F3	
Roller cutter	118 433

Accessories for Cassettes



Mounting Block

To connect top/bottom plate with rear panel.

The mounting block can also be used to enhance RFI shielding in conjunction with blank rear panel RG. The rear panel can be additionally drilled for extra contact points.

order no.: **409. 044 090**

Backplane Holder

To assemble backplanes on top/bottom plate.

order no.: **409. 119 013**

Accessories

Minimum order quantity each 100 pieces

	order no. 409.
To assemble the rear plate and the backplane holder at the top/bottom plates	
Oval head screw M 2.5 x 6	046 999
To assemble the backplane or the rear panel at the mounting block or backplane holder	
Oval head screw Taptite M 2.5 x 10	040 401
Spring washer 2.7	013 911



Cassette Angle

To assembly a free wiring level inside of the cassette.
Mounted on the top/bottom plate.

Material: steel

Finish: galvanized and colorless chromated

Ordering details cassette angle

length [mm]	for cassette nom. width [HP]	order no. 409.
9.18	8	039 851
19.34	10	039 853
29.50	12	039 855
39.66	14	039 857
75.22	21	039 864
110.78	28	039 954
181.90	42	039 968

Accessories

Minimum order quantity each 100 pieces

	order no. 409.
To assemble the cassette angle at the top/bottom plates	
Oval head screw M 2.5 x 5	039 691
To assemble the connectors at the cassette angle	
Tapered screw M 2.5 x 6.5	032 708



Shell

To cover the open space between the top and bottom rear panels for 6-U-cassette. The shell is assembled at the strut.

Material: aluminum
Finish: colorless chromated

Ordering details

	nom. width [HP]	order no. 409.
Shell 08	8	040 348
Shell 10	10	040 350
Shell 12	12	040 352
Shell 14	14	040 354
Shell 21	21	040 361
Shell 28	28	040 368
Shell 42	42	040 382

Accessories

Oval head screw M 3 x 12

Minimum order quantity 100 pieces

order no.: 409. 108 963



Screw retainer, grounding bushing and screw

Screw retainer 2.5 - M 2.5

To 2.5 mm thickness front panels, for pushing in the screw

Technical data

Material	POM
Color	gray or black
Continuous temperature	- 40 °C to + 100 °C

Ordering details

Minimum order quantity 100 pieces

	Color	order no. 409.
Screw retainer 2.5 - M 2.5	gray	100 539
Screw retainer 2.5 - M 2.5	black	100 538

Grounding Bushing M 2.5

To press in to the front panel in order to get electrical bounding to the cassette even when the front panel is anodized.

Material: brass, nickel plated

Minimum order quantity 10 pieces

order no.: **409. 082 594**

Screw M2.5 x 11.3

for 2.5 mm thick Front panels

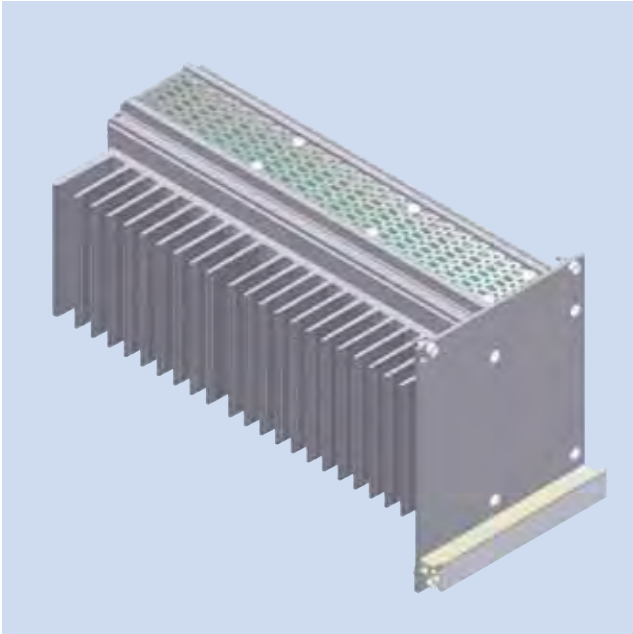
Material: Knurled head screw:
steel nickel plated
Others: stainless steel

Ordering details

Minimum order quantity 100 pieces

	head form	order no. 409.
Pan head screw	slotted	100 540
Oval head screw	cross slot	101 917
Knurled head screw	knurled	101 918

Cassette with Heat Sink



Cassette with Heat Sink

This cassette is designed for passive cooling of electronic sub assemblies and systems. The thermal power loss which is generated in the 19" cassette is dissipated by a heat sink which also serves as sidewall. The heat sink is covered by an asymmetric front panel. Euroboards are being fitted into card guides which can be snapped in every possible position in the cassette. A wide range of accessories, for example rear cover, handle and handle strip in different colors and types are available. The front panel can be fitted with RFI springs to realize RFI shielding of the front of the subrack. Optionally the complete cassette can be RFI shielded.

Delivery

4 depth profiles
 1 side plates
 1 heat sink, aluminum blank
 1 rear panel 3 U
 2 top/bottom plate
 1 front panel, with slits in the side edges for insertion of RFI gaskets
 1 handle
 1 aluminum ident-plate
 Mounting parts

Delivery

The cassette is delivered unassembled as individual parts or as a kit.

Ordering details cassette with heat sink

height [U]	depth [mm]	cassette + heat sink- width [HP]	order no. 409.
3	160	12 + 8	168 938
3	160	28 + 8	168 939
3	220	12 + 8	168 940
3	220	28 + 8	168 941

Accessories

	order no. 409.
For one flat front panel 2 RFI-springs are needed.	
RFI spring F3 - 3U	111 112
For assemble the RFI spring F3	
Roller cutter	118 433

Wallmount and Box

- ✓ Active cooled Wallmount Industrial PC
 - High performance mobile CPUs
 - Desktop, Wallmount or 19" mounting kit
 - Extensive range of upgrading options
- ✓ Fanless Box Industrial PC
 - Robust and maintenance-friendly design
 - Low power or mobile CPUs
 - Hardware extendable by Multi-I/O Bus



19" Rackmount

- ✓ 2 U and 4 U Rackmount
- ✓ High availability by using RAID, UPS, and redundant power supplies



Customer specific electronic systems

- ✓ Electronic products according to your requirements
- ✓ Consulting service and development for mechanics, electronics and wiring
- ✓ Professional electronic integration and wiring
- ✓ Certifications (CE, UL, shock, vibration, etc.) on request



Wallmount Industrial PC



Technical data

Housing	Dimension (HxWxD): 100 x 410 x 230 mm Weight: about 5 kg Material: fire-galvanized steel plate housing, top cover and base plate painted aluminium
Power supply	1 U power supply 180-250 W Input: 90-264 VAC, 47-63 Hz, active PFC
Mainboard	Kontron KTQM67 Mobile Intel® QM67 Express chip set
Memory / Storage	2 GB DDR3 SODIMM 2.5" HDD, Hitachi Travelstar 250 GB
CPU	FCPGA988, embedded Intel® Core™ i7 – 2xxx prozessor series Intel® Core™ i5 – 2xxx prozessor series Intel® Celeron® prozessor B810
Interface	6 x SATA (incl. 2 x SATAIII), RAID support USB 2.0: 6 x external, 8 x internal LAN: 3 x Intel® GB 4 x COM 1 x PCI-Express x16, 1 x PCI-Express Grafic: 2 x Display Port, LVDS and DVI

Description

The InterMas WM-M is a robust and long term available Wallmount Industrial PC. It has a compact and modular design and allows various technical and mechanical extensions.

Advantages

- ✓ Robust and maintenance-friendly housing
- ✓ Only long term available components
- ✓ Overpressure-based cooling concept with active ventilation
- ✓ Expansion slots via riser card
- ✓ Two hard disks with RAID 0 or RAID 1
- ✓ Hard drive bay with 2 x 2.5" operated from outside
- ✓ I/O plate for customer specific ports
- ✓ All operating elements and connections at the device front
- ✓ Assembly: 3 U 19" Rackmount, Wallmount, desktop housing
- ✓ Air filter easily replaceable from outside
- ✓ WLAN IEEE 802.11b/g/n (Draft 2.0), 144Mbps

Application

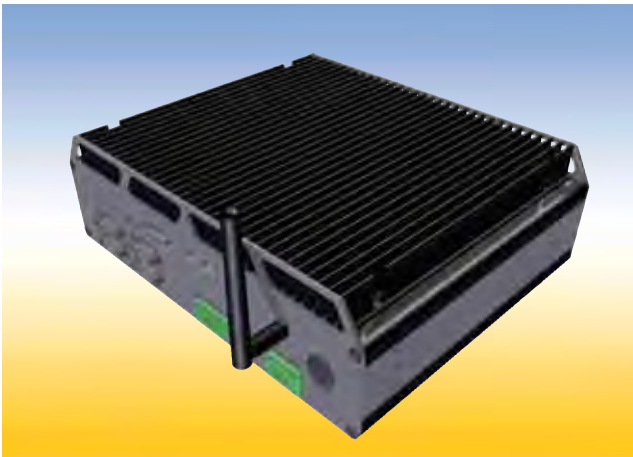
- ✓ Measurement and control
- ✓ Visualization
- ✓ Data logging and conversion
- ✓ Image and video data processing
- ✓ Soft-SPS IEC 61131

Optional components

- Optical disk drive DVD-ROM or DVD-RW
- Up to 16 GB DDR3 SODIMM
- Additional hard drive 2.5"
- Compact Flash
- WLAN: 144Mbps module incl. antenna
- 19" 3 U mounting flanges

General

- All components designed for 24/7 operation
- 5 – 50 °C operating temperature range
- Extensive test of all components including Burn-In test



Technical data

Housing	Dimension (HxWxD): 83 x 262 x 215 mm Weight: about 4 kg Material: aluminium anodized / painted
Power supply	Wide-range input 10...36 .DC Operating temperature range -20...+70 °C
Mainboard	Advantech MIO-5270D-S6A1E AMD G-Series + A50M FCH
Memory / Storage	1 GB DDR3 SODIMM 2.5" HDD, Hitachi Travelstar 250 GB
CPU	AMD Embedded-G series T40R 1.0GHz Single Core T40E 1.0GHz Dual Core T44R 1.2GHz Single Core T56N 1.65GHz Dual Core
Interface	2 x SATA, 1 x CFast USB 2.0: 4 x external, 2 x internal 2 x GBit LAN, Realtec RTL8111E 4 x COM Graphic: LVDS, VGA and DVI, Dual Display 1 x PCIe Mini Card, 1 x MIOe

Description

The InterMas CB-M is a robust and long term available Box Industrial PC. It has a compact and modular design, based on InterMas *D/Var* profiles. This construction method allows high flexibility of the case geometry in all three axes.

Advantages

- ✓ Robust and maintenance-friendly housing
- ✓ Only long term available components
- ✓ Passive cooling system
- ✓ No rotating components with CFast card
- ✓ 8 GPIO ports
- ✓ Extendable hardware via MI/O (Multiple I/O) extension
- ✓ All operating elements and connectors at the device front
- ✓ WLAN IEEE 802.11b/g/n (Draft 2.0), 144Mbps

Application

- ✓ Measurement and control
- ✓ Visualization
- ✓ Data logging and conversion
- ✓ Image and video data processing
- ✓ Soft-SPS IEC 61131

Optional components

- Wall mounting brackets
- 4 GB DDR3 SODIMM
- Additional hard drive 2.5"
- CFast Flash card
- WLAN: 144Mbps module incl. antenna

General

- All components designed for 24/7 operation
- 5 – 40 °C operating temperature range
- Extensive test of all components including Burn-In test

19" 4 U Rackmount Industrial PC



Technical data

Housing	Dimension (HxWxD): 177 (4 U) x 483 (19") x 448 mm Weight: about 15 kg Material: fire-galvanized steel plate housing, front plate painted aluminium
Power supply	Bicker BEA 630, 300 W Input voltage 90...264 VAC, 47-63 Hz, active PFC 4-kV-surge-input filter
Mainboard	Fujitsu D3076-S ATX Intel® Q67 Express chip set
Memory / Storage	2 GB DDR3 SDRAM 3.5" HDD, Hitachi Deskstar 320 GB
CPU	LGA 1155, embedded Intel® Core™ i7 – 2xxx prozessor series Intel® Core™ i5 – 2xxx prozessor series Intel® Core™ i3 – 2xxx prozessor series
Interface	6 x SATA (incl. 2 x SATAIII), RAID =0/1/5/10 support USB 2.0: 8 x external, 2 x internal 2 x GBit LAN, Intel 82579LM / Intel 82574L 2 x COM Intel® HD Graphics DX10.1, DVI-I / DisplayPort 4 x PCI, 2 x PCI-Express x16

Description

The InterMas RM-4 is a robust and long term available 19" 4 U Rackmount Industrial PC. Its robust and scalable chassis has an excellent mechanical stability, which makes the RM-4 suitable for use in harsh industrial environments.

Advantages

- ✓ Robust and maintenance-friendly housing
- ✓ Only long term available components
- ✓ Overpressure-based cooling concept with active ventilation
- ✓ 7 slots with variable hold-down brackets
- ✓ All operating elements and two USB-ports at the device front
- ✓ Optional assembly of telescopic rails
- ✓ Air filter for front-sided ventilation easily replaceable from outside
- ✓ WLAN IEEE 802.11b/g/n (Draft 2.0), 144Mbps
- ✓ TEAC 3.5" card reader

Application

- ✓ Measurement and control
- ✓ Visualization
- ✓ Data logging and conversion
- ✓ Image and video data processing
- ✓ Data recording and archiving
- ✓ Soft-SPS IEC 61131

Optional components

- Optical disk drive DVD-ROM or DVD-RW
- Up to 32 GB DDR3 SDRAM
- Up to 5 hard disks 3.5"
- Hard drives in RAID 0/1/5/10 configuration
- 3.5" card reader
- WLAN: 144Mbps module incl. antenna
- Hold down brackets for plug-in cards
- Telescopic rails

General

- All components designed for 24/7 operation
- 5 – 50 °C operating temperature range
- Extensive test of all components including Burn-In test

19" 2 U Rackmount Industrial PC



Technical data

Housing	Dimension (HxWxD): 88 (2 U) x 483 (19") x 443 mm Weight: about 12 kg Material: fire-galvanized steel plate housing, front plate painted aluminium
Power supply	2 U ATX power supply, 300 W Input voltage 90...264 VAC, 47-63 Hz, active PFC
Mainboard	Fujitsu D3071-S µATX Intel® Q67 Express chip set
Memory / Storage	2 GB DDR3 SDRAM 3.5" HDD, Hitachi Deskstar 320 GB
CPU	LGA 1155, embedded Intel® Core™ i7 – 2xxx prozessor series Intel® Core™ i5 – 2xxx prozessor series Intel® Core™ i3 – 2xxx prozessor series
Interface	6 x SATA (incl. 2 x SATAIII), RAID =0/1/5/10 support USB 2.0: 8 x external, 2 x internal 2 x GBit LAN, Intel 82579LM / Intel 82574L 2 x COM Intel® HD Graphics DX10.1, DVI-I / DisplayPort 2 x PCI, 2 x PCI-Express x16

Description

The InterMas RM-2 is a robust and long term available 19" 2 U Rackmount Industrial PC. Its robust and scalable chassis has an excellent mechanical stability, which makes the RM-2 suitable for use in harsh industrial environments.

Advantages

- ✓ Robust and maintenance-friendly housing
- ✓ Only long term available components
- ✓ Overpressure-based cooling concept with active ventilation
- ✓ Two slots via riser card
- ✓ All operating elements and two USB-ports at the device front
- ✓ Optional assembly of telescopic rails
- ✓ Air filter for front-sided ventilation easily replaceable from outside
- ✓ WLAN IEEE 802.11b/g/n (Draft 2.0), 144Mbps
- ✓ TEAC 3,5" card reader

Application

- ✓ Measurement and control
- ✓ Visualization
- ✓ Data logging and conversion
- ✓ Image and video data processing
- ✓ Data recording and archiving
- ✓ Soft-SPS IEC 61131

Optional components

- Optical disk drive DVD-ROM or DVD-RW
- Up to 32 GB DDR3 SDRAM
- Up to 3 hard disks 3.5"
- Hard drives in RAID 0/1 configuration
- 3.5" card reader
- WLAN: 144Mbps module incl. antenna
- Telescopic rails

General

- All components designed for 24/7 operation
- 5 – 50 °C operating temperature range
- Extensive test of all components including Burn-In test

Customer specific electronic systems

System consulting

- ✓ Project planning combining your specifications and our know-how

Development

- ✓ Mechanics, customer specific electronics, prototype construction
- ✓ Consider environmental conditions like shock, vibration, temperature and RF-signals

Production

- ✓ Metal processing, surface refinement, assembly

Elektronics and wiring

- ✓ ESD compliant electronic assembly and wiring

Quality assurance

- ✓ Electrical safety tests, component test, system test, Burn-In



Application examples

High speed data acquisition system

- Customer specific design with PCI slots at front side
- High EMI requirements because of high frequency clocking
- Optimized cooling for high-quality components

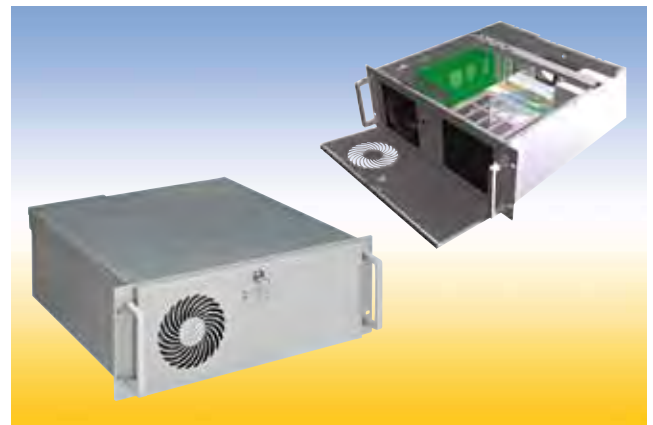
Control system with touch operation

- 2,5 U height and only 6 cm depth
- High performance in a small housing
- Development of a cooling concept
- Reliable touch operation



Highly available Industrial PC

- Lockable front door to prevent unauthorized access
- System with shock and vibration dampers
- High reliability by using RAID and redundant power supply



Please ask your local representative for your
individual system configuration.
You find your contact person on our homepage:
www.intermas-el.com

AC/DC converters

- ✓ PK MONOVOLT
- ✓ PK BIVOLT
- ✓ PK TRIVOLT
- ✓ VP 40
- ✓ VP 50



AC/DC converters with active PFC

- ✓ VP 80
- ✓ VP 150



AC/DC converters economy

- ✓ EC MONOVOLT
- ✓ EC TRIVOLT



DC/DC converters

- ✓ GK TRIVOLT





MONOVOLT AC/DC-converters

30 to 120 Watt switched mode AC/DC plug-in power supplies with one output in 3 U Eurocassettes for use in 19" subracks to IEC 60297-3.

- ✓ Compact rugged design in stable aluminum cassette
- ✓ High regulation accuracy
- ✓ Remote On/Off and Powerfail signal
- ✓ SENSE-operation and Overvoltage protection (OVP)
- ✓ PK 60-R for redundant operation
- ✓ Convection cooling
- ✓ CE marked for compliance to EMC and Low Voltage Directives
- ✓ Safety according to EN 60950, UL, cUL
- ✓ VERO standardised pinning
- ✓ 24 months warranty

Ordering details Power Supplies Monovolt AC/DC-converter

	nom. height/ nom. width [U] / [HP]	for nom. depth [mm]	single output [W]	output [V] / [A]	without powerfail order no. 116.
PK 30	3 / 8	>160	30	5V/6A	010016D*
PK 60	3 / 8	>160	60	5V/12A	010063D*
PK 60	3 / 8	>160	60	12V/5A	010064A*
PK 60	3 / 8	>160	60	24V/2,5A	010066F*
PK 120	3 / 14	>160	120	12V/10A	010070J
PK 120	3 / 14	>160	120	24V/5A	010072C

* EN 60950, UL and cUL certified

For applications according EN 61000-3-2, we recommend the VP-Series.

Accessories

	order no.
Reduced height front panel for PK 30	148-011002D
Reduced height front panel for PK 60	148-010021E
Reduced height front panel for PK 120	148-010019G
Male connector with coding strip H15 DIN 41612	017-010115K
Minimum order quantity 1 pack (10 pieces)	
Coding strip	017-010064F

Technical input data

Input voltage (switchable)	115 / 230VAC
Input frequency	47-63Hz
Inrush surge current limit	by NTC
Input voltage spike limit	by VDR
Hold-up time	>20 msec (at nominal values)
Efficiency	typ. > 80%
Safety: CE marking according to low voltage directive 73/23/EEG	
Safety according to	EN 60950, UL 1950
EMC: CE marking according EMC directive 89/336/EEG	
EMI conducted & radiated emission	EN 55022/B (0.15-30MHz; 30-1000MHz)
EMI immunity	EN 50082-2
Operating temperature / Storage temperature	0 °C...+70 °C / -25 °C...+85 °C
Relative humidity	max. 95% without condensation
Case material / finish	clear anodised aluminum cassette with cooling cutouts

Technical data: output voltage

	PK 30 V1	PK 60 V1	PK 60 V1	PK 60 V1	PK 120 V1	PK 120 V1
Single output	30 W	60 W	60 W	60 W	120 W	120 W
Output voltage	5V	5V	12V	24V	12V	24V
Adjustment range	4.85-5.5V	4.5-5.5V	11-13V	22-26V	10.8-13.2V	21.6-26.4V
Output nominal current	6A	12A	5A	2.5A	10A	5A
Ripple at full load	<40mV _{pp}	<40mV _{pp}	<40mV _{pp}	<40mV _{pp}	<40mV _{pp}	<40mV _{pp}
Line regulation (100% I _{OUT})	<0.2%	<0.3%	<0.2%	<0.2%	<0.2%	<0.2%
Load regulation static (10...90% I _{OUT})	<0.2%	<0.2%	<0.2%	<0.2%	<0.2%	<0.2%
Response time (10...90% I _{OUT})	<1ms	<0.8ms	<0.5ms	<0.5ms	<0.5ms	<0.5ms
Output current limit	>6.5A	>12.5A	>5.3A	>2.7A	>11A	>5.5A
Short circuit protection			continuously, automatic restart			
Overvoltage protection (OVP)	6-6.7V	5.5-6.0V adjustable	13.2-15V adjustable	26.4-30V adjustable	12-16.5V adjustable	27-29V adjustable
Powerfail signal (at full load >6ms)	—	V1<4.8V	—	V1<23V	>11.5V	>23.0V
Temperature coefficient	0.02%/°C	0.02%/°C	0.02%/°C	0.02%/°C	0.02%/°C	0.02%/°C
Output regulation with sense	0.5V max.	0.5V max.	0.5V max.	0.5V max.	0.5V max.	0.5V max.
Derating	1 W/°C above 55°C	1.6 W/°C above 45°C	1.6 W/°C above 45°C	1.6 W/°C above 45°C	2.4 W/°C above 55°C	2.4 W/°C above 55°C



PK-Series BIVOLT AC/DC-converters

30 to 60 Watt switched mode AC/DC plug-in power supplies with two outputs in 3 U/8 HP Eurocassettes for use in 19" sub racks to IEC 60297-3.

- ✓ High regulation accuracy
- ✓ All voltages individually adjustable
- ✓ Compact rugged design in stable aluminum cassette
- ✓ EN 60950, UL, and cUL approvals
- ✓ CE marked for compliance to EMC and Low Voltage Directives
- ✓ Overvoltage protection (OVP)
- ✓ No-load and short circuit proof
- ✓ Coded H15 connector
- ✓ VERO standardised pinning
- ✓ 24 months warranty

Ordering details Power Supplies AC/DC-converter

	nom. height/ nom. width [U] / [HP]	for nom. depth [mm]	single output [W]	output [V]/ [A]	order no. 116.
BIVOLT PK 60 A	3 / 8	>160	60	±12-15V/2A	010022A*

* EN 60950 certified

For applications according EN 61000-3-2, we recommend the VP-Series.

Accessories

	order no.
Reduced height front panel for PK 60	148-010011J
Male connector with coding strip H15 DIN 41612	017-010115K
Minimum order quantity 1 pack (10 pieces)	
Coding strip	017-010064F

Technical input data

Input voltage (switchable)	94-253VAC
Input frequency	47-63Hz
Inrush surge current limit	by NTC
Input voltage spike limit	by VDR
Hold-up time	>20 msec (at nominal values)
Efficiency	typ. > 80%
Safety: CE marking according to low voltage directive 73/23/EEG	
Safety according to	EN 60950, UL 1950
EMC: CE marking according EMC directive 89/336/EEG	
EMI conducted & radiated emission	EN 55022/B (0.15-30MHz; 30-1000MHz)
EMI immunity	EN 50082-2
Operating temperature / Storage temperature	0 °C...+70 °C / -25 °C...+85 °C
Relative humidity	max. 95% without condensation
Case material / finish	clear anodised aluminum cassette with cooling cutouts

Technical data: output voltage

	PK 60 A V1, V2
Dual output	60 W
Output voltage	±12-15V
Adjustment range	±12-15V
Output nominal current	2A, 2A
Ripple at full load	<20mV _{pp}
Line regulation (100% I _{OUT})	<0.2%
Load regulation static (10...90%I _{OUT})	<0.5%
Response time (10...90%I _{OUT})	<1ms
Output current limit	>2.2A
Short circuit protection	continuously, automatic restart
Overvoltage protection (OVP) fix	±16.5-19V
Powerfail-Signal (at full load>6ms)	>4.8V
Temperature coefficient	0.02%/°C
Derating	1.6 W/°C above 55°C



TRIVOLT AC/DC-converter

60 to 120 Watt switched mode AC/DC plug-in power supplies with three outputs in 3 U Eurocassettes for use in 19" subracks to IEC 60297-3.

- ✓ 3 high stability outputs, all adjustable
- ✓ Safety approvals to UL, cUL and EN 60950
- ✓ CE marked for compliance to EMC and Low Voltage Directives
- ✓ SENSE-operation (5V output)
- ✓ Overvoltage protection (OVP)
- ✓ Powerfail signal optional
- ✓ No-load and short circuit proof
- ✓ Coded H15 connector
- ✓ VERO standardised pinning
- ✓ 24 months warranty

Ordering details Power Supplies TRIVOLT AC/DC-converter

	nom. height/ nom. width [U] / [HP]	for nom. depth [mm]	single output [W]	outputs			order no. 116.
				V1	V2	V3	
TRIVOLT PK 60 A	3 / 8	160	60	5V/6A	+12-15V/1A	-12-15V/1A	010018J ¹⁾
TRIVOLT PK 60 B	3 / 8	160	60	5V/6A	+12-15V/2A	-12-15V/0.5A	010101G ¹⁾
TRIVOLT PK 120	3 / 14	160	120	5V/12A	+12-15V/2A	-12-15V/2A	010046C ²⁾
TRIVOLT PK1 20 PF	3 / 14	160	120	5V/12A	+12-15V/2A	-12-15V/2A	010078G ²⁾³⁾

¹⁾ EN 60950 and UL certified

²⁾ EN 60950 certified

³⁾ incl. Powerfail signal

For applications according EN 61000-3-2, we recommend the VP-Series.

Accessories

	order no.
Reduced height front panel for PK 60	148-010000K
Reduced height front panel for PK 120	148-010020H
Male connector with coding strip H15 DIN 41612	017-010115K
Minimum order quantity 1 pack (10 pieces)	
Coding strip	017-010064F

Technical input data

Input voltage (switchable)	94-253VAC
Input frequency	47-63Hz
Inrush surge current limit	by NTC
Input voltage spike limit	by VDR
Hold-up time	>20 msec (at nominal values)
Efficiency	typ. >75%
Safety: CE marking according to low voltage directive 73/23/EEG	
Safety according to	EN 60950, UL 1950
EMC: CE marking according EMC directive 89/336/EEG	
EMI conducted & radiated emission	EN 55022/B (0.15-30MHz; 30-1000MHz)
EMI immunity	EN 50082-2
Operating temperature / Storage temperature	0 °C...+70 °C / -25 °C...+85 °C
Relative humidity	max. 95% without condensation
Case material / finish	clear anodised aluminum cassette with cooling cutouts

Technical data: output voltage

	PK 60 A			PK 60 B			PK 120 / PK 120 PF		
	V1	V2	V3	V1	V2	V3	V1	V2	V3
Triple-output	60 W			60 W			120 W		
Output voltage	5V	+12V	-12V	5V	+12V	-12V	5V	+12V	-12V
Adjustment range	4.5-5.5V	+12-15V	-12-15V	4.5-5.5V	+12-15V	-12-15V	4.5-5.5V	+12-15V	-12-15V
Output nominal current	6A	1A	1A	6A	2A	0.5A	12A	2A	2A
Ripple at full load	<40mV _{pp}	<3mV _{pp}	<3mV _{pp}	<40mV _{pp}	<3mV _{pp}	<3mV _{pp}	<40mV _{pp}	<20mV _{pp}	<20mV _{pp}
Line regulation (100% I _{OUT})	<0.2%	<0.02%	<0.02%	<0.2%	<0.02%	<0.02%	<0.2%	<0.02%	<0.02%
Load regulation static (10...90% I _{OUT})	<0.2%	<0.2%	<0.2%	<0.5%	<0.5%	<0.5%	<0.2%	<0.2%	<0.2%
Response time (10...90% I _{OUT})	<1ms	<10µs	<10µs	<1ms	<10µs	<10µs	<0.2ms	<0.5ms	<0.5ms
Output current limit	>6.5A	>1.1A	>1.1A	>6.5A	>2.1A	>0.6A	>12.5A	>2.2A	>2.2A
Short circuit protection				continuously, automatic restart					
Overvoltage protection (OVP)	6.0-6.7V	-	-	6.0-6.7V	-	-	+5.5-6.0V adjustable	+16.5-19V fix	-16.5-19V fix
Powerfail signal (at full load >6ms)	<4.8V	-	-	<4.8V	-	-	>4.8V	-	-
Temperature coefficient	0.02%/°C			0.02%/°C			0.02%/°C		
Output regulation with sense	0.5V max.	-	-	0.5V max.	-	-	0.5V max.	-	-
Derating	1.6 W/°C above 55°C			1.6 W/°C above 55°C			4 W/°C above 55°C		

Power Supplies VP-Series, 40 and 50 1 - 3 Outputs



AC/DC-converter

40 or 50 Watt switched mode AC/DC plug-in power supplies in 3 U/4 HP Eurocassettes for use in 19" subracks to IEC 60297-3.

- ✓ Wide input range 94-253VAC
- ✓ High efficiency from 75% to 84%
- ✓ CE marking according EMI and LV directive
- ✓ Safety according to EN 60950, UL, cUL
- ✓ Optional: EMI frontpanel, no frontpanel
- ✓ VERO standard pinning, suits to PK 60
- ✓ SENSE-operation
- ✓ Convection cooling
- ✓ 24 months warranty

With modern switch mode technology VP 40 achieves an efficiency up to 75%, VP 50 up to 84%.

Ordering details Power Supplies AC/DC-converter

	nom.height/ nom. width [U] / [HP]	for nom. depth [mm]	output [W]	outputs	with front plate order no. 116.
VP 40-3 A	3 / 4	>160	40	5V/4A; +12...15V/0.6A; -12...-15V/0.6A	040311E*
VP 40-3 B	3 / 4	>160	40	+12...15V/1.4A; +12...15V/0.6A; -12...-15V/0.6A	040312B*
VP 40-3 C	3 / 4	>160	40	24V/0.8A; +12...15V/0.6A; -12...-15V/0.6A	040313K*
VP 50-1	3 / 4	>160	50	5V/10A	040151K*
VP 50-1	3 / 4	>160	50	12V/4.2A...15V/3.3A	040152G*
VP 50-1	3 / 4	>160	50	24V/2.1A	040153D*

* EN 60950-1 certified

Accessories

	order no.
Male connector with coding strip H15 DIN 41612	017-010115K
Minimum order quantity 1 pack (10 pieces)	
Coding strip	017-010064F

Technical input data

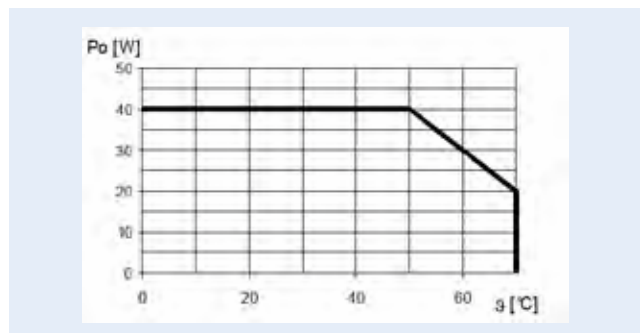
Input voltage	115 / 230VAC
Input frequency	47-63Hz
Inrush surge current limit	by NTC resistor
Input voltage spike limit	by VDR resistor
Hold-up time	≥60 ms at 230V / ≥10 ms at 115V
Powerfactor correction PFC	≥30 ms at 230V / ≥30 ms at 115V
Efficiency	>0,6
Safety: CE marking according to low voltage directive 2006/95/EG	
Safety according to	EN 60950-1
EMC: CE marking according EMC directive 2004/108/EG	EN 61000-6-3 (2007) EN 61000-6-2 (2006)
EMI conducted & radiated emission	EN 55022/B (0,15-30MHz; 30-1000MHz)
EMI immunity	EN 50082-2
Operating temperature / Storage temperature	0 °C...+70 °C / -25 °C...+85 °C
Relative humidity	max. 95%, not condensing
Dimensions (L x W x H) mm	162 x 20 x 100 mm, with front plate 128 mm

Technical data: output voltage

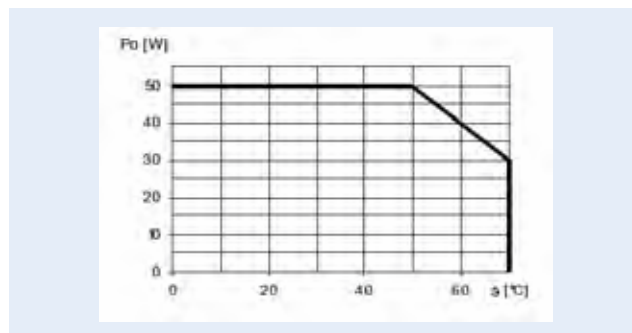
	VP 40-3 A			VP 40-3 B / C			VP 50-1		
	V1	V2	V3	V1B / C	V2B / C	V3B / C	V1	V1	V1
Output	40 W			40 W			50 W		
Output voltage	+5V	+12V	-12V	+12V	+12V	-12V	5V	12V	24V
Adjustment range	+5V	+12V...+15V	-12V...-15V	+12V...+15V / 24V	+12V...+15V	-12V...-15V	5V	12V...15V	24V
Output nominal current ¹⁾	4A	0.6A	0.6A	1.4A / 0.8A	0.6A	0.6A	10A	4.2A...3.3A	2.1A
Ripple at full load	≤20mVss	≤5mVss	≤5mVss	≤20mVss	≤5mVss	≤5mVss	≤20mVss	≤40mVss	≤20mVss
Line regulation (100% I _{OUT})	≤0.1%	≤0.02%	≤0.02%	≤0.1%	≤0.02%	≤0.02%	≤0.1%	≤0.1%	≤0.1%
Load regulation static (10...90% I _{OUT})	≤0.1%	≤0.4 ²⁾	≤0.4 ²⁾	≤0.1%	≤0.4 ²⁾	≤0.4 ²⁾	≤0.1%	≤0.1 ²⁾	≤0.1 ²⁾
Response time (10...90% I _{OUT})	≤0.4ms	≤20μs	≤20μs	≤0.4ms	≤20μs	≤20μs	≤0.4ms	≤0.4ms	≤0.4ms
Output current limit	>4.2A	>0.8A	>0.8A	>1.5A / 0.85A	>0.8A	>0.8A	>10A	3.6A...5.5A	>2.1A
Short circuit protection	yes			yes			yes		
Overvoltage protection (OVP)	5.85V...6.25V			16.5V...18V / 26.4V...31V	—	—	5.85V...6.25V	16.5V...18V	16.5...31V
Powerfail signal (at full load >6ms)	≥5ms befor V1<4.8V			optional	optional	optional	optional	optional	optional
Output regulation with sense	0.5V max.			0.5V max.	—	—	0.5V max.	0.5V max.	0.5V max.
Derating	2.5% / °C, from 50 °C			see derating curve					

¹⁾ maximum total output power: 40 / 50 Watt, see derating

²⁾ I_{OUT} V1 min. 1A



Derating curve VP 40



Derating curve VP 50

Power Supplies VP-Series, 80 and 150 1 - 3 Outputs



AC/DC-converter with PFC

80 or 150 Watt switched mode AC/DC plug-in power supplies in 3 U/8 HP respectively 12 HP Eurocassettes for use in 19" sub racks to IEC 60297-3.

- ✓ Active Powerfactor Correction PFC
- ✓ Wide input range 94-253VAC
- ✓ High efficiency from 83% up to 87%
- ✓ Power share between outputs
- ✓ N+1 redundant types on request
- ✓ CE marking acc. EMI and LV directive
- ✓ Safety according to EN 60950, UL, cUL
- ✓ VERO standard pinning, VP 80 suits to PK 60 and VP 150 suits to PK 120
- ✓ 24 months warranty

With the new VP 80 /150 series an efficiency from 83% up to 87% is achieved while power density is increased over its predecessors by more than 30%. Without the need for external heatsinking, the 80 W or 150 W output power can be achieved with natural convection cooling. A wide range of multi O/P units is further

extended through power share technology, allowing maximum flexibility in the way power is delivered across the voltage rails, for smaller and more economical solutions. The range is enhanced with „Type R“ versions, designed for N+1 redundant applications or battery back-up systems.

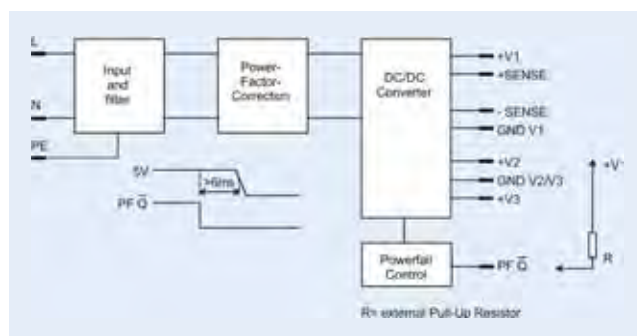
Ordering details Power Supplies AC/DC-converter

	nom.height/ nom. width [U] / [HP]	for nom. depth [mm]	output [W]	outputs	order no. 116.
VP 80-1	3 / 8	>120	80	24V/3.3A	020018B ¹⁾
VP 80-3 C	3 / 8	>120	80	5V/12A; +12V/4A; -12V/1A	020026D ¹⁾
VP 150-3	3 / 12	>120	150	5V/20A; +12V...15V/4A; -12...15V/2A	031530B ²⁾

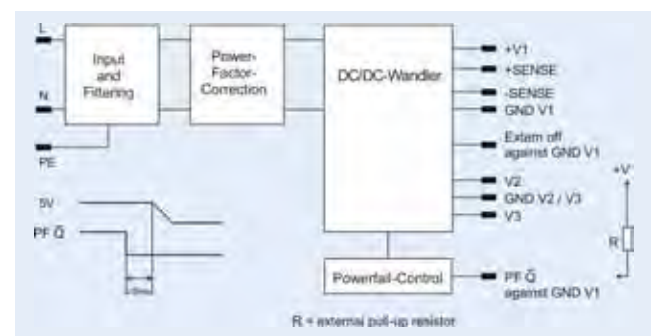
¹⁾ certified to EN 60950, UL, cUL; ²⁾ safety to EN 60950, UL, cUL

Accessories

	order no.
Male connector with coding strip H15 DIN 41612	017-010115K
Minimum order quantity 1 pack (10 pieces)	
Coding strip	017-010064F



Schematic diagram VP 80



Schematic diagram VP 150

Technical input data

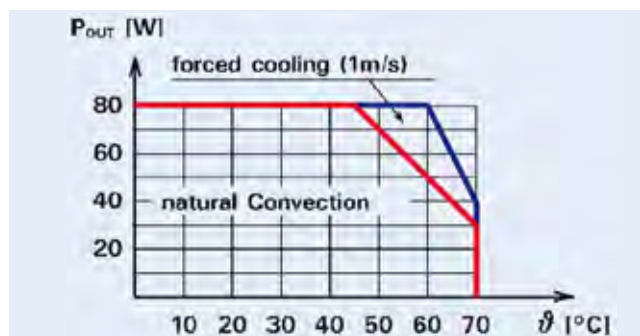
Input voltage	94-253VAC
Input frequency	47-63Hz
Inrush surge current limit	<27A (NTC)
Input voltage spike limit	by VDR
Hold-up time	>20 msec (at nominal values)
Powerfactor correction PFC	>0,95 / >0,98
Efficiency	up to 83% / typ. >81%
Safety: CE marking according to low voltage directive 73/23/EEG	
Safety according to	EN 60950
EMC: CE marking according EMC directive 89/336/EEG	
EMI conducted & radiated emission	EN 55022/B (0.15-30MHz; 30-1000MHz)
EMI immunity	EN 50082-2
Operating temperature / Storage temperature	0 °C...+70 °C / -40 °C...+85 °C
Relative humidity	max. 90% without condensation
Dimensions (L x W x H) mm	VP 80 162 x 32, 9 x100 mm / VP 150 162x60, 6x110 mm
Weight:	650 g / 1100 g

Technical data: output voltage

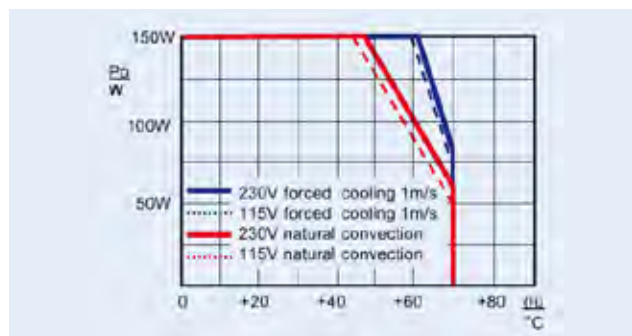
	VP 80-1 V1	VP 80-3 C V1 V2 V3			VP 150-3 V1 V2 V3		
Output	80 W	80 W			150 W		
Output voltage	24V	+5V	+12V	-12V	+5V	+12-15V	-12-15V
Adjustment range	22-26V	4.8-5.5V	fix	fix	4.8...5.5V	+11.8-15.2V	-11.8-15.2V
Output nominal current ¹⁾	3,3A	12A	4A	1A	20A ¹⁾	4A ¹⁾	2A ¹⁾
Ripple at full load	<40mV _{pp}	<40mV _{pp}	<40mV _{pp}	<10mV _{pp}	<40mV _{pp}	<20mV _{pp}	<20mV _{pp}
Line regulation (100% I _{OUT})	<0.1%	<0.2%	<0.2%	<0.2%	<0.2%	<0.2%	<0.2%
Load regulation static (10...90% I _{OUT})	<0.1%	<0.5%	<±4 ²⁾	<1.5% ²⁾	<0,5%	<0,2%	<0,2%
Response time (10...90% I _{OUT})	<0.1ms	<1ms	<1ms	<1ms	<1ms	<1ms	<1ms
Output current limit	>3.35A	>12.1A	>4.1A	>1.01A	>20.5A	>5A	>2.7A
Short circuit protection	yes, electronic, automatic restart						
Overvoltage protection (OVP)	27-32V	6.0-6.7V	—	—	6.0-6.5V fix	+16-18V fix	-16-18V fix
Powerfail signal (at full load >6ms)	V1<23V	<V1-4.8V	—	—	<V1-4.8V	—	—
Output regulation with sense	0.5V max.	0.5V max.	—	—	0.5V max.	—	—
Derating	2 W/°C over 45°C at natural convection; 4 W/°C over 60°C at enhanced cooling			see derating curve			

¹⁾ maximum total output power: 80 Watt or 150 Watt, see derating curve

²⁾ I_{OUT} V1 min. 1A



Derating curve VP 80



Derating curve VP 150



MONOVOLT AC/DC-converter

50 Watt switched mode AC/DC plug-in power supplies with one output in 3 U/8 HP steelcassettes for use in 19" sub racks to IEC 60297-3.

- ✓ Reduced cost power supply on 100 x 160 mm Eurocard
- ✓ Steel cover
- ✓ Wide input range
- ✓ Overvoltage protection (OVP)
- ✓ No load and short circuit proof
- ✓ Powerfail signal
- ✓ Coded H15 connector
- ✓ VERO standardised pinning
- ✓ Separate frontpanel kit with handle
- ✓ 24 months warranty

Ordering details Power Supplies Monovolt AC/DC-converter

	nom. height/ nom. width [U] / [HP]	for nom. depth [mm]	single output [W]	output [V]/ [A]	order no. 116.
EC 50	3 / 8	>160	50	24V/2.2A	010194F*

* EN 60950 certified

Accessories

	order no.
Front panel with handle: EC50	148-011001G
Male connector with coding strip H15 DIN 41612	017-010115K
Minimum order quantity 1 pack (10 pieces)	
Coding strip	017-010064F

Technical input data

Input voltage AC/DC	93-253VAC wide input
Input frequency	47-63Hz
Inrush surge current limit	by NTC
Input voltage spike limit	by VDR
Hold-up time	>20 msec (at nominal values)
Efficiency	typ. 68-75%
Safety: CE marking according to low voltage directive 73/23/EEG	
Safety according to	EN 60950, UL 1950, EN41003
EMC: CE marking according EMC directive 89/336/EEG	
EMI conducted & radiated emission	EN 55022/B (0.15-30MHz; 30-1000MHz)
EMI immunity	EN 50082-2
Operating temperature / Storage temperature	0 °C...+70 °C / -25 °C...+85 °C
Relative humidity	max. 95% without condensation
Case material / finish	ventilated steel cassette with cooling cutouts

Technical data: output voltage

	EC 50 V1
Single-output	50 W
Output voltage	24V
Adjustment range	21.6-26.8V
Output nominal current	2.2A
Ripple at full load	<40mV _{pp}
Line regulation (100% I _{OUT})	<0.2%
Load regulation static (10...90%I _{OUT})	<1%
Response time (10...90%I _{OUT})	<1ms
Output current limit	>2.4A
Short circuit protection	continuous, automatic restart
Overvoltage protection (OVP)	27-32V
Derating	1.2 W/°C over 45°C



TRIVOLT AC/DC-converter

50 Watt switched mode AC/DC plug-in power supplies with three output in 3 U steelcassettes for use in 19" subracks to IEC 60297-3.

- ✓ Economy priced alternative of PK series
- ✓ Steel cover
- ✓ Safety according to EN 60950
- ✓ Overvoltage protection (OVP)
- ✓ No load and short circuit proof
- ✓ Powerfail signal
- ✓ Coded H15 connector
- ✓ VERO standardized pinning
- ✓ Separate frontpanel kit with handle
- ✓ 24 months warranty

Ordering details Power Supplies Monovolt AC/DC-converter

	nom.height/ nom. width [U] / [HP]	for nom. depth [mm]	output [W]	outputs V1 V2 V3			order no. 116.
EC 50 C	3 / 8	>160	50	5V/5A	+15V/0.8A	-15V/0.8A	010186D*

* EN 60950 certified

Accessories

	order no.
Front panel with handle: EC50	148-011001G
Male connector with coding strip H15 DIN 41612	017-010115K
Minimum order quantity 1 pack (10 pieces)	
Coding strip	017-010064F

Technical input data

Input voltage AC/DC	93-253VAC wide input
Input frequency	47-63Hz
Inrush surge current limit	by NTC
Input voltage spike limit	by VDR
Hold-up time	>20 msec (at nominal values)
Efficiency	typ. 70%
Safety: CE marking according to low voltage directive 73/23/EEG	
Safety according to	EN 60950, UL 1950,
EMC: CE marking according EMC directive 89/336/EEG	
EMI conducted & radiated emission	EN 55022/B (0.15-30MHz; 30-1000MHz)
EMI immunity	EN 50082-2
Operating temperature / Storage temperature	0 °C...+70 °C / -25 °C...+85 °C
Relative humidity	max. 95% without conden- sation
Case material / finish	ventilated steel cassette with cooling cutouts

Technical data: output voltage

	EC 50		
	V1	V2	V3
	50 W		
Triple output	5V	+15V	-15V
Output voltage	4.5-5.5V	fix	fix
Adjustment range	5A	0.8A	0.8A
Output nominal current	<40mV _{pp} ¹⁾	<10mV _{pp} ¹⁾	<10mV _{pp} ¹⁾
Ripple at full load	<0.2%	<0.2%	<0.2%
Line regulation (100% I _{OUT})	<1%	<0.5%	<0.5%
Load regulation static (10...90% I _{OUT})	<1ms	<1ms	<1ms
Response time (10...90% I _{OUT})	>6A(>9A ²⁾)	>1.1A	>1.1A
Output current limit	yes, electronic, automatic restart		
Short circuit protection	6.0-6.7V	—	—
Overvoltage protection (OVP)	V1<4.8V	—	—
Powerfail-Signal (at full load>6ms)	0,05%/°C		
Temperature coefficient	1.5 W/°C above 45°C		
Derating			

¹⁾ V2/V3 linear post regulated

²⁾ at single load



TRIVOLT DC/DC-converter

60 to 120 Watt switched mode DC/DC plug-in converter with three outputs in 3 U Eurocassettes for use in 19" subracks IEC 60297-3.

- ✓ Compact rugged design in stable aluminum cassette
- ✓ DC input range 2:1 ratio
- ✓ High regulation accuracy
- ✓ Separate adjust of all outputs
- ✓ SENSE-operation and Overvoltage protection (OVP)
- ✓ Convection cooling
- ✓ CE marked for compliance to EMC and Low Voltage Directives
- ✓ VERO standardised pinning
- ✓ 24 months warranty

Ordering details Power Supplies TRIVOLT AC/DC-converter

	nom. height/ nom. width [U] / [HP]	for nom. depth [mm]	output [W]	outputs V1 V2 V3			order no. 116.
GK 120-2	3 / 14	>160	120	5V/12A	+12-15V/2A	-12-15V/2A	010175L

Accessories

	order no.
Reduced height front panel GK 120	148-010020H
Male connector with coding strip H15 DIN 41612	017-010115K
Minimum order quantity 1 pack (10 pieces)	
Coding strip	017-010064F

Technical input data

Input voltage	24VDC (18-36)
Inrush surge current limit	line impedance dependant
Input voltage spike limit	by Thyristor-Crowbar
Hold-up time	>3 msec (at nominal values)
Efficiency	typ. >70-75%
Safety: CE marking according to low voltage directive 73/23/EEG	
Safety according to EMC: CE marking according EMC directive 89/336/EEG	EN 60950, UL 1950,
EMI conducted & radiated emission	EN 55022/B (0.15-30MHz; 30-1000MHz)
EMI immunity	EN 50082-2
Operating temperature / Storage temperature	0 °C...+70 °C / -25 °C...+85 °C
Relative humidity	max. 95% without condensation
Case material / finish	Clear anodised aluminum cassette with cooling cutouts

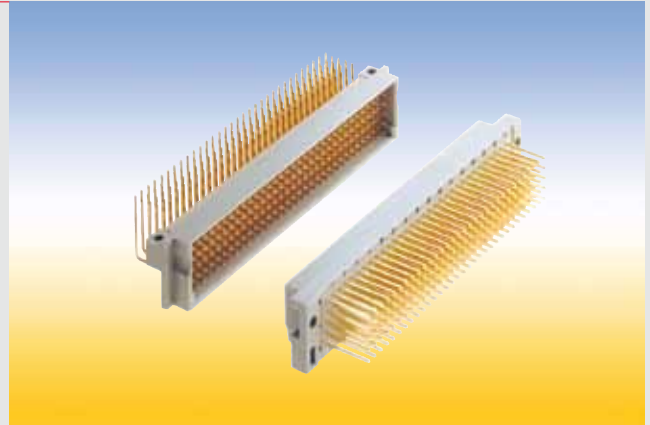
Technical data: output voltage

	GK 120-2		
	V1	V2	V3
Triple output	120 W		
Output voltage	5V	+12-15V	-12-15V
Adjustment range	4.5-5.5V	+12-15V	-12-15V
Output nominal current	12A	2A	2A
Ripple at full load	<40mV _{pp}	<20mV _{pp}	<20mV _{pp}
Line regulation (100% I _{OUT})	<0.2%	<0.2%	<0.2%
Load regulation static (10...90% I _{OUT})	<0.2%	<0.2%	<0.2%
Response time (10...90% I _{OUT})	<0.2ms	<0.5ms	<0.5ms
Output current limit	>12.5A	>2.2A	>2.2A
Short circuit protection	continuously, automatic restart		
Overvoltage protection (OVP)	5.5-6.0V	—	—
Output regulation with sense	0.5V max.	—	—
Temperature coefficient	0,05%/°C		
Derating	4 W/°C above 55°C		

Wiring and Accessories

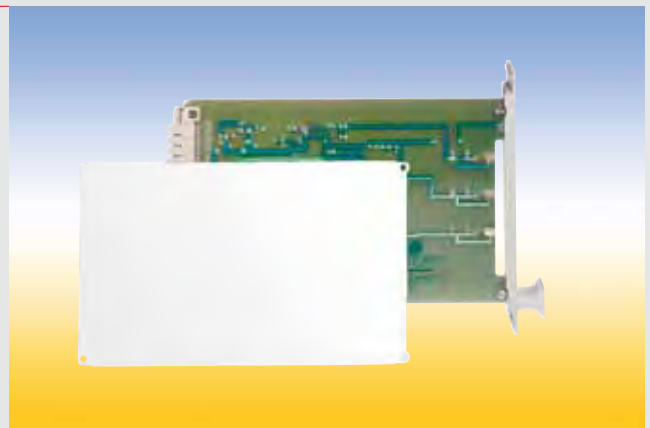
Connectors and Accessories

- ✓ In accordance with IEC 60 603-2 / DIN 41 612
- ✓ Designs supplementing the standards



Cover for Euroboards

- ✓ Self-extinguishing in accordance with UL 94-V0
- ✓ For use with or without a coding strip



Interface Housings for IEC 60 603-2 / DIN 41 612 Connectors

- ✓ Plastic version
- ✓ Metal version
- ✓ Shielding concept
- ✓ Also for railway applications in accordance with BN 74 016



SE Bus Bars

- ✓ High current capacity up to 120 A
- ✓ Two connection types
- ✓ 2 or 3-pole



Connectors

Coding key for IEC 60 603-2 / DIN 41 612 connectors

Since this catalog not only contains DIN 41612 connectors but also connectors which supplement the standard, the coding key has been extended accordingly.

Ordering example

Female connector C 0 6 4 M S - C 1 A - 1 A U - A 0 1

Connector	
Male connector	
Female connector	
style	B C D E F F/H G H M P Q R S U V Z,C
Number of poles	
Number of contacts	
Type of contact	F M
Termination technique	C K P S T W O

Position of the premating contact

Termination pin's surface

AU	Gold
AG	Silver
NI	Nickel
SN	Tin

Performance level

1	500 contact durability
2	400 contact durability
3	50 contact durability

Type of termination

A	For soldering into PCB's up to 1.6 mm thick
D	For soldering into PCB's up to 1.6 mm thick
E	For soldering into PCB's up to 2.4 mm thick
F	For soldering into PCB's up to 2.4 mm thick
H	For wire wrap technique to DIN 41611, part 2
L	For SMD-technique
M	For termi-point connection to DIN 41611
Q	For crimp-connection to DIN 41611, part 3
S	For fast-on technique to DIN 46244
T	By screw connection
U	For interfacing
V	For metal plate
W	For soldering wires crimp
X	For ribbon cable connection to DIN 41611
Y	For solid press-fit technique to DIN 41611
Z	For compliant press-fit technique to DIN 41611

Contact surface

1	Gold or gold alloy
2	Silver or silver alloy
3	Tin or tin alloy

Loading and contacts

B	connector housing, unloaded
C	connector housing, loaded
S	single contact

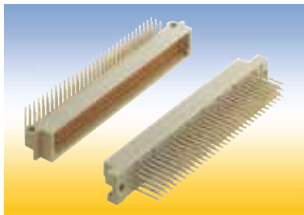
Connectors Styles B, C, D and E



Connectors style B

Ordering details

	no.poles: assignment:	064 ab 1...32
	terminations [mm]	order no. 409.
Male connector B MS - C1A - 2 SN	0.6 x 0.6 x 2.9	043 586
Female connector B FS - C1D - 2 SN	0.25 x 0.7 x 2.5	105 380



Connectors style C

Ordering details

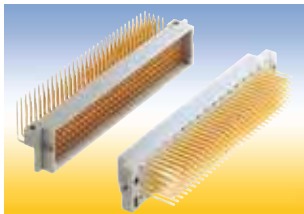
	no.poles: assignment:	032 ac 2...32	064 ac 1...32	096 abc 1...32
	terminations [mm]	order no. 409.	order no. 409.	order no. 409.
Male connector C MS - C1A - 2 SN	0.6 x 0.6 x 2.9	043 598	043 606	043 610
Female connector C FS - C1E - 2 SN	0.25 x 0.7 x 4	-	068 108	068 089
FW - C1H - 2 SN	0.6 x 0.6 x 13	045 891	045 894	045 897



Connectors style D

Ordering details

	no.poles: assignment:	032 ac 2...32
	terminations [mm]	order no. 409.
Male connector D MS - C1A - 2 SN	0.6 x 0.6 x 2.9	043 622
Female connector D FW - C1H - 2 SN	1 x 1 x 20	070 323
FC - B	f. male 0.6 x 0.6	031 022
FC - B	f. male 0.6 x 1/1.5	031 031



Connectors style E

Ordering details

	no.poles: assignment:	048 row separation 5,08 ace 2...32	048 row separation 2.54 ace 2...32
	terminations [mm]	order no. 409.	order no. 409.
Male connector E MS - C1A - 2 SN	0.6 x 0.6 x 2.9	045 210	045 235
Female connector E FW - C1H - 2 SN	1 x 1 x 20	070 425	-
FW - C1H - 2 SN	0.6 x 0.6 x 13	-	-
FC - B	f. male 1 x 1	031 030	-
FC - B	f. male 0.6x1/1.5	031 021	-

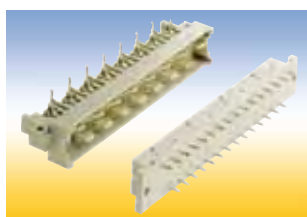
Connectors Styles F, H and R



Connectors style F

Ordering details

	terminations [mm]	no.poles: assignment:	032 zb 2...32	048 zbd 2...32
			order no. 409.	order no. 409.
Male connector F				
MS - C1A - 2 SN	0.6 x 0.6 x 2.9		022 622	041 660
Female connector F				
FW - C1E - 2 SN	1 x 1 x 4.5		070 969	024 567
FW - C1H - 2 SN	1 x 1 x 22		042 219	042 218
FC - B	f. male 0.6x1/1.5		-	031 015



Connectors style H

Ordering details

	terminations [mm]	no.poles: assignment:	011 b 2.5,8...32	015 dz 4...32
			order no. 409.	order no. 409.
Male connector H				
MS -C2A - 1 AG z32 at 3.5 mm premating	1.2 x 0.8 x 3.5		098 989	-
MS - C2A - 1 SN z32 at 1.5 mm premating	1.2 x 0.8 x 2.9		-	101 385
MT - C2S - 1 AG b32 at 3.5 mm premating	6.3 x 0.8 x 8		098 986	-
MT - C2S - 1 AG z32 at 1.5 mm premating	6.3 x 0.8 x 8		-	094 628
Female connector H				
FT - C2S - 1 AG	6.3 x 0.8 x 8		098 991	-
FT - C2S - 2 AG	6.3 x 0.8 x 8		-	071 015

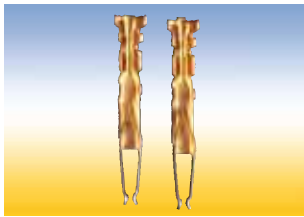


Connectors style R

Ordering details

	terminations [mm]	no.poles: assignment:	032 ac 2...32	064 ac 1...32	096 abc 1...32
			order no. 409.	order no. 409.	order no. 409.
Male connector R					
C1E - 2 SN	0.6 x 0.6 x 4		077 051	077 055	077 058
C1H - 2 SN	0.6 x 0.6 x 13		077 045	074 202	077 048
Female connector R					
C1A - 2 SN	0.6 x 0.6 x 6		077 038	074 203	077 042

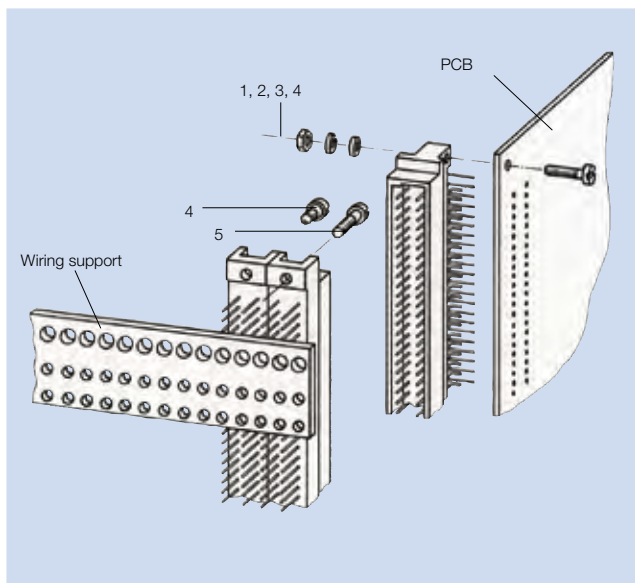
Crimp-Snap-In-Contacts, Crimp-Pliers Accessories for Connectors



Crimp-Snap-In-Contacts for Connectors style C, D, E, and F, Pliers and Unlocking Tool

Ordering details

	for connector style	conductor cross sec- tion [AWG]	order no. 409.	Pliers order no. 409.
Crimp-snap-in-male MC - S1Q - 2 NI	F	16 - 18	077 112	035 630
MC - S1Q - 2 NI	F	20 - 24	077 111	035 630
Crimp-snap-in-female for male contact 0.6x1/0.6x1.5				
FC - S1Q - 1 SN	D, E, F	16 - 18	031 019	035 630
FC - S1Q - 1 SN	D, E, F	20 - 26	031 018	035 630
FC - S1Q - 1 SN	D, E, F	26 - 28	031 020	031 120
Crimp-snap-in-female for male contact 1 x 1				
MC - S3Q - 3 SN	D, E, F	16 - 18	031 024	035 630
MC - S3Q - 3 SN	D, E, F	20 - 26	031 023	035 630
unlocking tool			031 123	-



Mounting of Connectors

Connectors in accordance to DIN 41612 can be mounted with commercial DIN screws.

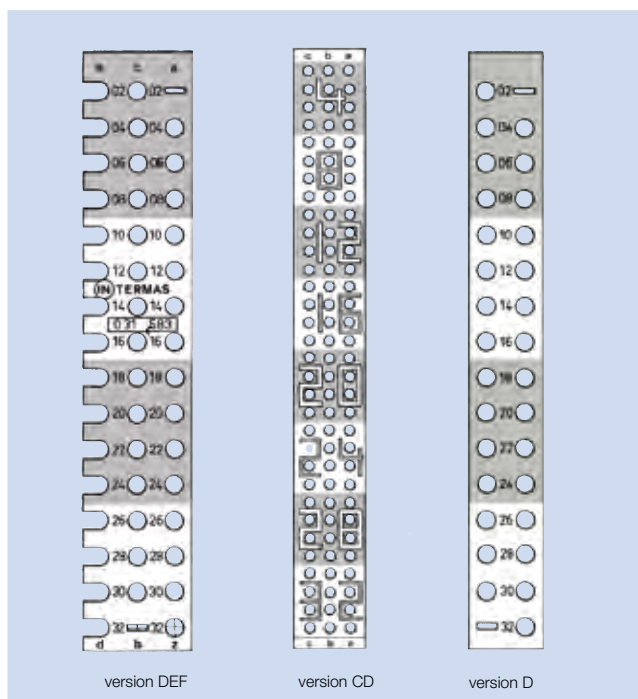
Using tapered screw, the connectors can be mounted in correct position without any adjustment or alignment.

Ordering details

Minimum order quantity each 100 pieces

	position	order no. 409.
Hexagonal nut M 2.5 DIN439	1	013 938
Spring washer 2.5 DIN 127	2	013 910
Washer 2.7 DIN 433	3	018 028
Pan head screw M 2.5x12 DIN 84	4	013 904
Tapered screw M 2.5 x 6.5	5	032 708
Tapered screw M 2.5 x 9	5	070 476

Accessories for Connectors



Marking Strips

IEC 60603-2 / DIN 41612 provides labeling for connectors on their wiring side.

Marking strips, made of thin plastic foil (Astralon), ensure the perfect designation of pin positions.

1. Type DEF

for connectors styles D, E and F with pin cross section 1,0 x 1,0 and 0,8 x 1,6 and 0,8 x 2,4 mm and for connectors with the type of termination V.

order no.: **409. 031 583**

2. Type CD

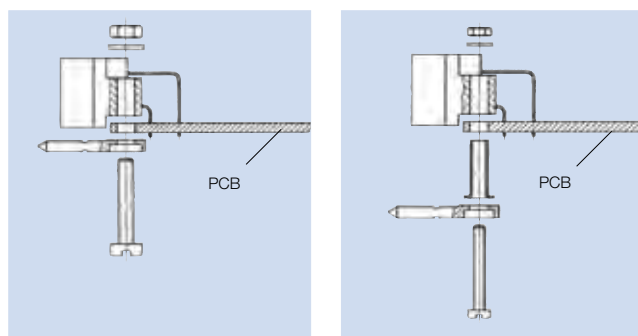
for connectors styles C and D with pin cross section 0,6 x 0,6 u. 1,0 x 1,0 mm and for connectors with the type of termination V.

order no.: **409. 022 714**

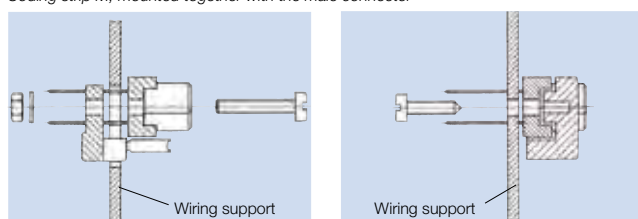
3. Typ D

for connectors style D

order no.: **409. 044 214**



Coding strip M, mounted together with the male connector



Coding strip F, mounted together with the female connector

Coding Strips

The coding strip is designed for attachment to connectors in accordance with IEC 60603-2 / DIN 41612 and is to be mounted together with the connector to the PCB. Also the mating coding part is mounted together with the connector to the wiring support. Each coding strip has 16 coding teeth, that can be broken off as necessary

Ordering details

	order no. 409.
Coding strip M ¹⁾	033 188
Coding strip F ¹⁾	033 189
Coding strip F-plate ^{1) 2)}	070 617
Coding strip F-plate 2 ^{1) 3)}	064 740

¹⁾ one functional unit comprises 1 coding strip M and one coding strip F

²⁾ for attaching with self tapping screws

³⁾ attaching at through hole

Cover for Euroboards

Description

This PCB cover protect the soldered side against dirt and contact. Two versions are available:
A standard PCB cover and a PCB cover for use with a coding strip.
The coding strip PCB cover can be used in connection with a coding strip on the connector.



Mounting of PCB cover standard at the front panel



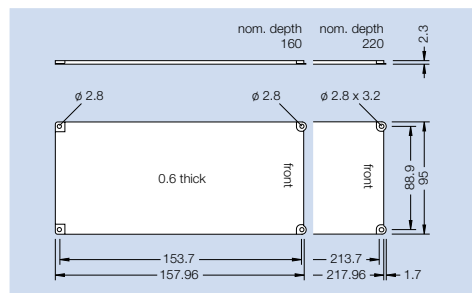
Mounting of PCB cover standard at side of the connector

Technical data

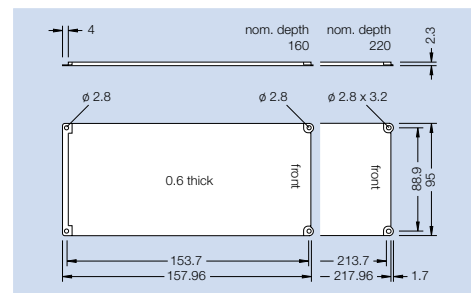
Material	PBT (Polyester)
Continuous temperature	-40 °C to +100 °C
Fire protection class	UL 94 V-0 at 0.8 mm
Color	white



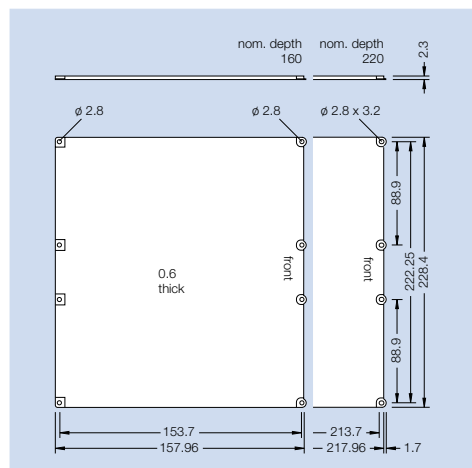
Mounting of PCB cover for coding strip jammed under the recess of the coding strip



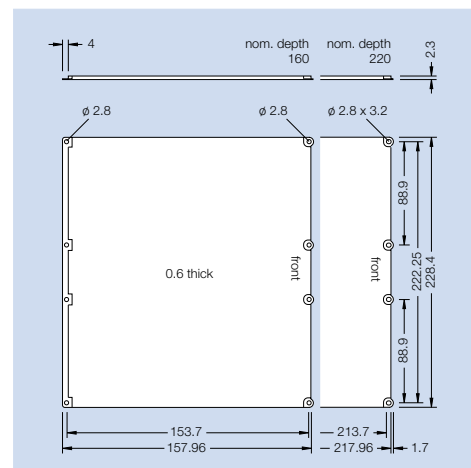
PCB cover standard 3U



PCB cover for coding strip 3U



PCB cover standard 6U



PCB cover for coding strip 6U

Ordering details

	PCB height [mm]	standard order no. 409.	coding strip order no. 409.
Cover for Euroboards			
3-160	100	100 652	100 650
3-220	100	100 662	100 660
6-160	233.35	102 110	102 109
6-220	233.35	102 113	102 112

Metallized PCB cover on request.

Plastic Interface Housings



Description

This compact and insulating interface housing is designed to accommodate DIN 41 612 / IEC 60 603-2 connectors. It is physically clamped into position between guide elements. The interface housings have the following advantages:

- ✓ Accommodation of either female or male connectors of any type of connection technology.
- ✓ Protects the connector during insertion and operation.
- ✓ Lifting screws ease insertion and removal.
- ✓ Three cable feed apertures.
- ✓ Strain relief.
- ✓ Allows installation of display and operating elements.
- ✓ Codable.

Metallized plastic interface housing for RFI-shielding available.

Technical data

Dimensions	IEC 60 297 / DIN 41 494
Material	interface housing: Makrolon, pebble gray guide components: Makrolon, black
Fire characteristics:	UL 94 V-1
Utilization category:	-25 °C, 100 °C, 90% relative humidity

Delivery kit interface housing

	pieces per kit style B	pieces per kit style C, E, F1, F	pieces per kit style C1, F2
Interface housing shells	2	2	2
Cover strip	1	-	-
Cable clamp	2	2	-
Blind plug	2	2	-
Strain relief kit	1	1	-
Mounting parts	1	1	1

Delivery

Interface housings:
As a kit of unassembled components, without guide components.

Guide components:
As an assembled kit.

Delivery kit guide elements

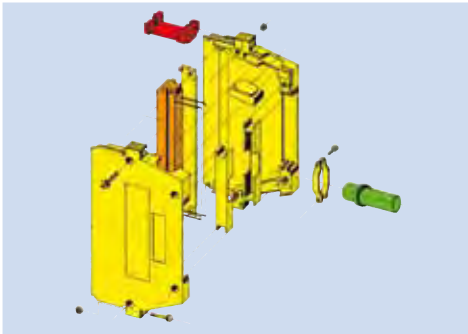
	pieces per kit
Guide element top	1
Guide element bottom	1
Mounting parts	1

Color code:

yellow: interface housing
orange: male connector
blue: female connector
red: guide components
green: accessories

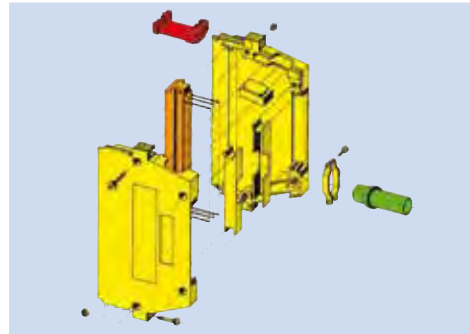
Plastic Interface Housings

Ordering details for interface housing kits (yellow: interface housing kit)



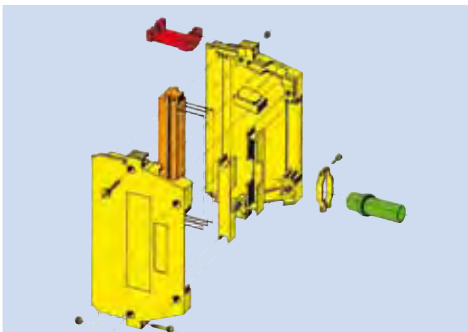
Interface Housing B

order no.: 409. 077 516



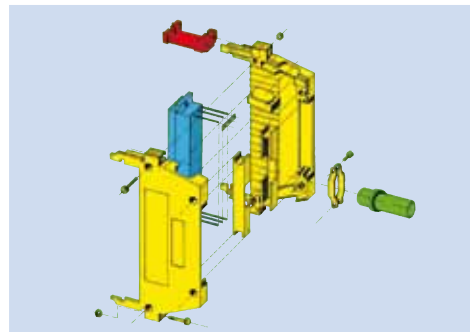
Interface Housing C

order no.: 409. 031 124



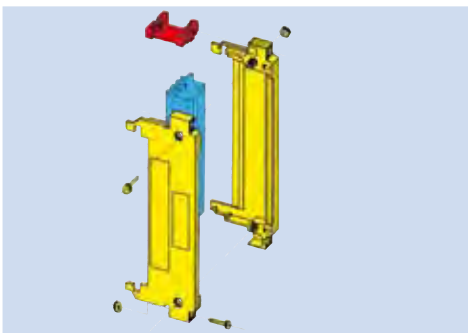
Interface Housing E

order no.: 409. 031 125



Interface Housing F

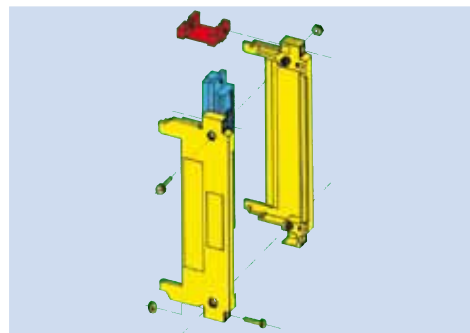
order no.: 409. 070 620



Interface Housing F2

for termination technique with ribbon cable

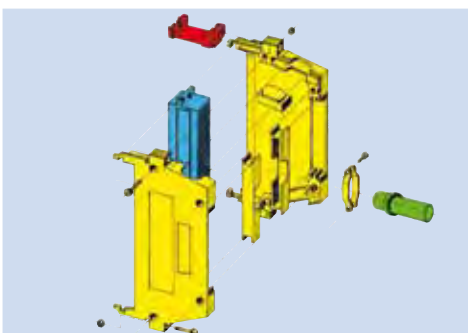
order no.: 409. 073 659



Interface Housing C1

for termination technique with ribbon cable

order no.: 409. 070 621

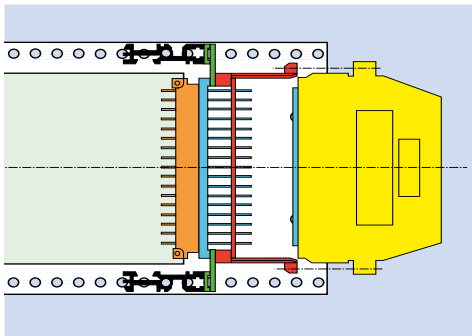


Interface Housing F1

for crimp-snap-in termination technique

order no.: 409. 071 876

Plastic Guide Components

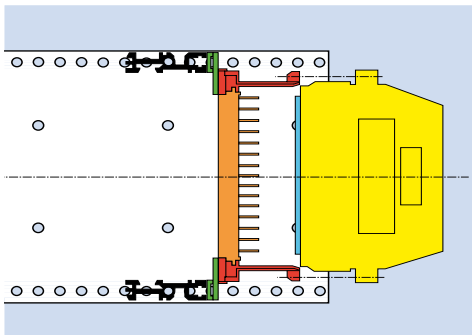


Application

For interface housings with female connector, to attach on the connecting pins of a female connector. Installation in the wiring field of the subrack.

Ordering details for kits

	length spacer	for interface housings	order no. 409.
Guide component C-Huk 13	6	C, C1	032 563
Guide component C-Huk 17	9	C, C1	032 564
Guide component D-Huk 20	11	D	032 565
Guide component D-Huk 26	17.5	D	032 566
Guide component E-Huk 20	11	E	032 567
Guide component E-Huk 26	17.5	E	032 568
Guide component F-Huk 22	22	E	032 569

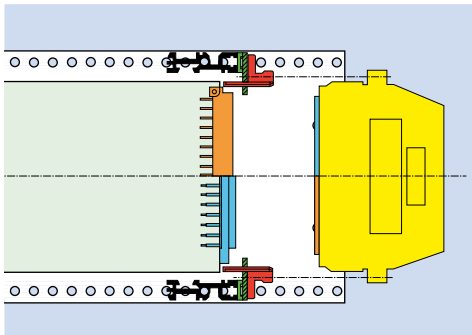


Application

For interface housings with female connector, to attach on the connecting pins of a *U-element*. Installation in the wiring field of the subrack.

Ordering details for kits

	for interface housings	order no. 409.
Guide component U-element	F, F1, F2	035 207

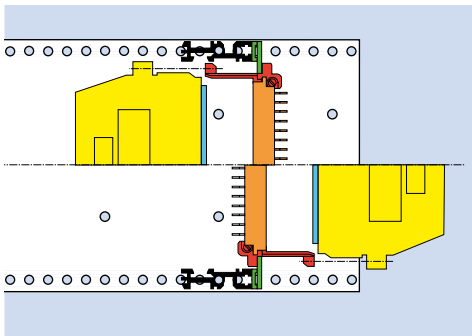


Application

For interface housings with female or male connector, for mating directly to the PCB (LP) connector. Installation in the wiring field of the subrack.

Ordering details for kits

	for interface housings and connectors	order no. 409.
Guide component CDFHR-LP	C, C1, D, M, F, F1, F2, H, R	032 553
Guide component E-LP	E	032 554



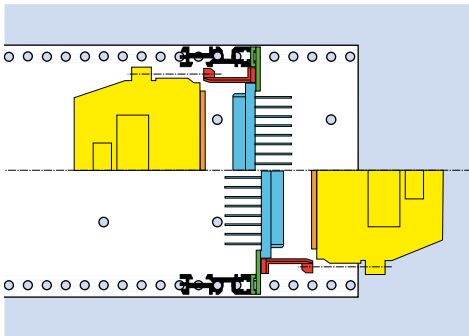
Application

For interface housings with female connector, for mating with a male connector, who is installed on the *connector attachment* (SB).

Ordering details for kits

	for interface housings and connectors	order no. 409.
Guide component CDR-M-SB/FP	B, Q, C, C1, R, D, M	032 520
Guide component E-M-SB/FP	E	032 551
Guide component F-M-SB/FP	F, F1, F2, U, H	032 575

Plastic Guide Components

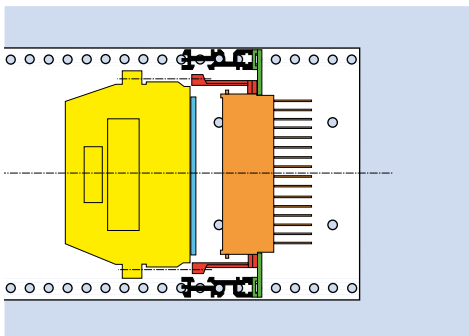


Application

For interface housings with male connector, for mating with a male connector, that is installed on the *connector attachment* (SB).

Ordering details for kits

	for interface housings and connectors	order no. 409.
Guide component CDHR-F-SB	C, C1, R, D, M, H, B, Q	032 555
Guide component E-M-F-SB	M	032 556

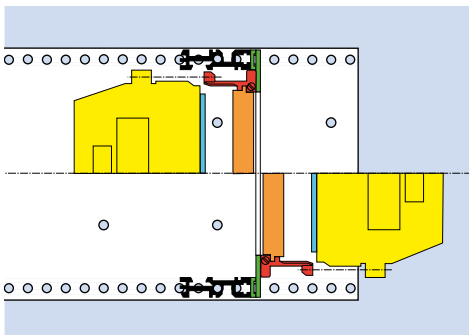


Application

For interface housings with female connector, for mating with an *I-element*. Installation in the wiring field of the subrack.

Ordering details for kits

	for interface housings and connectors	order no. 409.
Guide component I-unit	F, F1, F2	035 206

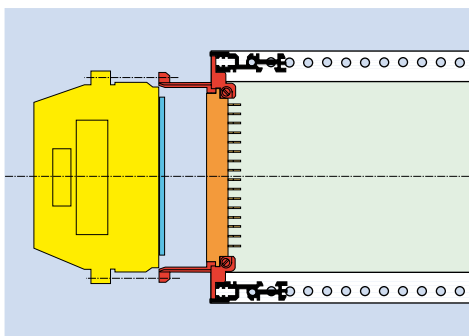


Application

For interface housings with female connector, for mating with a male connector, on *Backplane* (BP).

Ordering details for kits

	order no. 409.
Guide component CDHR-M-BP	072 620
Guide component E-M-BP	072 619



Application

For interface housings with female connector, for mating with a male connector, serves as a handle (*GL*), mounted on the service side of the subracks.

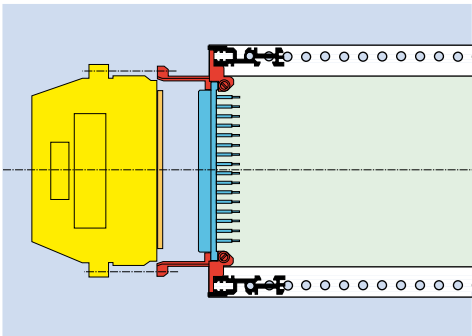
Ordering details for kits

	for interface housings and connectors	order no. 409.
Guide component CDR-M-GL	B, C, C1, R, Q, D, M	032 518
Guide component E-M-GL	E	032 549
Guide component F-M-GL	F, F1, F2, U, H	032 574

Color code:

yellow:	interface housing
orange:	male connector
blue:	female connector
red:	guide components
green:	accessories

Plastic Guide Components

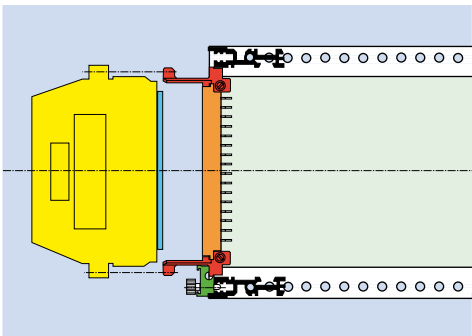


Application

For interface housings with male connector, for mating with a female connector, serves as a handle (*GL*), mounted on the service side of the subracks.

Ordering details for kits

	for interface housings and connectors	order no. 409.
Guide component CDHR-F-GL	B, Q, C, C1, R, D, M	032 519
Guide component E-F-GL	E	032 550

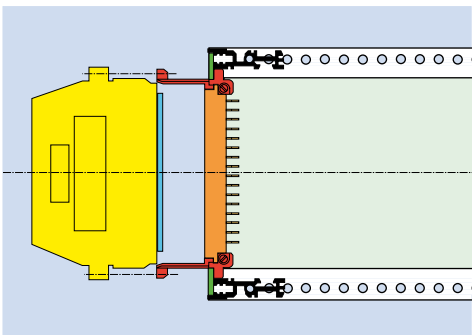


Application

For interface housings with female connector, for mating with a male connector, serves as a handle (*GL*). Installation in the wiring field of the subrack.

Ordering details for kits

	for interface housings and connectors	order no. 409.
Guide component F-M-GL	F, H15, U	035 316

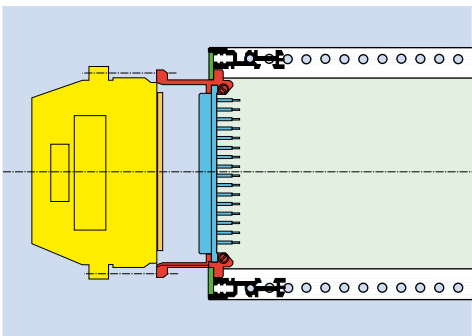


Application

For interface housings with female connector, for mating with a male connector, that is mounted on a *front panel (FP)*.

Ordering details for kits

	for interface housings and connectors	order no. 409.
Guide component CDR-M-SB/FP	B, Q, C, C1, R, D, M	032 520
Guide component E-M-SB/FP	E	032 551
Guide component F-M-SB/FP	F, F1, F2, H, U	032 575



Application

For interface housings with male connector, for mating with a female connector, that is mounted on a *front panel (FP)*.

Ordering details for kits

	for interface housings and connectors	order no. 409.
Guide component CDFHR-FP	B, C, C1, D, M, H11, Q, R	032 523
Guide component E-FP	E	032 552

Color code:

yellow:	interface housing
orange:	male connector
blue:	female connector
red:	guide components
green:	accessories

Accessories for Plastic Interface Housings



Cable Sleeve

Material: black rubber

for housing styles C, F, B

order no.: 409. 032 766

for housing style E

order no.: 409. 032 767



Cable Clamp Kit

consists of:
2 brackets and mounting parts

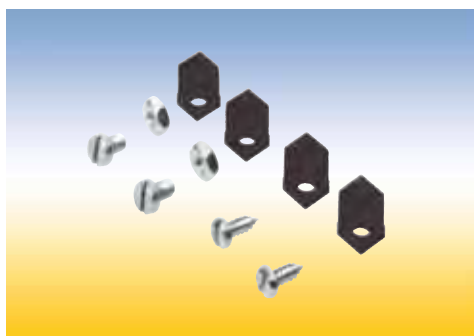
Material: metal

for housing styles C,D, F, H

order no.: 409. 034 532

for housing style E

order no.: 409. 034 533



Coding Kit

with 16 possibilities
consists of:
4 coding elements and mounting parts

Material: plastic

order no.: 409. 069 755



Coding Kit

with 32 possibilities
consists of:
4 coding elements and mounting parts

Material: metal

order no.: 409. 034 724

Metal Interface Housings



Description

The metal interface housing was developed on the basis of the plastic interface housing design as a totally metal housing with metal guide elements for heavy-duty use. It has the following advantages:

- ✓ Suitable for all 19" front panels in accordance with IEC 60 297-3 and IEEE fronts in accordance with P1101.10.
- ✓ For shielding between the interface housing and the front panel, in the E and F1 style RFI shielding panels can be added at the transfer side
- ✓ Coding already integrated or can be added, depending on the style
- ✓ Three cable feed apertures
- ✓ For cable diameters up to 17 mm
- ✓ For heavy-duty applications such as railway engineering, power station engineering etc.

Technical data

Dimensions	IEC 60 297 / DIN 41 494
Material	housing shells: die-cast zinc guide components: die-cast zinc or metallized plastic other parts: stainless steel, steel, brass
Finish:	housing shells: drum-polished or galvanized and chromated or or nickel plated other parts: galvanized, nickel-plated

Delivery kit interface housings metal

	pieces per kit standard	pieces per kit shielded
Interface housing shells	2	2
Cable clamps	1	1
Blind plug	2	2
Shielding plate	-	1
RFI-spring	-	1
Mounting parts	1	1

Delivery kit guide element

	pieces per kit
Guide component top	1
Guide component bottom	1
Mounting parts	1

Delivery

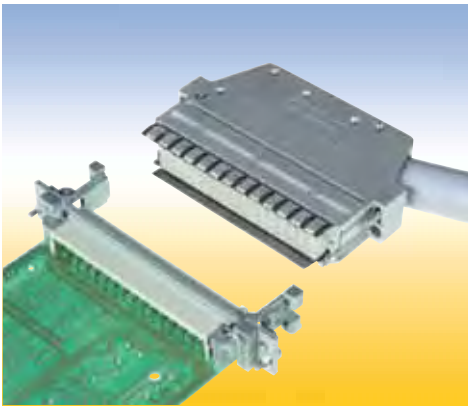
Interface housings:

As a kit of unassembled components, without guide components.

Guide components:

As an assembled kit.

Metal Interface Housings RFI



Metal interface housings metal RFI

Metal Interface Housings RFI E

For connectors styles E 48 and E 160.

Ordering details for kits

	width [HP]	drum- polished order no. 409.	galvanized+ chromated order no. 409.
Metal interface housings			
RFI E-standard	4	113 860	113 824
RFI E-shielded	4	-	113 849

Metal Interface Housings RFI F1

For connector styles F 48, C96, H11, H15, and F24/H7.

Ordering details for kits

	width [HP]	drum- polished order no. 409.	galvanized+ chromated order no. 409.
Metal interface housings			
RFI F1-standard	3	113 838	111 775
RFI F1-standard	4	113 840	111 245
RFI F1-shielded	4	-	113 841

Nickel plated metal interface housings RFI F1 on request.



RFI 20 COD-standard,
codable with marketables coding elements



RFI 20 COD-shielded, codable

Metal Interface Housings RFI 20 COD

With integrated coding,
for connector styles F 48, H15 and F24/H7

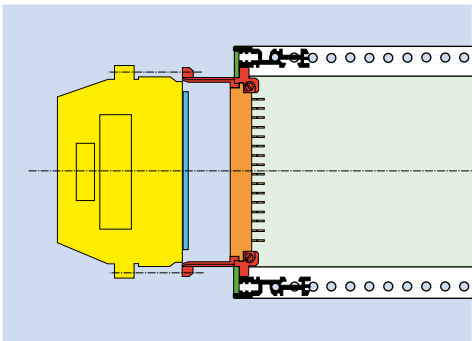
The Metal interface housings RFI 20 - standard are *not* supplied with RFI springs.

Ordering details for kits

	width [HP]	drum- polished order no. 409.	galvanized+ chromated order no. 409.
Metal interface housings			
HF20COD-standard	4	166 286	166 287
HF20COD-shielded	4	-	166 288

Nickel plated metal interface housings RFI 20 COD - standard on request.

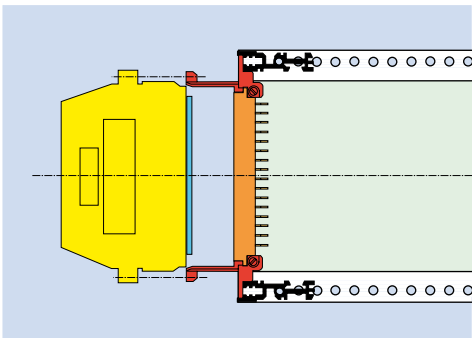
Metallized Guide Components



Application
Guide component F for mounting of a 3 HP metal interface housing in any position of the mounting area.

Ordering details for kits

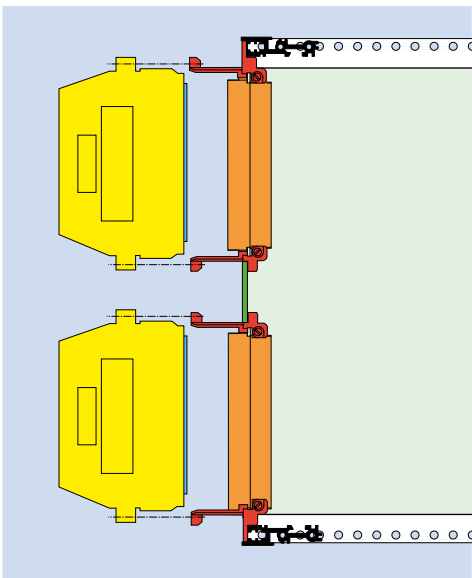
	for metal interface housing RFI	order no. 409.
Guide component F metal-lized	F1- 3 HP	114 122



Application
Guide component F with integrated front panel for mounting of a 3 HP metal interface housing RFI in a 3 U subrack..

Ordering details for kits

	for metal interface housing RFI	order no. 409.
Guide component F metal-lized	F1- 3 HP	114 121



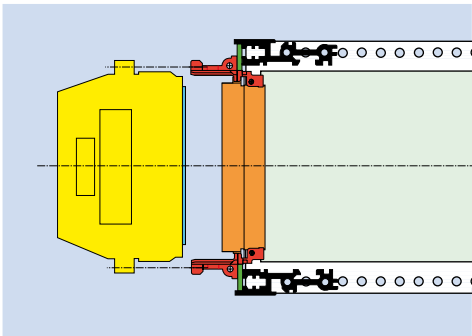
Application
Guide component F for mounting of a 3 HP metal interface housing RFI in the upper or lower area of 6 U subracks.gers.

Ordering details

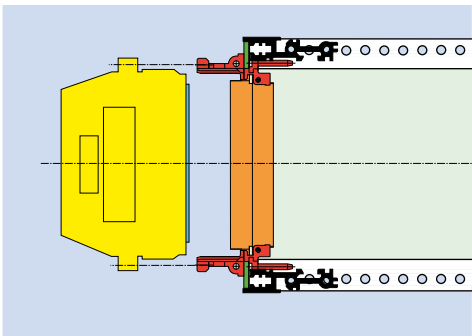
	for metal interface housing RFI	order no. 409.
Guide component F metal-lized	top - F1- 3 HP	114 119
Guide component F metal-lized	bottom - F1- 3 HP	114 120

Color code:
yellow: interface housing
orange: male connector
blue: female connector
red: guide components
green: accessories

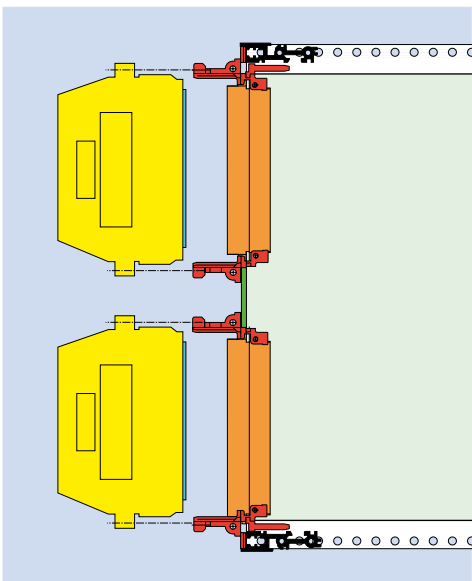
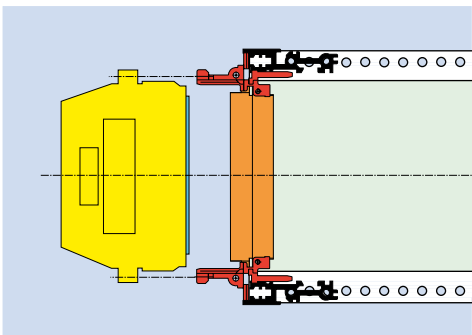
Metal Guide Components



without coding



with coding



Application

Guide component F/E for mounting of a 4 HP metal interface housing RFI in any position of the mounting area.

Ordering details for kits

	for metal interface housing RFI	order no. 409.
Guide component F/E metal	E, F1- 4 HP	114 933
Guide component F/E metal with coding	E, F1- 4 HP	114 007

Application

Guide component F/E with integrated front panel for mounting of a 4 HP metal interface housing RFI in a 3 U subrack.

Ordering details for kits

	for metal interface housing RFI	order no. 409.
Guide component F/E metal	F1- 4 HP	113 826

Application

Guide component F/E for mounting of a 4 HP metal interface housing RFI in the upper or lower area of 6 U subracks.

Ordering details for kits

	for metal interface housing RFI	order no. 409.
Guide component F/E metal	top - F1- 4 HP	113 830
Guide component F/E metal	bottom - F1- 4 HP	113 828

Accessories for Metal Interface Housings RFI E and F



Cable Clamp Kit

consists of:

2 brackets and mounting parts

Material: zink die-cast

Finish : galvanized

Ordering details for kits

	order no. 409.
Cable clamp 3 HP	113 788
Cable clamp 4 HP	112 279



Coding Kit

with 32 possibilities

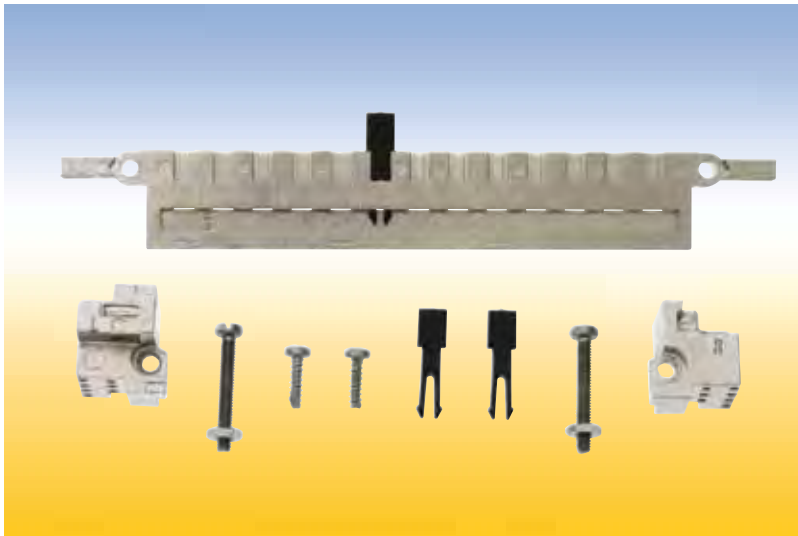
consists of:

4 coding elements and mounting parts

Material: metal

order no.: **409. 034 724**

Accessories for Metal Interface Housings RFI 20 COD



Retaining Parts Kit for mounting in subrack

Material: plastic
Finish: metallized

order no.: **409. 114 983**

Coding Strip RFI 20 for the male connector

Material: plastic
Finish: metallized

order no.: **409. 114 985**

Coding Pin RFI 20

Material: plastic

Packing unit: 100 pieces

order no.: **409. 115 095**



Cable Clamp Kit 4 HP - RFI 20

consists of:
2 brackets and mounting
parts

Material: zinc die-cast
Finish: metallized

Ordering details for kits

	order no. 409.
Cable clamp smal	114 982
Cable clamp wide	117 108

Insulated Bus Bar



Description

Insulated bus bar kit for the power supply in housings and cabinets.

The features of the bus bars:

- ✓ High current capacity up to 120 A.
- ✓ Safe against accidental hand contact up to 500 V in accordance with VDE 0106.
- ✓ The protective profile makes the bus bar safe against accidental finger contact up to 220 V in accordance with VDE 0470.
- ✓ Deliverable in any desired length.
- ✓ With a width of 25 mm, 3-pole use is possible.
- ✓ Insulating materials in accordance with the stipulations of VDE 0606.

Two connection versions are available:

1. Connection version A:

Alternating terminal lugs for A 6.3 x 0.3 flat push-on connectors and screw attachment

2. Connection version B:

Alternating terminal lugs for A 6.3 x 0.3 flat push-on connectors and double terminal lugs for A 2.8 x 0.8 flat push-on connectors or one A 6.3 x 0.8 flat push-on connector. Intermediate lengths can be produced by simply sawing.

Technical data

Number of poles	2- or 3-pole
Connection version A	A 6.3 x 0.8 DIN 46244/connection Ø 4.2 mm
Connection version B	A 6.3 x 0.8 / 2 x A 2.8 x 0.8 DIN 46244
Utilization category	-25 °C, +70°C, no condensation
Phase current	120 A at an ambient temperature of 20 °C; 80 A at 55 °C; 70 A at 70 °C
Max. operating voltage	500 V
Insulation class	group C in accordance with DIN/VDE 0110
Test voltage	3.1 kV
Amp capacity at 20°C	25 A per pin connection A 6.3 x 0.8
Material	bus bar: SE-Cu F37, hot-dip tinned insulating body: Luvogard COM PP8 end cap: PC, black mounting parts: steel, galvanized, colorless chromated
Fire protection class	insulating UL 94 V-0

Delivery

assembled

Kit consists of:

Rails
1 Plastic body
2 End caps
Mounting parts

Accessories

	order no. 409.
Mounting parts 401 (2 position points)	065 430
Mounting parts from 1600 mm (4 position points)	059 270
Connection lug 100 A	057 680

Ordering details for kits

	nom. length [mm]	for cabinet height	A 2poles order no. 409.	A 3poles order no. 409.	B 2poles order no. 409.	B 3poles order no. 409.
Bus bar 100 A-	401	-	-	061 443	-	080 695
Bus bar 100 A-	1600	1800	062 093	058 447	-	080 939
Bus bar 100 A-	1800	2000	062 094	058 449	080 696	080 941
Bus bar 100 A-	2000	2200	062 095	058 451	080 697	080 943

Accessories

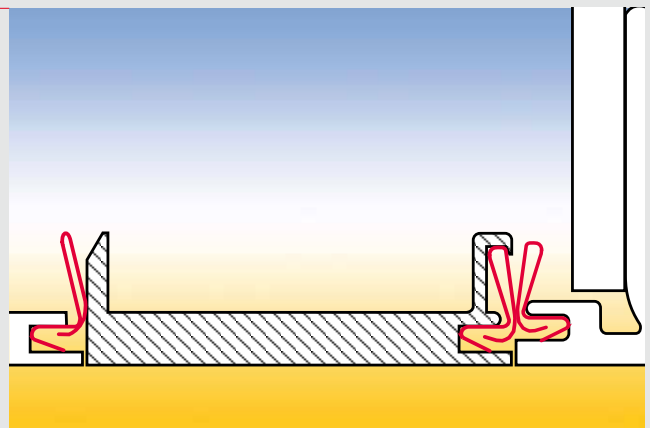
19" Cross-Flow Fan



19" Fan Unit 1 U



RFI Springs



19" Cross-Flow Fan



19" Cross-Flow Fan

For cooling of 160 mm deep modules.

Fan for cooling of 220 mm deep modules on request.

Delivery:

Cross-flow fan

Filter mat

Support grille for filter mat

Technical data

Power plant	current: squirrel-cage motor direct current: non commutator DC motor
Ambient temperature	current: -25 to +65 °C direct current: -25 to +55 °C
Bearings	grooved ball bearing
Life Expectancy	20.000 h
Protection class	IP 10 accordance to DIN 40050
Filter mat	Viledon PSB 145-S
Electrical connection	terminal strip on the back
Material	ventilator housing: steel side panel, flange, support grille, front grille: plastic
Finish	housing: galvanized and chromated

Ordering details 19" Cross-Flow Fan

	nom. depth [mm]	voltage [V]	frequency [Hz]	airflow [m³/h]	order no. 409.
for mounting into a cabinet EQR -160 KS	160	AC 230	50/60	260	091 833
GQR -160 KS 24 VG	160	DC 24	-	260	091 844
for mounting into a housing GQR - 160 KG	160	AC 230	50/60	235	091 834

Accessories

	order no. 409.
Protection grille	091 836
Plastic motor protection hood	091 835
per pack 10 pieces	
Filter mat for EQR and GQR	026 519
Filter mat for GQR -160 KG	026 520

19" Fan Unit 1 U



Technical data

Ambient temperature	max. 70 °C
Max. static pressure	73 - 88 Pa
Noise level	56.5 - 60.2 dB (A)
Power consumption	45 / 42 W
Materials	front panel: 3 mm aluminum anodized, housing: 1 mm steel, al-zinc

Ordering details

	depth [mm]	voltage [V]	frequency [Hz]	airflow [m³/h]	order no. 409.
Fan unit 1U	193	AC 230	50/60	440-520	166 274

19" Fan Unit 1 U

For cooling of modules in cabinets or housings.

Delivery:

- 1 front panel
- 1 housing with grille
- 3 fans
- 1 power connector
- 1 strain-relief

Fan unit with 6 fans and other voltages on request.



Technical data

Ambient temperature	max. 65 °C
Max. static pressure	70 Pa
Noise level	63.5 dB (A)
Power consumption	15.9 W
Materials	front panel: 3 mm aluminum anodized, housing: 1 mm steel, al-zinc

Ordering details

	depth [mm]	voltage [V]	airflow [m³/h]	order no. 409.
Fan unit 1 U with speed monitoring and control	193	DC 24	467	166 276

19" Fan Unit 1 U with speed monitoring and control

For cooling of modules in cabinets or housings.

Delivery:

- 1 front panel
- 1 housing with grille
- 3 fans
- 1 connection cable, cable length 2.5 m, open end
- 1 temperature sensor external, NTC resistor, cable length 1.5 m

Technical Data, Control & Monitoring

Switching control range	20 - 40 °C to 30 - 50 °C
Sensor connection	rear connector for temperature sensor
Signal for	speed < 20 % of the nom. speed; switch-on delay < 4 s, signal delay < 1 s
Signaling	display via LEDs floating contact switching capacity 20 W switching voltage max. 100 V

UFanRail® – Innovative cooling solution for railway applications

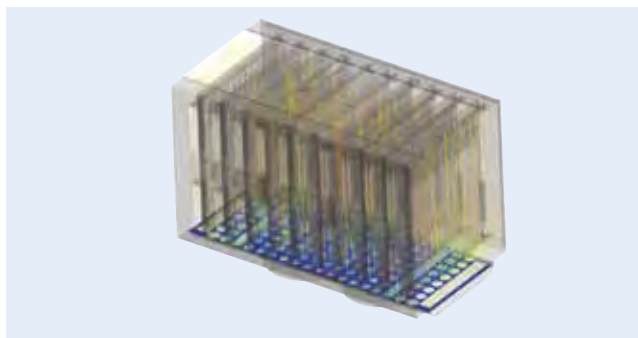


Description

Electronic components used in railway applications, especially in 19" cabinets and cases, require effective cooling. The patented *UFanRail*® airflow guide provides an effective linear cooling, which prevents the formation of temperature hot spots. This enables the electronics to run at a higher performance and also improves the MTBF of the electronics and mechanical components. Status information of the fan unit is communicated over TCP/IP or the railway specific Multifunctional Vehicle Bus (MVB).

Special design features

- ✓ Patented airflow regulator allows uniform airflow along the boarders
- ✓ Designed in accordance with railway standards
- ✓ Software Communication Interfaces:
 - TCP/IP, SNMP
 - Multifunction Vehicle Bus (MVB)
- ✓ Status information: Input voltage failure, locked rotor, fan speed, fan alarm, hours of operation, historic defects, ambient temperature etc. ...
- ✓ Alarm indication: Dry contacts NO/NC
- ✓ Fan speed control: Linearly controlled from 50-100% by temperature sensor



Technical Data

Input range	24...110VDC
Input voltage protection via surge filter	
Operating temperature	-25 bis +70 °C according to T1
Storage temperature	-40...+85 °C
Protection class	IP 20
Airflow	>400 m³/h
Signals	available at railway flat floating connector

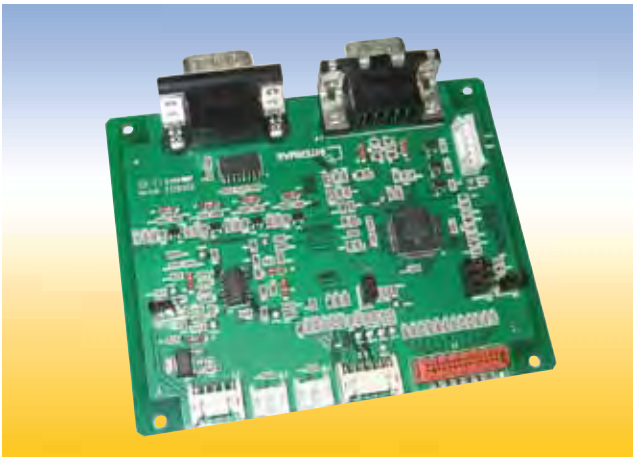
Railway standards and approvals

Fire and smoke	NF F 16-101, NF F 16-102 and CEN TS 45545-2
Safety	EN 50155-2007, IEC 61375-1, IEEE 1473-T, NF F 61-005, EN 50121-3-2, NF EN ISO 13857, EN 61373, STM-E-001, NF EN 60068-2-14

Ordering details

Product	number of fans	input voltage	fan speed setting	data communication	order no. 409.
UFR100	2	24 – 110 VDC	no	no	136 207
UFR100 NF F 61005	2	24 – 110 VDC	no	no	136 208
UFR200	2	24 – 110 VDC	yes; 50-100 %	TCP/IP, SNMP	136 209
UFR200 NF F 61005	2	24 – 110 VDC	yes; 50-100 %	TCP/IP, SNMP, MVB in middle of line	136 210
Accessories	quantity	specification	operating temp.	precision / stability	409.
Temperature sensor	1	LSZH	-40 - +100 °C	+/- 1 °C	136 211
Airflow guide	1				136 413

PCBA Monitoring Board



Technical Data

Voltage measurement

- ✓ Monitoring of four voltages: 3.3V, 5V, +12V und -12V
- ✓ Definable high and low threshold

Temperature measurement

- ✓ Connectors for two LM35 precision temperature sensors
- ✓ Programmable high threshold
- ✓ Programmable delta threshold if two LM35 probes are connected

Fan status

- ✓ Monitor up to four 12V or 24V fans
- ✓ Detect the following failures:
 - TACHO signal not in range
 - Fan alarm signal
- ✓ NTC input for each fan

VME/CPCI Bus signal

- ✓ Monitoring of following open drain signals:
 - SYSFAIL: VME, CPCI compliant
 - ACFAIL: VME, CPCI compliant
 - AC1, AC2
 - SYSRESET: VME, CPCI compliant
- ✓ Light LED on SYSFAIL

Ordering details

	order-no.
	409.
PCBA Monitoring Board	135 793

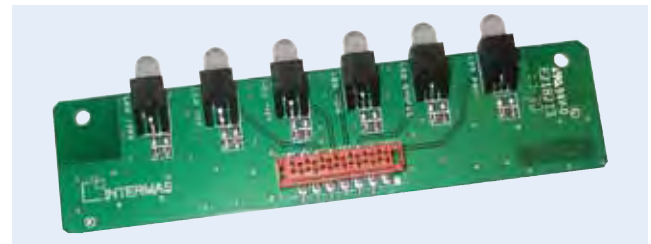
Description

The InterMas PCBA Monitoring Board allows the monitoring of critical system data like voltages, temperatures, fan status and VME or CompactPCI bus signals in real time. A LED board is used to visualize the status of the measured values.

LED Board

indicate following failures:

- 3.3V not in range
- 5V not in range
- $\pm 12V$ not in range
- Fan failure
- Temperature not in range
- SYSFAIL on VME-Bus



Programming the InterMas-PCBA

- ✓ Configure parameters with a graphical user interface
- ✓ Read measurement data via I2C-Bus and RS232
- ✓ Fully programmable flow control for monitoring algorithms



RFI Spring A2 and F3



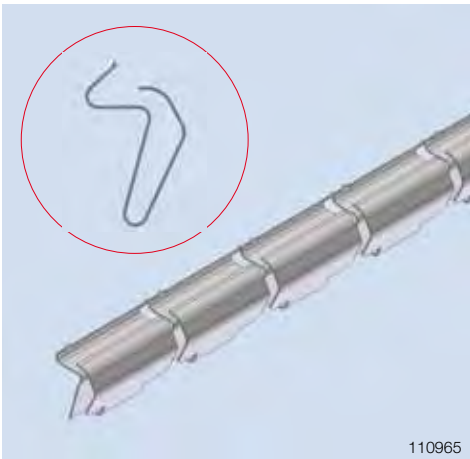
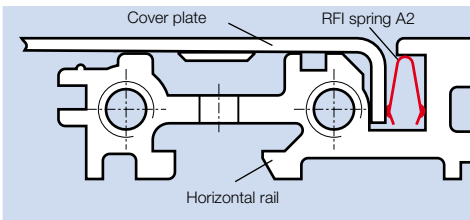
RFI Spring A2

Shielding between the cover plates and the subrack. The spring is snapped into the profile channel of the horizontal rail. It can be cut in 10 mm lengths.

Material: stainless steel, 0.1 mm thick

Ordering details

	nom. width [HP]	length [mm]	order no. 409.
RFI spring A2	36	182	107 724
RFI spring A2	42	217	090 800
RFI spring A2	84	427	085 011



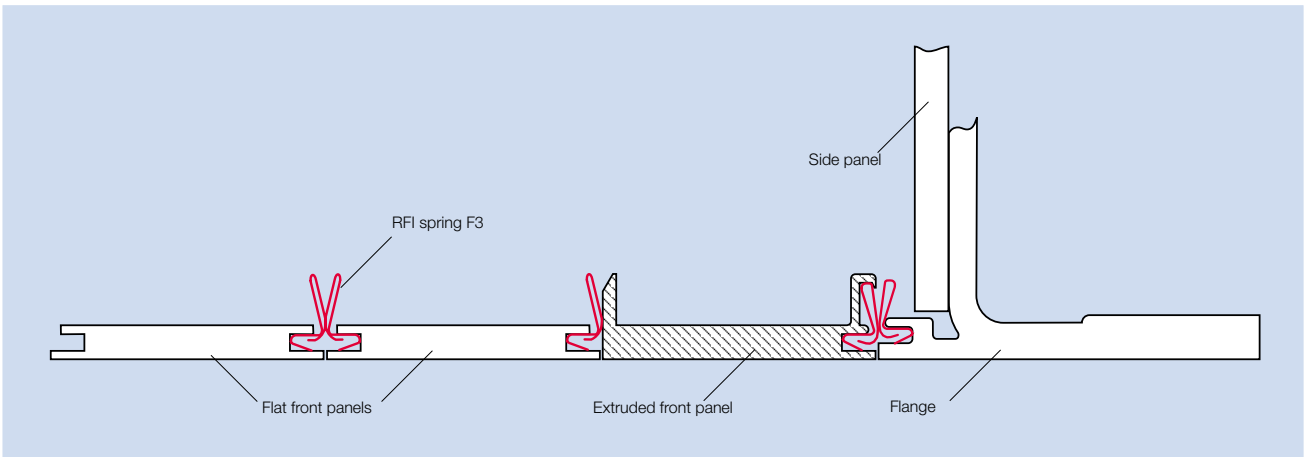
RFI Spring F3

Shielding between the front panels and between front panel and flange as well as shielding the cover plates of the *DiVar* housing. It can be cut in 7.41 mm lengths.

Material: stainless steel, 0.08 mm thick

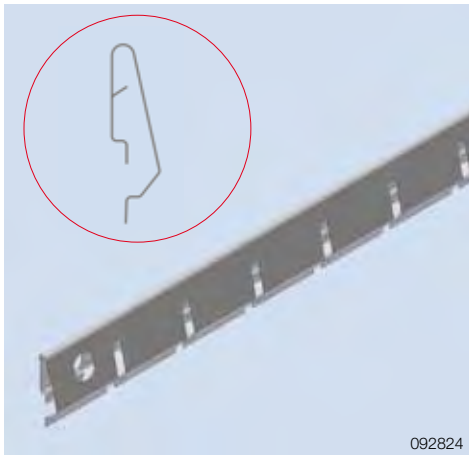
Ordering details

	nom. height [U]	height [mm]	order no. 409.
RFI spring F3-2	2	51.37	112 386
RFI spring F3-3-IEEE	3	95.83	111 112
RFI spring F3-3	3	110.65	111 636
RFI spring F3-4	4	155.11	112 387
RFI spring F3-6-IEEE	6	229.21	111 116
RFI spring F3-6	6	244.03	111 637



Shielding between the front panel and between front panel and flange

RFI Spring F1, Contact Profile and RFI Spring P2



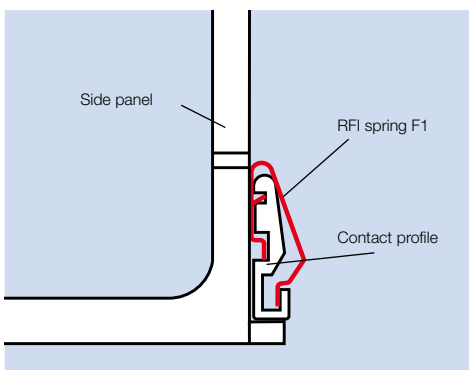
RFI Spring F1

Shielding between the front panel and side panel with the contact profile of the *InterRail* subrack.

Material: CuSn 0.1 mm thick

Ordering details

	nom. height [U]	height [mm]	order no. 409.
RFI spring F1-3	3	106.9	093 400
RFI spring F1-6	6	240.25	093 401



Contact Profile

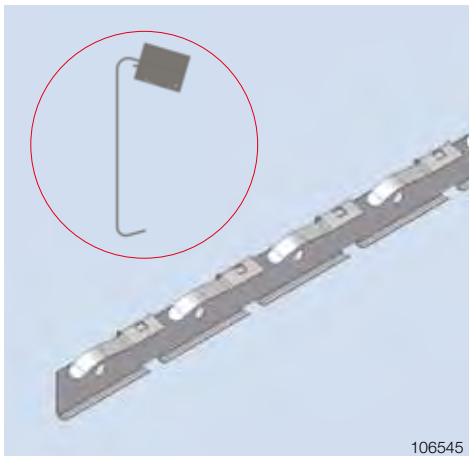
Shielding between front panel and side panel with the RFI spring F1 of the *InterRail* subrack.

Material: aluminum

Finish: colorless chromated

Ordering details

	nom. height [U]	height [mm]	order no. 409.
Contact profile -3	3	107.5	092 923
Contact profile -6	6	240.85	092 924



RFI Spring P2

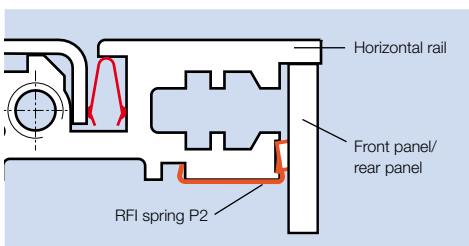
Shielding front panels and rear panel to the horizontal rail.

The spring is snapped into the profile channel of the horizontal rail. It can be cut in 15.24 mm lengths.

Material: stainless steel, 0.08 mm thick

Ordering details

	nom. width [HP]	length [mm]	order no. 409.
RFI spring P2	42	212.36	106 546
RFI spring P2	84	425.72	106 547



RFI Spring U1 and U2

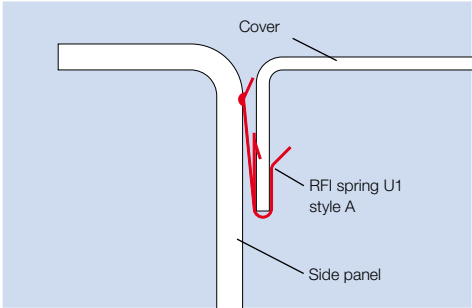


RFI Spring U1
Multiple applications. Shielding subracks, housings and cabinets with 1 mm - 2.5 mm sheet thickness. The spring can be cut in 10 mm lengths.

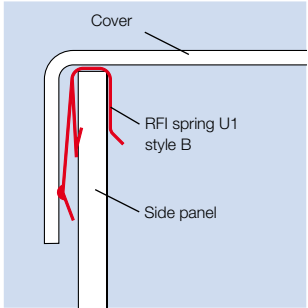
Material:
stainless steel, 0.1 mm thick

Ordering details

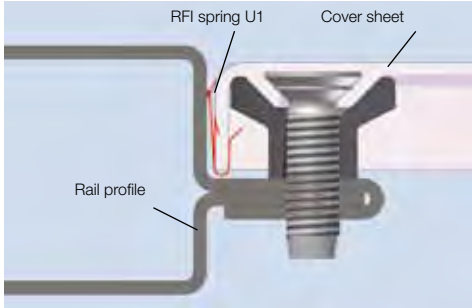
	style	sheet thick- ness [mm]	length [mm]	order no. 409.
RFI spring U1-1,0-230	A	1.0	229	114 840
RFI spring U1-1,5-400	A	1.5	399	101 830
RFI spring U1-2,0-270	B	2.0	269	107 323
RFI spring U1-2,5-270	B	2.5	269	103 792



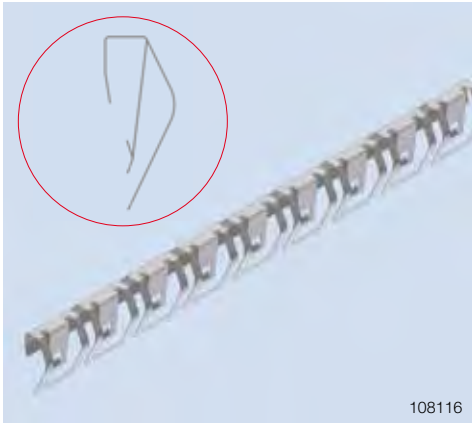
Subrack example of use



Subrack example of use



System cabinet example of use

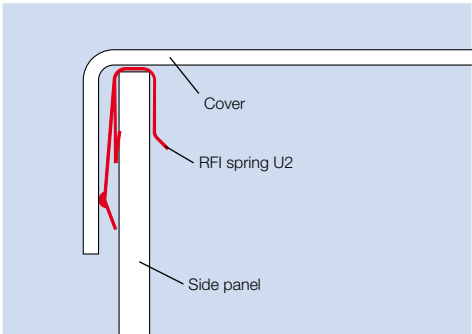


RFI Spring U2
Multiple applications. Shielding subracks, housings and cabinets with 2.5 mm sheet thickness. The spring can be cut in 10 mm lengths.

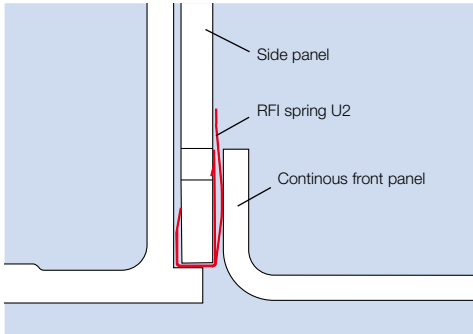
Material: stainless steel, 0.08 mm thick

Ordering details

	sheet thick- ness [mm]	length [mm]	order no. 409.
RFI spring U2	2.5	98.79	108 107
RFI spring U2	2.5	232.14	108 108
RFI spring U2	2.5	632.19	109 537



Subrack example of use



Subrack example of use

RFI Spring M-P2, G-A2, G-P2 and RFI Fabric Gasket



RFI Spring M-P2

Shielding between side panel and backplane with a mounting strip. The spring can be cut in 25 mm lengths.

Material: stainless steel, 0.08 mm thick

Dimensions: 85 x 5 mm

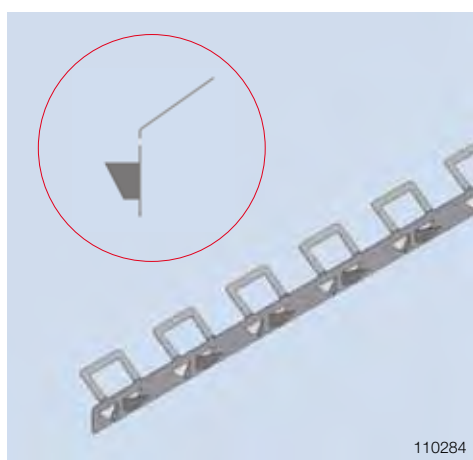
Length: 424 mm

order no.: **409. 106 533**

Accessories

Mounting strip

order no.: **409. 111 691**



RFI Spring G-A2

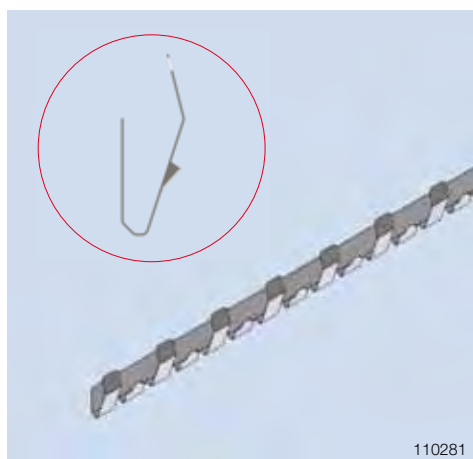
Shielding between the profiles and the cover plates of the *InterMeZo* housing.

The spring can be cut in 25 mm lengths.

Material: stainless steel, 0.15 mm thick

Length: 469 mm

order no.: **409. 110 960**



RFI Spring G-P2

Shielding between the door/rear panel and the profile of the *InterMeZo* housing.

The spring can be cut in 14.815 mm lengths.

Material: stainless steel, 0.15 mm thick

Length: 471.83 mm

order no.: **409. 111 534**



RFI Fabric Gasket, self-adhesive

Shielding between the door/rear panel and the profile of the housing.

Material: polyurethane foam core covered with copper-nickel (NiCuNi) metal fabric

Dimensions: height 9.5 x width 6.4 x length 1000 mm

Fire protection class: UL 94 V-0

order no.: **409. 175 397**

List of Order-Numbers 409.

Order no. 409.		Order no. 409.		Order no. 409.		Order no. 409.	
013		031		035		040 386	3.93
013 904	7.5	031 015	7.4	035 004	3.93	040 387	3.93
013 910	7.5	031 018	7.5	035 206	7.11	040 401	3.85, 4.10
013 911	3.64, 3.68	031 019	7.5	035 207	7.10		4.12
	3.69, 3.70	031 020	7.5	035 316	7.12	040 419	3.44
	3.71, 3.72	031 021	7.3	035 528	3.93	040 420	3.44
	3.85, 4.10	031 022	7.3	035 529	3.93	040 652	3.85
	4.12	031 023	7.5	035 630	7.5	040 969	4.10
013 919	3.44, 2.7	031 024	7.5	035 665	3.93		
013 938	3.68, 3.70	031 030	7.3			041	
	3.71, 3.72	031 031	7.3	038		041 008	4.11
	3.85, 3.94	031 120	7.5	038 687	4.9	041 012	4.11
	7.5	031 123	7.5	038 689	4.9	041 657	3.85
017		031 124	7.9	038 691	4.9	041 660	7.4
017 929	3.85	031 125	7.9	038 693	4.9		
017 956	3.85	031 583	7.6	038 700	4.9	042	
017 956	3.89			038 707	4.9	042 218	7.4
		032		038 721	4.9	042 219	7.4
018		032 518	7.11	038 763	4.9		
018 028	7.5	032 519	7.12	038 765	4.9	043	
018 055	3.65	032 520	7.10, 7.12	038 767	4.9	043 035	3.93
		032 523	7.12	038 769	4.9	043 036	3.93
		032 549	7.11	038 776	4.9	043 488	4.11
022		032 550	7.12	038 783	4.9	043 514	4.8
022 622	7.4	032 551	7.10, 7.12	038 797	4.9	043 516	4.8
022 672	4.11	032 552	7.12			043 518	4.8
022 714	7.6	032 553	7.10	039		043 525	4.8
022 791	3.85	032 554	7.10	039 540	4.7	043 532	4.8
022 792	3.85, 4.10	032 555	7.11	039 542	4.7	043 546	4.8
022 793	3.85, 4.10	032 556	7.11	039 543	4.7	043 586	7.3
022 794	3.85, 4.10	032 563	7.10	039 546	4.7	043 598	7.3
022 796	3.85, 4.10	032 564	7.10	039 547	4.7	043 606	7.3
022 798	3.85, 4.10	032 565	7.10	039 603	4.7	043 610	7.3
022 800	4.10	032 566	7.10	039 604	4.7	043 622	7.3
022 802	3.85	032 567	7.10	039 691	3.66, 3.69		
022 807	3.85, 4.10	032 568	7.10		4.10, 4.12	044	
022 814	4.10	032 569	7.10	039 851	4.12	044 090	4.12
		032 574	7.11	039 853	4.12	044 214	7.6
024		032 575	7.10, 7.12	039 855	4.12		
024 361	3.64	032 708	3.64, 4.12	039 857	4.12	045	
024 380	3.64		7.5	039 864	4.12	045 210	7.3
024 567	7.4	032 766	7.13	039 954	4.12	045 235	7.3
024 738	3.61	032 767	7.13	039 968	4.12	045 891	7.3
024 740	3.61					045 894	7.3
024 830	3.95	033		040		045 897	7.3
		033 188	7.6	040 348	4.13		
026		033 189	7.6	040 350	4.13	046	
026 068	3.39			040 352	4.13	046 098	4.11
026 519	8.2	034		040 354	4.13	046 999	4.12
026 520	8.2	034 532	7.13	040 361	4.13		
026 586	3.64	034 533	7.13	040 368	4.13	047	
		034 724	7.13, 7.18	040 382	4.13	047 221	3.50
				040 385	3.93	047 243	3.50

List of Order-Numbers 409.

Order no. 409.		Order no. 409.		Order no. 409.		Order no. 409.	
047 285	3.50	053 329	3.46	062 094	7.20	074	
047 421	3.49	053 343	3.46	062 095	7.20	074 056	1.7
047 443	3.49	053 385	3.46			074 057	1.7
047 485	3.49			064		074 202	7.4
047 601	3.66	056		064 687	3.59	074 203	7.4
047 621	3.52	056 135	3.93	064 740	7.6	074 387	2.7, 3.44
047 643	3.52			064 947	3.59		
047 685	3.52	057				077	
047 821	3.51	057 680	7.20	065		077 038	7.4
047 843	3.51			065 430	7.20	077 042	7.4
047 885	3.51	058		065 819	3.45	077 045	7.4
048		058 102	3.67, 3.69	065 882	3.94	077 048	7.4
048 684	3.54		3.70, 3.71	065 883	3.94	077 051	7.4
048 784	3.54		3.74, 3.94	065 888	3.89	077 055	7.4
		058 447	7.20			077 058	7.4
049		058 449	7.20	067		077 111	7.5
049 668	1.10	058 451	7.20	067 624	3.55, 3.56	077 112	7.5
049 670	1.10	058 910	3.85		3.57, 3.94	077 516	7.9
049 677	1.9	058 910	4.10				
049 679	1.9	058 912	3.85, 4.10	068		078	
049 680	1.9	058 914	4.10	068 089	7.3	078 428	3.81
049 681	1.9	058 916	3.85	068 108	7.3	078 641	1.8
049 682	1.9	058 921	3.85, 4.10	068 698	3.75	078 646	1.8
049 721	3.49	058 928	4.10	068 760	1.10	078 693	3.36
049 743	3.49	058 942	3.85, 4.10			078 942	3.58
049 785	3.49	058 944	3.29	069			
049 921	3.52			069 047	3.59	079	
049 943	3.52	059		069 302	1.10	079 184	3.54
049 985	3.52	059 270	7.20	069 369	1.9	079 202	4.7
		059 632	3.70	069 755	7.13	079 203	4.7
050		059 634	3.70	069 774	3.70	079 284	3.54
050 121	3.51	059 636	3.70			079 384	3.54
050 129	3.51	059 640	2.9	070		079 521	3.46
050 143	3.51			070 323	7.3	079 543	3.46
050 185	3.51	061		070 425	7.3	079 585	3.46
050 567	1.9	061 051	3.71	070 476	7.5		
050 688	1.8	061 052	3.71	070 617	7.6	080	
		061 059	3.71	070 620	7.9	080 068	3.70
051		061 060	3.71	070 621	7.9	080 695	7.20
051 981	3.7, 3.9	061 061	3.71	070 969	7.4	080 696	7.20
	3.16, 3.17	061 062	3.71			080 697	7.20
	3.18, 3.19	061 086	3.71	071		080 939	7.20
	3.24, 3.26	061 088	3.71	071 015	7.4	080 941	7.20
	3.27, 3.65	061 443	7.20	071 876	7.9	080 943	7.20
		061 468	3.67				
052		061 469	3.67	072		081	
052 156	3.36, 3.37	061 526	3.67	072 533	3.59	081 039	1.10
	3.39	061 541	3.65	072 619	7.11		
052 720	3.75			072 620	7.11	082	
		062				082 063	3.58
053		062 043	3.46	073		082 121	3.49
053 321	3.46	062 085	3.46	073 659	7.9	082 143	3.49
		062 093	7.20			082 185	3.49

List of Order-Numbers 409.

Order no. 409.		Order no. 409.		Order no. 409.		Order no. 409.	
082 239	3.57	087 639	3.40	094 602	3.64	097	
082 594	3.96, 4.13	087 802	3.41	094 604	3.64, 3.68	097 201	3.79
083		087 820	3.45		3.69, 3.70	097 202	3.79
083 091	3.69	087 821	3.45		3.71, 3.72	097 203	3.79
		087 824	3.41	094 605	3.85	097 204	3.79
085		088		094 628	7.4	097 205	3.79
085 001	3.36	088 190	3.56	094 700	3.9	097 206	3.79
085 002	3.36	088 365	3.47	094 701	3.9	097 207	3.79
085 003	3.36			094 702	3.9	097 208	3.79
085 010	3.70	089		094 703	3.9	097 210	3.79
085 011	3.53, 8.6	089 238	3.85	094 704	3.9	097 212	3.79
085 095	3.36	089 240	3.85	094 705	3.9	097 214	3.79
085 096	3.36	089 244	3.56	094 706	3.9	097 221	3.79
085 097	3.36			094 707	3.9	097 228	3.79
085 689	3.93	090		094 708	3.9	097 242	3.79
085 695	3.44	090 799	3.47	094 709	3.9	097 284	3.79
085 696	3.44	090 800	3.53, 8.6	094 710	3.9	097 286	3.37
				094 711	3.9	097 404	3.79
086		091		096		097 406	3.79
086 333	3.37	091 255	3.7, 3.9	096 403	3.83	097 408	3.79
086 334	3.37		3.16, 3.17	096 404	3.83	097 412	3.79
086 336	3.37		3.18, 3.19	096 405	3.83	097 414	3.79
086 337	3.37		3.24, 3.25	096 406	3.83	097 421	3.79
086 513	2.6		3.26, 3.27	096 407	3.83	097 428	3.79
086 514	2.6	091 833	8.2	096 408	3.83	097 442	3.79
086 516	2.6	091 834	8.2	096 410	3.83	097 484	3.79
086 517	2.6	091 835	8.2	096 412	3.83	097 601	3.79
086 519	2.6	091 836	8.2	096 416	3.83	097 602	3.79
086 522	2.6	091 844	8.2	096 421	3.83	097 603	3.79
086 787	3.41			096 604	3.83	097 604	3.79
086 791	3.41	092		096 605	3.83	097 605	3.79
087		092 502	3.51	096 606	3.83	097 606	3.79
087 340	3.7	092 602	3.49	096 608	3.83	097 607	3.79
087 341	3.7	092 785	3.74	096 610	3.83	097 608	3.79
087 342	3.7	092 786	3.95	096 612	3.83	097 610	3.79
087 364	3.7	092 923	8.7	096 703	3.83	097 612	3.79
087 365	3.7	092 924	8.7	096 704	3.83	097 614	3.79
087 366	3.7	093		096 705	3.83	097 621	3.79
087 388	3.7	093 400	8.7	096 706	3.83	097 628	3.79
087 389	3.7	093 401	8.7	096 707	3.83	097 642	3.79
087 390	3.7	093 548	3.52	096 708	3.83	097 684	3.79
087 440	3.7	093 605	3.25, 3.26	096 710	3.83	097 804	3.79
087 441	3.7		3.27, 3.29	096 712	3.83	097 806	3.79
087 442	3.7			096 716	3.83	097 808	3.79
087 446	3.7	093 606	3.25, 3.26	096 721	3.83	097 812	3.79
087 447	3.7		3.27, 3.29	096 904	3.83	097 814	3.79
087 448	3.7			096 905	3.83	097 821	3.79
087 462	3.7	094		096 906	3.83	097 828	3.79
087 463	3.7	094 458	3.89	096 908	3.83	097 842	3.79
087 464	3.7	094 459	3.89	096 910	3.83	097 884	3.79
087 475	3.50	094 464	3.93	096 912	3.83	097 957	3.96

List of Order-Numbers 409.

Order no. 409.		Order no. 409.		Order no. 409.		Order no. 409.	
098		102 118	3.89	105 655	3.53	108 246	3.50
098 986	7.4	102 297	3.75	105 656	3.53	108 250	3.28
098 989	7.4	102 344	3.87	105 789	3.44	108 251	3.28
098 991	7.4	102 348	3.87	105 790	3.54	108 252	3.29
		102 352	3.87			108 253	3.29
099		102 356	3.87	106		108 254	3.29
099 730	3.94	102 361	3.87	106 102	3.49	108 255	3.29
099 731	3.94	102 384	3.87	106 103	3.49	108 274	3.25
099 883	3.54	102 388	3.87	106 530	3.74	108 275	3.25
		102 392	3.87	106 531	3.74	108 875	3.57
100		102 404	3.87	106 533	8.9	108 876	3.57
100 538	3.79, 3.96	102 405	3.87	106 546	3.53, 8.7	108 962	4.10
		102 406	3.87	106 547	3.16, 3.17	108 963	4.10, 4.13
4.13		102 408	3.87		3.18, 3.19	108 987	3.51
100 539	3.79, 3.96	102 410	3.87		3.25, 3.26	108 988	3.51
	4.13	102 412	3.87		3.27, 3.29		
100 540	3.96, 4.13	102 416	3.87		3.53, 8.7	109	
100 650	7.7	102 421	3.87	106 750	3.37	109 058	3.70
100 652	7.7	102 432	3.29	106 751	3.62	109 537	8.8
100 660	7.7	102 454	3.87			109 934	3.47
100 662	7.7	102 458	3.87	107		109 937	3.50
100 667	3.85	102 462	3.87	107 323	8.8	109 984	2.6
100 843	3.62	102 822	3.28	107 342	3.58	109 985	2.6
				107 518	3.83	109 986	2.6
101		103		107 520	3.83	109 987	2.6
101 276	3.70	103 005	3.85	107 521	3.83	109 988	2.6
101 385	7.4	103 006	3.85, 4.10	107 522	3.83		
101 830	8.8	103 007	3.85, 4.10	107 716	3.28	110	
101 843	3.89	103 008	3.85, 4.10	107 719	3.40	110 201	3.36
101 844	3.89	103 205	3.85	107 721	3.50	110 202	3.36
101 917	3.96, 4.13	103 206	3.85, 4.10	107 722	3.53	110 234	3.36
101 918	3.96, 4.13	103 207	3.85, 4.10	107 723	3.56	110 238	3.36
101 923	3.89	103 208	3.85, 4.10	107 724	8.6	110 248	3.36
101 276	3.70	103 358	3.68, 3.69	107 727	3.94	110 249	3.36
101 385	7.4		3.70, 3.72	107 728	3.94	110 360	2.7
101 830	8.8		3.74	107 841	3.50	110 361	2.7
101 843	3.89	103 777	3.62	107 842	3.50	110 366	2.7
101 844	3.89	103 792	8.8	107 846	3.53	110 367	2.7
101 917	3.58, 3.79	103 810	3.85, 4.10	107 847	3.53	110 368	2.7
	3.96, 4.10	103 812	3.85, 4.10	107 905	3.56	110 370	2.7
	4.13	103 814	4.10	107 906	3.56	110 372	2.7
101 918	3.96, 4.13	103 816	3.85			110 375	2.7
101 923	3.89	103 821	3.85, 4.10	108		110 376	2.7
101 924	3.89	103 828	4.10	108 008	3.52	110 378	2.7
		103 842	3.85, 4.10	108 012	3.60	110 379	2.7
102				108 045	3.60	110 381	2.7
102 109	7.7	104		108 061	3.50	110 382	2.7
102 110	7.7	104 030	3.50	108 101	3.70	110 392	2.6
102 112	7.7	104 994	3.49	108 107	8.8	110 395	2.6
102 113	7.7			108 108	8.8	110 452	2.6
102 114	3.85	105		108 120	3.70	110 453	2.6
102 115	3.85	105 380	7.3	108 157	3.70	110 454	2.6
102 117	3.89	105 602	3.40	108 173	3.66	110 455	2.6

List of Order-Numbers 409.

Order no. 409.		Order no. 409.		Order no. 409.		Order no. 409.	
110 456	2.6	112		113 028	3.80	113 673	3.91
110 457	2.6	112 054	3.64	113 029	3.80	113 674	3.91
110 960	8.9	112 055	3.64	113 030	3.80	113 675	3.91
111		112 092	2.7	113 079	3.91	113 676	3.91
111 112	3.58, 3.81	112 093	2.7	113 147	3.88	113 685	3.84
	3.84, 3.88	112 094	2.7	113 148	3.88	113 693	3.84
	3.91, 3.92	112 152	3.91	113 149	3.88	113 705	3.81
	4.11, 4.14	112 154	3.91	113 170	3.88	113 706	3.81
	8.6	112 202	3.42	113 171	3.88	113 711	3.84
111 116	3.58, 3.81	112 205	3.42	113 172	3.88	113 713	3.72, 3.73
	3.84, 3.88	112 234	3.42	113 400	3.72	113 723	3.84
	3.91, 3.92	112 252	3.80	113 450	3.72, 3.73	113 725	3.84
	4.11, 8.6	112 258	3.80	113 583	3.80	113 729	3.84
111 157	3.68	112 279	7.18	113 586	3.80	113 762	3.84
111 182	3.47	112 386	3.42, 8.6	113 589	3.80	113 788	7.18
111 184	3.55	112 387	3.42, 8.6	113 590	3.80	113 824	7.15
111 199	3.52	112 400	3.91	113 592	3.80	113 826	7.17
111 245	7.15	112 401	3.91	113 593	3.80	113 828	7.17
111 285	2.6	112 402	3.91	113 594	3.80	113 830	7.17
111 286	2.6	112 403	3.91	113 595	3.80	113 838	7.15
111 287	2.6	112 404	3.91	113 596	3.80	113 840	7.15
111 534	8.9	112 405	3.91	113 598	3.80	113 841	7.15
111 556	2.6	112 408	3.91	113 599	3.80	113 849	7.15
111 557	2.6	112 409	3.91	113 608	3.80	113 860	7.15
111 559	2.6	112 410	3.91	113 609	3.80	113 905	3.73
111 560	2.6	112 411	3.91	113 611	3.80	113 948	3.81
111 561	2.6	112 412	3.91	113 612	3.80	113 950	3.81
111 562	2.6	112 413	3.91	113 613	3.80	114	
111 604	3.88	112 413	3.91	113 614	3.80	114 007	7.17
111 605	3.88	112 453	3.68	113 617	3.80	114 082	3.80
111 606	3.88	112 454	3.68	113 620	3.88	114 119	7.16
111 608	3.80	112 507	2.7	113 622	3.88	114 120	7.16
111 609	3.80	112 551	3.80	113 626	3.88	114 121	7.16
111 610	3.80	112 557	3.80	113 640	3.88	114 122	7.16
111 611	3.80	112 578	3.80	113 641	3.91	114 240	3.39
111 613	3.88	112 581	3.80	113 647	3.91	114 241	3.39
111 614	3.88	112 611	3.80	113 654	3.91	114 242	3.39
111 615	3.88	112 617	3.80	113 655	3.88	114 243	3.39
111 616	3.88	112 638	3.80	113 656	3.88	114 361	3.80
111 618	3.80	112 641	3.80	113 657	3.88	114 362	3.80
111 619	3.80	112 644	3.88	113 658	3.88	114 363	3.80
111 620	3.80	112 650	3.88	113 659	3.88	114 365	3.80
111 621	3.80	112 668	3.88	113 660	3.88	114 366	3.80
111 636	3.42, 3.44	112 725	3.88	113 661	3.88	114 367	3.80
	8.6	112 773	3.91	113 662	3.88	114 368	3.80
111 637	3.42, 3.44	112 778	3.91	113 663	3.88	114 370	3.84
	8.6	112 790	3.91	113 665	3.88	114 371	3.84
111 691	8.9	112 821	3.80	113 667	3.88	114 372	3.84
111 774	2.9	112 872	3.39	113 668	3.88	114 373	3.84
111 775	7.15	112 876	3.39	113 669	3.88	114 374	3.84
111 847	3.88	112 943	3.80	113 670	3.88	114 376	3.84
		113		113 671	3.91	114 377	3.84
		113 027	3.80	113 672	3.91		

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114 378	3.84	114 759	3.39	118		122 622	3.83
114 379	3.84	114 760	3.39	118 374	3.44	122 624	3.83
114 380	3.84	114 762	3.39	118 433	3.80, 3.84	122 625	3.83
114 381	3.84	114 766	3.39		3.88, 3.91	122 626	3.83
114 383	3.84	114 840	8.8		3.92, 4.11	122 627	3.83
114 384	3.80	114 933	7.17		4.14	122 628	3.83
114 385	3.80	114 982	7.19	118 608	3.62	122 639	3.87
114 386	3.80	114 983	7.19	119		122 640	3.87
114 387	3.80	114 985	7.19	119 013	4.12	122 641	3.87
114 388	3.80	115		119 024	4.9	122 642	3.87
114 389	3.80	115 005	4.9	119 026	4.9	122 643	3.87
114 390	3.80	115 007	4.9	119 028	4.9	122 644	3.87
114 391	3.80	115 009	4.9	119 030	4.9	122 645	3.87
114 392	3.80	115 011	4.9	119 037	4.9	122 646	3.87
114 393	3.80	115 018	4.9	119 044	4.9	122 647	3.87
114 396	3.84	115 025	4.9	119 058	4.9	122 648	3.60
114 397	3.84	115 039	4.9	120		122 649	3.60
114 399	3.84	115 042	3.51	120 282	4.9	122 650	3.60
114 400	3.84	115 095	7.19	120 283	4.9	122 651	3.60
114 401	3.84	115 171	3.70	120 790	3.61	130	
114 403	3.84	115 224	3.55	121		130 883	3.62
114 404	3.84	115 236	3.70	121 329	3.55	130 889	3.72
114 405	3.84	115 270	3.55	121 519	3.51	130 890	3.62
114 406	3.84	115 540	3.55	121 808	2.9	131	
114 407	3.84	115 542	3.55	121 941	3.61	131 354	1.8
114 408	3.84	115 701	3.52	122		131 478	3.62
114 410	3.84	115 771	3.48	122 131	3.44	131 548	3.62
114 413	3.91	115 823	3.48	122 295	3.32	131 550	1.9
114 415	3.91	115 824	3.48	122 297	3.32	131 652	2.7
114 453	3.80	115 898	3.57	122 300	3.33	131 688	3.62
114 454	3.80	115 899	3.57	122 301	3.33	131 701	3.62
114 455	3.80	116		122 356	2.10	131 813	3.62
114 458	3.80	116 200	3.69	122 357	2.10	131 836	3.62
114 459	3.80	116 319	3.58	122 358	2.10	131 845	3.62
114 463	3.91	116 333	3.60	122 359	2.10	131 973	3.72
114 464	3.80	116 334	3.60	122 360	2.10	132	
114 465	3.80	116 335	3.60	122 377	3.52	132 038	3.62
114 466	3.80	116 336	3.60	122 378	3.52	132 240	1.9
114 469	3.80	116 416	3.60	122 379	3.53	132 464	1.10
114 470	3.80	116 418	3.60	122 380	4.9	132 601	1.9
114 475	3.91	116 440	3.72	122 421	3.48	132 603	1.9
114 476	3.80	116 441	3.73	122 549	3.55	132 604	1.9
114 487	3.80	116 442	3.72, 3.73	122 550	3.55	132 605	1.9
114 537	3.84	116 484	3.19	122 607	3.92	132 606	1.9
114 538	3.84	116 507	3.48	122 608	3.92	132 735	1.10
114 540	3.84	116 586	3.49	122 609	3.92	132 778	1.8
114 541	3.84	116 588	3.48	122 610	3.92		
114 562	3.47, 3.81	116 603	3.55	122 611	3.92		
114 612	3.42	117		122 612	3.92		
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133 306	2.9	162 713	3.16	165 638	4.4	165 867	4.5
133 307	2.9	162 714	3.16	165 639	4.4	165 868	4.5
133 308	2.9	162 715	3.16	165 642	4.4	165 869	4.5
		162 716	3.17	165 643	4.4	165 870	4.5
135		162 717	3.17	165 644	4.4	165 871	4.5
135 793	8.5	162 718	3.17	165 645	4.4	165 873	4.5
		162 719	3.17	165 646	4.4	165 881	4.5
136		162 720	3.18	165 647	4.4	165 896	4.6
136 207	8.4	162 721	3.18	165 698	4.5	165 897	4.6
136 208	8.4	162 722	3.18	165 699	4.5	165 898	4.6
136 209	8.4	162 723	3.18	165 700	4.5		
136 210	8.4	162 724	3.18	165 701	4.5	166	
136 211	8.4	162 725	3.18	165 702	4.5	166 100	4.6
136 413	8.4	162 726	3.18	165 703	4.5	166 101	4.6
		162 727	3.18	165 706	4.5	166 102	4.6
161		162 728	3.19	165 707	4.5	166 112	4.6
161 034	3.19	162 729	3.19	165 708	4.5	166 113	4.6
161 059	3.51	162 730	3.25	165 709	4.5	166 114	4.6
161 104	3.55	162 731	3.25	165 710	4.5	166 116	4.6
161 105	3.55	162 732	3.25	165 711	4.5	166 117	4.6
161 110	3.43	162 733	3.25	165 713	4.5	166 118	4.6
161 113	3.43	162 734	3.26	165 721	4.5	166 208	2.5
161 155	3.39	162 735	3.26	165 730	4.5	166 209	2.5
161 156	3.39	162 736	3.26	165 731	4.5	166 210	2.5
161 157	3.39	162 737	3.26	165 732	4.5	166 211	2.5
161 160	3.39	162 738	3.26	165 733	4.5	166 212	2.5
161 161	3.59	162 739	3.26	165 734	4.5	166 213	2.5
161 162	3.59	162 740	3.27	165 735	4.5	166 214	2.5
161 165	3.59	162 741	3.27	165 738	4.5	166 215	2.5
161 166	3.59	162 742	3.27	165 739	4.5	166 216	2.5
161 173	3.39	162 743	3.27	165 740	4.5	166 217	2.5
161 174	3.39	162 744	3.27	165 741	4.5	166 218	2.5
161 188	3.39	162 745	3.27	165 742	4.5	166 219	2.5
161 189	3.39			165 743	4.5	166 220	2.5
161 193	3.39	165		165 842	4.5	166 237	4.8
161 245	3.49	165 602	4.4	165 843	4.5	166 238	4.8
		165 603	4.4	165 844	4.5	166 239	4.8
162		165 604	4.4	165 845	4.5	166 240	4.8
162 610	3.24	165 605	4.4	165 846	4.5	166 241	4.8
162 611	3.24	165 606	4.4	165 847	4.5	166 242	4.8
162 612	3.24	165 607	4.4	165 850	4.5	166 243	4.8
162 613	3.24	165 610	4.4	165 851	4.5	166 261	1.6
162 614	3.24	165 611	4.4	165 852	4.5	166 262	1.6
162 700	3.7	165 612	4.4	165 853	4.5	166 263	1.6
162 701	3.7	165 613	4.4	165 854	4.5	166 264	1.6
162 703	3.7	165 614	4.4	165 855	4.5	166 265	1.6
162 704	3.7, 3.9	165 615	4.4	165 858	4.5	166 266	1.6
162 705	3.7, 3.9	165 617	4.4	165 859	4.5	166 270	3.59
162 708	3.16	165 625	4.4	165 860	4.5	166 274	8.3
162 709	3.16	165 634	4.4	165 861	4.5	166 276	8.3
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168 917	3.87	116-010194F	6.12
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168 920	3.87	116-031530B	6.10
168 921	3.87	116-040151K	6.8
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168 936	2.12	116-040153D	6.8
168 937	2.12	116-040301J	6.8
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168 939	4.14	116-040303C	6.8
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172 630	2.8	148-010011J	6.4
172 631	2.8	148-011002D	6.2
172 640	2.8	148-010019G	6.2
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