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
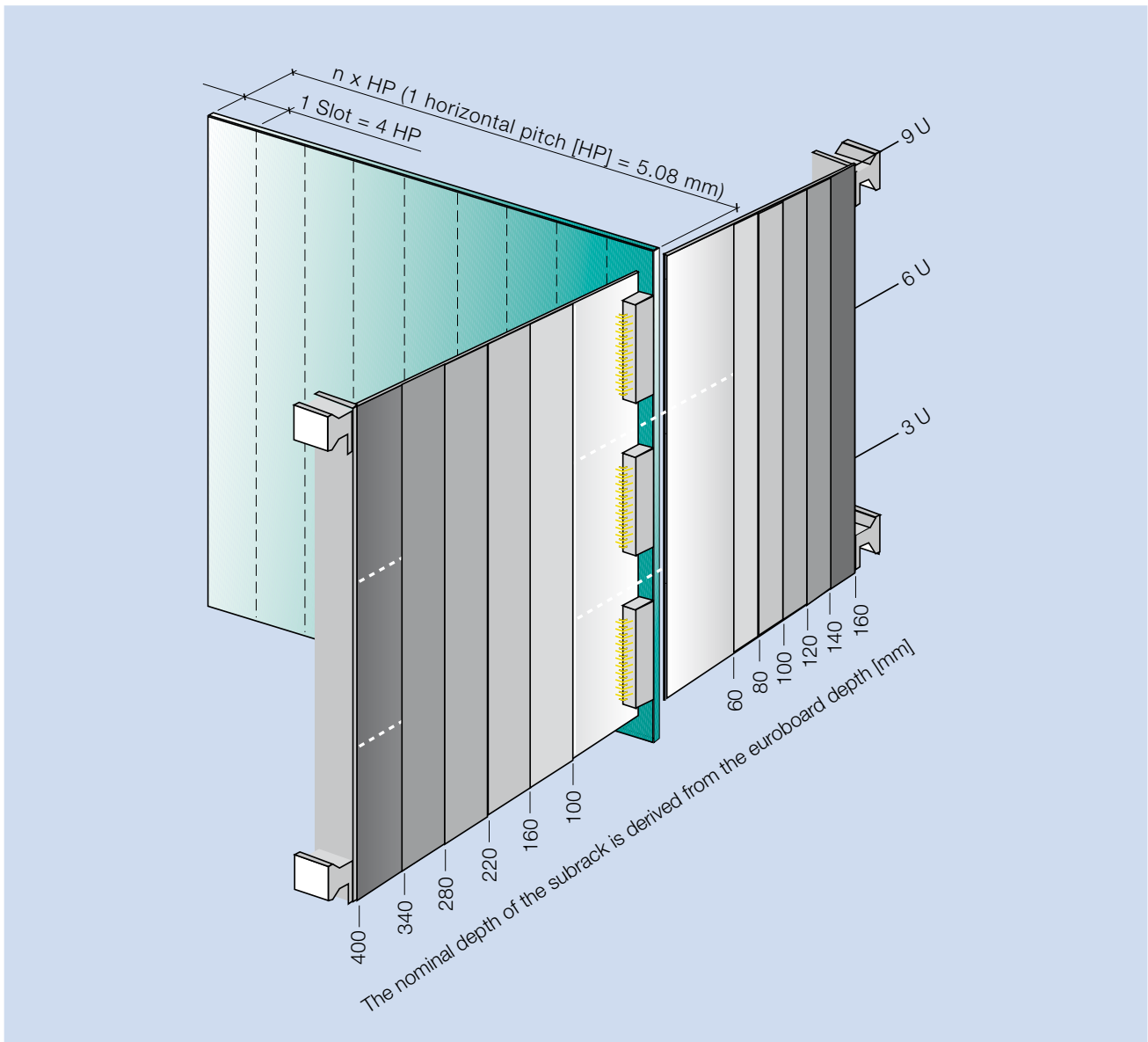
System-Modules CompactPCI

√   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 aquivalent 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 stucked 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 aquivalent to 5.08 mm.

Busboards are specified in slots.
1 Slot is aquivalent 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 41612.

2. Type *beta*

The rear profiles with integral Z-rail are suitable for the direct mounting of connectors to DIN 41612.

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.

This catalog contains stock and standard parts. Other products and sizes on request.

Technical data

Standards	compliant with DIN 41 494 D IEC 60 297
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 40 050 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.

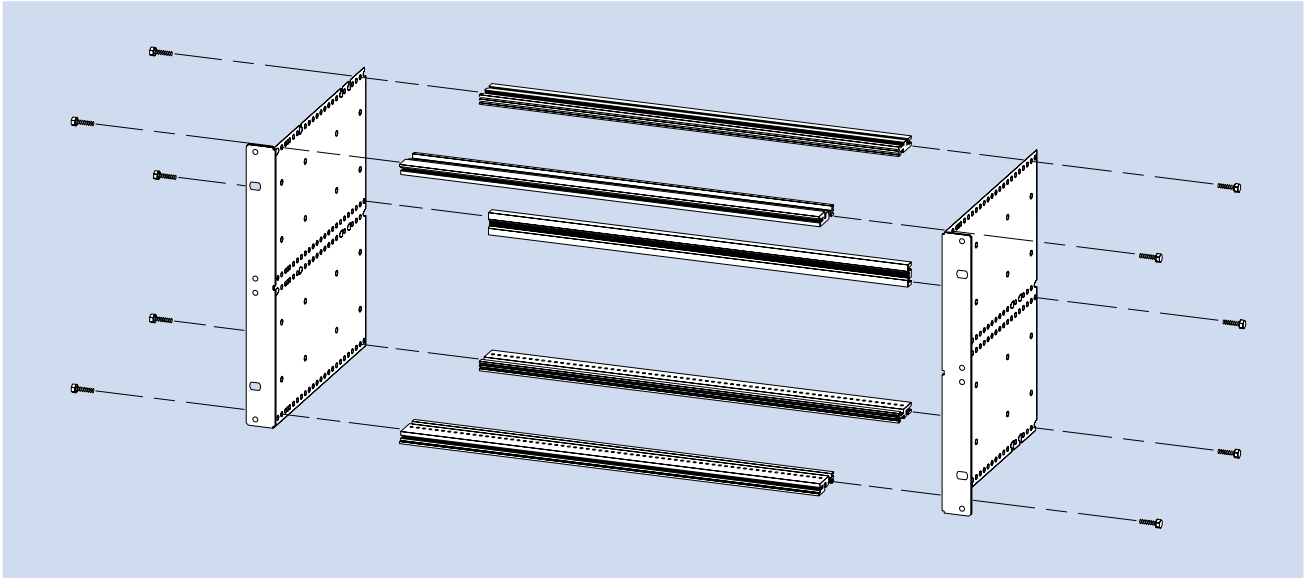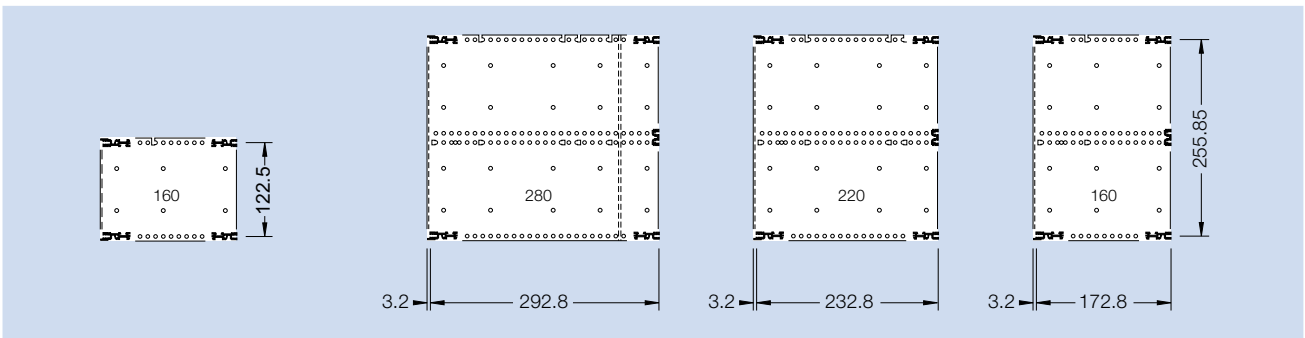Subracks
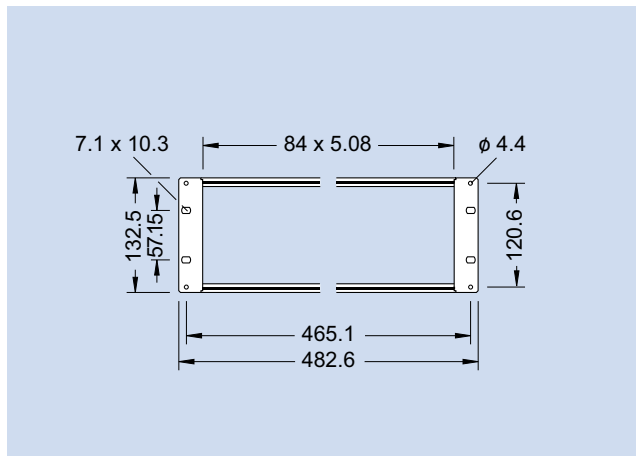
Dimensions
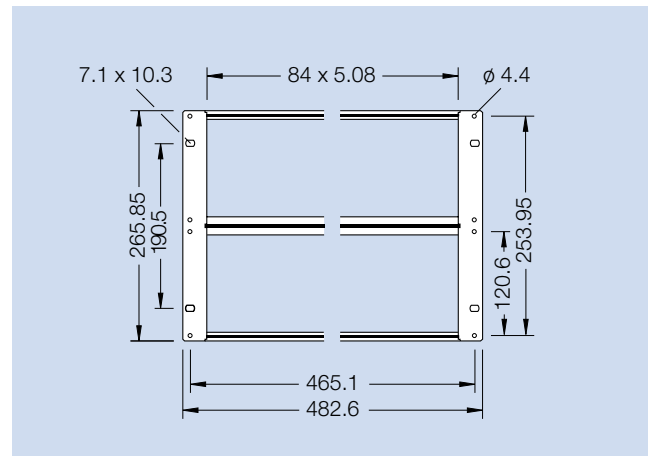
Front of subrack 3 U
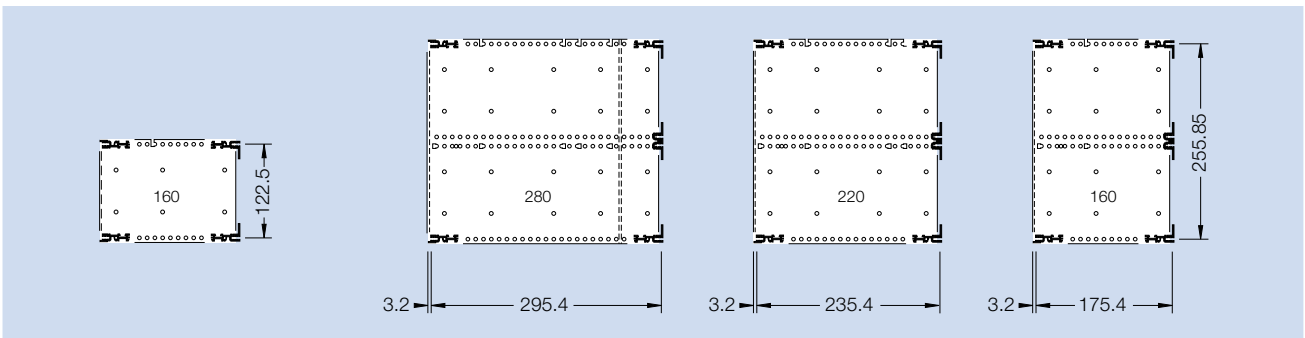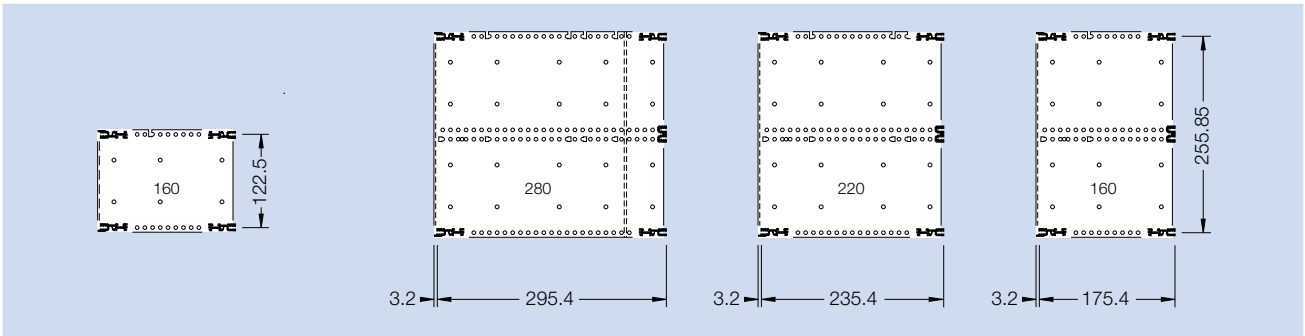

Front of subrack 6 U

Subrack *FLEXIBLE Fi*

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

This catalog contains stock and standard parts. Other products and sizes on request.

Ordering details for kits

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

Subracks

Delivery

	pieces per kit *alpha* 3 HE	pieces per kit *alpha* 6 HE	pieces per kit *beta* 3 HE	pieces per kit *beta* 6 HE	pieces per kit *delta* 3 HE	pieces per kit *delta* 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

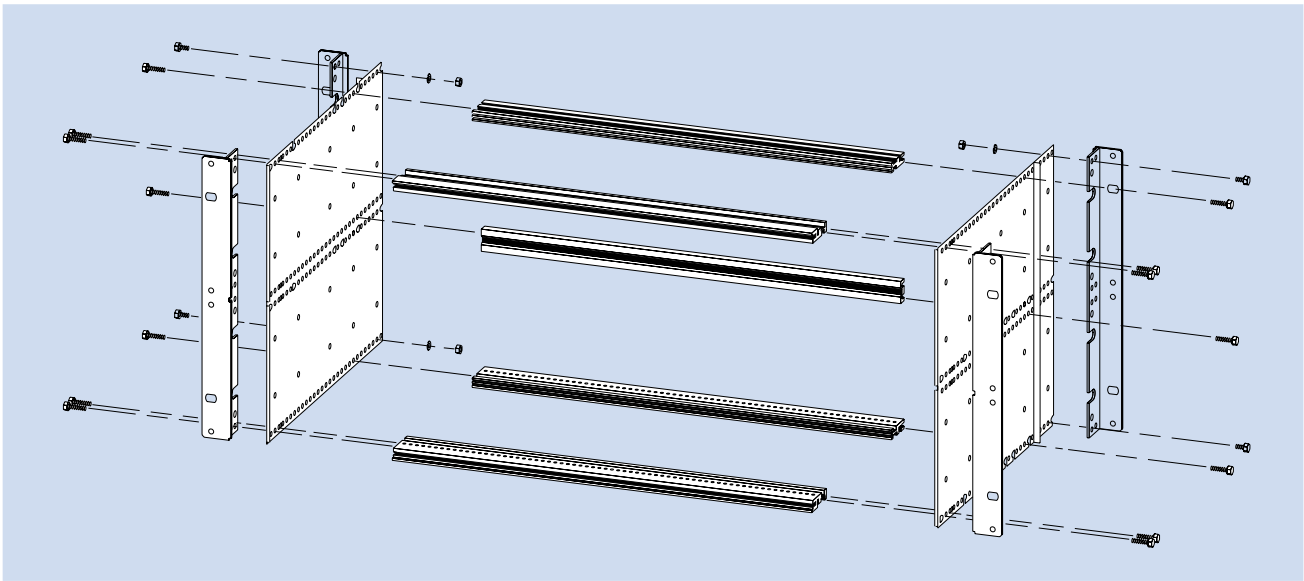|	order no. 409.
Threaded strip 84 x M 2.5	091 255
Insulating strip 84 HP	051 981

Kits with 2 cover plate ø 8.5 mm and mounting parts

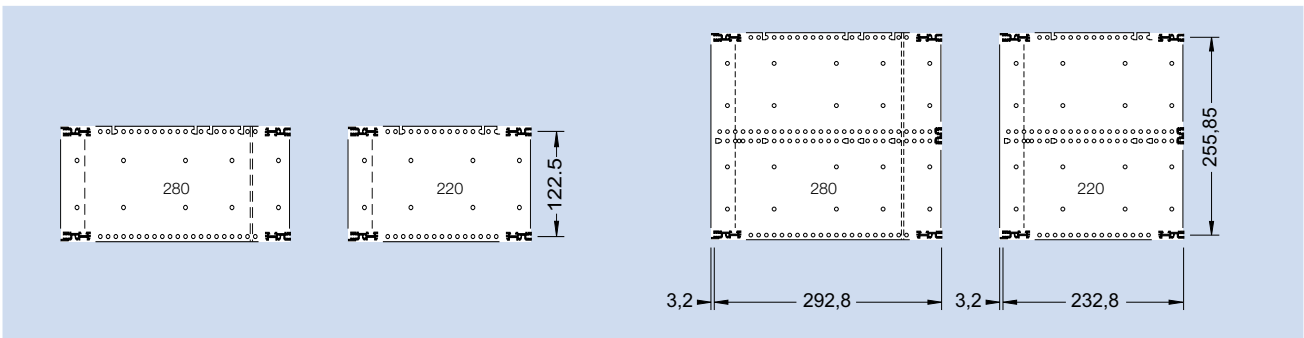|	
Cover plates kit slide-in 160	162 700
Cover plates kit slide-in 220	162 701
Cover plates kit screw-on 160	162 703
Cover plates kit screw-on 220	162 704
Cover plates kit screw-on 280	162 705

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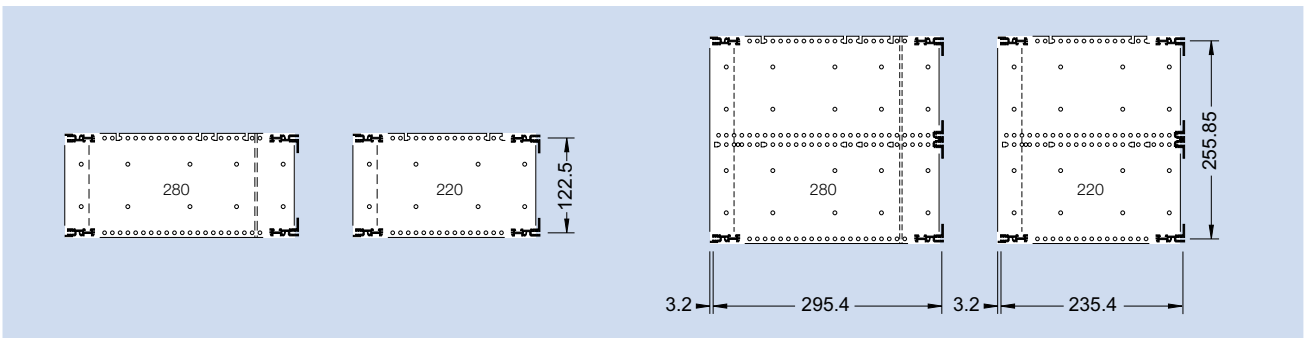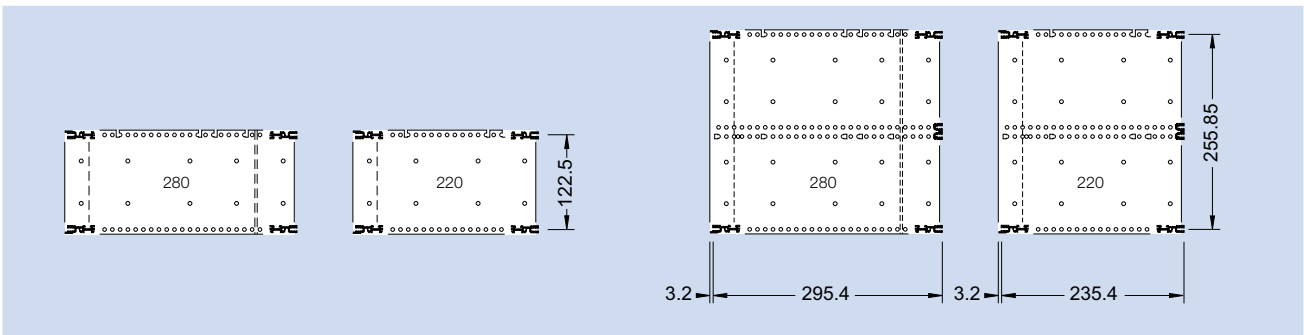
Subrack *FLEXIBLE Fs*

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

This catalog contains stock and standard parts. Other products and sizes on request.

Ordering details for kits

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

Delivery

	pieces per kit *alpha* 3 U	pieces per kit *alpha* 6 U	pieces per kit *beta* 3 U	pieces per kit *beta* 6 U	pieces per kit *delta* 3 U	pieces per kit *delta* 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.

Subracks

Subrack *RFI-SHIELDED*

Description

The system dimensions of the *RFI-SHIELDED* sub-rack 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 assambled and wired subrack according your requirements.

This catalog contains stock and standard parts. Other products and sizes on request.

Subrack *RFI-SHIELDED*

Technical data

|	
Standards	compliant with DIN 41 494 D IEC 60 297-3, 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 60 603-2 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 40 050 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
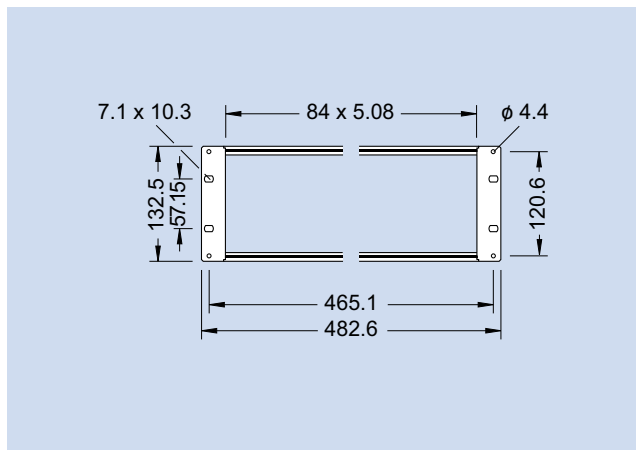
Front of subrack 3 U
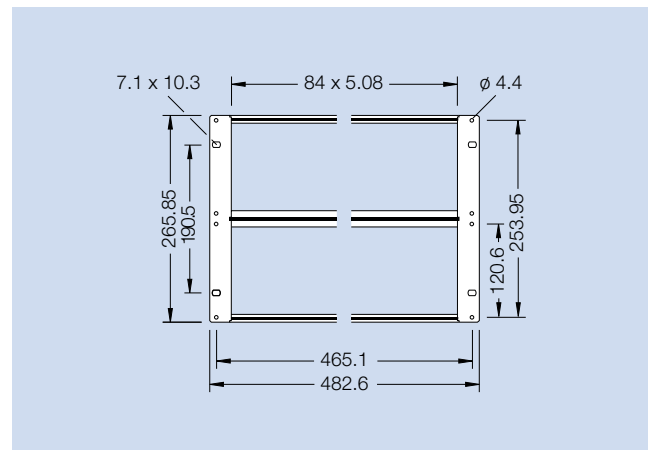
Front of subrack 6 U

Measurement Configuration, Tests, Measurement Results
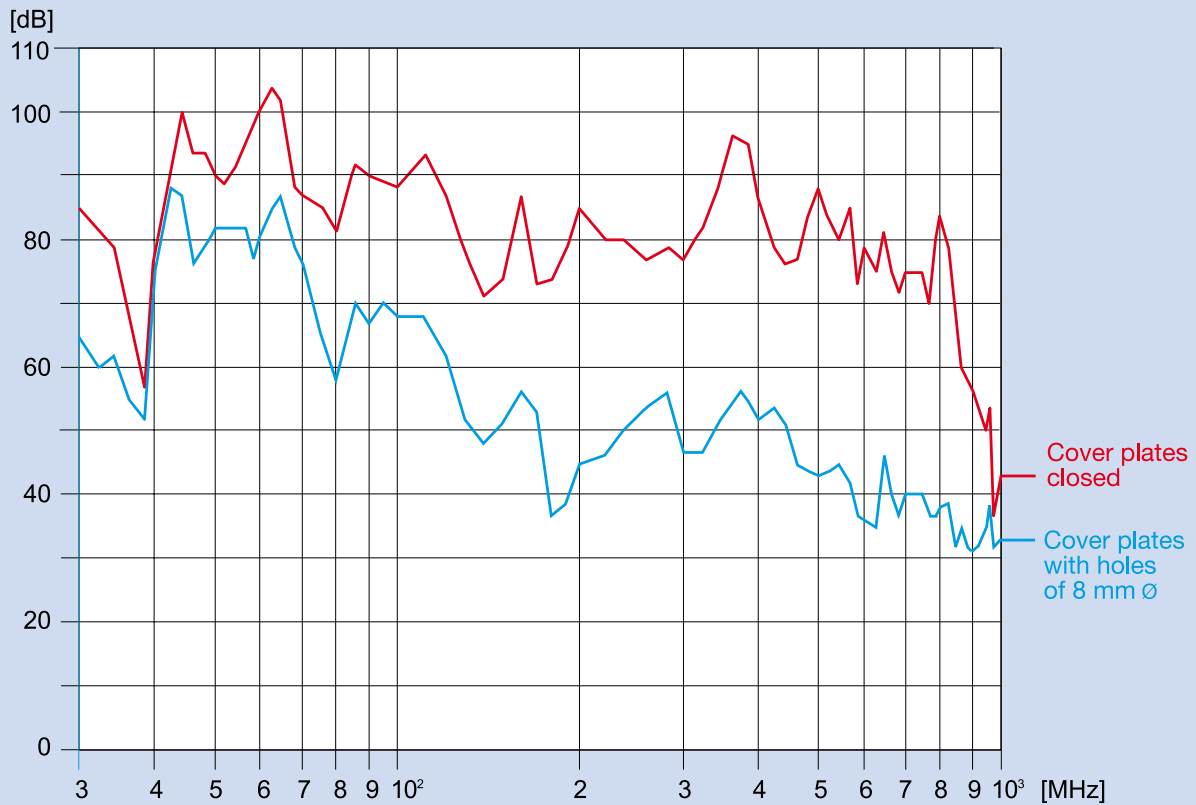
Shielding efficiency as function of grade of perforation of the covers

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.

Frequenzy steps

Frequenzy 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.
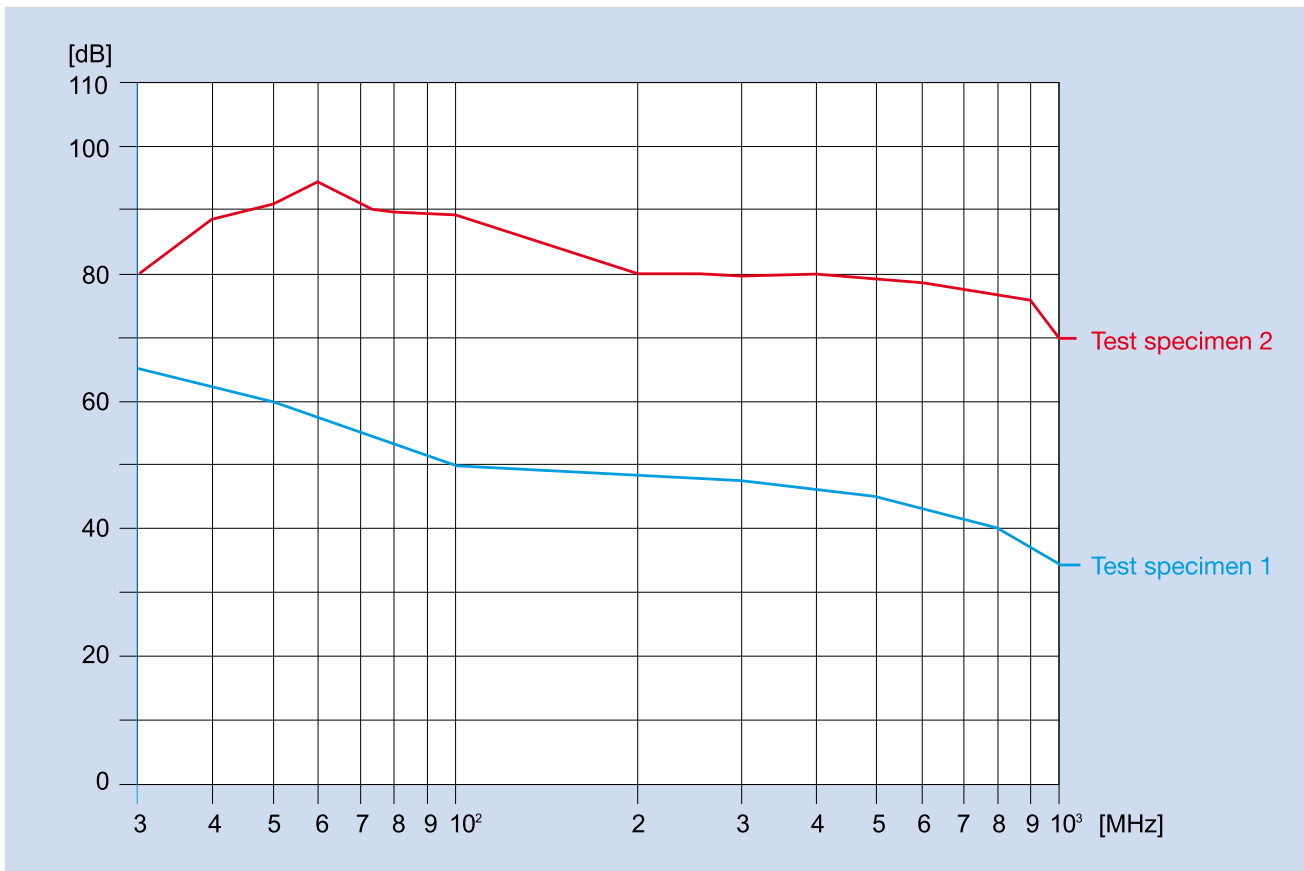
Shielding effectiveness

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.

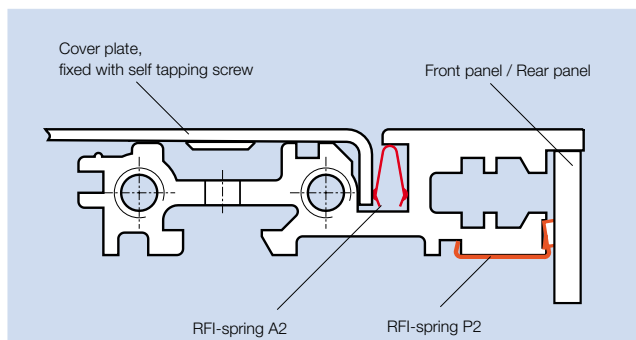4. The cover panel is screwed directly to the side panel; springs are thus not necessary here.

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.

Side panel

RFI-spring F3

Flat front panel

Extruded front panel
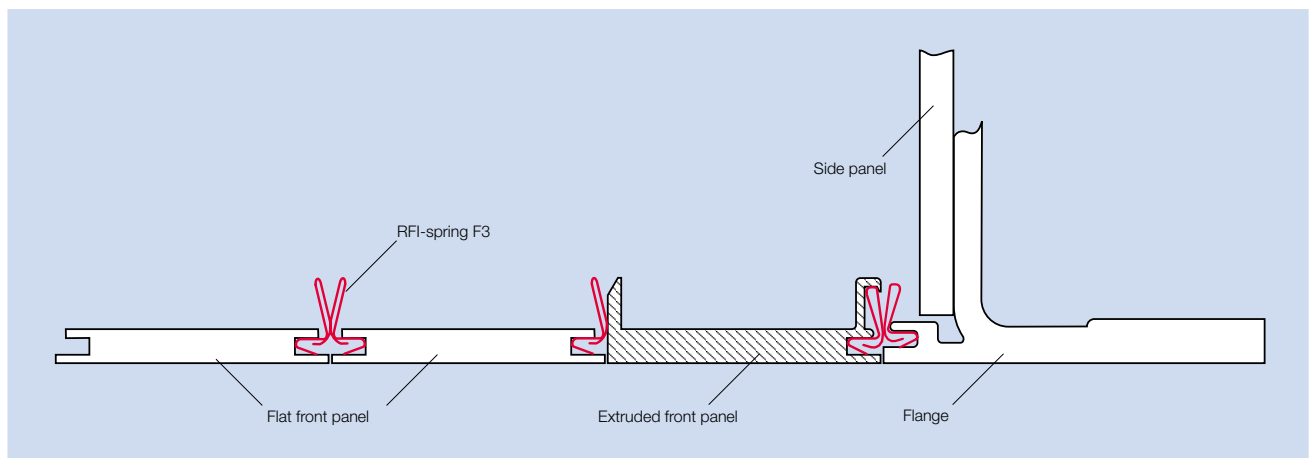
Flange

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

Cover plate, fixed with self tapping screw

Front panel / Rear panel

RFI-spring A2

RFI-spring P2

Bonding with RFI-springs

This catalog contains stock and standard parts. Other products and sizes on request.
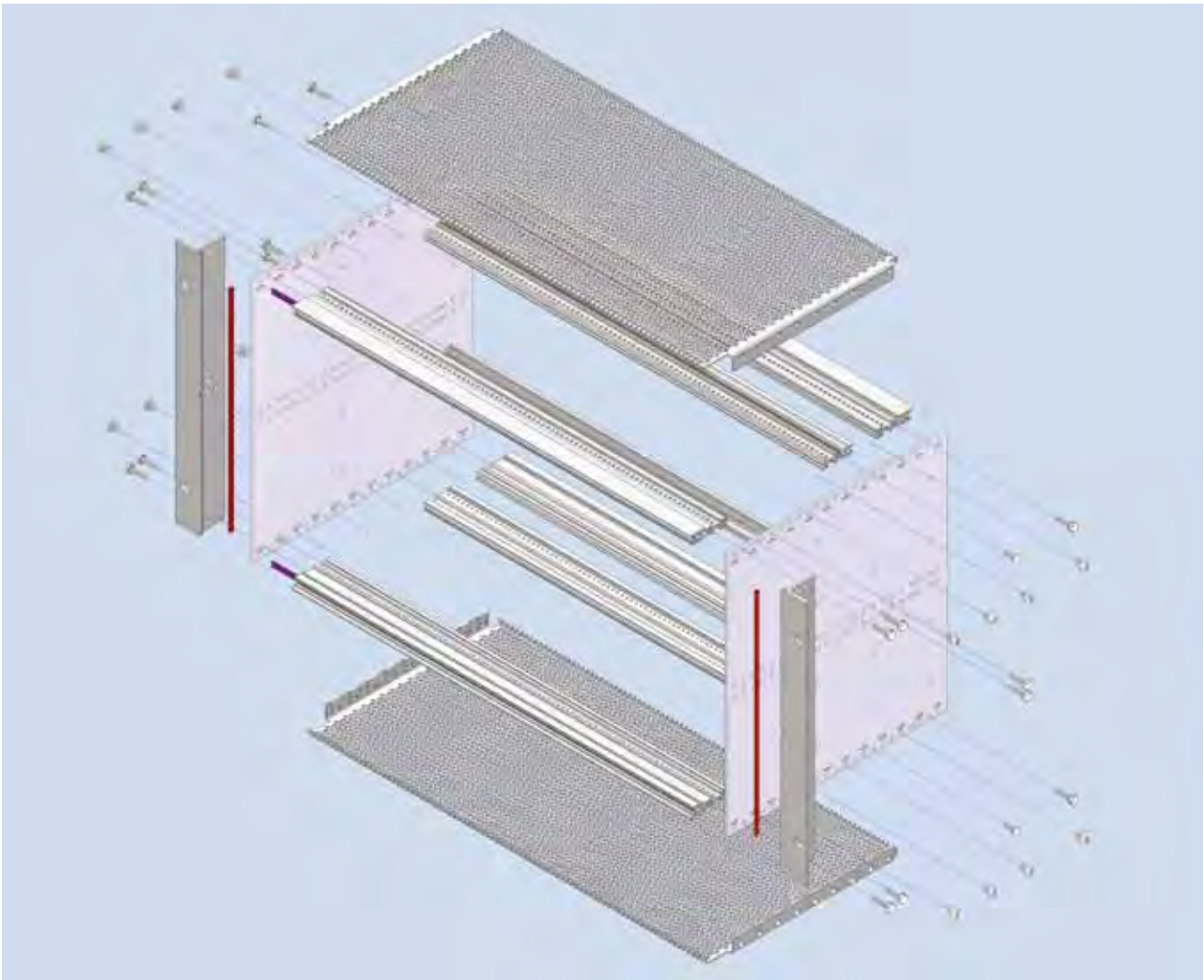
Assembling example

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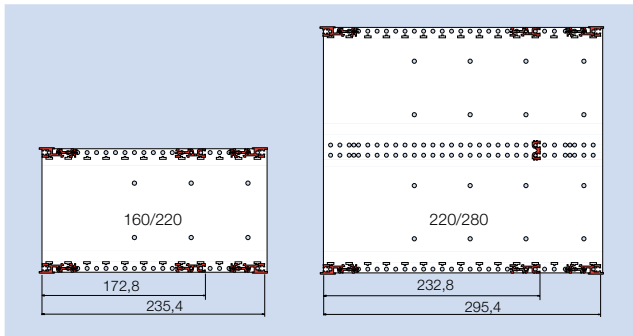
Depth dimensions type alpha 3 U and 6 U
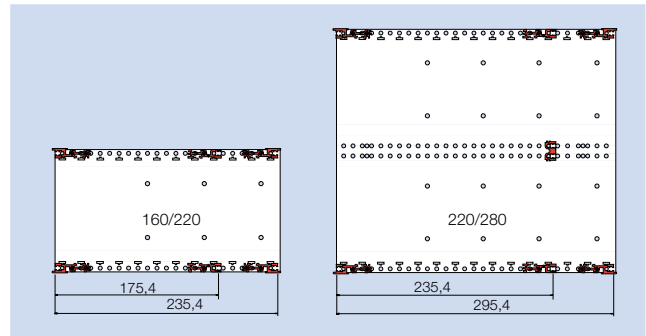
Depth dimensions type delta 3 U and 6 U

Ordering details for kits

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

Delivery

	pieces per kit *alpha* 3 U	pieces per kit *alpha* 6 U	pieces per kit *delta* 3 U	pieces per kit *delta* 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) For your custom subrack please order threaded strips separately.	2	2	2	2
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.

This catalog contains stock and standard parts. Other products and sizes on request.

Depth dimensions type delta 3 U and 6 U

Ordering details for kits

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

Delivery

|	pieces per kit *delta* 3 U	pieces per kit *delta* 6 U
Side panel	2	2
Flange	2	2
Cover	1	1
RFI-spring F3 (flange/front panel)	2	2
Threaded strip (front only) For your custom subrack please order threaded strips separately.	2	2
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
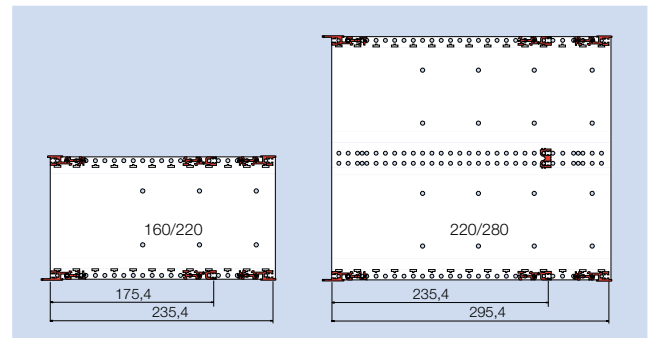
Depth dimensions IEEE type delta 3 U and 6 U

Ordering details for kits

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

Delivery

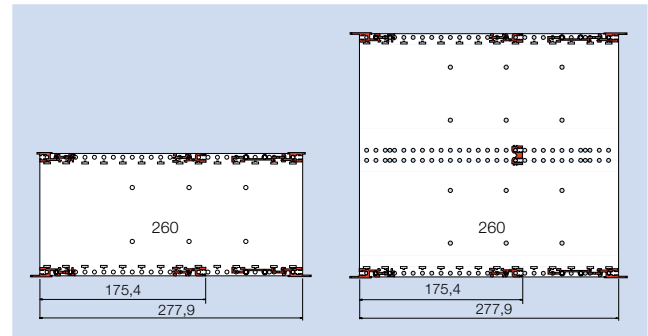|	pieces per kit *alpha* 3 U	pieces per kit *alpha* 6 U	pieces per kit *delta* 3 U	pieces per kit *delta* 6 U
Side panel	2	2	2	2
Flange	2	2	2	2
RFI-spring F3 (flange/front panel)	2	2	2	2
Threaded strip (front only) For your custom subrack please order threaded strips separately.	2	2	2	2
Cover plates punched holes ⌀ 4 / 5.2 x 4mm	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.

This catalog contains stock and standard parts. Other products and sizes on request.

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 *alpha* order no. **409.**	type *delta* order no. **409.**
3 U - subrack			
RFI-SHIELDED Rear I/O-84-3-160+80	260	**162 728**	**162 729**
6 U - subrack			
RFI-SHIELDED Rear I/O-84-6-160+80	260	**116 484**	**161 034**

Delivery

	pieces per kit *alpha* 3 U	pieces per kit *alpha* 6 U	pieces per kit *delta* 3 U	pieces per kit *delta* 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) For your custom subrack please order threaded strips separately.	2	2	2	2
Cover plates punched holes ⌀ 4 / 5.2 x 4mm	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.

Subrack *InterRail*®

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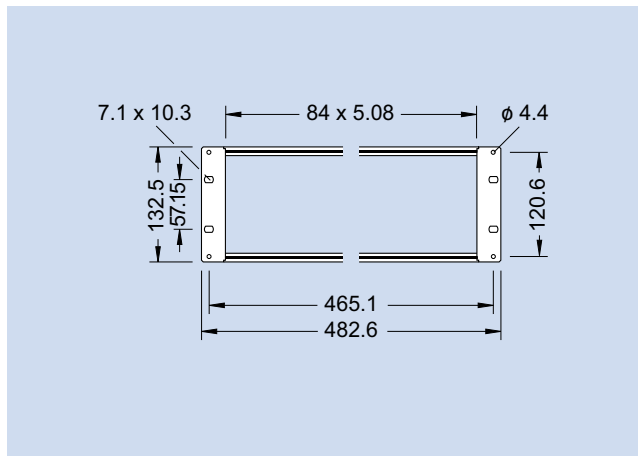Supplied as unassembled kits.
These are either packed as a kit of parts for one unit or as individual components, whereby parts of similar type are packed together.

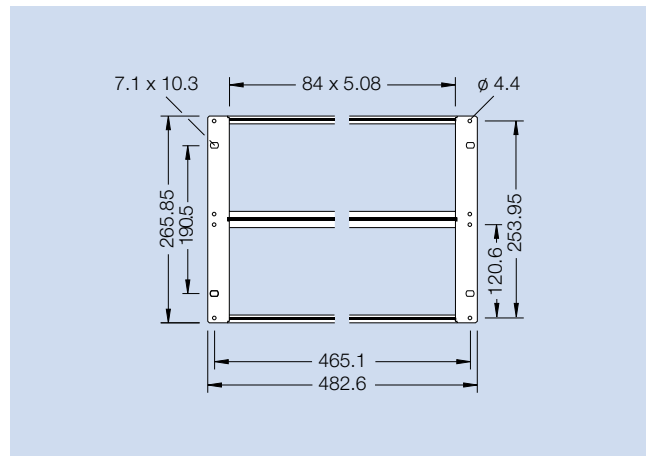On request, delivered as assembled and wired subrack according your requirements.

This catalog contains stock and standard parts. Other products and sizes on request.

Technical data

Standards	IEC 60 297, 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 60 603-2
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.

Subracks

Dimensions

Front of subrack 3 U

Front of subrack 6 U

Subrack *InterRail*®
Tests in accordance with SNCF NF standards and DIN EN 50155

■ **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:
a) Determination of the critical resonance frequency
b) 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:
1. In the X-axis
   21 x 420 g boards
2. In the Z-axis
   21 x 420 g boards
3. In the Y-axis
   21 x 240 g boards
4. 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 52.5Hz (see the measurement curve).

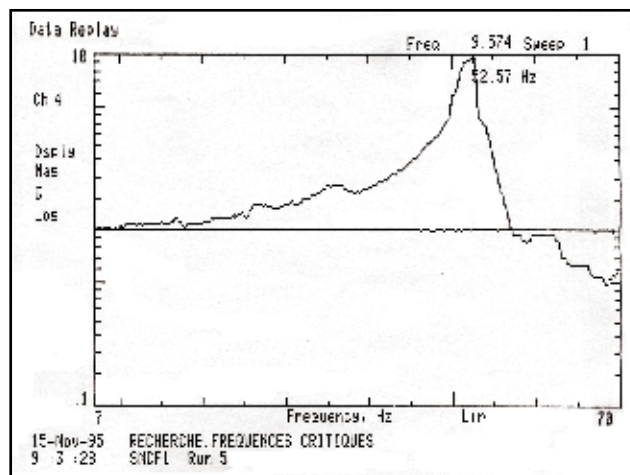**Measurement results with stiffened boards**
These measurements are not demanded by the testing standard but were nonetheless also performed.
Excerpt from the results of the measurement in the Y-axis, measured on the front profile rail:
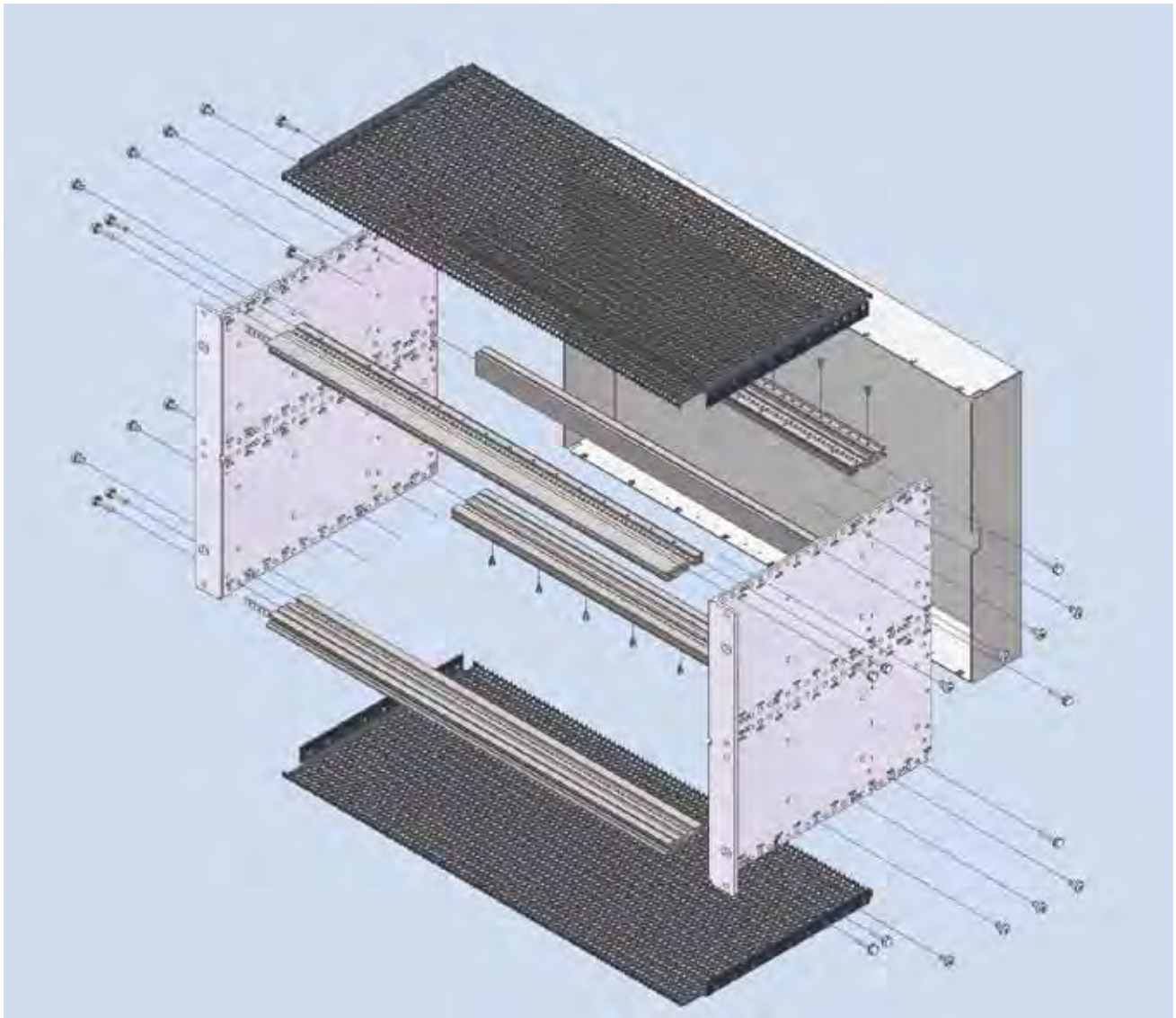Maximum resonance sharpness 7.6 g at 47.1 Hz.

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.

This catalog contains stock and standard parts. Other products and sizes on request.

Subrack *InterRail*®

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

Subrack *InterRail*®
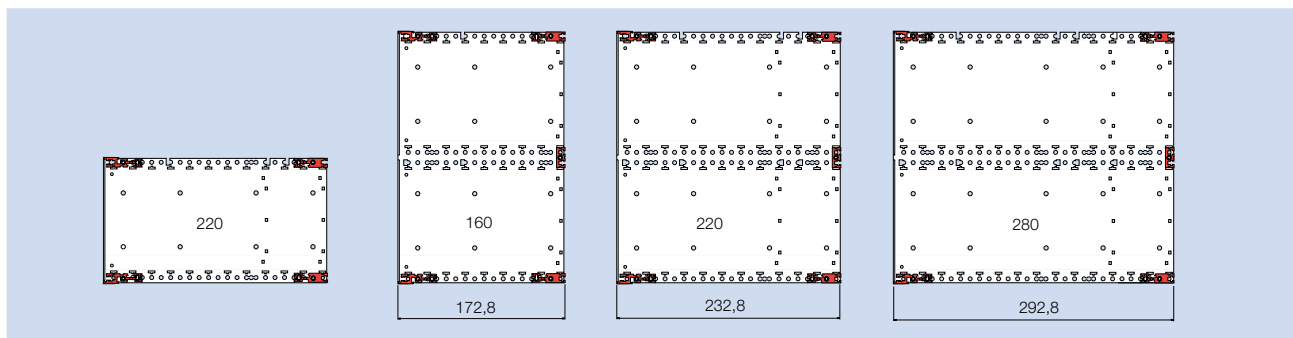
Depth dimensions type alpha 3 U and 6 U

Ordering details for kits

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

Delivery

	pieces per kit *alpha* 3 U	pieces per kit *alpha* 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.

This catalog contains stock and standard parts. Other products and sizes on request.
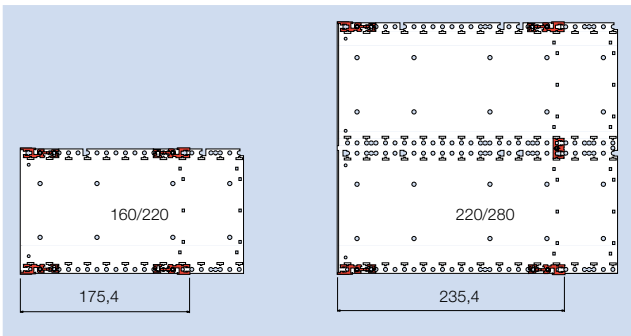
Depth dimensions type delta 3 U and 6 U

Ordering details for kits

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

Delivery

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

Delivery

	pieces per kit *alpha* 3 U	pieces per kit *alpha* 6 U	pieces per kit *delta* 3 U	pieces per kit *delta* 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 ⌀ 4 / 5.2 x 4mm	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.

This catalog contains stock and standard parts. Other products and sizes on request.

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

Delivery

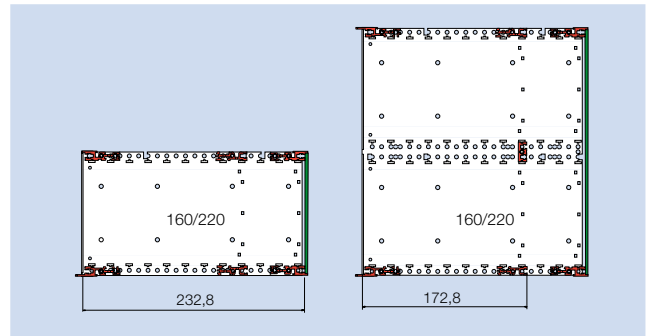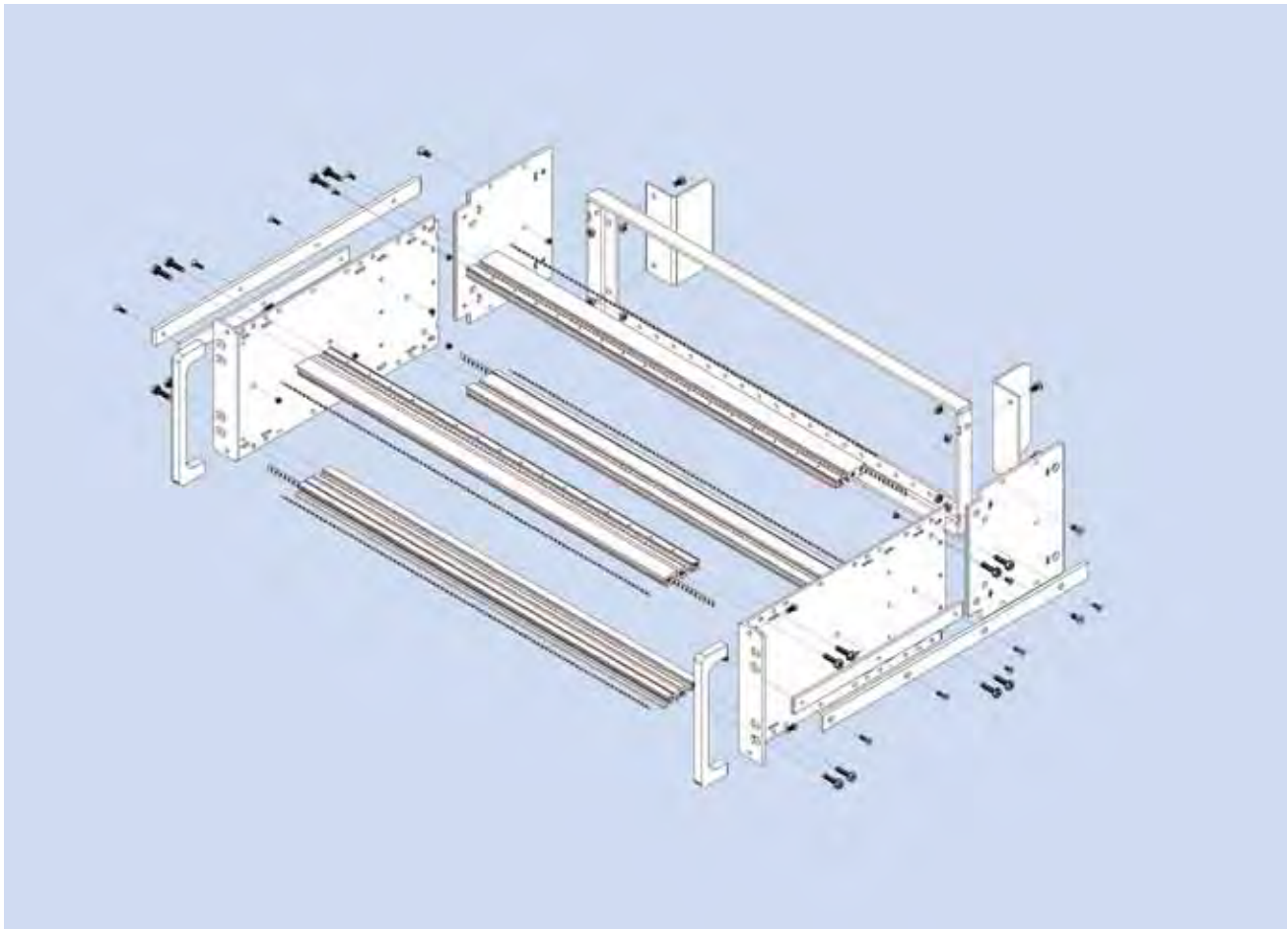|	pieces per kit *with cover* 3 U	pieces per kit *with cover* 6 U	pieces per kit *f. front panel* 3 U	pieces per kit *f. front panel* 6 U
Side panel with flange	2	2	2	2
Threaded strip (front only) For your custom subrack please order threaded strips separately.	2	2	2	2
Cover plates punched holes ⌀ 4 / 5.2 x 4mm	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.

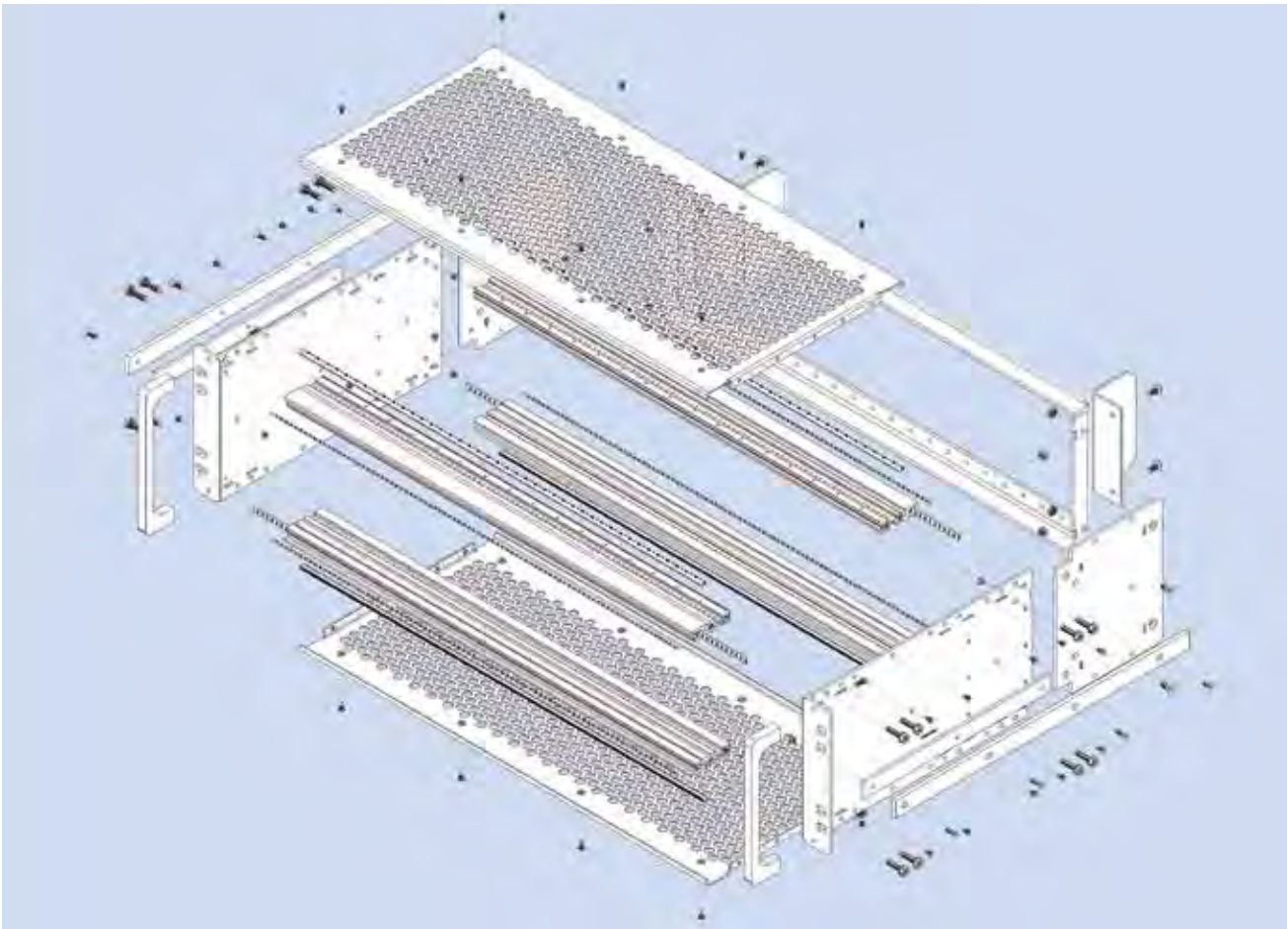This catalog contains stock and standard parts. Other products and sizes on request. | 3.27

Subrack *InterRail® - SNCF*

Delivery

	pieces per kit *alpha* 3 U	pieces per kit *alpha* 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 *alpha* order no. **409.**
3 U - subrack		
InterRail SNCF-36-3-220	36 - 220	**108 251**
InterRail SNCF-84-3-220	84 - 220	**108 250**
6 U - subrack		
InterRail SNCF-36-6-220	36 - 220	**107 716**
InterRail SNCF-84-6-220	84 - 220	**102 822**

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

This catalog contains stock and standard parts. Other products and sizes on request.

Delivery

	pieces per kit *delta* 3 U	pieces per kit *delta* 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 ⌀ 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 *delta* order no. **409.**
3 U - subrack		
InterRail SNCF RFI-36-3-220	36 - 220	**108 255**
InterRail SNCF RFI-84-3-220	84 - 220	**108 254**
6 U - subrack		
InterRail SNCF RFI-36-6-220	36 - 220	**108 253**
InterRail SNCF RFI-84-6-220	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
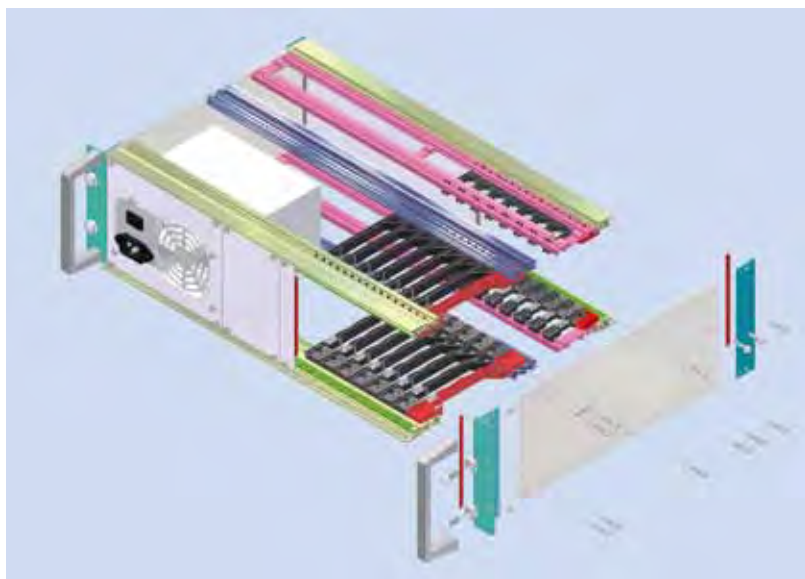
√ Convection or active ventilation

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.

This catalog contains stock and standard parts. Other products and sizes on request.

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.

Subracks

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.

This catalog contains stock and standard parts. Other products and sizes on request.

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, 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   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-4 U-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, 6 U, 64 Bit, system slot right
    (1 Slot free e. g. for hard disk or driver)
2   Front panels 6 U - 4 HP (1 at the front, 1 at the rear)
1   ATX 300 W 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	pieces _____
❑ Subrack	pieces _____

Dimensions

height:	❑ 3 U	❑ 6 U		❑ other _____ U	
width:	❑ 84 HP	❑ 42 HP		❑ other _____ HP	
depth:	❑ 260 mm			❑ other _____ mm	

Backplane

❑ **CPU**	number of slots _____
❑ **J1 VME**	number of slots _____
❑ **J1/J2 Monilithic 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

3.34   This catalog contains stock and standard parts. Other products and sizes on request.

Subrack Accessories

Single Parts

√ Side Panels
√ Flanges
√ Closing Profiles
√ Handle
√ Side Panel Extender
√ Side Panel Connector
√ Horizontal Rails
√ Cover Plates
√ Rear Covers
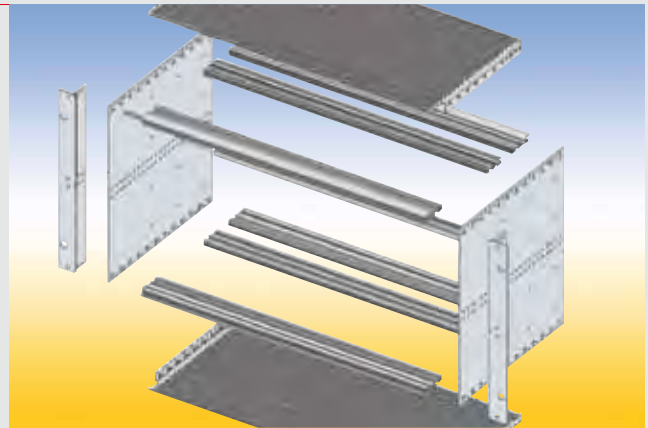
Configurations

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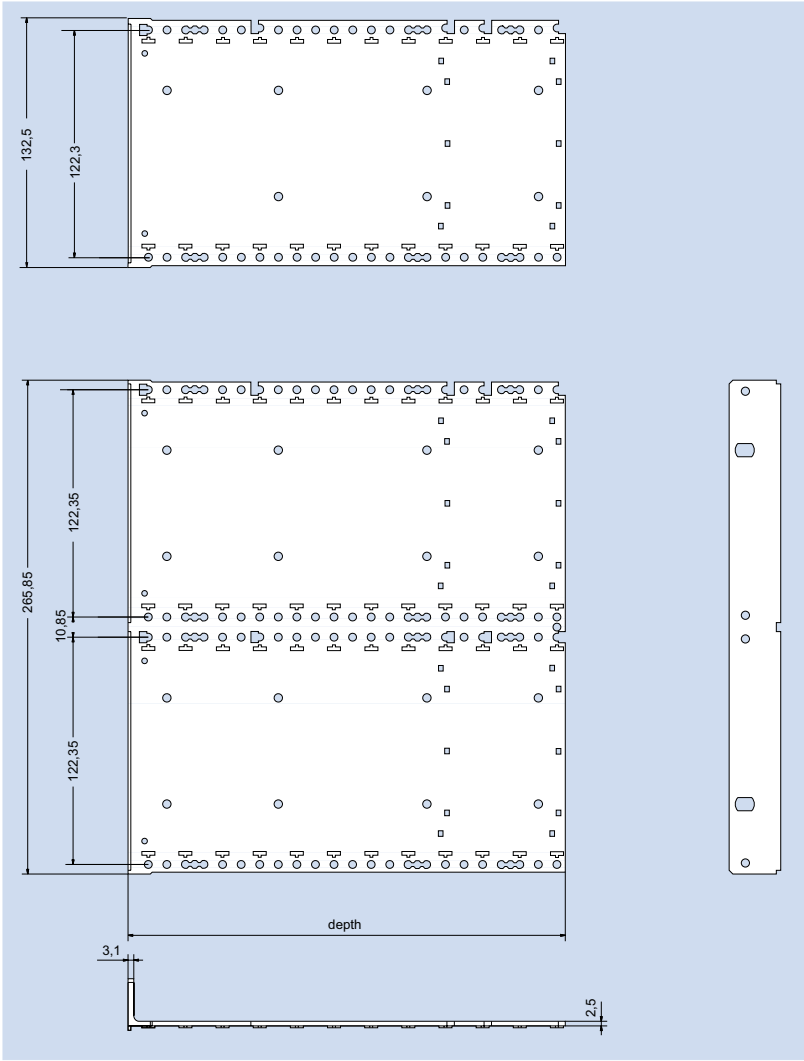√ Z-Rail A, Mounting Rail B
√ Card Guide and Accessories

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.

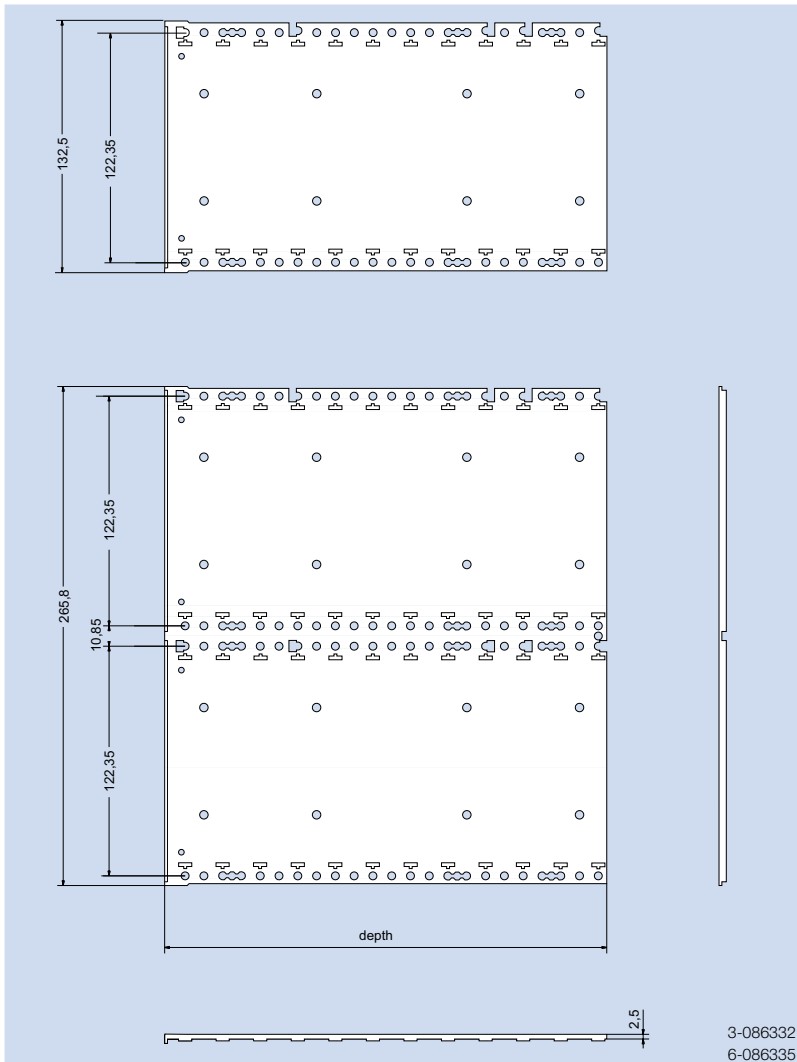Minimumm order quantity 100 pieces

order no.: 409. 078 693

This catalog contains stock and standard parts. Other products and sizes on request.

Side Panel Fs

for subrack *FLEXIBLE Fs*

Side Panel Fs (flange separate)

Material: aluminum, extruded
Finish: colorless chromated

3-086332
6-086335

Ordering details

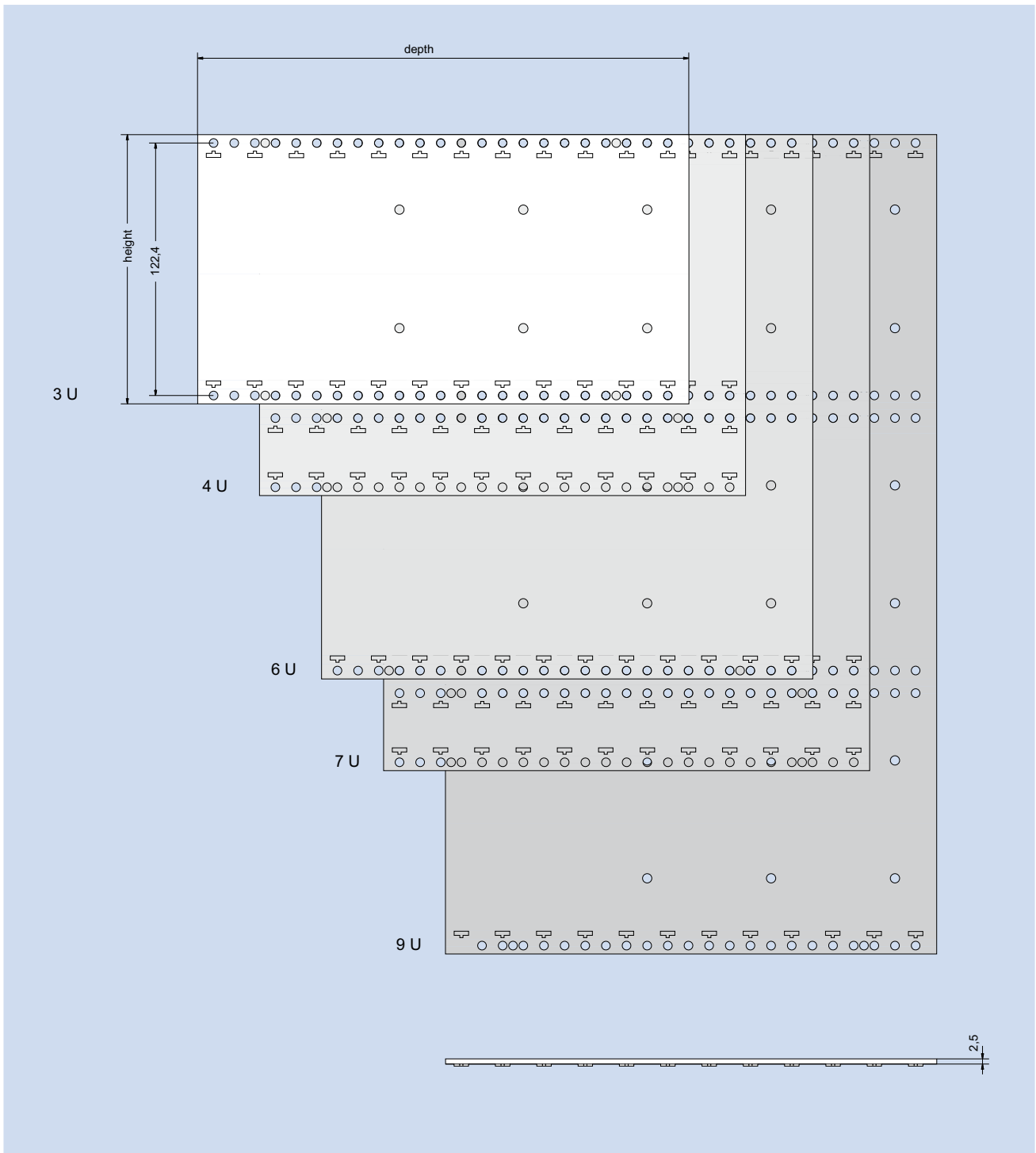|	nom. height [U]	nom. depth [mm]	depth [mm]	order no. **409.**
Side panel Fs - 3 - 160	3	160	174.2	106 750
Side panel Fs - 3 - 220	3	220	234.2	086 333
Side panel Fs - 3 - 280	3	280	294.2	086 334
Side panel Fs - 6 - 160	6	160	174.2	097 286
Side panel Fs - 6 - 220	6	220	234.2	086 336
Side panel Fs - 6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

Minimumm order quantity 100 pieces
order no.: 409. 052 156

Side Panel RFI without Flange

depth

height

122,4

3 U

4 U

6 U

7 U

9 U

2,5

|

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

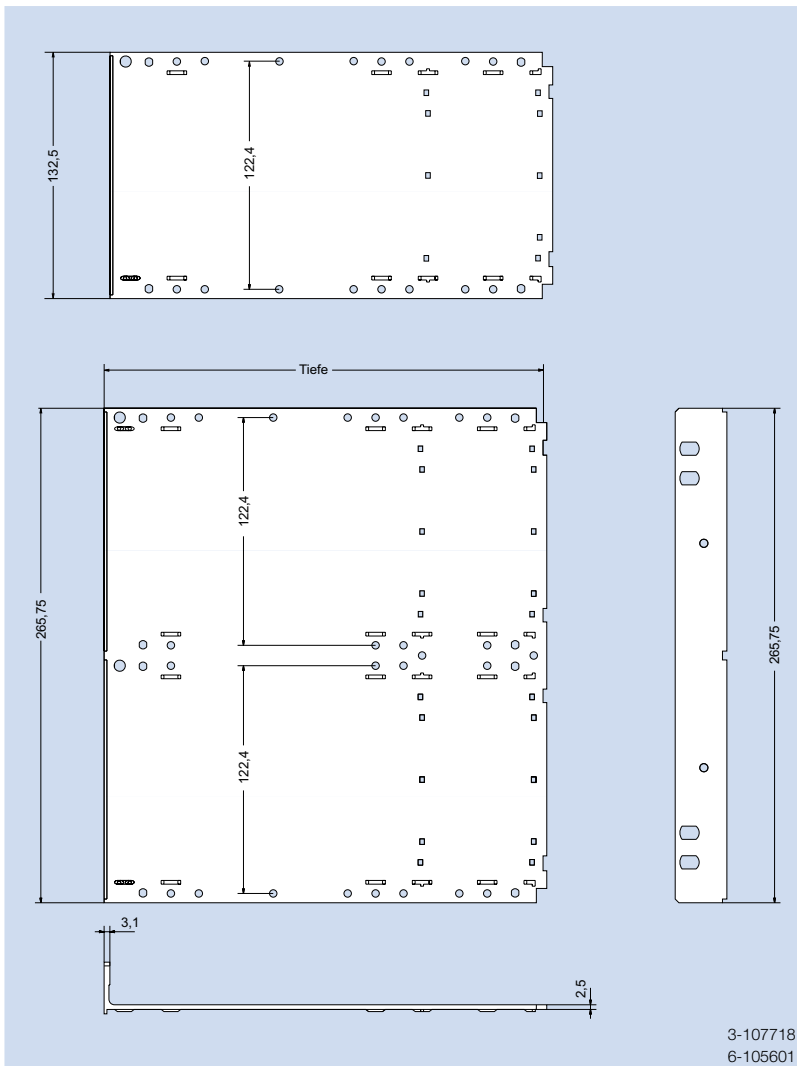|	order no. 409.
For assembly of the side panel to the profiled rail. Minimumm order quantity 100 pieces	
Hexagon cupped point head screw M 4 x 16 Torx T 20	052 156
For assembly of the middle profiled rail by using an outside fixed cover plate. Minimum order quantity 10 pieces	
Hexagon head screw M 4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

Side Panel *InterRail*® *SNCF*

3-107718
6-105601

for subrack *InterRail SNCF*

Side Panel *InterRail SNCF*

Material: aluminum, extruded
Finish: colorless chromated

Ordering details

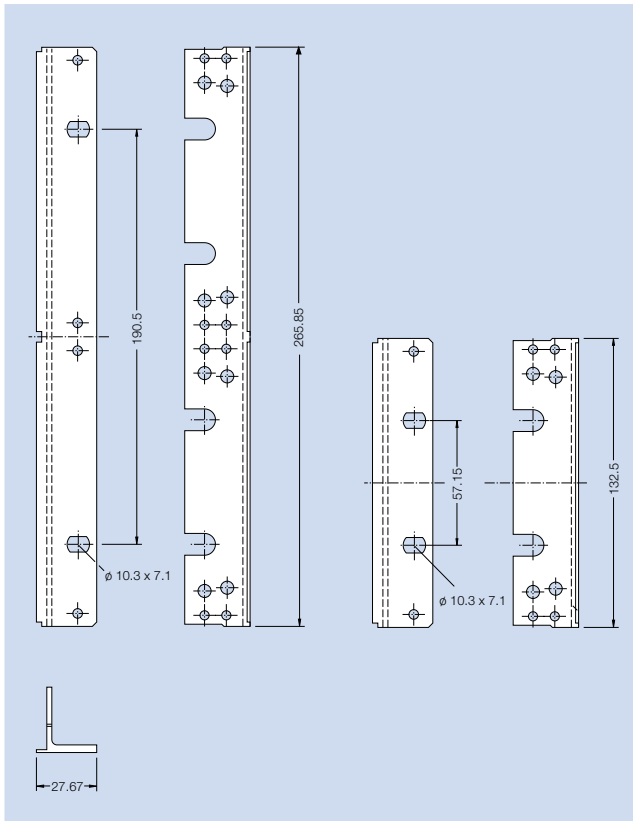|	nom. height [U]	nom. depth [mm]	depth [mm]	order no. **409.**
Side panel *InterRail - SNCF* - 3 - 220	3	220	237.9	**107 719**
Side panel *InterRail - SNCF* - 6 - 220	6	220	237.9	**105 602**

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.

Minimumm order quantity 100 pieces

order no.: 409. 087 639

This catalog contains stock and standard parts. Other products and sizes on request.
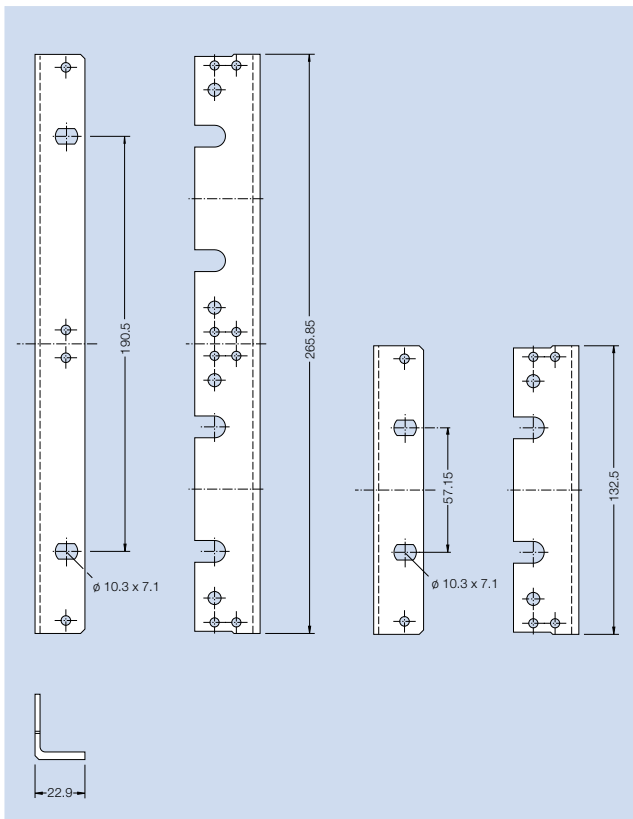
for subrack *FLEXIBLE Fs*

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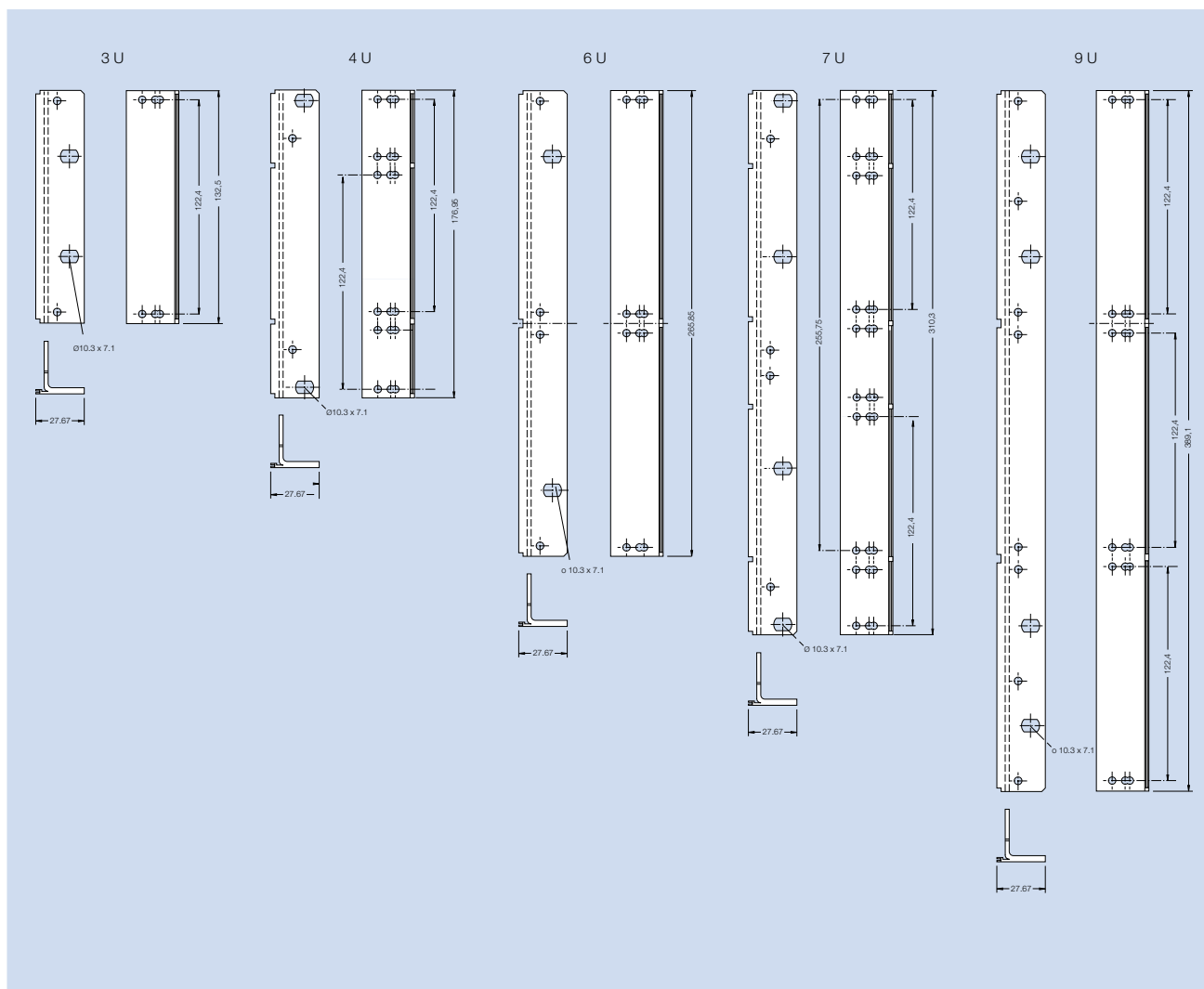This flange can be mounted at various depth on the side panel grid.

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

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.

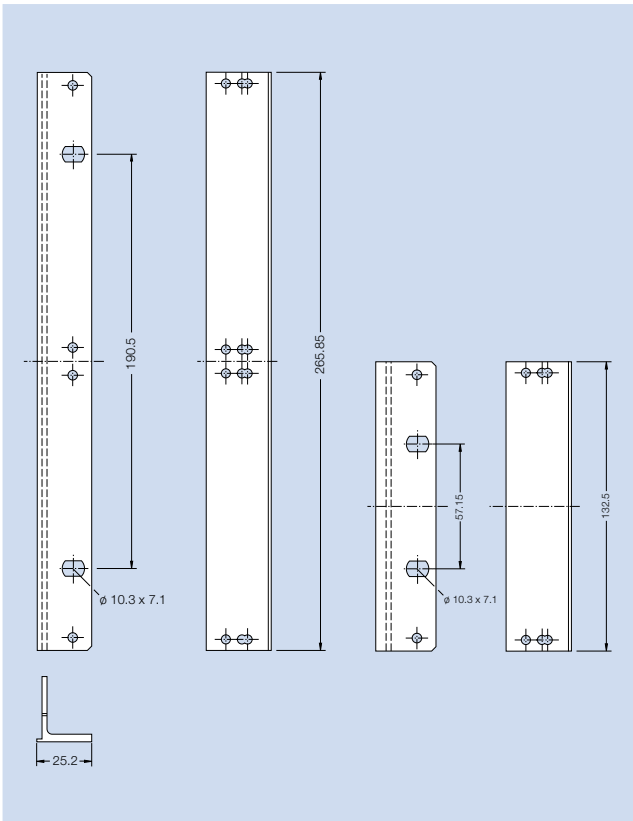**Material:**   aluminum, extruded
Finish: colorless chromated

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

This catalog contains stock and standard parts. Other products and sizes on request.

Flange RFI - FP

This flange is suitable for mounting of a continous 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
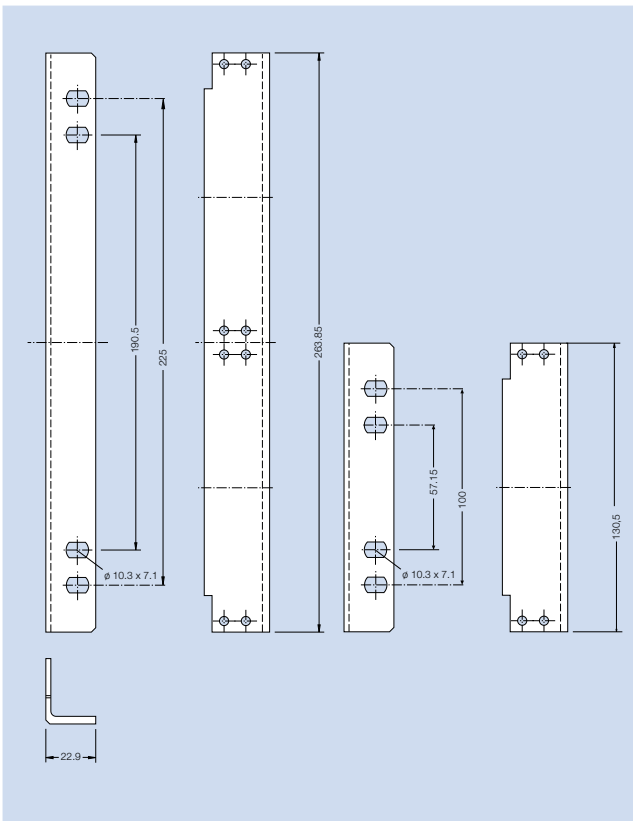
Flange for Wall Mounting

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
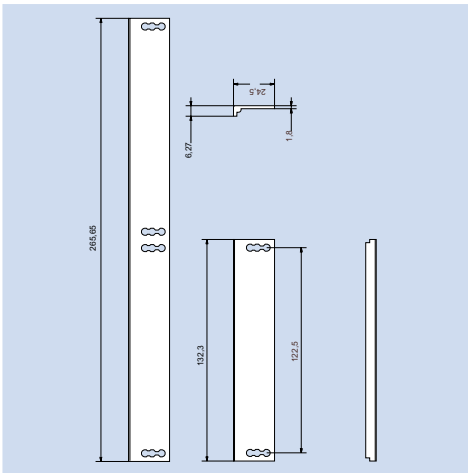
Closing Profile F

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
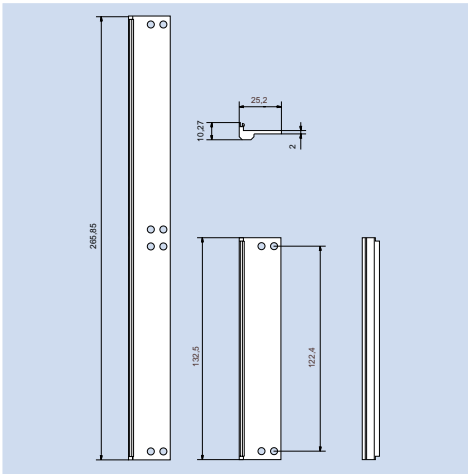
Closing Profile RFI - F3

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.
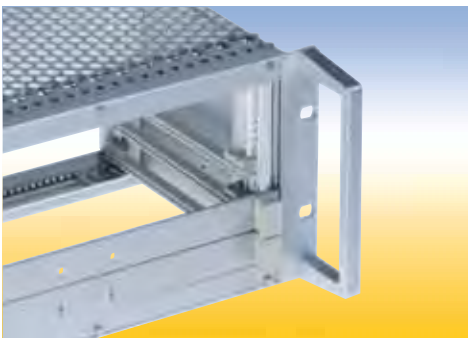
With slits for insertion of RFI-springs.

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
Minimumm order quantity 100 pieces

order no.: 409. 105 789

Mounting parts for fastening a subrack into a housing

Screw retrainer M6
Color: black
Material: POM
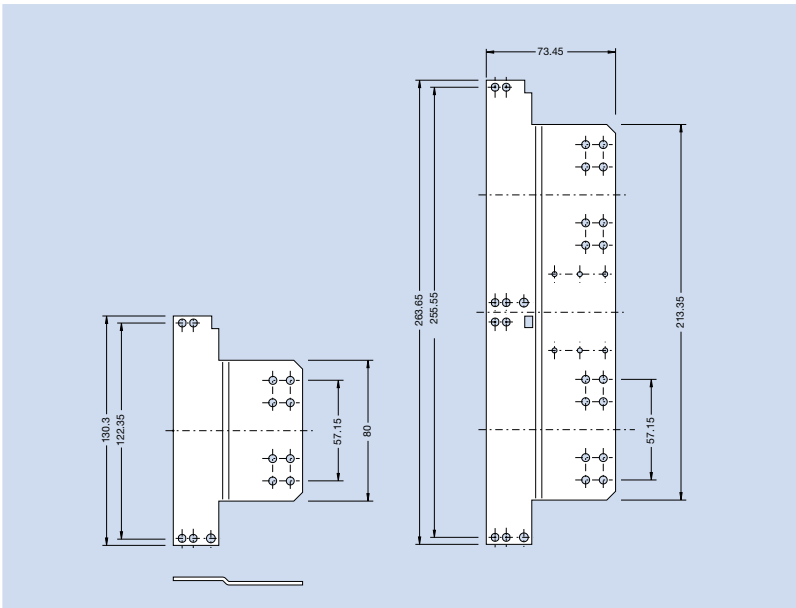Minimum order quantity 10 pieces

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**

This catalog contains stock and standard parts. Other products and sizes on request.
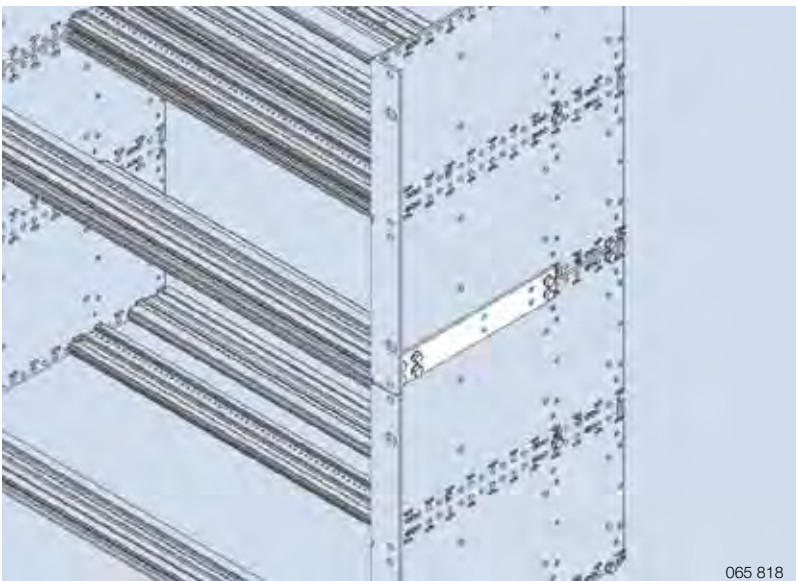
Side Panel Extender, Side Panel Connector

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

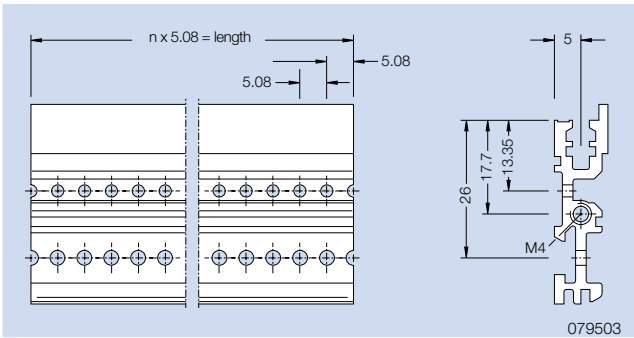|	order no. 409.
Side panel extender 3 U	087 820
Side panel extender 6 U	087 821

065 818

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**

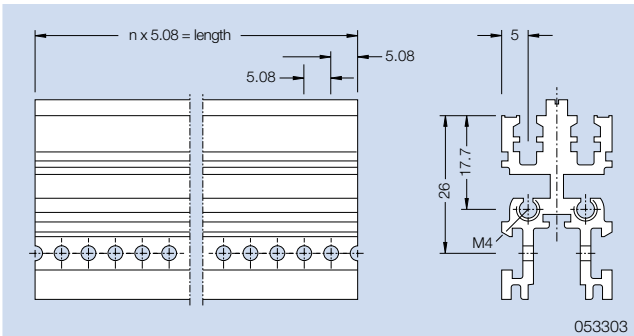# Horizontal Rails

079503

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. **409.**
Front profile VE1	21	106.68	079 521
Front profile VE1	43	218.44	079 543
Front profile VE1	85	431.80	079 585

053303

## 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. **409.**
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

061543
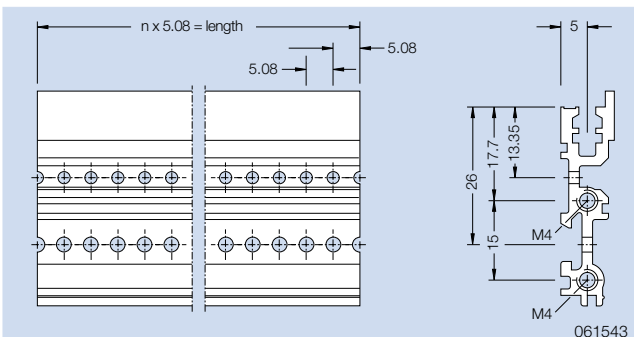
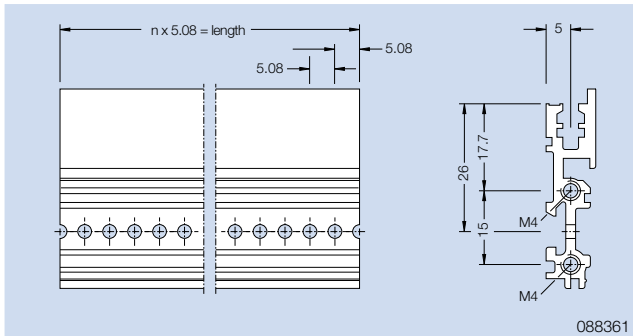## for subrack *FLEXIBLE*

Front Profile VE12
With 2 tapped holes.

Material: aluminum
Finish: colorless chromated

Ordering details

	nom. width [HP]	length [mm]	order no. **409.**
Front profile VE12	43	218.44	062 043
Front profile VE12	85	431.80	062 085

This catalog contains stock and standard parts. Other products and sizes on request.
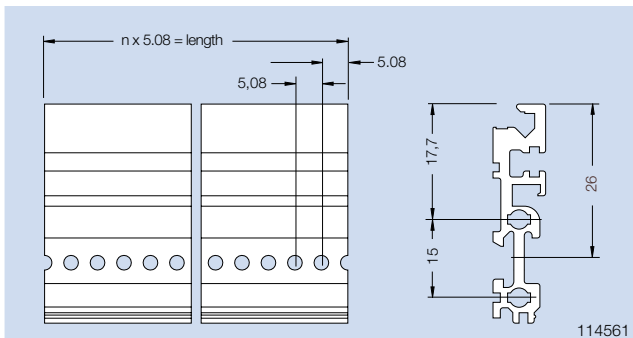
for subrack *RFI-SHIELDED*

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

088361

Ordering details

	nom. width [HP]	length [mm]	order no. 409.
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

114561

Ordering details

	nom. width [HP]	length [mm]	order no. 409.
Front profile V12-SFP-RFI	85	431.80	114 562
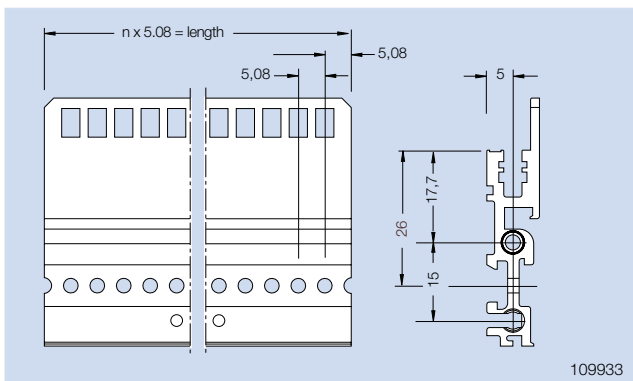
for subrack *RFI-SHIELDED* and *InterRail*

Front Profile V12-IEEE
With grid holes for IEEE handle.

Material: aluminum
Finish: colorless chromated

109933

Ordering details

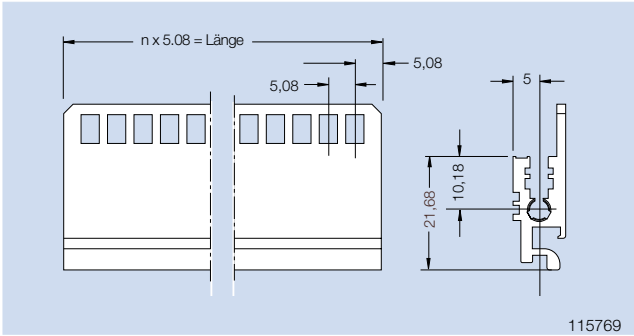|	nom. width [HP]	length [mm]	order no. 409.
Front profile V12-IEEE-RFI	43	218.44	111 182
Front profile V12-IEEE-RFI	85	431.80	109 934

Horizontal Rails
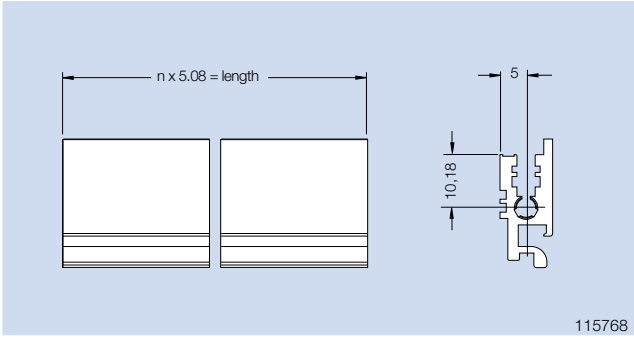
115768

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

115769

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
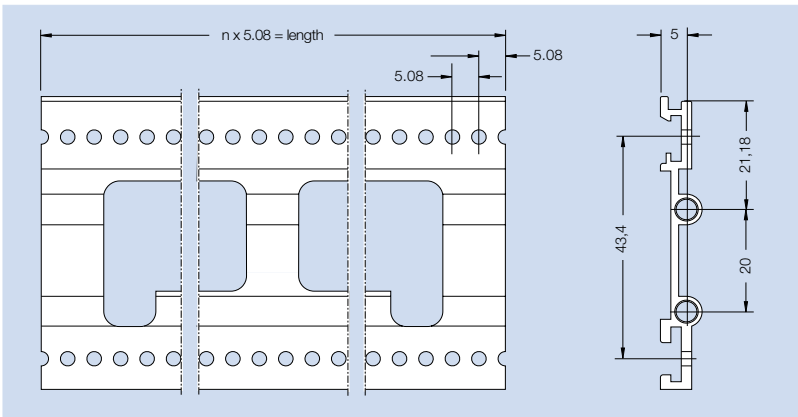
for subrack *RFI-SHIELDED* and *InterRail*

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

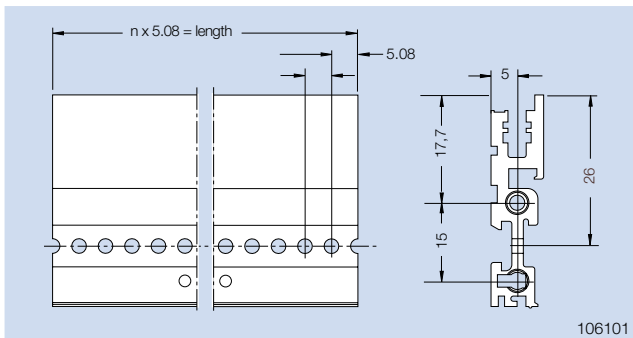This catalog contains stock and standard parts. Other products and sizes on request.

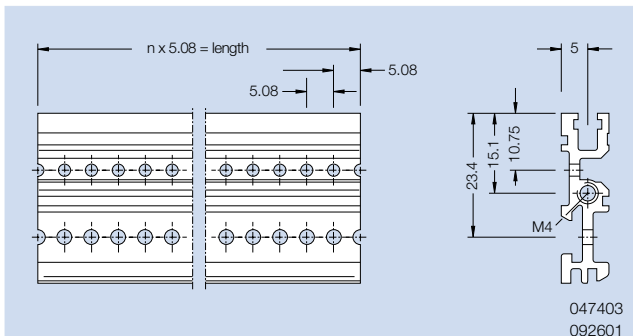## for subrack *RFI-SHIELDED* and *InterRail*

Front Profile V12-S-RFI
(also rear profile by using a front panel on the rear).
Strengthened version.

Material: aluminum
Finish: colorless chromated

106101

Ordering details

	nom. width [HP]	length [mm]	order no. 409.
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

047403
092601

Ordering details

	nom. width [HP]	length [mm]	anodized order no. 409.	chromated order no. 409.
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
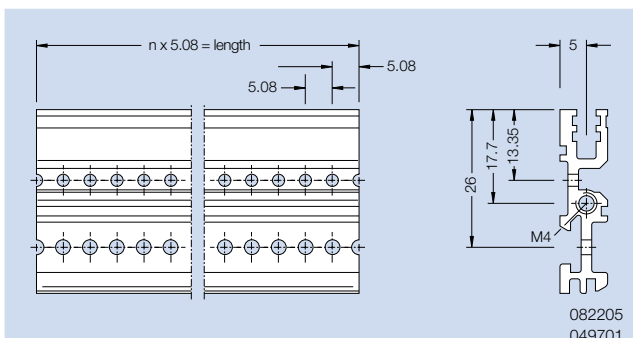
for subrack *FLEXIBLE* and *RFI-SHIELDED*

Rear Profile HE2
(type *delta*).

Material: aluminum
Finish: anodized or colorless chromated

082205
049701

Ordering details

	nom. width [HP]	length [mm]	anodized order no. 409.	chromated order no. 409.
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

087476
078948

for subrack *FLEXIBLE*

Rear Profile HZE
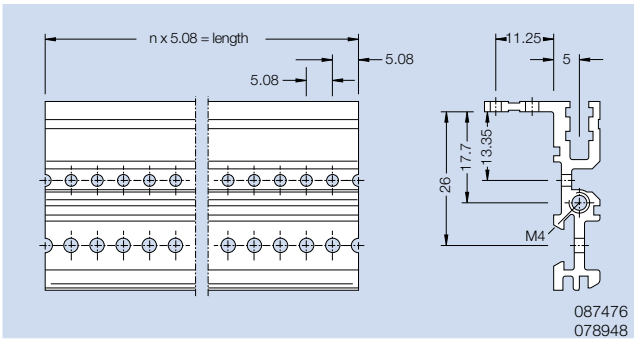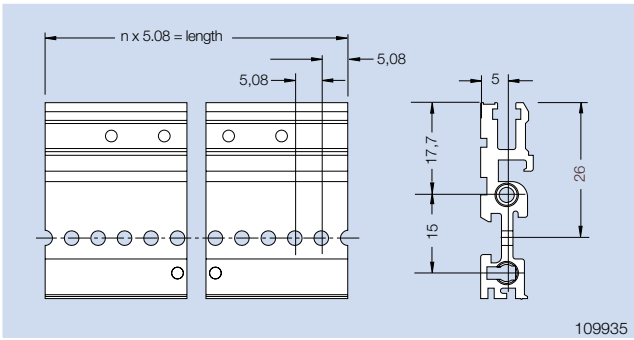(type *beta*) with integrated connector attachment.

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**

109935

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**

107840
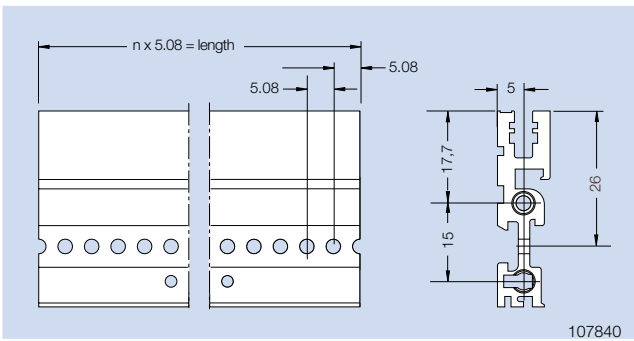
for subrack *InterRail*

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**

This catalog contains stock and standard parts. Other products and sizes on request.
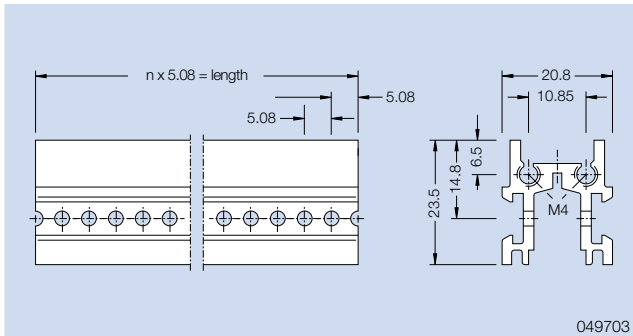
for subrack *FLEXIBLE* and *RFI-SHIELDED*

Rear Profile 2xHK
For partition e. g. 6 U subracks into two fields of 3 U.

Material: aluminum
Finish: anodized

049703

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
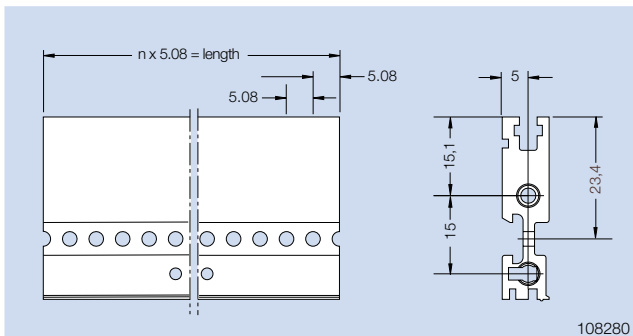
for subrack *InterRail*

Rear Profile H12-S
(type *alpha*).
Strengthened version.

Material: aluminum
Finish: colorless chromated

108280

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

E047803
C092501

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

049702
091248

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
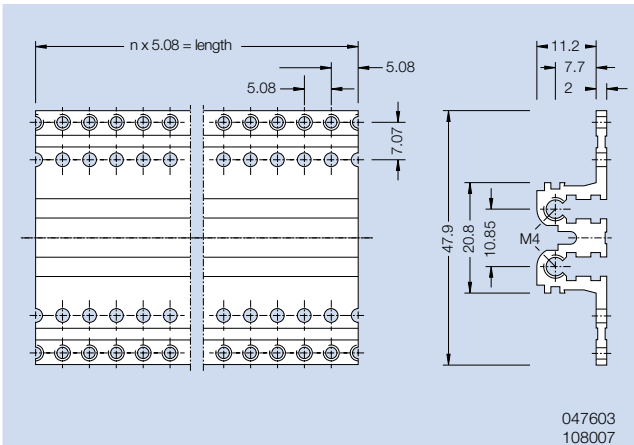
047603
108007

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

This catalog contains stock and standard parts. Other products and sizes on request.
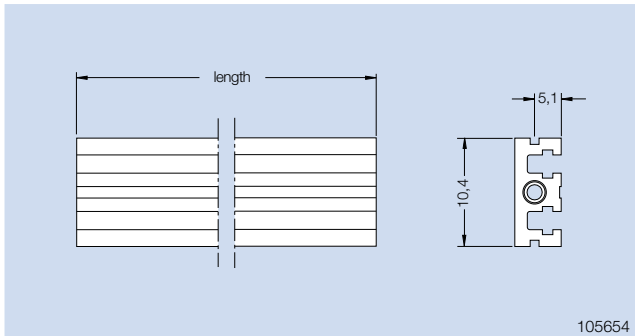
105654

for subrack *InterRail*

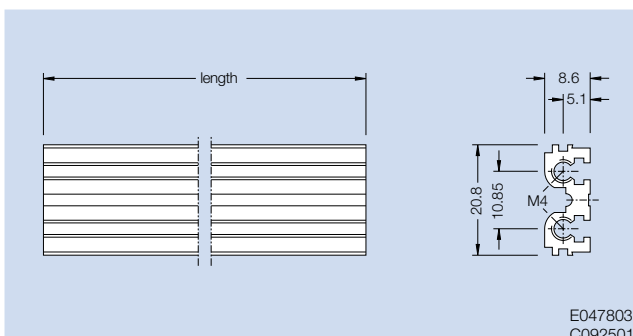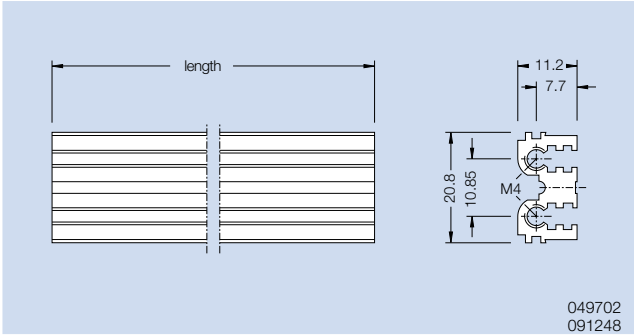### Center Profile M1-S
Mounted in the rear of a 6 U subrack (type *alpha*).
Strengthened version.

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

107845
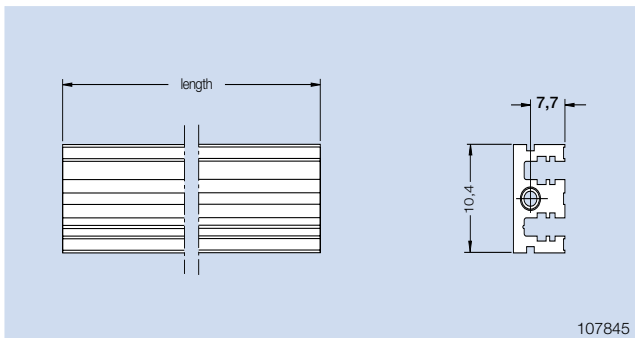
for subrack *InterRail*

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

079009
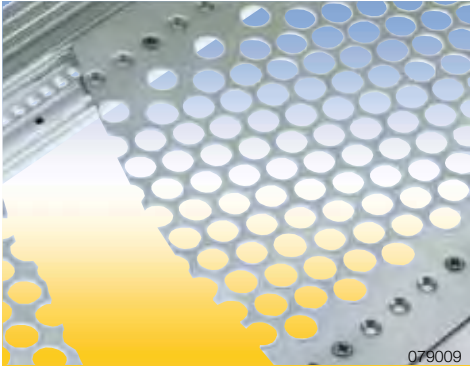
Accessories

Self tapping counter sunk scrrew M 2.5x10

Minimumm 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**

048049
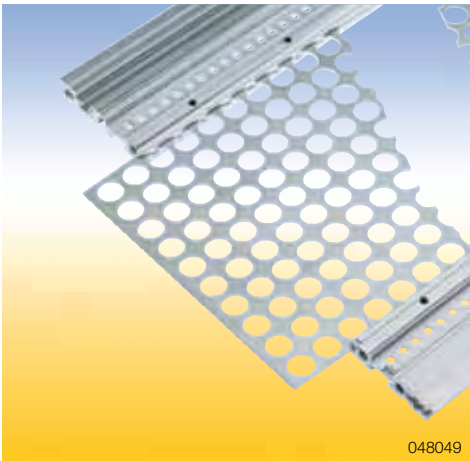
for subrack *FLEXIBLE Fi*

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**

099881

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**

This catalog contains stock and standard parts. Other products and sizes on request.

Cover Plates

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

099881

for subrack *InterRail*

Cover Plate *InterRail*
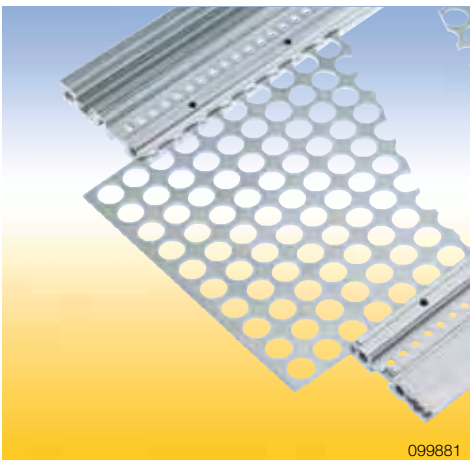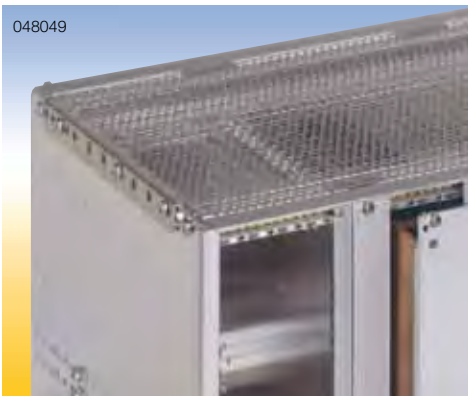Hole diameter 8.0 mm.
The cover plate is mounted with self tapping counter sunk screws at the side panels and at the horizontal rails.

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

Ordering details

	nom. width [HP]	nom. depth [mm]	order no. 409.
Cover plate *InterRail*	84	160	107 906
Cover plate *InterRail*	84	220	107 905
Cover plate *InterRail*	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
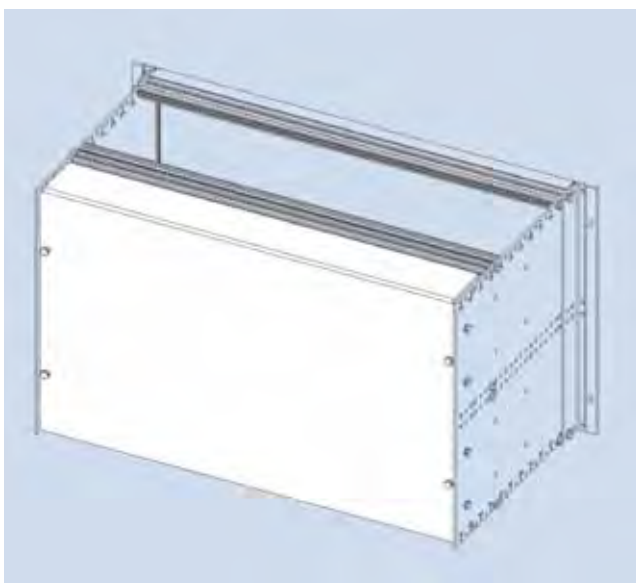
for subrack *FLEXIBLE*

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

This catalog contains stock and standard parts. Other products and sizes on request.
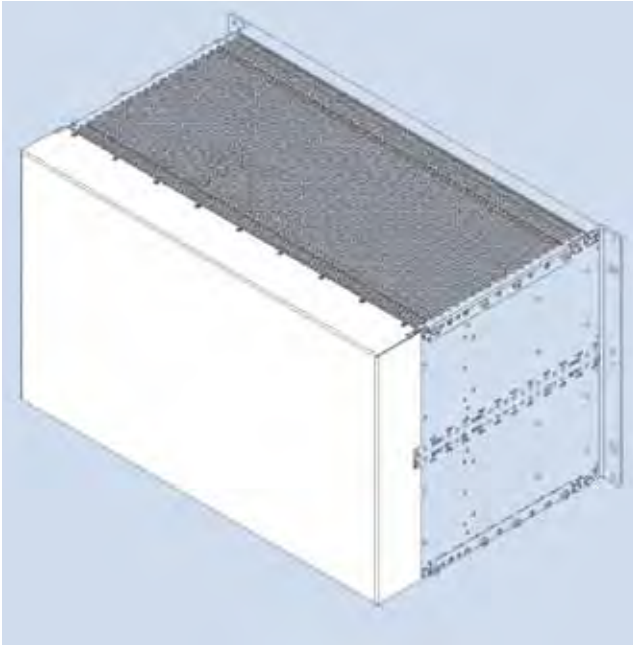
Rear Cover RFI 84 HP
Protective wiring rear cover for RFI shielded enclosure.

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
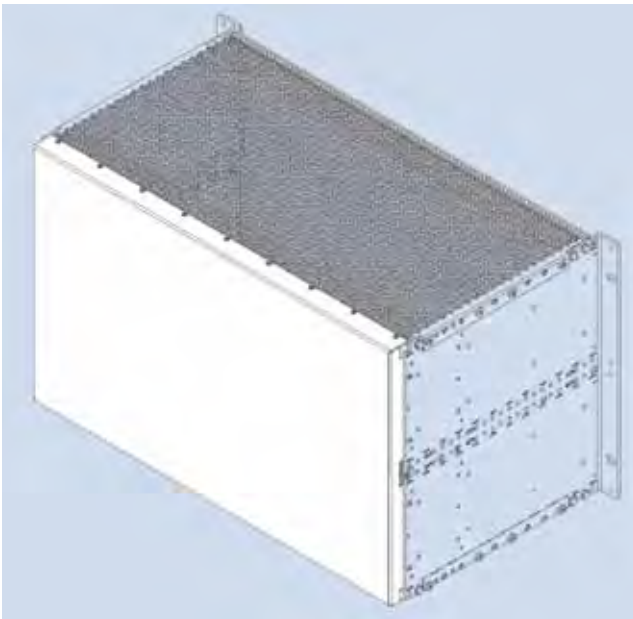
Rear Cover RFI 84 HP, inside
Protective wiring rear cover for RFI shielded enclosure.

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. Minimumm order quantity 100 pieces	
Counter sunk screw M 2.5 x 6	067 624
For assembling the rear cover to the side panel. Minimumm order quantity 100 pieces	
Self tapping Taptite screw M 2.5 x 6	082 239

Subrack Accessories

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 6 U PCB's and 2 fields of 3 U.

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
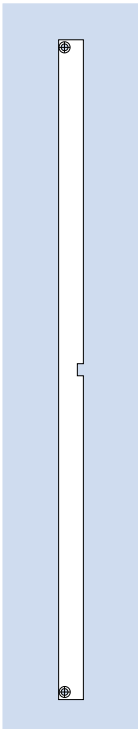
Blind Front Panel for Subrack Divider
For covering of the divider strip.
Optional with RFI-springs for a RFI shielded front.

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

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

Accessories

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

Counterbore for screw M4
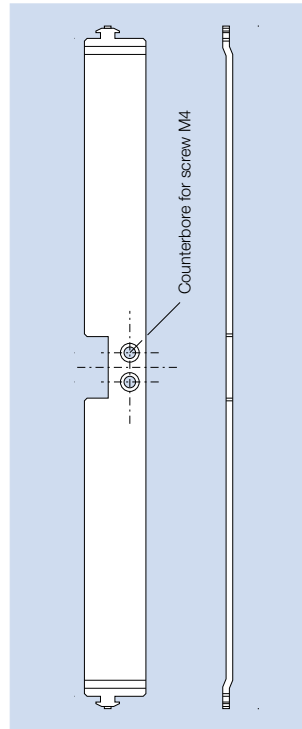
Divider Strip

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

This catalog contains stock and standard parts. Other products and sizes on request.

Subrack Divider,
Horizontal Mounting Frame
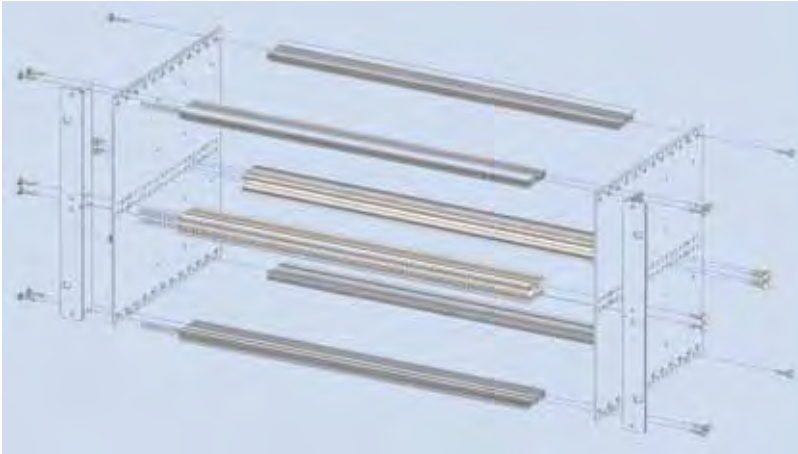
for subrack *FLEXIBLE* and *RFI-SHIELDED*

Subrack Divider Kit 2 x 3 U - 84 HP
For partitioning a 6 U subrack in 2 x 3 U.

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 3 U 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 *alpha* order no. **409.**	type *beta* order no. **409.**	type *delta* 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
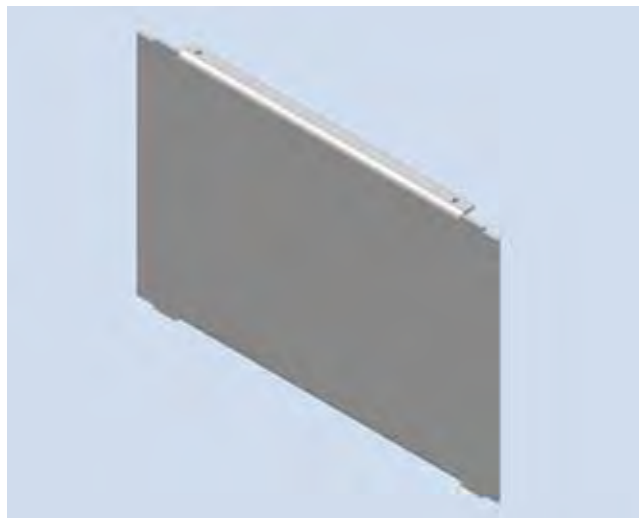
Separating Wall

For separating a subrack int 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

This catalog contains stock and standard parts. Other products and sizes on request.
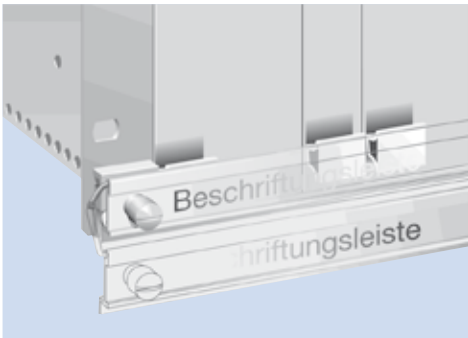
for subrack *FLEXIBLE Fs*, *RFI-SHIELDED*, *InterRail*

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 witout 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
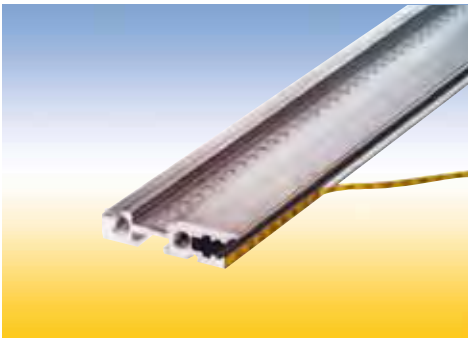
Label Strip

Self adhesive. For identifiying 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

070168
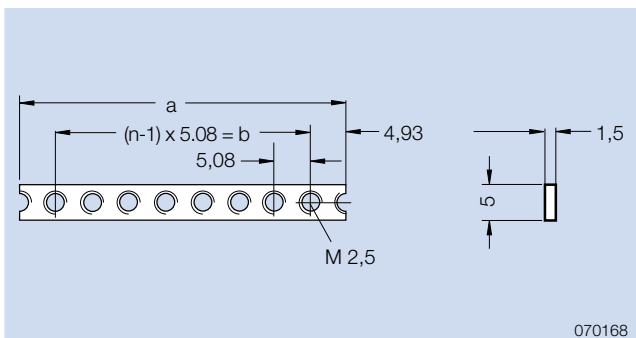
Threaded Strip M 2.5
For attaching the front panels and assembly parts at the wiring field.

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

034636
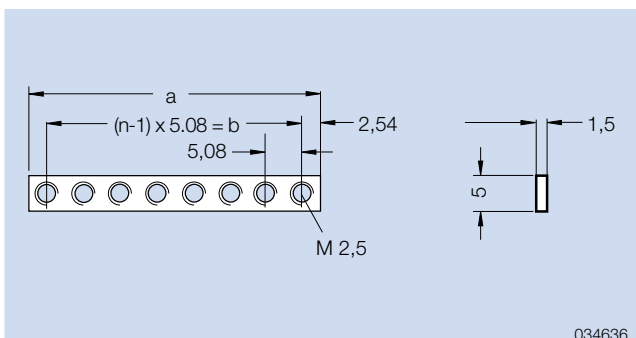
Threaded Strip M 2.5 addable
This threaded strip could be added to other strips and the space between the holes always adds up 5.08 mm.

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

118606
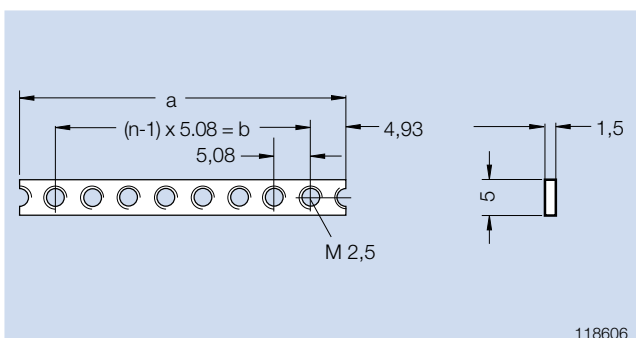
Threaded Strip M 2.5 - stainless steel
For attaching the front panels and assembly parts at the wiring field.
This threaded strip is for nonmagnetic applications.

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

This catalog contains stock and standard parts. Other products and sizes on request.

037257
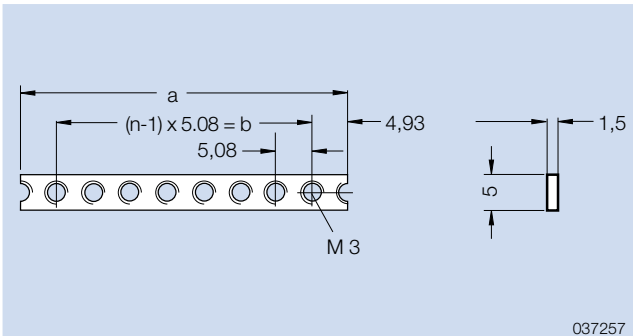
Threaded Strip M 3

Material: steel
Finish: galvanized, chromated

Ordering details threaded strip M 3

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

037256
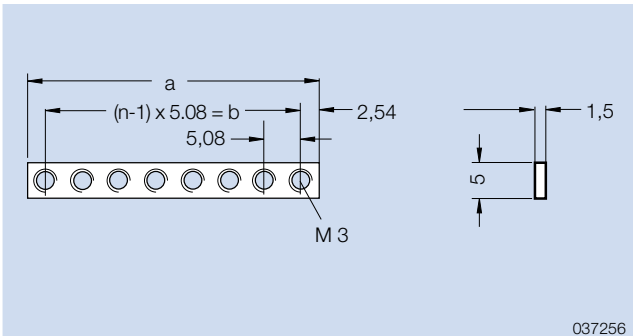
Threaded Strip M 3 addable

Material: steel
Finish: galvanized, chromated

Ordering details threaded strip M 3 addable

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

Z-Rail A,
Mounting Rail B

023521

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
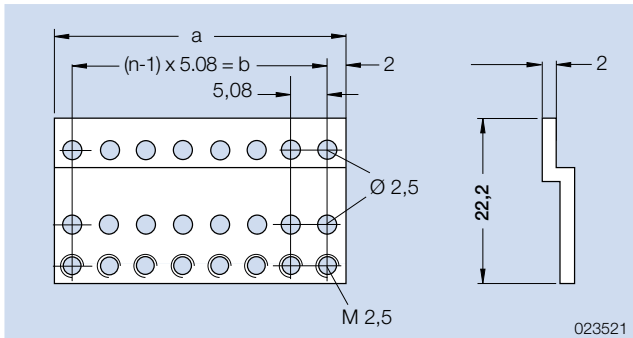
Z-Rail A tapped M 2.5
For mounting connectors in accordance to IEC 60603/
DIN 41 612 in subracks type *alpha*.
Mounted on the rear profile.

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

112052

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 alpha	
Oval head screw M 2.5 x 12 ISO 7045	094 604
for type delta	
Oval head screw M 2.5 x 8 ISO 7045	094 602

Mounting Rail B tapped M 2.5
For mounting connectors in accordance to IEC 60603/
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

This catalog contains stock and standard parts. Other products and sizes on request.

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
Continous 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

Insulating Bushing 2.6

For use together with mounting rail B and insulating strip.

Technical data

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

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

Subrack Accessories

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
Continous 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 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
Continous temperature	– 40 °C up to + 115 °C
Fire protection class	UL 94 V–0

Subrack Accessories

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

This catalog contains stock and standard parts. Other products and sizes on request.

3.67

Card Guide
with integrated push and pull assist
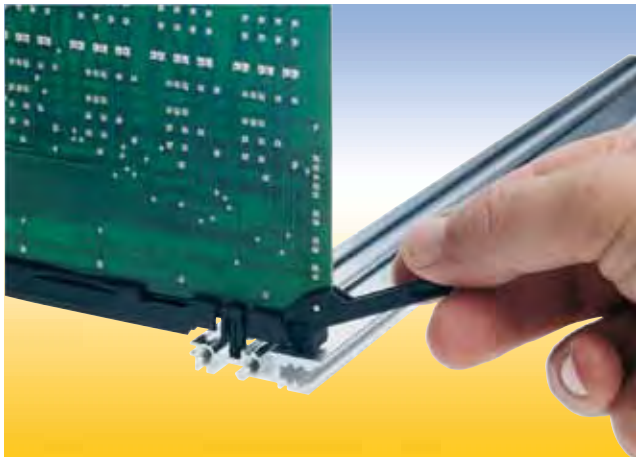
Card Guide with integrated push and pull assist
This special card guide with an integral small lever aids in the handling of PCB's with high pin plug in connectors.
The lever is supported by the walls of a special guide chamber when the board is pulled out or pushed in.
It is suitable for a spring to 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 buttom

Technical data

Material	card guide: Polyester, fiber glass reinforced lever: Polyphenylenoxid grooved pin: steel, blank
Color	black
Continous temperature	– 40 °C up to + 130 °C
Fire protection class	UL 94 V–0
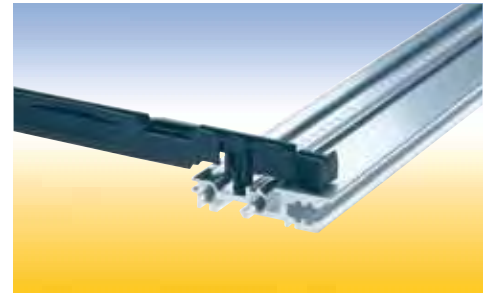
Ordering details kit
card guide with integrated push and pull assist

	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

This catalog contains stock and standard parts. Other products and sizes on request.

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 als be secured with screws.

Delivery:
1 card guide CONN top
1 card guide CONN bottom

Subrack Accessories

Technical data

Material	nom. length 160: Lexan 500 nom. length 220: PBT
Color	gray
Continous 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
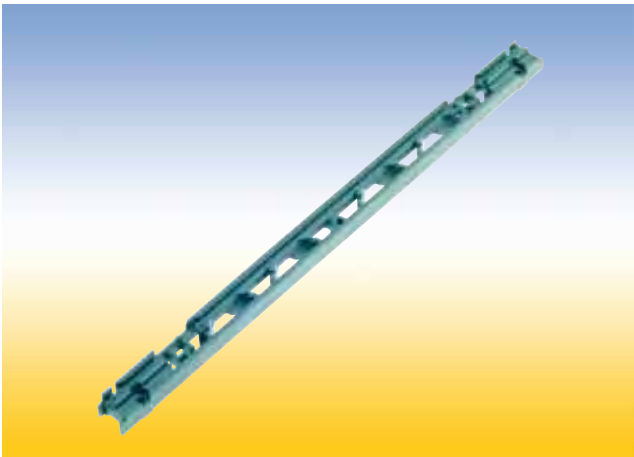
Card Guide VIB
Lattice construction for heavy mechanical loads.
With a provision for a spring to contact front panels and for contacting a track near the PCB edge.
This card guides can be snapped in and/or secured with screws.

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.

Technical data

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

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

This catalog contains stock and standard parts. Other products and sizes on request.

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.

Subrack Accessories

Technical data

Material	end pieces: Noryl SE1 center piece: aluminum or Noryl ENV 125
Color	end pieces: black center piece: black, silver
Continous 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

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.
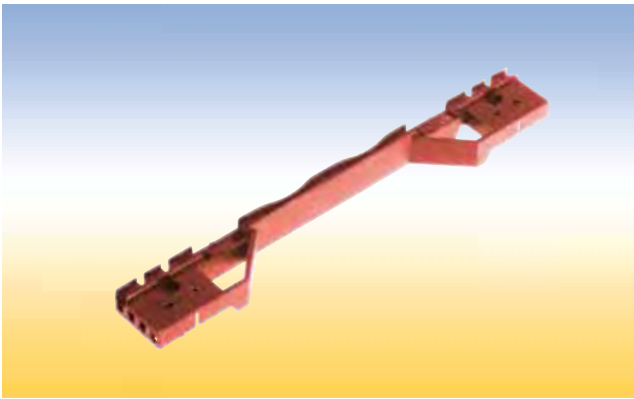
Technical data

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

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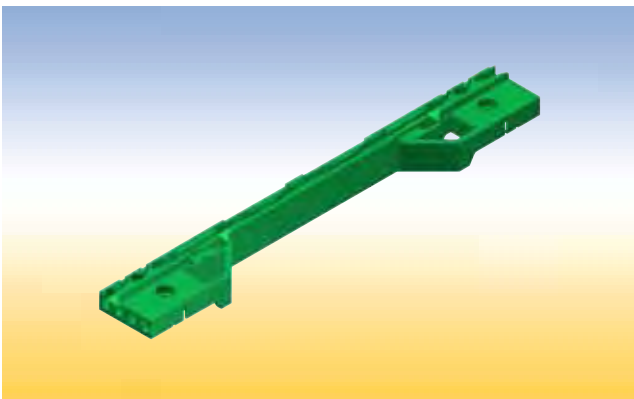
color	nom. length [mm]	PCB thickness [mm]	order no. 409.
black	160	1.6 - 2.4	113 400
black	220	1.6 - 2.4	131 973
red	160	1.6 - 2.4	116 440

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.

Technical data

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

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

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

This catalog contains stock and standard parts. Other products and sizes on request.
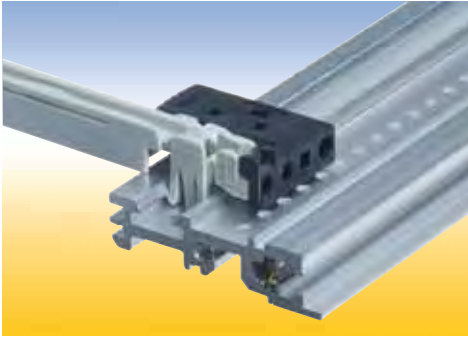
for card guide UNIVERSAL, CONN, VIB and VARIO

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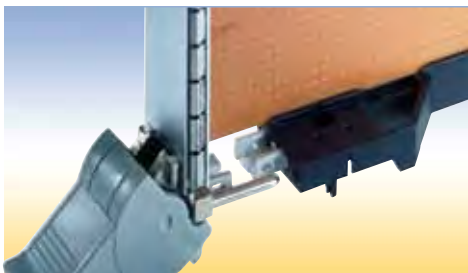
Contact Spring IEEE
Snapped into the IEEE card guide or IEEE coding head to ground the alignment pin of the front panel.

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

Subrack Accessories

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
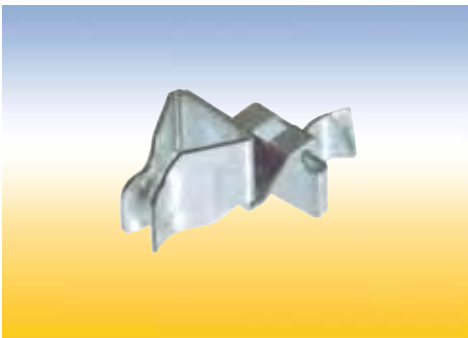
For premating grounding. In connection with front connector with male contact.

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**

This catalog contains stock and standard parts. Other products and sizes on request.

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
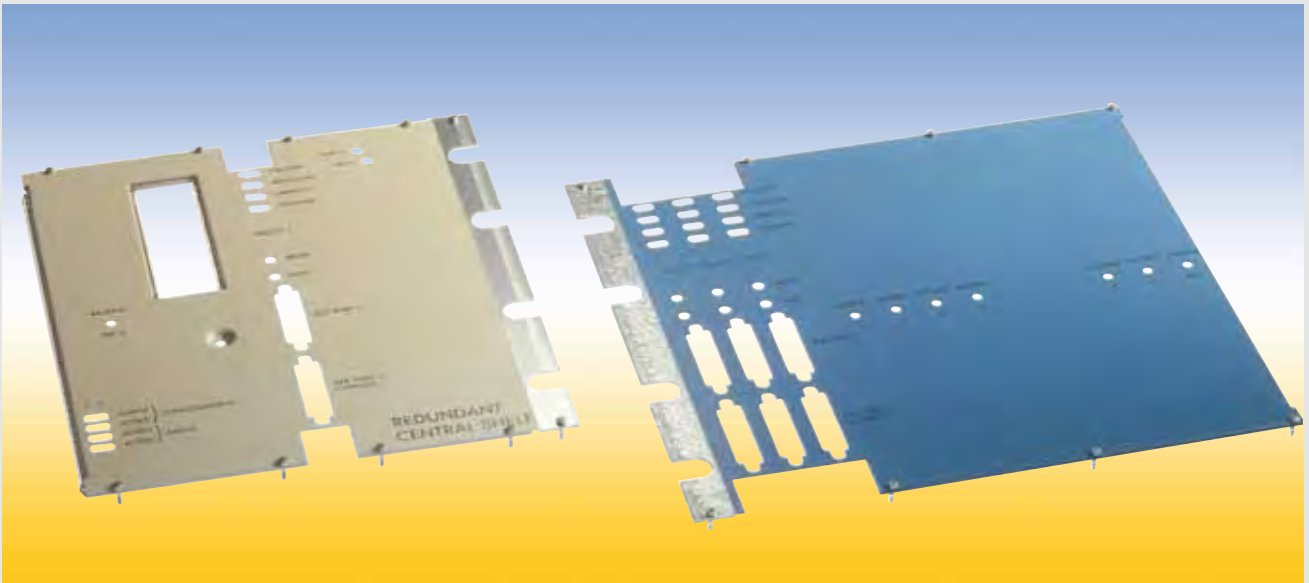
In addition to the wide range of standard front panels we also provide on request individual customer specific custom front panels with punching, surface finish and silk screening.
Textured or smooth painted in all revelant RAL-colors, abrasion-resistant silk-screen printing as well as color coordinated 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
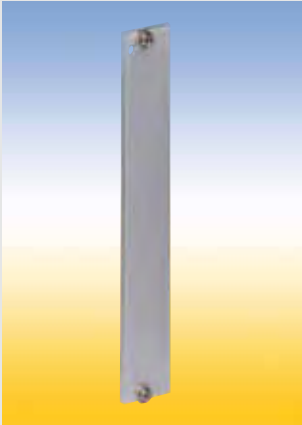
√   **Blind Front Panels**

√   **Front Panels with Handle**
√   **Handles**

√   **Front Panels with Ejector Handle**
√   **Ejector Handles**

√   **Front Panels with IEEE Handle**
√   **IEEE-Handles**
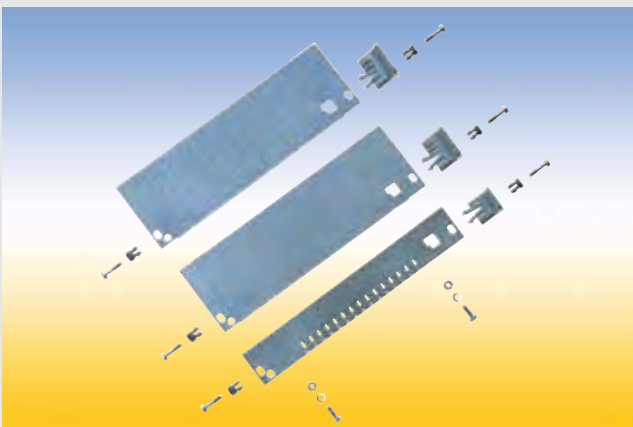
√   **Plastic Front Panels**

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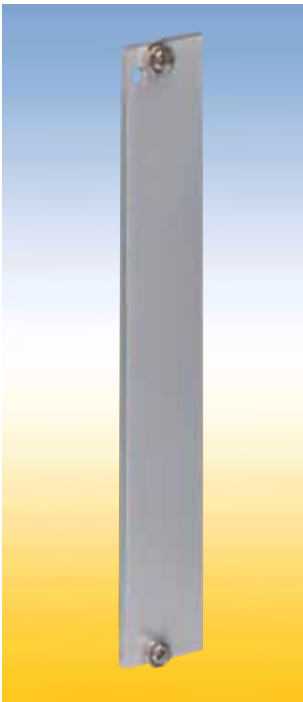
Blind Front Panels
For covering empty sections or to carry various components in subracks.

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.

1 HP - 2 HP	3 HP - 8 HP	9 HP - 84 HP

This catalog contains stock and standard parts. Other products and sizes on request.

Ordering details blind front panels (flat front panel)

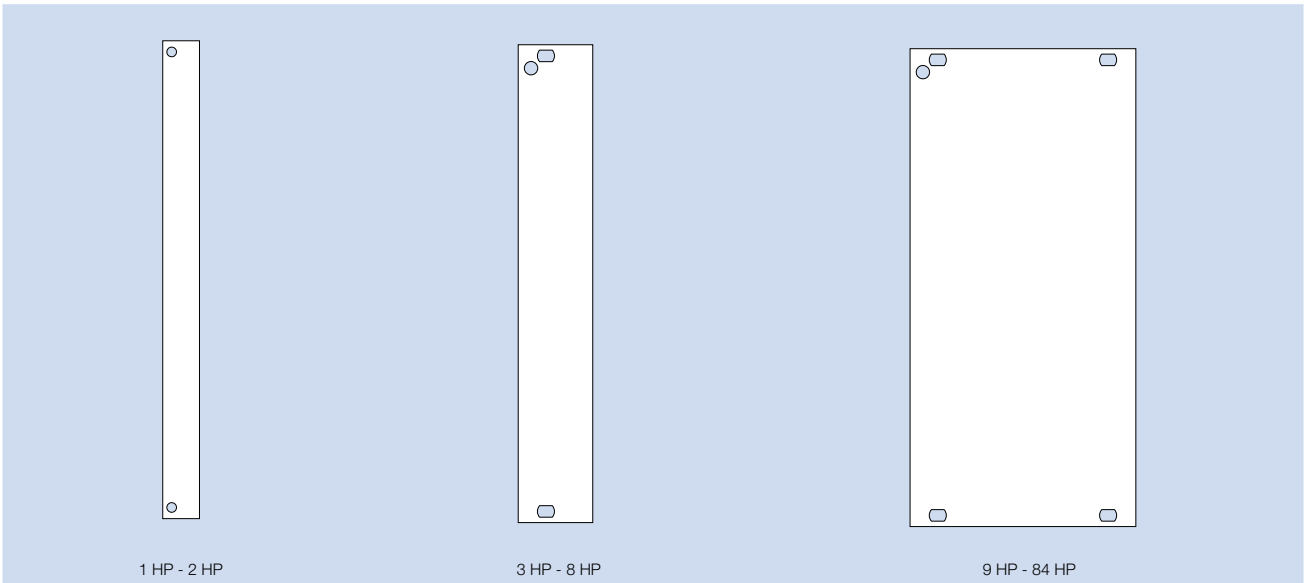|	nom. width [HP]	3 U blank order no. 409.	3 U anodized/ conductive order no. 409.	6 U blank order no. 409.	6 U anodized/ conductive order no. 409.
Blind front panel	1	097 201	-	097 601	-
Blind front panel	2	097 202	-	097 602	-
Blind front panel	3	097 203	-	097 603	-
Blind front panel	4	097 204	097 404	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

Subrack Accessories

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 M 2.5 gray	-	2	4	100 539
Screw retainer M 2.5 black	-	2	4	100 538
Cross-head screw M 2.5 x 11.3	2	2	4	101 917

Blind Front Panels RFI
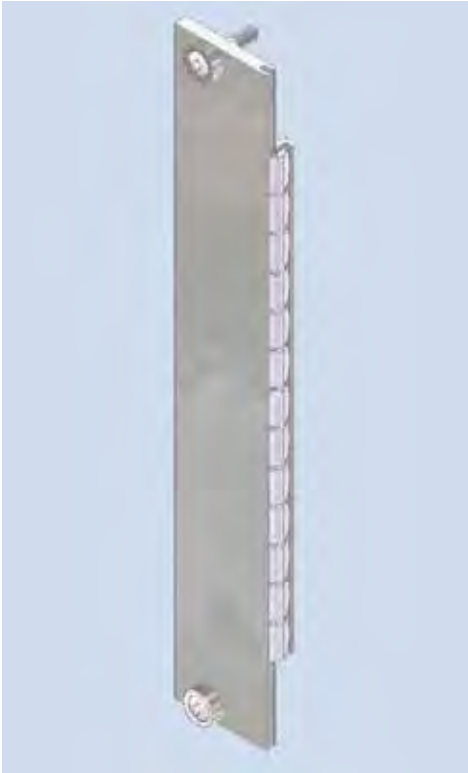
Ordering details kit - blind front panel RFI

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:

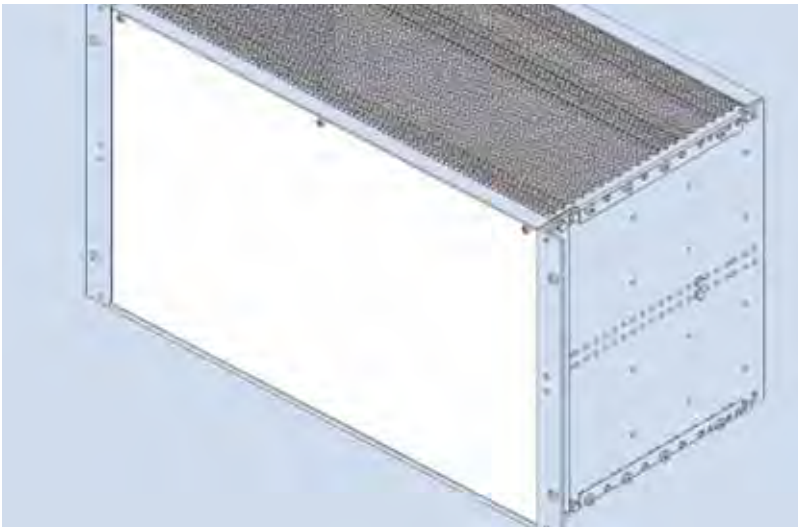|	pieces for 1-2 HP	pieces for 3-8 HP	pieces for 9-43 HP	pieces for 44-85 HP
Front panel	1	1	1	1
RFI spring F3 extruded/flat	1 / 2	1 / 2	1 / 2	1 / 2
Grounding bushing M 2.5	-	2	4	6
Mounting parts-kit	1	1	1	1

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	-	-

This catalog contains stock and standard parts. Other products and sizes on request.

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
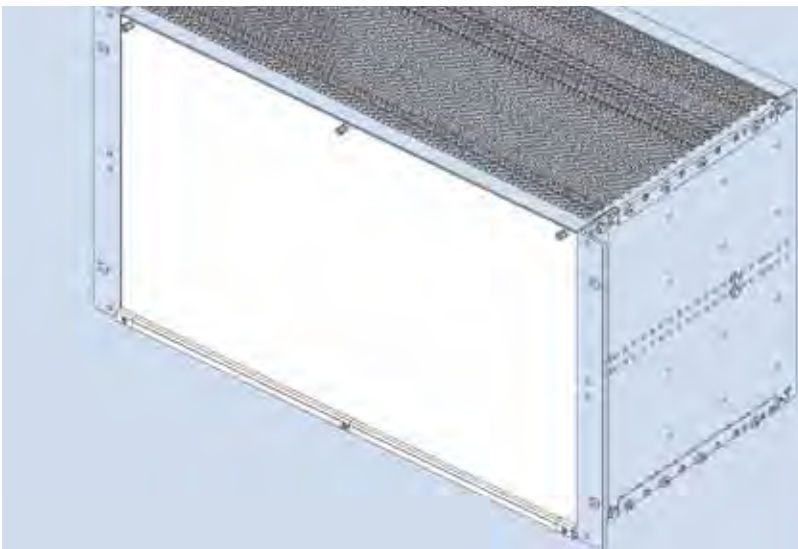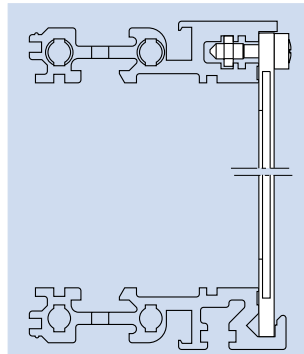3 grounding bushing M 2.5
3 cross-head screw M 2.5 x 11.3

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 - 3 U	111 112
RFI spring F3 - 6 U	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 - 3 U	111 112
RFI spring F3 - 6 U	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.
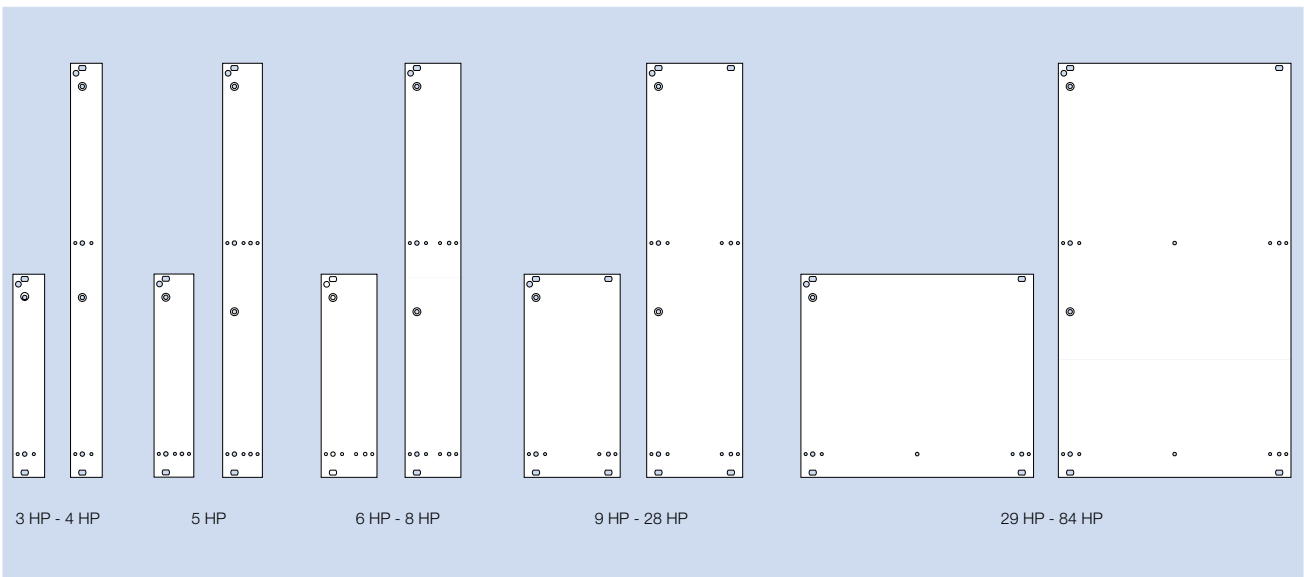
Four versions are available:

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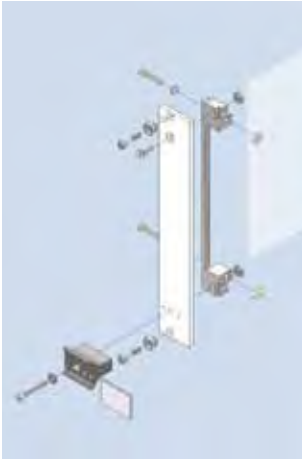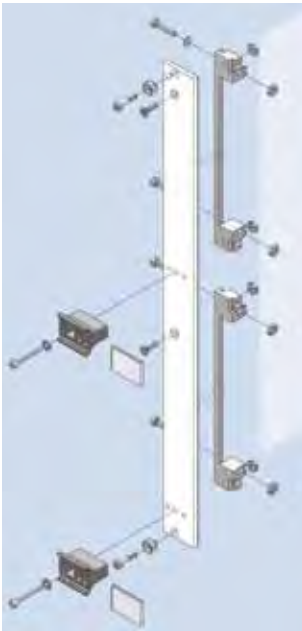Front panels are delivered unassembled as single parts or as a kit.

| 3 HP - 4 HP | 5 HP | 6 HP - 8 HP | 9 HP - 28 HP | 29 HP - 84 HP |

Hole pattern of the front panels

This catalog contains stock and standard parts. Other products and sizes on request.

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	-

Subrack Accessories

Front Panels RFI with Handle
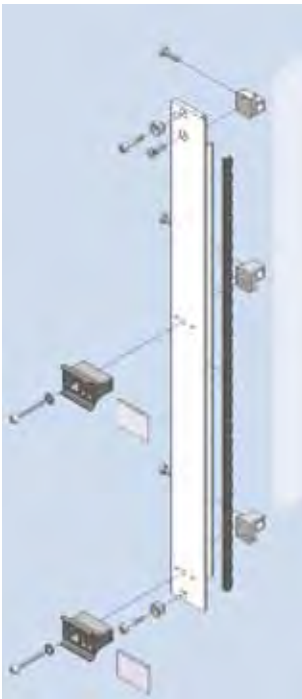
Ordering details kit - front panel RFI with handle

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 - 3 U	111 112
RFI spring F3 - 6 U	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

This catalog contains stock and standard parts. Other products and sizes on request.
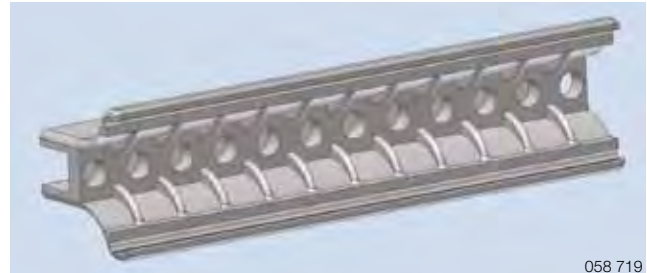
Handle FP

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, 10% fiber-glass reinforced
Color	gray RAL 7032, black
Continous 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
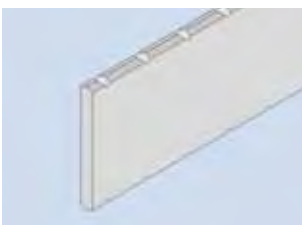
Ident Plate

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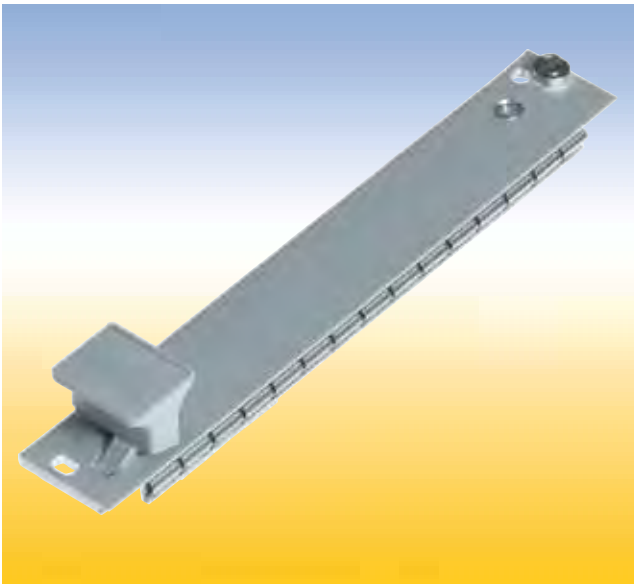
Technical data

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

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	-

Subrack Accessories

This catalog contains stock and standard parts. Other products and sizes on request.

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
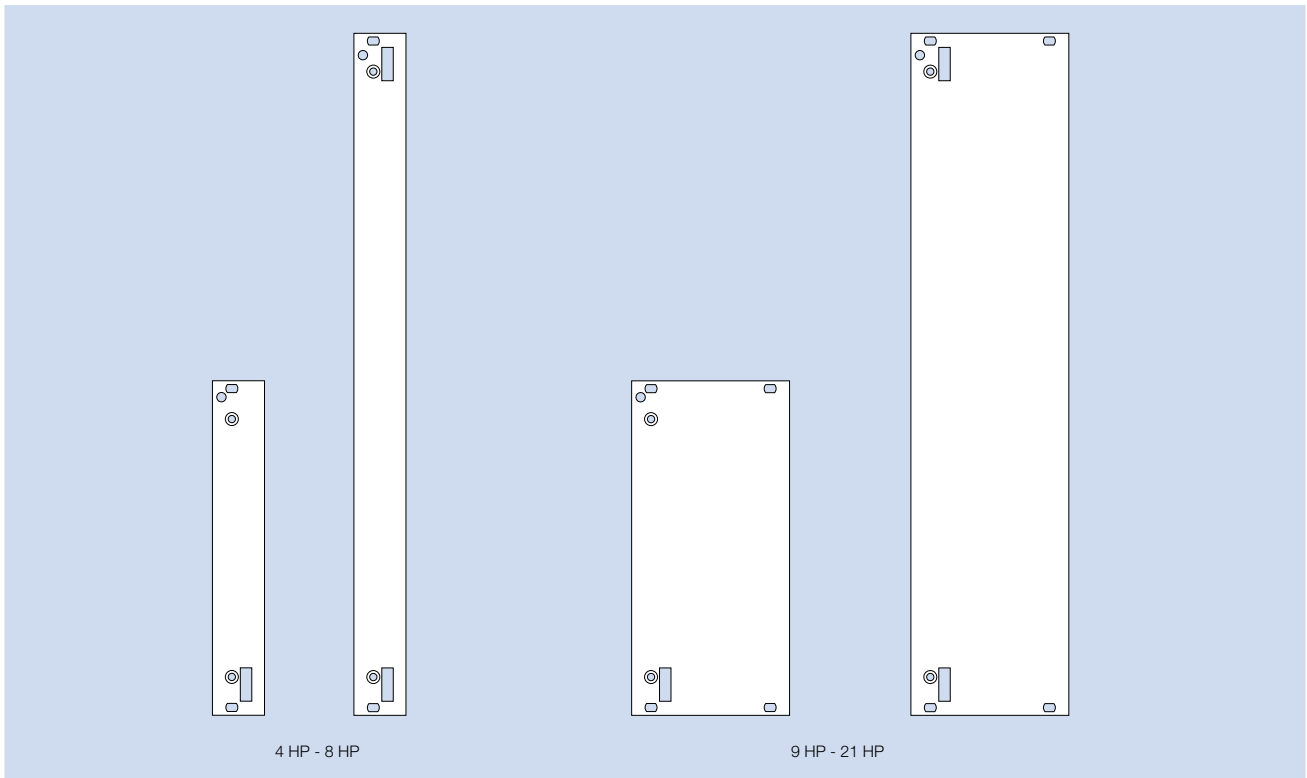the front connector.

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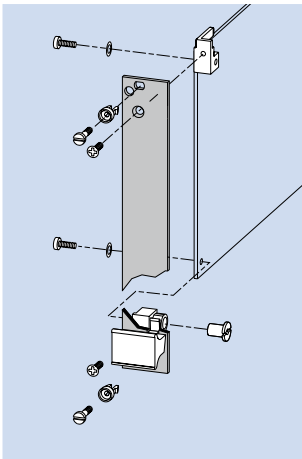
Delivery
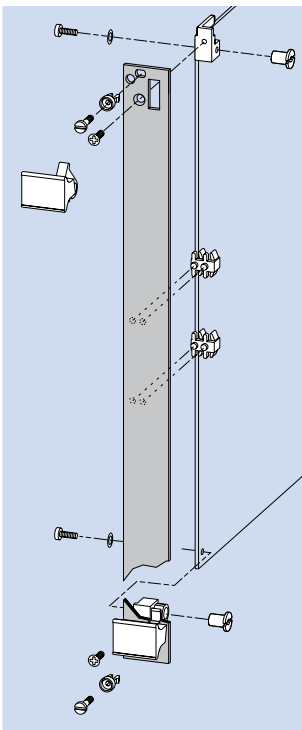Front panels are delivered unassembled as single parts
or as a kit.

4 HP - 8 HP

9 HP - 21 HP

Hole pattern of the front panels

3.86 | This catalog contains stock and standard parts. Other products and sizes on request.

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

| 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.
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)

nom. width [HP]	3 U blank order no. 409.	3 U anodized/ conductive order no. 409.	6 U for support pluged-in blank order no. 409.	6 U for support pluged-in anodized/ conductive order no. 409.	6 U for support screwed blank order no. 409.	6 U for support screwed anodized/ conductive 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	-	-

Subrack Accessories

Front Panels RFI with Ejector Handle
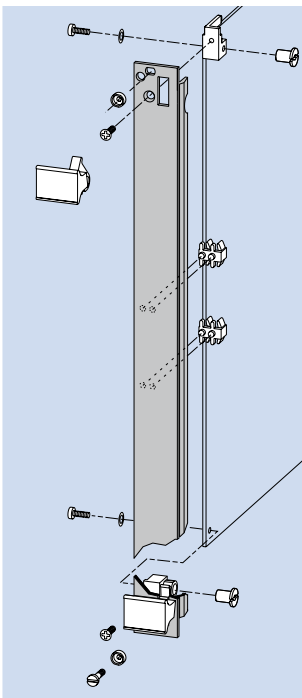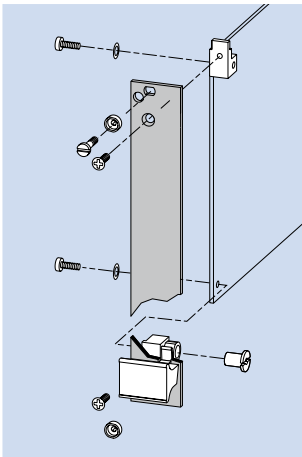
Ordering details - kit front panel RFI with ejector handle

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 conduvtive
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 - 3 U	111 112
RFI spring F3 - 6 U	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

This catalog contains stock and standard parts. Other products and sizes on request.
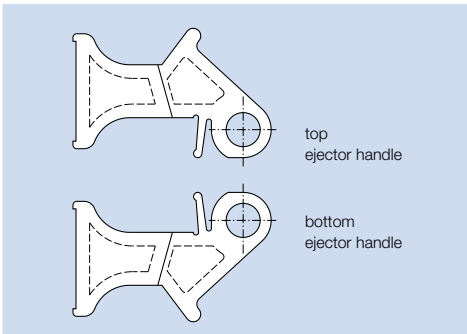
Ejector Handle

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
Continous temperature	– 40 °C to + 100 °C
Fire protection class	UL 94 V–0

top ejector handle

bottom ejector handle

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

top ejector handle

bottom ejector handle
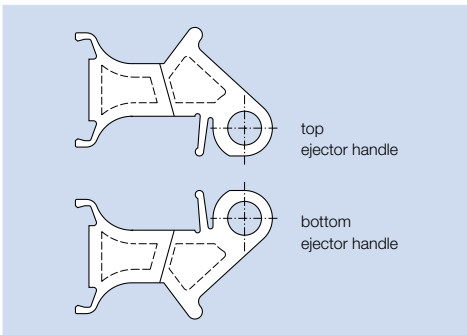
Ejector handle 4 HP

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

Ordering details ejector handle 4 HP

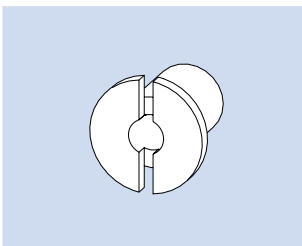| version	gray order no. 409.	black order no. 409.
top	102 117	101 843
bottom	102 118	101 844

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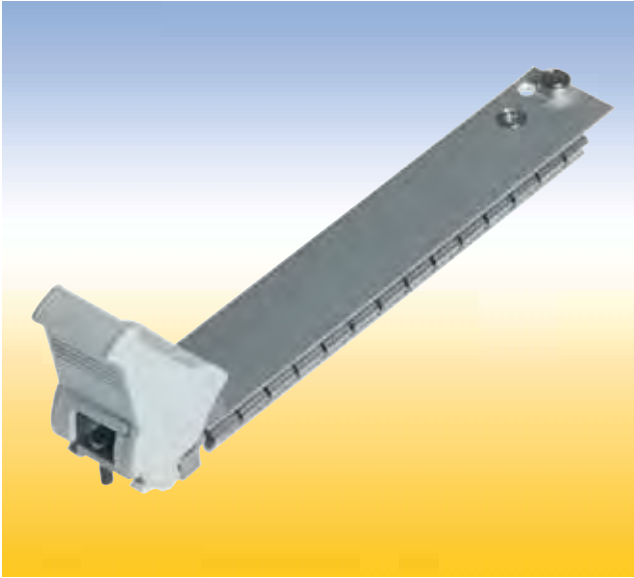
order no.: **409. 017 956**

Bearing Bushing 4

for handle 4 HP

Material: steel, galvanized
Finish: colorless chromated

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

Subrack Accessories

Front Panels RFI with IEEE Handle

Technical data

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

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.

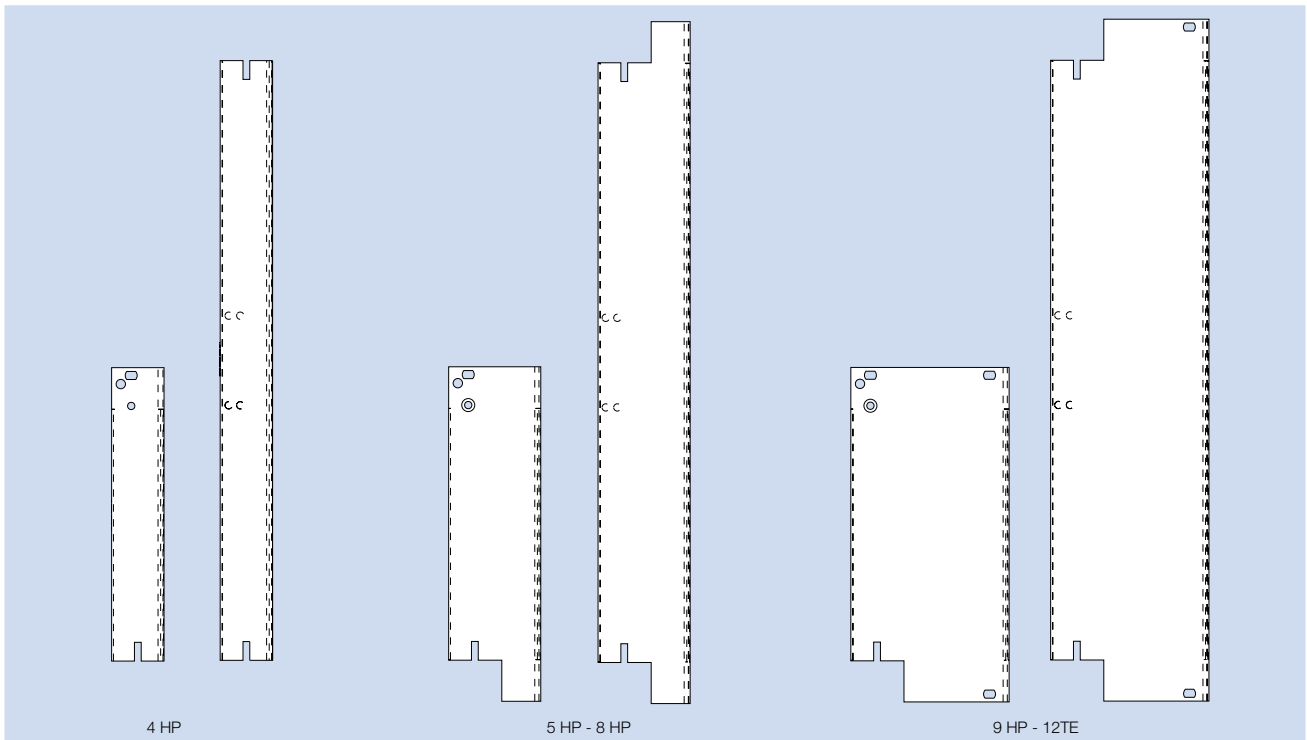Two versions with IEEE handle are available:

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

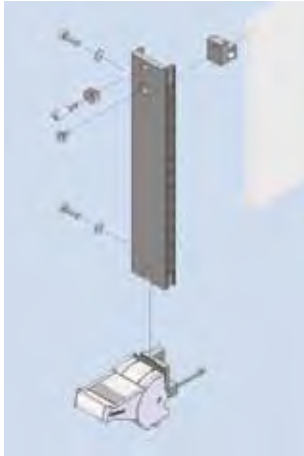Front panels are delivered with the assambled IEEE handle as single parts or as a kit.

4 HP   5 HP - 8 HP   9 HP - 12TE

Hole pattern of the front panels

This catalog contains stock and standard parts. Other products and sizes on request.

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 - 3 U	111 112
RFI spring F3 - 6 U	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

This catalog contains stock and standard parts. Other products and sizes on request.

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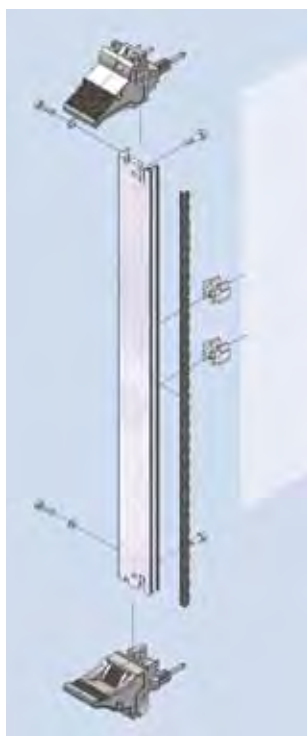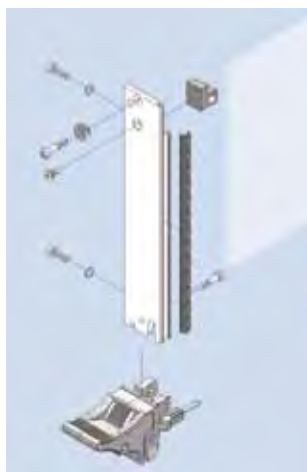
**Ordering details kit -
extruded front panel RFI with IEEE handle, black,
hot-swap in the bottom handle**

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 top black	-	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 - 3 U	111 112
RFI spring F3 - 6 U	111 116
For assemble the RFI spring F3	
Roller cutter	118 433

This catalog contains stock and standard parts. Other products and sizes on request.
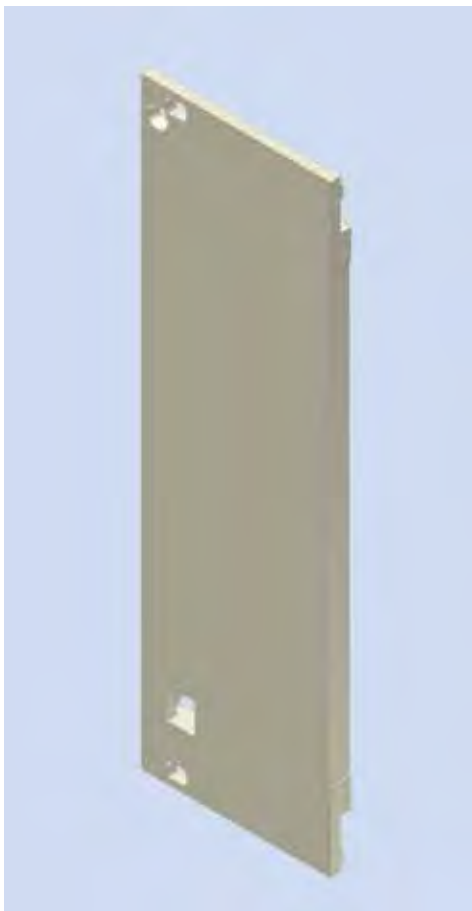
Plastic Front Panels
On the rear side of the 2 mm thick front panel is an integrated front connector for attaching 1.6 mm thickness 3 U PCBs.
The handle snappes in into the front panel, therefore the front panel can be modified easily.

Delivery
As single part

Technical data

Material	Polycarbonate, 10% fiber-glass reinforced
Color	RAL 7032, pearl gray or black
Continous 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 snappes 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
Continous 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
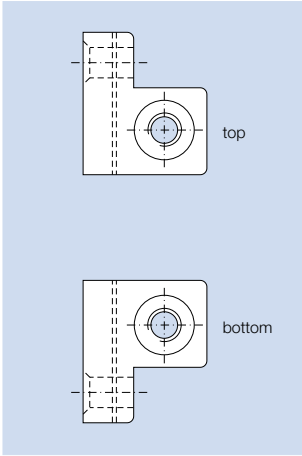
Front Connector

Material: zinc die-cast
Finish: untreated

Ordering details

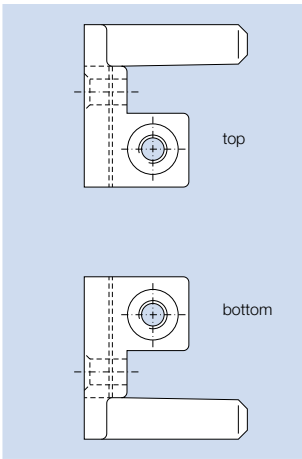|	order no. 409.
Front connector top	099 731
Front connector bottom	099 730

Accessories

Counter sunk screw M 2.5 x 6
self tapping
Minimum order quantity 100 pieces

order no.: 409. 067 624

Front Connector with Male Contact
For premating front panel grounding.

Material: zinc die-cast
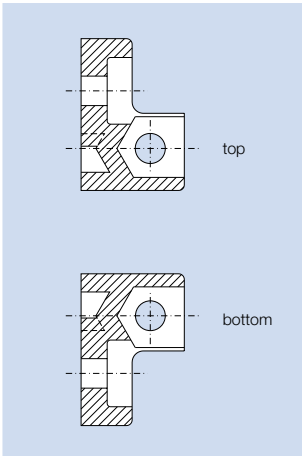**Finish:** tin-plated

Ordering details

	order no. 409.
Front connector top	107 728
Front connector bottom	107 727

Accessories

	order no. 409.
Front panel grounding contact	058 102
Minimum order quantity 100 pieces	
Self tapping counter sunk screw M 2.5 x 6	067 624

Plastic Front Connector

Technical data

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

Ordering details

	order no. 409.
Front connector top	065 883
Front connector bottom	065 882

Accessories
Minimum order quantity 100 pieces

	order no. 409.
Hexagonal nut M 2.5	013 938
Counter sunk screw M 2.5 x 6	067 624

This catalog contains stock and standard parts. Other products and sizes on request.
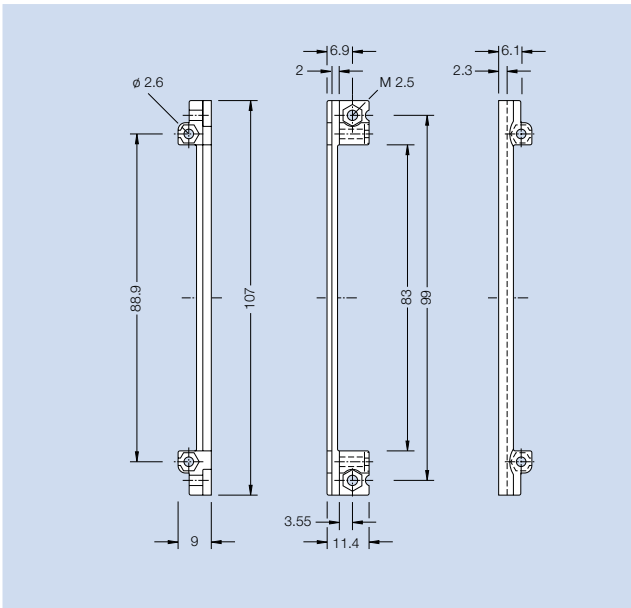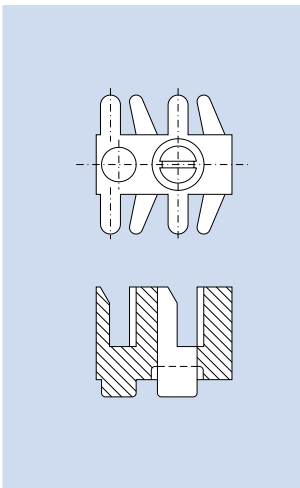
Front Connector FEE

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**

This catalog contains stock and standard parts. Other products and sizes on request.

Screw Retainer, Grounding Bushing, Quick Lock E

Screw retainer, Grounding bushing and Screw

Screw Retainer 2.5 - M 2.5
For 2.5 mm thick front panels, for pluging in the screw

Technical data

Material	POM
Color	gray or black
Continous 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 bounding 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 M 2.5 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	sloted	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
Continous temperature	– 40 °C to + 100 °C

This catalog contains stock and standard parts. Other products and sizes on request.