



**CONNECT AND PROTECT**

**Connectors**

  
nvent

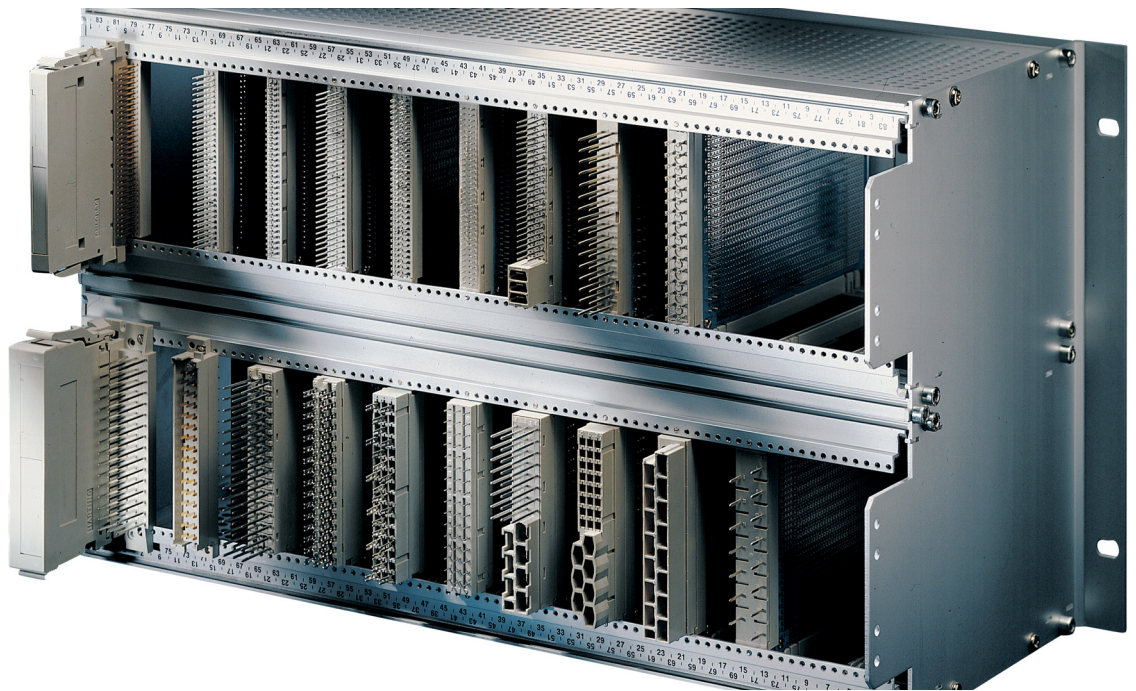
**SCHROFF**

# Connectors, busbars

**OVERVIEW**

**MAIN KATALOG**

- Cabinets ..... 1
- Wall mounted cases ..... 2
- Accessories for cabinets and wall mounted cases .. 3
- Climate control .. 4
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- Subracks/ 19" chassis ..... 6
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05592002

## STANDARDS

- Connectors in accordance with:  
IEC 60603-2 / DIN 41612

### Requirements classes DIN 41612, Part 5 Requirements class 1

- 500 connector cycles
- 250 connector cycles, 21 day gas test with 10 ppm SO<sub>2</sub>, measurement of contact resistance
- 250 connector cycles, then visual inspection, no abrasion of contact surface down to the base metal, no impairment of function

### Requirements class 2

- 400 connector cycles
- 200 connector cycles, 4 day gas test with 10 ppm SO<sub>2</sub>, measurement of contact resistance
- 200 connector cycles, then visual inspection, no abrasion of contact surface down to the base metal, no impairment of function

### Requirements class 3

- 50 connector cycles, no gas test, then visual inspection, no impairment to function

### Requirements class VG 95 324, part 1

- 500 connector cycles, then 1 day gas test with 10 000 ppm SO<sub>2</sub> and 1 day gas test with 10 000 ppm H<sub>2</sub>S, then visual inspection, no abrasion of contact surface down to base metal, no impairment of function

## MODIFICATIONS

Extended delivery program

- Connectors to IEC 60603-2 with requirements classes 1, 3 and defence equipment standard  
Minimum quantity: 300 pieces
- Connectors with selective contacts  
Minimum quantity: 500 pieces
- Complementary types to standard IEC 60603-2 („half“ type)  
Minimum quantity: 300 pieces
- Not catalogued connectors to IEC 60603-2  
Minimum quantity: 300 pieces

Note:  
Prices and delivery times available on request

# Connectors, busbars

## GENERAL TECHNICAL DATA

### Contamination level 1

None or dry, non-conductive contamination. Contamination has no effect.

### Contamination level 2

Non-conductive contamination only. Occasional transient conductivity due to condensation may occur. Contamination levels 3 and 4 are not taken into account as they do not apply to the connectors listed in this catalogue. The minimum creepage distances represented in the table relate to the CTI values of insulation group III a/b.

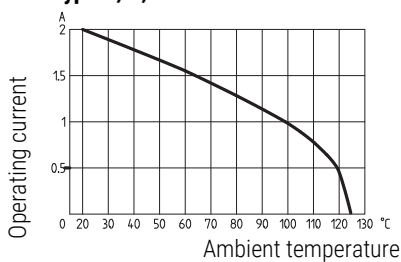
### Reference voltage, minimum creepage distance and contamination level

Minimum creepage distance in mm

- Contamination level 1	0.09	0.125	0.14	0.18	0.2	0.22	0.25	0.28	0.32	0.42	0.56	0.75	1.0	0.3	1.8	2.4	3.2
- Contamination level 2	0.42	0.50	0.53	1.2	1.25	1.30	1.40	1.50	1.60	2.00	2.50	3.20	4.0	5.0	6.3	8.0	10

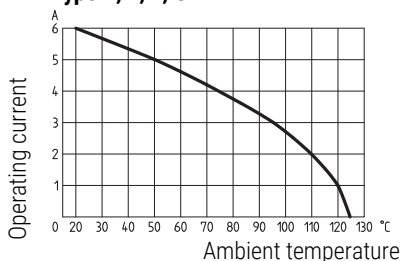
## DERATING DIAGRAMS

### Type B, C, R

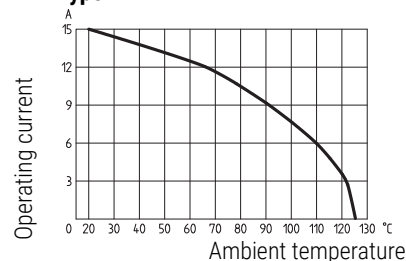


The current-carrying capacity of connectors is restricted by the thermal loading capacity of the materials, the contact elements - including connections - and insulation elements. The derating curve applies therefore for currents that may flow continuously (not intermittently) and simultaneously through each contact element of the connector without exceeding the maximum acceptable temperature. Measurement and control procedures in accordance with DIN 41 640, part 3.

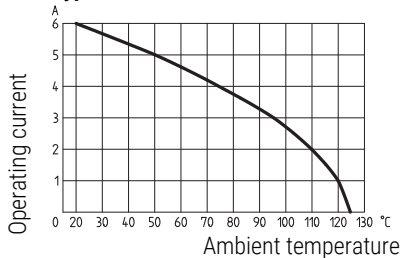
### Type D, E, F, G



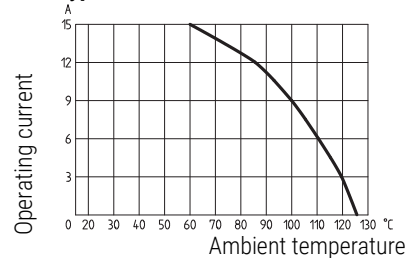
### Type H



### Type D, E, F, G



### Type H



sva42501 sva42502 sva42503 sva42504 sva42505

Overview ..... 11.3

### Connectors

Connector types 11.4

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Keying/coding pegs for codable female connectors ..... 11.7

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### Busbars

4-pin for Faston connector 6.3 x 0.8 mm ..... 11.10

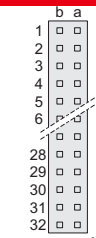
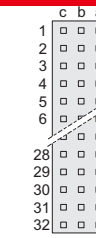
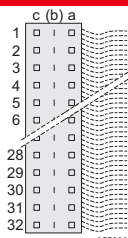
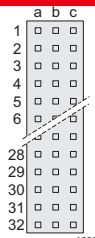

PCB busbars ..... 11.11

Busbars ..... 11.11

# Accessories – Connectors

## OVERVIEW OF TYPES, CONNECTORS EN 60603 (DIN 41612)

### ORDER INFORMATION

Description	Number of contacts	Row assignment	Type B	Type C	Type C for ribbon cables	Type R	Type D
Drawing: View of rear of plug							
			1 piece	1 piece	1 piece	1 piece	1 piece

### Male connector

Solder pins, length 3 mm, 0.6 mm x 0.6 mm; angled	32	a, c	–	<b>69001-826</b>	–	–	<b>69001-831</b>
	64	a, b	<b>69001-801</b>	–	–	–	–
	64	a, c	–	<b>69001-821</b>	–	–	–
	96	a, b, c	–	<b>69001-816</b>	–	–	–

### Female connector

Wire-wrap pins, length 13 mm, 0.6 mm x 0.6 mm, straight;	32	a, c	–	<b>69001-691</b>	–	–	–
	64	a, c	–	<b>69001-685</b>	–	–	–
	96	a, b, c	–	<b>69001-679</b>	–	–	–
Wire-wrap pins, length 20 mm, 1 mm x 1 mm, straight;	32	a, c	–	–	–	–	<b>69001-697</b>
Solder pins, length 2.5 mm, Ø 0.6 mm, straight	64	a, b	<b>69001-664</b>	–	–	–	–
	64	a, c	–	<b>69001-693</b>	–	–	–
	96	a, b, c	–	<b>69001-696</b>	–	–	–
Solder pins, length 3 mm, 0.6 mm x 0.6 mm, angled	64	a, c	–	–	–	<b>69001-976</b>	–
	96	a, b, c	–	–	–	<b>69001-728</b>	–
Solder pins, length 4 mm, Ø 0.6 mm, straight	64	a, c	–	<b>69001-678</b>	–	–	–
	96	a, b, c	–	<b>69001-677</b>	–	–	–
Solder eye, length 5.5 mm	32	a, c	–	–	–	–	<b>69001-698</b>
Snap-on/screw-on for 64-pin cable	64	a, c	–	–	<b>69005-596</b>	–	–
Spring contacts for crimping, 0.14 - 0.5 mm <sup>2</sup> , 50 pieces			–	–	–	–	<b>21100-293</b>
Spring contacts for crimping, 0.75 - 1.5 mm <sup>2</sup> , 50 pieces			–	–	–	–	<b>21100-294</b>
Torx panhead screw M2.5 x 7, PU 100 pieces, for direct mounting on z-rail			<b>24560-147</b>	<b>24560-147</b>	<b>24560-147</b>	<b>24560-147</b>	<b>24560-147</b>

Technical Data	Type B	Type C	Type C for ribbon cables	Type R	Type D
Connector pitch	2.54 mm	2.54 mm	2.54 mm	2.54 mm	5.08 mm
Current load max. at 20 °C	2 A	2 A	1 A	2 A	6 A
Test voltage U <sub>eff</sub> contact-contact	1 kV	1 kV	1 kV	1 kV	1.55 kV
Test voltage U <sub>eff</sub> contact-earth	1.55 kV	1.55 kV	–	1.55 kV	1.55 kV
Contact resistance	≤ 20 mΩ	≤ 20 mΩ	–	≤ 20 mΩ	≤ 20 mΩ
Coding on the connector	–	–	–	–	–
Separate coding	yes	yes	yes	yes	yes
Contact surface	solidly gold-plated	solidly gold-plated	solidly gold-plated	solidly gold-plated	solidly gold-plated
Air gap contact-contact	>1.2 mm	>1.2 mm	–	>1.2 mm	>1.6 mm
Creepage distances contact-contact	>1.2 mm	>1.2 mm	–	>1.2 mm	>3.0 mm
Insertion and withdrawal forces	32-pin < 30 N; 64-pin < 60 N; 96-pin < 90 N	32-pin < 30 N; 64-pin < 60 N; 96-pin < 90 N	64-pin < 60 N	64-pin < 60 N; 96-pin < 90 N	32-pin < 40 N

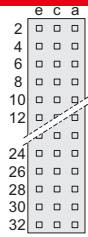
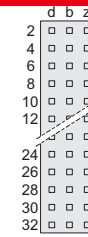
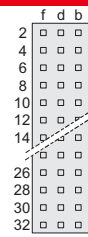
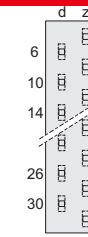

### NOTE

- Connectors are compliant with requirements class 2

# Accessories – Connectors

## OVERVIEW OF TYPES, CONNECTORS EN 60603 (DIN 41612)

### ORDER INFORMATION

Description	Number of contacts	Row assignment	Type E	Type F	Type G	Type H	Mixed type (M), type F and type H
Drawing: View of rear of plug							
			1 piece	1 piece	1 piece	1 piece	1 piece
<b>Male connector</b>							
Solder pins, length 2.9 mm, 0.6 mm x 0.6 mm; angled	32	z, b	-	<b>69001-851</b>	-	-	-
	32	z, d	-	<b>69001-853</b>	-	-	-
	48	a, c, e	<b>69001-879</b>	-	-	-	-
	48	z, b, d	-	<b>69001-846</b>	-	-	-
	64	z, b, d, f	-	-	<b>69001-856</b>	-	-
Solder pins, length 3 mm, 1.2 mm x 0.8 mm; angled; connector pins not protruding	15	z, d	-	-	-	<b>69001-865</b>	-
Solder pins, recessed, length 2.9 mm, 1.2 mm x 0.8 mm; angled	15	z, d	-	-	-	<b>69001-860</b>	-
FASTON connector 6.3 mm x 0.8 mm; straight	15	z, d	-	-	-	<b>69001-866</b>	-
Solder pins, length 2.9 mm, FØ 0.6 mm, H Ø 1.6 mm; angled	24+7-pin	z, b, d	-	-	-	-	-

<b>Female connector</b>							
Wire-wrap pins, length 22 mm, 1 mm x 1 mm; straight	32	z, b	-	<b>69001-717</b>	-	-	-
	48	a, c, e	<b>69001-877</b>	-	-	-	-
	48	z, b, d	-	<b>69001-711</b>	-	-	-
	64	z, b, d, f	-	-	<b>69001-723</b>	-	-
F: Wire-wrap pins, length 22 mm, 1 mm x 1 mm; H: FASTON connector 6.3 mm x 0.8 mm; straight	24+7-pin	z, b, d	-	-	-	-	<b>69001-755</b>
Solder pins, length 4 mm, 0.8 mm x 0.8 mm; straight	15	z, d	-	-	-	<b>69001-981</b>	-
Solder pins, length 4.5 mm, 0.4 mm x 0.6 mm; straight	48	z, b, d	-	<b>69001-884</b>	-	-	-
Solder pins, length 10 mm, 0.8 mm x 0.8 mm; straight	15	z, d	-	-	-	<b>69001-980</b>	-
Wiring with FASTON connector 6.3 mm x 0.8 mm; straight	15	z, d	-	-	-	<b>69001-733</b>	-
Solder eyes, length 9.5 mm	32	z, b	-	<b>69001-718</b>	-	-	-
	32	z, d	-	<b>69001-722</b>	-	-	-
	48	z, b, d	-	<b>69001-712</b>	-	-	-
F: Solder eyes; H: FASTON connector 6.3 mm x 0.8 mm; straight	24+7-pin	z, b, d	-	-	-	-	<b>69001-944</b>
Torx panhead screw M2.5 x 7, PU 100 pieces, for direct mounting on z-rail			<b>24560-147</b>	<b>24560-147</b>	<b>24560-147</b>	<b>24560-147</b>	<b>24560-147</b>

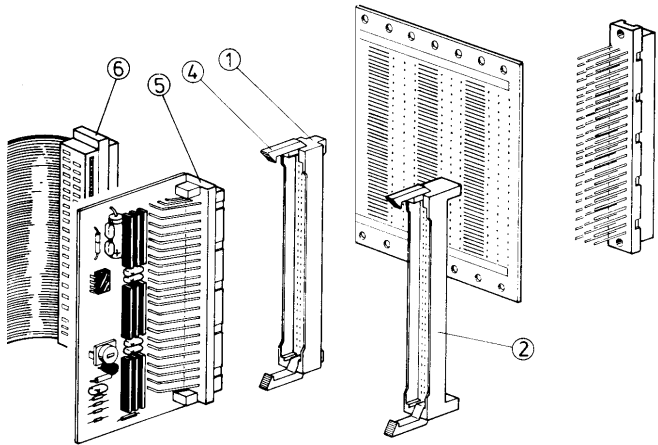
Technical Data	Type E	Type F	Type G	Type H	Mixed type (M), type F and type H	
Connector pitch	5.08 mm	5.08 mm	5.08 mm	10.16 mm	5.08 mm	10.16 mm
Current load max. at 20 °C	6 A	6 A	6 A	15 A	6 A	15 A
Test voltage U <sub>eff</sub> contact-contact	1.55 kV	1.55 kV	1.55 kV	3.10 kV	1.55 kV	3.10 kV
Test voltage U <sub>eff</sub> contact-earth	1.55 kV	2.50 kV	2.50 kV	3.10 kV	2.50 kV	3.10 kV
Contact resistance	≤ 20 mΩ	≤ 20 mΩ	≤ 20 mΩ	≤ 8 mΩ	≤ 20 mΩ	≤ 8 mΩ
Coding on the connector	-	-	-	yes	-	-
Separate coding	yes	yes	yes	yes	yes	yes
Contact surface	solidly gold-plated	solidly gold-plated	solidly gold-plated	hard silver-plated	solidly gold-plated	hard silver-plated
Air gap contact-contact	>1.6 mm	>1.6 mm	>1.6 mm	>4.5 mm	>1.6 mm	>4.5 mm
Creepage distances contact-contact	>3.0 mm	>3.0 mm	>3.0 mm	>8.0 mm	>3.0 mm	>8.0 mm
Insertion and withdrawal forces	48-pin < 75 N	32-pin < 50 N 48-pin < 75 N	64-pin < 100 N	15-pin < 90 N	24+7-pin < 85 N	

### NOTE

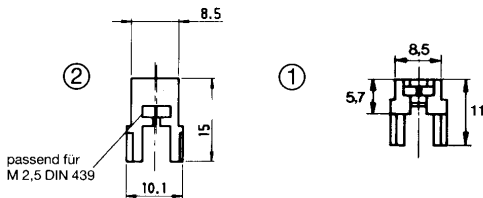
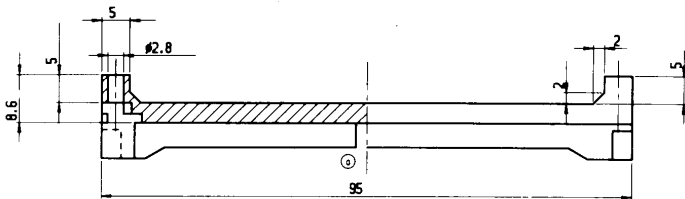
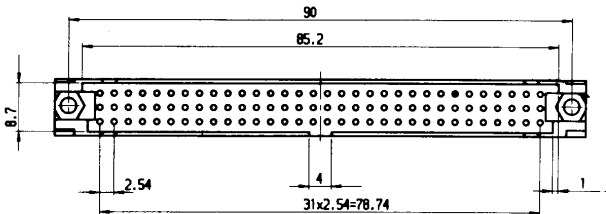
- Connectors are compliant with requirements class 2

# Accessories – Connectors

## BLANK CONNECTOR HOUSINGS/LOCKING LEVERS



A4\_2449



A3\_401

- For types C and R
- The connector housing is fixed to the board with screws; it is pushed over wire wrap posts (e.g. on the rear of backplanes) and thereby forms a male connector
- Locking levers can be used e.g. to lock terminator boards or I/O connectors in place



### ORDER INFORMATION

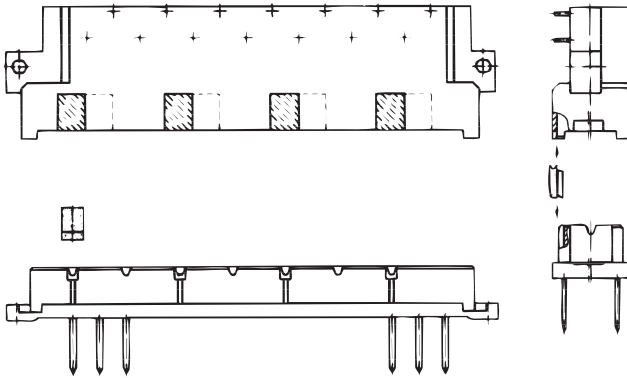
Item	Description	Qty/PU	Part no.
1	Housing with M 2.5 nuts, for posts 0.6 × 0.6 × 17 mm, backplane thickness 3.2 mm	1	<b>29090-001</b>
2	Housing with M 2.5 nuts, for posts 0.6 × 0.6 × 13 mm, backplane thickness 3.2 mm	1	<b>29090-002</b>
2	Housing with M 2.5 nuts, for posts 0.6 × 0.6 × 13 mm, backplane thickness 1.6 mm	1	<b>29001-019</b>
4	Locking lever for type R, grey	1	<b>69001-995</b>
4	Locking lever for type C, black	1	<b>69001-106</b>

### NOTE

- 29090-001 is the replacement product for 69001-210 and 29001-015
- 29090-002 is the replacement product for 69001-814 and 29001-016
- 29001-019 is the replacement product for 69001-311

# Accessories – Connectors

## KEYING/CODING PEGS FOR CODABLE FEMALE CONNECTORS



- For female connector type H
- Without loss of space
- Max. 70 keying/coding possibilities
- The keying/coding pegs are plugged into the female connector; the corresponding keying/coding fields (situated opposite) of the male connectors are broken out

### ORDER INFORMATION

Description	Qty/PU	Part no.
Keying/coding pegs, PBTP, UL 94 V-0	40	<b>21101-252</b>

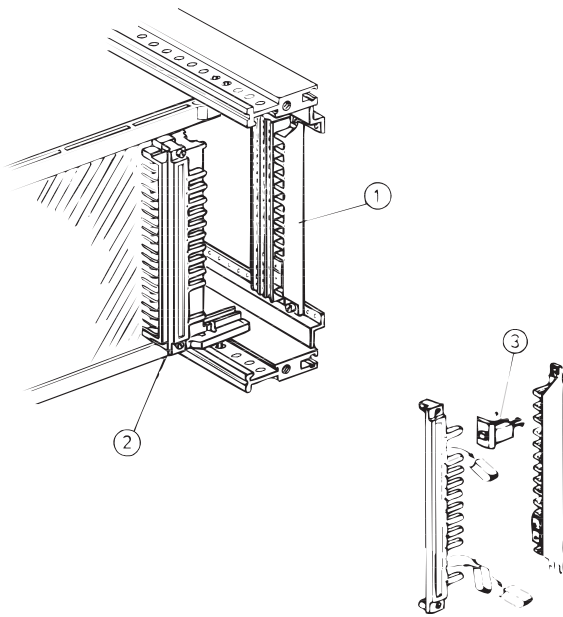
### Keying/coding

- Keying/coding prevents plug-in units becoming mixed up
- Keying/coding for type H
  - Fixing direct onto plug by means of keying/coding peg in the female connector
- Keying/coding for all types in accordance with EN 60603 (DIN 41612)
  - Fixing via additional mounting of keying/coding strips

Keying/coding pegs	For female connector
Part no.	Part no.
	<b>69001-733</b>
<b>21101-252</b>	<b>69001-980</b>
	<b>69001-981</b>

# Accessories – Connectors

## KEYING/CODING STRIPS



A4-2424

- For all types in accordance with EN 60603 (DIN 41612)
- Used with plug-in units to prevent mix-up
- Space for plugs with keying/coding strip:
  - 4 HP for types B, C, D, F, H
  - 5 HP for types E, G
- 66 keying/coding possibilities when two coding pins are used
- 924 keying/coding possibilities when six coding pins are used

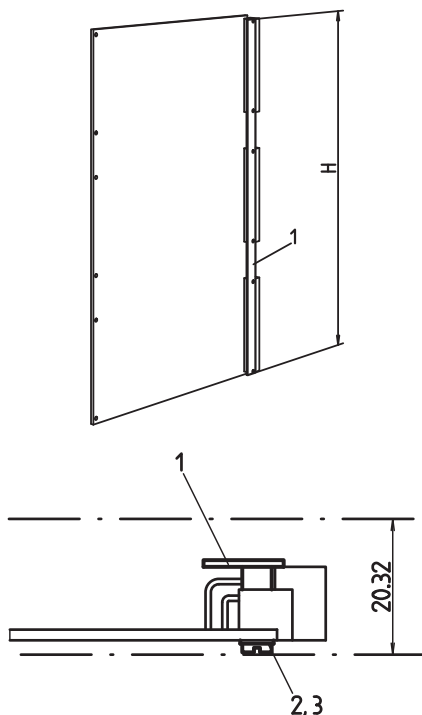
### ORDER INFORMATION

Item	Description	Qty/PU	Part no.
1, 2, 3	Contact strip PBTP, UL 94 V-0, 10 pieces, female strip, PBTP, UL 94 V-0, 10 pieces, keying/coding pins, PBTP, UL 94 V-0, 20 pieces	1	<b>20800-042</b>
1, 2, 3	Spacer element for types E, G	20	<b>20800-036</b>
3	Keying/coding pin	100	<b>20800-078</b>
Assembly kit Screw M2.5 × 18, PU 100 pieces			<b>21100-404</b>

### NOTE

- For connectors types E and G spacers are always required

## PCB STRENGTHENING (9 U)



LKA42609

LKA42593

- Protects large PCBs from bending
- Creates an additional crossbar (in accordance with IEEE recommendations, P 896, Nubus, Multibus<sup>®</sup> II etc.) that links all connectors
- Fixing points match connectors in accordance with EN 60603 (DIN 41612), types B, R, C and D

### DELIVERY COMPRISES (kit)

Item	Qty	Description
1	1	PCB strengthening, Al extrusion, anodised, cut edges plain; separator, stainless steel, riveted on
2	6	Cheesehead screw M 2,5 × 12, St, nickel-plated
3	6	Washer 2.6, St, nickel-plated

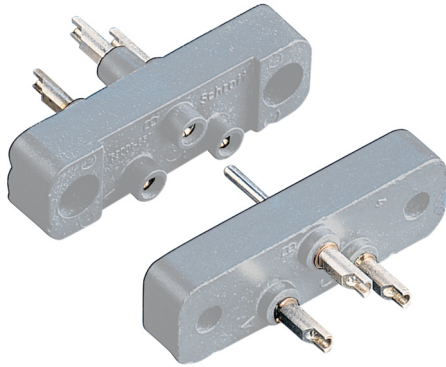
### ORDER INFORMATION

Description	Height H mm	Part no.
For 9 U PCBs	361.6	<b>20809-441</b>



# Accessories – Connectors

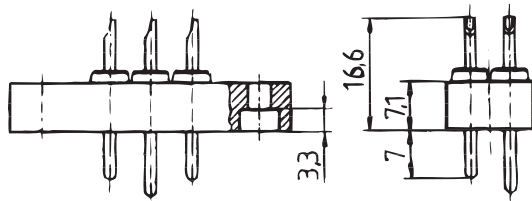
## CONNECTORS, 3-PIN



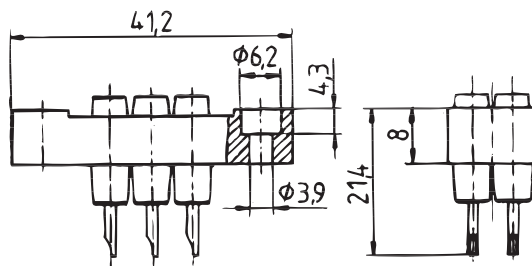
- Used for mains/line voltage supplies
- Male connector with advanced earth protection contact (B)

### ORDER INFORMATION

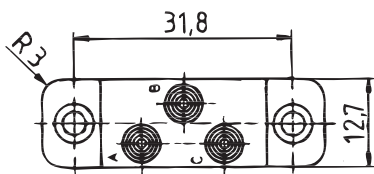
Item	Description	Qty/PU	Part no.
1	Male connector	1	<b>69001-651</b>
2	Female connector strip	1	<b>69001-652</b>
3	Mounting plate for fixing in subrack, socket terminal strip mounts on z-rail (with threaded holes to EN 60603, DIN 41612)	1	<b>30812-002</b>



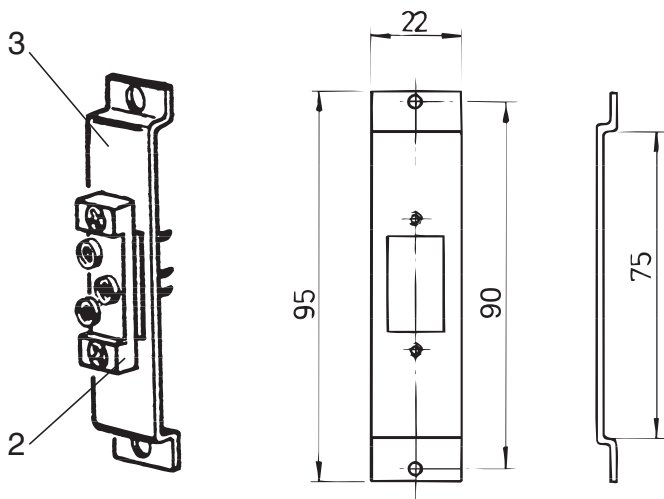
Dimensional drawing of multi-pin connector



Dimensional drawing of socket terminal strip



Dimensional drawing of mounting plate



3: Mounting plate  
2: Socket terminal strip

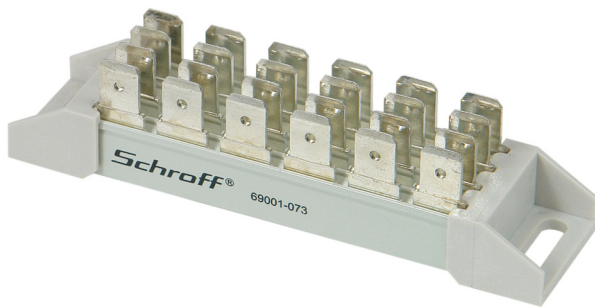
Dimension drawing of mounting plate

### TECHNICAL DATA

Nominal current per contact	10 A
Air gap	≥ 4.4 mm
Creepage distance	≥ 7.6 mm
Test voltage	3 kV (eff)
Contact resistance	approx. 10 mΩ
Connection	Solder eye connection up to 1 mm
Ambient temperature	23 °C ... 130 °C
Contact pins, sockets	galvanically silver-plated
Housing material	Keripol R gray (type 802 as per DIN 16911)
Flammability	UL 94-HB

# Accessories – Horizontal busbars

## BUSBAR, 4-POLE, FOR FASTON CONNECTORS, 6.3 X 0.8 MM



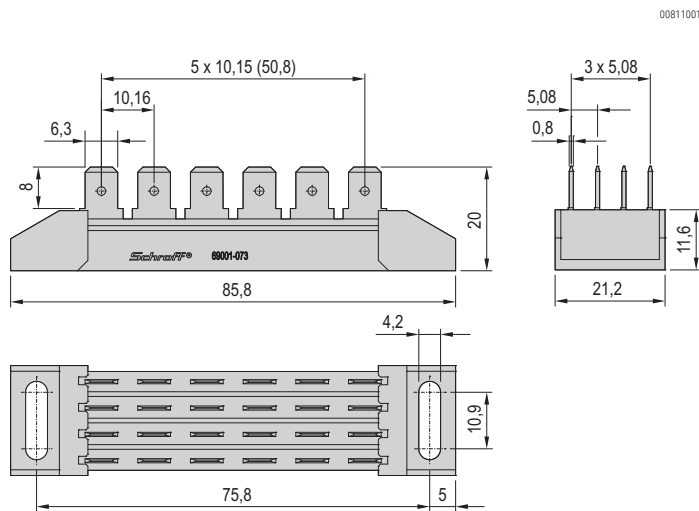
- 24 connection points (4-poles, 6 connectors each)
- To supply mains voltage to 19" subracks
- Fixing in HP grid increments (spacing 15 HP), external dimension < 17 HP

### DELIVERY COMPRISES

Item	Qty	Description
1	1	Busbar, 4-pole (for 6 Faston connectors 6.3 x 0.8 mm)

### ORDER INFORMATION

Description	Part no.
Busbar, 4-pole, for Faston connectors, 6.3 x 0.8 mm	<b>69001-073</b>



00811001

### TECHNICAL DATA

Operating voltage	250 V <sub>AC</sub>
Test voltage: Bar – Bar	3.5 kV <sub>eff</sub>
Test voltage: Pin – Earth	5.0 kV <sub>eff</sub>
Operating current at 20 °C per pin (= 6 connections)	$\sum I \leq 35$ A
Temperature range	-40 °C ... +100 °C
Material: Faston, busbars	CuZn, surface tin-plated
Material: insulating body	PC/ABS, UL 94-V0
Connector type	for Fastons 6.3 x 0.8 mm, 4-pin, 6 Fastons per pin
Connection pitch	5.08 x 10.16 mm

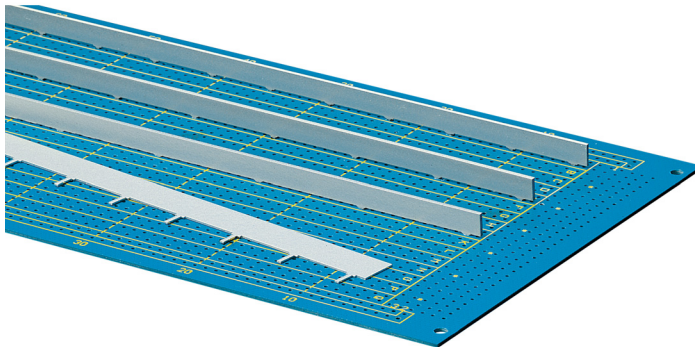
### NOTE

- Other lengths, 2-pole and 3-pole versions, brass contacts available on request

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# Accessories – Horizontal busbars

## PCB BUSBARS

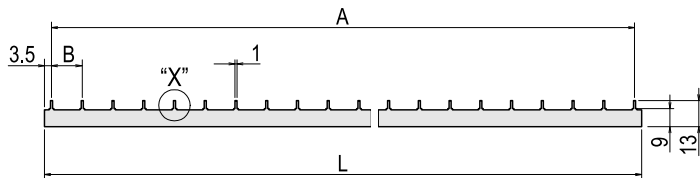


- Power distribution on printed circuit boards and backplanes
- Fault elimination
- Increases the stiffness of PCBs

### ORDER INFORMATION

Width B HP	Length L mm	Dimension A mm	Part no.
3	220.3	14 × 15.24 = 213.36	<b>30925-001</b>
3	342.3	22 × 15.24 = 335.28	<b>30925-002</b>
4	210.2	10 × 20.32 = 203.2	<b>30925-003</b>
4	332.1	16 × 20.32 = 325.12	<b>30925-004</b>
5	210.2	8 × 25.4 = 203.2	<b>30925-005</b>
5	337.2	13 × 25.4 = 330.2	<b>30925-006</b>

Delivery is exclusively in Standard Pack Quantity (SPQ): Please order at least 10 pieces or a multiple. Pricing is per individual item.



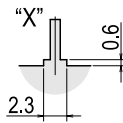
00892008

### TECHNICAL DATA

Conductor material	E-Cu, tin-plated
Pin dimensions	0.8 × 1.0 mm
Max. operating current	30 A
DC resistance	2.5 mΩ/m

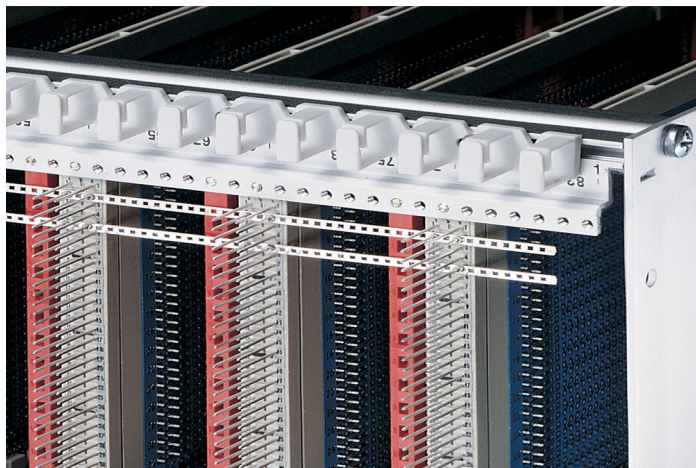
### NOTE

- Special designs available on request



A41743

## SOLDER STRIP CONDUCTOR



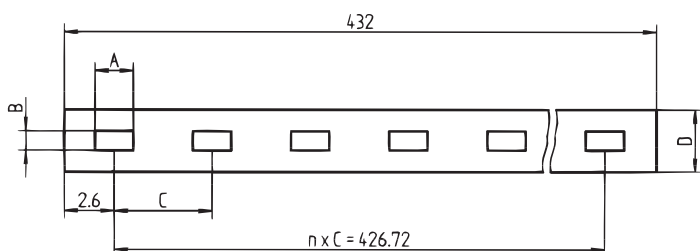
- Efficient linking of connections in the same grid and with the same potential
- Also suitable for EN 60603 (DIN 41612) connectors with wire-wrap pin

### ORDER INFORMATION

Connection type	A mm	B mm	C mm	D mm	n	Qty/PU	Part no.
Wire-wrap pins 0.6 × 0.6 mm	1.14	0.9	2.54	2.3	168	1	<b>60800-064</b>
Wire-wrap pins 1.0 × 1.0 mm	1.65	1.4	5.08	3.2	84	1	<b>60800-080</b>

### TECHNICAL DATA

Conductor material	E-Cu F30, tin-plated
Max. operating current wire-wrap pins 0.6 × 0.6 mm	≤ 4 A
Max. operating current wire-wrap pins 1.0 × 1.0 mm	≤ 4 A



00892016

AZA42390

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