

FL-PP-RJ45... / FL CAT5...

Mini patch panel

Data sheet
104622_en_03

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1 Description

The mini patch panels **FL-PP-RJ45... / FL CAT5...** provide the transition from the field cabling to the cabling inside the control cabinet.

The connection from the patch panel to the termination device takes place via the RJ45 socket. Pre-assembled patch cables in different connection lengths from 0.24 m to 10 m are available for this.

The field cabling is applied easily to spring-cage, screw, or IDC connection terminal blocks, depending on the version. The individual terminal blocks are clearly labeled for connection according to Ethernet standard TIA 568 A and B as well as PROFINET. This eliminates the need to crimp an RJ45 connector to the field line.

You can establish the shield contact to the DIN rail using a jumper either directly or using an RC element.

The comprehensive range of DIN rail patch panel products opens up multiple possibilities for securing the field cable.

- Spring-cage connection terminal blocks
- Screw connection terminal blocks
- IDC connection terminal blocks
- RJ45-RJ45 transition

Features

- CAT5e
- 8-pin assignment: 1:1
- 10/100/1000 Mbps
- Mounting on a DIN rail
- Safe connection to ground potential
- FL-PP-RJ45/RJ45-B with extended temperature range -40°C ... 85°C



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This data sheet is valid for all products listed on the following page:

2 Table of contents

1	Description.....	1
2	Table of contents	2
3	Ordering data.....	3
4	Technical data	4
5	Safety regulations and installation notes.....	5
6	Patch panel FL-PP-RJ45-SCC with spring-cage connection terminal blocks	6
6.1	Design.....	6
6.2	Dimensions	6
6.3	Connecting the Ethernet network	6
7	Patch panel FL-PP-RJ45-LSA with IDC connection terminal blocks	7
7.1	Design.....	7
7.2	Dimensions	7
7.3	Connecting the Ethernet network	7
8	Patch panel FL-PP-RJ45-SC with screw connection terminal blocks	8
8.1	Design.....	8
8.2	Dimensions	8
8.3	Connecting the Ethernet network	8
9	Patch panel FL-PP-RJ45/RJ45 with RJ45 socket.....	9
9.1	Design.....	9
9.2	Dimensions	9
9.3	Connecting the Ethernet network	9
10	Patch panel FL-PP-RJ45/RJ45-B with RJ45 socket, narrow design width.....	10
10.1	Dimensions	10
10.2	Connecting the Ethernet network	10
11	Patch panel FL-CAT5 TERMINAL BOX with screw connection terminal blocks	11
11.1	Design.....	11
11.2	Dimensions	11
11.3	Connecting the Ethernet network	11
12	Shield grounding selection.....	12
13	Circuit diagrams.....	13

3 Ordering data

Products

Description	Type	Order No.	Pcs. / Pkt.
Patch panel, one RJ45 socket to 8 spring-cage connection terminal blocks (1:1 assignment), CAT5e, 10/100/1000 Mbps, DIN rail mounting, IP20, option of shield contacting on DIN rail via jumpers	FL-PP-RJ45-SCC	2901642	1
Patch panel, one RJ45 socket to 8 screw connection terminal blocks (1:1 assignment), CAT5e, 10/100/1000 Mbps, DIN rail mounting, IP20, option of shield contacting on DIN rail via jumpers	FL-PP-RJ45-SC	2901643	1
Patch panel, one RJ45 socket to 8 IDC connection terminal blocks (1:1 assignment), CAT5e, 10/100/1000 Mbps, DIN rail mounting, IP20, option of shield contacting on DIN rail via jumpers	FL-PP-RJ45-LSA	2901645	1
Patch panel, two RJ45 sockets (1:1 assignment), CAT5e, 10/100/1000 Mbps, DIN rail mounting, IP20, option of shield contacting on DIN rail via jumpers	FL-PP-RJ45/RJ45	2901646	1
Patch panel, narrow design width, extended temperature range, two RJ45 sockets, 1:1 assignment, consistent shield, CAT5, 10/100/1000 Mbps, DIN rail mounting, IP20	FL-PP-RJ45/RJ45-B	2904933	1
Patch panel, one RJ45 socket to 4 screw connection terminal blocks (assignment 1, 2, 3, 6), CAT5, 10/100 Mbps, DIN rail mounting, IP20, shield contacting on DIN rail	FL-CAT5 TERMINAL BOX	2744610	1

Accessories

Description	Type	Order No.	Pcs. / Pkt.
Passive network isolator for electrical isolation in Ethernet networks. For the protection of Ethernet devices from potential differences up to 4 kV. Can be used for transmission speeds of up to 100 Mbit/s. Connection via RJ45 and COMBICON plug-in screw terminal block.	FL ISOLATOR 100-RJ/SC	2313928	1
Passive network isolator for electrical isolation in Ethernet networks. For the protection of Ethernet devices from potential differences up to 4 kV. Can be used for transmission speeds of up to 100 Mbit/s. Connection for two RJ45 connectors possible.	FL ISOLATOR 100-RJ/RJ	2313931	1
Passive network isolator for electrical isolation in Ethernet networks. For the protection of Ethernet devices from potential differences up to 4 kV. Can be used for transmission speeds of up to 1 Gbps. Connection for two RJ45 connectors possible.	FL ISOLATOR 1000-RJ/RJ	2313915	1

Cables

Patch cable, CAT5, pre-assembled, 0.24 m	FL CAT5 PATCH 0,24	2700301	10
Patch cable, CAT5, pre-assembled, 0.3 m	FL CAT5 PATCH 0,3	2832250	10
Patch cable, CAT5, pre-assembled, 0.5 m	FL CAT5 PATCH 0,5	2832263	10
Patch cable, CAT5, pre-assembled, 1.0 m	FL CAT5 PATCH 1,0	2832276	10
Patch cable, CAT5, pre-assembled, 1.5 m	FL CAT5 PATCH 1,5	2832221	10
Patch cable, CAT5, pre-assembled, 2.0 m	FL CAT5 PATCH 2,0	2832289	10
Patch cable, CAT5, pre-assembled, 3.0 m	FL CAT5 PATCH 3,0	2832292	10
Patch cable, CAT5, pre-assembled, 5.0 m	FL CAT5 PATCH 5,0	2832580	10
Patch cable, CAT5, pre-assembled, 7.5 m	FL CAT5 PATCH 7,5	2832616	10
Patch cable, CAT5, pre-assembled, 10.0 m	FL CAT5 PATCH 10,0	2832629	10
CAT5-SF/UTP cable (J-02YS(ST)C HP 2 x 2 x 24 AWG), heavy-duty installation cable 2 x 2 x 0.22 mm ² , solid conductor, shielded, outer sheath: 7.8 mm diameter, inner sheath: 5.75 mm ± 0.15 mm diameter, (Length in meters according to customer requirements)	FL CAT5 HEAVY	2744814	1
CAT5-SF/UTP cable (J-02YS(ST)C HP 2 x 2 x 24 AWG), heavy-duty installation cable 2 x 2 x 0.22 mm ² , solid conductor, shielded, outer sheath: 7.8 mm diameter, inner sheath: 5.75 mm ± 0.15 mm diameter, pre-assembled on both sides with RJ45 connector, crossover or line (Length in meters according to customer requirements)	FL CAT5 HEAVY CONF/	2744827	1
CAT5-SF/UTP cable (J-L102YS(ST)C H 2 x 2 x 26 AWG), light-duty, flexible installation cable 2 x 2 x 0.14 mm ² , fine strand, shielded, outer sheath: 5.75 mm ± 0.15 mm diameter (Length in meters according to customer requirements)	FL CAT5 FLEX	2744830	1

Accessories [...]

Description	Type	Order No.	Pcs. / Pkt.
CAT5-SF/UTP cable (J-LI02YS(ST)C H 2 x 2 x 26 AWG), light-duty, flexible installation cable 2 x 2 x 0.14 mm ² , fine strand, shielded, outer sheath: 5.75 mm ± 0.15 mm diameter, pre-assembled on both sides with RJ45 plug, crossover or line assignment (Length in meters according to customer requirements)	FL CAT5 FLEX CONF/	2744843	1
Tools			
Crimping pliers, for assembling the RJ45 connectors FL PLUG RJ45..., for on-site assembly	FL CRIMPTOOL	2744869	1
Actuation tool, for ST terminal blocks, also suitable for use as a flat-bladed screwdriver, size: 0.4 x 2.5 x 75 mm, 2-component handle, with non-slip grip	SZF 0-0.4X2.5	1204504	1
Split-core tool for connecting cables to LSA-Plus strips	CT-WZ/A	2765505	1
Stripping tool, for the multi-level stripping of shielded cables	VS-CABLE-STRIP-VARIO	1657407	1

4 Technical data

Ethernet interface	FL-PP-RJ45-SCC	FL-PP-RJ45-LSA	FL-PP-RJ45-SC	FL-PP-RJ45/RJ45	FL-PP-RJ45/RJ45-B	FL-CAT5 TERMINAL BOX
Connection	Spring-cage connection	IDC	Screw connection	RJ45	RJ45	Screw connection
Cable diameter	6 ... 10 mm	6 ... 10 mm	6 ... 10 mm	-	-	6 ... 10 mm
Conductor cross section, solid	0.2 ... 1.5 mm ²	0.128...0.325 mm ²	0.14 ... 1.5 mm ²	-	-	0.14 ... 1.5 mm ²
Conductor cross section, stranded	0.2 ... 1.0 mm ²	0.128...0.325 mm ²	0.14 ... 1.0 mm ²	-	-	0.14 ... 1.0 mm ²
AWG	24 ... 16	26 ... 22	26 ... 16	-	-	26 ... 16
Connection	RJ45 CAT5e				RJ45 CAT5	
Transmission speed	10/100/1000 Mbps				10/100 Mbps	
Transmission length	100 m (incl. patch cables)					
Pin assignment	1 : 1					
Cable impedance	100 Ω					
Insertion cycles	≤ 2500					

General data

Degree of protection	IP20					
Weight	45 g	55 g	55 g	39 g	33 g	39 g
Dimensions W / H / D	29 x 90 x 53 mm	22.5 x 78 x 44 mm	25 x 90 x 52 mm			
Housing material	PVC/PA					

Ambient conditions

Ambient temperature (operation)	-25°C ... 70°C	-40°C ... 85°C	-25°C ... 70°C
Ambient temperature (installation)	-10°C ... 70°C	-40°C ... 85°C	-10°C ... 70°C
Ambient temperature (storage/transport)	-25°C ... 85°C	-40°C ... 85°C	-25°C ... 85°C
Max. permissible relative humidity (operation)	25 % ... 95 % (no condensation)		
Vibration resistance according to IEC 60068-2-6	5g, 150 Hz, 2.5 h, in XYZ direction		
Shock test according to IEC 60068-2-27	25g, 11 ms period, half-sine shock pulse		

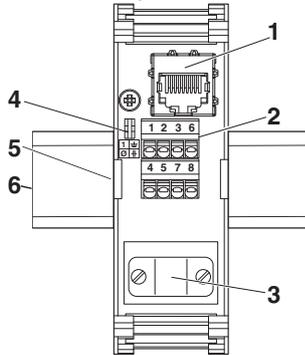
5 Safety regulations and installation notes

**WARNING:**

- Only qualified specialist personnel may install, start up, and operate the device.
- National safety and accident prevention regulations must be observed.
- Installation should be carried out as described in the installation instructions.
- Access to circuits within the device is not permitted.
- The device is maintenance-free. Repairs may only be carried out by the manufacturer.
- The device is a built-in device.

6 Patch panel FL-PP-RJ45-SCC with spring-cage connection terminal blocks

6.1 Design



- 1 RJ45 socket (TP port)
- 2 Spring-cage connection terminal blocks for field cabling
- 3 Strain relief with shield connection
- 4 Jumper for selecting shield grounding
- 5 Universal snap-on foot for DIN rails
- 6 DIN rail

6.2 Dimensions

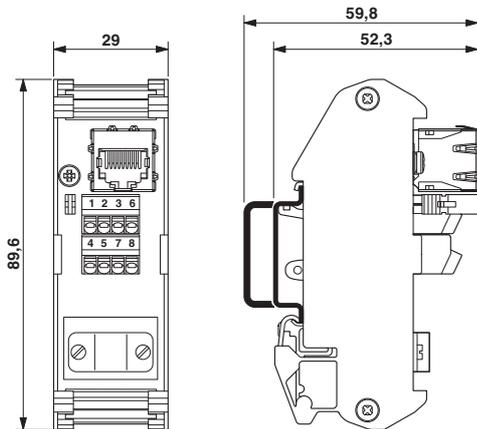


Figure 1 Dimensions FL-PP-RJ45-SCC

6.3 Connecting the Ethernet network

Twisted pair interface (TP port)



Only use shielded twisted pair cables and corresponding shielded RJ45 connectors.

- Push the Ethernet patch cable to the termination device with the RJ45 connector into the RJ45 socket (TP port) until the connector audibly snaps in.

Pin assignment and color coding

PROFINET		Ethernet	
		TIA 568 A	TIA 568 B
1 2 3 6		1 2 3 6 4 5 7 8	1 2 3 6 4 5 7 8
1 YE		1 WH/GN	1 WH/OG
2 OG		2 GN	2 OG
3 WH		3 WH/OG	3 WH/GN
6 BU		6 OG	6 GN
		4 BU	4 BU
		5 WH/BU	5 WH/BU
		7 WH/BN	7 WH/BN
		8 BN	8 BN

Figure 2 Ethernet (IEC 80.3u: TIA 568 A, TIA 568 B) and PROFINET

- OG = orange
- WH = white
- GN = green
- YE = yellow
- BU = blue
- BN = brown

Spring-cage connection terminal blocks

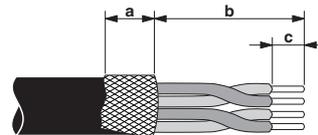


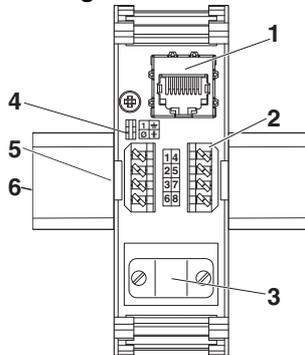
Figure 3 Required stripping lengths

- a = 10 mm
- b = 40 mm
- c = 8 mm

- Remove cable sheath in accordance with length B.
- Fold back 10 mm of the braided shield over the outer sheath.
- Remove the aluminum foil.
- Shorten wires 4, 5, 7, and 8 to 10 mm as required for the lower terminal blocks.
- Strip off all individual wires to 8 mm.
- Lay the shield under the clip bracket of the strain relief and screw them tight.
- Connect all individual wires to the spring-cage connection terminal blocks. If possible, make sure the individual wires remain twisted up to the connection terminal blocks.

7 Patch panel FL-PP-RJ45-LSA with IDC connection terminal blocks

7.1 Design



- 1 RJ45 socket (TP port)
- 2 IDC connection terminal blocks for field cabling
- 3 Strain relief with shield connection
- 4 Jumper for selecting shield grounding
- 5 Universal snap-on foot for DIN rails
- 6 DIN rail

7.2 Dimensions

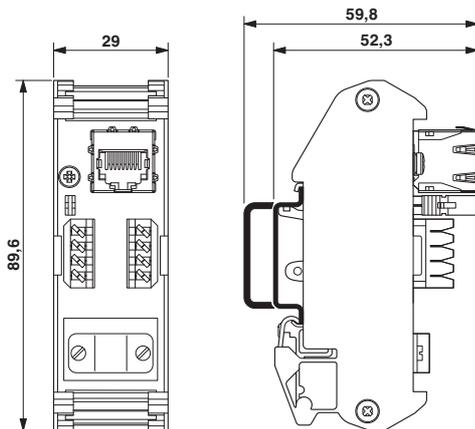


Figure 4 Dimensions FL-PP-RJ45-LSA

7.3 Connecting the Ethernet network

Twisted pair interface (TP port)



Only use shielded twisted pair cables and corresponding shielded RJ45 connectors.

- Push the Ethernet patch cable to the termination device with the RJ45 connector into the RJ45 socket (TP port) until the connector audibly snaps in.

Pin assignment and color coding

PROFINET		Ethernet																	
		TIA 568 A	TIA 568 B																
1	2	3	6	1	2	3	6	4	5	7	8	1	2	3	6	4	5	7	8
YE	OG	WH	BU	WH/GN	GN	WH/OG	OG	BU	WH/BU	WH/BN	BN	WH/OG	OG	WH/GN	GN	BU	WH/BU	WH/BN	BN

Figure 5 Ethernet (IEC 80.3u: TIA 568 A, TIA 568 B) and PROFINET

- OG = orange
- WH = white
- GN = green
- YE = yellow
- BU = blue
- BN = brown

IDC connection terminal blocks

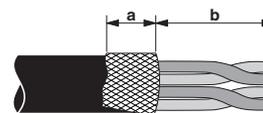


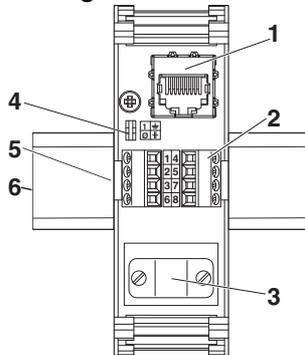
Figure 6 Required stripping lengths

- a = 10 mm
- b = 50 mm

- Remove cable sheath in accordance with length B.
- Fold back 10 mm of the braided shield over the outer sheath.
- Remove the aluminum foil.
- Lay the shield under the clip bracket of the strain relief and screw them tight.
- Connect the wire pairs to the insulation-displacement terminal strip with the help of the insulation-displacement connector split-core tool. If possible, make sure the individual wires remain twisted up to the terminal strips.
- Make sure that the wires are flush with the terminal strip.

8 Patch panel FL-PP-RJ45-SC with screw connection terminal blocks

8.1 Design



- 1 RJ45 socket (TP port)
- 2 Screw connection terminal blocks for field cabling
- 3 Strain relief with shield connection
- 4 Jumper for selecting shield grounding
- 5 Universal snap-on foot for DIN rails
- 6 DIN rail

8.2 Dimensions

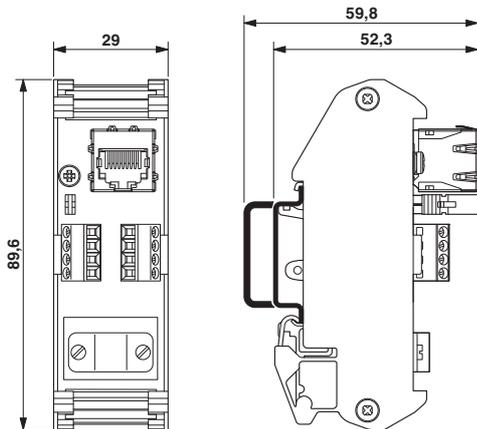


Figure 7 Dimensions FL-PP-RJ45-SC

8.3 Connecting the Ethernet network

Twisted pair interface (TP port)



Only use shielded twisted pair cables and corresponding shielded RJ45 connectors.

- Push the Ethernet patch cable to the termination device with the RJ45 connector into the RJ45 socket (TP port) until the connector audibly snaps in.

Pin assignment and color coding

PROFINET		Ethernet																	
		TIA 568 A	TIA 568 B																
1	2	3	6	1	2	3	6	4	5	7	8	1	2	3	6	4	5	7	8
Yellow	Orange	White	Blue	Green	Orange	White	Blue	Brown	Green	White	Blue	Brown	Green	Orange	White	Blue	Brown		
1	2	3	6	1	2	3	6	4	5	7	8	1	2	3	6	4	5	7	8
YE	OG	WH	BU	1	2	3	6	4	5	7	8	1	2	3	6	4	5	7	8
				1	2	3	6	4	5	7	8	1	2	3	6	4	5	7	8
				WH/GN	GN	WH/OG	OG	BU	WH/BU	WH/BN	BN	WH/OG	OG	WH/GN	GN	BU	WH/BU	WH/BN	BN

Figure 8 Ethernet (IEC 80.3u: TIA 568 A, TIA 568 B) and PROFINET

- OG = orange
- WH = white
- GN = green
- YE = yellow
- BU = blue
- BN = brown

Screw connection terminal blocks

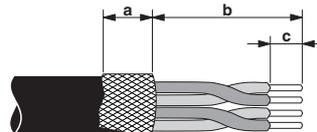


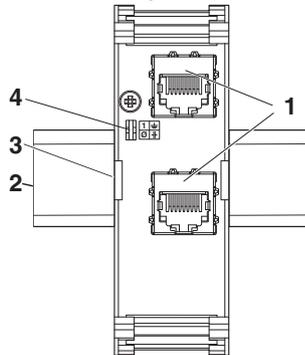
Figure 9 Required stripping lengths

- a = 10 mm
- b = 35 mm
- c = 5 mm

- Remove cable sheath in accordance with length B.
- Fold back 10 mm of the braided shield over the outer sheath.
- Remove the aluminum foil.
- Strip off each individual wire to 5 mm.
- Lay the shield under the clip bracket of the strain relief and screw them tight.
- Connect the individual wires to the screw terminal blocks. If possible, make sure the individual wires remain twisted up to the connection terminal blocks.

9 Patch panel FL-PP-RJ45/RJ45 with RJ45 socket

9.1 Design



- 1 RJ45 socket (TP port)
- 2 DIN rail
- 3 Universal snap-on foot for DIN rails
- 4 Jumper for selecting shield grounding

9.2 Dimensions

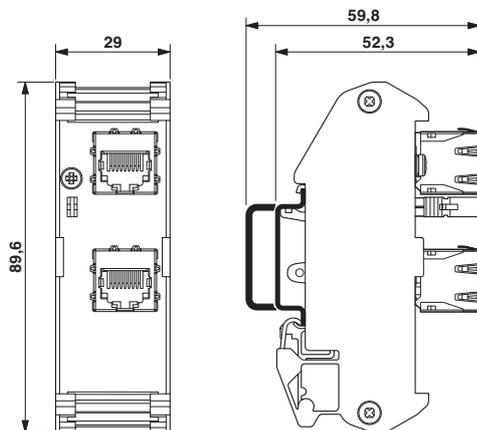


Figure 10 Dimensions FL-PP-RJ45/RJ45

9.3 Connecting the Ethernet network

The device is equipped with two RJ45 Ethernet interfaces for connection of twisted-pair cables.



Only use shielded twisted pair cables and corresponding shielded RJ45 connectors.

- Push the Ethernet patch cable to the termination device with the RJ45 connector into the RJ45 socket (TP port) until the connector audibly snaps in.
- Push the field cable with the RJ45 connector into the second RJ45 socket until the connector audibly snaps in.



The port that is assigned for incoming and outgoing lines is not important for the correct function of the device.

10 Patch panel FL-PP-RJ45/RJ45-B with RJ45 socket, narrow design width

10.1 Dimensions

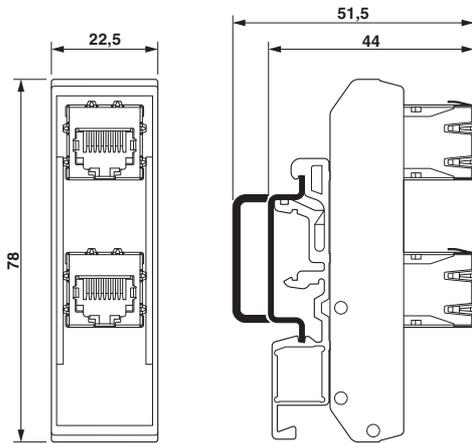


Figure 11 Dimensions FL-PP-RJ45/RJ45-B

10.2 Connecting the Ethernet network

The device is equipped with two RJ45 Ethernet interfaces for connection of twisted-pair cables.



Only use shielded twisted pair cables and corresponding shielded RJ45 connectors.

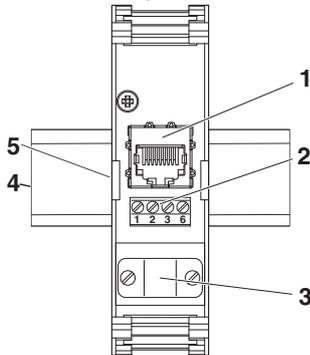
- Push the Ethernet patch cable to the termination device with the RJ45 connector into the RJ45 socket (TP port) until the connector audibly snaps in.
- Push the field cable with the RJ45 connector into the second RJ45 socket until the connector audibly snaps in.



The port that is assigned for incoming and outgoing lines is not important for the correct function of the device.

11 Patch panel FL-CAT5 TERMINAL BOX with screw connection terminal blocks

11.1 Design



- 1 RJ45 socket (TP port)
- 2 Screw connection terminal blocks
- 3 Strain relief with shield connection
- 4 DIN rail
- 5 Universal snap-on foot for DIN rails

11.2 Dimensions

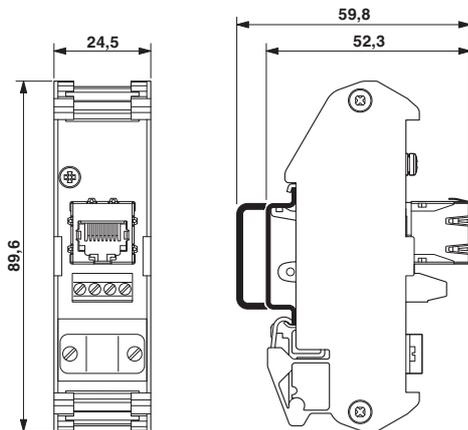


Figure 12 Dimensions FL-CAT5 TERMINAL BOX

11.3 Connecting the Ethernet network

Twisted pair interface (TP port)

i Only use shielded twisted pair cables and corresponding shielded RJ45 connectors.

- Push the Ethernet patch cable to the termination device with the RJ45 connector into the RJ45 socket (TP port) until the connector audibly snaps in.

Pin assignment and color coding

PROFINET		Ethernet	
		TIA 568 A	TIA 568 B
1 2 3 6		1 2 3 6	1 2 3 6
1	YE	1	WH/GN
2	OG	2	GN
3	WH	3	WH/OG
6	BU	6	OG

Figure 13 Ethernet (IEC 80.3u: TIA 568 A, TIA 568 B) and PROFINET

- YE = yellow
- OG = orange
- WH = white
- BU = blue

Screw connection terminal blocks

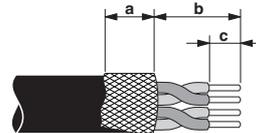


Figure 14 Required stripping lengths

- a = 10 mm
 - b = 10 mm
 - c = 5 mm
- Remove cable sheath in accordance with length B.
 - Fold back 10 mm of the braided shield over the outer sheath.
 - Remove the aluminum foil.
 - Strip off each individual wire to 5 mm.
 - Lay the shield under the clip bracket of the strain relief and screw them tight.
 - Connect the individual wires to the screw terminal blocks. If possible, make sure the individual wires remain twisted up to the connection terminal blocks.

12 Shield grounding selection



With the following patch panels, the shield is fundamentally connected to the DIN rail via the universal snap-on foot:

- FL-PP-RJ45/RJ45-B
- FL-CAT5 TERMINAL BOX

With the following patch panels you can select the type of shielding with a jumper:

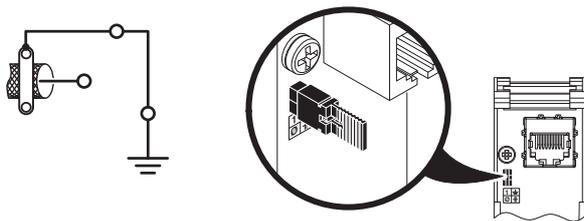
- FL-PP-RJ45-SCC
- FL-PP-RJ45-SC
- FL-PP-RJ45-LSA
- FL-PP-RJ45/RJ45

For default upon delivery, the jumper is inserted and the shield is positioned directly on the PE. With this arrangement, there is a low-ohmic electrical connection between the shield and the ground potential.

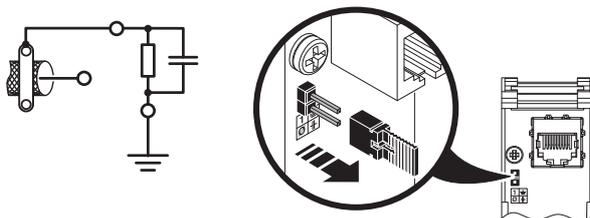
By removing the jumper, the shield is connected to the ground potential via an RC combination. A high-ohmic resistance parallel to a capacitor ensures that high-frequency disturbances are delivered effectively against PE without constituting a low-ohmic electrical connection.

A single-sided grounding of the shield between two patch panels is best suited for suppressing electrical fields and ground loops.

Shield connection direct to PE (default setting)



Shield connection to PE via RC element



13 Circuit diagrams

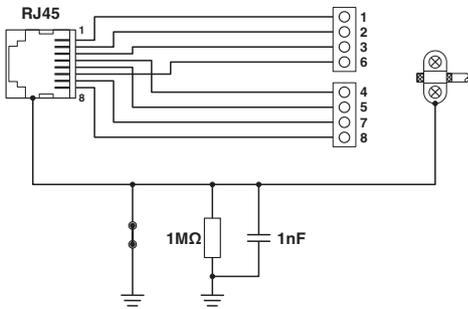


Figure 15 FL-PP-RJ45-SCC (2901642)
 FL-PP-RJ45-SC (2901643)
 FL-PP-RJ45-LSA (2901645)

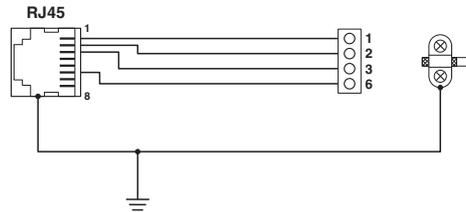


Figure 18 FL-CAT5 TERMINAL BOX (2744610)

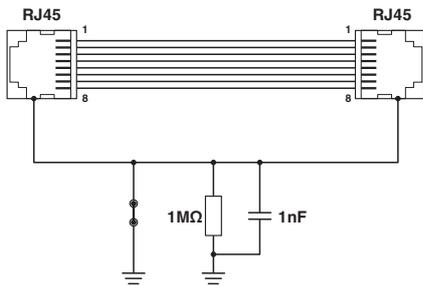


Figure 16 FL-PP-RJ45/RJ45 (2901646)

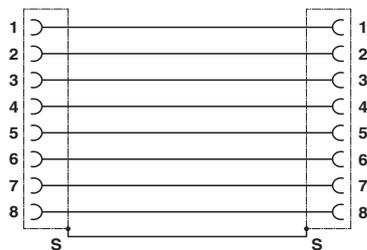


Figure 17 FL-PP-RJ45/RJ45-B (2904933)