

# INJ 11...-T

## PoE injector with electrical isolation

Data sheet  
107981\_en\_02

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### 1 Description

The injectors connect Ethernet devices without PoE (e.g. switches) with PoE-ready end devices (e.g. IP cameras). The injector as power sourcing equipment (PSE) provides the required power to a powered device (PD) by way of the data cable.

The injector and end device negotiate the electrical power requirements autonomously. Ensure that end devices with an electrical power requirement of up to 30 W fulfill the requirements of IEEE 802.3af and at.

The power supply and the Power over Ethernet port are electrically isolated. Thus, the device is protected against short circuits in the data lines on the field side.

### Features

- Compliant with IEEE 802.3 af (PoE) and IEEE 802.3 at (PoE+) up to 30 W
- Product versions up to 60 W for 4-pair PoE (PoE++)
- Automatic detection of IEEE 802.3at or 802.3af PD
- DIP switch for selecting the cable pairs for the transfer of energy in mode A or B.
- Extended supply voltage range of 18 V DC ... 57 V DC, redundant
- 10/100/1000 Mbps
- Extended temperature range of -40 °C ...+75 °C
- Safe shield connection to ground potential
- Mounting on a DIN rail



Make sure you always use the latest documentation.  
It can be downloaded from the product at [phoenixcontact.net/products](https://phoenixcontact.net/products).

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### 3 Ordering data

Description	Type	Order No.	Pcs./Pkt.
PoE injector, 30 W, two RJ45 sockets, 10/100/1000 Mbps, DIN rail mounting, IP20, expanded temperature range of -40°C ... 75°C, potential separation	INJ 1100-T	2703009	1
PoE injector, 60 W, two RJ45 sockets, 10/100/1000 Mbps, DIN rail mounting, IP20, expanded temperature range of -40°C ... 75°C, potential separation	INJ 1110-T	2703010	1
Accessories	Type	Order No.	Pcs./Pkt.
Crimping pliers, for assembling the RJ45 plugs FL PLUG RJ45..., for assembly on site	FL CRIMPTOOL	2744869	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 <sup>2</sup> , solid conductor, shielded, outer sheath: 7.8 mm diameter, inner sheath: 5.75 mm ±0.15 mm diameter cable, Ethernet CAT5 (100 Mbps), 4-position, Halogen-free compound, HM 2 in acc. with VDE 0207, water blue RAL 5021, cable length: Free input (0.25 ... 1000.0 m)	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 <sup>2</sup> , solid conductor, shielded, outer sheath: 7.8 mm diameter, inner sheath: 5.75 mm ±0.15 mm diameter, preassembled on both sides with RJ45 plug, crossover or line network cable, number of positions: 4, 100 Mbps, CAT5	FL CAT5 HEAVY CONF/	2744827	1
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 <sup>2</sup> , stranded, shielded, outer sheath: 5.75 mm ±0.15 mm diameter	FL CAT5 FLEX	2744830	1
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 <sup>2</sup> , stranded, shielded, outer sheath: 5.75 mm ±0.15 mm diameter, preassembled on both sides with RJ45 plug, crossover or line assignment network cable, number of positions: 4, 100 Mbps, CAT5	FL CAT5 FLEX CONF/	2744843	1
Passive network isolator for electrical isolation in Ethernet networks. This protects Ethernet devices from potential differences of up to 4 kV. Can be used for transmission speeds of up to 100 Mbps. Connection using RJ45 and COMBICON plug-in screw terminal block.	FL ISOLATOR 100-RJ/SC	2313928	1
Passive network isolator for electrical isolation in Ethernet networks. This protects Ethernet devices from potential differences of up to 4 kV. Can be used for transmission speeds of up to 100 Mbps. Possible to connect two RJ45 plugs.	FL ISOLATOR 100-RJ/RJ	2313931	1

Accessories	Type	Order No.	Pcs./Pkt.
Passive network isolator for electrical isolation in Ethernet networks. This protects Ethernet devices from potential differences of up to 4 kV. Can be used for transmission speeds of up to 1 Gbps. Possible to connect two RJ45 plugs.	FL ISOLATOR 1000-RJ/RJ	2313915	1
Passive network isolator for electrical isolation in Ethernet networks. For the protection of Ethernet devices against potential differences of up to 4 kV. Can be used for transmission speeds of up to 100 Mbps. Ethernet connection via two M12 sockets (D-coded).	FL ISOLATOR 100-M12	2902985	1
Patch cable, CAT5, assembled, 0.3 m	FL CAT5 PATCH 0,3	2832250	10
Patch cable, CAT5, assembled, 0.5 m	FL CAT5 PATCH 0,5	2832263	10
Patch cable, CAT5, assembled, 1 m	FL CAT5 PATCH 1,0	2832276	10
Patch cable, CAT5, assembled, 1.5 m	FL CAT5 PATCH 1,5	2832221	10
Patch cable, CAT5, assembled, 2 m	FL CAT5 PATCH 2,0	2832289	10
Patch cable, CAT5, assembled, 3 m	FL CAT5 PATCH 3,0	2832292	10
Patch cable, CAT6, pre-assembled, 0.3 m	FL CAT6 PATCH 0,3	2891181	10
Patch cable, CAT6, pre-assembled, 0.5 m	FL CAT6 PATCH 0,5	2891288	10
Patch cable, CAT6, pre-assembled, 1.0 m	FL CAT6 PATCH 1,0	2891385	10
Patch cable, CAT6, pre-assembled, 1.5 m	FL CAT6 PATCH 1,5	2891482	10
Patch cable, CAT6, pre-assembled, 2.0 m	FL CAT6 PATCH 2,0	2891589	10
Patch cable, CAT6, pre-assembled, 3.0 m	FL CAT6 PATCH 3,0	2891686	10
Patch cable, CAT6, pre-assembled, 5.0 m	FL CAT6 PATCH 5,0	2891783	10
Patch cable, CAT6, pre-assembled, 7.5 m	FL CAT6 PATCH 7,5	2891880	10
Patch cable, CAT6, pre-assembled, 10 m	FL CAT6 PATCH 10	2891877	10
Patch cable, CAT6, pre-assembled, 12.5 m	FL CAT6 PATCH 12,5	2891369	5
Patch cable, CAT6, pre-assembled, 15.0 m	FL CAT6 PATCH 15,0	2891372	5
Patch cable, CAT6, pre-assembled, 20.0 m	FL CAT6 PATCH 20,0	2891576	5
Stripping tool, for the multi-level stripping of shielded cables	VS-CABLE-STRIP-VARIO	1657407	1
RJ45 connector, degree of protection: IP20, number of positions: 8, 1 Gbps, CAT5 (IEC 11801:2002), material: PA, connection method: IDC fast connection, connection cross section: AWG 26- 23, cable outlet: straight, color: traffic grey A RAL 7042	VS-08-RJ45-5-Q/IP20	1656725	1
RJ45 connector, degree of protection: IP20, number of positions: 8, 1 Gbps, CAT5 (IEC 11801:2002), material: PA, connection method: IDC fast connection, connection cross section: AWG 26- 23, cable outlet: straight, color: black	VS-08-RJ45-5-Q/IP20 BK	1658008	1
Actuation tool, for ST terminal blocks, also suitable for use as a bladed screwdriver, size: 0.4 x 2.5 x 75 mm, 2-component grip, with non-slip grip	SZF 0-0,4X2,5	1204504	10

Accessories	Type	Order No.	Pcs./Pkt.
<b>Electronic diagonal cutter</b> , tapered head, angled (21°), without chamfer, with opening spring	MICROFOX-SP	1212488	1
Network cable, Ethernet CAT6 <sub>A</sub> (10 Gbps), 8-position, PUR halogen-free, water blue RAL 5021, shielded, free cable end, on free cable end, cable length: Free entry (0.5 ... 400 m)	VS-OE-OE-94F/...	1417359	1



Please observe section 6.1 „Accessories: power supply“ when selecting the power supply.

## 4 Technical data

Supply	INJ 1100-T	INJ 1110-T
Supply voltage range	18 V DC ... 57 V DC	18 V DC ... 57 V DC
Nominal supply voltage	24 V DC 48 V DC	24 V DC 48 V DC
Max. current consumption	2.1 A	4.2 A
Maximum current consumption (Ex areas)	1.4 A (24 V DC) 0.7 A (48 V DC)	2.73 A (24 V DC) 1.34 A (48 V DC)
Power consumption	≤ 75 W	≤ 75 W
Protective circuit	Reverse polarity protection	Reverse polarity protection
Electrical isolation	VCC // FE // PoE	VCC // FE // PoE
Test voltage data interface/power supply	1.5 kV AC (50 Hz, 1 min.)	1.5 kV AC (50 Hz, 1 min.)
Conductor cross section, flexible	0.75 mm <sup>2</sup> ... 4.00 mm <sup>2</sup>	0.75 mm <sup>2</sup> ... 4.00 mm <sup>2</sup>
Conductor cross section, solid	0.75 mm <sup>2</sup> ... 4.00 mm <sup>2</sup>	0.75 mm <sup>2</sup> ... 4.00 mm <sup>2</sup>
Conductor cross section AWG	20 AWG ... 12 AWG	20 AWG ... 12 AWG
Ethernet	INJ 1100-T	INJ 1110-T
Connection method	RJ45 CAT5e	RJ45 CAT5e
Output power	30 W	60 W
Maximum output power	40 W	75 W
Output nominal voltage	54 V DC (PoE)	54 V DC (PoE)
Serial transmission speed	10/100/1000 Mbps	10/100/1000 Mbps
Transmission length	100 m (including patch cables)	100 m (including patch cables)
Connection line	twisted pair, shielded, CAT5 or better	twisted pair, shielded, CAT5 or better
Pin assignment	1:1	1:1

General data	INJ 1100-T	INJ 1110-T
Basic functions	PSE/Midspan, compliant with IEEE 802.3af, at	PSE/Midspan, compliant with IEEE 802.3af, at
Degree of protection	IP20 (Manufacturer's declaration)	IP20 (Manufacturer's declaration)
Mounting position	vertical	vertical
Mounting type	DIN rail mounting	DIN rail mounting
Dimensions (W/H/D)	30.2 mm x 130 mm x 120 mm	30.2 mm x 130 mm x 120 mm
External cable diameter	5.5 mm ... 6.5 mm	5.5 mm ... 6.5 mm
Housing material	Plastic gray	Plastic gray
Vibration resistance in acc. with EN 60068-2-6/IEC 60068-2-6	10 Hz ... 57 Hz, amplitude $\pm 3.5$ mm, 57 Hz ... 150 Hz, 5g	10 Hz ... 57 Hz, amplitude $\pm 3.5$ mm, 57 Hz ... 150 Hz, 5g
Shock in acc. with EN 60068-2-27/IEC 60068-2-27	25g for 11 ms, three shocks in each direction	25g for 11 ms, three shocks in each direction
MTTF (mean time to failure) SN 29500 standard, temperature 25 °C, operating cycle 21 % (5 days a week, 8 hours a day)	2342 Years	3062 Years
MTTF (mean time to failure) SN 29500 standard, temperature 40 °C, operating cycle 34.25 % (5 days a week, 12 hours a day)	1167 Years	1397 Years
MTTF (mean time to failure) SN 29500 standard, temperature 40 °C, operating cycle 100 % (7 days a week, 24 hours a day)	467 Years	558 Years
<b>Ambient conditions</b>		
Ambient temperature (operation)	-40 °C ... 75 °C	
Ambient temperature (storage/transport)	-40 °C ... 85 °C	
Permissible humidity (operation)	10 % ... 95 % (non-condensing)	
Altitude	5000 m (for restrictions see manufacturer's declaration)	
<b>Approvals / Certificates</b>		
Conformance	CE-compliant	
UL, USA/Canada	Class I, Zone 2, AEx nA IIC T4, Ex nA IIC Gc X T4 Class I, Division 2, Groups A, B, C, D	
UL, USA	UL 60079-0 Ed. 6 / UL 60079-15 Ed. 4	
UL, Canada	CSA 22.2 No. 60079-0 Ed. 3 / CSA 22.2 No. 60079-15:16	
Electromagnetic compatibility	Conformance with EMC Directive 2014/30/EU FCC Part 15B Class A CISPR 22	
Noxious gas test	ISA-S71.04-1985 G3 Harsh Group A	

**Conformance with EMC Directive 2014/30/EU****Noise immunity according to EN 61000-6-2**

Electrostatic discharge	EN 61000-4-2	
	Contact discharge	± 6 kV (Test Level 3)
	Discharge in air	± 8 kV (Test Level 3)
	Indirect discharge	± 6 kV
	Comments	Criterion B
Electromagnetic HF field	EN 61000-4-3	
	Frequency range	80 MHz ... 3 GHz (Test Level 3)
	Field intensity	10 V/m
	Comments	Criterion A
Fast transients (burst)	EN 61000-4-4	
	Input	± 2.2 kV (1 minute)
	Signal	± 2.2 kV (1 minute)
	Comments	Criterion B
Surge current loads (surge)	EN 61000-4-5	
	Input	± 0.5 kV
	Signal	± 1 kV (Data line, asymmetrical) ± 2 kV (I/O cable on field side only, asymmetric)
	Comments	Criterion B
Conducted interference	EN 61000-4-6	
	Frequency range	0.15 MHz ... 80 MHz
	Voltage	10 V
	Comments	Criterion A

**Emitted interference in acc. with EN 61000-6-4**

Interference emission	EN 61000-6-4 Class A, industrial applications
	EN 61000-6-3 Class B, domain of use: residential and small commercial

## 5 Safety regulations and installation notes



### CAUTION:

Observe the following safety notes when using the device.

- Installation, operation, and maintenance may only be carried out by qualified electricians. Follow the installation instructions as described.
- When installing and operating the device, the applicable regulations and safety directives (including national safety directives), as well as general technical regulations, must be observed. The technical data is provided in this package slip and on the certificates (conformity assessment, additional approvals where applicable).
- The device must not be opened or modified. Do not repair the device yourself, replace it with an equivalent device. Repairs may only be carried out by the manufacturer. The manufacturer is not liable for damage resulting from violation.
- The IP20 protection (IEC 60529/EN 60529) of the device is intended for use in a clean and dry environment. The device must not be subject to mechanical strain and/or thermal loads, which exceed the limits described.
- The device is designed exclusively for SELV operation according to IEC 60950-1/EN 60950-1/VDE 0805. The device may only be connected to devices, which meet the requirements of EN 60950-1.

### 5.1 UL notes

#### INJ 1100-T



IND. CONT. EQ., ALSO  
LISTED IND. CONT.  
EQ. FOR HAZ. LOC.  
E366272



U = 18 - 57 V DC

P = max. 40 W

PoE<sub>Out</sub> = 54 V DC max. 30 W @ 75°C

Derating from 65°C 1.5 W/K

Amb. Temp.: -40°C < T<sub>a</sub> < 75°C

Class I, Zone 2, AEx nA IIC T4, Ex nA IIC Gc X T4

Class I, Division 2, Groups A, B, C and D

#### INJ 1110-T



IND. CONT. EQ., ALSO  
LISTED IND. CONT.  
EQ. FOR HAZ. LOC.  
E366272



U = 18 - 57 V DC

P = max. 75 W

PoE<sub>Out</sub> = 54 V DC max. 42 W @ 75°C

Derating from 70°C 3.6 W/K

Amb. Temp.: -40°C < T<sub>a</sub> < 75°C

Class I, Zone 2, AEx nA IIC T4, Ex nA IIC Gc X T4

Class I, Division 2, Groups A, B, C and D



**WARNING: Explosion hazard when used in potentially explosive areas**

Please make sure that the following notes and instructions are observed.

**INDUSTRIAL CONTROL EQUIPMENT FOR HAZARDOUS LOCATIONS**

- A) This equipment must be mounted in an enclosure certified for use in Class I, Zone 2 minimum and rated IP54 minimum in accordance with IEC 60529 when used in Class I, Zone 2 environment.
- B) Device shall only be used in an area of not more than pollution degree 2.
- C) If the equipment is used in a manner not specified, the protection provided by the equipment may be impaired.
- D) Minimum temperature rating of the cables to be connected to the field wiring terminals: 90°C
- E) The external circuits connected to the terminal of the device must be supplied from SELV/PELV.
- F) The device has to be built in the final safety enclosure, which has adequate rigidity according to UL 61010-1, UL 61010-2-201 and meets the requirements with respect to spread of fire.
- G) Use copper conductors only.

## 6 Product description

Product variants					
Order No.	Designation	Power	Port 2	Temperature range	Function
2703009	INJ 1100-T	30 W	RJ45 socket	-40 °C ... 75 °C	Electrical isolation
2703010	INJ 1110-T	60 W			
The following product versions are described in a separate data sheet:					
2703005	INJ 1000	30 W	RJ45 socket	0 °C ... 60 °C	
2703006	INJ 1000-T			-40 °C ... 75 °C	
2703007	INJ 1010	60 W		0 °C ... 60 °C	
2703008	INJ 1010-T			-40 °C ... 75 °C	
The following product versions with advanced functions are described in a separate data sheet:					
2703011	INJ 2101-T	30 W	Screw terminal blocks	-40 °C ... 75 °C	Potential separation, surge protection and shield current monitoring
2703012	INJ 2102-T		IDC terminal blocks		
1004065	INJ 2103-T		Push-in terminal blocks		
2703013	INJ 2111-T	60 W	Screw terminal blocks		
2703014	INJ 2112-T		IDC terminal blocks		
1004066	INJ 2113-T		Push-in terminal blocks		

### 6.1 Accessories: power supply

#### INJ 1100-T

PoE output 0 W ... 30 W	
2902992	UNO-PS/1AC/24DC/ 60W
2903147	TRIO-PS-2G/1AC/24DC/3/C2LPS
2909576	QUINT4-PS/1AC/24DC/2.5/PT

#### INJ 1110-T

PoE output 0 W ... 30 W	
2902992	UNO-PS/1AC/24DC/ 60W
2903147	TRIO-PS-2G/1AC/24DC/3/C2LPS
2909576	QUINT4-PS/1AC/24DC/2.5/PT
PoE output 31 W ... 60 W	
2902994	UNO-PS/1AC/24DC/90W/C2LPS
2903148	TRIO-PS-2G/1AC/24DC/5
2909577	QUINT4-PS/1AC/24DC/3.8/PT

6.2 Dimensions

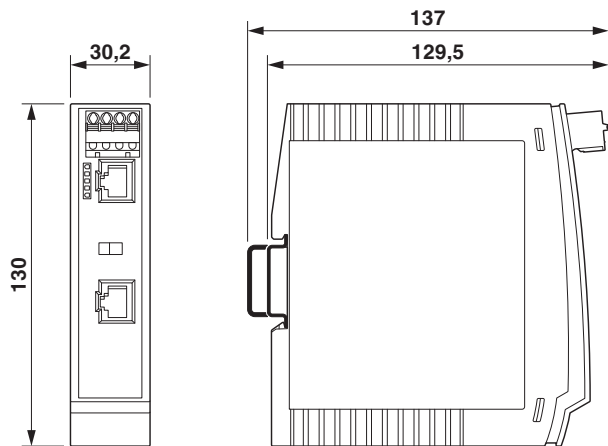


Figure 1 Dimensions

6.3 Function elements

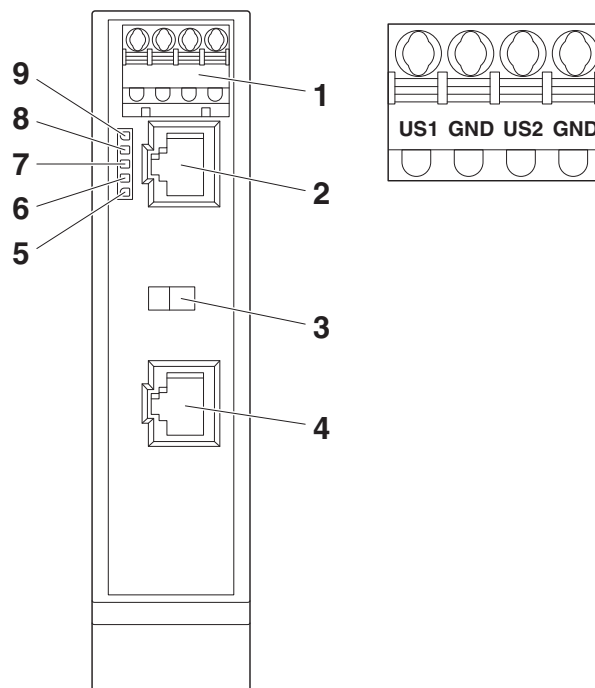


Figure 2 Function elements

1	US1 GND	Supply voltage
	US2 GND	Redundant supply voltage
2	RJ45 socket	Data
3	DIP switch	
4	RJ45 socket	Data + PoE
5	LED	No function
6	LED S2	<b>Status Mode B 4, 5, 7, 8</b>
	On	Power supply PD OK
	Flashing	Overload mode B, short circuit, startup failed, cable under load isolated
	OFF	PD not supplied or no PD connected
7	LED S1	<b>Status Mode A 1, 2, 3, 6</b>
	On	Power supply PD OK
	Flashing	Overload mode A, short circuit, startup failed
	S1 + S2 flashing	Internal error, PoE chip too hot
8	LED U2	Supply voltage US2
9	LED U1	Supply voltage US1

## 6.4 Setting the DIP switches

### INJ 1100-T

DIP	ON	OFF (default)
1	Mode B wires 4, 5, 7, 8	Mode A wires 1, 2, 3, 6
2	not connected	

By default upon delivery, PoE is modulated on data cables 1, 2, 3, 6.

The cables 4, 5, 7, 8 are not used at a transmission with 100 Mbps (spare pairs). If you set DIP 1 to ON, PoE is modulated on these spare pairs.

- Use DIP 1 to select over which two wire pairs the PoE feed is to be transmitted.
- Restart the device to adopt these settings.

### INJ 1110-T

DIP	ON	OFF (default)
1	back-off	back-off disabled
2	4 pairs	2 x 2 pairs

Guideline IEEE 802.3bt for end devices with an electrical power requirement greater than 30 W has not yet been published. For this reason, the injector and end device may not be able to negotiate the electrical power requirements autonomously in rare cases.

This can occur in particular when the PSE and PD chips are from different manufacturers.

- Check the cabling.
- If the devices do not automatically mediate the power requirement, switch DIP 1 to ON.
- Restart the device to adopt these settings.
- If this is not successful, switch DIP 2 to ON also. DIP 1 no longer has a function.
- Restart the device to adopt these settings.



Contact Phoenix Contact when these measures do not help.  
Keep the documentation of your end device ready.

## 7 Installation

### 7.1 Mounting

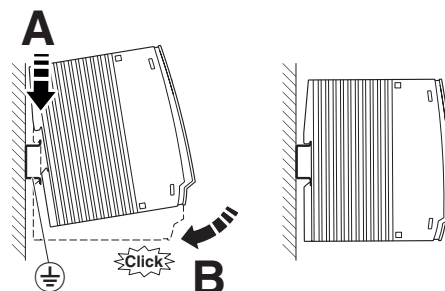


Figure 3 Mounting on a DIN rail

The device is intended for installation in a control cabinet.

- Connect a 35 mm EN DIN rail to the protective earth via a grounding terminal block. The device is grounded by snapping it onto the DIN rail.
- Snap the device onto the DIN rail.

### 7.2 Removal

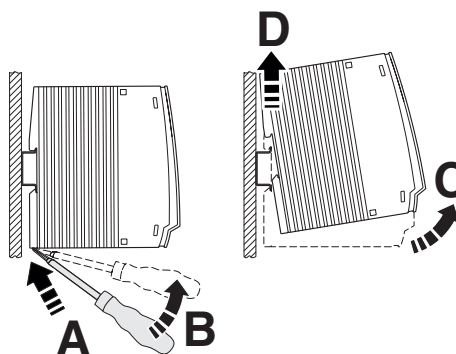


Figure 4 Removal

- Push down the locking tab with a screwdriver, needle-nose pliers or similar.
- Slightly pull the bottom edge of the device away from the mounting surface.
- Pull the device away from the DIN rail.

### 7.3 RJ45 interface



**NOTE: Interference**  
 Only use shielded twisted pair cables and corresponding shielded RJ45 connectors.

- Only twisted pair cables with an impedance of 100 Ω can be connected to the RJ45 Ethernet interface.
- Insert the Ethernet cable with the RJ45 plug into the TP interface until the plug engages audibly. Observe the plug keying.

### 7.4 Power Supply Voltage

- Connect the supply voltage to US1 and GND.
- Optionally, you can connect a redundant supply voltage to US2 and GND.



There is no reverse polarity protection for >50 V DC redundant feed-in.  
 – Provide overcurrent protection ( $I \leq 5 \text{ A}$ ) in the installation.

## 8 Derating

### 30 W

- 30 W, row installation: derating from 65°C 1.5 W/K

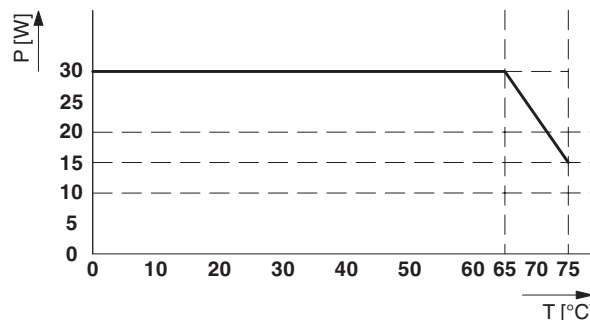


Figure 5 Derating above 65°C: 1.5 W/K

### 60 W

- 60 W, free standing: derating from 70°C 3.6 W/K

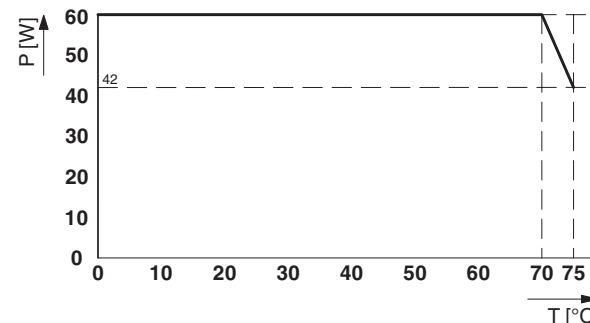


Figure 6 Derating above 70°C: 3.6 W/K

- 60 W, row installation: derating from 45°C 1.5 W/K

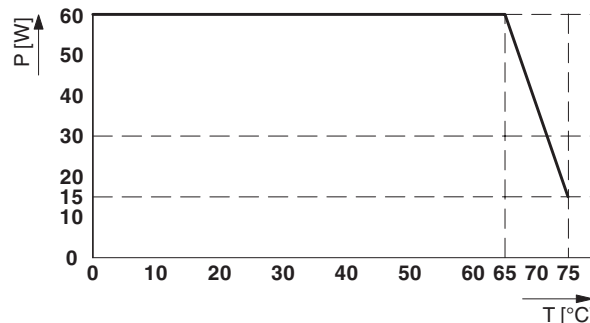


Figure 7 Derating above 65°C: 1.5 W/K