

INJ 2...



PoE injector with surge protection

Data sheet
107979_en_06

© Phoenix Contact

2024-02-20

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.

With the 30 W devices (210x-T), the relay can disconnect the PoE power.

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.

Thanks to the different connection terminal blocks for the PoE-conducting port, the injectors also perform the function of a patch panel.

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
- Shield current monitoring with visual display of undesirable cable shield currents
- Integrated surge protection in accordance with IEC 61643-21 with IEC test classification C2
- Various connection options depending on the product version
 - Screw terminal blocks
 - IDC connection
 - Push-in connection



Make sure you always use the latest documentation.
It can be downloaded from the product page at www.phoenixcontact.com/products.



WARNING: Explosion hazard when used in potentially explosive areas

Follow the instructions described here during installation and observe the safety notes at all times!

2 Table of contents

1	Description	1
2	Table of contents	2
3	Ordering data	3
4	Technical data	5
5	Safety regulations and installation notes	10
	5.1 Installation notes	10
	5.2 Installation in Zone 2	11
	5.3 UL notes	12
6	Transport and unpacking	13
7	Product description	13
	7.1 Accessories: power supply	14
	7.2 Dimensions	14
	7.3 Function elements	14
	7.4 Power dissipation	15
	7.5 Setting the DIP switches	15
8	Installation	16
	8.1 Mounting	16
	8.2 Removal	16
	8.3 RJ45 interface	16
	8.4 Terminal assignment	17
	8.5 Stripping	18
	8.6 Screw terminal blocks (INJ 2101-T and INJ 2111-T)	18
	8.7 IDC terminal blocks (INJ 2102-T and INJ 2112-T)	18
	8.8 Push-in terminal blocks (INJ 2103-T and INJ 2113-T)	18
	8.9 Shield contacting with strain relief	19
	8.10 Power supply voltage	19
9	Shield current monitoring	20
10	Surge protection	20
11	Derating	21
12	Disposal	22

3 Ordering data

Description	Type	Item no.	Pcs./Pkt.
PoE injector, 30 W, RJ45 jack on screw terminal blocks, 10/100/1000 Mbps, DIN rail mounting, IP20, potential separation, shield contacting with strain relief, shield current monitoring, surge protection	INJ 2101-T	2703011	1
PoE injector, 30 W, RJ45 jack on IDC terminal blocks, 10/100/1000 Mbps, DIN rail mounting, IP20, potential separation, shield contacting with strain relief, shield current monitoring, surge protection	INJ 2102-T	2703012	1
PoE injector, 30 W, RJ45 jack on Push-in terminal blocks, 10/100/1000 Mbps, DIN rail mounting, IP20, potential separation, shield contacting with strain relief, shield current monitoring, surge protection	INJ 2103-T	1004065	1
PoE injector, 60 W, RJ45 jack on screw terminal blocks, 10/100/1000 Mbps, DIN rail mounting, IP20, potential separation, shield contacting with strain relief, shield current monitoring, surge protection	INJ 2111-T	2703013	1
PoE injector, 60 W, RJ45 jack on IDC terminal blocks, 10/100/1000 Mbps, DIN rail mounting, IP20, potential separation, shield contacting with strain relief, shield current monitoring, surge protection	INJ 2112-T	2703014	1
PoE injector, 60 W, RJ45 jack on Push-in terminal blocks, 10/100/1000 Mbps, DIN rail mounting, IP20, potential separation, shield contacting with strain relief, shield current monitoring, surge protection	INJ 2113-T	1004066	1
Accessories	Type	Item no.	Pcs./Pkt.
Crimping pliers, for assembling the RJ45 plugs FL PLUG RJ45..., for assembly on site	FL CRIMPTOOL	2744869	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
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, degree of protection: IP20, number of positions: 8, 10 Gbps, CAT6 _A , cable outlet: straight, Ethernet	NBC-R4AC-R4AC-IE8A/.../...	1411854	1

Accessories	Type	Item no.	Pcs./Pkt.
Patch cable, CAT6 _A , 4-pair, shielded, connection not crossed (line), assembled at both ends with RJ45/IP20 connectors, outer sheath material: PUR, length: 2.0 m	NBC-R4AC/10G-R4AC/10G-94F/2,0	1408360	1
Patch cable, CAT6 _A , 4-pair, shielded, connection not crossed (line), assembled at both ends with RJ45/IP20 connectors, outer sheath material: PUR, length: 3.0 m	NBC-R4AC/10G-R4AC/10G-94F/3,0	1408365	1
Patch cable, degree of protection: IP20, cable length: 1 m, number of positions: 4, 100 Mbps, CAT5, material: PA 6.6, PROFINET	NBC-R4AC/1,0-93B/R4AC	1408968	1
Patch cable, degree of protection: IP20, cable length: 2 m, number of positions: 4, 100 Mbps, CAT5, material: PA 6.6, PROFINET	NBC-R4AC/2,0-93B/R4AC	1408969	1
Patch cable, CAT5, assembled, 0.3 m	FL CAT5 PATCH 0,3	2832250	1
Patch cable, CAT5, assembled, 0.5 m	FL CAT5 PATCH 0,5	2832263	1
Patch cable, CAT5, assembled, 1 m	FL CAT5 PATCH 1,0	2832276	1
Patch cable, CAT5, assembled, 1.5 m	FL CAT5 PATCH 1,5	2832221	1
Patch cable, CAT5, assembled, 2 m	FL CAT5 PATCH 2,0	2832289	1
Patch cable, CAT5, assembled, 3 m	FL CAT5 PATCH 3,0	2832292	1
RJ45 connector, design: RJ45, degree of protection: IP20, number of positions: 8, 10 Gbps, CAT6 _A , material: Plastic, connection method: Insulation displacement connection, connection cross section: AWG 26- 24, cable outlet: straight, color: black, Ethernet	VS-08-RJ45-10G/Q	1419001	1
RJ45 connector, design: RJ45, degree of protection: IP20, number of positions: 4, 100 Mbps, CAT5, material: Plastic, connection method: Insulation displacement connection, cable outlet: straight, color: traffic grey A RAL 7042, PROFINET	VS-PN-RJ45-5-Q/IP20	1658435	1
RJ45 connector, design: RJ45, degree of protection: IP20, number of positions: 8, 1 Gbps, CAT5, material: Plastic, connection method: Insulation displacement connection, connection cross section: AWG 26- 23, cable outlet: straight, color: traffic grey A RAL 7042, Ethernet	VS-08-RJ45-5-Q/IP20	1656725	1
RJ45 connector, design: RJ45, degree of protection: IP20, number of positions: 8, 1 Gbps, CAT5, material: Plastic, connection method: Insulation displacement connection, connection cross section: AWG 26- 23, cable outlet: straight, color: black, Ethernet	VS-08-RJ45-5-Q/IP20 BK	1658008	1
Stripping tool, for the multi-level stripping of shielded cables	VS-CABLE-STRIP-VARIO	1657407	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	Item no.	Pcs./Pkt.
Electronic diagonal cutter , tapered head, angled (21°), without chamfer, with opening spring	MICROFOX-SP	1212488	1
Data cable, Ethernet CAT6 _A (10 Gbps), 8-position, PUR halogen-free, water blue RAL 5021, shielded (Tinned copper braided shield), free cable end, on free cable end, cable length: Free entry (0.5 ... 400 m)	VS-OE-OE-94F/...	1417359	1
 Please observe section " 7.1 Accessories: power supply " when selecting the power supply.			

4 Technical data

Supply	INJ 2101-T INJ 2102-T INJ 2103-T	INJ 2111-T INJ 2112-T INJ 2113-T
Supply voltage range	18 V DC ... 57 V DC	18 V DC ... 57 V DC
Nominal supply voltage	24 V DC (SELV/PELV, restrictions for ATEX applications) 48 V DC	24 V DC (SELV/PELV, restrictions for ATEX applications) 48 V DC
Max. current consumption	2.1 A	4.2 A
Max. current consumption	1.4 A (24 V DC, Ex areas in accordance with UL-HazLoc) 0.7 A (48 V DC, Ex areas in accordance with UL-HazLoc)	2.73 A (24 V DC, Ex areas in accordance with UL-HazLoc) 1.34 A (48 V DC, Ex areas in accordance with UL-HazLoc)
Power consumption	≤ 40 W	≤ 75 W
Protective circuit	Reverse polarity protection	Reverse polarity protection
Electrical isolation	VCC // SCM + FE // PoE	VCC // SCM + 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	0.2 mm ² ... 2.5 mm ²	0.2 mm ² ... 2.5 mm ²
rigid	0.2 mm ² ... 2.5 mm ²	0.2 mm ² ... 2.5 mm ²
AWG	20 ... 12	20 ... 12
Flexible with ferrules without plastic sleeve	0.25 mm ² ... 2.5 mm ²	0.25 mm ² ... 2.5 mm ²
Flexible with ferrules with plastic sleeve	0.25 mm ² ... 2.5 mm ²	0.25 mm ² ... 2.5 mm ²

Power over Ethernet	INJ 2101-T INJ 2111-T	INJ 2102-T INJ 2112-T	INJ 2103-T INJ 2113-T
Connection method	Screw connection	IDC connection	Push-in connection
	CAT5e	CAT5e	CAT5e
Conductor cross section, flexible	0.14 mm²...1.5 mm²	0.14 mm²...0.34 mm²	0.2 mm² ... 1.5 mm²
Conductor cross section, rigid	0.14 mm²...1.5 mm²	0.14 mm²...0.34 mm²	0.2 mm² ... 1.5 mm²
Conductor cross section, flexible [AWG]	28 ... 16	26 ... 22	26 ... 16
Conductor cross section flexible, with ferrule without plastic sleeve	-	-	0.25 mm²...1.5 mm² (only together with CRIMPFOX 6)
Conductor cross section, flexible, with ferrule, with plastic sleeve	-	-	0.25 mm²...1.5 mm² (only together with CRIMPFOX 6)
Stripping length	5 mm	-	8 mm
Strain relief	Tool-free	Tool-free	Tool-free
Pin assignment	1:1	1:1	1:1
Tightening torque	0.22 Nm...0.25 Nm	-	-
Wire diameter incl. insulation	-	1.6 mm (Terminal block is tested with PVC insulation - other insulation materials available on request)	-
Frequency of connections between conductors of the same cross section	-	10	-
Transmission method	CAT5e	CAT5e	CAT5e
Frequency	125 MHz	125 MHz	125 MHz
Serial transmission speed	10/100/1000 Mbps	10/100/1000 Mbps	10/100/1000 Mbps
Ethernet	INJ 2101-T INJ 2102-T INJ 2103-T	INJ 2111-T INJ 2112-T INJ 2113-T	
Connection method	RJ45 jack	RJ45 jack	
	CAT5e	CAT5e	
Output power	30 W	60 W	
Maximum output power	40 W (UL)	75 W (UL)	
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	

Surge protectionNominal discharge current I_n (8/20) μ s, Core-ground 1 kA (C2 - 2 kV)Nominal discharge current I_n (8/20) μ s, Shield-ground 1 kA (C2 - 2 kV)

Standards IEC 61643-21

Shield current monitoringSwitch-on threshold ≥ 30 mA

Local diagnostics Yellow LED

Precision $\pm 5\%$

Response time 3 s

Shield current ≤ 2 A

Power consumption 270 mW (Shield current monitoring)

General data**INJ 2101-T**
INJ 2102-T
INJ 2103-T**INJ 2111-T**
INJ 2112-T
INJ 2113-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)

Flammability rating according to UL 94 V0 V0

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

Cable diameter 5.5 mm ... 6.5 mm 5.5 mm ... 6.5 mm

Material

Housing Plastic Plastic

Color

Housing light grey (7035) light grey (7035)

Vibration resistance in accordance with EN 60068-2-6/ IEC 60068-2-6 10 Hz ... 57 Hz, amplitude ± 3.5 mm, 57 Hz ... 150 Hz, 5g 10 Hz ... 57 Hz, amplitude ± 3.5 mm, 57 Hz ... 150 Hz, 5g

Shock in accordance with EN 60068-2-27/IEC 60068-2-27 30g for 11 ms, three shocks in each spatial direction 30g for 11 ms, three shocks in each spatial direction

Continuous shock in accordance with EN 60068-2-27/ IEC 60068-2-27 10g for 16 ms, 1000 shocks in each spatial direction 10g for 16 ms, 1000 shocks in each spatial direction

MTTF (mean time to failure) SN 29500 standard, temperature 25°C, operating cycle 21% 1510 Years 1797 Years

MTTF (mean time to failure) SN 29500 standard, temperature 40°C, operating cycle 34.25% 661 Years 733 Years

MTTF (mean time to failure) SN 29500 standard, temperature 40°C, operating cycle 100% 256 Years 283 Years

Ambient conditions	INJ 2101-T INJ 2102-T INJ 2103-T	INJ 2111-T INJ 2112-T INJ 2113-T
Ambient temperature (operation)	-40 °C ... 65 °C (75°C, observe derating)	-40 °C ... 45 °C (75°C, observe derating)
Ambient temperature (storage/transport)	-40 °C ... 85 °C	-40 °C ... 85 °C
Permissible humidity (operation)	10 % ... 95 % (non-condensing)	10 % ... 95 % (non-condensing)
Altitude	≤ 5000 m (For restrictions, see the manufacturer's declaration for altitude operation) ≤ 2000 m (Restrictions for ATEX applications)	≤ 5000 m (For restrictions, see the manufacturer's declaration for altitude operation) ≤ 2000 m (Restrictions for ATEX applications)
Air pressure (operation)	80 kPa ... 110 kPa (Restrictions for ATEX applications)	80 kPa ... 110 kPa (Restrictions for ATEX applications)
Conformance/Approvals	INJ 2101-T INJ 2102-T INJ 2103-T	INJ 2111-T INJ 2112-T INJ 2113-T
ATEX Please follow the special installation instructions in the documentation!	Ⓔ II 3G Ex ec nC IIC T4 Gc PxCIF19ATEX2703011X	Ⓔ II 3G Ex ec nC IIC T4 Gc PxCIF19ATEX2703014X
CE	CE-compliant	
UL, USA/Canada	Class I, Zone 2, AEx nA IIC T4, Ex nA IIC Gc X T4 Class I, Div. 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	
Corrosive gas test	ISA-S71.04-1985 G3 Harsh Group A	

Conformance with EMC Directive 2014/30/EU

Immunity in accordance with 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

Criterion A Normal operating behavior within the specified limits.

Criterion B Temporary impairment to operational behavior that is corrected by the device itself.

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

5.1 Installation notes

**CAUTION:**

Observe the following safety notes when using the device.

- The category 3 product is designed for installation in zone 2 potentially explosive areas. It satisfies the requirements of the following standards:
 - EN 60079-0, EN 60079-7, EN 60079-15
 - Comprehensive details are to be found in the EU Declaration of Conformity which is enclosed and also available on our website in the latest version.
- 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 safety-relevant data is listed in this document.
- Observe the specified conditions for use in potentially explosive areas! Also observe the requirements of EN/IEC 60079-14.
- Opening or modifying the product is prohibited. Do not repair the product yourself; replace it with an equivalent product instead. Repairs may only be carried out by the manufacturer. The manufacturer is not liable for damage resulting from non-compliance.
- Do not subject the product to mechanical and/or thermal stress that exceeds the specified limits.
- The product must be stopped and immediately removed from the Ex area if it is damaged, has been subjected to an impermissible load, stored incorrectly, or if it malfunctions.
- The device is designed exclusively for operation with SELV/PELV from a Class ES1 “electrical energy source” in accordance with EN/IEC 62368-1 and VDE 0868-1. The device may only be connected to devices that meet the requirements of class ES1 in accordance with EN/IEC 62368-1.

5.2 Installation in Zone 2

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

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

- Use in potentially explosive areas is not permitted in China.
- Install the device in such a way that a degree of protection of at least IP54 is achieved in accordance with EN 60529. To this end, use a suitable, approved housing that meets the requirements of EN 60079-0.
- Only devices that are designed for operation in Ex Zone 2 and the conditions at the installation location may be connected to the circuits in Zone 2.
- In potentially explosive areas, only connect and disconnect cables and plug-in connections (e.g., connector, SD card, DIN rail connector, etc.) when the power is disconnected.
- For safe operation, lockable plug-in connections (e.g., connector, SD card, DIN rail connector, etc.) must be fully inserted and have a functional interlock (e.g., locking clip, screw connection, etc.).
- Insert the interlock. Repair any damaged plug-in connections immediately.
- Only connect one cable per terminal point.
- Use the device in an environment that does not exceed pollution degree 2 in accordance with EN 60664-1.
- Use transient protection so that short-term surge voltages do not exceed 119 V.
- The switches of the device that can be accessed may only be actuated when the power supply to the device is disconnected or when it has been ensured that there is no potentially explosive atmosphere present.
- For ATEX applications, the installation altitude is limited to 80 kPa/2000 m above mean sea level.
- Between the Ethernet connection, U_n , and FE, surge protective devices discharge interferences of $<500 V_{rms}$.
- The device must be installed upright in Zone 2.
- The DIN rail must be connected to protective ground. The maximum shield current is 2 A.
- Before measuring the insulation, disconnect the plugs for the Ethernet cables and power supply. Otherwise, inaccurate measurements may occur. Reinsert the plugs once the insulation measurement has been completed.
- The product is not designed for use in potentially dust-explosive atmospheres.

5.3 UL notes



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.

INJ 2101-T, INJ 2102-T, INJ 2103-T



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



U = 18 - 57 V DC

P = max. 40 W

PoE_{Out} = 54 V DC max. 30 W @ 75°C

Derating from 65°C 1.5 W/K

Amb. Temp.: -40°C < T_a < 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 2111-T, INJ 2112-T, INJ 2113-T



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



U = 18 - 57 V DC

P = max. 75 W

PoE_{Out} = 54 V DC max. 42 W @ 75°C

Derating from 70°C 3.6 W/K

Amb. Temp.: -40°C < T_a < 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

6 Transport and unpacking

- Check the delivery for visible damage caused by transportation.
- Submit claims for any transport damage immediately. Inform Phoenix Contact or your supplier as well as the shipping company without delay.
- Read the complete packing slip carefully.
- Retain the packing slip.
- Keep the packaging for a possible later transport.

7 Product description

Product variants					
Item No.	Designation	Power	Port 2	Temperature range	Function
2703011	INJ 2101-T	30 W	Screw terminal blocks	-40°C ... 65°C (75°C, observe derating)	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	-40°C ... 45°C (75°C, observe derating)	
2703014	INJ 2112-T		IDC terminal blocks		
1004066	INJ 2113-T		Push-in terminal blocks		
The following product versions with basic functions are described in separate data sheets:					
2703005	INJ 1000	30 W	RJ45 jack	-40 °C ... 60 °C	
2703006	INJ 1000-T			-40 °C ... 75 °C	
2703007	INJ 1010	60 W		-40 °C ... 60 °C	
2703008	INJ 1010-T				
2703009	INJ 1100-T	30 W		-40 °C ... 75 °C	Electrical isolation
2703010	INJ 1110-T	60 W			

7.1 Accessories: power supply

INJ 2101-T, INJ 2102-T, INJ 2103-T

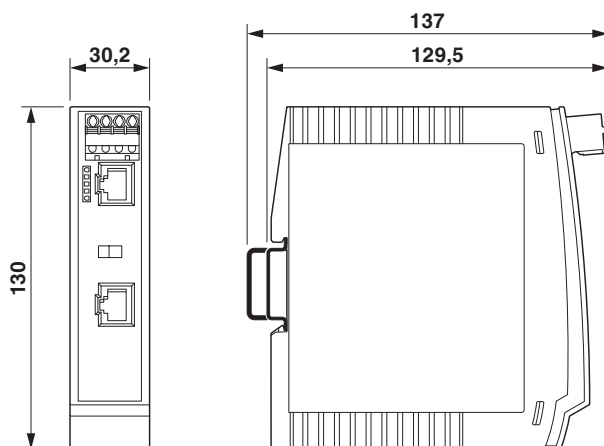
PoE output 0 W ... 30 W	
2902992	UNO-PS/1AC/24DC/ 60W
2903147	TRIO-PS-2G/1AC/24DC/3/C2LPS
2909576	QUINT4-PS/1AC/24DC/2.5/PT

INJ 2111-T, INJ 2112-T, INJ 2113-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

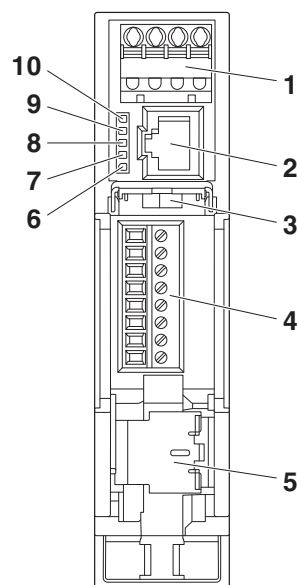
7.2 Dimensions

Figure 1 Dimensions



7.3 Function elements

Figure 2 Function elements



- | | | | | |
|----|--|--|---|--------------------------|
| 1 | X1 | US1 | GND | 18 V DC ... 57 V DC |
| | | US2 | GND | Redundant supply voltage |
| 2 | X2 | RJ45 jack Data | | |
| 3 | DIP switch | | | |
| 4 | X3 | Port 2 depending on product version, see above | | |
| 5 | Shield contact spring (shield contacting with strain relief) | | | |
| 6 | SC | LED | Shield current monitoring | |
| 7 | S2 | LED | Status | 4, 5, 7, 8 |
| | | | Mode 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 | |
| 8 | S1 | LED | Status | 1, 2, 3, 6 |
| | | | Mode A | |
| | | On | Power supply PD OK | |
| | | Flashing | Overload mode A, short circuit, startup failed | |
| | | S1 + S2 flashing | Internal error, PoE chip too hot | |
| 9 | U2 | LED | Supply voltage US2 | |
| 10 | U1 | LED | Supply voltage US1 | |

7.4 Power dissipation

INJ 2101-T, INJ 2102-T, INJ 2103-T

30 W devices	Input voltage		
	18 V	24 V	48 V
Power dissipation	7 W	5 W	5 W
Power dissipation at a maximum load of 30 W	37 W	35 W	35 W
Maximum current	2.06 A	1.46 A	0.73 A

INJ 2111-T, INJ 2112-T, INJ 2113-T

60 W devices	Input voltage		
	18 V	24 V	48 V
Power dissipation	12 W	9 W	9 W
Power dissipation at a maximum load of 60 W	72 W	69 W	69 W
Maximum current	4 A	2.88 A	1.44 A

7.5 Setting the DIP switches

INJ 2101-T, INJ 2102-T, INJ 2103-T

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

- Other designations for Mode B: Spare Pairs, Midspan, Alternative-B, Alt-B
- Other designations for Mode A: Signal Pairs, Endspan, Data, Alternative-A, Alt-A

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 2111-T, INJ 2112-T, INJ 2113-T

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

The IEEE 802.3bt directive for end devices with an electrical power requirement greater than 30 W had not been published when the injectors were developed. 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.

8 Installation



NOTE: device damage

Connecting or disconnecting PoE cables under load will damage the contacts.

- Only connect and disconnect PoE cables when the voltage is disconnected.

Installation in Ex area (zone 2)

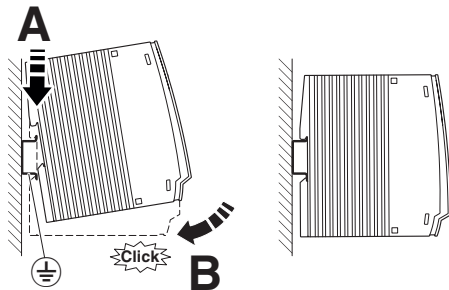


WARNING: Explosion hazard when used in potentially explosive areas

- Only mount or remove the device when it is disconnected and de-energized.
- Only connect and disconnect cables when the voltage is disconnected.

8.1 Mounting

Figure 3 Mounting on a DIN rail

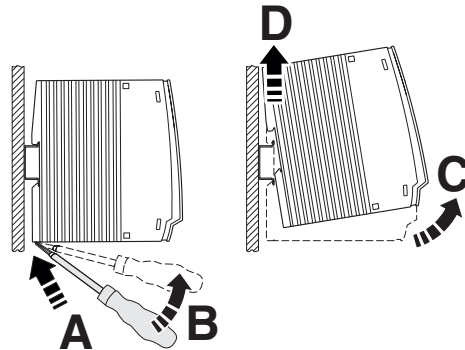


The device is intended for installation in a control cabinet.

- 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.

8.2 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.

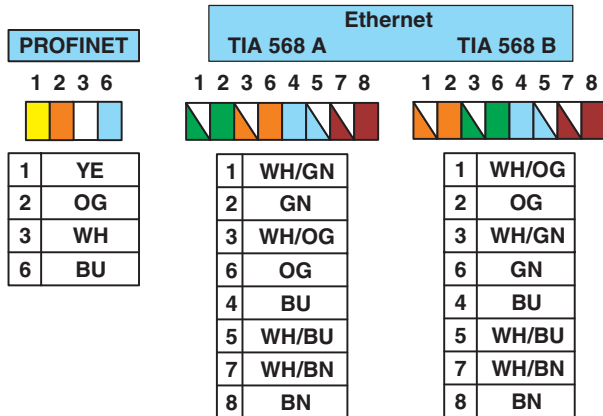
8.3 RJ45 interface

- Only use shielded twisted pair cables and matching 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 connector into the Ethernet port until the connector engages with a click. Observe the connector coding.

8.4 Terminal assignment

Terminal assignment for Ethernet (IEEE 802.3: TIA 568 A, TIA 568 B) and PROFINET

Figure 5 Terminal assignment



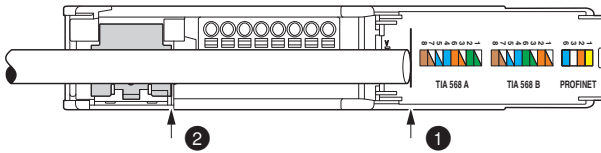
Key:

OG Orange
 WH White
 GN Green
 YE Yellow
 BU Blue
 BN Brown

8.5 Stripping

You can quickly determine the stripping length:

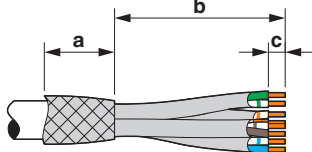
Figure 6 Stripping length



- Open the cover.
- Place the cable end on the marking line ①.
- The edge of the shield contact spring ② indicates the correct length for stripping (5.5 cm).
- Strip the cable.
- Keep the aluminum foil on the single wires as far as possible.
- Fold back 20 mm of the braided shield backwards over the outer sheath.

8.6 Screw terminal blocks (INJ 2101-T and INJ 2111-T)

Figure 7 Stripping specifications



- a 20 mm
- b 55 mm
- c 5 mm

- Strip off each individual wire to 5 mm.
- If possible, make sure that the individual wires remain twisted up to the terminal blocks.
- Connect the single wires to the terminal blocks.

8.7 IDC terminal blocks (INJ 2102-T and INJ 2112-T)

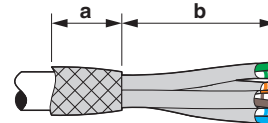


NOTE: device damage

Note the following limitations:

- Single wire diameter: 1.6 mm maximum
- Wire insulation material: PVC

Figure 8 Stripping specifications

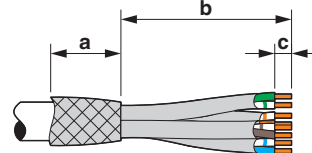


- a 20 mm
- b 55 mm

- Open the connection terminal blocks.
- Insert the single wires into the connection terminals as far as they will go.
- Snap in the terminal blocks.

8.8 Push-in terminal blocks (INJ 2103-T and INJ 2113-T)

Figure 9 Stripping specifications

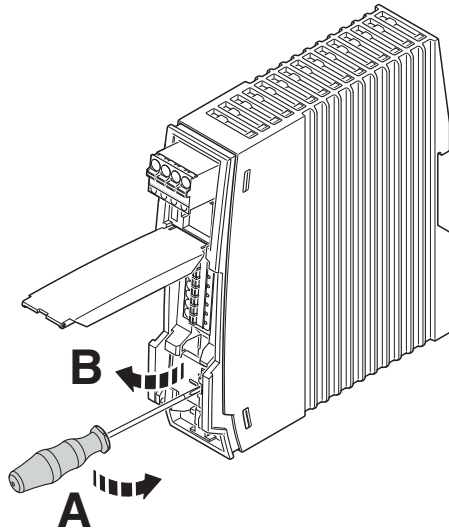


- a 20 mm
- b 55 mm
- c 8 mm

- Strip off each individual wire to 8 mm.
- If possible, make sure that the individual wires remain twisted up to the terminal blocks.
- Connect the single wires to the terminal blocks.

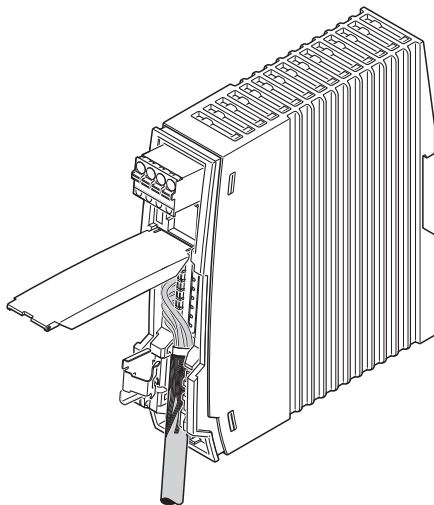
8.9 Shield contacting with strain relief

Figure 10 Open shield contact spring



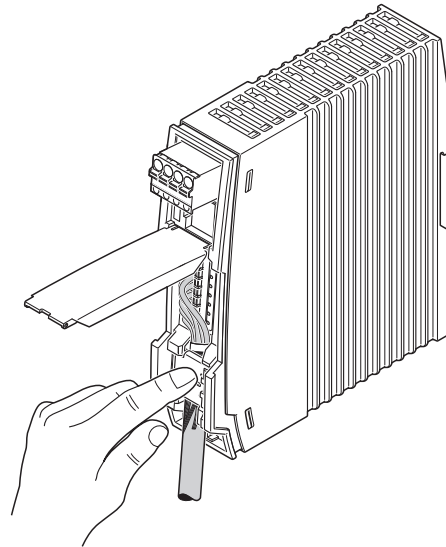
- Only use cables with an outside diameter of 5.5 ... 6.5 mm.
- Open the shield contact spring.
- If the spring is latched in place, use a screwdriver to open it.

Figure 11 Inserting the cable



- Place the cable with the folded braided shield into the guiding shaft.

Figure 12 Close shield contact spring



- Snap in the shield contact spring. The braided shield is pressed against the left side of the guiding shaft. This establishes the shield contacting.
- Organize the wires so that you can close the cover.



Fully snap in the foldable cover to prevent unintentional opening.

8.10 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.

9 Shield current monitoring

If there are different potential references within an installation, equalization currents can flow via the cable shielding. This can damage the device or disrupt communication.

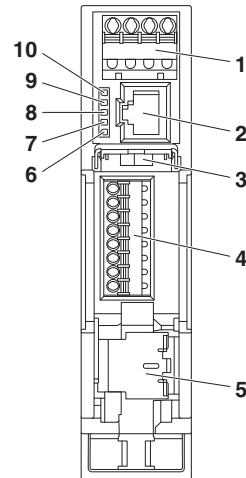
LED 6 lights up in the event of cable shield currents greater than +30 mA and less than -30 mA on the PoE-conducting port 2.

The LED may flicker or flash because the shield currents are not constant. You can reduce the equipotential bonding across the data lines by laying the equipotential bonding lines between the individual installation sites separately.

10 Surge protection

The surge protection protects the injector and the downstream devices against overvoltages that can arise via the PoE-conducting port 2.

- Protective function in accordance with CAT5e for data rates of up to 1 GB

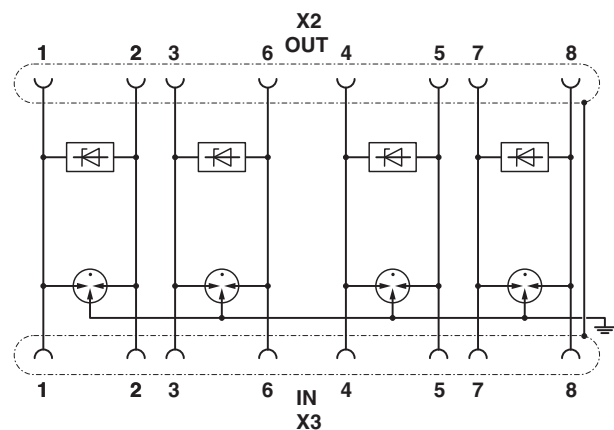


- | | | | |
|---|----|-----|--|
| 2 | X2 | OUT | Protected output side |
| 4 | X3 | IN | Unprotected side, possible surge voltage |

- Install the injector immediately upstream of the device to be protected.
- Connect the RJ45 connection X2 and the device to be protected via a patch cable (see accessories).

Grounding can be created directly on the NS 35 DIN rail.

Figure 13 Circuit diagram (surge protection only)



11 Derating

INJ 2101-T, INJ 2102-T, INJ 2103-T

Umgebungstemperaturbereich / Ambient temperature range

-40 °C ≤ T_{amb} ≤ +65 °C (+75 °C)

See derating

INJ 2111-T, INJ 2112-T, INJ 2113-T

Umgebungstemperaturbereich / Ambient temperature range

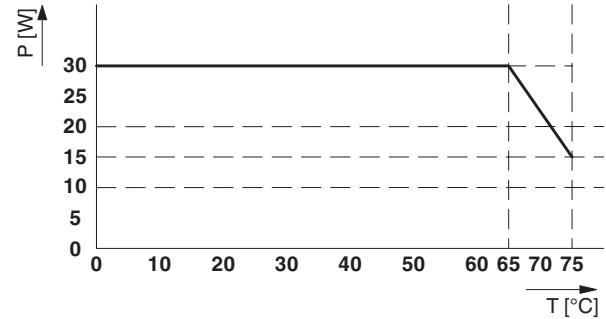
-40 °C ≤ T_{amb} ≤ +45 °C (+75 °C)

See derating

30 W

- 30 W, free standing: no derating, PoE output: 54 V DC, max. 30 W at 75°C
- 30 W, row installation: derating from 65°C 1.5 W/K

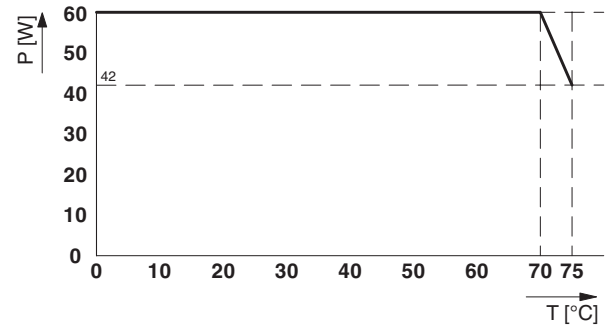
Figure 14 Derating above 65°C: 1.5 W/K



60 W

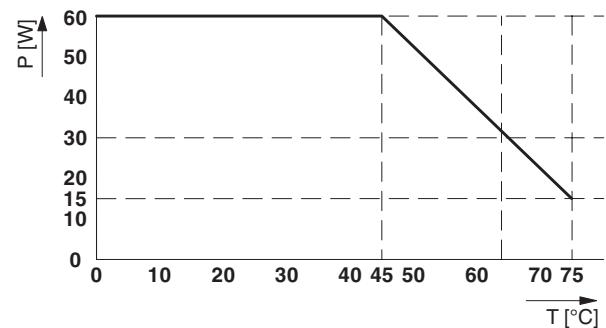
- 60 W, free standing: derating from 70°C 3.6 W/K

Figure 15 Derating above 70°C: 3.6 W/K



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

Figure 16 Derating above 45°C: 1.5 W/K



12 Disposal



The symbol with the crossed-out trash can indicates that this item must be collected and disposed of separately. Phoenix Contact or our service partners will take the item back for free disposal. For information on the available disposal options, visit www.phoenixcontact.com.