



▶ PDP67 F 8DI4DO 5/5 ION
PDP67 F 8DI4DO 5/5 VA ION

PILZ
THE SPIRIT OF SAFETY

Operating Manual-1006985-EN-02
- Decentralised periphery



This document is the original document.

Where unavoidable, for reasons of readability, the masculine form has been selected when formulating this document. We do assure you that all persons are regarded without discrimination and on an equal basis.

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SD means Secure Digital

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1 Introduction

1.1 Validity of documentation

This documentation is valid for the products PDP67 F 8DI4DO 5/5 ION and PDP67 F 8DI4DO 5/5 VA ION. It is valid until new documentation is published.

This operating manual explains the function and operation, describes the installation and provides guidelines on how to connect the product.

1.2 Using the documentation

This document is intended for instruction. Only install and commission the product if you have read and understood this document. The document should be retained for future reference.

1.3 Definition of symbols

Information that is particularly important is identified as follows:



DANGER!

This warning must be heeded! It warns of a hazardous situation that poses an immediate threat of serious injury and death and indicates preventive measures that can be taken.



WARNING!

This warning must be heeded! It warns of a hazardous situation that could lead to serious injury and death and indicates preventive measures that can be taken.



CAUTION!

This refers to a hazard that can lead to a less serious or minor injury plus material damage, and also provides information on preventive measures that can be taken.



NOTICE

This describes a situation in which the product or devices could be damaged and also provides information on preventive measures that can be taken. It also highlights areas within the text that are of particular importance.



INFORMATION

This gives advice on applications and provides information on special features.

2 Overview

2.1 Scope of supply

- ▶ Decentralised input module PDP67 F 8DI4DO 5/5 ION or PDP67 F 8DI4DO 5/5 VA ION
- ▶ 4 End caps

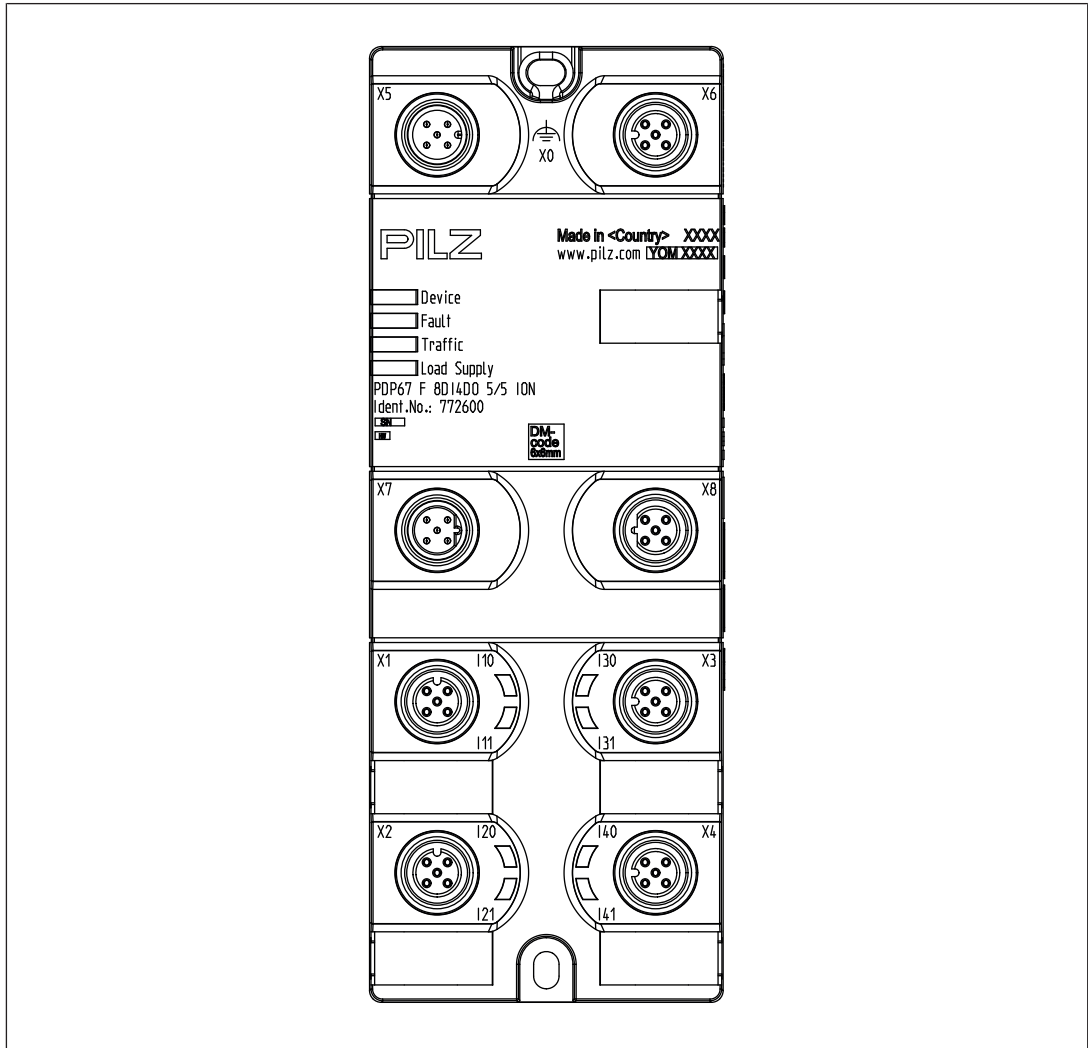
2.2 Product features

Application of the products PDP67 F 8DI4DO 5/5 ION or PDP67 F 8DI4DO 5/5 VA ION: Decentralised input/output modules for connection to a Pilz control system, for use in a rugged industrial environment up to protection type IP67.

The product has the following features:

- ▶ Protection type IP67
- ▶ 8 Inputs for connecting 8 single-channel or 4 dual-channel sensors
- ▶ 4 Outputs, which can be configured as
 - Standard outputs
 - Test pulse outputs
 - 24 V outputs
- ▶ 4 Outputs, which can be configured as
 - Safe outputs (failsafe outputs)
 - Standard outputs
 - Test pulse outputs
 - 24 V outputs
- ▶ Separate supply to the outputs
- ▶ Module is galvanically isolated from CAN bus
- ▶ LED indicator for:
 - Operating status
 - Error
 - Connection status
 - Supply voltage
 - Status of the inputs
- ▶ VA type with stainless steel screw connection for special protection against corrosion

2.3 Front view



Legend

- X0: Functional earth
- X1 ... X4: Inputs/outputs
- X5: Interface to the control system (Supply) or to X6 on the upstream module
- X6: Interface to X5 on the downstream module
- X7: Interface to the 24 V supply (Load Supply) or to X8 on the upstream module
- X8: Interface to X7 on the downstream module or unused
- LEDs: Device
- Fault
- Traffic
- Load Supply
- I10 ... I41

3 Safety

3.1 Intended use

The products PDP67 F 8DI4DO 5/5 ION and PDP67 F 8DI4DO 5/5 VA ION are decentralised input/output modules, which are suitable for use in a rugged industrial environment up to protection type IP67. They may not be used in a potentially explosive area.

The module can be connected to a link module PNOZ m EF PDP Link from the configurable control system PNOZmulti 2.

Lifts Directive

The product PDP67 F 8DI4DO 5/5 ION, PDP67 F 8DI4DO 5/5 VA ION can be used as a PESSRAL (programmable electronic system in safety-related applications for lifts) in accordance with the Lifts Directive 2014/33/EU. It meets the requirements for passenger and goods lifts in accordance with EN 81-1/2, EN 81-20, EN 81-22 and EN 81-50, as well as the requirements for escalators and moving walks in accordance with EN 115-1.

The safety controller should be installed in a protected environment that meets at least the requirements of pollution degree 2.

Example: Protected inside space or control cabinet with protection type IP54 and appropriate air conditioning.

Improper use

The following is deemed improper use in particular:

- ▶ Any component, technical or electrical modification to the product,
- ▶ Use of the product outside the areas described in this operating manual,
- ▶ Use of the product outside the technical details (see chapter entitled [Technical Details](#) [📖 31]).



NOTICE

EMC-compliant electrical installation

The product is designed for use in an industrial environment. The product may cause interference if installed in other environments. If installed in other environments, measures should be taken to comply with the applicable standards and directives for the respective installation site with regard to interference.

3.1.1 Third-party manufacturer licence information

The product contains open source software, whose terms of use could further limit the product's application area. It is essential that you observe the third-party manufacturer licence information.

Further information is available in the document "Third-party manufacturer license information PDP67 F 10DI4DO 5/8 ION, PDP67 EF 8DI4DO 5/5 ION" (document number 1006623) at www.pilz.com.

3.2 Safety regulations

3.2.1 Safety assessment

Before using a device, a safety assessment in accordance with the Machinery Directive is required.

The product as an individual component fulfils the functional safety requirements in accordance with EN ISO 13849 and EN IEC 62061. However, this does not guarantee the functional safety of the overall plant/machine. To achieve the relevant safety level of the overall plant/machine's required safety functions, each safety function needs to be considered separately.

3.2.2 Use of qualified personnel

The products may only be assembled, installed, programmed, commissioned, operated, decommissioned and maintained by persons who are competent to do so.

A competent person is a qualified and knowledgeable person who, because of their training, experience and current professional activity, has the specialist knowledge required. In order to inspect, assess and handle products, devices, systems, plant and machinery, this person must be familiar with the state of the art and the applicable national, European and international laws, directives and standards.

It is the company's responsibility only to employ personnel who

- ▶ Are familiar with the basic regulations concerning health and safety / accident prevention,
- ▶ Have read and understood the information provided in the section entitled Safety
- ▶ Have a good knowledge of the generic and specialist standards applicable to the specific application.

3.2.3 Warranty and liability

All claims to warranty and liability will be rendered invalid if:

- ▶ The product was used contrary to the purpose for which it is intended
- ▶ Damage can be attributed to not having followed the guidelines in the manual or
- ▶ Operating personnel are not suitably trained.

3.2.4 Disposal

- ▶ In safety-related applications, please comply with the mission time T_M stated in the safety-related characteristic data.
- ▶ When decommissioning, please comply with local regulations regarding the disposal of electronic devices (e.g. Electrical and Electronic Equipment Act).

3.3 Applicable documentation

This document includes only part of the information required for the use of the product. To understand and correctly use the product you must read further documents.

Please read the following documents:

- ▶ "PNOZmulti Safety Manual" (document number 21103)

- ▶ "PNOZmulti Installation Manual" (document number 1002265)
- ▶ The advanced functions of the device are described in the online help for the PNOZmulti Configurator, in the document "PNOZmulti 2 Communication Interfaces" and in the document "PNOZmulti Special Applications". Only use these functions once you have read and understood the documentation.
- ▶ The connectable PNOZmulti base units, the max. number of connectable modules and the system reaction times can be taken from the document "PNOZmulti System Expansion" (document number 1002217).

4 Security

To secure plants, systems, machines and networks against cyberthreats it is necessary to implement (and continuously maintain) an overall industrial security concept that is state of the art.

Perform a risk assessment in accordance with VDI/VDE 2182 or IEC 62443-3-2 and plan the security measures with care. If necessary, seek advice from Pilz Customer Support.

4.1 Required security measures

The product is not protected against physical manipulation.

Carry out the bus wiring and position the PDP67 modules in such a way that manipulation is made more difficult or will be detected.

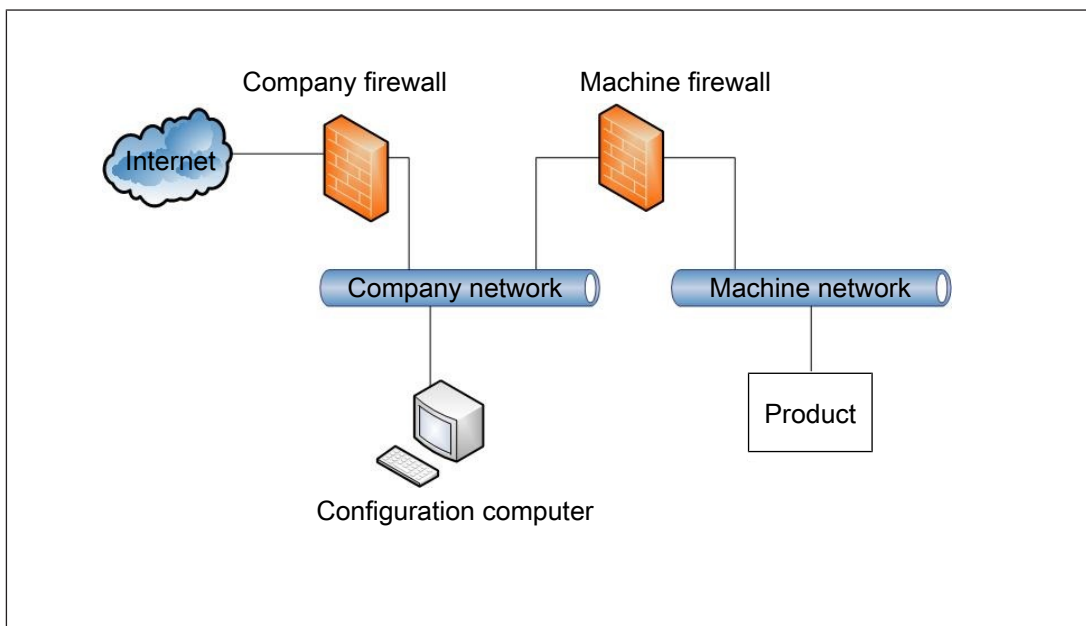


Fig.: Example network topology

- ▶ Note the network data for risk analysis and the security measures.

5 Function description

The functions of the inputs and outputs are configured in the PNOZmulti Configurator.

5.1 Inputs

Single and dual-channel sensors can be connected to the inputs, with or without test pulses.

The input signals must show a "High" ("1"-signal) of 24 VDC (+15 ... +30 VDC) and a "Low" ("0"-signal) of 0 VDC (-3 ... +5 VDC).

The safety-related inputs must operate in normally energised mode.

The input status is signalled to the control system via the bus.

Green LEDs indicate the status of the inputs I10, I11, I20, I21, I30, I31, I40 and I41 an (see Display elements for device diagnostics).

Test pulses can be used to check the inputs for shorts across contacts and correct functionality.

5.2 Configurable outputs

The outputs can be used as standard outputs, as test pulse outputs or as 24 VDC outputs.

The test pulse outputs are suitable for testing the sensor wiring. All safety-related inputs must operate in accordance with normally energised mode.

Two test pulses are available on each plug-in connector; these test pulses are permanently assigned to the inputs. The assignment of the test pulses to the inputs cannot be changed in the PNOZmulti Configurator.

If the test pulse outputs are not being used, they can be configured as standard outputs or 24 VDC outputs in the PNOZmulti Configurator.

Outputs O20, O21, O40, O41 can also be configured as safe outputs (failsafe outputs). The safe semiconductor outputs can be used for safety functions.

The safety-related outputs must be used in the application in such a way that the off state corresponds to the safe state.



CAUTION!

Danger when the safe outputs are used without a restart interlock

When the product is restarted, the safe outputs switch back on automatically. A restart interlock must be provided on safety-related applications.

5.3 Data download

Communication with the control system is via a safe data link. Data is exchanged cyclically.

5.4 Diagnostics

The status and error messages shown by the LEDs are saved in an error stack. The system software can read this error stack.

6 Installation

6.1 General installation guidelines

The product must be fastened to a flat mounting surface, so that there is no strain on the housing when the module is screwed down. The mounting distances will depend on which plug-in connectors are used and on the bending radius of the cables.

Unused connectors should be sealed using end caps.

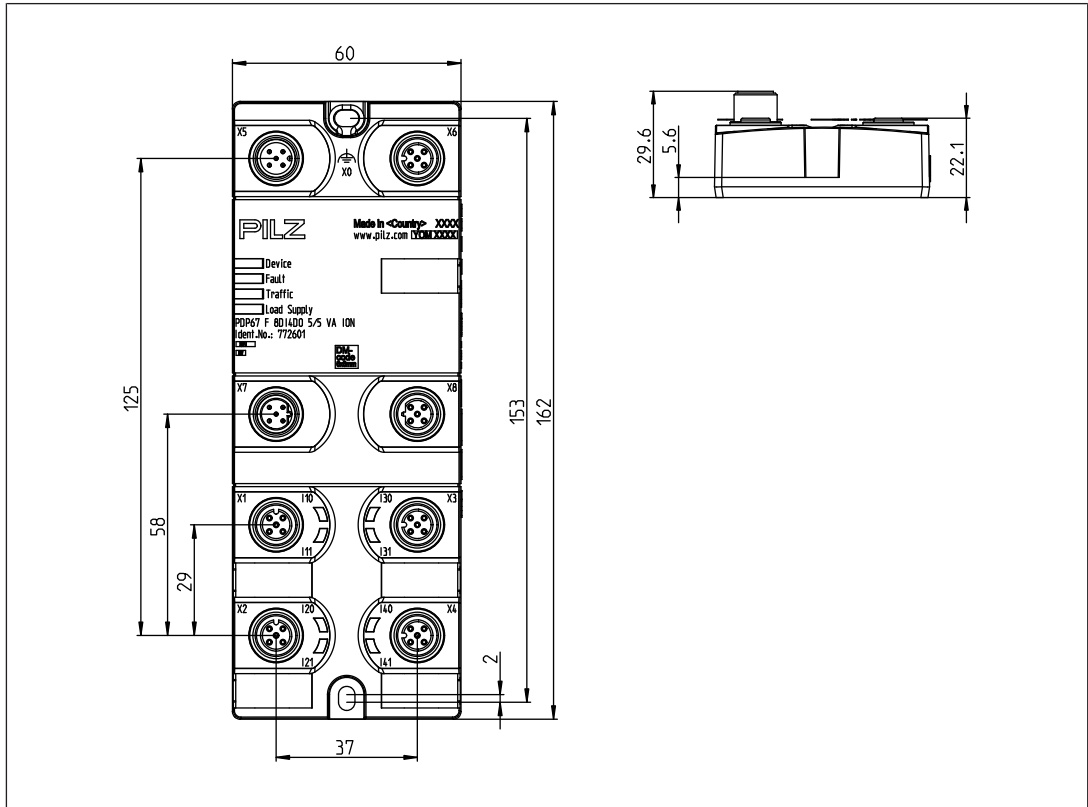
To install the system, proceed as follows:

- ▶ Fit 2 x M4 internal threads on the mounting surface.
- ▶ Use two fixing screws to attach the product to the mounting plate.
- ▶ With shielded cables, connect the functional earth to the fixing screw X0.
- ▶ Use internal hexagonal fixing screws with a strength class of 8.8 or comparable fixing screws with a torque setting of 1 Nm.
- ▶ Protect the device from:
 - Water or fluids with more stringent conditions than IP67,
 - Chemicals
 - Harmful substances
 - Intentional damage.

To meet the requirements of protection type IP67, ensure that:

- ▶ All used M12 connections must be connected with a torque setting of 0.6 Nm.
- ▶ All end caps must be fastened with a torque setting of 0.6 Nm. We recommend you use a torque screwdriver with PH3 bit.

6.2 Dimensions in mm



7 Preparing for operation

7.1 Supply Voltage

Supply

The supply voltage "Supply" is the internal bus voltage and is used to supply the device. It is fed via the link module PNOZ m EF PDP Link.

Load Supply

The supply voltage "Load Supply" is used to supply the outputs.

Please note the following when connecting the supply voltage:

- ▶ The potentials for Supply and Load Supply are galvanically isolated by basic insulation.
- ▶ When selecting the power supply, please refer to the requirements stated under [Technical details](#) [31].
- ▶ Overvoltage or interference voltages can damage or even destroy the electronics on the products PDP67 F 8DI4DO 5/5 ION, PDP67 F 8DI4DO 5/5 VA ION. The affected outputs on the control system are shut down. You should therefore take note of the relevant EMC measures.



WARNING!

Safe electrical isolation must be ensured for the 24 V supply. Failure to do so could result in electric shock. Power supplies must comply with EN 62368-1 or EN 61010-2-201, for example.

- To achieve the lowest possible residual ripple, we recommend that you install a three-phase bridge rectifier or regulated supply.
- The "Ground" connection to the earth bar or earth fault monitor must be in accordance with the relevant national regulations (e.g. EN 60204-1, NFPA 79: 17-7, NEC: Article 250).



INFORMATION

The module's output circuits have been designed to guarantee maximum safety. To achieve this, extensive tests are carried out internally. Momentary interruptions of the "Load Supply" during a test procedure can falsify the test result, causing the following malfunction: if the "Load Supply" is interrupted momentarily, the unbuffered outputs transmit a "0" signal.

Behaviour in the case of test pulse outputs:

The buffered module electronics read this signal at the pulsed inputs, thereby triggering the user's configured reaction.

Example: The system reacts as though an E-STOP pushbutton has been operated, although this is not the case: there has been a supply interruption.

Remedy: The "Load Supply" must be buffered.

Behaviour in the case of safe outputs:

The PNOZmulti switches to a STOP state, shuts down all the safe outputs and issues a message.

Remedy: Use buffered power supplies.

Connection

► **Supply**

The "Supply" is fed via the link module PNOZ m EF PDP Link. Connect the module PDP67 F 8DI4DO 5/5 ION, PDP67 F 8DI4DO 5/5 VA ION to the link module PNOZ m EF PDP via the male connector X5. To forward the supply voltage to other modules, connect the socket X6 to X5 on the downstream module.

► **Load Supply**

Connect the module PDP67 F 8DI4DO 5/5 ION, PDP67 F 8DI4DO 5/5 VA ION to an external power supply via the male connector X7 using a 5-pin M12 plug-in connector. To forward the supply voltage to other modules, connect the socket X8 to the connector X7 on the downstream module. The socket is physically adjacent to the M12 plug-in connector.

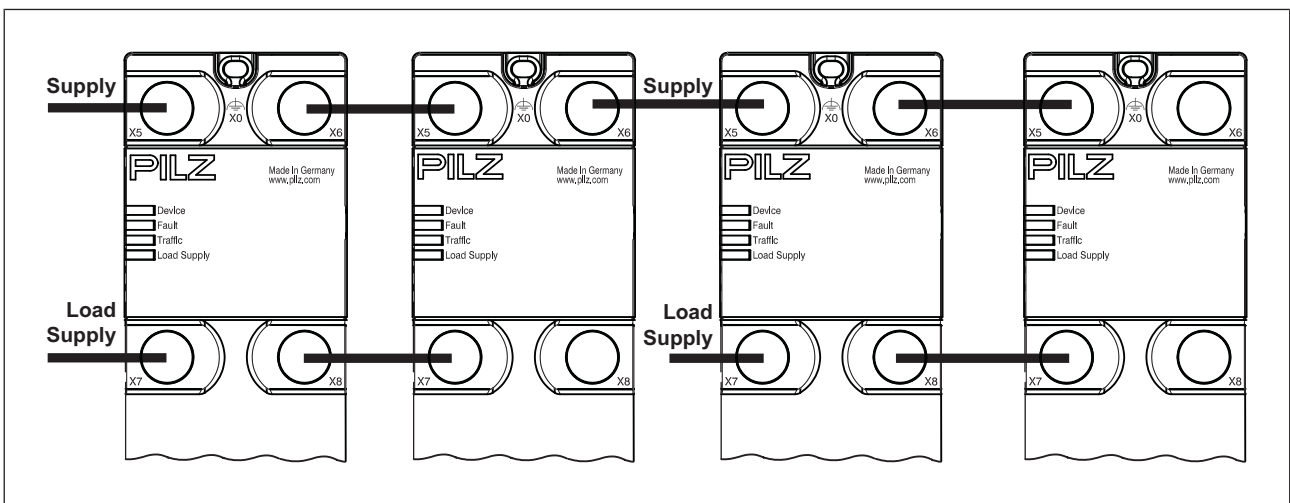


Fig.: Example for connecting and distributing the supply voltage



WARNING!

The current load capacity of the M12 plug-in connector is 4 A per pin. You must ensure that this value is not exceeded. Exceeding the permitted current load capacity can damage the plug-in connector.

When forwarding the "Load Supply", the external supply voltage must be fed in again at X7 if necessary (see diagram "Example of connecting and forwarding the supply voltage").

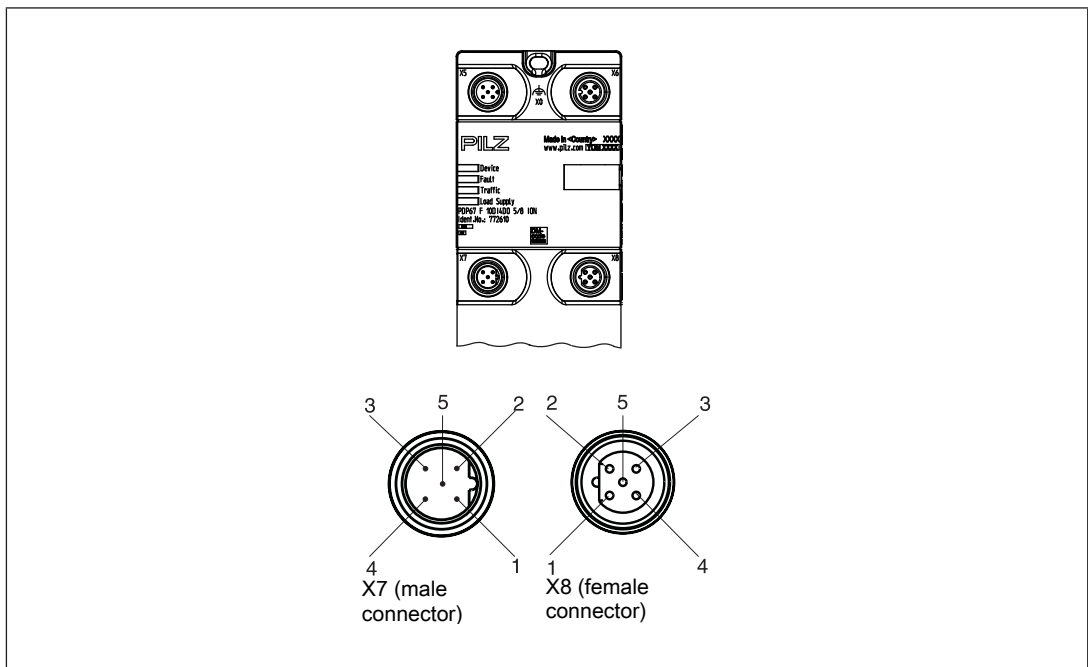
With the plug-in connectors X2 and X4, please note that a total current should be observed via the common GND pin.

Please note that the connection of the additional supply voltage is not monitored for overload.



INFORMATION

Connect the functional earth to the fixing screw X0.



Legend:

- 1: + 24 VDC
- 2: + 24 VDC
- 3: 0 V
- 4: 0 V
- 5: n.a.

7.2 General wiring guidelines

Note:

- ▶ Information given in the "Technical details" must be followed.

- ▶ Where safety-related applications are concerned, it is essential that short circuits and open circuits are unable to cause a hazardous condition within a plant. The way in which this is done will depend on the degree of hazard from the plant section, the switching frequency of the sensors and the level of safety of the sensors and actuators.
- ▶ Please refer to the link module's operating manual for details of the maximum cable length.
- ▶ Use copper wiring with a temperature stability of 85 °C.
- ▶ Pilz pre-assembled cable can be used to connect the inputs and outputs (see order reference).
- ▶ We recommend you use pre-assembled plug-in connectors to connect the inputs and test pulse outputs (see order reference).



CAUTION!

The power supply must meet the regulations for extra low voltages with protective electrical separation (SELV, PELV).



CAUTION!

In order to guarantee protection type IP67, unused plug-in connectors should be sealed using the end caps provided.

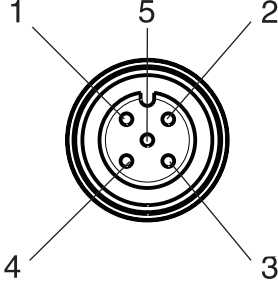


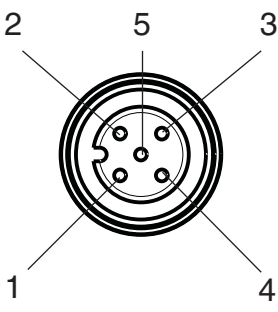
CAUTION!

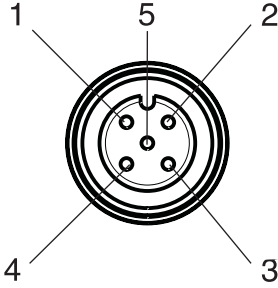
Make sure that the plug-in connectors are connected to the sensors and actuators correctly. Once you have run a function test to check that the plug-in connectors are connected to the sensors and actuators correctly, the connections should be labelled. If the connections to the sensors and actuators are incorrect, life-threatening situations may arise on the plant.

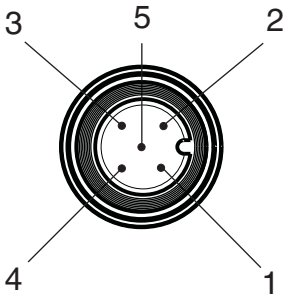
7.3 Connector pin assignment

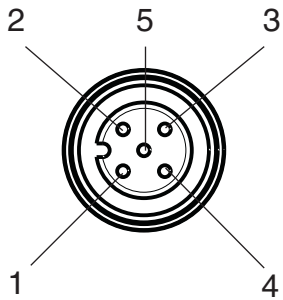
Inputs/outputs	Assignment	
X1		
5-pin M12 female connector A-coded	1: Test pulse T10 / ST output O10 / 24 VDC 2: Input I10 3: 0 V 4: Input I11 5: Test pulse T11 / 24 VDC / ST output O11	

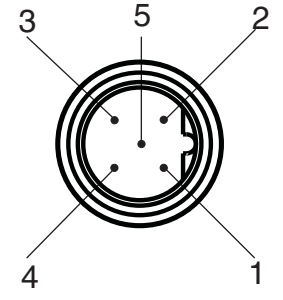
Inputs/outputs X2	Assignment	
5-pin M12 female connector A-coded	1: Test pulse T20 / ST output O20 / 24 VDC / FS output O20 2: Input I20 3: 0 V 4: Input I21 5: Test pulse T21/ 24 VDC / ST output O21 / FS output O21	

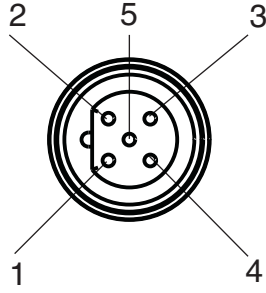
Inputs/outputs X3	Assignment	
5-pin M12 female connector A-coded	1: Test pulse T30 / 24 VDC / ST output O30 2: Input I30 3: 0 V 4: Input I31 5: Test pulse T31 / 24 VDC / ST output O31	

Inputs/outputs X4	Assignment	
5-pin M12 female connector A-coded	1: Test pulse T40 / 24 VDC / ST output O40 / FS output O40 2: Input I40 3: 0 V 4: Input I41 5: Test pulse T41 / 24 VDC / ST output O41 / FS output O41	

Interface to the link module: X5	Assignment	
5-pin M12 male connector A-coded Supply voltage "Supply"	1: VCC 2: CAN- 3: GND 4: CAN+ 5: Shield	

Interface to the next de-centralised module: X6	Assignment	
5-pin M12 female connector A-coded Supply voltage "Supply"	1: VCC 2: CAN- 3: GND 4: CAN+ 5: Shield	

Interface to the 24 V power supply or to previous de-centralised module: X7	Assignment	
5-pin M12 male connector B-coded Supply voltage "Load Supply"	1: + 24 VDC 2: + 24 VDC 3: 0 V 4: 0 V 5: n.a.	

Interface to the 24 V power supply or to next decentralised module: X8	Assignment	
5-pin M12 female connector B-coded Supply voltage "Load Supply"	1: + 24 VDC 2: + 24 VDC 3: 0 V 4: 0 V 5: n.a.	

7.4 Connection



NOTICE

In the event of an automatic start or manual start with bridged start contact (fault):

The device starts up automatically when the safeguard is reset, e.g. when the E-STOP pushbutton is released. Prevent an unexpected restart through external circuit measures or a corresponding configuration in the user program of the PNOZmulti Configurator, for example.

7.4.1 Example: Single-channel, failsafe input device, without test pulse



WARNING!

Short circuits between the cable to the input device and the 24 V line or between cables to various input devices will not be detected. Depending on the application, serious injury or death may result.

Avoid short circuits by

- Appropriate wiring
- Wiring in accordance with the requirements of IEC 61076-2-101 and IEC 60204-1, clause 14.1.1 and 14.1.2

Features	Connection
<ul style="list-style-type: none"> ▶ Depending on the application area and its respective regulations, this connection diagram is suitable for input devices with frequent and infrequent operation up to PL d of EN ISO 13849-1 and up to max. SIL 2 of EN IEC 62061. ▶ The input device must be approved for failsafe applications. ▶ Please read the instructions provided with the input device. 	

7.4.2 Example: dual-channel, failsafe input devices, without test pulses



WARNING!

On input devices with identical channels, short circuits between the cable to the input device and the 24 V line or between cables to both input devices will not be detected. Depending on the application, serious injury or death may result.

Avoid short circuits by

- Appropriate wiring
- Wiring in accordance with the requirements of IEC 61076-2-101 and IEC 60204-1, clause 14.1.1 and 14.1.2

Features	Connection
<p>▶ This type of connection is mainly used for signal inputs with frequent operation.</p> <p>▶ Depending on the application area and its respective regulations, this connection diagram is suitable for input devices with frequent operation with diverse channels up to PL e of EN ISO 13849-1 and up to max. SIL 3 of EN IEC 62061, provided the functionality of both input device channels is monitored in the user program via a plausibility check.</p> <p>▶ The input device must be approved for failsafe applications.</p> <p>If you are using input devices with different (diverse) channels, adjacent inputs may be used. Short circuits will be detected in the user program via the plausibility check.</p>	

7.4.3 Example: dual-channel, failsafe input device with electronic OSSD outputs, without test pulses



WARNING!

On input devices with identical channels, short circuits between the cable to the input device and the 24 V line or between cables to both input devices will not be detected. Depending on the application, serious injury or death may result.

Avoid short circuits by

- Appropriate wiring
- Wiring in accordance with the requirements of IEC 61076-2-101 and IEC 60204-1, clause 14.1.1 and 14.1.2

Features	Connection
<ul style="list-style-type: none"> ▶ Depending on the area of application and the regulations applicable there, the connection example is suitable in accordance with the details stated under Safety-related characteristic data. ▶ The input device must be approved for failsafe applications. ▶ Please read the instructions provided with the input device. ▶ Connection to ports X1/X3. 	<p>The diagram illustrates the electrical connections for two input devices. The upper device, labeled X7, has three terminals: 1, 3, and 4. Terminal 1 is connected to the L+ line through a resistor. Terminal 3 is connected to the L- line. Terminal 4 is connected to a common ground. The lower device, labeled X1, has six terminals: 1, 2, 3, 4, I10, and I11. Terminals 1, 2, 3, and 4 are connected to a 24V source through a diode symbol, indicating a failsafe configuration. Terminal I10 is connected to terminal 2, and terminal I11 is connected to terminal 3.</p>

7.4.4 Example: Single-channel, failsafe input device, with test pulse



CAUTION!

Short circuits between the cable to the input device and the 24 V line or between cables to various input devices will not be detected.

Avoid short circuits by

- Appropriate wiring
- Wiring in accordance with the requirements of IEC 61076-2-101 and IEC 60204-1, clause 14.1.1 and 14.1.2

Features	Connection
<ul style="list-style-type: none"> ▶ Depending on the application area and its respective regulations, this connection diagram is suitable up to PL d of EN ISO 13849-1 and up to max. SIL 2 of EN IEC 62061. ▶ The input device must be approved for failsafe applications. ▶ Test pulses can be used to check the inputs for short circuit to 24 V and correct functionality. Short circuits that short out the input device (cable from the test pulse to the input device and cable from the input device to the input) will not be detected. ▶ Please read the instructions provided with the input device. ▶ Only input devices with N/C contacts can be tested. 	

7.4.5 Example: Dual-channel, failsafe input device, with test pulse

Features	Connection
<ul style="list-style-type: none"> ▶ Depending on the application area and its respective regulations, this connection diagram is suitable up to PL d of EN ISO 13849-1 and up to max. SIL 3 of EN IEC 62061. ▶ The input device must be approved for failsafe applications. ▶ This type of connection is mainly used for signal inputs with infrequent operation. ▶ As the test pulses are permanently assigned to the inputs, all short circuits will be detected, with the exception of short circuits that short out the input device (cable from the test pulse to the input device and cable from the input device to the input). 	

7.4.6 Example: single-channel mechanical safety gate system, with test pulses

Features	Connection
<ul style="list-style-type: none"> ▶ Depending on the area of application and the regulations applicable there, the connection example is suitable in accordance with the details stated under Safety-related characteristic data. ▶ The input device must be approved for failsafe applications. ▶ Please read the instructions provided with the input device. ▶ Connection to ports X1/X2/X3/X4. 	




7.4.7 Example: safety gate system PSENSlock














Features	Connection
<ul style="list-style-type: none"> ▶ Depending on the area of application and the regulations applicable there, the connection example is suitable in accordance with the details stated under Safety-related characteristic data. ▶ The input device must be approved for failsafe applications. ▶ Please read the instructions provided with the input device. ▶ PSENSlock ▶ Connection to ports X2/X4. 	

8 Operation

8.1 Display elements for device diagnostics

Legend

-  LED on
-  LED flashes
-  LED off

LED	LED status	Meaning
Device		Green The device is ready for operation
		The device is not ready for operation
Fault		Red Internal fault
		No error
Traffic		Yellow Connection to control system established
		Yellow Error in the connection to the control system. Flashing stops a max. of 1 min. after the fault has been rectified.
		No connection to control system established
Input LEDs		Green 1 signal is present
		Green Link module has detected a pulse error. Once the fault has been rectified, the decentralised input module will continue to work normally after a waiting period of just a few seconds.
		0 signal is present
Load supply		Yellow Voltage is present
		Yellow The supply voltage is/was too low. Once the fault has been rectified, the LED will not stop flashing until the system has been switched off and then on again.
		Voltage is missing

9 Maintenance and testing

It is not necessary to perform maintenance work on the product in normal operation.

- ▶ Please return any faulty product to Pilz.

10 Technical details

Where standards are undated, the 2023-03 valid editions apply.

General	772600	772601
Certifications	CE, TÜV, UKCA, cULus Listed	CE, TÜV, UKCA, cULus Listed
Application range	Standard/failsafe	Standard/failsafe
Electrical data	772600	772601
Supply voltage		
for	Supply	Supply
Voltage	24 V	24 V
Kind	DC	DC
Voltage tolerance	-30 %/+25 %	-30 %/+25 %
Current load capacity at UB	4 A	4 A
Supply voltage		
for	Load supply	Load supply
Voltage	24 V	24 V
Kind	DC	DC
Voltage tolerance	-30 %/+25 %	-30 %/+25 %
Current load capacity at UB	8 A	8 A
External unit fuse protection F1 max.	10Y	10Y
Inputs	772600	772601
Quantity	8	8
Voltage at inputs	24 V	24 V
Input type in accordance with EN 61131-2	1, 3	1, 3
Input current range	2,4 - 4,6 mA	2,4 - 4,6 mA
Max. processing time of input when signal changes from "1" to "0"	1 ms	1 ms
Potential isolation	Yes	Yes
Semiconductor outputs	772600	772601
Output	O10, O11, O30, O31	O10, O11, O30, O31
Number of positive-switching single-pole semiconductor outputs	4	4
Function	24 VDC output, standard output, test pulse output	24 VDC output, standard output, test pulse output
Rated voltage	24 V DC	24 V DC
Typ. output current at "1" signal and rated voltage of semiconductor output	0,5 A	0,5 A
Permitted current range	0,000 - 0,600 A	0,000 - 0,600 A
Residual current at "0" signal	< 0,500 mA	< 0,500 mA
Max. internal voltage drop	< 3,0 V	< 3,0 V

Semiconductor outputs	772600	772601
Max. processing time of semiconductor output when signal changes from "1" to "0"	5 ms	5 ms
Potential isolation	Yes	Yes
Short circuit-proof	Yes	Yes
Permitted loads	inductive, capacitive, resistive	inductive, capacitive, resistive
Output rating in accordance with UL 61010-1	general use, pilot duty, resistive	general use, pilot duty, resistive
Semiconductor outputs	772600	772601
Output	O20, O21, O40, O41	O20, O21, O40, O41
Number of positive-switching single-pole semiconductor outputs	4	4
Function	24 VDC output, failsafe output, standard output, test pulse output	24 VDC output, failsafe output, standard output, test pulse output
Rated voltage	24 V DC	24 V DC
Typ. output current at "1" signal and rated voltage of semiconductor output	2 A	2 A
Permitted current range	0,000 - 2,500 A	0,000 - 2,500 A
Residual current at "0" signal	< 0,500 mA	< 0,500 mA
Max. internal voltage drop	< 3,0 V	< 3,0 V
Potential isolation	Yes	Yes
Short circuit-proof	Yes	Yes
Permitted loads	inductive, capacitive, resistive	inductive, capacitive, resistive
Output rating in accordance with UL 61010-1	general use, pilot duty, resistive	general use, pilot duty, resistive
Test pulse outputs	772600	772601
Max. cable length between test pulse output and input	20 m	20 m
Environmental data	772600	772601
Climatic suitability	EN 60068-2-78	EN 60068-2-78
Ambient temperature		
in accordance with the standard	EN 60068-2-14	EN 60068-2-14
Temperature range	-30 - 60 °C	-30 - 60 °C
Storage temperature		
in accordance with the standard	EN 60068-2-1/-2	EN 60068-2-1/-2
Temperature range	-40 - 70 °C	-40 - 70 °C
Climatic suitability		
in accordance with the standard	EN 60068-2-78	EN 60068-2-78
Humidity	93 % r. h. at 40 °C	93 % r. h. at 40 °C
Max. operating height above SL	2000 m	2000 m
EMC	EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN IEC 61000-6-4	EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN IEC 61000-6-4

Environmental data	772600	772601
Vibration		
in accordance with the standard	EN 60068-2-6	EN 60068-2-6
Frequency	10 - 55 Hz	10 - 55 Hz
Amplitude	0,35 mm	0,35 mm
Acceleration	1g	1g
Shock stress		
in accordance with the standard	EN 60068-2-27	EN 60068-2-27
Number of shocks	3	3
Acceleration	15g	15g
Duration	11 ms	11 ms
in accordance with the standard	EN 60068-2-27	EN 60068-2-27
Number of shocks	500	500
Acceleration	10g	10g
Duration	16 ms	16 ms
Airgap creepage		
in accordance with the standard	IEC 60664-1	IEC 60664-1
Overvoltage category	II	II
Pollution degree	2	2
Protection type		
in accordance with the standard	EN 60529	EN 60529
Housing	IP67 (not evaluated by UL)	IP67 (not evaluated by UL)
in accordance with UL 61010	Type 1 Indoor use only	Type 1 Indoor use only
Potential isolation	772600	772601
Potential isolation between	Input and int. bus voltage	Input and int. bus voltage
Type of potential isolation	Basic insulation	Basic insulation
Rated surge voltage	500 V	500 V
Potential isolation between	SC output and int. bus volt.	SC output and int. bus volt.
Type of potential isolation	Basic insulation	Basic insulation
Rated surge voltage	500 V	500 V
Mechanical data	772600	772601
Material		
Housing	PBT, PET, Valox 855	PBT, PET, Valox 855
Coding	PC	PC
Connection type	M12	Stainless steel 1.4305
Mounting type	screw interlocked	screw interlocked
Dimensions		
Height	162 mm	162 mm
Width	60 mm	60 mm
Depth	30 mm	30 mm
Weight	315 g	315 g

10.1 Safety characteristic data



NOTICE

You must comply with the safety characteristic data in order to achieve the required safety level for your plant/machine.

Unit	Operating mode	EN ISO 13849-1: 2023 PL	EN ISO 13849-1: 2023 Category	EN IEC 62061 SIL CL/ max. SIL	EN IEC 62061 61508 PFH _D [1/h]	EN/IEC 61511 61508 SIL	EN/IEC 61511 61508 PFD	EN ISO 13849-1: 2023 T _M [year]
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Input								
Inputs	1-channel	PL d	Cat. 2	SIL 2	3,50E-09	SIL 2	3,07E-04	20
Inputs	2-channel	PL e	Cat. 4	SIL 3	7,21E-11	SIL 3	6,26E-06	20
Output								
SC outputs (1-pole)	1-channel	PL d	Cat. 2	SIL 2	4,19E-10	SIL 2	3,58E-05	20
SC outputs (1-pole)	2-channel	PL e	Cat. 4	SIL 3	4,07E-10	SIL 3	3,49E-05	20
Bus interface								
Bus interface	All	PL e	Cat. 4	SIL 3	2,93E-10	SIL 3	1,76E-05	20

Explanatory notes for the safety-related characteristic data:

- ▶ T_M is the maximum mission time in accordance with EN ISO 13849-1. The value also applies as the retest interval in accordance with EN IEC 61508-6 and EN IEC 61511 and as the proof test interval and mission time in accordance with EN IEC 62061.

All the units used within a safety function must be considered when calculating the safety characteristic data.



INFORMATION

A safety function's SIL/PL values are **not** identical to the SIL/PL values of the units that are used and may differ from these.

11 Order reference

11.1 Order reference for module

Product type	Features	Order no.
PDP67 F 8DI4DO 5/5 ION	Decentralised input/output module, protection type IP67, connection via link module, 8 safe digital inputs, 4 safe digital outputs, 8 outputs can be configured as standard, test pulse or 24 V outputs, separate supply to the outputs	772600
PDP67 F 8DI4DO 5/5 VA ION	Decentralised input/output module, protection type IP67, connection via link module, 8 safe digital inputs, 4 safe digital outputs, 8 outputs can be configured as standard, test pulse or 24 V outputs, separate supply to the outputs, stainless steel screw connection	772601

11.2 Order reference for accessories

End caps

Product type	Features	Order no.
Caps for IP67 modules	Accessories, end caps for M12 ports on PDP67 and PSS67 devices, protection type IP67, black, PU 4 pieces.	380324

Cable

Product type	Features		Order no.
PSS SB BUS-CABLE LC	Cable, bus/power hybrid cable, PUR, yellow RAL1003, 2x0.38+2x0.24+ 1x0.38, shielded, by the metre.	1 - 100 m	311074
PSS67 I/O Cable	Cable, PUR, yellow RAL1003, 5x 0.25 mm ² , shielded, by the metre.	1 - 30 m	380320
PSS67 Cable M8sf M12sm, 3 m	Connection cable, PUR, yellow RAL1003, suitable for drag chains, 4-pin, M8 straight female connector, A-coded, M12 straight male connector, A-coded, 5x 0.25 mm ² .	3 m	380200
PSS67 Cable M8sf M12sm, 5 m	Connection cable, PUR, yellow RAL1003, suitable for drag chains, 4-pin, M8 straight female connector, A-coded, M12 straight male connector, A-coded, 5x 0.25 mm ² .	5 m	380201
PSS67 Cable M8sf M12sm, 10 m	Connection cable, PUR, yellow RAL1003, suitable for drag chains, 4-pin, M8 straight female connector, A-coded, M12 straight male connector, A-coded, 5x 0.25 mm ² .	10 m	380202
PSS67 Cable M8sf M12sm, 30 m	Connection cable, PUR, yellow RAL1003, suitable for drag chains, 4-pin, M8 straight female connector, A-coded, M12 straight male connector, A-coded, 5x 0.25 mm ² .	30 m	380203
PSS67 Cable M8af M12sm, 3m	Connection cable, PUR, yellow RAL1003, suitable for drag chains, 4-pin, M8 angled female connector, A-coded, M12 straight male connector, A-coded, 5x 0.25 mm ² .	3 m	380204

Product type	Features		Order no.
PSS67 Cable M8af M12sm, 5m	Connection cable, PUR, yellow RAL1003, suitable for drag chains, 4-pin, M8 angled female connector, A-coded, M12 straight male connector, A-coded, 5x 0.25 mm ² .	5 m	380205
PSS67 Cable M8af M12sm, 10m	Connection cable, PUR, yellow RAL1003, suitable for drag chains, 4-pin, M8 angled female connector, A-coded, M12 straight male connector, A-coded, 5x 0.25 mm ² .	10 m	380206
PSS67 Cable M8af M12sm, 30m	Connection cable, PUR, yellow RAL1003, suitable for drag chains, 4-pin, M8 angled female connector, A-coded, M12 straight male connector, A-coded, 5x 0.25 mm ² .	30 m	380207
PSS67 Cable M12sf M12sm, 3 m	Connection cable, PUR, yellow RAL1003, suitable for drag chains, 5-pin, M12 straight female connector, A-coded, M12 straight male connector, A-coded, 5x 0.25 mm ² .	3 m	380208
PSS67 Cable M12sf M12sm, 5 m	Connection cable, PUR, yellow RAL1003, suitable for drag chains, 5-pin, M12 straight female connector, A-coded, M12 straight male connector, A-coded, 5x 0.25 mm ² .	5 m	380209
PSS67 Cable M12sf M12sm, 10 m	Connection cable, PUR, yellow RAL1003, suitable for drag chains, 5-pin, M12 straight female connector, A-coded, M12 straight male connector, A-coded, 5x 0.25 mm ² .	10 m	380210
PSS67 Cable M12sf M12sm, 30 m	Connection cable, PUR, yellow RAL1003, suitable for drag chains, 5-pin, M12 straight female connector, A-coded, M12 straight male connector, A-coded, 5x 0.25 mm ² .	30 m	380211
PDP67 Cable M12-5sf M12-5sm, 0.5m	Connection cable, PUR, yellow RAL1003, suitable for drag chains, 5-pin, M12 angled female connector, A-coded, M12 angled male connector, A-coded, 5x 0.25 mm ² .	0.5 m	380710
PDP67 Cable M12-5sf M12-5sm, 1 m	Connection cable, PUR, yellow RAL1003, suitable for drag chains, 5-pin, M12 angled female connector, A-coded, M12 angled male connector, A-coded, 5x 0.25 mm ² .	1 m	380711
PDP67 Cable M12-5sf M12-5sm, 1.5 m	Connection cable, PUR, yellow RAL1003, suitable for drag chains, 5-pin, M12 angled female connector, A-coded, M12 angled male connector, A-coded, 5x 0.25 mm ² .	1.5 m	380712
PDP67 Cable M12-5sf M12-5sm, 2 m	Connection cable, PUR, yellow RAL1003, suitable for drag chains, 5-pin, M12 angled female connector, A-coded, M12 angled male connector, A-coded, 5x 0.25 mm ² .	2 m	380713
PDP67 Cable M12-5sf M12-5sm, 3 m	Connection cable, PUR, yellow RAL1003, suitable for drag chains, 5-pin, M12 angled female connector, A-coded, M12 angled male connector, A-coded, 5x 0.25 mm ² .	3 m	380212

Product type	Features		Order no.
PDP67 Cable M12-5sf M12-5sm, 5 m	Connection cable, PUR, yellow RAL1003, suitable for drag chains, 5-pin, M12 angled female connector, A-coded, M12 angled male connector, A-coded, 5x 0.25 mm ² .	5 m	380213
PDP67 Cable M12-5sf M12-5sm, 10 m	Connection cable, PUR, yellow RAL1003, suitable for drag chains, 5-pin, M12 angled female connector, A-coded, M12 angled male connector, A-coded, 5x 0.25 mm ² .	10 m	380214
PDP67 Cable M12-5sf M12-5sm, 20 m	Connection cable, PUR, yellow RAL1003, suitable for drag chains, 5-pin, M12 angled female connector, A-coded, M12 angled male connector, A-coded, 5x 0.25 mm ² .	20 m	380220
PDP67 Cable M12-5sf M12-5sm, 30 m	Connection cable, PUR, yellow RAL1003, suitable for drag chains, 5-pin, M12 angled female connector, A-coded, M12 angled male connector, A-coded, 5x 0.25 mm ² .	30 m	380215
Cable/FC/ M12-5SMX/ M12-5SFX/A/ 0.5/0Q34/BK	Field connection cable, M12 straight male connector, 5-pin, A-coded, M12 straight female connector, PUR, suitable for drag chains, 5x 0.34 mm ² .	0.5 m	C1000015
Cable/FC/ M12-5SMX/ M12-5SFX/A/ 003/0Q34/BK	Field connection cable, M12 straight male connector, 5-pin, A-coded, M12 straight female connector, PUR, suitable for drag chains, 5x 0.34 mm ² .	3 m	C1000016
Cable/FC/ M12-5SMX/ M12-5SFX/A/ 005/0Q34/BK	Field connection cable, M12 straight male connector, 5-pin, A-coded, M12 straight female connector, PUR, suitable for drag chains, 5x 0.34 mm ² .	5 m	C1000017
Cable/FC/ M12-5SMX/ M12-5SFX/A/ 010/0Q34/BK	Field connection cable, M12 straight male connector, 5-pin, A-coded, M12 straight female connector, PUR, suitable for drag chains, 5x 0.34 mm ² .	10 m	C1000018
Cable/FC/ M12-5SMX/ M12-5SFX/A/ 020/0Q34/BK	Field connection cable, M12 straight male connector, 5-pin, A-coded, M12 straight female connector, PUR, suitable for drag chains, 5x 0.34 mm ² .	20 m	C1000019
Cable/FC/ M12-5SMX/ M12-5SFX/A/ 030/0Q34/BK	Field connection cable, M12 straight male connector, 5-pin, A-coded, M12 straight female connector, PUR, suitable for drag chains, 5x 0.34 mm ² .	30 m	C1000020
Cable/FC/ M12-5AMX/ M12-5SFX/A/ 0.5/0Q34/BK	Field connection cable, M12 angled male connector, 5-pin, A-coded, M12 straight female connector, PUR, suitable for drag chains, 5x 0.34 mm ² .	0.5 m	C1000021
Cable/FC/ M12-5AMX/ M12-5SFX/A/ 003/0Q34/BK	Field connection cable, M12 angled male connector, 5-pin, A-coded, M12 straight female connector, PUR, suitable for drag chains, 5x 0.34 mm ² .	3 m	C1000022

Product type	Features		Order no.
Cable/FC/ M12-5AMX/ M12-5SFX/A/ 005/0Q34/BK	Field connection cable, M12 angled male connector, 5-pin, A-coded, M12 straight female connector, PUR, suitable for drag chains, 5× 0.34 mm ² .	5 m	C1000023
Cable/FC/ M12-5AMX/ M12-5SFX/A/ 010/0Q34/BK	Field connection cable, M12 angled male connector, 5-pin, A-coded, M12 straight female connector, PUR, suitable for drag chains, 5× 0.34 mm ² .	10 m	C1000024
Cable/FC/ M12-5AMX/ M12-5SFX/A/ 020/0Q34/BK	Field connection cable, M12 angled male connector, 5-pin, A-coded, M12 straight female connector, PUR, suitable for drag chains, 5× 0.34 mm ² .	20 m	C1000025
Cable/FC/ M12-5AMX/ M12-5SFX/A/ 030/0Q34/BK	Field connection cable, M12 angled male connector, 5-pin, A-coded, M12 straight female connector, PUR, suitable for drag chains, 5× 0.34 mm ² .	30 m	C1000026
PSEN cable M12-12sf/ M12-12sm, 1m	Connection cable, PUR, yellow RAL1003, suitable for drag chains, 12-pin, M12 straight female connector, A-coded, M12 straight male connector, A-coded, 8x 0.25 mm ² .	1 m	570357
PSEN cable M12-12sf/ M12-12sm, 2m	Connection cable, PUR, yellow RAL1003, suitable for drag chains, 12-pin, M12 straight female connector, A-coded, M12 straight male connector, A-coded, 8x 0.25 mm ² .	2 m	570358
PSEN cable M12-12sf/ M12-12sm, 3m	Connection cable, PUR, yellow RAL1003, suitable for drag chains, 12-pin, M12 straight female connector, A-coded, M12 straight male connector, A-coded, 8x 0.25 mm ² .	3 m	570359
PSEN cable M12-8sf M12-12sm, 5m	Connection cable, PUR, yellow RAL1003, suitable for drag chains, 12-pin, M12 straight female connector, A-coded, M12 straight male connector, A-coded, 8x 0.25 mm ² .	5 m	570360
PSEN cable M12-12sf/ M12-12sm, 10m	Connection cable, PUR, yellow RAL1003, suitable for drag chains, 12-pin, M12 straight female connector, A-coded, M12 straight male connector, A-coded, 8x 0.25 mm ² .	10 m	570361
PSEN cable M12-12sf/ M12-12sm, 20m	Connection cable, PUR, yellow RAL1003, suitable for drag chains, 12-pin, M12 straight female connector, A-coded, M12 straight male connector, A-coded, 8x 0.25 mm ² .	20 m	570362
PSS67 Supply Cable IN sf OUT sm, B, 0.5m	Connection cable, PUR, black RAL9005, suitable for drag chains, 5-pin, B-coded, M12 straight female connector, M12 straight male connector, 5x 0.5 mm ² .	0.5 m	380249
PSS67 Supply Cable IN sf OUT sm, B, 3 m	Connection cable, PUR, black RAL9005, suitable for drag chains, 5-pin, B-coded, M12 straight female connector, M12 straight male connector, 5x 0.5 mm ² .	3 m	380250
PSS67 Supply Cable IN sf OUT sm, B, 5m	Connection cable, PUR, black RAL9005, suitable for drag chains, 5-pin, B-coded, M12 straight female connector, M12 straight male connector, 5x 0.5 mm ² .	5 m	380251

Product type	Features		Order no.
PSS67 Supply Cable IN sf OUT sm, B, 10m	Connection cable, PUR, black RAL9005, suitable for drag chains, 5-pin, B-coded, M12 straight female connector, M12 straight male connector, 5x 0.5 mm ² .	10 m	380252
PSS67 Supply Cable IN af OUT am, B, 3m	Connection cable, PUR, black RAL9005, suitable for drag chains, 5-pin, B-coded, M12 angled female connector, M12 angled male connector, 5x 0.5 mm ² .	3 m	380253
PSS67 Supply Cable IN af OUT am, B, 5m	Connection cable, PUR, black RAL9005, suitable for drag chains, 5-pin, B-coded, M12 angled female connector, M12 angled male connector, 5x 0.5 mm ² .	5 m	380254
PSS67 Supply Cable IN af OUT am, B, 10m	Connection cable, PUR, black RAL9005, suitable for drag chains, 5-pin, B-coded, M12 angled female connector, M12 angled male connector, 5x 0.5 mm ² .	10 m	380255
PSS67 Supply Cable IN sf, B, 3m	Connection cable, PUR, black RAL9005, suitable for drag chains, 5-pin, B-coded, M12 straight female connector, open cable end	3 m	380256
PSS67 Supply Cable IN sf, B, 5m	Connection cable, PUR, black RAL9005, suitable for drag chains, 5-pin, B-coded, M12 angled female connector, M12 angled male connector, 5x 0.5 mm ² .	5 m	380257
PSS67 Supply Cable IN sf, B, 10m	Connection cable, PUR, black RAL9005, suitable for drag chains, 5-pin, B-coded, M12 angled female connector, M12 angled male connector, 5x 0.5 mm ² .	10 m	380258
PSS67 Supply Cable IN af, B, 3m	Connection cable, PUR, black RAL9005, suitable for drag chains, 5-pin, B-coded, M12 angled female connector, open cable end, 5x 0.5 mm ² .	3 m	380259
PSS67 Supply Cable IN af, B, 5m	Connection cable, PUR, black RAL9005, suitable for drag chains, 5-pin, B-coded, M12 angled female connector, open cable end, 5x 0.5 mm ² .	5 m	380260
PSS67 Supply Cable IN af, B, 10m	Connection cable, PUR, black RAL9005, suitable for drag chains, 5-pin, B-coded, M12 angled female connector, open cable end, 5x 0.5 mm ² .	10 m	380261

Adapter

Product type	Features	Order no.
PSEN ma adapter	Cable, adapter, IP68, M12 female connector, black, straight, 4-pin, A-coded on M12 male connector, black, angled, 5-pin, A-coded, PUR, 0.1 m, 4x 0.34 mm ² , black, for connecting the sensors PSENmag (safety switch)/PIT en1.0 (enabling switch) to PSS67 and PDP67.	380300
PSEN ml Y junction M12	Plug-in connector, Y-adapter, IP67, M12 male connector (X1, evaluation device), 8-pin, A-coded on M12 female connector (X3, sensor), 12-pin, A-coded and M12 female connector (X2, sensor/next plug-in connector), 8-pin, A-coded, to connect the PSENmlock series connection.	570486

Cable accessories

Product type	Features	Order no.
Stripping tool	Tool for fast and multi-stage stripping of coaxial cables, PU 1 set.	380070
PSS67 M12 connector, straight, male, 5pole	Plug-in connector, 5-pin, M12 straight male connector, A-coded, screw connection, material ring nut: CuZn nickel-plated, outer cable diameter: 4-6 mm.	380308
PSS67 M12 connector, straight, female, 5pole	Plug-in connector, 5-pin, M12 straight female connector, A-coded, screw connection, material ring nut: CuZn nickel-plated, outer cable diameter: 4-6 mm.	380309
PSS67 M12 connector, angled, male, 5pole	Plug-in connector, 5-pin, M12 angled male connector, A-coded, screw connection, material ring nut: CuZn nickel-plated, outer cable diameter: 4-6 mm.	380310
PSS67 M12 connector, angled, female, 5pole	Plug-in connector, 5-pin, M12 angled female connector, A-coded, screw connection, material ring nut: CuZn nickel-plated, outer cable diameter: 4-6 mm.	380311
PSS67 M12 connector, straight, male, 5pole. B	Plug-in connector, 5-pin, M12 straight male connector, B-coded, screw connection, material ring nut: CuZn nickel-plated, outer cable diameter: 4-6 mm.	380312
PSS67 M12 connector, straight, female, 5pole. B	Plug-in connector, 5-pin, M12 straight female connector, B-coded, screw connection, material ring nut: CuZn nickel-plated, outer cable diameter: 4-6 mm.	380313
PSS67 M12 connector, angled, male, 5pole. B	Plug-in connector, 5-pin, M12 angled male connector, B-coded, screw connection, material ring nut: CuZn nickel-plated, outer cable diameter: 4-6 mm.	380314
PSS67 M12 connector, angled, female, 5pole. B	Plug-in connector, 5-pin, M12 angled female connector, B-coded, screw connection, material ring nut: CuZn nickel-plated, outer cable diameter: 4-6 mm.	380315

12 **EC declaration of conformity**

This product/these products meet the requirements of the directive 2006/42/EC on machinery of the European Parliament and of the Council. The complete EC Declaration of Conformity is available on the Internet at www.pilz.com/downloads.

Representative: Pilz GmbH & Co. KG, Felix-Wankel-Str. 2, 73760 Ostfildern, Germany

13 UKCA-Declaration of Conformity

This product(s) complies with following UK legislation: Supply of Machinery (Safety) Regulation 2008.

The complete UKCA Declaration of Conformity is available on the Internet at www.pilz.com/downloads.

Representative: Pilz Automation Technology, Pilz House, Little Colliers Field, Corby, Northamptonshire, NN18 8TJ United Kingdom, eMail: mail@pilz.co.uk

Support

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1006985-EN-02, 2025-08 Printed in Germany
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