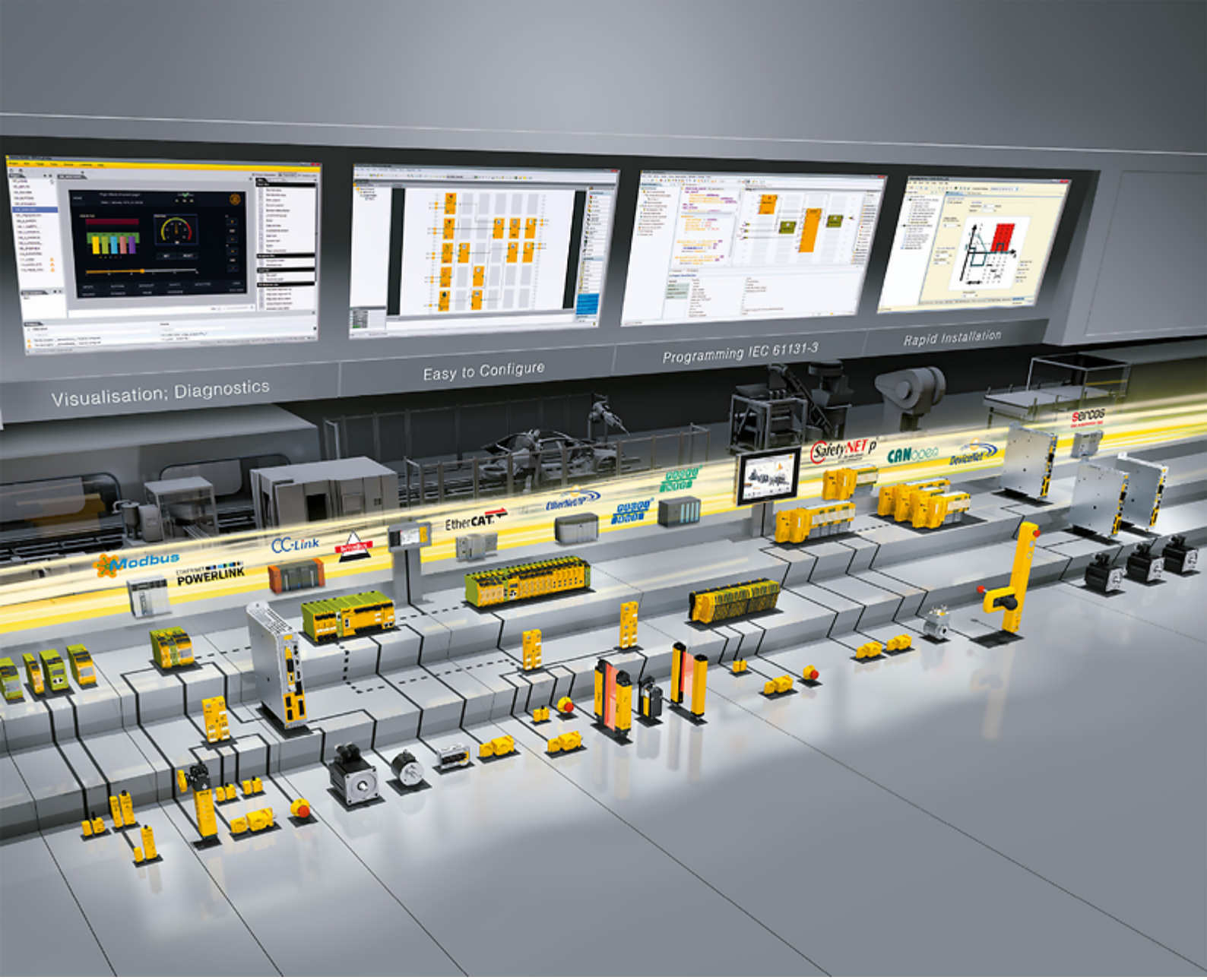


PNOZ mi2p

PILZ
THE SPIRIT OF SAFETY

- Configurable, safe small controllers PNOZmulti Classic

Operating Manual-21135-EN-04

1 Introduction

1.1 Validity of documentation

This documentation is valid for the product PNOZ mi2p. 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

- Expansion module PNOZ mi2p
- Jumper

2.2 Unit features

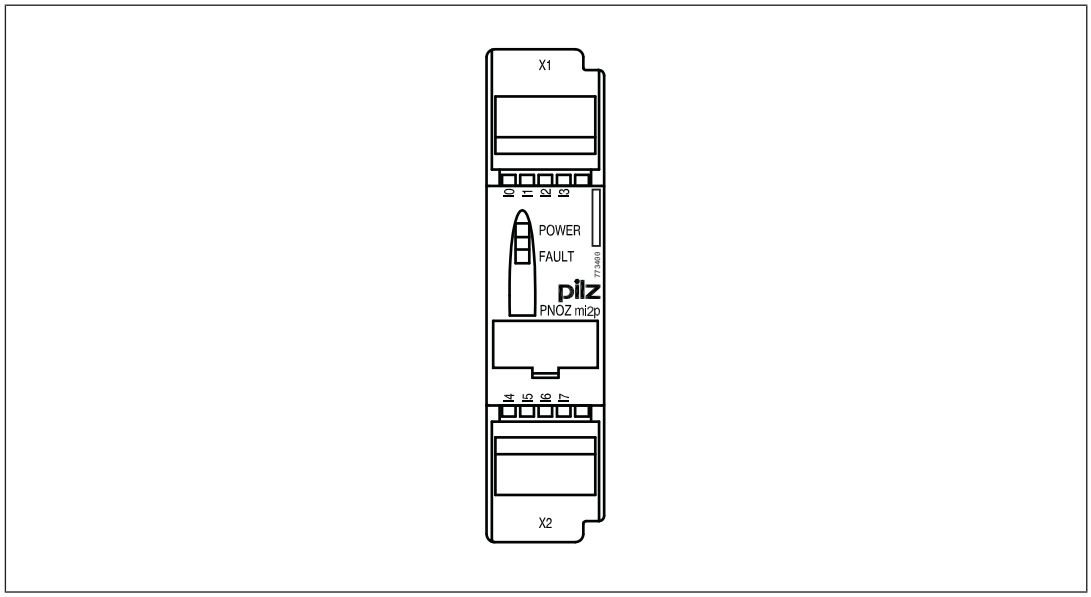
Application of the product PNOZ mi2p:

Expansion module for connection to a base unit from the PNOZmulti system.

The product has the following features:

- 8 inputs for standard functions
- Can be configured in the PNOZmulti Configurator
- LED indicator for:
  - Status of PNOZmulti
- Max. 8 PNOZ mi2p can be connected to the base unit
- Plug-in connection terminals:
  Either spring-loaded terminal or screw terminal available as an accessory (see Order references for accessories).
- Please refer to the document "PNOZmulti System Expansion" for the PNOZmulti base units that can be connected.

2.3 Front view



Legend:

- Inputs I0 – I7

3 Safety

3.1 Intended use

The expansion module may only be connected to a base unit from the configurable system PNOZmulti (please refer to the document "PNOZmulti System Expansion" for details of the base units that can be connected).

The configurable system PNOZmulti is used for the safety-related interruption of safety circuits and is designed for use in:

- Emergency stop equipment
- Safety circuits in accordance with VDE 0113 Part 1 and EN 60204-1

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 manual,
- Use of the product outside the technical details (see Technical details [📖 15]).

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.

3.2 System requirements

Please refer to the "Product Modifications PNOZmulti" document in the "Version overview" section for details of which versions of the base unit and PNOZmulti Configurator can be used for this product.

3.3 Safety regulations

3.3.1 Use of qualified personnel

The products may only be assembled, installed, programmed, commissioned, operated, maintained and decommissioned by competent persons.

A competent person is someone who, because of their training, experience and current professional activity, has the specialist knowledge required to test, assess and operate the work equipment, devices, systems, plant and machinery in accordance with the general standards and guidelines for safety technology.

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 this description under "Safety",
- And have a good knowledge of the generic and specialist standards applicable to the specific application.

3.3.2 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,
- Operating personnel are not suitably qualified,
- Any type of modification has been made (e.g. exchanging components on the PCB boards, soldering work etc.).

3.3.3 Disposal

- When decommissioning, please comply with local regulations regarding the disposal of electronic devices (e.g. Electrical and Electronic Equipment Act).

3.3.4 For your safety

The unit meets all the necessary conditions for safe operation. However, you should always ensure that the following safety requirements are met:

- This operating manual only describes the basic functions of the unit. The expanded functions are described in the PNOZmulti Configurator's online help. Only use these functions once you have read and understood the documentations.
- Do not open the housing or make any unauthorised modifications.
- Please make sure you shut down the supply voltage when performing maintenance work (e.g. exchanging contactors).

4 Function description

4.1 Functions

The expansion module provides additional inputs.

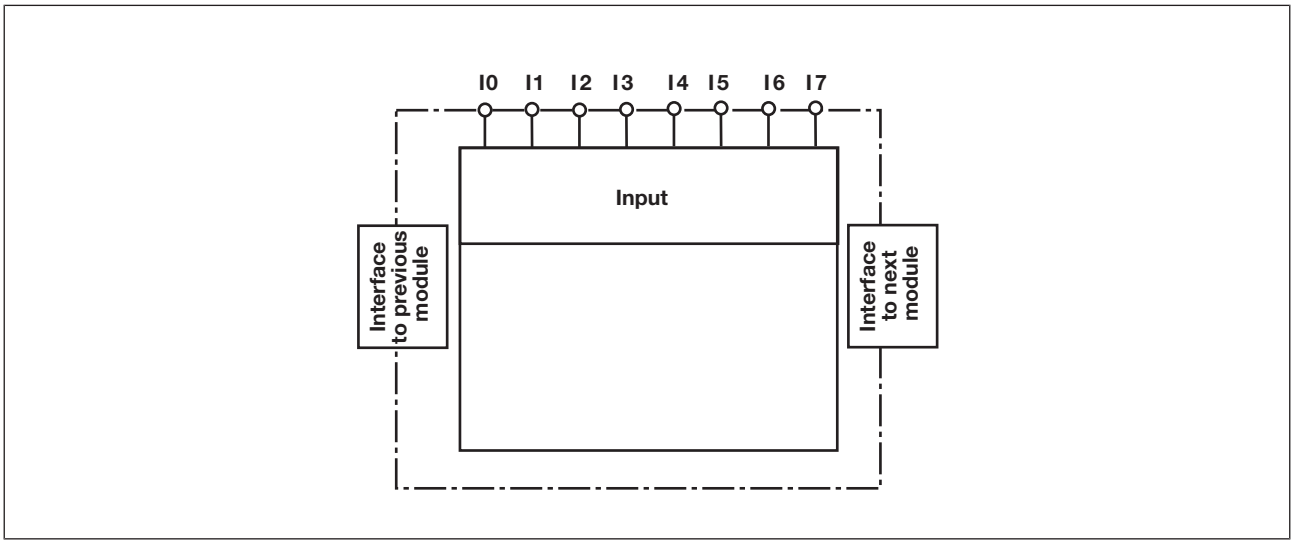
The function of the inputs on the safety system depends on the safety circuit created using the PNOZmulti Configurator. A removable data medium is used to download the safety circuit to the base unit. The base unit has 2 microcontrollers that monitor each other. They evaluate the input circuits on the base unit and expansion modules and switch the outputs on the base unit and expansion modules accordingly.

The online help on the PNOZmulti Configurator contains descriptions of the operating modes and all the functions of the PNOZmulti safety system, plus connection examples.

4.2 System reaction time

Calculation of the maximum reaction time between an input switching off and a linked output in the system switching off is described in the document "PNOZmulti System Expansion".

4.3 Block diagram



5 Installation

5.1 General installation guidelines

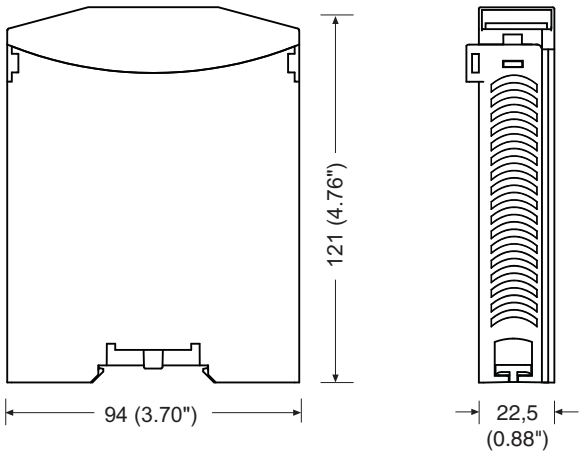
- The control system should be installed in a control cabinet with a protection type of at least IP54. Fit the control system to a horizontal mounting rail. The venting slots must face upward and downward. Other mounting positions could destroy the control system.
- Use the locking elements on the rear of the unit to attach it to a mounting rail. Connect the control system to the mounting rail in an upright position, so that the earthing springs on the control system are pressed on to the mounting rail.
- The ambient temperature of the devices in the control cabinet must not exceed the figure stated in the technical details. Air conditioning may otherwise be required.
- To comply with EMC requirements, the mounting rail must have a low impedance connection to the control cabinet housing.

NOTICE

Damage due to electrostatic discharge!

Electrostatic discharge can damage components. Ensure against discharge before touching the product, e.g. by touching an earthed, conductive surface or by wearing an earthed armband.

5.2 Dimensions in mm



5.3 Connecting the base unit and expansion modules

Connect the base unit and the expansion modules as described in the operating manuals for the base modules.

- The terminator must be fitted to the last expansion module
- Install the expansion module in the position configured in the PNOZmulti Configurator.

The position of the expansion modules is defined in the PNOZmulti Configurator. The expansion modules are connected to the left or right of the base unit, depending on the type.

Please refer to the document "PNOZmulti System Expansion" for details of the number of modules that can be connected to the base unit and the module types.

6 Commissioning

6.1 General wiring guidelines

The wiring is defined in the circuit diagram of the PNOZmulti Configurator.

Please note:

- Information given in the Technical details [15] must be followed.
- The position of the expansion module is specified in the Hardware configuration of the PNOZmulti Configurator.
- Use copper wiring with a temperature stability of 75 °C.
- The safety system and input circuits must always be supplied by a single power supply. The power supply must meet the regulations for extra low voltages with protective separation.

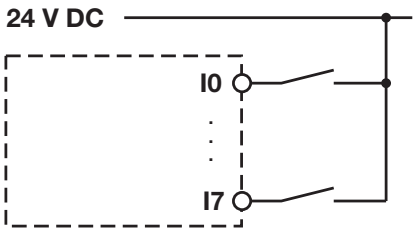
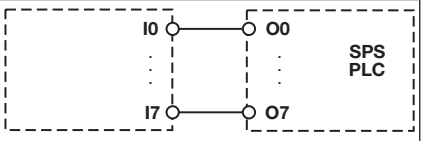
6.2 Download modified project to the PNOZmulti system

As soon as an additional expansion module has been connected to the system, the project must be amended in the PNOZmulti Configurator and downloaded back into the base unit. Proceed as described in the operating manual for the base unit.

NOTICE

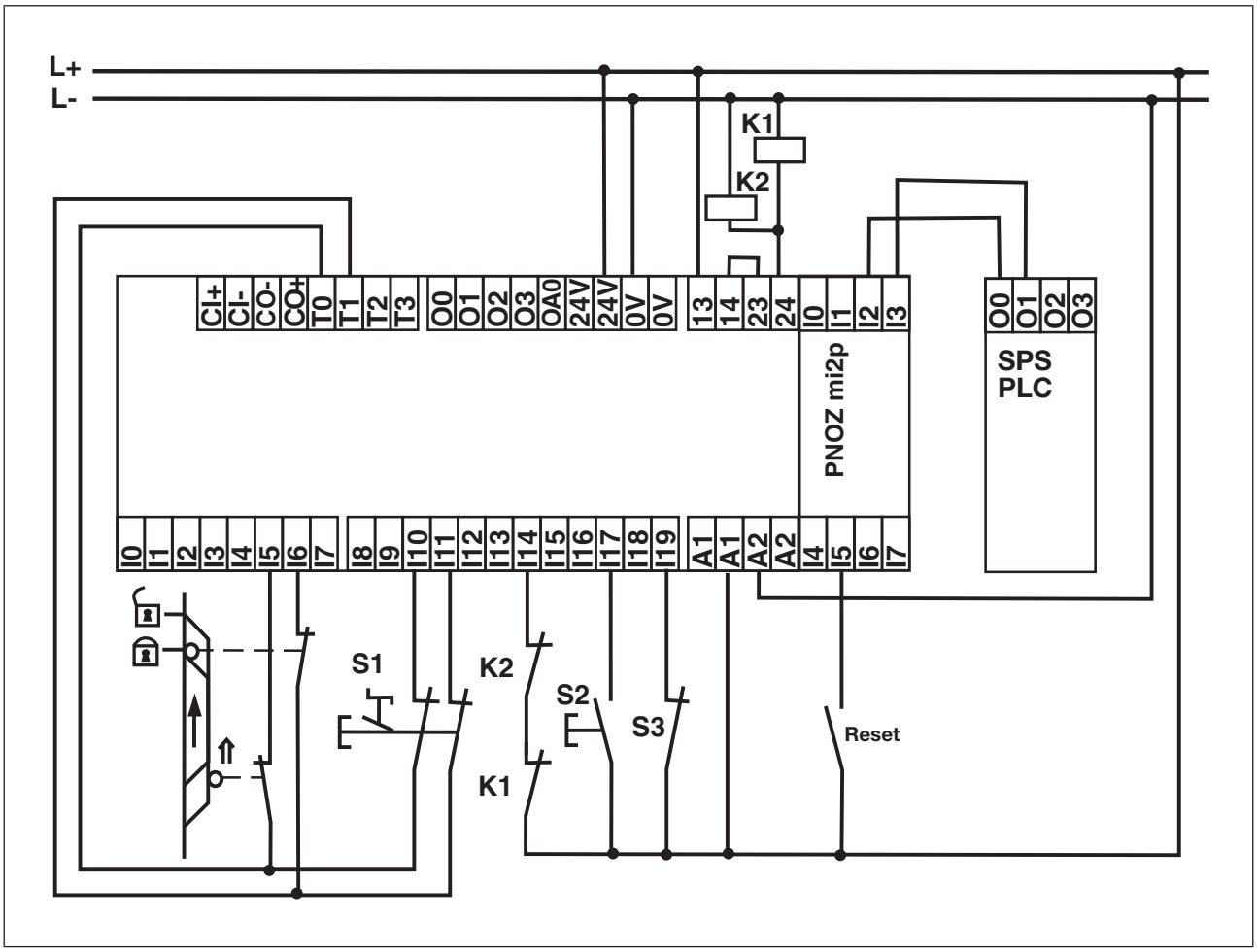
For the commissioning and after every user program change, you must check whether the safety devices are functioning correctly.

6.3 Connection

Input circuit	Contact	Semiconductor
Not safety-related		

6.4 Connection example

Poll of PLC outputs (standard function)



7 Operation

When the supply voltage is switched on, the PNOZmulti copies the configuration from the chip card.

The PNOZmulti system is ready for operation when the "POWER" and "RUN" LEDs on the base unit are lit continuously.

Status indicators:

"**I0**" ... "**I7**" lights: Input I0 ... I7 carries a high signal

"**I0**" ... "**I7**" off: Input I0 ... I7 carries a low signal

7.1 Messages

Legend

 LED on

 LED flashes

● LED off

Base unit						PNOZ mi2p	Error
In-put Ix	RUN	DIAG	FAULT	IFAULT	OFAULT	FAULT	
	●						Internal error on the expansion module

8 Technical details

General	
Certifications	**BG, CCC, CE, EAC (Eurasian), KOSHA, TÜV, cU-Lus Listed**
Electrical data	
Supply voltage	
for	**Module supply**
internal	**Via base unit**
Voltage	**5 V**
Kind	**DC**
Voltage tolerance	**-2 %/+2 %**
Power consumption	**2,5 W**
Status indicator	**LED**
Inputs	
Number	**8**
Signal level at "0"	**-3 - +5 V DC**
Signal level at "1"	**15 - 30 V DC**
Input voltage in accordance with EN 61131-2 Type 1	**24 V DC**
Min. pulse duration	**18 ms**
Pulse suppression	**0,6 ms**
Potential isolation	**No**
Times	
Switch-on delay	**5 s**
Supply interruption before de-energisation	**20 ms**
Simultaneity, channel 1 and 2 max.	**3 s**
Simultaneity in the two-hand circuit	**0,5 s**
Environmental data	
Ambient temperature	
In accordance with the standard	**EN 60068-2-14**
Temperature range	**0 - 60 °C**
Forced convection in control cabinet off	**55 °C**
Max. temperature in accordance with UL	**0 - 55 °C**
Storage temperature	
In accordance with the standard	**EN 60068-2-1/-2**
Temperature range	**-25 - 70 °C**
Climatic suitability	
In accordance with the standard	**EN 60068-2-30, EN 60068-2-78**
Humidity	**93 % r. h. at 40 °C**
Condensation during operation	**Not permitted**
Max. operating height above sea level	**2000 m**
EMC	**EN 61131-2**

Environmental data	
Vibration	
In accordance with the standard	**EN 60068-2-6**
Frequency	**10 - 150 Hz**
Acceleration	**1g**
Shock stress	
In accordance with the standard	**EN 60068-2-27**
Acceleration	**15g**
Duration	**11 ms**
Airgap creepage	
In accordance with the standard	**EN 61131-2**
Overvoltage category	**III**
Pollution degree	**2**
Rated insulation voltage	**30 V**
Protection type	
In accordance with the standard	**EN 60529**
Housing	**IP20**
Terminals	**IP20**
Mounting area (e.g. control cabinet)	**IP54**
Mechanical data	
Mounting position	**horizontally on mounting rail**
DIN rail	
Top hat rail	**35 x 7,5 EN 50022**
Recess width	**27 mm**
Max. cable length	
Max. cable length per input	**1 km**
Material	
Bottom	**PPO UL 94 V0**
Front	**ABS UL 94 V0**
Connection type	**Spring-loaded terminal, screw terminal**
Conductor cross section with screw terminals	
1 core flexible	**0,25 - 1,5 mm², 24 - 16 AWG**
2 core with the same cross section, flexible without crimp connectors or with TWIN crimp connectors	**0,25 - 0,75 mm², 24 - 20 AWG**
Torque setting with screw terminals	**0,25 Nm**
Stripping length with screw terminals	**7 mm**
Conductor cross section with spring-loaded terminals	
1 core flexible without crimp connector	**0,25 - 1,5 mm², 24 - 16 AWG**
1 core flexible with crimp connector	**0,25 - 0,75 mm², 24 - 20 AWG**
Spring-loaded terminals: Terminal points per connection	**1**
Stripping length with spring-loaded terminals	**9 mm**
Dimensions	
Height	**94 mm**
Width	**22,5 mm**
Depth	**121 mm**

Mechanical data	
Weight	**119 g**

Where standards are undated, the 2020-07 latest editions shall apply.

9 Order reference

9.1 Product

Product type	Features	Order No.
PNOZ mi2p	8 standard inputs	773 410

9.2 Accessories

Connection terminals

Product type	Features	Order No.
Set spring terminals	1 set of spring-loaded terminals	783 400
Set screw terminals	1 set of screw terminals	793 400

Terminator, jumper

Product type	Features	Order no.
PNOZmulti bus terminator	Terminator	779 110
KOP-XE	Jumper	774 639

Support

Technical support is available from Pilz round the clock.

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