

PZE 9P



Operating Manual-1003288-EN-15

- Safety relays









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.

All rights to this documentation are reserved by Pilz GmbH & Co. KG. Copies may be made for the user's internal purposes. Suggestions and comments for improving this documentation will be gratefully received.

Pilz®, PIT®, PMI®, PNOZ®, Primo®, PSEN®, PSS®, PVIS®, SafetyBUS p®, SafetyEYE®, SafetyNET p®, the spirit of safety® are registered and protected trademarks of Pilz GmbH & Co. KG in some countries.



Introduction	5
Validity of documentation	5
Using the documentation	5
Definition of symbols	
•	
Safety	6
Intended use	
Safety regulations	
Safety assessment	
Use of qualified personnel	
Warranty and liability	
Disposal	
For your safety	7
Unit features	8
Safety features	8
Block diagram/terminal configuration	8
Type: 24 V AC/DC	
Type: 24 - 240 V AC/DC	9
Provident describition	_
Function description	9
	_
Installation	9
Wiring	10
Preparing for operation	10
Operation	11
Status indicators	
Faults – Interference	12
Dimensions in mm	12
Difference in filling	12
Tankwinal dataila	
Technical details	
Safety characteristic data	24
Supplementary data	
Service life graph	25

Remove plug-in terminals	26
Order reference	26
EC declaration of conformity	26
UKCA-Declaration of Conformity	27

Introduction

Validity of documentation

This documentation is valid for the product PZE 9P. 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.

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.

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 fea-

Safety

Intended use

The contact expansion module PZE 9P meets the requirements of EN 60947-5-1 and EN 60204-1. It is an expansion module for increasing the number of contacts available on a base unit. Base units are all

- ▶ Safety relays with feedback loop
- programmable safety systems with feedback loop

The max. achievable safety level depends on the base unit. The expansion module may not exceed this. The safety-related characteristic values stated under safety-related characteristic data [24] can only be achieved if the base unit also exhibits these safety characteristic values.

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 [☐ 13]).



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.

Safety regulations

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.

Use of qualified personnel

The products may only be assembled, installed, programmed, commissioned, operated, maintained and decommissioned 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. To be able to inspect, assess and operate devices, systems and machines, the person has to be informed of 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.

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.).

Disposal

- ▶ In safety-related applications, please comply with the mission time T_M 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).

For your safety

The unit meets all the necessary conditions for safe operation. However, please note the following:

Note for overvoltage category III: If voltages higher than low voltage (>50 VAC or >120 VDC) are present on the unit, connected control elements and sensors must have a rated insulation voltage of at least 250 V.

Unit features

- ▶ Positive-guided relay outputs:
 - 8 safety contacts (N/O), instantaneous
 - 1 auxiliary contact (N/C), instantaneous
- LED display for:
 - Supply voltage
 - Switch status of the safety contacts
- ▶ Connection for feedback loop
- ▶ Operation: Single or dual-channel
- ▶ Plug-in connection terminals (either spring-loaded terminal or screw terminal)
- ▶ See order reference for unit types

Safety features

The unit meets the following safety requirements:

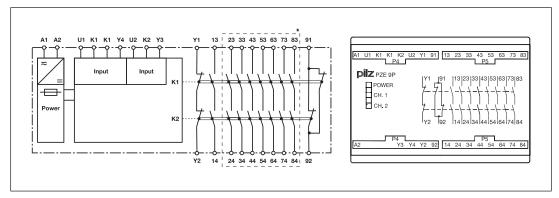
- ▶ The contact expansion module expands an existing circuit. As the output relays are monitored via the base unit's feedback loop, the safety functions on the existing circuit are transferred to the contact expandsion module.
- ▶ The safety function remains effective in the case of a component failure.
- Earth fault in the feedback loop: Detected, depending on the base unit that is used.
- ▶ Earth fault in the input circuit:

 The output relays de-energise and the safety contacts open.

Block diagram/terminal configuration

Type: 24 V AC/DC

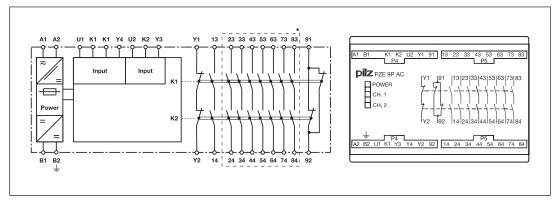
▶ U_B: 24 VAC/DC; Order no. 777140, 787140



*Safe separation from non-marked area, except for safety contact 13-14, in accordance with EN 60947-1, 6 kV, basic insulation between all safety contacts.

Type: 24 - 240 V AC/DC

▶ U_B: 24 - 240 VAC/DC, 24 VAC/DC; Order no. 777148, 787148



^{*}Safe separation from non-marked area, except for safety contact 13-14, in accordance with EN 60947-1, 6 kV, basic insulation between all safety contacts.

Function description

The contact expansion module PZE 9P is an add-on device without delay-on de-energisation. It is used to expand a safety circuit. The contact expansion module is driven by a base unit (e. g. emergency stop relay). When operating voltage is supplied the "POWER" LED will light.

- ▶ Functional procedure once the input circuit is closed (e.g. safety contacts on the base unit are closed):
 - Safety contacts 13-14, 23-24, 33-34, 43-44, 53-54, 63-64, 73-74 and 83-84 close, auxiliary contact 91-92 opens.
 - The LEDs "CH.1" and "CH.2" are lit.
- ▶ Functional procedure once the input circuit is opened (e.g. safety contacts on the base unit are opened):
 - Safety contacts 13-14, 23-24, 33-34, 43-44, 53-54, 63-64, 73-74 and 83-84 are opened redundantly, auxiliary contact 91-92 is closed.
 - The LEDs "CH.1" and "CH.2" go out.

Installation

- ▶ The unit should be installed in a control cabinet with a protection type of at least IP54.
- ▶ Use the notch on the rear of the unit to attach it to a DIN rail (35 mm).
- ▶ When installed vertically: Secure the unit by using a fixing element (e.g. retaining bracket or end angle).

Wiring

Please note:

- ▶ Information given in the "Technical details [☐ 13]" must be followed.
- ▶ Outputs 13-14, 23-24, 33-34, 43-44, 53-54, 63-64, 73-74, 83-84 are safety contacts; output 91-92 is an auxiliary contact (e.g. for display).
- Do not use auxiliary contact 91-92 for safety circuits!
- Do not connect undesignated terminals.
- ▶ To prevent contact welding, a fuse should be connected before the output contacts (see Technical details [☐ 13]).
- ▶ Calculation of the max. cable length I_{max} in the input circuit:

$$I_{max} = \frac{R_{lmax}}{R_{l} / km}$$

 R_{lmax} = max. overall cable resistance (see Technical details [13]) R_{l} / km = cable resistance/km

- ▶ Use copper wiring with a temperature stability of 60/75 °C.
- ▶ To prevent EMC interferences (particularly common-mode interferences) the measures described in EN 60204-1 must be executed. This includes the separate routing of cables of the control circuits (input, start and feedback loop) from other cables for energy transmission or the shielding of cables, for example.
- Adequate protection must be provided on all output contacts with capacitive and inductive loads
- Do not switch low currents using contacts that have been used previously with high currents.
- ▶ 777140, 787140 units or 777148, 787148 units, when the supply voltage is connected via B1 and B2: The power supply must meet the regulations for extra low voltages with protective electrical separation (SELV, PELV).

Preparing for operation

Supply voltage	24 - 240 V AC/DC	24 VAC/DC
Order no.: 777148, 787148	A1 \$\documents \text{L1} \text{A2 \$\documents \text{N}} \text{N}	B1 \$\dots \text{L1/L+}
	 FE	B2 0 N/L-
Order no.: 777140, 787140		A1 \$\(\frac{1}{2}\)
		A2 0 N/L-

Input circuit	Single-channel	Dual-channel
without detection of shorts across contacts Base unit: Safety relay PNOZ X Driven via safety contacts	K1 U1 K2 O U2 O Y3 V4 PZE	→ K1 → U1 → K2 → U2 → Y3 → Y4 → PZE
with detection of shorts across contacts Base unit: Safety relay PNOZ X Driven via safety contacts		→ K1 → U1 → K2 → U2 → Y3 → Y4 → PZE
without detection of shorts across contacts Base unit: Safety system or PNOZmulti Driven via safe semiconductor outputs (24 VDC)	010 K1 U1 V K2 V V V V V V V V V V V V V V V V V	01 0 K1 U1 U1 U2
Feedback loop	Base unit: Safety relay PNOZ X	Base unit: Safety system or PNOZmulti
Y1, Y2 and Input are inputs on the base unit; they evaluate the feedback loop	Y1 0 Y1 Y2 PZE	24 V DC

Operation

When the relay outputs are switched on, the mechanical contact on the relay cannot be tested automatically. Depending on the operational environment, measures to detect the non-opening of switching elements may be required under some circumstances.

When the product is used in accordance with the European Machinery Directive, a check must be carried out to ensure that the safety contacts on the relay outputs open correctly. Open the safety contacts of the contact expansion module (switch off outputs of the base unit) and start the base unit again so that the internal diagnostics can check that the safety contacts open correctly

- ▶ for SIL CL 3/PL e at least 1x per month
- ▶ for SIL CL 2/PL d at least 1x per year



NOTICE

The safety functions should be checked after initial commissioning and each time the plant/machine is changed. The safety functions may only be checked by qualified personnel.

Status indicators

LEDs indicate the status and errors during operation:

_____ LED on

POWER

Supply voltage is present.

CH.1
Safety contacts of channel 1 are closed.

Safety contacts of channel 2 are closed.

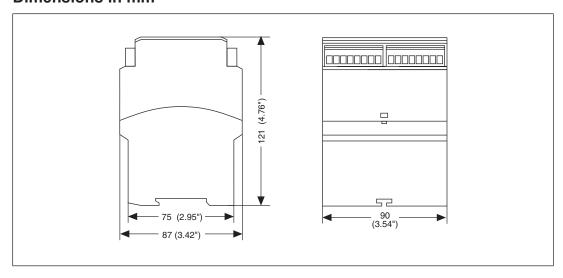
Faults – Interference

By closing or interrupting the input circuit you can check whether the unit switches on or off correctly.

For safety reasons, the unit cannot be started if the following faults are present:

- Contact malfunction: As the contact block is connected to a base unit, reactivation will not be possible if the contacts have welded after the input circuit has opened.
- Den circuit, short circuit or earth fault (e.g. in the input circuit)

Dimensions in mm



Technical details

Order no. 777140 - 787140

See below for more order numbers

General	777140	787140
	CCC, CE, EAC, TÜV, UKCA,	CCC, CE, EAC, TÜV, UKCA,
Certifications	cULus Listed	cULus Listed
Electrical data	777140	787140
Supply voltage		
Voltage	24 V	24 V
Kind	AC/DC	AC/DC
Voltage tolerance	-15 %/+10 %	-15 %/+10 %
Output of external power supply (AC)	9,5 VA	9,5 VA
Output of external power supply (DC)	3,5 W	3,5 W
Frequency range AC	50 - 60 Hz	50 - 60 Hz
Residual ripple DC	160 %	160 %
Duty cycle	100 %	100 %
Inputs	777140	787140
Quantity	2	2
Voltage at		
Input circuit DC	24 V	24 V
Current at		
Input circuit DC	40 mA	40 mA
Max. overall cable resistance RI- max		
Single-channel at UB DC	50 Ohm	50 Ohm
Single-channel at UB AC	80 Ohm	80 Ohm
Dual-channel without detection of shorts across contacts at UB DC	100 Ohm	100 Ohm
Dual-channel without detection of shorts across contacts at UB AC	160 Ohm	160 Ohm
Dual-channel with detection of shorts across contacts at UB DC	5 Ohm	5 Ohm
Dual-channel with detection of shorts across contacts at UB AC	10 Ohm	10 Ohm
Relay outputs	777140	787140
Number of output contacts		
Safety contacts (N/O), instant-		
aneous	8	8
Auxiliary contacts (N/C)	1	1
Max. short circuit current IK	1 kA	1 kA

Relay outputs	777140	787140
Utilisation category		
in accordance with the standard	EN 60947-4-1	EN 60947-4-1
Utilisation category of safety con-		
tacts		
AC1 at	240 V	240 V
Min. current	0,01 A	0,01 A
Max. current	8 A	8 A
Max. power	2000 VA	2000 VA
DC1 at	24 V	24 V
Min. current	0,01 A	0,01 A
Max. current	8 A	8 A
Max. power	200 W	200 W
Utilisation category of auxiliary con-	-	
tacts	0.40.1/	0.40.1/
AC1 at	240 V	240 V
Min. current	0,01 A	0,01 A
Max. current	2 A	2 A
Max. power	500 VA	500 VA
DC1 at	24 V	24 V
Min. current	0,01 A	0,01 A
Max. current	2 A	2 A
Max. power	50 W	50 W
Utilisation category		
in accordance with the standard	EN 60947-5-1	EN 60947-5-1
Utilisation category of safety contacts		
AC15 at	230 V	230 V
Max. current	5 A	5 A
DC13 (6 cycles/min) at	24 V	24 V
Max. current	7 A	7 A
Utilisation category of auxiliary contacts	-	
AC15 at	230 V	230 V
Max. current	2 A	2 A
DC13 (6 cycles/min) at	24 V	24 V
Max. current	2 A	2 A
Utilisation category in accordance with UL		
Voltage	240 V AC G. P.	240 V AC G. P.
with current	8 A	8 A
Voltage	24 V DC G. P. Resistive	24 V DC G. P. Resistive
with current	5 A	5 A
Pilot Duty	B300, R300	B300, R300

Relay outputs	777140	787140
External contact fuse protection, safety contacts		
in accordance with the standard	EN 60947-5-1	EN 60947-5-1
Max. melting integral	240 A ² s	240 A ² s
Blow-out fuse, quick	10 A	10 A
Blow-out fuse, slow	6 A	6 A
Blow-out fuse, gG	10 A	10 A
Circuit breaker 24V AC/DC, characteristic B/C	6 A	6 A
External contact fuse protection, auxiliary contacts		
Max. melting integral	240 A²s	240 A²s
Blow-out fuse, quick	4 A	4 A
Blow-out fuse, slow	2 A	2 A
Blow-out fuse, gG	4 A	4 A
Circuit breaker, 24 V AC/DC, characteristic B/C	2 A	2 A
Contact material	AgSnO2 + 0,2 μm Au	AgSnO2 + 0,2 μm Au
Conventional thermal current	777140	787140
while loading several contacts		
Ith per contact at UB AC; AC1: 240 V, DC1: 24 V		
Conv. therm. current with 1 contact	8 A	8 A
Conv. therm. current with 2 contacts	8 A	8 A
Conv. therm. current with 3 contacts	8 A	8 A
Conv. therm. current with 4 contacts	7,1 A	7,1 A
Conv. therm. current with 5 contacts	6,3 A	6,3 A
Conv. therm. current with 6 contacts	5,8 A	5,8 A
Conv. therm. current with 7 contacts	5,4 A	5,4 A
Conv. therm. current with 8 contacts	5 A	5 A

Conventional thermal current	777140	787140
while loading several contacts		
Ith per contact at UB DC; AC1: 240 V, DC1: 24 V		
Conv. therm. current with 1 contact	8 A	8 A
Conv. therm. current with 2 contacts	8 A	8 A
Conv. therm. current with 3 contacts	8 A	8 A
Conv. therm. current with 4 contacts	7,1 A	7,1 A
Conv. therm. current with 5 contacts	6,3 A	6,3 A
Conv. therm. current with 6 contacts	5,8 A	5,8 A
Conv. therm. current with 7 contacts	5,4 A	5,4 A
Conv. therm. current with 8 contacts	5 A	5 A
Times	777140	787140
Switch-on delay		
with automatic start typ.	30 ms	30 ms
with automatic start max.	40 ms	40 ms
with automatic start after power		
on typ.	30 ms	30 ms
with automatic start after power on max.	40 ms	40 ms
Delay-on de-energisation		
with E-STOP typ.	20 ms	20 ms
with E-STOP max.	30 ms	30 ms
with power failure typ.	110 ms	110 ms
with power failure max.	200 ms	200 ms
Supply interruption before de-ener-		
gisation in the input circuit	10 ms	10 ms
Supply interruption before de-energisation	20 ms	20 ms
Environmental data	777140	787140
Climatic suitability	EN 60068-2-78	EN 60068-2-78
Ambient temperature		
Temperature range	-10 - 55 °C	-10 - 55 °C
Storage temperature		
Temperature range	-40 - 85 °C	-40 - 85 °C
Climatic suitability		
Humidity	93 % r. h. at 40 °C	93 % r. h. at 40 °C
Condensation during operation	Not permitted	Not permitted
EMC	EN 60947-5-1, EN 61000-6-2, EN 61326-3-1	EN 60947-5-1, EN 61000-6-2, EN 61326-3-1

Vibration	Environmental data	777140	787140
in accordance with the standard Frequency	Vibration		
Frequency Amplitude	in accordance with the standard	EN 60068-2-6	EN 60068-2-6
Amplitude 0,35 mm 0,35 mm Airgap creepage in accordance with the standard Overvoltage category III III III Pollution degree 2 2 2 Rated insulation voltage 50 V 250 V Rated impulse withstand voltage 6 kV 6 kV Protection type Housing IP40 IP40 Terminals IP20 IP20 Mounting area (e.g. control cabinet) Inet 10,000,000 cycles I10,000,000 cycles Mechanical data 777140 787140 Mounting position Any Any Any Mechanical life 10,000,000 cycles 10,000,000 cycles Material Bottom PPO UL 94 V1 PPO UL 94 V1 Front ABS UL 94 V0 ABS UL 94 V0 Top PPO UL 94 V1 PPO UL 94 V1 Connection type Screw terminal Screw terminals 1 core flexible 0,25 - 2,5 mm², 24 - 12 AWG - 2 core with the same cross section, flexible with crimp connectors, no plastic sleeve 2 core with the same cross section, flexible with crimp connectors or with TWIN crimp connector or coss section with screw terminals 0,5 Nm Stripping length with screw terminals: Terminals Spring-loaded terminals: T			
Airgap creepage in accordance with the standard Overvoltage category Pollution degree 2 Rated insulation voltage 250 V 250 V Rated impulse withstand voltage 6 kV 6 kV Protection type Housing IP40 IP40 Terminals IP20 IP20 Mounting area (e.g. control cabinet) Inet) IP54 Mechanical data 777140 787140 Mounting position Any Any Mechanical life 10,000,000 cycles 10,000,000 cycles Material Bottom PP0 UL 94 V1 PP0 UL 94 V1 Front ABS UL 94 V0 ABS UL 94 V0 Top PPO UL 94 V1 PPO UL 94 V1 Connection type PPO UL 94 V1 PPO UL 94 V1 Connection type Screw terminal Plug-in plug-in Conductor cross section with screw terminals 1 core flexible 2 core with the same cross section, flexible with crimp connectors or with TWIN crimp connectors Conductor cross section with screw terminals 1 core glexible with screw terminals 0,5 Nm - Conductor cross section with screw terminals 0,2 - 1,5 mm², 24 - 16 AWG - 2 core with the same cross section, flexible with screw terminals 0,5 Nm - Conductor cross section with screw terminals 0,5 Nm - Conductor cross section with screw terminals 1 core plug-in - Conductor cross section with screw terminals 0,5 Nm - Core setting with screw terminals 0,5 Nm - Core setting with screw terminals 1 core plug-in - Conductor cross section with screw terminals 0,5 Nm - Core setting with screw terminals 1 core plug-in - Conductor cross section with screw terminals 1 core plug-in - Core setting with screw terminals 1 core plug-in - Core setting with screw terminals 1 core plug-in - Core setting with screw terminals 1 core plug-in - Core setting with screw terminals 1 core plug-in - Core setting with screw terminals 1 core plug-in - Cor			
in accordance with the standard Overvoltage category III III IIII Pollution degree 2 2 2 Rated insulation voltage 250 V 250 V Rated impulse withstand voltage 6 kV 6 kV Protection type Housing IP40 IP40 IP40 Terminals IP20 IP20 Mounting area (e.g. control cabinet) IP54 IP54 Mechanical data 777140 787140 Mounting position Any Any Any Mechanical life 10,000,000 cycles 10,000,000 cycles Material Bottom PPO UL 94 V1 PPO UL 94 V1 Front ABS UL 94 V0 ABS UL 94 V0 Top PPO UL 94 V1 PPO UL 94 V1 Connection type Screw terminal Spring-loaded terminals 1 core flexible 0,25 - 2,5 mm², 24 - 12 AWG - 2 core with the same cross section, flexible with out crimp connectors or with TWIN crimp connectors or with TWIN crimp connectors or with TWIN crimp connectors or with Screw terminals Stripping length with screw terminals Spring-loaded terminals: Terminal points per connector Spring-loaded terminals: Terminal points per connection Stripping length with spring-loaded	· · · · · · · · · · · · · · · · · · ·		
Dovervoltage category		EN 60947-1	EN 60947-1
Pollution degree 2			
Rated insulation voltage 250 V 250 V Rated impulse withstand voltage 6 kV 6 kV Protection type Housing IP40 IP40 Terminals IP20 IP20 Mounting area (e.g. control cabinet) IP54 IP54 Mechanical data 777140 787140 Mounting position Any Any Mechanical life 10,000,000 cycles 10,000,000 cycles Material Bottom PP0 UL 94 V1 PP0 UL 94 V1 Front ABS UL 94 V0 ABS UL 94 V0 Top PP0 UL 94 V1 PP0 UL 94 V1 Connection type Screw terminal Spring-loaded terminals 1 core flexible 0,25 - 2,5 mm², 24 - 12 AWG 2 core with the same cross section, flexible with crimp connectors, no plastic sleeve 2 core with TWIN crimp connectors or with the same cross section with screw terminals 8 mm - Conductor cross section with screw terminal solo, 5 Nm - Stripping length with screw terminals Flexible with/without crimp connector - Conductor cross section with spring-loaded terminals: Flexible with/without crimp connector - Spring-loaded terminals: Terminal points per connection - Spring-loaded terminals: Terminal points per connection - Stripping length with spring-loaded			
Rated impulse withstand voltage Protection type Housing IP40 IP40 Terminals IP20 IP20 Mounting area (e.g. control cabinet) Mounting parea (e.g. control cabinet) Mechanical data 777140 787140 Mounting position Any Any Mechanical life 10,000,000 cycles 10,000,000 cycles Material Bottom PPO UL 94 V1 PPO UL 94 V1 Front ABS UL 94 V0 ABS UL 94 V0 Top PPO UL 94 V1 PPO UL 94 V1 Connection type Screw terminal Spring-loaded terminals 1 core flexible 0,25 - 2,5 mm², 24 - 12 AWG - 2 core with the same cross section, flexible with crimp connector or, no plastic sleeve 2 core with TWIN crimp connectors or with Screw terminals 0,5 Nm - Stripping length with screw terminals 0,5 Nm - Spring-loaded terminals: Flexible without crimp connector - 0,2 - 1,5 mm², 24 - 16 AWG Spring-loaded terminals: Terminal points per connection - 2 Stripping length with spring-loaded			
Protection type Housing IP40 IP40 Terminals IP20 IP20 Mounting area (e.g. control cabinet) IP54 IP54 Mechanical data 777140 787140 Mounting position Any Any Mechanical life 10,000,000 cycles 10,000,000 cycles Material Bottom PPO UL 94 V1 PPO UL 94 V1 Front ABS UL 94 V0 ABS UL 94 V0 Top PPO UL 94 V1 PPO UL 94 V1 Connection type Screw terminal Spring-loaded terminal Mounting type plug-in plug-in Conductor cross section with screw terminals 1 core flexible 0,25 - 2,5 mm², 24 - 12 AWG - 2 core with the same cross section, flexible with crimp connectors or with TWIN crimp connectors or with TWIN crimp connectors or with TWIN crimp connectors or with screw terminals Torque setting with screw terminals 0,5 Nm - Stripping length with screw terminals 8 mm - Conductor cross section with screw terminals 9 mm - Stripping length with screw terminals 9 mm - Stripping-loaded terminals: Flexible with/without crimp connector - 2 Stripping length with spring-loaded Stripping length with spring-loaded			
Housing Terminals IP20 IP20 Mounting area (e.g. control cabinet) IP54 IP54 Mechanical data 777140 787140 Mounting position Any Any Mechanical life 10,000,000 cycles 10,000,000 cycles Material Bottom PPO UL 94 V1 PPO UL 94 V1 Front ABS UL 94 V0 ABS UL 94 V0 Top PPO UL 94 V1 PPO UL 94 V1 Connection type Screw terminal Spring-loaded terminal Plug-in Conductor cross section with screw terminals 1 core flexible without crimp connectors or with TWIN crimp connectors or with TWIN crimp connectors or with screw terminals 0,5 Nm - Stripping length with screw terminals 1 mm - Conductor cross section with screw terminals 0,5 Nm - Stripping-loaded terminals: Flexible withvithout crimp connector - Conductor cross section with screw terminals 0,5 Nm - Stripping-loaded terminals: Flexible withvithout crimp connector - Conductor cross section with screw terminals 0,5 Nm - Stripping-loaded terminals: Flexible withvithout crimp connector - Spring-loaded terminals: Terminal points per connection - Stripping length with spring-loaded Stripping-loaded terminals Terminal points per connection - Stripping length with spring-loaded	· · · · · · · · · · · · · · · · · · ·		
Terminals Mounting area (e.g. control cabinet) Mechanical data 777140 787140 Mounting position Any Mechanical life 10,000,000 cycles 10,000,000 cycles Material Bottom PPO UL 94 V1 PPO UL 94 V1 Front ABS UL 94 V0 Top PPO UL 94 V1 PPO UL 94 V1 PPO UL 94 V1 PPO UL 94 V1 Connection type Screw terminal Mounting type plug-in Conductor cross section with screw terminals 1 core flexible 2 core with the same cross section, flexible with crimp connectors or with TWIN crimp connectors Torque setting with screw terminals Conductor cross section with screw terminals 8 mm Conductor cross section with screw terminals - Conductor cross section with screw terminals 0,2 - 1,5 mm², 24 - 16 AWG - Conductor cross section with screw terminals 8 mm - Conductor cross section with screw terminals Conductor cross section with screw terminals 8 mm - Conductor cross section with screw terminals Conductor cross section with screw terminals 8 mm - Conductor cross section with screw terminals Conductor cross section with screw terminals Conductor cross section with screw terminals Fixipping length with screw terminals Conductor cross section with screw terminal		IP40	IP40
Mounting area (e.g. control cabinet) Mechanical data 777140 787140 Mounting position Any Any Mechanical life 10,000,000 cycles 10,000,000 cycles Material Bottom PPO UL 94 V1 PPO UL 94 V1 Front ABS UL 94 V0 Top PPO UL 94 V1 Connection type Screw terminal Mounting type plug-in Conductor cross section with screw terminals 1 core flexible 2 core with the same cross section, flexible with crimp connectors, no plastic sleeve 2 core with the same cross section, flexible without crimp connectors or with TWIN crimp connectors 0,2 - 1,5 mm², 24 - 16 AWG Torque setting with screw terminals Conductor cross section with screw terminals 8 mm — Conductor cross section with screw terminals Conductor cross section with screw terminals 2 Stripping length with screw terminals Spring-loaded terminals: Terminal points per connection — Stripping length with spring-loaded Stripping length with spring-loaded	· ·		
inet) IP54 IP54 Mechanical data 777140 787140 Mounting position Any Any Mechanical life 10,000,000 cycles 10,000,000 cycles Material Bottom PPO UL 94 V1 PPO UL 94 V1 Front ABS UL 94 V0 ABS UL 94 V0 Top PPO UL 94 V1 PPO UL 94 V1 Connection type Screw terminal Spring-loaded terminal plug-in Mounting type plug-in plug-in Conductor cross section with screw terminals 1 core flexible 2 core with the same cross section, flexible with crimp connectors, no plastic sleeve 2 core with the same cross section, flexible without crimp connectors or with TWIN crimp connectors or with TWIN crimp connectors or with TWIN crimp connectors Torque setting with screw terminals 0,5 Nm - Stripping length with screw terminals 8 mm - Conductor cross section with spring-loaded terminals: Flexible with/without crimp connector - Spring-loaded terminals: Terminal points per connection - 2 Stripping length with spring-loaded Stripping length with spring-loaded		20	20
Mounting position		IP54	IP54
Mechanical life 10,000,000 cycles 10,000,000 cycles Material Bottom PPO UL 94 V1 PPO UL 94 V1 Front ABS UL 94 V0 ABS UL 94 V0 Top PPO UL 94 V1 PPO UL 94 V1 Connection type Screw terminal Spring-loaded terminal Mounting type plug-in plug-in Conductor cross section with screw terminals 1 core flexible 0,25 - 2,5 mm², 24 - 12 AWG - 2 core with the same cross section, flexible with crimp connectors, no plastic sleeve 2 core with TWIN crimp connectors or with TWIN crimp connectors or with TWIN crimp connectors or with TWIN screw terminals Stripping length with screw terminals 0,5 Nm - Stripping length with screw terminals Flexible with/without crimp connector - Spring-loaded terminals: Flexible with/without crimp connector - Spring-loaded terminals: Terminal points per connection - Stripping length with spring-loaded	Mechanical data	777140	787140
Material Bottom PPO UL 94 V1 PPO UL 94 V1 Front ABS UL 94 V0 ABS UL 94 V0 Top PPO UL 94 V1 PPO UL 94 V1 Connection type Screw terminal Spring-loaded terminal Mounting type plug-in plug-in Conductor cross section with screw terminals 1 core flexible 0,25 - 2,5 mm², 24 - 12 AWG - 2 core with the same cross section, flexible with crimp connectors, no plastic sleeve 0,25 - 1 mm², 24 - 16 AWG - 2 core with the same cross section, flexible without crimp connectors or with TWIN crimp connectors or with TWIN crimp connectors Torque setting with screw terminals 0,5 Nm - Stripping length with screw terminals 8 mm - Conductor cross section with spring-loaded terminals: Flexible with/without crimp connector - Spring-loaded terminals: Terminal points per connection - Stripping length with spring-loaded Stripping length with spring-loaded	Mounting position	Any	Any
Bottom PPO UL 94 V1 PPO UL 94 V1 Front ABS UL 94 V0 ABS UL 94 V0 Top PPO UL 94 V1 PPO UL 94 V1 Connection type Screw terminal Spring-loaded terminal Mounting type plug-in plug-in Conductor cross section with screw terminals 1 core flexible 0,25 - 2,5 mm², 24 - 12 AWG - 2 core with the same cross section, flexible with crimp connectors, no plastic sleeve 0,25 - 1 mm², 24 - 16 AWG - 2 core with the same cross section, flexible without crimp connectors or with TWIN crimp connectors or with TWIN crimp connectors or with TWIN crimp connectors Torque setting with screw terminals 0,5 Nm - Stripping length with screw terminals 8 mm - Conductor cross section with spring-loaded terminals: Flexible with/without crimp connector - Spring-loaded terminals: Terminal points per connection - Stripping length with spring-loaded	Mechanical life	10,000,000 cycles	10,000,000 cycles
Front Top PPO UL 94 V1 PPO UL 94 V1 Connection type Screw terminal Spring-loaded terminal Mounting type plug-in plug-in Conductor cross section with screw terminals 1 core flexible 0,25 - 2,5 mm², 24 - 12 AWG - 2 core with the same cross section, flexible with crimp connectors, no plastic sleeve 0,25 - 1 mm², 24 - 16 AWG - 2 core with the same cross section, flexible without crimp connectors or with TWIN crimp connectors or with TWIN crimp connectors or with screw terminals 0,5 Nm - Stripping length with screw terminals 8 mm - Conductor cross section with spring-loaded terminals: Flexible with/without crimp connector - 0,2 - 1,5 mm², 24 - 16 AWG Spring-loaded terminals: Terminal points per connection - 2 Stripping length with spring-loaded	Material		
Top PPO UL 94 V1 Spring-loaded terminal Connection type plug-in plug-in Conductor cross section with screw terminals 1 core flexible 0,25 - 2,5 mm², 24 - 12 AWG - 2 core with the same cross section, flexible with crimp connectors, no plastic sleeve 2 core with the same cross section, flexible without crimp connectors or with TWIN crimp connectors or with TWIN crimp connectors or with TWIN crimp connectors 0,2 - 1,5 mm², 24 - 16 AWG - Torque setting with screw terminals 0,5 Nm - Stripping length with screw terminals 8 mm - Conductor cross section with spring-loaded terminals: Flexible with/without crimp connector - 0,2 - 1,5 mm², 24 - 16 AWG Spring-loaded terminals: Terminal points per connection - 2 Stripping length with spring-loaded	Bottom	PPO UL 94 V1	PPO UL 94 V1
Connection type Screw terminal Spring-loaded terminal Mounting type plug-in plug-in Conductor cross section with screw terminals 1 core flexible 0,25 - 2,5 mm², 24 - 12 AWG - 2 core with the same cross section, flexible with crimp connectors, no plastic sleeve 0,25 - 1 mm², 24 - 16 AWG - 2 core with the same cross section, flexible without crimp connectors or with TWIN crimp connectors or with TWIN crimp connectors 0,2 - 1,5 mm², 24 - 16 AWG - Torque setting with screw terminals 0,5 Nm - Stripping length with screw terminals 8 mm - Conductor cross section with spring-loaded terminals: Flexible with/without crimp connector - Spring-loaded terminals: Terminal points per connection - Stripping length with spring-loaded	Front	ABS UL 94 V0	ABS UL 94 V0
Mounting type plug-in plug-in Conductor cross section with screw terminals 1 core flexible 0,25 - 2,5 mm², 24 - 12 AWG - 2 core with the same cross section, flexible with crimp connectors, no plastic sleeve 0,25 - 1 mm², 24 - 16 AWG - 2 core with the same cross section, flexible without crimp connectors or with TWIN crimp connectors or with TWIN crimp connectors Torque setting with screw terminals 0,5 Nm - Stripping length with screw terminals 8 mm - Conductor cross section with spring-loaded terminals: Flexible with/without crimp connector - Spring-loaded terminals: Terminal points per connection - Stripping length with spring-loaded Stripping length with spring-loaded	Тор	PPO UL 94 V1	PPO UL 94 V1
Conductor cross section with screw terminals 1 core flexible 2 core with the same cross section, flexible with crimp connectors, no plastic sleeve 2 core with the same cross section, flexible without crimp connectors or with TWIN crimp connectors Torque setting with screw terminals Stripping length with screw terminals Conductor cross section with spring-loaded terminals: Terminal points per connection Stripping length with spring-loaded Stripping length with spring-loaded Conductor cross section with spring-loaded Stripping length with spring-loaded	Connection type	Screw terminal	Spring-loaded terminal
terminals 1 core flexible 2 core with the same cross section, flexible with crimp connectors, no plastic sleeve 2 core with the same cross section, flexible without crimp connectors or with TWIN crimp connectors 1 core flexible without crimp connectors or with TWIN crimp connectors 1 core flexible without crimp connectors 2 core with the same cross section, flexible without crimp connectors 1 core flexible with the same cross section, flexible with screw terminals 2 core with the same cross section, flexible with screw terminals 3 core flexible with the same cross section, flexible with screw terminals 4 core flexible with the same cross section with spring-loaded terminals: Flexible with/without crimp connector 5 core with the same cross section with spring-loaded terminals: Terminal points per connection 2 core with the same cross section with spring-loaded 2 core with the same cross section with spring-loaded 2 core with the same cross section with spring-loaded 2 core with the same cross section with spring-loaded	Mounting type	plug-in	plug-in
1 core flexible 2 core with the same cross section, flexible with crimp connectors, no plastic sleeve 2 core with the same cross section, flexible without crimp connectors or with TWIN crimp connectors O,2 - 1,5 mm², 24 - 16 AWG Torque setting with screw terminals O,5 Nm Torque setting with screw terminals Stripping length with screw terminals 8 mm Conductor cross section with spring-loaded terminals: Flexible with/without crimp connector Spring-loaded terminals: Terminal points per connection Stripping length with spring-loaded Stripping length with spring-loaded			
2 core with the same cross section, flexible with crimp connectors, no plastic sleeve 0,25 - 1 mm², 24 - 16 AWG — 2 core with the same cross section, flexible without crimp connectors or with TWIN crimp connectors 0,2 - 1,5 mm², 24 - 16 AWG — Torque setting with screw terminals 0,5 Nm — Stripping length with screw terminals 8 mm — Conductor cross section with spring-loaded terminals: Flexible with/without crimp connector — 0,2 - 1,5 mm², 24 - 16 AWG Spring-loaded terminals: Terminal points per connection — 2 Stripping length with spring-loaded		0.25 - 2.5 mm ² 24 - 12 AWG	
tion, flexible with crimp connectors, no plastic sleeve 0,25 - 1 mm², 24 - 16 AWG — 2 core with the same cross section, flexible without crimp connectors or with TWIN crimp connectors 0,2 - 1,5 mm², 24 - 16 AWG — Torque setting with screw terminals 0,5 Nm — Stripping length with screw terminals 8 mm — Conductor cross section with spring-loaded terminals: Flexible with/without crimp connector — 0,2 - 1,5 mm², 24 - 16 AWG Spring-loaded terminals: Terminal points per connection — 2 Stripping length with spring-loaded		0,23 - 2,3 mm , 24 - 12 AVVG	_
ors, no plastic sleeve 2 core with the same cross section, flexible without crimp connectors or with TWIN crimp connectors			
tion, flexible without crimp connectors or with TWIN crimp connectors 0,2 - 1,5 mm², 24 - 16 AWG Torque setting with screw terminals Stripping length with screw terminals 8 mm — Conductor cross section with spring-loaded terminals: Flexible with/without crimp connector Spring-loaded terminals: Terminal points per connection Stripping length with spring-loaded Stripping length with spring-loaded		0,25 - 1 mm ² , 24 - 16 AWG	_
nectors or with TWIN crimp connectors 0,2 - 1,5 mm², 24 - 16 AWG Torque setting with screw terminals 0,5 Nm Stripping length with screw terminals als 8 mm Conductor cross section with spring-loaded terminals: Flexible with/without crimp connector Spring-loaded terminals: Terminal points per connection Stripping length with spring-loaded Stripping length with spring-loaded			
nectors 0,2 - 1,5 mm², 24 - 16 AWG — Torque setting with screw terminals 0,5 Nm — Stripping length with screw terminals 8 mm — Conductor cross section with spring-loaded terminals: Flexible with/without crimp connector — 0,2 - 1,5 mm², 24 - 16 AWG Spring-loaded terminals: Terminal points per connection — 2 Stripping length with spring-loaded			
Torque setting with screw terminals 0,5 Nm — Stripping length with screw terminals 8 mm — Conductor cross section with spring-loaded terminals: Flexible with/without crimp connector — 0,2 - 1,5 mm², 24 - 16 AWG Spring-loaded terminals: Terminal points per connection — 2 Stripping length with spring-loaded		0.2 - 1.5 mm². 24 - 16 AWG	_
Stripping length with screw terminals 8 mm — Conductor cross section with spring-loaded terminals: Flexible with/without crimp connector — 0,2 - 1,5 mm², 24 - 16 AWG Spring-loaded terminals: Terminal points per connection — 2 Stripping length with spring-loaded		 	
als 8 mm — Conductor cross section with spring-loaded terminals: Flexible with/without crimp connector — 0,2 - 1,5 mm², 24 - 16 AWG Spring-loaded terminals: Terminal points per connection — 2 Stripping length with spring-loaded			
spring-loaded terminals: Flexible with/without crimp connector – 0,2 - 1,5 mm², 24 - 16 AWG Spring-loaded terminals: Terminal points per connection – 2 Stripping length with spring-loaded		8 mm	_
with/without crimp connector – 0,2 - 1,5 mm², 24 - 16 AWG Spring-loaded terminals: Terminal points per connection – 2 Stripping length with spring-loaded			
Spring-loaded terminals: Terminal points per connection – 2 Stripping length with spring-loaded			
points per connection – 2 Stripping length with spring-loaded	· · · · · · · · · · · · · · · · · · ·		0,2 - 1,5 mm², 24 - 16 AWG
		_	2
terminals – 8 mm			
	terminals		8 mm

Mechanical data	777140	787140	
Dimensions			
Height	87 mm	87 mm	
Width	90 mm	90 mm	
Depth	121 mm	121 mm	
Weight	430 g	430 g	

Where standards are undated, the 2022-09 latest editions shall apply.

Order no. 777148 - 787148

O a maranal	777440	707440
General	777148	787148
Certifications	CCC, CE, EAC, TÜV, UKCA, cULus Listed	CCC, CE, EAC, TÜV, UKCA, cULus Listed
Electrical data	777148	787148
Supply voltage		
Voltage	24 - 240 V	24 - 240 V
Kind	AC/DC	AC/DC
Voltage tolerance	-15 %/+10 %	-15 %/+10 %
Output of external power supply (AC)	9,5 VA	9,5 VA
Output of external power supply (DC)	6 W	6 W
Frequency range AC	50 - 60 Hz	50 - 60 Hz
Residual ripple DC	160 %	160 %
Supply voltage		
Voltage	24 V	24 V
Kind	AC/DC	AC/DC
Voltage tolerance	-15 %/+10 %	-15 %/+10 %
Output of external power supply (AC)	9,5 VA	9,5 VA
Output of external power supply (DC)	3,5 W	3,5 W
Frequency range AC	50 - 60 Hz	50 - 60 Hz
Residual ripple DC	160 %	160 %
Duty cycle	100 %	100 %
Inputs	777148	787148
Quantity	2	2
Voltage at		
Input circuit DC	24 V	24 V
Current at		
Input circuit DC	40 mA	40 mA
		

Inputs	777148	787148
Max. overall cable resistance RI-		
max		
Single-channel at UB DC	50 Ohm	50 Ohm
Single-channel at UB AC	80 Ohm	80 Ohm
Dual-channel without detection		
of shorts across contacts at UB	100 Ohm	100 Ohm
DC Dual-channel without detection	100 Onin	100 Onini
of shorts across contacts at UB		
AC	160 Ohm	160 Ohm
Dual-channel with detection of		
shorts across contacts at UB DC	3 Ohm	3 Ohm
Dual-channel with detection of		
shorts across contacts at UB AC		8 Ohm
Relay outputs	777148	787148
Number of output contacts		
Safety contacts (N/O), instant-	0	0
aneous	8	8
Auxiliary contacts (N/C)	1	1
Max. short circuit current IK	1 kA	1 kA
Utilisation category	EN 00047 4 4	EN 00047 4 4
in accordance with the standard	EN 60947-4-1	EN 60947-4-1
Utilisation category of safety contacts		
AC1 at	240 V	240 V
Min. current	0,01 A	0,01 A
Max. current	8 A	8 A
Max. power	2000 VA	2000 VA
DC1 at	24 V	24 V
Min. current	0,01 A	0,01 A
Max. current	8 A	8 A
Max. power	200 W	200 W
Utilisation category of auxiliary contacts		
AC1 at	240 V	240 V
Min. current	0,01 A	0,01 A
Max. current	2 A	2 A
Max. power	500 VA	500 VA
DC1 at	24 V	24 V
Min. current	0,01 A	0,01 A
Max. current	2 A	2 A
Max. power	50 W	50 W
Utilisation category		
in accordance with the standard	EN 60947-5-1	EN 60947-5-1

Relay outputs	777148	787148
Utilisation category of safety con-		
tacts		
AC15 at	230 V	230 V
Max. current	5 A	5 A
DC13 (6 cycles/min) at	24 V	24 V
Max. current	7 A	7 A
Utilisation category of auxiliary con-	-	
tacts		
AC15 at	230 V	230 V
Max. current	2 A	2 A
DC13 (6 cycles/min) at	24 V	24 V
Max. current	2 A	2 A
Utilisation category in accordance with UL		
Voltage	240 V AC G. P.	240 V AC G. P.
with current	8 A	8 A
Voltage	24 V DC G. P. Resistive	24 V DC G. P. Resistive
with current	5 A	5 A
Pilot Duty	B300, R300	B300, R300
External contact fuse protection, safety contacts		
in accordance with the standard	EN 60947-5-1	EN 60947-5-1
Max. melting integral	240 A²s	240 A²s
Blow-out fuse, quick	10 A	10 A
Blow-out fuse, slow	6 A	6 A
Blow-out fuse, gG	10 A	10 A
Circuit breaker 24V AC/DC, characteristic B/C	6 A	6 A
External contact fuse protection, auxiliary contacts		
Max. melting integral	240 A²s	240 A²s
Blow-out fuse, quick	4 A	4 A
Blow-out fuse, slow	2 A	2 A
Blow-out fuse, gG	4 A	4 A
Circuit breaker, 24 V AC/DC,		
characteristic B/C	2 A	2 A
Contact material	AgSnO2 + 0,2 μm Au	AgSnO2 + 0,2 μm Au

Conventional thermal current	777148	787148
while loading several contacts		
Ith per contact at UB AC; AC1: 240 V, DC1: 24 V		
Conv. therm. current with 1 contact	8 A	8 A
Conv. therm. current with 2 contacts	8 A	8 A
Conv. therm. current with 3 contacts	8 A	8 A
Conv. therm. current with 4 contacts	7,1 A	7,1 A
Conv. therm. current with 5 contacts	6,3 A	6,3 A
Conv. therm. current with 6 contacts	5,8 A	5,8 A
Conv. therm. current with 7 contacts	5,4 A	5,4 A
Conv. therm. current with 8 contacts	5 A	5 A
Ith per contact at UB DC; AC1: 240 V, DC1: 24 V		
Conv. therm. current with 1 con-		
tact	8 A	8 A
Conv. therm. current with 2 contacts	8 A	8 A
Conv. therm. current with 3 contacts	8 A	8 A
Conv. therm. current with 4 contacts	7,1 A	7,1 A
Conv. therm. current with 5 contacts	6,3 A	6,3 A
Conv. therm. current with 6 contacts	5,8 A	5,8 A
Conv. therm. current with 7 contacts	5,4 A	5,4 A
Conv. therm. current with 8 contacts	5 A	5 A
Times	777148	787148
Switch-on delay		
with automatic start typ.	30 ms	30 ms
with automatic start max.	40 ms	40 ms
with automatic start after power on typ.	300 ms	300 ms
with automatic start after power on max.	350 ms	350 ms

Delay-on de-energisation with E-STOP typ. 20 ms 20 ms 30 ms 310 ms 31	Times	777148	787148
with E-STOP typ. 20 ms 30 ms 30 ms with power failure typ. 200 ms 200 ms with power failure max. 310 ms 310 ms with power failure typ. UB 240 V 500 ms 500 ms with power failure typ. UB 24 V 630 ms 630 ms with power failure typ. UB 24 V 150 ms 150 ms with power failure typ. UB 24 V 200 ms 200 ms Supply interruption before de-energisation in the input circuit 10 ms 10 ms Supply interruption before de-energisation 20 ms 20 ms Environmental data 77748 78748 Climatic suitability EN 60068-2-78 EN 60068-2-78 Ambient temperature -10 - 55 °C -10 - 55 °C Temperature range -40 - 85 °C -40 - 85 °C Climatic suitability Humidity 93 % r. h. at 40 °C 93 % r. h. at 40 °C Condensation during operation Not permitted Not permitted EMC EN 60947-5-1, EN 61000-6-2, EN EN 60947-5-1, EN 61000-6-2, EN Frequency 10 - 55 Hz 10 - 55 Hz			
with E-STOP max. 30 ms 200 ms 200 ms with power failure typ. 200 ms 200 ms with power failure max. 310 ms 310 ms with power failure max. UB 240 V 500 ms With power failure max. UB 240 V 630 ms 630 ms with power failure max. UB 24 V 200 ms 200 ms Supply interruption before de-energisation in the input circuit 10 ms 10 ms Supply interruption before de-energisation in the input circuit 20 ms 20 ms Environmental data 777148 787148 Climatic suitability EN 60068-2-78 EN 60068-2-78 Ambient temperature -10 - 55 °C -10 - 55 °C Temperature range -40 - 85 °C -40 - 85 °C Climatic suitability Humidity 93 % r. h. at 40 °C 93 % r. h. at 40 °C Condensation during operation Not permitted Not permitted EMC EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 EN 60947-51, EN 61000-6-2, EN 61326-3-1 Frequency 10 - 55 Hz 10 - 55 Hz 10 - 55 Hz	•	20 ms	20 ms
with power failure typ. 200 ms 310 ms 300 ms 630 ms	• •		
with power failure max. 310 ms 500 ms with power failure typ. UB 240 V 500 ms 500 ms with power failure max. UB 24V V 630 ms 630 ms with power failure typ. UB 24 V V 150 ms 150 ms with power failure typ. UB 24 V V 200 ms 200 ms Supply interruption before de-energisation in the input circuit 10 ms 10 ms Supply interruption before de-energisation 20 ms 20 ms Environmental data 777148 787148 Climatic suitability EN 60068-2-78 EN 60068-2-78 Ambient temperature 10 - 55 °C -10 - 55 °C Storage temperature range -10 - 55 °C -40 - 85 °C Climatic suitability Humidity 93 % r. h. at 40 °C Plumidity 93 % r. h. at 40 °C 93 % r. h. at 40 °C Condensation during operation Not permitted Not permitted EMC EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 Vibration in accordance with the standard EN 60068-2-6 EN 60068-2-6 Frequency 10 - 55 Hz <td></td> <td></td> <td></td>			
with power failure typ. UB 240 V 500 ms with power failure max. UB 240 V 630 ms 630 ms 630 ms with power failure typ. UB 24 V 150 ms 150 ms with power failure max. UB 24 V 200 ms 200 ms Supply interruption before de-energisation in the input circuit 10 ms 10 ms Supply interruption before de-energisation in the input circuit 10 ms 20 ms Supply interruption before de-energisation 20 ms 20 ms Supply interruption before de-energisation 20 ms 20 ms Environmental data 777148 787148 Climatic suitability EN 60068-2-78 EN 60068-2-78 Ambient temperature range -10 - 55 °C -10 - 55 °C Storage temperature range -40 - 85 °C -40 - 85 °C Climatic suitability Humidity 93 % r. h. at 40 °C 93 % r. h. at 40 °C Condensation during operation Not permitted Not permitted EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 Vibration in accordance with the standard in accordance with the standard in accordance with the standard Overvoltage category 10 - 55 Hz 10 - 55 H			
with power failure max. UB 240 V 630 ms 630 ms with power failure typ. UB 24 V 200 ms 150 ms 200 ms Supply interruption before de-energisation in the input circuit 10 ms 10 ms 20 ms Environmental data 777148 787148 Climatic suitability EN 60068-2-78 EN 60068-2-78 Ambient temperature Temperature Temperature range -40 - 85 °C -10 - 55 °C Storage temperature Temperature Temperature Temperature range -40 - 85 °C -40 - 85 °C Climatic suitability Humidity 93 % r. h. at 40 °C 93 % r. h. at 40 °C Condensation during operation EM 61326-3-1 Vibration in accordance with the standard Frequency 10 - 55 Ftz 10 - 55 F	•		
V 630 ms 630 ms with power failure typ. UB 24 V 150 ms 150 ms with power failure max. UB 24 V 200 ms 200 ms Supply interruption before de-energisation in the input circuit 10 ms 10 ms Supply interruption before de-energisation 20 ms 20 ms Environmental data 777148 787148 Climatic suitability EN 60068-2-78 EN 60068-2-78 Ambient temperature -10 - 55 °C -10 - 55 °C Storage temperature -10 - 55 °C -40 - 85 °C Temperature range -40 - 85 °C -40 - 85 °C Climatic suitability Hundrity 93 % r. h. at 40 °C Hundrity 93 % r. h. at 40 °C 93 % r. h. at 40 °C Condensation during operation Not permitted EMC EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 Forequency 10 - 55 Hz EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 Frequency 10 - 55 Hz 10 - 55 Hz Amplitude 0,35 mm 0,35 mm Airgap creepage in accordance with the standard Covervoltage category EN			
with power failure max. UB 24 V 200 ms 200 ms Supply interruption before de-energisation in the input circuit 10 ms 10 ms Supply interruption before de-energisation 20 ms 20 ms Environmental data 777148 787148 Climatic suitability EN 60068-2-78 EN 60068-2-78 Ambient temperature range -10 - 55 °C -10 - 55 °C Storage temperature range -40 - 85 °C -40 - 85 °C Cilmatic suitability 93 % r. h. at 40 °C 93 % r. h. at 40 °C Humidity 93 % r. h. at 40 °C 93 % r. h. at 40 °C Condensation during operation Not permitted Not permitted EMC EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 Vibration in accordance with the standard Frequency EN 60068-2-6 EN 60068-2-6 Frequency 10 - 55 Hz 10 - 55 Hz 10 - 55 Hz Amplitude 0,35 mm 0,35 mm 0,35 mm Airgap creepage in accordance with the standard Overvoltage category EN 60947-1 EN 60947-1 Pollution degree 2	•	630 ms	630 ms
Supply interruption before de-energisation in the input circuit Supply interruption before de-energisation 20 ms 20 ms Environmental data 777148 787148 Climatic suitability EN 60068-2-78 EN 60068-2-78 EN 60068-2-78 Ambient temperature Temperature range -10 - 55 °C Storage temperature Temperature range -40 - 85 °C -40 - 85 °C Climatic suitability Humidity 93 % r. h. at 40 °C Sondensation during operation EMC EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 Vibration in accordance with the standard Frequency 10 - 55 Hz Amplitude Airgap creepage in accordance with the standard Overvoltage category Pollution degree 2 2 Rated insulation voltage EN 60947-1 EN 60	with power failure typ. UB 24 V	150 ms	150 ms
gisation in the input circuit 10 ms 10 ms Supply interruption before de-energisation 20 ms 20 ms Environmental data 777148 787148 Climatic suitability EN 60068-2-78 EN 60068-2-78 Ambient temperature Temperature range -10 - 55 °C -10 - 55 °C Storage temperature range -40 - 85 °C -40 - 85 °C Climatic suitability Humidity 93 % r. h. at 40 °C 93 % r. h. at 40 °C Condensation during operation Not permitted Not permitted EMC EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 Vibration in accordance with the standard Frequency EN 60068-2-6 EN 60068-2-6 Frequency 10 - 55 Hz 10 - 55 Hz 10 - 55 Hz Amplitude 0,35 mm 0,35 mm Airgap creepage in accordance with the standard Overvoltage category EN 60947-1 EN 60947-1 Urilliance 2 2 Rated insulation voltage 250 V 250 V Rated impulse withstand voltage 6 kV 6 kV <t< td=""><td>with power failure max. UB 24 V</td><td>200 ms</td><td>200 ms</td></t<>	with power failure max. UB 24 V	200 ms	200 ms
Supply interruption before de-energisation 20 ms 20 ms Environmental data 777148 787148 Climatic suitability EN 60068-2-78 EN 60068-2-78 Ambient temperature Temperature range -10 - 55 °C -10 - 55 °C Storage temperature Temperature range -40 - 85 °C -40 - 85 °C Climatic suitability 93 % r. h. at 40 °C 93 % r. h. at 40 °C Condensation during operation Not permitted Not permitted EMC EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 Vibration in accordance with the standard and in accordance with the standard on the standard of expenses EN 60068-2-6 EN 60068-2-6 Frequency 10 - 55 Hz 10 - 55 Hz 10 - 55 Hz Amplitude 0,35 mm 0,35 mm Airgap creepage in accordance with the standard Overvoltage category EN 60947-1 EN 60947-1 Pollution degree 2 2 2 Rated impulse withstand voltage 250 V 6 kV Protection type Housing IP40 IP40	Supply interruption before de-ener-		
Servironmental data	gisation in the input circuit	10 ms	10 ms
Environmental data 777148 787148 Climatic suitability EN 60068-2-78 EN 60068-2-78 Ambient temperature Temperature range -10 - 55 °C -10 - 55 °C Storage temperature range -40 - 85 °C -40 - 85 °C Climatic suitability Humidity 93 % r. h. at 40 °C 93 % r. h. at 40 °C Condensation during operation Not permitted Not permitted EMC EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 Vibration in accordance with the standard Frequency 10 - 55 Hz 10 - 55 Hz Amplitude 0,35 mm 0,35 mm Airgap creepage in accordance with the standard Overvoltage category EN 60947-1 EN 60947-1 Overvoltage category III III III Pollution degree 2 2 Rated insulation voltage 250 V 250 V Rated insulation voltage 250 V 6 kV Protection type Housing IP40 IP40 Terminals IP20 IP54 Mounting area (e.g. control cabinet) I			
Climatic suitability EN 60068-2-78 EN 60068-2-78 Ambient temperature Temperature ange -10 - 55 °C -10 - 55 °C Storage temperature range -40 - 85 °C -40 - 85 °C Climatic suitability		20 ms	20 ms
Ambient temperature Temperature range Temperatur	Environmental data	777148	787148
Temperature range -10 - 55 °C -10 - 55 °C Storage temperature Temperature range -40 - 85 °C -40 - 85 °C Climatic suitability Humidity 93 % r. h. at 40 °C 93 % r. h. at 40 °C Condensation during operation EMC EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 Vibration in accordance with the standard Frequency 10 - 55 Hz 10 - 55 Hz 10 - 55 Hz Amplitude 0,35 mm 0,35 mm Airgap creepage in accordance with the standard Overvoltage category III III Pollution degree 2 2 Rated insulation voltage 250 V 250 V Rated impulse withstand voltage Frequency Housing Page 1 P40 IP40 Terminals IP20 IP54 Mechanical data 777148 787148 Mounting position Any Any	Climatic suitability	EN 60068-2-78	EN 60068-2-78
Storage temperature Temperature range -40 - 85 °C Climatic suitability Humidity 93 % r. h. at 40 °C Sondensation during operation EMC EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 Vibration in accordance with the standard Frequency 10 - 55 Hz Amplitude 0,35 mm Airgap creepage in accordance with the standard Overvoltage category III III Overvoltage category Rated insulation voltage EN 60947-1 UII III III Pollution degree 2 Rated insulation voltage EN 60 W Protection type Housing IP40 IP40 IP40 IP54 Mechanical data 777148 Mounting position Any Any	Ambient temperature		
Temperature range -40 - 85 °C -40 - 85 °C Climatic suitability Humidity 93 % r. h. at 40 °C 93 % r. h. at 40 °C Condensation during operation Not permitted Not permitted EMC EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 Vibration in accordance with the standard Frequency 10 - 55 Hz 10 - 55 Hz 10 - 55 Hz Amplitude 0,35 mm 0,35 mm Airgap creepage in accordance with the standard Overvoltage category III III IIII Pollution degree 2 2 Rated insulation voltage 250 V 250 V Rated impulse withstand voltage 6 kV Protection type Housing IP40 IP40 Terminals IP20 IP20 Mounting area (e.g. control cabinet) inet) IP54 Mechanical data 777148 Mounting position Any Mounting position Not permitted 93 % r. h. at 40 °C 94 % 6004-5-1, EN 6004-5-1	Temperature range	-10 - 55 °C	-10 - 55 °C
Climatic suitability Humidity 93 % r. h. at 40 °C 93 % r. h. at 40 °C Condensation during operation EMC EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 Vibration in accordance with the standard Frequency 10 - 55 Hz Amplitude 0,35 mm 0,35 mm Airgap creepage in accordance with the standard Overvoltage category III Pollution degree 2 Rated insulation voltage EN 60947-1 Frequency 10 - 55 Hz 20 + 50 Hz 10 - 55 Hz 20 + 50 Hz 10 - 55 Hz 20 + 50 Hz 20	Storage temperature		
Humidity 93 % r. h. at 40 °C 93 % r. h. at 40 °C Condensation during operation Not permitted Not permitted EMC EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 Vibration in accordance with the standard Frequency 10 - 55 Hz 0,35 mm 0,35 mm Airgap creepage in accordance with the standard Overvoltage category III III III IIII Pollution degree 2 2 2 Rated insulation voltage 250 V 250 V Rated impulse withstand voltage 6 kV Protection type Housing IP40 IP40 Terminals IP20 IP20 Mounting area (e.g. control cabinet) Mechanical data 777148 Mechanical data 777148 Mounting position Not permitted Not equal 40 °C Not permitted EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 EN 60947-1 III	Temperature range	-40 - 85 °C	-40 - 85 °C
Condensation during operation Not permitted Not permitted EMC EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 Vibration in accordance with the standard Frequency EN 60068-2-6 EN 60068-2-6 Frequency 10 - 55 Hz 10 - 55 Hz Amplitude 0,35 mm 0,35 mm Airgap creepage in accordance with the standard Overvoltage category EN 60947-1 EN 60947-1 Overvoltage category III III Pollution degree 2 2 Rated insulation voltage 250 V 250 V Rated impulse withstand voltage 6 kV 6 kV Protection type Housing IP40 IP40 Terminals IP20 IP20 Mounting area (e.g. control cabinet) IP54 IP54 Mechanical data 777148 787148 Mounting position Any Any	Climatic suitability		
EMC EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 Vibration in accordance with the standard Frequency EN 60068-2-6 EN 60068-2-6 Frequency 10 - 55 Hz 10 - 55 Hz Amplitude 0,35 mm 0,35 mm Airgap creepage in accordance with the standard Overvoltage category EN 60947-1 EN 60947-1 Pollution degree 2 2 Rated insulation voltage 250 V 250 V Rated impulse withstand voltage 6 kV 6 kV Protection type Housing IP40 IP40 Terminals IP20 IP20 Mounting area (e.g. control cabinet) IP54 IP54 Mechanical data 777148 787148 Mounting position Any Any			
Vibration in accordance with the standard EN 60068-2-6 Frequency 10 - 55 Hz 10 - 55 Hz Amplitude 0,35 mm 0,35 mm Airgap creepage in accordance with the standard EN 60947-1 Overvoltage category III III Pollution degree 2 2 Rated insulation voltage 250 V 250 V Rated impulse withstand voltage 6 kV Protection type Housing IP40 IP40 Terminals IP20 IP20 Mounting area (e.g. control cabinet) inet) IP54 Mechanical data 777148 787148 Mounting position Any Any	Humidity	93 % r. h. at 40 °C	93 % r. h. at 40 °C
in accordance with the standard FN 60068-2-6 Frequency 10 - 55 Hz 10 - 55 Hz Amplitude 0,35 mm 0,35 mm Airgap creepage in accordance with the standard Overvoltage category III III Pollution degree 2 2 Rated insulation voltage 250 V 250 V Rated impulse withstand voltage 6 kV 6 kV Protection type Housing IP40 IP40 Terminals IP20 IP20 Mounting area (e.g. control cabinet) IP54 Mechanical data 777148 787148 Mounting position Any Any	-		
Frequency Amplitude 0,35 mm 0,35 mm 0,35 mm Airgap creepage in accordance with the standard Overvoltage category Pollution degree 2 Rated insulation voltage EN 60947-1 Rated impulse withstand voltage For Everyor Bull For Ever	Condensation during operation	Not permitted EN 60947-5-1, EN 61000-6-2, EN	Not permitted EN 60947-5-1, EN 61000-6-2, EN
Amplitude 0,35 mm 0,35 mm Airgap creepage in accordance with the standard Overvoltage category III IIII Pollution degree 2 2 Rated insulation voltage 250 V 250 V Rated impulse withstand voltage 6 kV 6 kV Protection type Housing IP40 IP40 Terminals IP20 IP20 Mounting area (e.g. control cabinet) IP54 Mechanical data 777148 787148 Mounting position Any Any	Condensation during operation EMC	Not permitted EN 60947-5-1, EN 61000-6-2, EN	Not permitted EN 60947-5-1, EN 61000-6-2, EN
Airgap creepage in accordance with the standard EN 60947-1 EN 60947-1 Overvoltage category III III Pollution degree 2 2 Rated insulation voltage 250 V 250 V Rated impulse withstand voltage 6 kV Protection type Housing IP40 IP40 Terminals IP20 IP20 Mounting area (e.g. control cabinet) IP54 IP54 Mechanical data 777148 787148 Mounting position Any Any	Condensation during operation EMC Vibration	Not permitted EN 60947-5-1, EN 61000-6-2, EN 61326-3-1	Not permitted EN 60947-5-1, EN 61000-6-2, EN 61326-3-1
in accordance with the standard Overvoltage category III III IIII Pollution degree 2 2 Rated insulation voltage 250 V 250 V Rated impulse withstand voltage 6 kV 6 kV Protection type Housing IP40 IP40 Terminals IP20 IP20 Mounting area (e.g. control cabinet) IP54 IP54 Mechanical data 777148 787148 Mounting position Any Any	Condensation during operation EMC Vibration in accordance with the standard	Not permitted EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 EN 60068-2-6	Not permitted EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 EN 60068-2-6
Overvoltage category Pollution degree 2 Rated insulation voltage 250 V Rated impulse withstand voltage 6 kV Protection type Housing Terminals IP20 Mounting area (e.g. control cabinet) IP54 IP54 Mechanical data 777148 Mounting position III III III III III III III III III I	Condensation during operation EMC Vibration in accordance with the standard Frequency	Not permitted EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 EN 60068-2-6 10 - 55 Hz	Not permitted EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 EN 60068-2-6 10 - 55 Hz
Pollution degree 2 Rated insulation voltage 250 V Rated impulse withstand voltage 6 kV Protection type Housing IP40 IP40 Terminals IP20 IP20 Mounting area (e.g. control cabinet) IP54 IP54 Mechanical data 777148 787148 Mounting position Any Any	Condensation during operation EMC Vibration in accordance with the standard Frequency Amplitude	Not permitted EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 EN 60068-2-6 10 - 55 Hz	Not permitted EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 EN 60068-2-6 10 - 55 Hz
Rated insulation voltage 250 V 250 V Rated impulse withstand voltage 6 kV 6 kV Protection type Housing IP40 IP40 Terminals IP20 IP20 Mounting area (e.g. control cabinet) IP54 IP54 Mechanical data 777148 787148 Mounting position Any Any	Condensation during operation EMC Vibration in accordance with the standard Frequency Amplitude Airgap creepage	Not permitted EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 EN 60068-2-6 10 - 55 Hz 0,35 mm	Not permitted EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 EN 60068-2-6 10 - 55 Hz 0,35 mm
Rated impulse withstand voltage 6 kV 6 kV Protection type Housing IP40 IP40 Terminals IP20 IP20 Mounting area (e.g. control cabinet) IP54 IP54 Mechanical data 777148 787148 Mounting position Any Any	Condensation during operation EMC Vibration in accordance with the standard Frequency Amplitude Airgap creepage in accordance with the standard	Not permitted EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 EN 60068-2-6 10 - 55 Hz 0,35 mm EN 60947-1	Not permitted EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 EN 60068-2-6 10 - 55 Hz 0,35 mm EN 60947-1
Protection type Housing IP40 IP40 Terminals IP20 IP20 Mounting area (e.g. control cabinet) IP54 IP54 Mechanical data 777148 787148 Mounting position Any Any	Condensation during operation EMC Vibration in accordance with the standard Frequency Amplitude Airgap creepage in accordance with the standard Overvoltage category	Not permitted EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 EN 60068-2-6 10 - 55 Hz 0,35 mm EN 60947-1 III	Not permitted EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 EN 60068-2-6 10 - 55 Hz 0,35 mm EN 60947-1 III
Housing IP40 IP40 Terminals IP20 IP20 Mounting area (e.g. control cabinet) IP54 IP54 Mechanical data 777148 787148 Mounting position Any Any	Condensation during operation EMC Vibration in accordance with the standard Frequency Amplitude Airgap creepage in accordance with the standard Overvoltage category Pollution degree	Not permitted EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 EN 60068-2-6 10 - 55 Hz 0,35 mm EN 60947-1 III	Not permitted EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 EN 60068-2-6 10 - 55 Hz 0,35 mm EN 60947-1 III
Terminals IP20 IP20 Mounting area (e.g. control cabinet) IP54 IP54 Mechanical data 777148 787148 Mounting position Any Any	Condensation during operation EMC Vibration in accordance with the standard Frequency Amplitude Airgap creepage in accordance with the standard Overvoltage category Pollution degree Rated insulation voltage	Not permitted EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 EN 60068-2-6 10 - 55 Hz 0,35 mm EN 60947-1 III 2 250 V	Not permitted EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 EN 60068-2-6 10 - 55 Hz 0,35 mm EN 60947-1 III 2
Mounting area (e.g. control cabinet) IP54 IP54 Mechanical data 777148 Mounting position Any Any	Condensation during operation EMC Vibration in accordance with the standard Frequency Amplitude Airgap creepage in accordance with the standard Overvoltage category Pollution degree Rated insulation voltage Rated impulse withstand voltage	Not permitted EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 EN 60068-2-6 10 - 55 Hz 0,35 mm EN 60947-1 III 2 250 V	Not permitted EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 EN 60068-2-6 10 - 55 Hz 0,35 mm EN 60947-1 III 2
inet) IP54 IP54 Mechanical data 777148 787148 Mounting position Any Any	Condensation during operation EMC Vibration in accordance with the standard Frequency Amplitude Airgap creepage in accordance with the standard Overvoltage category Pollution degree Rated insulation voltage Rated impulse withstand voltage Protection type	Not permitted EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 EN 60068-2-6 10 - 55 Hz 0,35 mm EN 60947-1 III 2 250 V 6 kV	Not permitted EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 EN 60068-2-6 10 - 55 Hz 0,35 mm EN 60947-1 III 2 250 V 6 kV
Mechanical data777148787148Mounting positionAnyAny	Condensation during operation EMC Vibration in accordance with the standard Frequency Amplitude Airgap creepage in accordance with the standard Overvoltage category Pollution degree Rated insulation voltage Rated impulse withstand voltage Protection type Housing	Not permitted EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 EN 60068-2-6 10 - 55 Hz 0,35 mm EN 60947-1 III 2 250 V 6 kV	Not permitted EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 EN 60068-2-6 10 - 55 Hz 0,35 mm EN 60947-1 III 2 250 V 6 kV
Mounting position Any Any	Condensation during operation EMC Vibration in accordance with the standard Frequency Amplitude Airgap creepage in accordance with the standard Overvoltage category Pollution degree Rated insulation voltage Rated impulse withstand voltage Protection type Housing Terminals	Not permitted EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 EN 60068-2-6 10 - 55 Hz 0,35 mm EN 60947-1 III 2 250 V 6 kV	Not permitted EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 EN 60068-2-6 10 - 55 Hz 0,35 mm EN 60947-1 III 2 250 V 6 kV
	Condensation during operation EMC Vibration in accordance with the standard Frequency Amplitude Airgap creepage in accordance with the standard Overvoltage category Pollution degree Rated insulation voltage Rated impulse withstand voltage Protection type Housing Terminals Mounting area (e.g. control cab-	Not permitted EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 EN 60068-2-6 10 - 55 Hz 0,35 mm EN 60947-1 III 2 250 V 6 kV IP40 IP20	Not permitted EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 EN 60068-2-6 10 - 55 Hz 0,35 mm EN 60947-1 III 2 250 V 6 kV IP40 IP20
Mechanical life 10,000,000 cycles 10,000,000 cycles	Condensation during operation EMC Vibration in accordance with the standard Frequency Amplitude Airgap creepage in accordance with the standard Overvoltage category Pollution degree Rated insulation voltage Rated impulse withstand voltage Protection type Housing Terminals Mounting area (e.g. control cabinet)	Not permitted EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 EN 60068-2-6 10 - 55 Hz 0,35 mm EN 60947-1 III 2 250 V 6 kV IP40 IP20 IP54	Not permitted EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 EN 60068-2-6 10 - 55 Hz 0,35 mm EN 60947-1 III 2 250 V 6 kV IP40 IP20 IP54
	Condensation during operation EMC Vibration in accordance with the standard Frequency Amplitude Airgap creepage in accordance with the standard Overvoltage category Pollution degree Rated insulation voltage Rated impulse withstand voltage Protection type Housing Terminals Mounting area (e.g. control cabinet) Mechanical data	Not permitted EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 EN 60068-2-6 10 - 55 Hz 0,35 mm EN 60947-1 III 2 250 V 6 kV IP40 IP20 IP54 777148	Not permitted EN 60947-5-1, EN 61000-6-2, EN 61326-3-1 EN 60068-2-6 10 - 55 Hz 0,35 mm EN 60947-1 III 2 250 V 6 kV IP40 IP20 IP54 787148

Mechanical data	777148	787148
Material		
Bottom	PPO UL 94 V1	PPO UL 94 V1
Front	ABS UL 94 V0	ABS UL 94 V0
Тор	PPO UL 94 V1	PPO UL 94 V1
Connection type	Screw terminal	Spring-loaded terminal
Mounting type	plug-in	plug-in
Conductor cross section with screw terminals		
1 core flexible	0,25 - 2,5 mm², 24 - 12 AWG	_
2 core with the same cross section, flexible with crimp connectors, no plastic sleeve	0,25 - 1 mm², 24 - 16 AWG	_
2 core with the same cross sec- tion, flexible without crimp con- nectors or with TWIN crimp con- nectors	0,2 - 1,5 mm², 24 - 16 AWG	_
Torque setting with screw terminals	0,5 Nm	_
Stripping length with screw terminals	8 mm	_
Conductor cross section with spring-loaded terminals: Flexible with/without crimp connector	_	0,2 - 1,5 mm², 24 - 16 AWG
Spring-loaded terminals: Terminal points per connection	_	2
Stripping length with spring-loaded terminals	-	8 mm
Dimensions		
Height	87 mm	87 mm
Width	90 mm	90 mm
Depth	121 mm	121 mm
Weight	455 g	455 g

Where standards are undated, the 2022-09 latest editions shall apply.

Safety characteristic data



NOTICE

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

_	PL e	Cat. 4	SIL 3	2,31E-09	SIL 3	2,03E-06	20
	PL	Category	maximum SIL				T _м [year]
	2015	2015	SIL CL/	PFH _D [1/h]	SIL	PFD	2015
mode	13849-1:	13849-1:	62061	62061	61511	61511	13849-1:
Operating	EN ISO	EN ISO	EN IEC	EN IEC	EN/IEC	EN/IEC	EN ISO

Explanatory notes for the safety-related characteristic data:

- ▶ Safety characteristic data in accordance with EN IEC 62061 and EN/IEC 61511 was calculated based on EN/IEC 61508.
- ▶ 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 be different. We recommend that you use the PAScal software tool to calculate the safety function's SIL/PL values.

Supplementary data



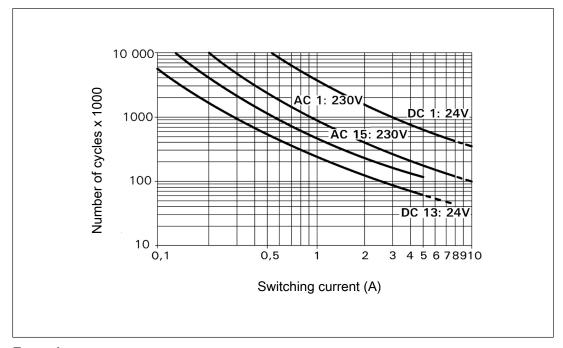
CAUTION!

It is essential to consider the relay's service life graphs. The relay outputs' safety-related characteristic data is only valid if the values in the service life graphs are met.

The PFH value depends on the switch frequency and the load of the relay output. If the service life graphs are not accessible, the stated PFH value can be used irrespective of the switch frequency and the load, as the PFH value already considers the relay's B10d value as well as the failure rates of the other components.

Service life graph

The service life graphs indicate the number of cycles from which failures due to wear must be expected. The wear is mainly caused by the electrical load; the mechanical load is negligible.



Example

Inductive load: 0.2 A

▶ Utilisation category: AC15

▶ Contact service life: 4 000 000 cycles

Provided the application to be implemented requires fewer than 4 000 000 cycles, the PFH value (see Technical details) can be used in the calculation.

To increase the service life, sufficient spark suppression must be provided on all output contacts. With capacitive loads, any power surges that occur must be noted. With DC contactors, use flywheel diodes for spark suppression.

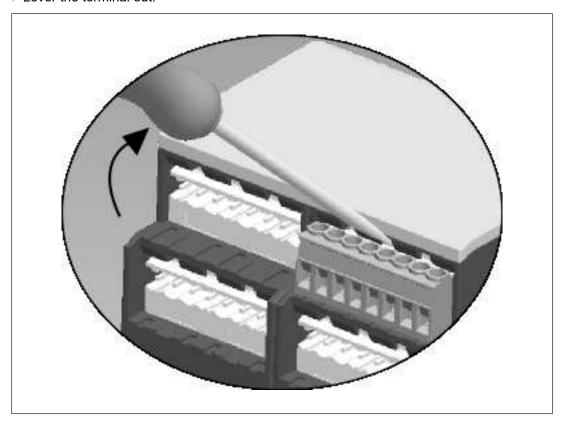
Remove plug-in terminals

Procedure

Insert a suitable screwdriver into the housing recess behind the terminal.

Do not remove the terminals by pulling the cables!

Lever the terminal out.



Order reference

Product type	Features	Connection type	Order no.
PZE 9P C	24 VAC/DC	Spring-loaded terminals	787 140
PZE 9P	24 VAC/DC	Screw terminals	777 140
PZE 9P C	24 V AC/DC, 24 - 240 V AC/DC	Spring-loaded terminals	787 148
PZE 9P	24 V AC/DC, 24 - 240 V AC/DC	Screw terminals	777 148

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: Hansjürgen Horter, Pilz GmbH & Co. KG, Felix-Wankel-Straße 2, 73760 Ostfildern, Germany

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



Technical support is available from Pilz round the clock.

Americas	
Brazil	

+55 11 97569-2804

Canada

+1 888 315 7459

Mexico

+52 55 5572 1300 USA (toll-free)

+1 877-PILZUSA (745-9872)

Asia

China

+86 21 60880878-216

Japan

+81 45 471-2281

South Korea

+82 31 778 3300

Australia and Oceania

Australia

+61 3 95600621

New Zealand

+64 9 6345350

Europe

Austria

+43 1 7986263-0

Belgium, Luxembourg

+32 9 3217570

France

+33 3 88104003

Germany

+49 711 3409-444

Ireland

+353 21 4804983

Italy, Malta

+39 0362 1826711

Scandinavia

+45 74436332

Spain

+34 938497433

Switzerland

+41 62 88979-32

The Netherlands

+31 347 320477

Turkey

+90 216 5775552

United Kingdom

+44 1536 462203

You can reach our international hotline on:

+49 711 3409-222 support@pilz.com

Pilz develops environmentally-friendly products using ecological materials and energy-saving technologies. Offices and production facilities are ecologically designed, environmentally-aware and energy-saving. So Pilz offers sustainability, plus the security of using energy-efficient products and environmentally-friendly solutions.











CECE®, CHRE®, CMSE®, InduraNET p®, Leansafe®, Master of Safety®, Master of Security®, PAS4000®, PAScoal®, PASconfig®, Pilz®, PTID®, PMCprimo®, PMCprotego®, PMCpr

