



## PIT es Set/1

**PILZ**  
THE SPIRIT OF SAFETY

► Control and signal devices

This document is a translation of the original document.

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

Source code from third-party manufacturers or open source software has been used for some components. The relevant licence information is available on the Internet on the Pilz homepage.

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.



SD means Secure Digital

<b>Introduction</b>	<b>5</b>
Validity of documentation	5
Using the documentation	5
Definition of symbols	5
<b>Safety</b>	<b>6</b>
Intended use	6
Safety regulations	6
Safety assessment	6
Use of qualified personnel	6
Warranty and liability	7
Disposal	7
For your safety	7

<b>Unit features</b>	<b>7</b>
<b>Function description</b>	<b>8</b>
<b>Installation</b>	<b>8</b>
<b>Preparing for operation</b>	<b>10</b>
<b>Dimensions</b>	<b>13</b>
<b>Technical details order no. 400430 - 400432</b>	<b>21</b>
<b>Technical details order no. 400433 - 400435</b>	<b>22</b>
<b>Technical details order no. 400436 - 400438</b>	<b>23</b>
<b>Technical details order no. 400439 - 400442</b>	<b>24</b>
<b>Technical details order no. 400443 - 400445</b>	<b>25</b>
<b>Technical details order no. 400446 - 400448</b>	<b>26</b>
<b>Technical details order no. 400449 - 400451</b>	<b>27</b>
<b>Technical details order no. 400452 - 400454</b>	<b>28</b>
<b>Technical details order no. 400455 - 400457</b>	<b>30</b>
<b>Technical details order no. 400458 - 400459</b>	<b>30</b>
<b>Safety characteristic data</b>	<b>31</b>
<b>Order reference</b>	<b>32</b>
Product	32
Accessories	33
<b>EC declaration of conformity</b>	<b>34</b>

## Introduction

### Validity of documentation

This documentation is valid for the product PIT es Set/1. 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 features.

**Safety****Intended use**

The emergency stop device consists of an E-STOP pushbutton and a contact block. It is intended for use in safety circuits in accordance with EN 60204-1. Before using the device, a safety assessment of the overall system must be performed in accordance with the Machinery Directive.

**CAUTION!**

It must not be possible to defeat the E-STOP pushbuttons. Otherwise material damage and severe injuries may result, depending on the application.

The E-STOP pushbutton may **not** be used in place of other safety measures.

E-STOP pushbutton with key-release:

The key must be removed immediately after release and must be kept safely.

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 chapter entitled "Technical details").

**Safety regulations****Safety assessment**

Before using a unit it is necessary to perform a safety assessment in accordance with the Machinery Directive.

Functional safety is guaranteed for the product as a single component. However, this does not guarantee the functional safety of the overall plant/machine. In order to achieve the required safety level for the overall plant/machine, define the safety requirements for the plant/machine and then define how these must be implemented from a technical and organisational standpoint.

**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.

### 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:

- ▶ Check the function of the pushbutton before commissioning for the first time and then at regular intervals (at least annually).
- ▶ E-STOP pushbutton with protective collar: check that the E-STOP pushbutton is accessible and can be reached.

### Unit features

The emergency stop device consists of an E-STOP pushbutton PIT es/1 and a contact block PIT esc/1. Various types are available; these can be ordered as sets or can be put together as modular assemblies.

Features:

- ▶ E-STOP device in accordance with IEC/EN 60947-5-1, IEC/EN 60947-5-5
- ▶ Panel mount version or surface mount version with two-part surface mount housing
- ▶ Turn in either direction to release or turn right for key-release
- ▶ Various mushroom-type pushbuttons
  - Standard mushroom-type pushbutton

- Mushroom-type pushbutton with key-release
- Illuminated mushroom-type pushbutton
- Mushroom-type pushbutton for hygiene critical areas in accordance with DIN EN 1672-2
- Mushroom-type pushbutton with inscribed E-STOP symbol
- ▶ Contact blocks for applications up to PL e of EN ISO 13849-1 and SIL CL 3 of EN IEC 62061
- ▶ Connected to contact blocks via spring-loaded terminal (quick connection), screw connection or M12 connector

### Function description

The emergency stop device is used to shut down plant and machine sections in order to reduce or avert imminent or existing hazards to persons and damage to machinery or materials.

### Installation



#### CAUTION!

The emergency stop device should always be installed with the supply voltage switched off.

### Panel mount version

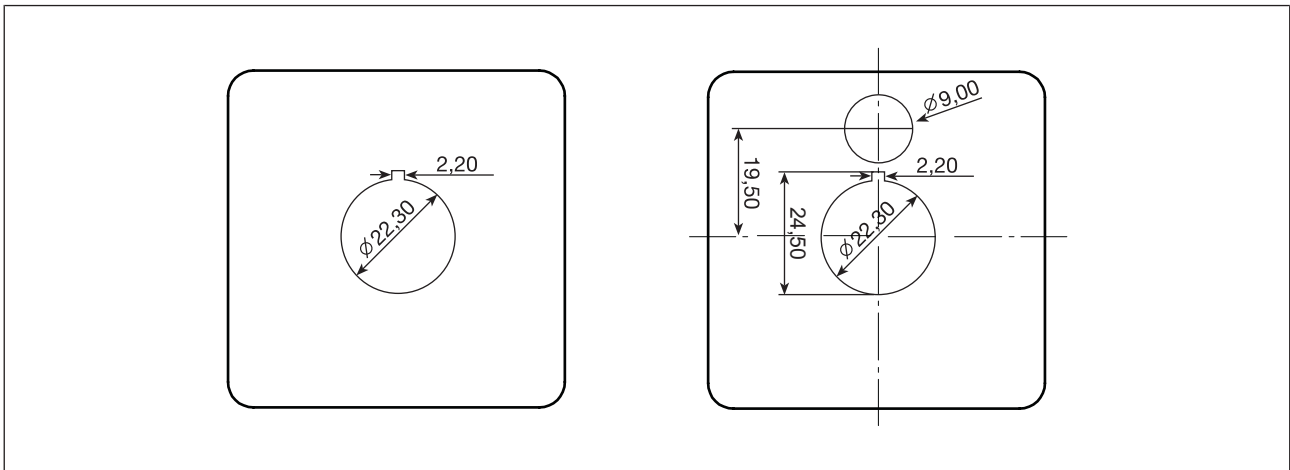


#### NOTICE

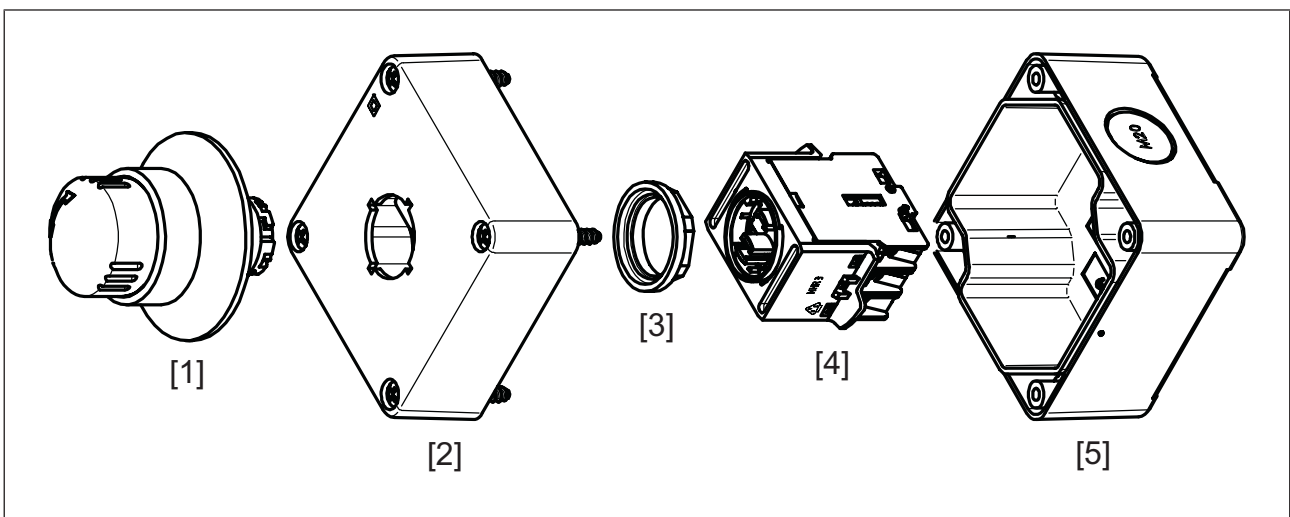
Particularly in hygiene areas, use mounting plates with a smooth surface to ensure a tight seal.

- ▶ Prepare a cutout (Ø 22.3 mm) in the mounting plate.
- ▶ With illuminated E-STOP pushbuttons: Prepare another opening in the mounting plate for the lighting connection
- ▶ Guide the E-STOP pushbutton into the mounting plate opening and secure it using the plastic nut (size 24 spanner). Note the max. torque setting of 2.5 Nm.
- ▶ Connect the contact block to the neck of the E-STOP pushbutton and secure it by turning it to the right.





### Surface mount housing



### Legend

- [1] E-STOP pushbutton
- [2] Upper part of the surface mount housing
- [3] Plastic nut
- [4] Contact block
- [5] Lower part of the surface mount housing
- ▶ With illuminated E-STOP pushbuttons:
  - Drill through one of the holes indicated on the upper part of the surface mount housing.
  - Attach the contact block to the bracket.
  - Guide the cable through the opening in the upper part of the surface mount housing and connect it to the E-STOP pushbutton.
- ▶ If an M12 connector is not fitted, break out the stuffing box connection on the lower part of the surface mount housing.
- ▶ Use two screws to attach the lower part of the surface mount housing.

- ▶ After connecting the wiring to the contact block: Screw the upper part of the surface mount housing to the lower part.

### When used in a hygiene area

The E-STOP device PIT es Set7u may be used on food processing machinery in the food zone/splash zone (in accordance with DIN EN 1672-2 and DIN ISO 14159).

With applications in a hygiene area please note:

- ▶ Permitted ambient temperature of the E-STOP pushbutton PIT es7u: -30 ... +40 °C, briefly +70 °C
- ▶ Avoid lasting contact with hydrocarbons such as petrol, oil, grease.
- ▶ When used outdoors: protect the device from sunlight.
- ▶ Installation:
  - Use mounting plates with a smooth surface to ensure a tight seal.
  - Material thickness of the mounting plates for PIT es Set6u: 1 ... 4.5 mm, for PIT es Set7u: 1 ... 6.5 mm
  - Torque of the fastening nut for PIT es Set6u: 1 ... 1.7 Nm, for PIT es Set7u: 1.5 ... 2.2 Nm
  - A distance of 50 mm should be maintained between E-STOP devices to enable cleaning between the devices.
  - We recommend that the device is installed vertically so that liquids can drain off.
- ▶ Cleaning and disinfection
  - Cleaning intervals: always before the device is first put into service and then at regular intervals in accordance with the internal cleaning schedule.
  - You should also clean the device outside of these cleaning intervals if the surface is contaminated, with oily or greasy materials for example.
- ▶ Cleaning agent:
  - We recommend commercial low-concentrated cleaners and disinfectant with low acid content. Do not use highly concentrated solutions!
  - Use clean, lint-free cloths. Do not use sharp, hard or pointed objects (e.g. steel wool, steel brush)!
  - Do not use high pressure cleaners.

### Preparing for operation

Please note the following when connecting the wiring to the contact blocks:

With PIT es Set/1, the contact blocks are supplied pre-assembled in a bracket. With illuminated E-STOP pushbuttons, the contact block must be attached to the bracket.



#### NOTICE

Check the function of the emergency stop device before commissioning for the first time and then at regular intervals (at least annually).

On devices with spring-loaded terminals, we recommend cables with crimp connections and a cable cross section of

- ▶ Max. 0.5 mm<sup>2</sup> for devices with order no. 400451 and 400456
- ▶ Max. 2.5 mm<sup>2</sup> for all other devices.

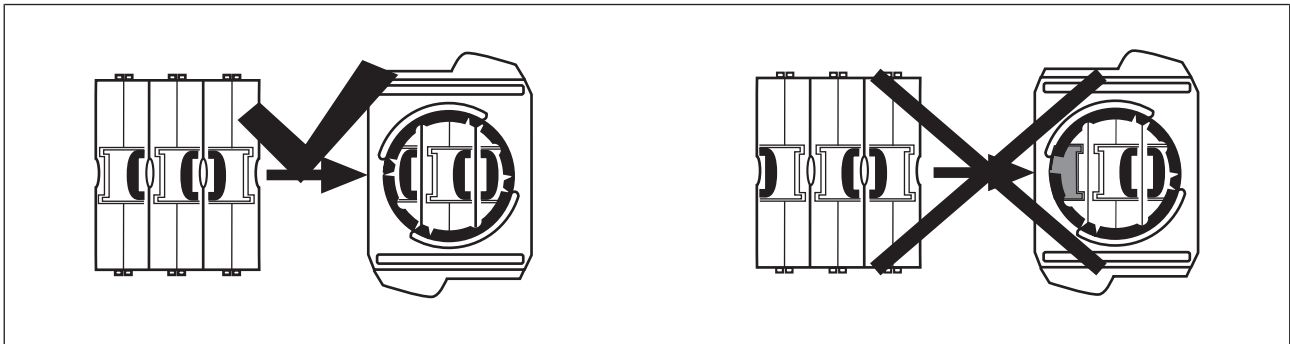
Wiring devices with surface mount housing:

- ▶ With illuminated E-STOP pushbuttons: Break out one of the openings indicated on the upper part of the surface mount housing.
- ▶ To route the cable, break out one of the pre-prepared openings on the lower part of the surface mount housing.
- ▶ Use a plastic M20 stuffing box for sealing and strain relief (a stuffing box is included with PIT es Set6.5cr). Make sure that the contact blocks which are installed in the enclosure are properly connected, so that - when the unit is used correctly - the requirements with regard to airgap creepage are satisfied for an enclosure with protective insulation.

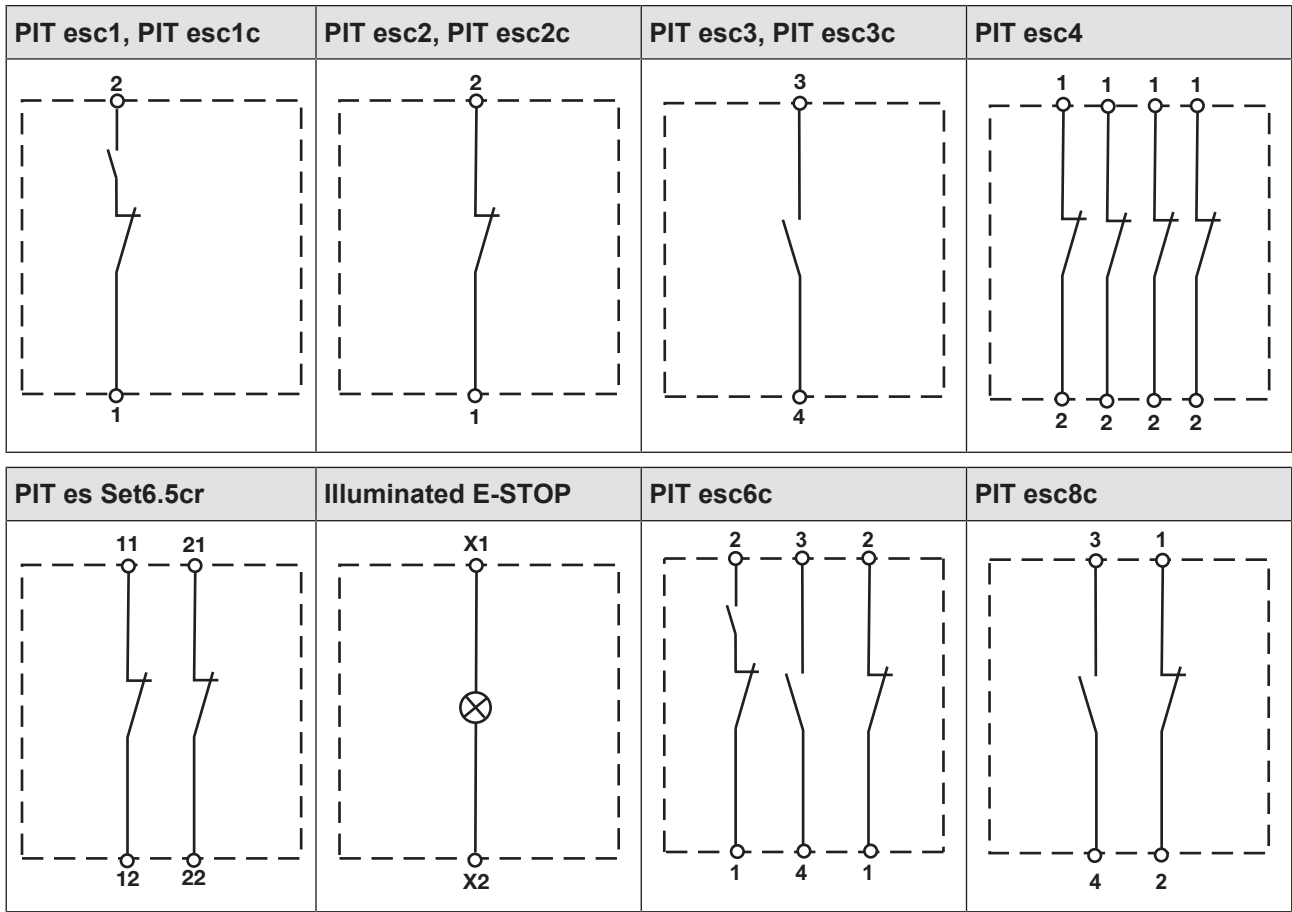


#### NOTICE

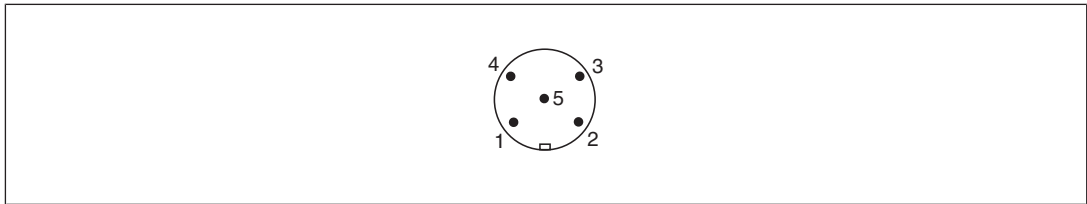
Please note the following when dismantling and reconnecting the individual contact blocks: The slides of the outer contact blocks must be pointing inwards, so that all of the slides are within the ring when the bracket is attached (see Fig. 3).



Assignment of contact blocks

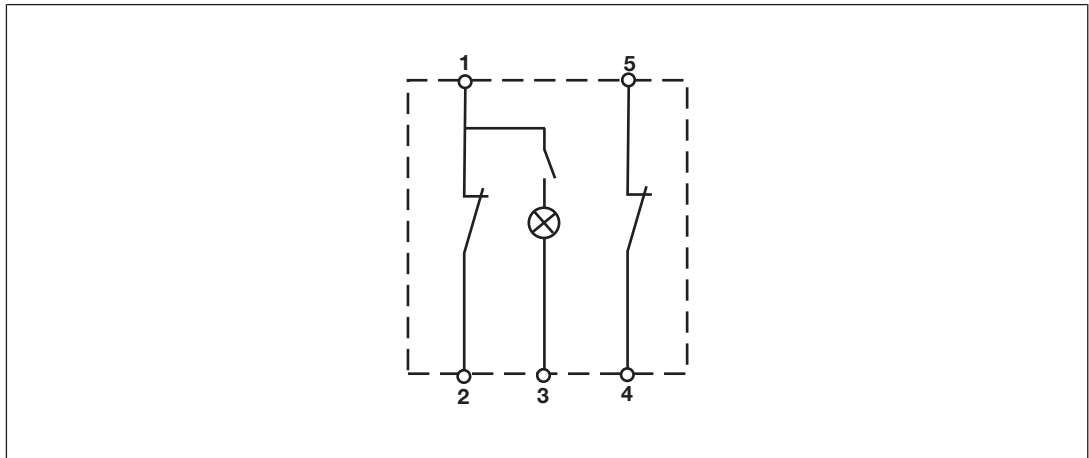


Assignment of the 5-pin M12 male connector

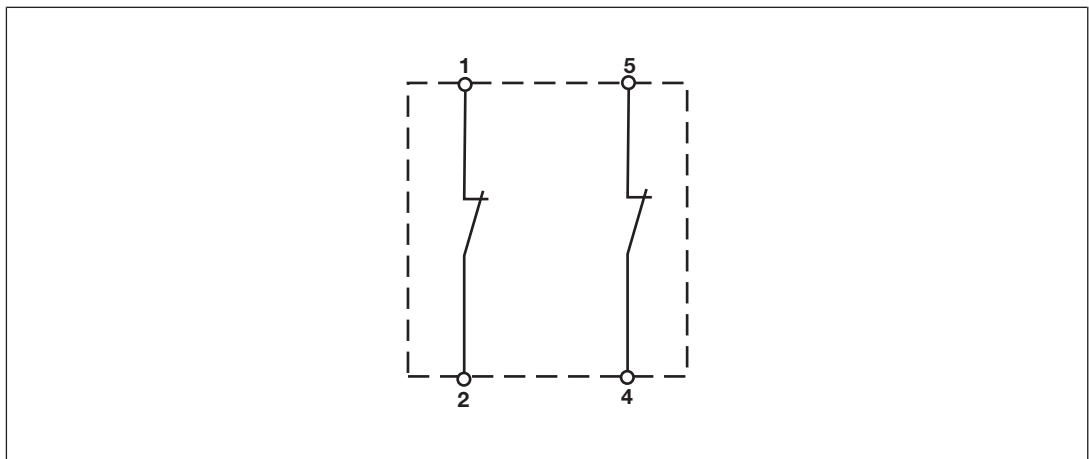


PIN	Function
1	Input, channel 1
2	Output, channel1
3	0 V U <sub>B</sub>
4	Output, channel2
5	Input, channel 2

▶ Connection diagram with illumination

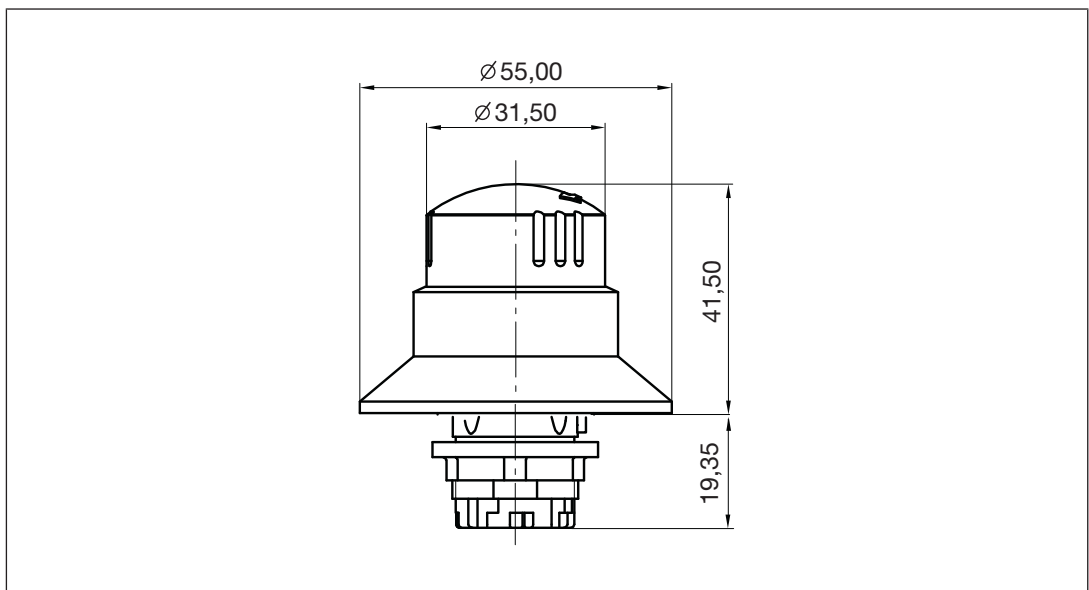


▶ Connection diagram without illumination

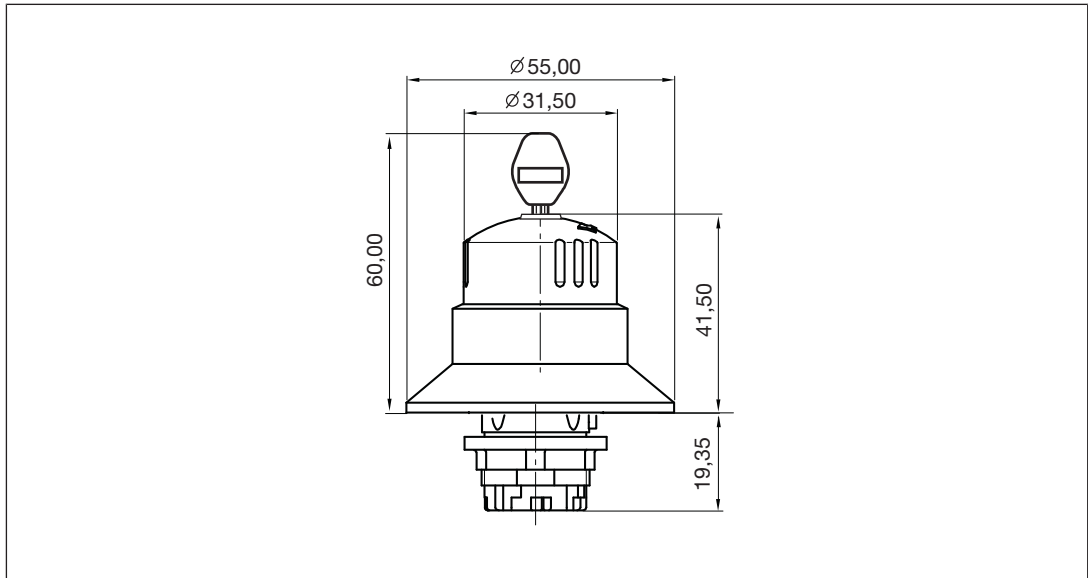


**Dimensions**

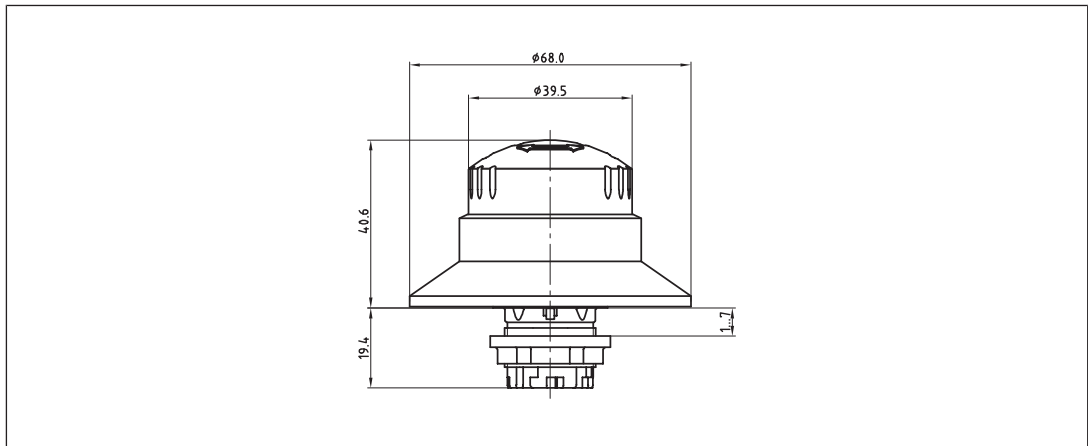
**E-STOP pushbutton (PIT es1s, PIT es1u)**



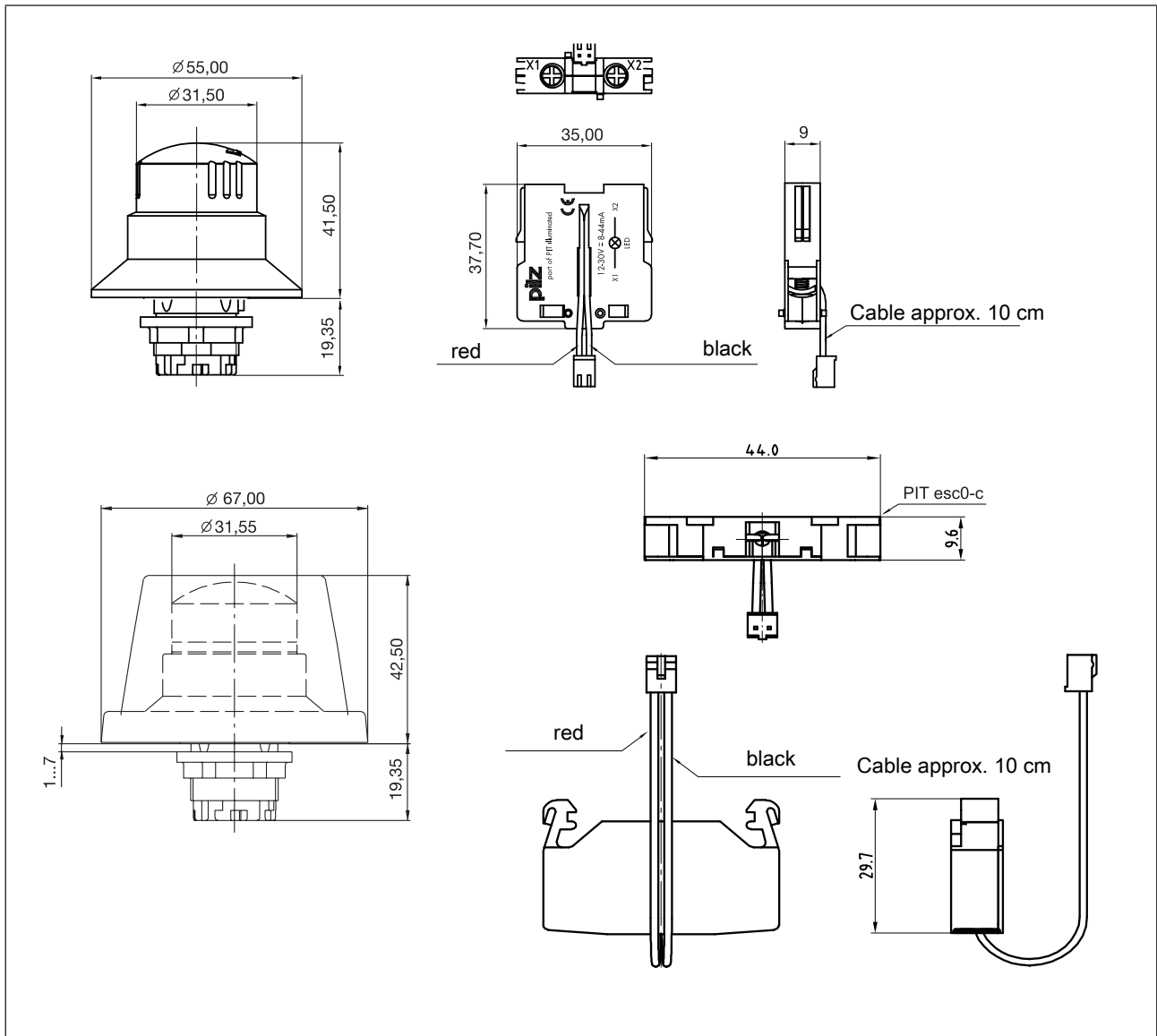
**E-STOP pushbutton with key-release (PIT es8s, PIT es8u)**



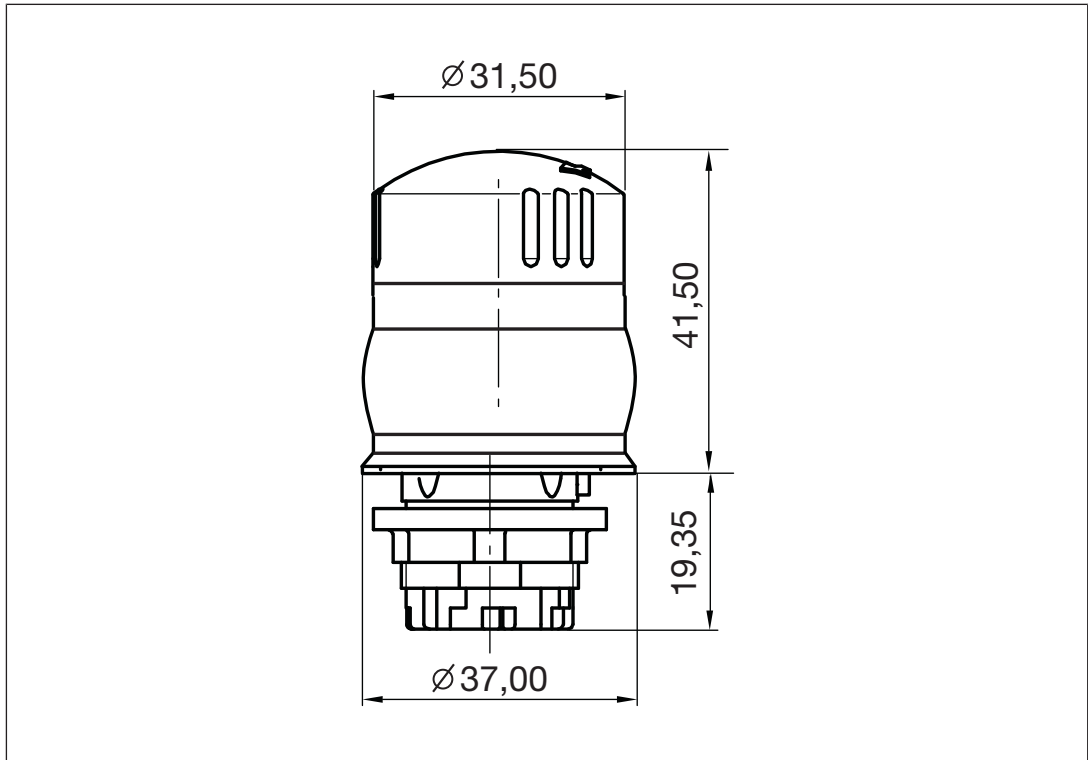
**Large E-STOP pushbutton (68 mm) (PIT es 2s, PIT es2u)**



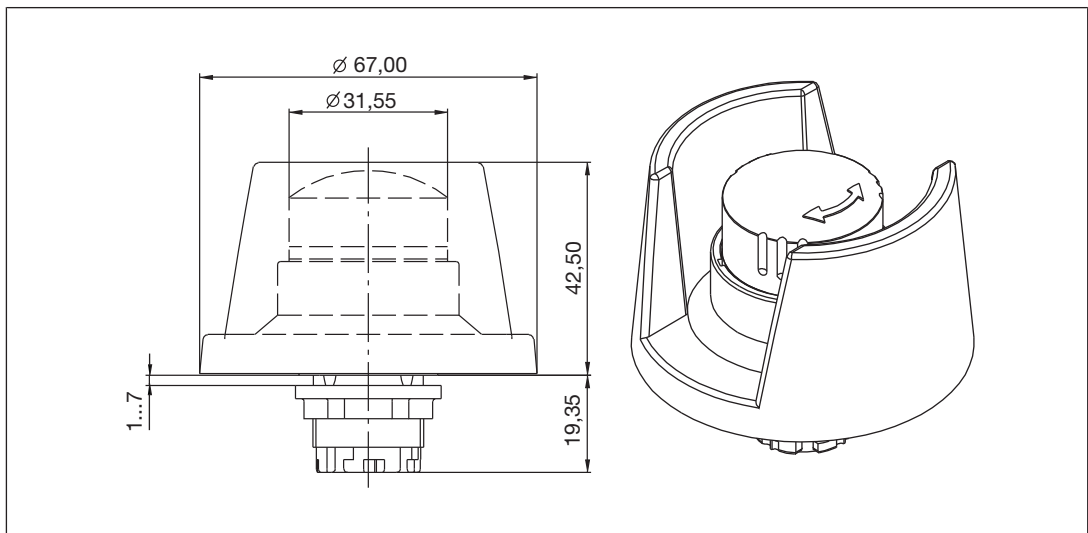
**E-STOP pushbutton with illumination (PIT es3s, PIT es3u)**  
**E-STOP pushbutton with illuminated protective collar (PIT es4s, PIT es4u)**



**E-STOP pushbutton for hygiene critical areas (PIT es7u)**

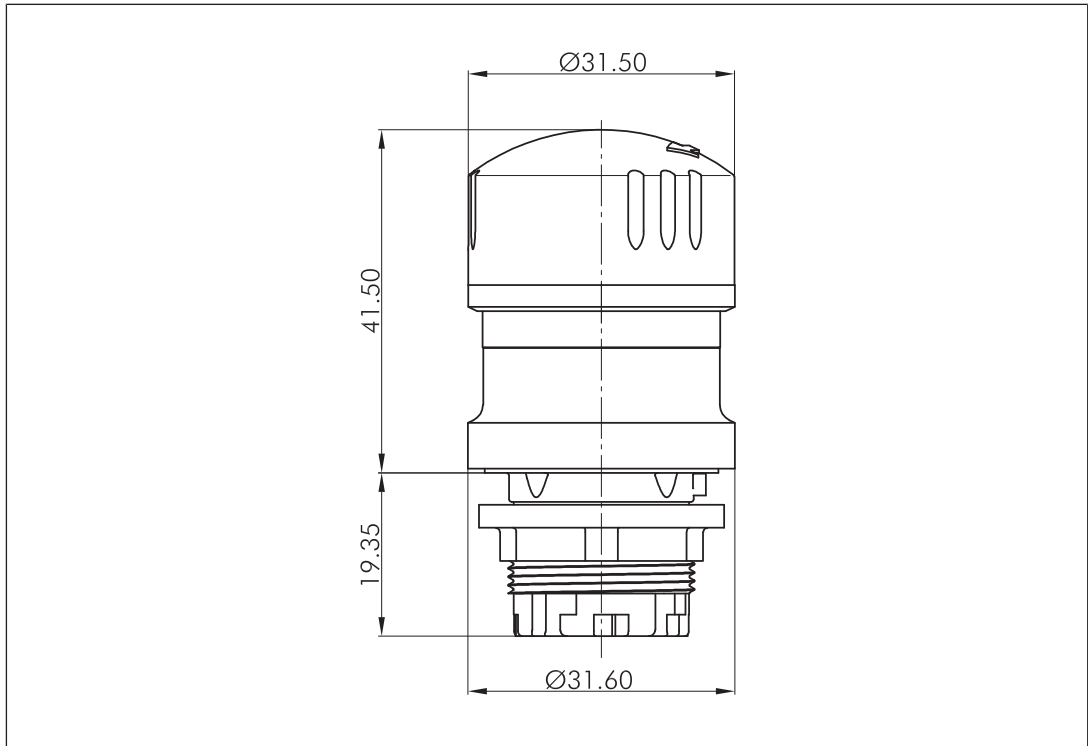


**E-STOP pushbutton with protective collar (PIT es5s, PIT es5u)**

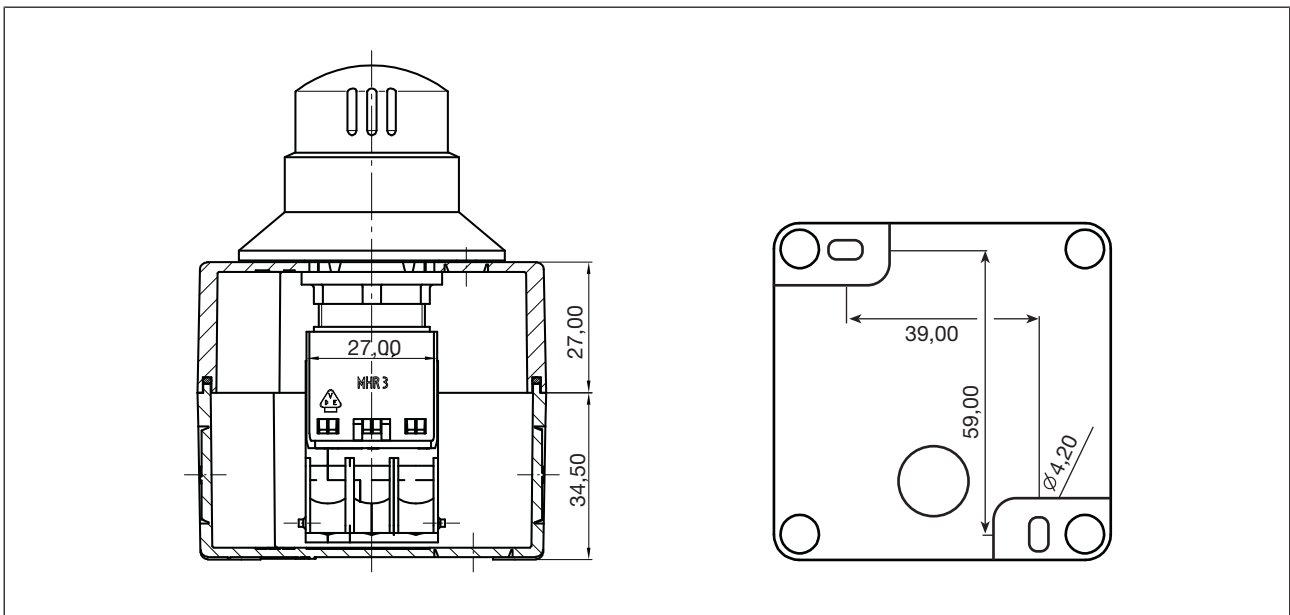




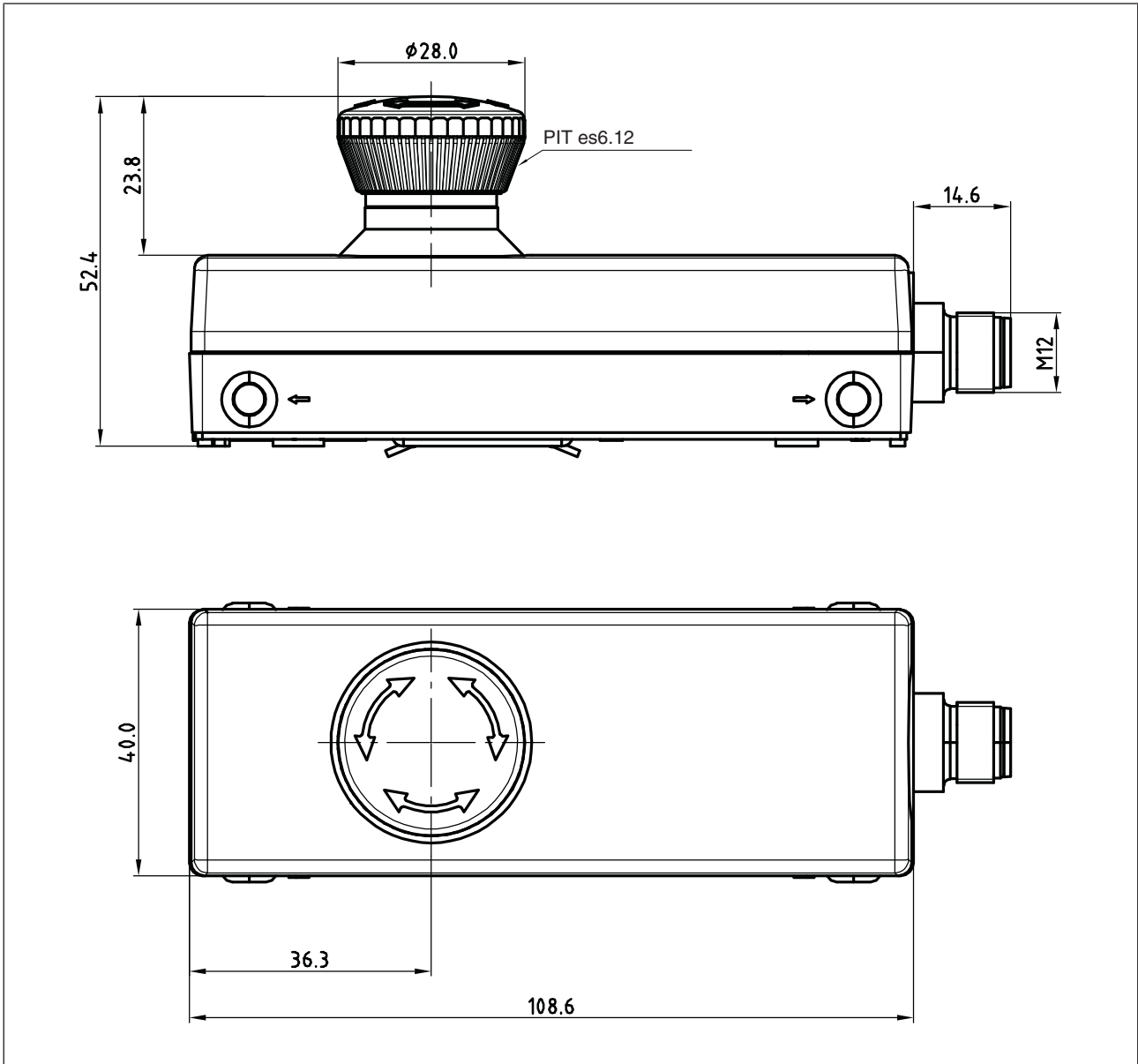
**E-STOP pushbutton without protective collar (PIT es9u)**

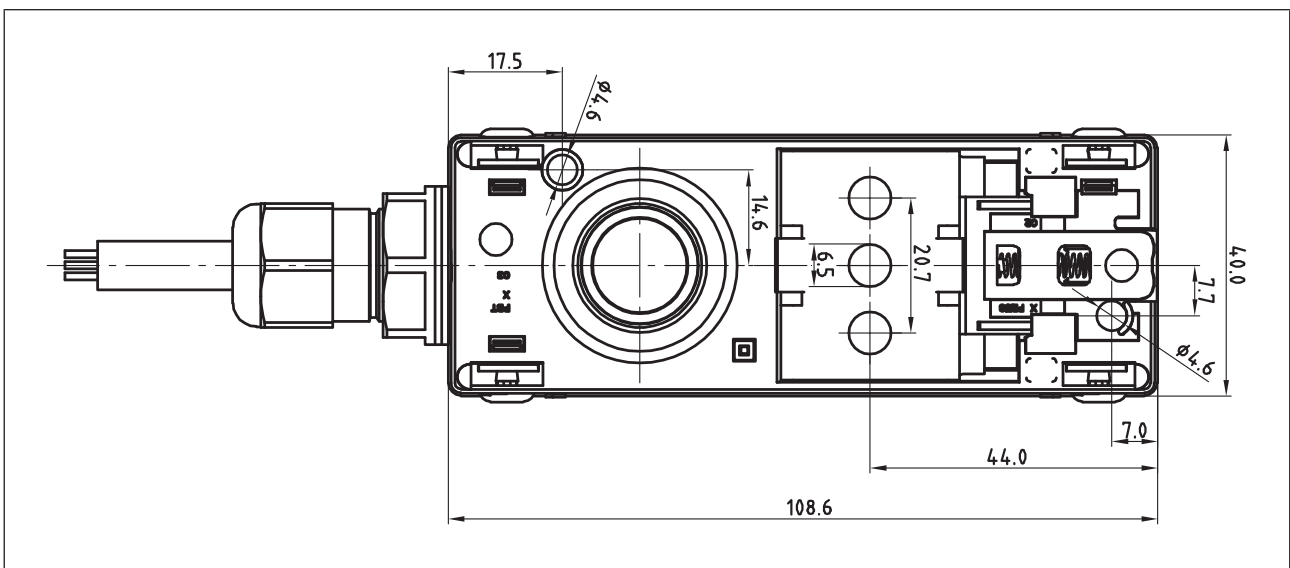
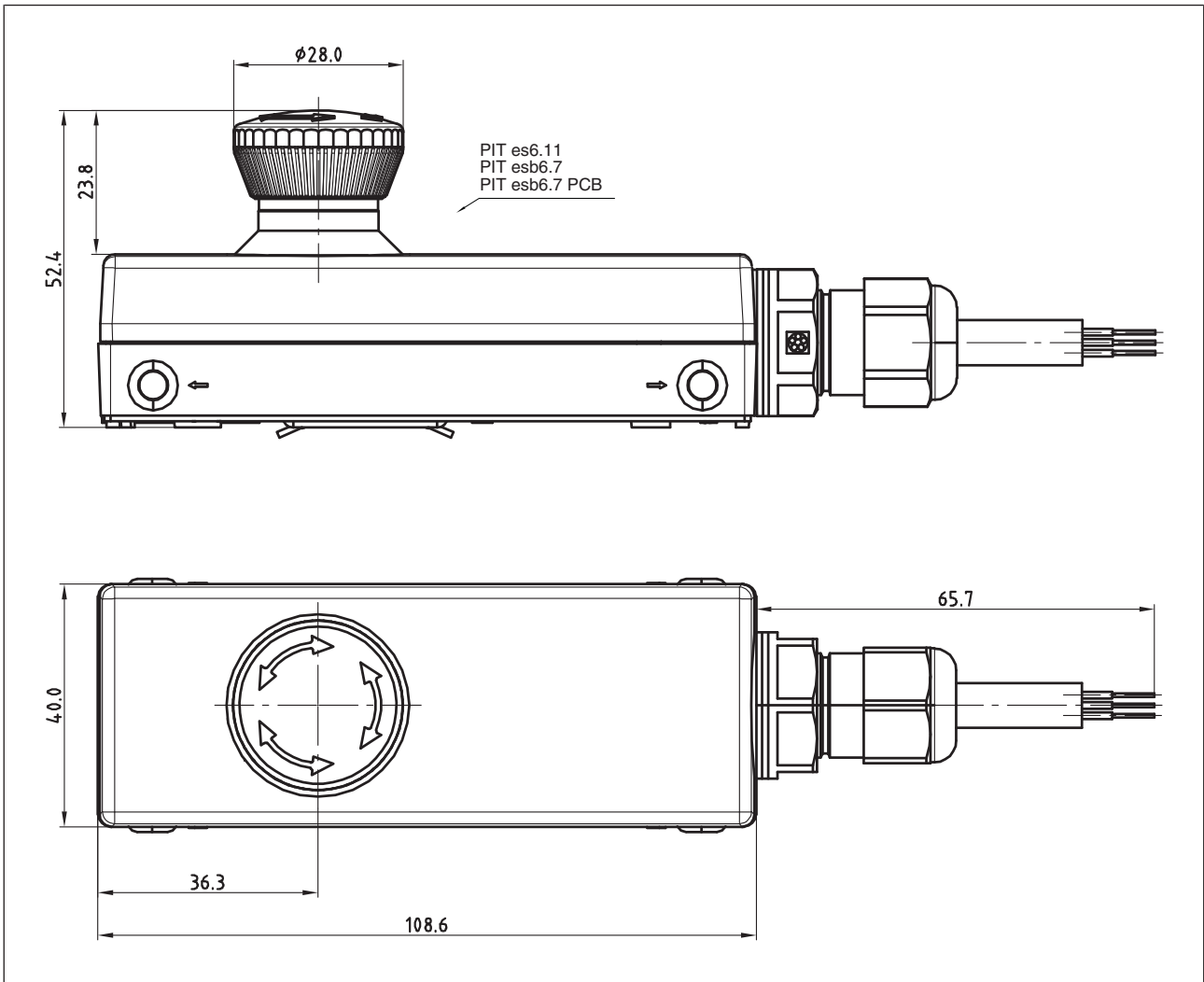


**Surface mount version with E-STOP pushbutton**

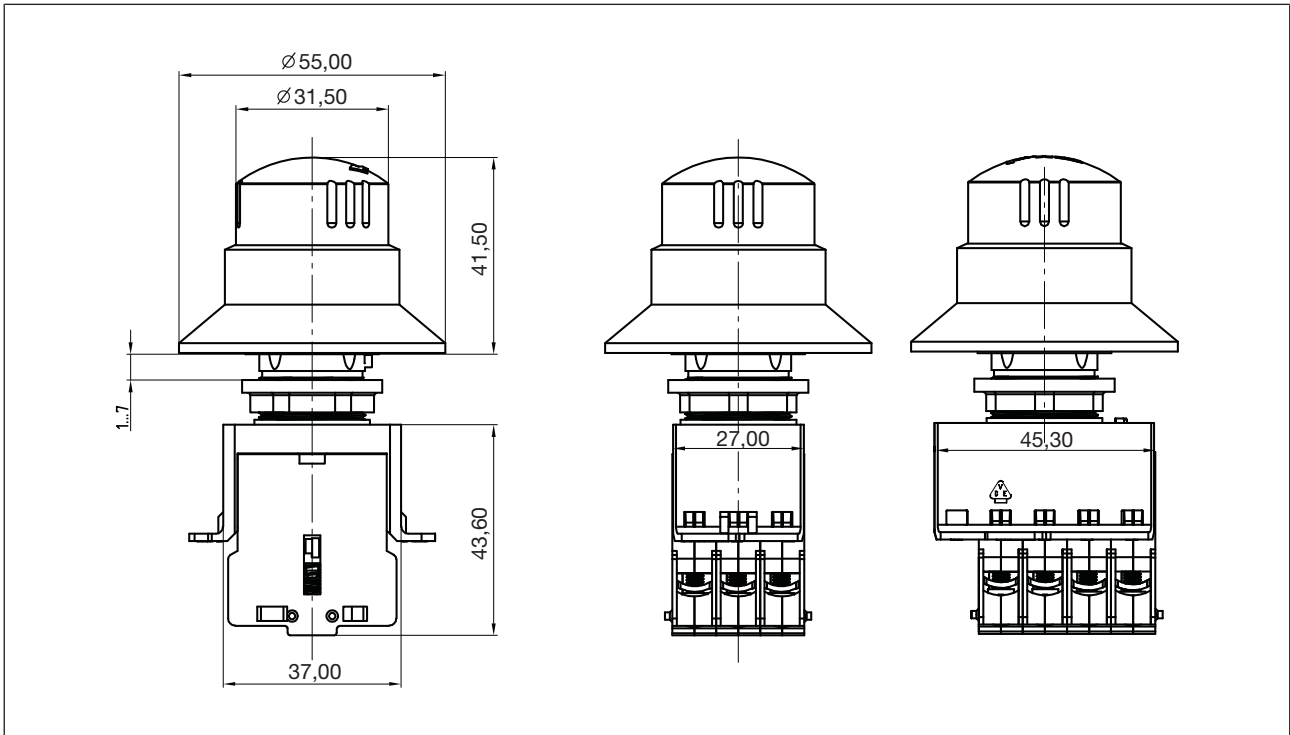


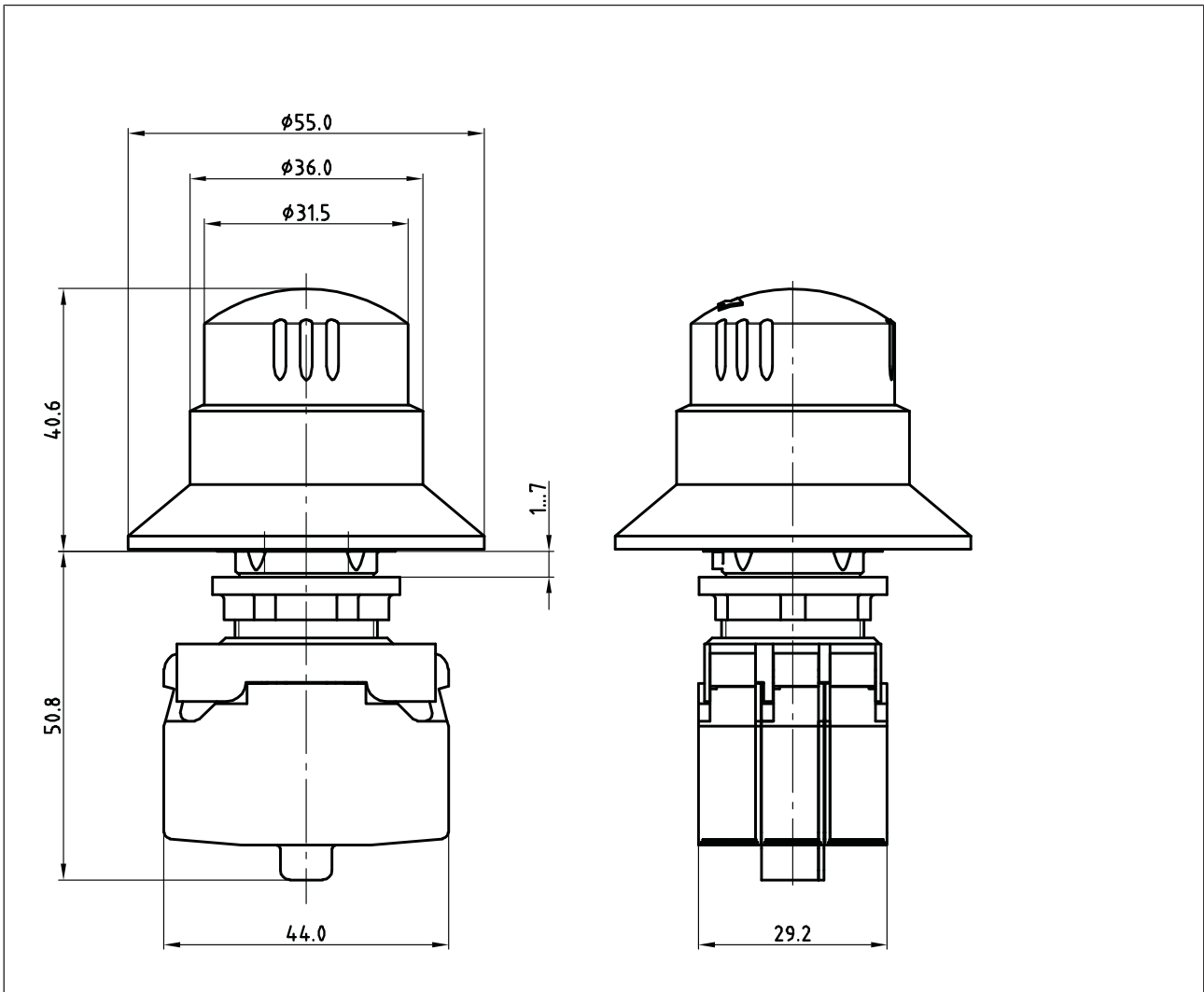
Surface mount version, profile rail, with E-STOP pushbutton (PIT es Set6u-5 nr, PIT es Set6u-5 cr)





Panel mount version with E-STOP pushbutton





**Technical details order no. 400430 - 400432**

General	400430	400431	400432
Approvals	CE	CE	CE
Self-monitored	yes	yes	yes
Electrical data	400430	400431	400432
Volume resistance	100 mOhm	100 mOhm	100 mOhm
Min. contact current	1 mA	5 mA	1 mA
E-STOP	400430	400431	400432
Utilisation category			
In accordance with the standard	EN 60947-5-1	EN 60947-5-1	EN 60947-5-1
Contacts, AC15 at	250 V	250 V	250 V
Current	3 A	3 A	3 A
Contacts, DC13 at	24 V	24 V	24 V
Current	2 A	2 A	2 A

<b>E-STOP</b>	<b>400430</b>	<b>400431</b>	<b>400432</b>
Conventional thermal current	<b>16 A</b>	<b>10 A</b>	<b>16 A</b>
Contact material	<b>AgNi</b>	<b>AgNi</b>	<b>AgNi</b>
<b>Times</b>	<b>400430</b>	<b>400431</b>	<b>400432</b>
Bounce time	<b>10 ms</b>	<b>10 ms</b>	<b>10 ms</b>
<b>Environmental data</b>	<b>400430</b>	<b>400431</b>	<b>400432</b>
Ambient temperature			
Temperature range	<b>-30 - 70 °C</b>	<b>-25 - 55 °C</b>	<b>-30 - 70 °C</b>
Storage temperature			
Temperature range	<b>-50 - 85 °C</b>	<b>-50 - 85 °C</b>	<b>-50 - 85 °C</b>
Rated insulation voltage	<b>250 V</b>	<b>250 V</b>	<b>250 V</b>
Protection type			
Housing	<b>IP65</b>	<b>IP65</b>	<b>IP65</b>
<b>Mechanical data</b>	<b>400430</b>	<b>400431</b>	<b>400432</b>
Mounting position	<b>Any</b>	<b>Any</b>	<b>Any</b>
Mechanical life	<b>20,000 cycles</b>	<b>50,000 cycles</b>	<b>20,000 cycles</b>
Connection type	<b>Screw terminal</b>	<b>Spring-loaded terminal</b>	<b>Screw terminal</b>
Dimensions			
Height	<b>100 mm</b>	<b>92 mm</b>	<b>100 mm</b>
Width	<b>55 mm</b>	<b>55 mm</b>	<b>55 mm</b>
Weight	<b>54 g</b>	<b>51 g</b>	<b>66 g</b>

Where standards are undated, the 2016-05 latest editions shall apply.

### Technical details order no. 400433 - 400435

<b>General</b>	<b>400433</b>	<b>400434</b>	<b>400435</b>
Approvals	<b>CE</b>	<b>CE</b>	<b>CE</b>
Self-monitored	<b>yes</b>	<b>yes</b>	<b>yes</b>
<b>Electrical data</b>	<b>400433</b>	<b>400434</b>	<b>400435</b>
Volume resistance	<b>100 mOhm</b>	<b>100 mOhm</b>	<b>100 mOhm</b>
Min. contact current	<b>5 mA</b>	<b>1 mA</b>	<b>5 mA</b>
<b>E-STOP</b>	<b>400433</b>	<b>400434</b>	<b>400435</b>
Utilisation category			
In accordance with the standard	<b>EN 60947-5-1</b>	<b>EN 60947-5-1</b>	<b>EN 60947-5-1</b>
Contacts, AC15 at	<b>250 V</b>	<b>250 V</b>	<b>250 V</b>
Current	<b>3 A</b>	<b>3 A</b>	<b>3 A</b>
Contacts, DC13 at	<b>24 V</b>	<b>24 V</b>	<b>24 V</b>
Current	<b>2 A</b>	<b>2 A</b>	<b>2 A</b>
Conventional thermal current	<b>10 A</b>	<b>16 A</b>	<b>10 A</b>
Contact material	<b>AgNi</b>	<b>AgNi</b>	<b>AgNi</b>

<b>Times</b>	<b>400433</b>	<b>400434</b>	<b>400435</b>
Bounce time	10 ms	10 ms	10 ms
<b>Environmental data</b>	<b>400433</b>	<b>400434</b>	<b>400435</b>
Ambient temperature			
Temperature range	-25 - 55 °C	-30 - 70 °C	-25 - 55 °C
Storage temperature			
Temperature range	-50 - 85 °C	-50 - 85 °C	-50 - 85 °C
Rated insulation voltage	250 V	250 V	250 V
Protection type			
Housing	IP65	IP65	IP65
<b>Mechanical data</b>	<b>400433</b>	<b>400434</b>	<b>400435</b>
Mounting position	Any	Any	Any
Mechanical life	50,000 cycles	20,000 cycles	50,000 cycles
Connection type	Spring-loaded terminal	Screw terminal	Spring-loaded terminal
Dimensions			
Height	92 mm	87 mm	92 mm
Width	55 mm	74 mm	68 mm
Weight	60 g	74 g	67 g

Where standards are undated, the 2016-05 latest editions shall apply.

### Technical details order no. 400436 - 400438

<b>General</b>	<b>400436</b>	<b>400437</b>	<b>400438</b>
Approvals	CE	CE	CE
Self-monitored	yes	yes	yes
Lamp			
Kind	LED	LED	–
Colour	Yellow	Yellow	–
<b>Electrical data</b>	<b>400436</b>	<b>400437</b>	<b>400438</b>
Supply voltage			
Voltage	12 - 30 V	12 - 30 V	–
Kind	AC/DC	AC/DC	–
Max. inrush current at UB	44 mA	44 mA	–
Volume resistance	100 mOhm	100 mOhm	100 mOhm
Min. contact current	1 mA	5 mA	1 mA
<b>Inputs</b>	<b>400436</b>	<b>400437</b>	<b>400438</b>
Input current range	15 mA	15 mA	–

<b>E-STOP</b>	<b>400436</b>	<b>400437</b>	<b>400438</b>
Utilisation category			
In accordance with the standard	<b>EN 60947-5-1</b>	<b>EN 60947-5-1</b>	<b>EN 60947-5-1</b>
Contacts, AC15 at Current	<b>250 V 3 A</b>	<b>250 V 3 A</b>	<b>250 V 3 A</b>
Contacts, DC13 at Current	<b>24 V 2 A</b>	<b>24 V 2 A</b>	<b>24 V 2 A</b>
Conventional thermal current	<b>16 A</b>	<b>10 A</b>	<b>16 A</b>
Contact material	<b>AgNi</b>	<b>AgNi</b>	<b>AgNi</b>
<b>Times</b>	<b>400436</b>	<b>400437</b>	<b>400438</b>
Bounce time	<b>10 ms</b>	<b>10 ms</b>	<b>10 ms</b>
<b>Environmental data</b>	<b>400436</b>	<b>400437</b>	<b>400438</b>
Ambient temperature			
Temperature range	<b>-25 - 55 °C</b>	<b>-25 - 55 °C</b>	<b>-30 - 70 °C</b>
Storage temperature			
Temperature range	<b>-25 - 80 °C</b>	<b>-25 - 80 °C</b>	<b>-50 - 85 °C</b>
Rated insulation voltage	<b>250 V</b>	<b>250 V</b>	<b>250 V</b>
Protection type			
Housing	<b>IP65</b>	<b>IP65</b>	<b>IP65</b>
<b>Mechanical data</b>	<b>400436</b>	<b>400437</b>	<b>400438</b>
Mounting position	<b>Any</b>	<b>Any</b>	<b>Any</b>
Mechanical life	<b>20,000 cycles</b>	<b>50,000 cycles</b>	<b>20,000 cycles</b>
Connection type	<b>Screw terminal</b>	<b>Spring-loaded terminal</b>	<b>Screw terminal</b>
Dimensions			
Height	<b>100 mm</b>	<b>92 mm</b>	<b>100 mm</b>
Width	<b>55 mm</b>	<b>56 mm</b>	<b>68 mm</b>
Weight	<b>83 g</b>	<b>75 g</b>	<b>83 g</b>

Where standards are undated, the 2016-05 latest editions shall apply.

### Technical details order no. 400439 - 400442

<b>General</b>	<b>400439</b>	<b>400441</b>	<b>400442</b>
Approvals	<b>CE</b>	<b>CE</b>	<b>CE</b>
Self-monitored	<b>yes</b>	<b>yes</b>	<b>yes</b>
<b>Electrical data</b>	<b>400439</b>	<b>400441</b>	<b>400442</b>
Volume resistance	<b>100 mOhm</b>	<b>100 mOhm</b>	<b>100 mOhm</b>
Min. contact current	<b>5 mA</b>	<b>1 mA</b>	<b>5 mA</b>



<b>E-STOP</b>	<b>400439</b>	<b>400441</b>	<b>400442</b>
Utilisation category			
In accordance with the standard	<b>EN 60947-5-1</b>	<b>EN 60947-5-1</b>	<b>EN 60947-5-1</b>
Contacts, AC15 at Current	<b>250 V 3 A</b>	<b>250 V 3 A</b>	<b>250 V 3 A</b>
Contacts, DC13 at Current	<b>24 V 2 A</b>	<b>24 V 2 A</b>	<b>24 V 2 A</b>
Conventional thermal current	<b>10 A</b>	<b>16 A</b>	<b>10 A</b>
Contact material	<b>AgNi</b>	<b>AgNi</b>	<b>AgNi</b>
<b>Times</b>	<b>400439</b>	<b>400441</b>	<b>400442</b>
Bounce time	<b>10 ms</b>	<b>10 ms</b>	<b>10 ms</b>
<b>Environmental data</b>	<b>400439</b>	<b>400441</b>	<b>400442</b>
Ambient temperature			
Temperature range	<b>-25 - 55 °C</b>	<b>-30 - 70 °C</b>	<b>-25 - 55 °C</b>
Storage temperature			
Temperature range	<b>-50 - 85 °C</b>	<b>-50 - 85 °C</b>	<b>-50 - 85 °C</b>
Rated insulation voltage	<b>250 V</b>	<b>250 V</b>	<b>250 V</b>
Protection type			
Housing	<b>IP65</b>	<b>IP69K</b>	<b>IP69K</b>
<b>Mechanical data</b>	<b>400439</b>	<b>400441</b>	<b>400442</b>
Mounting position	<b>Any</b>	<b>Any</b>	<b>Any</b>
Mechanical life	<b>50,000 cycles</b>	<b>6050 cycles</b>	<b>6050 cycles</b>
Connection type	<b>Spring-loaded terminal</b>	<b>Screw terminal</b>	<b>Spring-loaded terminal</b>
Dimensions			
Height	<b>92 mm</b>	<b>100 mm</b>	<b>92 mm</b>
Width	<b>68 mm</b>	<b>50 mm</b>	<b>44 mm</b>
Weight	<b>77 g</b>	<b>62 g</b>	<b>56 g</b>

Where standards are undated, the 2016-05 latest editions shall apply.

### Technical details order no. 400443 - 400445

<b>General</b>	<b>400443</b>	<b>400444</b>	<b>400445</b>
Approvals	<b>CE</b>	<b>CE</b>	<b>CE</b>
Self-monitored	<b>yes</b>	<b>yes</b>	<b>yes</b>
<b>Electrical data</b>	<b>400443</b>	<b>400444</b>	<b>400445</b>
Volume resistance	<b>100 mOhm</b>	<b>100 mOhm</b>	<b>100 mOhm</b>
Min. contact current	<b>1 mA</b>	<b>5 mA</b>	<b>1 mA</b>

<b>E-STOP</b>	<b>400443</b>	<b>400444</b>	<b>400445</b>
Utilisation category			
In accordance with the standard	<b>EN 60947-5-1</b>	<b>EN 60947-5-1</b>	<b>EN 60947-5-1</b>
Contacts, AC15 at Current	<b>250 V</b> <b>3 A</b>	<b>250 V</b> <b>3 A</b>	<b>250 V</b> <b>3 A</b>
Contacts, DC13 at Current	<b>24 V</b> <b>2 A</b>	<b>24 V</b> <b>2 A</b>	<b>24 V</b> <b>2 A</b>
Conventional thermal current	<b>16 A</b>	<b>10 A</b>	<b>16 A</b>
Contact material	<b>AgNi</b>	<b>AgNi</b>	<b>AgNi</b>
<b>Times</b>	<b>400443</b>	<b>400444</b>	<b>400445</b>
Bounce time	<b>10 ms</b>	<b>10 ms</b>	<b>10 ms</b>
<b>Environmental data</b>	<b>400443</b>	<b>400444</b>	<b>400445</b>
Ambient temperature			
Temperature range	<b>-30 - 70 °C</b>	<b>-25 - 55 °C</b>	<b>-30 - 70 °C</b>
Storage temperature			
Temperature range	<b>-50 - 85 °C</b>	<b>-50 - 85 °C</b>	<b>-50 - 85 °C</b>
Rated insulation voltage	<b>250 V</b>	<b>250 V</b>	<b>250 V</b>
Protection type			
Housing	<b>IP65</b>	<b>IP65</b>	<b>IP65</b>
<b>Mechanical data</b>	<b>400443</b>	<b>400444</b>	<b>400445</b>
Mounting position	<b>Any</b>	<b>Any</b>	<b>Any</b>
Mechanical life	<b>20,000 cycles</b>	<b>50,000 cycles</b>	<b>20,000 cycles</b>
Connection type	<b>Screw terminal</b>	<b>Spring-loaded terminal</b>	<b>Screw terminal</b>
Dimensions			
Height	<b>100 mm</b>	<b>93 mm</b>	<b>100 mm</b>
Width	<b>55 mm</b>	<b>55 mm</b>	<b>55 mm</b>
Weight	<b>78 g</b>	<b>72 g</b>	<b>77 g</b>

Where standards are undated, the 2016-05 latest editions shall apply.

### Technical details order no. 400446 - 400448

<b>General</b>	<b>400446</b>	<b>400447</b>	<b>400448</b>
Approvals	<b>CE</b>	<b>CE</b>	<b>CE</b>
Self-monitored	<b>yes</b>	<b>yes</b>	<b>yes</b>
<b>Electrical data</b>	<b>400446</b>	<b>400447</b>	<b>400448</b>
Volume resistance	<b>100 mOhm</b>	<b>100 mOhm</b>	<b>100 mOhm</b>
Min. contact current	<b>5 mA</b>	<b>1 mA</b>	<b>5 mA</b>

<b>E-STOP</b>	<b>400446</b>	<b>400447</b>	<b>400448</b>
Utilisation category			
In accordance with the standard	<b>EN 60947-5-1</b>	<b>EN 60947-5-1</b>	<b>EN 60947-5-1</b>
Contacts, AC15 at	<b>250 V</b>	<b>250 V</b>	<b>250 V</b>
Current	<b>3 A</b>	<b>3 A</b>	<b>3 A</b>
Contacts, DC13 at	<b>24 V</b>	<b>24 V</b>	<b>24 V</b>
Current	<b>2 A</b>	<b>2 A</b>	<b>2 A</b>
Conventional thermal current	<b>10 A</b>	<b>16 A</b>	<b>10 A</b>
Contact material	<b>AgNi</b>	<b>AgNi</b>	<b>AgNi</b>
<b>Times</b>	<b>400446</b>	<b>400447</b>	<b>400448</b>
Bounce time	<b>10 ms</b>	<b>10 ms</b>	<b>10 ms</b>
<b>Environmental data</b>	<b>400446</b>	<b>400447</b>	<b>400448</b>
Ambient temperature			
Temperature range	<b>-25 - 55 °C</b>	<b>-25 - 55 °C</b>	<b>-25 - 55 °C</b>
Storage temperature			
Temperature range	<b>-50 - 85 °C</b>	<b>-50 - 85 °C</b>	<b>-50 - 85 °C</b>
Rated insulation voltage	<b>250 V</b>	<b>250 V</b>	<b>250 V</b>
Protection type			
Housing	<b>IP65</b>	<b>IP65</b>	<b>IP65</b>
<b>Mechanical data</b>	<b>400446</b>	<b>400447</b>	<b>400448</b>
Mounting position	<b>Any</b>	<b>Any</b>	<b>Any</b>
Mechanical life	<b>50,000 cycles</b>	<b>20,000 cycles</b>	<b>50,000 cycles</b>
Connection type	<b>Spring-loaded terminal</b>	<b>Screw terminal</b>	<b>Spring-loaded terminal</b>
Dimensions			
Height	<b>92 mm</b>	<b>72 mm</b>	<b>72 mm</b>
Width	<b>55 mm</b>	<b>103 mm</b>	<b>103 mm</b>
Depth	<b>–</b>	<b>72 mm</b>	<b>72 mm</b>
Weight	<b>69 g</b>	<b>161 g</b>	<b>155 g</b>

Where standards are undated, the 2016-05 latest editions shall apply.

### Technical details order no. 400449 - 400451

<b>General</b>	<b>400449</b>	<b>400450</b>	<b>400451</b>
Approvals	<b>CE</b>	<b>CE</b>	<b>CE, EAC (Eurasian)</b>
Self-monitored	<b>yes</b>	<b>yes</b>	<b>No</b>
Lamp			
Kind	<b>LED</b>	<b>–</b>	<b>–</b>
Colour	<b>Yellow</b>	<b>–</b>	<b>–</b>
<b>Electrical data</b>	<b>400449</b>	<b>400450</b>	<b>400451</b>
Supply voltage			
Voltage	<b>12 - 30 V</b>	<b>–</b>	<b>–</b>
Kind	<b>AC/DC</b>	<b>–</b>	<b>–</b>
Max. inrush current at UB	<b>44 mA</b>	<b>–</b>	<b>–</b>

<b>Electrical data</b>	<b>400449</b>	<b>400450</b>	<b>400451</b>
Volume resistance	100 mOhm	100 mOhm	100 mOhm
Min. contact current	1 mA	1 mA	1 mA
<b>Inputs</b>	<b>400449</b>	<b>400450</b>	<b>400451</b>
Input current range	15 mA	–	–
<b>E-STOP</b>	<b>400449</b>	<b>400450</b>	<b>400451</b>
Utilisation category			
In accordance with the standard	EN 60947-5-1	EN 60947-5-1	EN 60947-5-1
Contacts, AC15 at	250 V	250 V	250 V
Current	3 A	3 A	1,5 A
Contacts, DC13 at	24 V	24 V	120 V
Current	2 A	2 A	0,6 A
Conventional thermal current	16 A	16 A	5 A
Contact material	AgNi	AgNi	AgNi
<b>Times</b>	<b>400449</b>	<b>400450</b>	<b>400451</b>
Bounce time	10 ms	10 ms	10 ms
<b>Environmental data</b>	<b>400449</b>	<b>400450</b>	<b>400451</b>
Ambient temperature			
Temperature range	-25 - 55 °C	-25 - 55 °C	-25 - 55 °C
Storage temperature			
Temperature range	-25 - 80 °C	-50 - 85 °C	-25 - 80 °C
Rated insulation voltage	250 V	250 V	250 V
Protection type			
Housing	IP65	IP65	IP65
<b>Mechanical data</b>	<b>400449</b>	<b>400450</b>	<b>400451</b>
Mounting position	Any	Any	Any
Mechanical life	20,000 cycles	20,000 cycles	50,000 cycles
Connection type	Screw terminal	Screw terminal	Spring-loaded terminal
Dimensions			
Height	72 mm	103 mm	51 mm
Width	103 mm	72 mm	42 mm
Depth	72 mm	72 mm	108 mm
Weight	178 g	177 g	122 g

Where standards are undated, the 2016-05 latest editions shall apply.

### Technical details order no. 400452 - 400454

<b>General</b>	<b>400452</b>	<b>400453</b>	<b>400454</b>
Approvals	CE	CE	CE
Self-monitored	yes	yes	yes

<b>General</b>	<b>400452</b>	<b>400453</b>	<b>400454</b>
Lamp			
Kind	–	–	<b>LED</b>
Colour	–	–	<b>Yellow</b>
<b>Electrical data</b>	<b>400452</b>	<b>400453</b>	<b>400454</b>
Supply voltage			
Voltage	–	–	<b>12 - 30 V</b>
Kind	–	–	<b>AC/DC</b>
Max. inrush current at UB	–	–	<b>44 mA</b>
Volume resistance	<b>100 mOhm</b>	<b>100 mOhm</b>	<b>100 mOhm</b>
Min. contact current	<b>1 mA</b>	<b>1 mA</b>	<b>1 mA</b>
<b>Inputs</b>	<b>400452</b>	<b>400453</b>	<b>400454</b>
Input current range	–	–	<b>15 mA</b>
<b>E-STOP</b>	<b>400452</b>	<b>400453</b>	<b>400454</b>
Utilisation category			
In accordance with the standard	<b>EN 60947-5-1</b>	<b>EN 60947-5-1</b>	<b>EN 60947-5-1</b>
Contacts, AC15 at	<b>250 V</b>	<b>250 V</b>	<b>250 V</b>
Current	<b>3 A</b>	<b>3 A</b>	<b>3 A</b>
Contacts, DC13 at	<b>24 V</b>	<b>24 V</b>	<b>24 V</b>
Current	<b>2 A</b>	<b>2 A</b>	<b>2 A</b>
Conventional thermal current	<b>16 A</b>	<b>16 A</b>	<b>16 A</b>
Contact material	<b>AgNi</b>	<b>AgNi</b>	<b>AgNi</b>
<b>Times</b>	<b>400452</b>	<b>400453</b>	<b>400454</b>
Bounce time	<b>10 ms</b>	<b>10 ms</b>	<b>10 ms</b>
<b>Environmental data</b>	<b>400452</b>	<b>400453</b>	<b>400454</b>
Ambient temperature			
Temperature range	<b>-25 - 55 °C</b>	<b>-25 - 55 °C</b>	<b>-25 - 55 °C</b>
Storage temperature			
Temperature range	<b>-50 - 85 °C</b>	<b>-25 - 80 °C</b>	<b>-25 - 80 °C</b>
Rated insulation voltage	<b>250 V</b>	<b>250 V</b>	<b>250 V</b>
Protection type			
Housing	<b>IP65</b>	<b>IP65</b>	<b>IP65</b>
<b>Mechanical data</b>	<b>400452</b>	<b>400453</b>	<b>400454</b>
Mounting position	<b>Any</b>	<b>Any</b>	<b>Any</b>
Mechanical life	<b>20,000 cycles</b>	<b>20,000 cycles</b>	<b>20,000 cycles</b>
Connection type	<b>Screw terminal</b>	<b>M12</b>	<b>M12</b>
Dimensions			
Height	<b>72 mm</b>	<b>103 mm</b>	<b>103 mm</b>
Width	<b>103 mm</b>	<b>72 mm</b>	<b>72 mm</b>
Depth	<b>72 mm</b>	<b>85 mm</b>	<b>85 mm</b>
Weight	<b>172 g</b>	<b>178 g</b>	<b>212 g</b>

Where standards are undated, the 2016-05 latest editions shall apply.

### Technical details order no. 400455 - 400457

<b>General</b>	<b>400455</b>	<b>400457</b>
Approvals	CE, EAC (Eurasian)	CE
Self-monitored	No	yes
<b>Electrical data</b>	<b>400455</b>	<b>400457</b>
Volume resistance	100 mOhm	100 mOhm
Min. contact current	1 mA	1 mA
<b>E-STOP</b>	<b>400455</b>	<b>400457</b>
Utilisation category		
In accordance with the standard	EN 60947-5-1	EN 60947-5-1
Contacts, AC15 at	–	250 V
Current	–	3 A
Contacts, DC13 at	–	24 V
Current	–	2 A
Conventional thermal current	–	16 A
Contact material	AgNi, vergoldet	AgNi
<b>Times</b>	<b>400455</b>	<b>400457</b>
Bounce time	10 ms	10 ms
<b>Environmental data</b>	<b>400455</b>	<b>400457</b>
Ambient temperature		
Temperature range	-25 - 55 °C	-30 - 70 °C
Storage temperature		
Temperature range	-25 - 80 °C	-50 - 85 °C
Rated insulation voltage	250 V	250 V
Protection type		
Housing	IP65	IP65
<b>Mechanical data</b>	<b>400455</b>	<b>400457</b>
Mounting position	Any	Any
Mechanical life	50,000 cycles	20,000 cycles
Connection type	M12	Screw terminal
Dimensions		
Height	53 mm	100 mm
Width	42 mm	50 mm
Depth	123 mm	–
Weight	113 g	72 g

Where standards are undated, the 2016-05 latest editions shall apply.

### Technical details order no. 400458 - 400459

<b>General</b>	<b>400458</b>	<b>400459</b>
Approvals	CE, EAC (Eurasian)	CE, EAC (Eurasian)
Self-monitored	yes	yes

<b>Electrical data</b>	<b>400458</b>	<b>400459</b>
Volume resistance	<b>100 mOhm</b>	<b>100 mOhm</b>
Min. contact current	<b>1 mA</b>	<b>5 mA</b>
<b>E-STOP</b>	<b>400458</b>	<b>400459</b>
Utilisation category		
In accordance with the standard	<b>EN 60947-5-1</b>	<b>EN 60947-5-1</b>
Contacts, AC15 at	<b>250 V</b>	<b>250 V</b>
Current	<b>3 A</b>	<b>3 A</b>
Contacts, DC13 at	<b>24 V</b>	<b>24 V</b>
Current	<b>2 A</b>	<b>2 A</b>
Conventional thermal current	<b>16 A</b>	<b>10 A</b>
Contact material	<b>AgNi</b>	<b>AgNi</b>
<b>Times</b>	<b>400458</b>	<b>400459</b>
Bounce time	<b>10 ms</b>	<b>10 ms</b>
<b>Environmental data</b>	<b>400458</b>	<b>400459</b>
Ambient temperature		
Temperature range	<b>-30 - 70 °C</b>	<b>-25 - 55 °C</b>
Storage temperature		
Temperature range	<b>-50 - 85 °C</b>	<b>-50 - 85 °C</b>
Rated insulation voltage	<b>250 V</b>	<b>250 V</b>
Protection type		
Housing	<b>IP65</b>	<b>IP65</b>
<b>Mechanical data</b>	<b>400458</b>	<b>400459</b>
Mounting position	<b>Any</b>	<b>Any</b>
Mechanical life	<b>20,000 cycles</b>	<b>50,000 cycles</b>
Connection type	<b>Screw terminal</b>	<b>Spring-loaded terminal</b>
Dimensions		
Height	<b>100 mm</b>	<b>88 mm</b>
Width	<b>52 mm</b>	<b>44 mm</b>
Weight	<b>60 g</b>	<b>53 g</b>

Where standards are undated, the 2016-05 latest editions shall apply.

### Safety characteristic data



#### NOTICE

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

<b>Safety characteristic data</b>	
B10d in accordance with EN ISO 13849-1:2015 and EN 62061	104.000
Lambda <sub>d</sub> /Lambda in accordance with EN 62061	0,20

## Order reference

### Product

### Sets

Product type	Features	Order no.
PIT es Set1s-1	PIT es1s + PIT esc1 + PIT MHR3	400 430
PIT es Set1s-1c	PIT es1s + PIT esc1c + PIT es holder 3c	400 431
PIT es Set1s-5	PIT es1s + PIT esc1 + PIT esc2 + PIT MHR3	400 432
PIT es Set1s-5c	PIT es1s + PIT esc1c + PIT esc2c + PIT es holder 3c	400 433
PIT es Set2s-5	PIT es2s + PIT esc1 + PIT esc2 + PIT MHR3	400 434
PIT es Set2s-5c	PIT es2s + PIT esc1c + PIT esc2c + PIT es holder 3c	400 435
PIT es Set3s-5	PIT es3s + PIT esc1 + PIT esc2 + PIT MHR3	400 436
PIT es Set3s-5c	PIT es3s + PIT esc1c + PIT esc2c + PIT es holder 3c	400 437
PIT es Set5s-5	PIT es5s + PIT esc1 + PIT esc2 + PIT MHR3	400 438
PIT es Set5s-5c	PIT es5s + PIT esc1c + PIT esc2c + PIT es holder 3c	400 439
PIT es Set7u-5	PIT es7s + PIT esc1 + PIT esc2 + PIT MHR3	400 441
PIT es Set7u-5c	PIT es7s + PIT esc1c + PIT esc2c + PIT es holder 3c	400 442
PIT es Set8s-5	PIT es8s + PIT esc1 + PIT esc2 + PIT MHR3	400 443
PIT es Set8s-5c	PIT es8s + PIT esc1c + PIT esc2c + PIT es holder 3c	400 444
PIT es Set1s-6	PIT es1s + PIT esc1 + PIT esc2 + PIT MHR3	400 445
PIT es Set1s-6c	PIT es1s + PIT esc1c + PIT esc2c + PIT esc3c + PIT es holder 3c	400 446
PIT es Set1s-5 s	PIT es1s + PIT es box + PIT esc1 + PIT esc2 + PIT MHR3	400 447
PIT es Set1s-5cs	PIT es1s + PIT es box + PIT esc1c + PIT esc2c + PIT es holder3c	400 448
PIT es Set3s-5 s	PIT es3s + PIT es box + PIT esc1 + PIT esc2 + PIT MHR3	400 449
PIT es Set5s-5 s	PIT es5s + PIT es box + PIT esc1 + PIT esc2 + PIT MHR3	400 450
PIT es Set6u-5cr	Non-modular set for rail mounting	400 451
PIT es Set1s-6 s	PIT es1s + PIT es box + PIT esc1 + PIT esc2 + PIT esc3 + PIT MHR3	400 452
PIT es Set1s-5ns	PIT es1s + PIT es box with M12 connector	400 453
PIT es Set3s-5ns	PIT es3s + PIT es box with M12 connector	400 454
PIT es Set6u-5nr	Non-modular set with M12 connection for rail mounting	400 455
PIT es Set9u-7	PIT es9u + PIT esc1 + PIT esc2 + PIT esc2 + PIT MHR3	400 457
PIT es Set9u-5	PIT es9u + PIT esc1 + PIT esc2 + PIT MHR3	400 458
PIT es Set9u-5c	PIT es9u + PIT esc1c + PIT esc2c + PIT es holder3c	400 459



**E-STOP pushbuttons**

Product type	Features	Order no.
PIT es1s	Inscription: E-STOP symbol	400 131
PIT es1u	Uninscribed	400 531
PIT es2s	Large (60 mm), inscription: E-STOP symbol	400 132
PIT es2u	Large (60 mm), uninscribed	400 532
PIT es3s	Illuminated, inscription: E-STOP symbol	400 133
PIT es3s-c	Illuminated, inscription: E-STOP symbol, with spring-loaded terminals	400 143
PIT es3u	Illuminated, uninscribed	400 533
PIT es3u-c	Illuminated, uninscribed, with spring-loaded terminals	400 543
PIT es4s	Illuminated, inscription: E-STOP symbol, protective collar	400 134
PIT es4u	Illuminated, uninscribed, protective collar	400 534
PIT es5s	Inscription: E-STOP symbol, protective collar	400 135
PIT es5u	Uninscribed, protective collar	400 535
PIT es7u	Uninscribed, IP69K	400 537
PIT es8s	Inscription: E-STOP symbol, key-release	400 138
PIT es8u	Uninscribed, key-release	400 538
PIT es9u	Uninscribed	400 539

**Contact blocks**

Product type	Features	Order no.
PIT esc1	1 monitored N/C, screw terminal	400 315
PIT esc1c	1 monitored N/C, spring-loaded terminal	400 316
PIT esc2	1 N/C, screw terminal	400 320
PIT esc2c	1 N/C, spring-loaded terminal	400 321
PIT esc3	1 N/O, screw terminal	400 310
PIT esc3c	1 N/O, spring-loaded terminal	400 311
PIT esc4	4 N/C, screw terminal	400 324
PIT esc6c	1 N/C with monitoring, 1 N/O, 1 N/C, spring-loaded terminal	400 308
PIT esc8c	1 N/C, 1 N/O, spring-loaded terminal	400 309

**Accessories**

Product type	Features	Order no.
PIT MHR3	3 slots	400 330
PIT MHR5	5 slots	400 340
PIT es holder3c	3 slots, for spring-loaded terminals	400 331

### **EC declaration of conformity**

This product/these products meet the requirements of the directive 2006/42/EC for 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](http://www.pilz.com/downloads).

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

# ► Support

Technical support is available from Pilz round the clock.

## Americas

### Brazil

+55 11 97569-2804

### Canada

+1 888-315-PILZ (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 31 450 0680

## Australia

+61 3 95600621

## Europe

### Austria

+43 1 7986263-0

### Belgium, Luxembourg

+32 9 3217575

### France

+33 3 88104000

### Germany

+49 711 3409-444

### Ireland

+353 21 4804983

### Italy, Malta

+39 0362 1826711

## Scandinavia

+45 74436332

## Spain

+34 938497433

## Switzerland

+41 62 88979-30

## The Netherlands

+31 347 320477

## Turkey

+90 216 5775552

## United Kingdom

+44 1536 462203

### You can reach our international hotline on:

+49 711 3409-444

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.

*Energy*  
saving by Pilz



Pilz GmbH & Co. KG  
Felix-Wankel-Straße 2  
73760 Ostfildern, Germany  
Tel.: +49 711 3409-0  
Fax: +49 711 3409-133  
info@pilz.com  
www.pilz.com

**PILZ**  
THE SPIRIT OF SAFETY