PITestop

PILZ
THE SPIRIT OF SAFETY

▸ Control and signal devices

Introduction

Validity of documentation

This documentation is valid for the product PITestop. 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 device PITestop is intended for use in safety circuits in accordance with IEC/EN 60947-5-1, IEC/EN 60947-5-5, EN 60204-1, EN ISO 13849-1. 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 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 this description under "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:

▶ 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 device consists of an actuator PIT es and a contact block PIT esc. Various types are available; these can be ordered as sets or can be put together as modular assemblies.

Features:

▶ Panel mount version or surface mount version with two-part enclosure (box)

▶ Turn in either direction to release or turn right for key-release

▶ various actuators

– Standard actuator

– Actuator with key-release

– Illuminated actuator

– Black stop actuators or red E-STOP actuators

▶ Contact blocks for applications up to PL e of EN ISO 13849-1 and SIL CL 3 of EN IEC 62061

Function description

The **PIT es** units are E-STOP and Stop pushbuttons.

The **PIT es E-STOP pushbuttons** are used to shut down plant and machine sections in order to reduce or avert imminent or existing hazards to people and damage to machinery or materials.

The **PIT es STOP pushbuttons** are used to shut down plant and machine sections, e.g. for maintenance work.

Modules

Actuator:

▶ E-STOP actuators (red)

– PIT es5.12 (actuator with protective collar and key-release)

▶ STOP actuator (black, for area shutdown)

– PIT es2.11 (standard actuator)

– PIT es2.12 (actuator with key-release)

– PIT es2.13 (illuminated actuator)

E-STOP box:

▶ PIT es box

Individual contact blocks:

▶ PIT es safe contact block for panel mount version

– PIT esc1 (1 N/C / N/O contact*)

▶ PIT es safe contact block for surface mount version

– PIT esc2.1 (1 N/C contact)

– PIT esc3 (1 N/O contact)

Contact block bracket:

▶ PIT MHR3 (3 slots)

▶ PIT MHR5 (5 slots)

> **! NOTICE**
>
> The illuminating contact block for the illuminated actuator requires one slot.

Contact block sets, pre-assembled with bracket:

▶ PIT es safe contact block for panel mount version

– PIT esb1 (1 N/C / N/O contact*)

- – PIT esb1.2 (1 N/C / N/O contact*, 1 N/C contact)

- – PIT esb1.3 (1 N/C / N/O contact*, 1 N/C contact, 1 N/O contact)

- – PIT esb1.4 (1 N/C / N/O contact*, 1 N/O contact)

▶ PIT es safe contact block for surface mount version

- – PIT esb2.1 (1 N/C contact)

- – PIT esb2.2 (2 N/C contact)

- – PIT esb2.3 (2 N/C contacts, 1 N/O contact)

- – PIT esb2.4 (1 N/C contacts, 1 N/O contact)

* safe contact block, see Connection diagrams [📖 12]

Pre-assembled E-STOP sets:

▶ PIT es Set3.1:

- – E-STOP actuator PIT es3.11

- – Contact block set PIT esb1.2

▶ PIT es Set3.2:

- – E-STOP actuator PIT es3.11

- – Contact block set PIT esb1.2

▶ PIT es Set4.1:

- – E-STOP actuator PIT es3.11

- – E-STOP box PIT es box

- – Contact block set PIT esb1.2

▶ PIT es Set4.2:

- – E-STOP actuator PIT es3.11

- – E-STOP box PIT es box

- – Contact block set PIT esb 2.3

Installation

> ⚠️ **CAUTION!**
>
> The pushbutton should always be installed with the supply voltage switched off.

Panel mount version

▶ Insert the actuator into an opening in the panel (see Opening in the panel in the panel mount version [📖 10])

▶ Use the plastic nut to secure it (24 mm spanner)

▶ only with illuminated actuators:

- – Attach "illuminating contact block" to the contact block bracket

- – Feed the cable through an opening in the panel (see Opening in the panel in the panel mount version [📖 10]) and attach to the actuator

▶ Push the contact block onto the actuator and turn it clockwise to engage

Surface mount version

▶ only with illuminated actuators:

– Break out one of the holes indicated on the upper part of the surface mount housing

– Attach "illuminating contact block" to the contact block bracket

– Guide the cable through the opening in the upper part of the surface mount housing and connect it to the actuator

▶ Break out the stuffing box connection on the lower part of the surface mount housing

▶ Secure the lower part of the surface mount housing with two screws (see Attachment of the enclosure for a surface mount version [📖 10])

▶ After connecting the wiring to the contact block, screw the upper part of the surface mount housing with actuator and contact block to the lower part of the enclosure
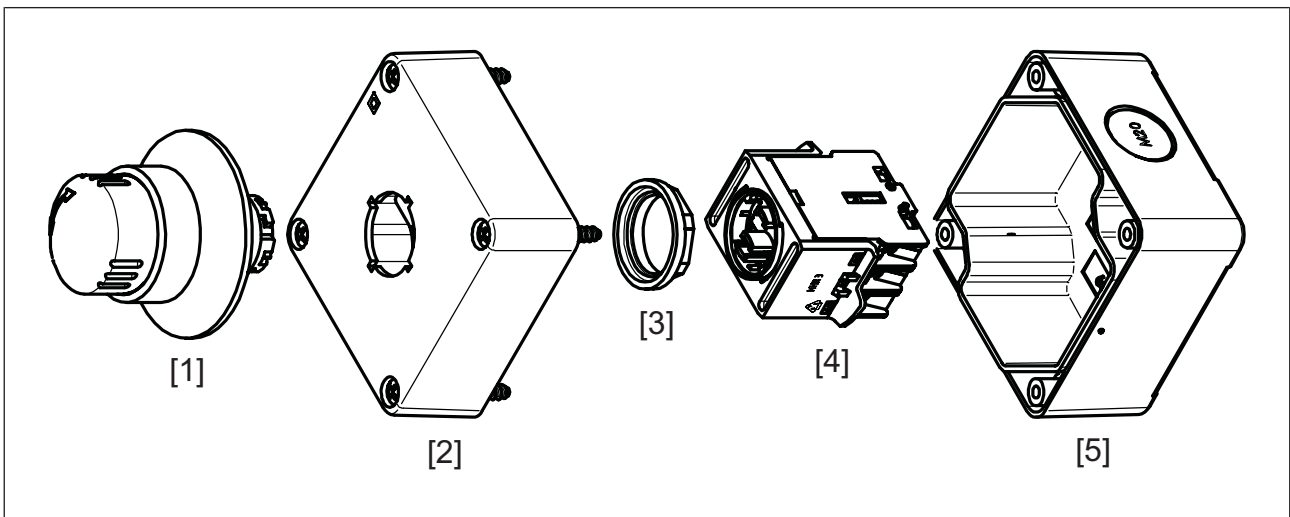

[1]

[2]

[3]

[4]

[5]

Fig.: Installing PITestop

Legend

[1] Actuator

[2] Upper part of the surface mount housing

[3] Plastic nut

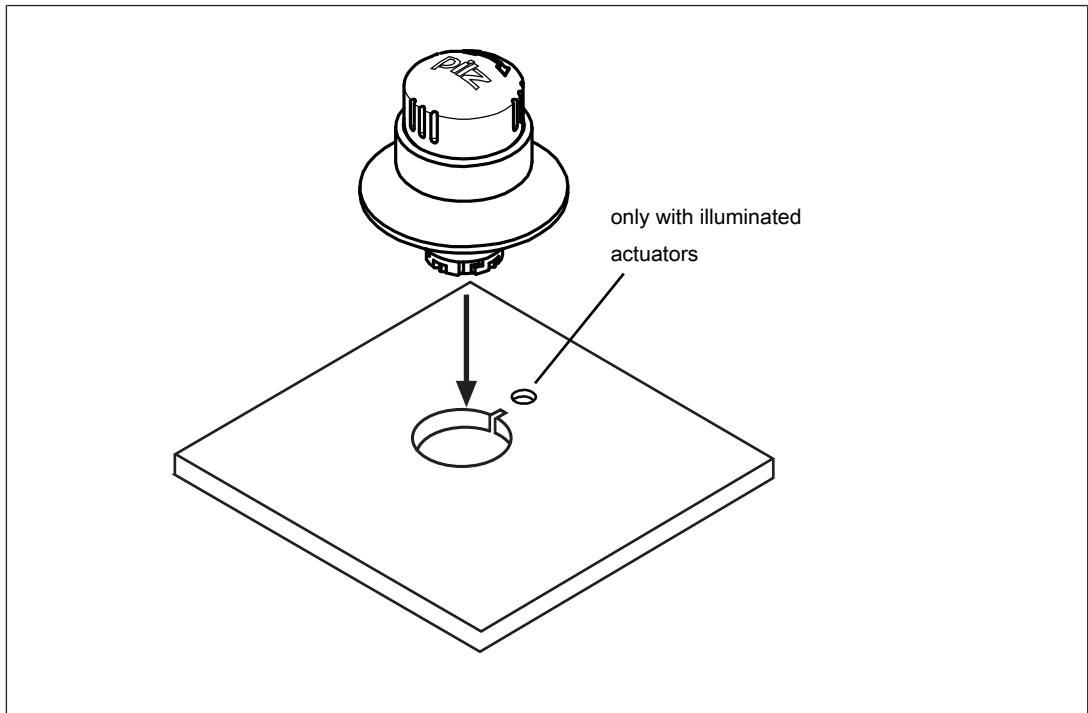[4] Contact block

[5] Lower part of the surface mount housing

only with illuminated actuators

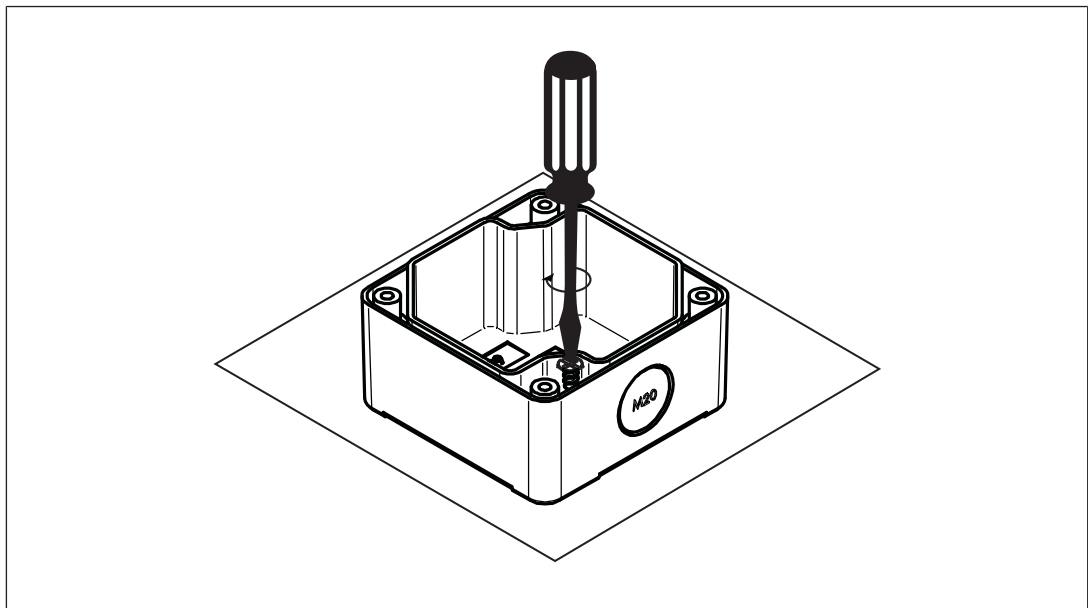Fig.: Opening in the panel in the panel mount version

Fig.: Attachment of the enclosure for a surface mount version

Preparing for operation

> **ⓘ NOTICE**
>
> Check the function of the pushbutton before commissioning for the first time and then at regular intervals (at least annually).

▸ The wiring is connected to the contact block via fixed terminals with a screw connection

Version with surface mount housing

▸ only with illuminated actuators: 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 connection for sealing and strain relief

▸ 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.

Contact blocks

The contact blocks are supplied pre-assembled in a bracket.
With the illuminated actuators the illuminating contact block must also be attached to the bracket.

> **ⓘ 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 drawing below).
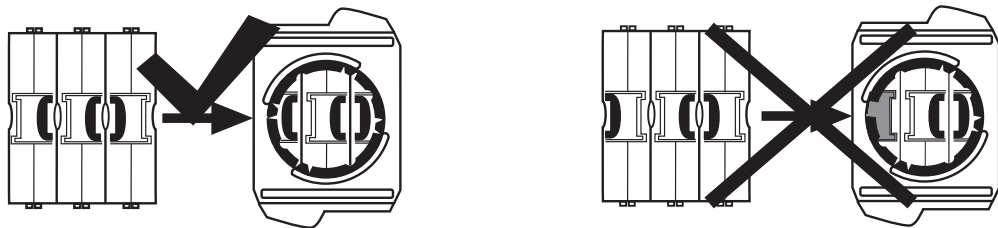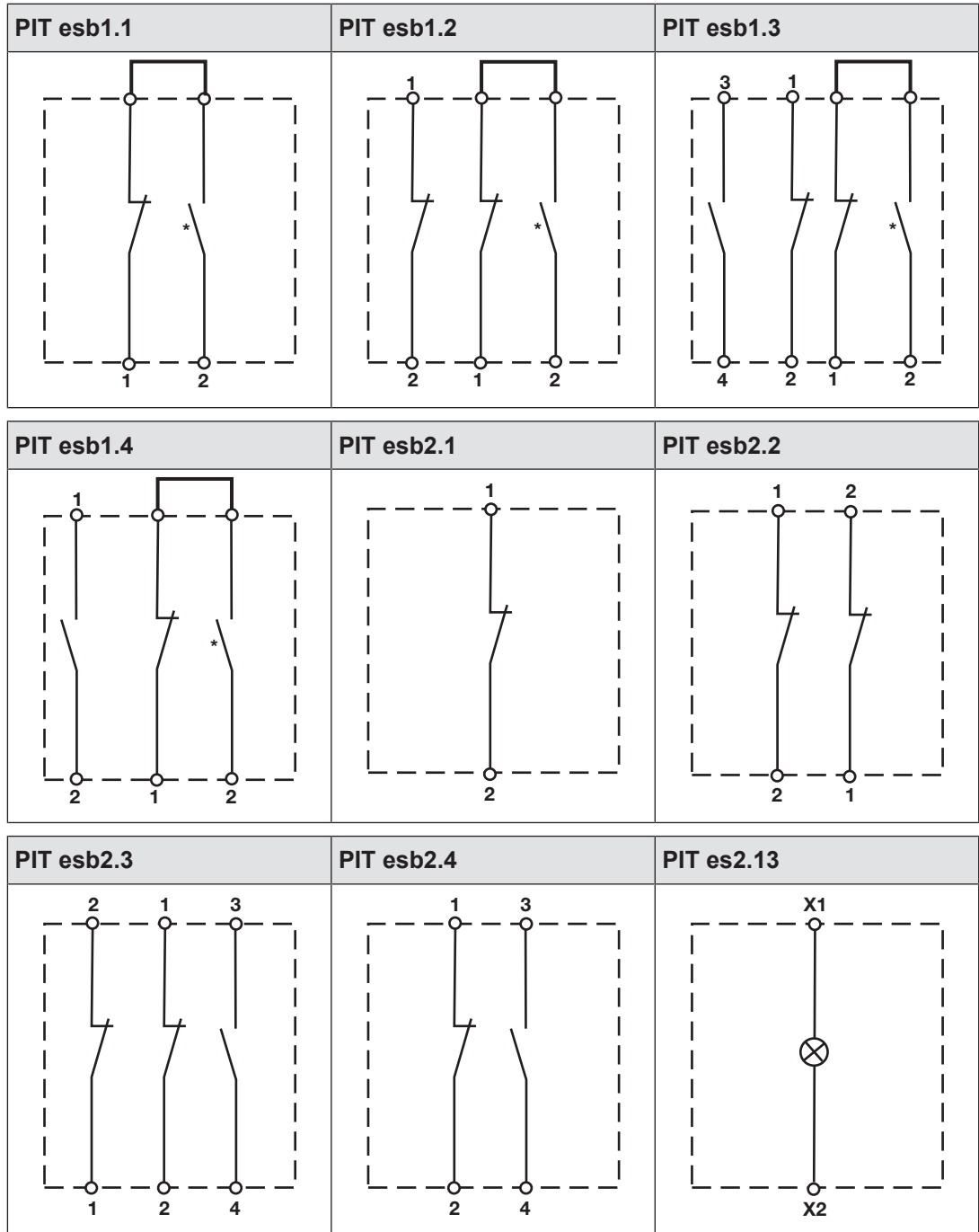

Fig.: Attachment of the enclosure

Connection diagrams

PIT esb1.1	PIT esb1.2	PIT esb1.3

PIT esb1.4	PIT esb2.1	PIT esb2.2

PIT esb2.3	PIT esb2.4	PIT es2.13

*The contacts are closed when the actuator is snapped in place

> **NOTICE**
>
> Contact block sets PIT esb1.2, PIT esb1.4 and PIT esb2.3 cannot be used with an illuminated actuator!

Dimensions

Standard actuator (PIT es2.11)
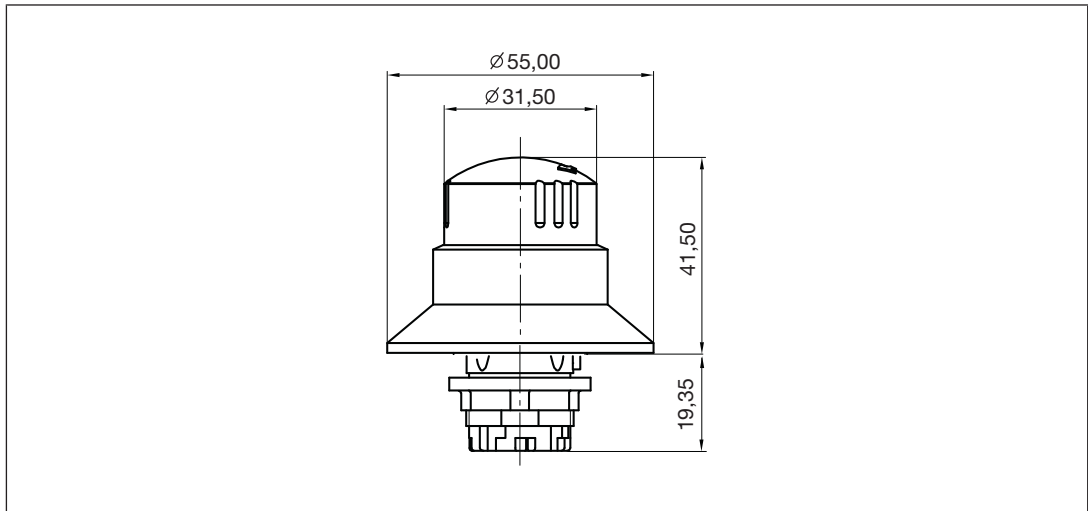
Actuator with key-release (PIT es2.12)
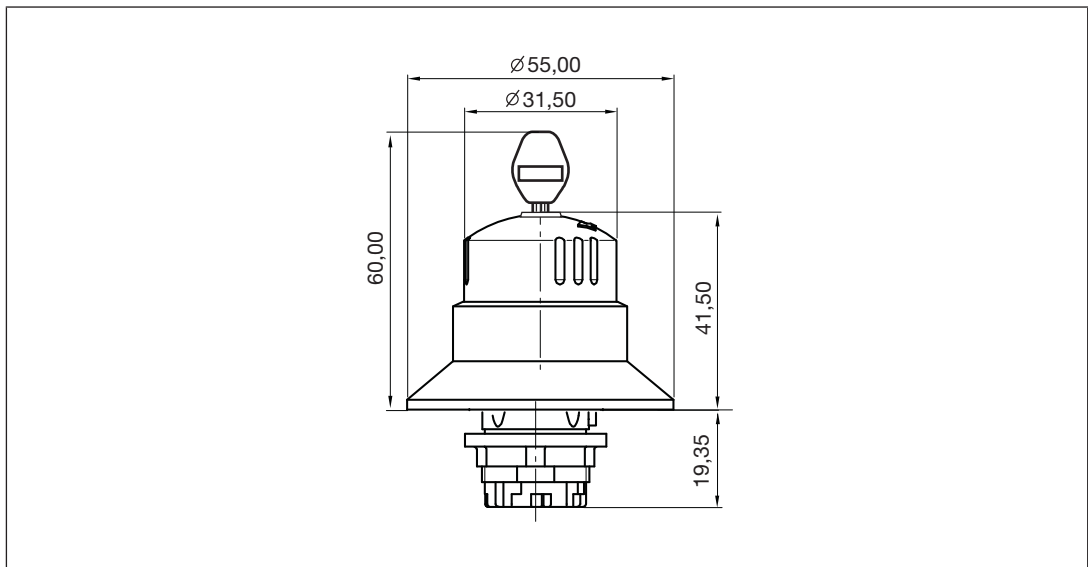
Actuator with illumination (PIT es2.13)

Actuator with key-release and protective collar (PIT es5.12)

Surface mount version with standard actuator (PIT es2.11)

Panel mount version with standard actuator (PIT es2.11)

Opening(s) in the panel

Drawing on the right: only for illuminated actuators PIT es2.13

Technical details

Order no. 400510 – 400511

See below for more order numbers

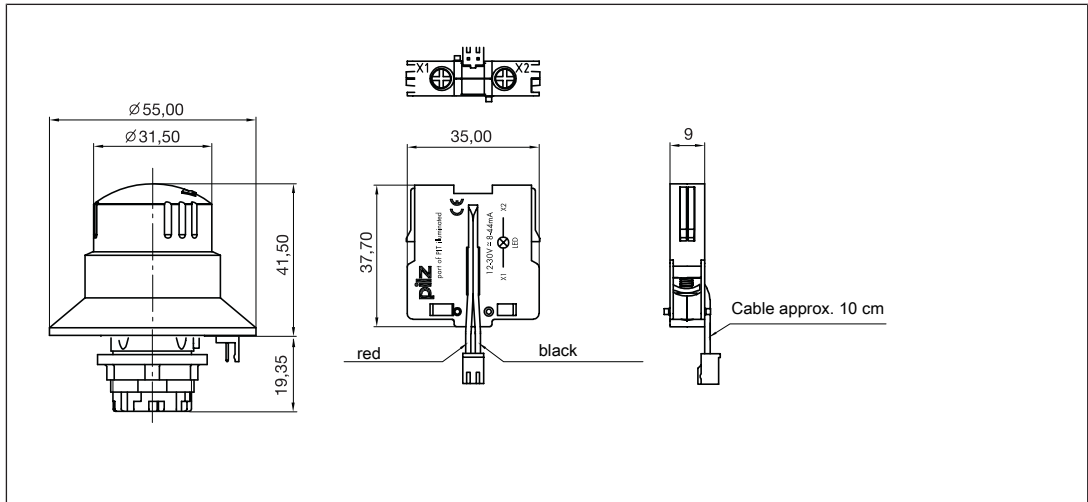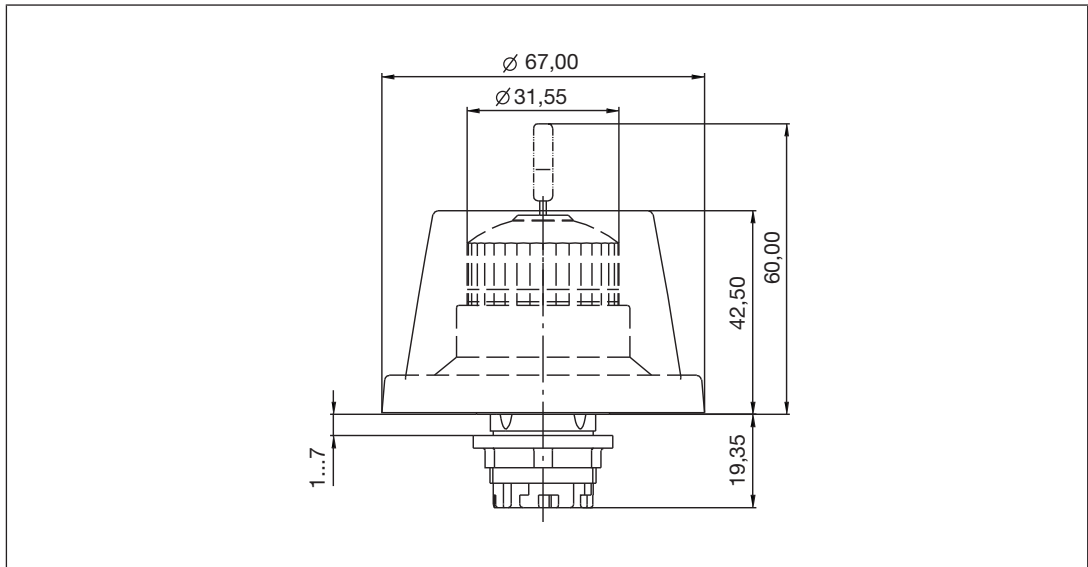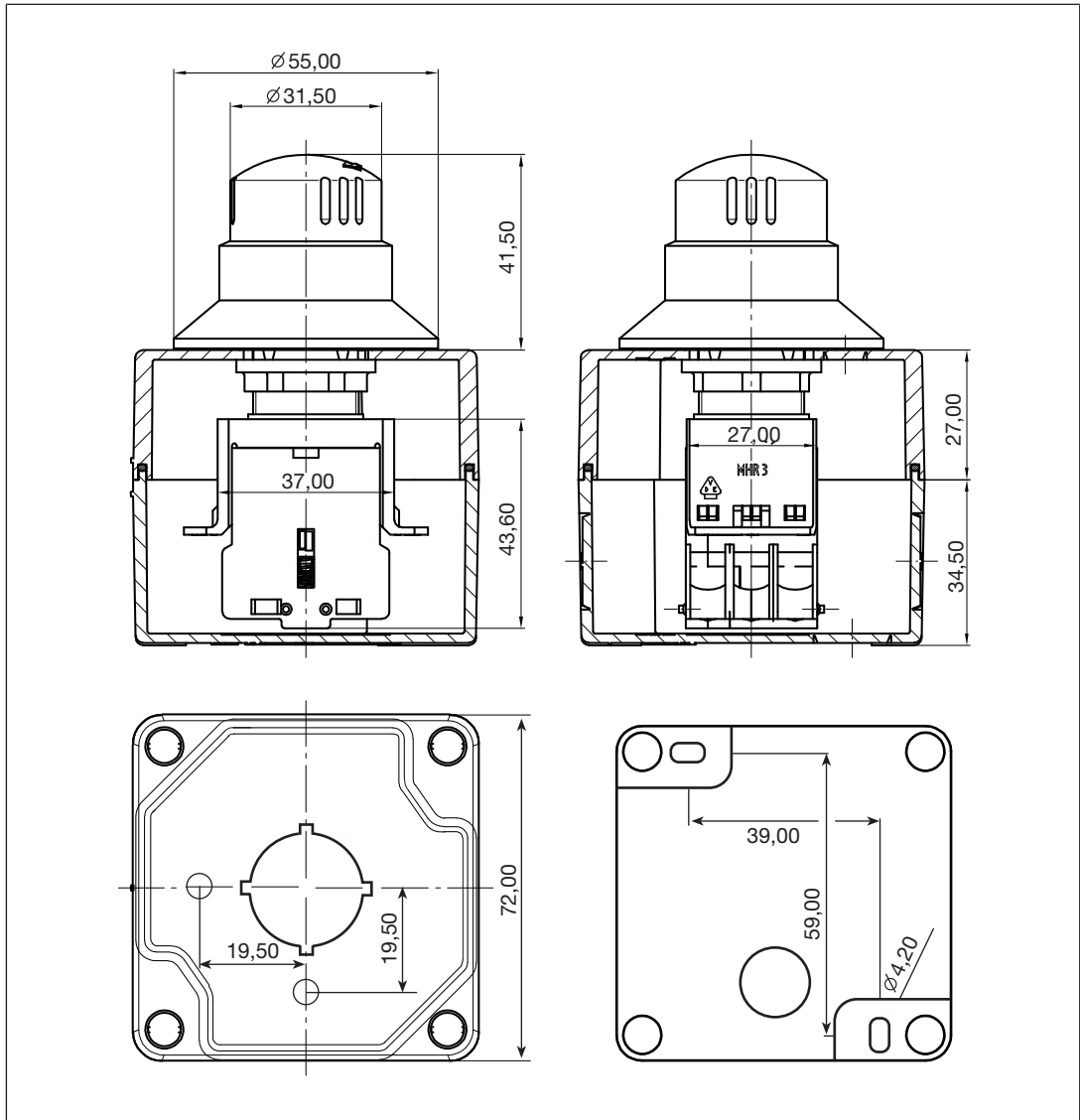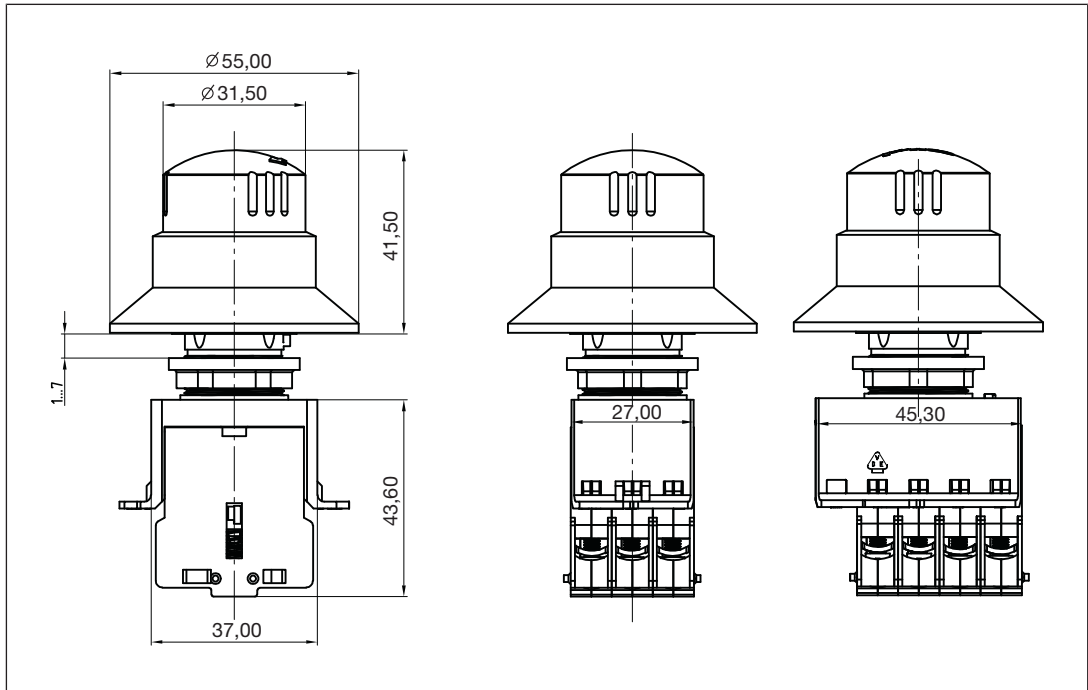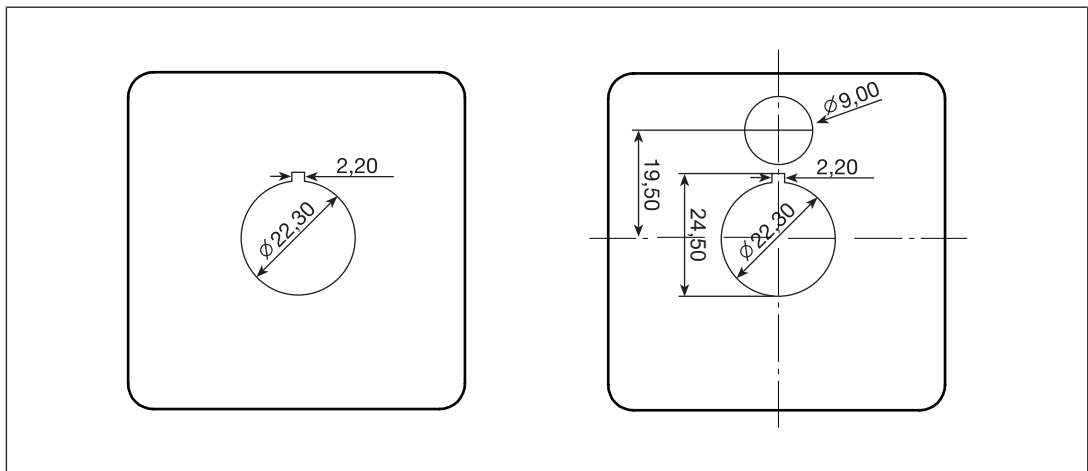| General	400510	400511
Approvals	TÜV, cULus Listed	TÜV, cULus Listed
Self-monitored	yes	yes
Electrical data	**400510**	**400511**
Min. contact current	1 mA	1 mA
E-STOP	**400510**	**400511**
Utilisation category		
In accordance with the standard	EN 60947-5-1	EN 60947-5-1
Contacts, AC15 at	230 V	230 V
Current	3 A	3 A
Contacts, DC13 at	24 V	24 V
Current	2 A	2 A
Conventional thermal current	16 A	16 A
Environmental data	**400510**	**400511**
Ambient temperature		
Temperature range	-30 - 70 °C	-30 - 70 °C
Rated insulation voltage	600 V	600 V
Protection type		
Housing	IP65	IP65
Mechanical data	**400510**	**400511**
Connection type	Screw terminal	Screw terminal
Dimensions		
Height	41,5 mm	41,5 mm
Width	27 mm	45,3 mm
Depth	43,6 mm	43,6 mm
Diameter of pushbutton	55 mm	55 mm
Weight	77 g	93 g

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

Order no. 400520 – 400521

General	400520	400521
Approvals	TÜV, cULus Listed	TÜV, cULus Listed
Self-monitored	No	No
Electrical data	**400520**	**400521**
Min. contact current	1 mA	1 mA

E-STOP	400520	400521
Utilisation category		
In accordance with the standard	**EN 60947-5-1**	**EN 60947-5-1**
Contacts, AC15 at	**230 V**	**230 V**
Current	**3 A**	**3 A**
Contacts, DC13 at	**24 V**	**24 V**
Current	**2 A**	**2 A**
Conventional thermal current	**16 A**	**16 A**
Environmental data	**400520**	**400521**
Ambient temperature		
Temperature range	**-30 - 70 °C**	**-30 - 70 °C**
Rated insulation voltage	**600 V**	**600 V**
Protection type		
Housing	**IP65**	**IP65**
Mechanical data	**400520**	**400521**
Connection type	**Screw terminal**	**Screw terminal**
Dimensions		
Height	**72 mm**	**72 mm**
Width	**72 mm**	**72 mm**
Depth	**103 mm**	**103 mm**
Weight	**162 g**	**172 g**

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.

Safety characteristic data	
B10d in accordance with EN ISO 13849-1:2015 and EN 62061	181.500
Lambda$_d$/Lambda in accordance with EN 62061	0,20

Order reference

Product

E-STOP sets

Product type	Features	Order no.
PIT es Set3.1	PIT es3.11 + PIT esb1.2	400 510
PIT es Set3.2	PIT es3.11 + PIT esb1.3	400 511
PIT es Set4.1	PIT es3.11 + PIT es box + PIT esb2.2	400 520
PIT es Set4.2	PIT es3.11 + PIT es box + PIT esb2.3	400 521

Individual contact blocks

Product type	Features	Order no.
PIT esc1	1 safe N/C, screw terminal	400 315
PIT esc2	1 N/C, screw terminal	400 320
PIT esc3	1 N/O, screw terminal	400 310

Contact block sets

Product type	Features	Order no.
PIT esb1.1	1 safe N/C, screw terminal	400 305
PIT esb1.2	1 safe N/C, 1 N/C, screw terminal	400 301
PIT esb1.3	1 safe N/C, 1 N/C, 1 N/O, screw terminal	400 304
PIT esb1.4	1 N/C, 1 N/O, screw terminal	400 307
PIT esb2.1	1 N/C, screw terminal	400 300
PIT esb2.2	2 N/C, screw terminal	400 302
PIT esb2.3	2 N/C, 1 N/O, screw terminal	400 303
PIT esb2.4	1 N/C, 1 N/O, screw terminal	400 306

Actuator

Product type	Features	Order no.
PIT es2.11	Standard actuator, black	400 110
PIT es2.12	Actuator with key-release, black	400 111
PIT es2.13	Illuminated actuator, black	400 112
PIT es5.12	Actuator with key-release and protective collar, red, no Pilz inscription on the actuator	400 601

Accessories

Contact block brackets

Product type	Features	Order no.
PIT MHR3	Bracket for containing 3 contact blocks	400 330
PIT MHR5	Bracket for containing 5 contact blocks	400 340

E-STOP box

Product type	Features	Order no.
PIT es box 72 x 72 x 61 mm	Surface mount housing IP67, protection class II, cable gland 2 x M16	400 200

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.

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▶ Support

Technical support is available from Pilz round the clock.

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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

BLUeCOMPETENCE
Alliance Member

Partner of the Engineering Industry
Sustainability Initiative

pilz
the spirit of safety

Partner of:
The Best of
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