EN

Enabling Switches
ZS

EUCHNER
More than safety.

EUCHNER

More than safety.

Headquarters in Leinfelden-Echterdingen

Logistics center in Leinfelden-Echterdingen

Production location in Unterböhringen

Internationally successful – the EUCHNER company

EUCHNER GmbH + Co. KG is a world-leading company in the area of industrial safety technology. EUCHNER has been developing and producing high-quality switching systems for mechanical and systems engineering for more than 60 years.
The medium-sized family-operated company based in Leinfelden, Germany, employs around 800 people around the world.

18 subsidiaries and other sales partners in Germany and abroad work for our international success on the market.

Quality and innovation – the EUCHNER products

A look into the past shows EUCHNER to be a company with a great inventive spirit. We take the technological and ecological challenges of the future as an incentive for extraordinary product developments.

EUCHNER safety switches monitor safety doors on machines and installations, help to minimize dangers and risks and thereby reliably protect people and processes. Today, our products range from electromechanical and electronic components to intelligent integrated safety solutions. Safety for people, machines and products is one of our dominant themes.

We define future safety technology with the highest quality standards and reliable technology. Extraordinary solutions ensure the great satisfaction of our customers. The product ranges are subdivided as follows:

- Transponder-coded Safety Switches
- Transponder-coded Safety Switches with guard locking
- Multifunctional Gate Box MGB
- Access management systems (Electronic-Key-System EKS)
- Electromechanical Safety Switches
- Magnetically coded Safety Switches
- Enabling Switches
- Safety Relays
- Emergency Stop Devices
- Hand-Held Pendant Stations and Handwheels
- Safety Switches with AS-Interface
- Joystick Switches
- Position Switches

made in Germany

Contents

Enabling Switches

About this catalog

The Enabling Switch ZS catalog provides an overview of our two-stage enabling devices and three-stage enabling switches. Due to their robust and ergonomic design, these switches are the right choice for numerous applications.

You will find the technical data after the product overview. There is a reference to the page with the related technical data on the pages listing the products.
At the front of the catalog, you will find useful information on the topic of enabling switches.

You will find the following series and accessories in this catalog:

3-stage enabling switches

Enabling switches for installation	Hand-held enabling switches				Accessories
ZSE and ZXE	in housing ZSM or as kit	in housing G1 or as kit	in housing G1, G3	in housing G2	
 ZSE  ZXE	ZSM 	ZSA  G1	ZSB  G1  G3	ZSR  G2	Cables, plug connectors, holders, blanking covers

2-stage enabling devices

Enabling devices for installation	Hand-held enabling devices
ZSG	in housing G1 or as kit
 ZSG	ZSA  G1

Standards and approvals

Standards

Enabling switches that are integrated into safety circuits have a safety function. For this reason, they are assessed based on the Machinery Directive and the European standards. The Machinery Directive has been implemented in national law in the EU member states and, as a result, is binding for all manufacturers.
Detailed requirements for switches are defined in EN 60947 Part 5-1 (Low-voltage switchgear and controlgear – Part 5-1: Control circuit devices and switching elements – Electromechanical control circuit devices).
If the requirements of these standards are met, conformity with the applicable laws and therefore with the Machinery Directive is assumed. EUCHNER enabling switches comply with the relevant standards for safety switchgear and thereby help you to comply with safety requirements during the design of your machinery.

User standards

As a user, you should take into consideration the following standards of relevance for enabling switches:

European and international standards

Standard	Title
EN 60 204	Safety of machinery – Electrical equipment of machines
EN 775/ EN ISO 10218	Robotics – Safety requirements for robot systems in an industrial environment (ISO 10218:1992, modified)
VDI 2853	Safety requirements for construction, equipment and operation of industrial robots (withdrawn)
VDI 2854	Safety requirements for automated flexible manufacturing systems

American standards

Standard	Title
ANSI B11-TR3-2000	Risk Assessment and Risk Reduction – A Guide to Estimate, Evaluate and Reduce Risks Associated with Machine Tools
NFPA 79 (2002)	Electrical Standard for Industrial Machinery
OSHA 29 CFR 1910	
Subpart O	Machinery and Machine Guarding
Subpart P	Hand and Portable Power Tools and Other Hand-Held Equipment
Subpart S	Electrical

Please also observe any existing C standards.

Approvals

To demonstrate conformity, the Machinery Directive also includes the possibility of type examination. In addition to taking into account all relevant standards, EUCHNER commissions type examinations by a notified body. Many of the enabling switches listed in this catalog have been tested by an employers' liability insurance association (BG) and are given in the lists from the BG.
Furthermore, many enabling switches are listed by Underwriters Laboratories (UL) and the Canadian Standards Association (CSA). These enabling switches can be used in countries in which this listing is required. The approval symbols on the individual pages of the catalog indicate which body tested the enabling switches.
With the aid of the approval symbols listed below, you can quickly see which approvals are available for the related enabling switches:

DGUV Test Sicherheit geprüft tested safety	Switches with this symbol have the approval of the German Social Accident Insurance Association (DGUV) – formerly the employers' liability insurance association (BG)
c UL us LISTED	Switches with this symbol are approved by Underwriters Laboratories (UL, Canada and USA)

Function and technology used in enabling switches

Task of enabling switches

Enabling switches are manually operated control devices that, together with other command switches, enable commands related to potentially hazardous conditions to be run as long as the enabling switches are actuated continuously.
These switches are used wherever operating personnel must work directly in the danger zone on machines and installations. This is necessary during setup, programming, testing or servicing work, for example. As per Annex 1 of the Machinery Directive, the protective action of movable guards can be disabled in these operating modes. The Machinery Directive places the condition that these operating modes must be secured using a lockable device (e.g. key-operated rotary switch) and machine operation is allowed to be triggered only by a second, separate action.
To enable the operator in the danger zone of a machine to activate a machine movement, an enabling device must additionally be actuated. The operator must also be able to stop the machine movement using the enabling device. This task is performed by the enabling switch.
Every person who is in the hazardous area must carry an enabling device so that suitable action can be taken in case of danger.

Two-stage enabling device or three-stage enabling switch?

The operator can start a machine movement only if he/she actuates the enabling device and keeps it in the actuated position. The movement is stopped again when the switch is released. This two-stage function (OFF-ON) is provided by all enabling switches.
However, experience shows that the operator often clenches the enabling device in an emergency.
In this case, a three-stage enabling switch is better and is specifically requested in many C standards. This switch has three switch positions (OFF-ON-OFF) and, if the operator clenches the switch, it is actuated beyond the enabling position (center position) and the machine is shut down as a result.
If a 2-stage enabling device is used, it must also be ensured that, in an emergency, the operator is in a position to activate an emergency stop device in close proximity (VDI 2853). The following symbols are used to identify the type of enabling switch in the catalog:

Symbol for a 2-stage enabling device

Symbol for a 3-stage enabling switch

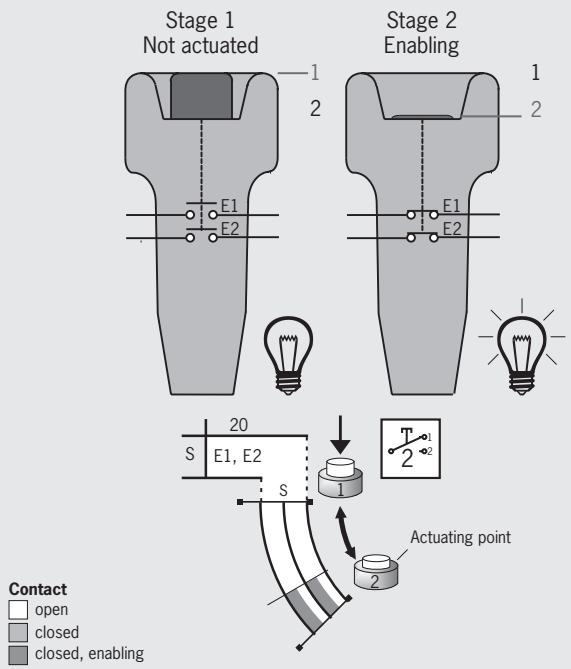
Large selection of switching elements

To be able to cover as many applications as possible, EUCHNER enabling switches can be fitted with various switching elements of single-channel or dual-channel design. Monitoring contacts are also available, as are additional devices or displays.

Positively driven contacts ⊖

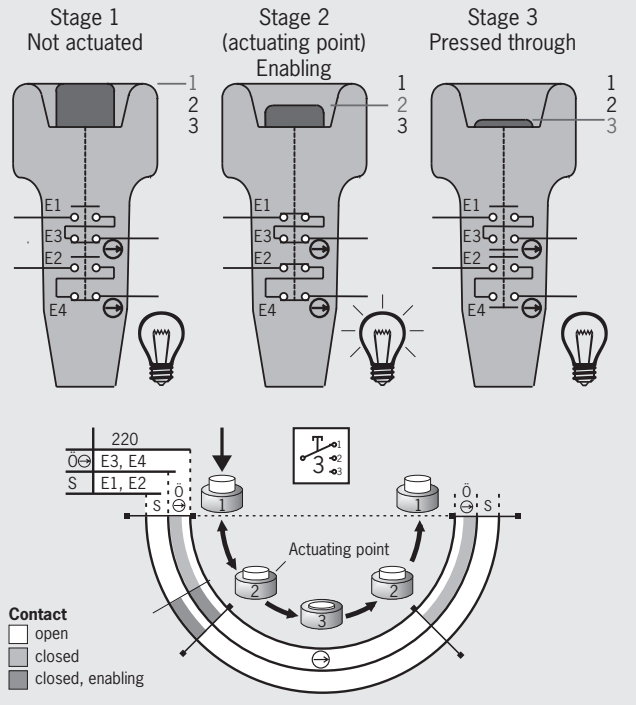
Positively driven contacts are used in many switching elements. These are special switching contacts that are designed to ensure that the switching contacts are always reliably separated. Even if contacts are welded together, the connection is opened by the actuating force.

Function sequence of two-stage enabling device



2-stage enabling device

Function sequence of three-stage enabling switch



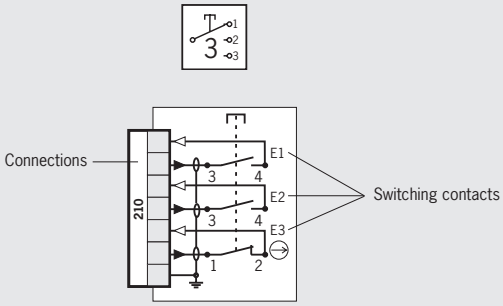
3-stage enabling switch

As can be clearly seen in the figure, the enabling function can be achieved only in stage 2. This function is provided by the closing of the normally open contacts (NO = E1 and E2).
If the button is released, that is back from stage 2 to stage 1, the normally open contacts are opened again. The 2-stage enabling devices and 3-stage enabling switches are identical in this function.

If, as in this example, the button on a 3-stage enabling switch is pressed past the actuating point (stage 2) in panic (to stage 3), this not only resets the normally open contacts (NO) but additionally opens the safe positively driven contacts (NC ⊖).
The patented switching system ensures that the enabling function does not become active in stage 2 on reset of the pushbutton from stage 3 to stage 1. In this example, enabling is possible only if normally open and positively driven contacts are closed at the same time. This situation is possible only on actuation from stage 1 to stage 2. In the other direction, from stage 3 to stage 1, stage 2 is skipped and unintentional restarting prevented. Once the pushbutton has reached stage 1, the function sequence can be started again.
Due to its design, the switching unit also provides a wear-free, constant actuating point (stage 2).

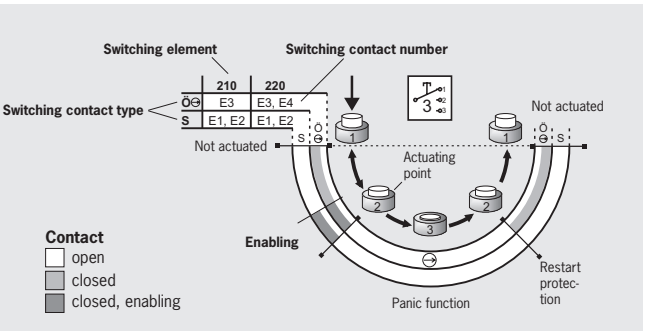
Reading travel diagrams and wiring diagrams

For each of the switching elements used, there is a travel diagram that, depending on the enabling switch's switching stage, shows the switching states.
The following example is intended to explain these aspects:



Wiring diagram for switching element 210

The wiring diagram shows the switching element in the free position (enabling switch not actuated).
The switching element 210 has three switching contacts (E1, E2 and E3). The switching contact E3 is designed as a positively driven contact, the other two switching contacts as normally open contacts.



Travel diagram for switching element 210

As in this example, several switching elements are combined in one travel diagram in some cases. Here, along with the switching element 210 with the switching contacts E1, E2 and E3, there is also the switching element 220 with the switching contacts E1 to E4.
The letters on the left beside the switching contact E3 define the switching contact type, a positively driven contact (NC ⊖) in this case.

The following switching contact types are available:

- NO normally open contact
- NC normally closed contact
- NC ⊖ positively driven contact
- NO/NC three-point switch
  (3-stage switching contact with normally open/normally closed function; switching stage dependent on the actuating travel)
- NO/NC ⊖ three-point switch
  (like NO/NC but with positively driven contact)

The travel diagram shows the switching state of each switching contact for the three switch stages "Not actuated," "Enabling" and "Panic function" (pressed past actuating point). Gray areas mean "switch closed"; white areas mean "switch open."

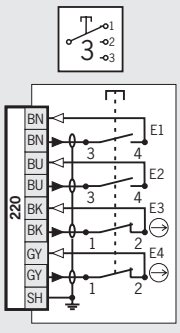
In the example for switching element 210, the sequence is as follows:

- In the not actuated state, the positively driven contact E3 is closed (gray area) and the two normally open contacts E1 and E2 are open.
- When the switch has reached stage 2, the normally open contacts E1 and E2 are closed, E3 remains closed. This is the enabling area.
- If the switch is released, the switching contacts return to their initial state.
- If the switch is pressed beyond the enabling area, all switching contacts are opened. This is the "panic function" area on the travel diagram.
- If the switch is now released again, the positively driven contact E3 is closed again. The switching system prevents the normally open contacts E1 and E2 from closing again at the same time (restart protection).

An optimal sequence is provided by the series connection of E1 (normally open contact) and E3 (positively driven contact), as then enabling is possible only at the actuating point. On pressing through to stage 3, the safe positively driven contact opens the safety circuit. On this switching element, E2 can be used as a monitoring contact or a 2nd channel.

Single-channel and dual-channel enabling switches

Often, two positively driven contacts and normally open contacts are employed to increase safety using the principle of duplicated design (redundancy). This dual-channel design ensures that on the failure of one channel or on a fault in the control circuit (e.g. in the machine wiring), the safety function can still be provided with the aid of the second channel. An example is given in the wiring diagram for switching element 220:

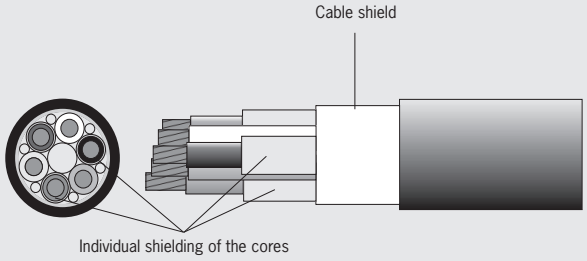


Wiring diagram for switching element 220

The normally open contact E1 and the positively driven contact E3 as well as the normally open contact E2 and the positively driven contact E4 can be connected externally in series. In this way, a dual-channel design is achieved.

Safety in case of faults

Along with the possibility of using positively driven contacts and the possible dual-channel layout of the design, the patented connecting cables from EUCHNER provide additional protection on the occurrence of faults. Not only the outer shielding of the cable but also the individual shielding of the cores enables short circuits or cable breaks due to crushing, for example, to be detected by a control system.



Layout of connecting cables

Protection against tampering

An enabling switch can ensure that operation is free of hazards only if it is not bypassed. To prevent tampering, our enabling switches are designed such that it is more difficult to bypass the safety function. The best protection against tampering is, however, acceptance by the user.

Ergonomics

To achieve the related user acceptance of a manually operated control device, the focus of EUCHNER enabling switches is on safe and balanced handling, even over extended periods (e.g. when observing manufacturing processes). Enabling switches manufactured by EUCHNER have a low weight, an ergonomic housing design and a light, stable actuating point. Both thumb-actuated switches and switches that can be actuated with several fingers in order to maintain the actuating force over an extended period are used.

By selecting a coiled cable with long cable ends, the weight of the switch is reduced as the heavy, spiral part of the cable lies on the floor and only the lighter, straight part needs to be held by the user.

Enabling switches for installation

The enabling devices in series ZSG and the enabling switches in series ZSE and ZXE can be integrated into any housings or control panels. As a result, every customer can prepare a customized solution to suit his/her specific application.

Kits for enabling switches

Using enabling switch kits from EUCHNER, you can assemble your own customized enabling switch ideally matched to your requirements.
The kit is available for the housing G1 as a two- or three-stage version and for the ZSM as a three-stage version. Various switching elements are available.

Hand-held enabling switches

The enabling switches in the series ZSM, ZSA, ZSB and ZSR are installed in a housing and are already pre-wired. Depending on version, the hand-held enabling switches feature a degree of protection up to IP67 (see chapter *Technical data* page 80 ff.). In addition to providing the enabling function, EUCHNER enabling switches can be equipped with additional command buttons (pushbutton, selector switch, key-operated rotary switch or emergency stop device) and LED indicators. In this way, work processes such as axis selection and the movement of axes can be performed directly at the machine using the enabling switch.

Electrical connection

Different cable lengths and cable types are available for the connection of the pre-assembled hand-held enabling switches.
Modern wiring concepts increasingly utilize plug-in connections. The enabling switch does not need to remain permanently connected, but is plugged in as required.
Furthermore, a switch with plug connector can be easily replaced during servicing work. This configuration results in short downtimes.
The enabling switches ZSM, ZSA, ZSB and ZSR are available with various plug connectors. In addition to the related mating connectors, further accessories are available.

Identification of switching elements

The switching elements used in our enabling switches have a numerical designation. A selection of switching elements is available depending on the series.

Explanation of symbols and notation

Symbols and specific notation related to the switch or the switching contact are used time and again in the catalog. The following example is intended to explain these aspects:

Notation
1 NC ⊖ + 1 NO

Explanation
Normally closed contacts are represented by NC, normally open contacts by NO. The number defines how many contacts are available. The symbol following the NC indicates that the NC contact is a positively driven contact. This switch therefore has one normally closed contact and one normally open contact; the normally closed contact is a positively driven contact.

Acknowledgment of enabling

Vibration signal
The enabling switch ZSM is optionally equipped with a vibration motor. This permits acknowledgment of enabling in a loud environment, for example. The signal pulsates, similar to the vibration signal of cellular telephones.

LED
An LED can also be optionally used as visual acknowledgment. Several products are equipped accordingly.

Emergency stop/machine stop
All emergency stop devices with red pushbutton must be active in the danger zone. Since a plugged connection could be unplugged in certain circumstances, enabling switches with plug connectors are equipped only with a gray machine stop. Otherwise, it must be ensured that confusion between effective and non-effective devices is ruled out.

Selection table for built-in enabling switches ZSE and ZXE

Design

E Built-in version (without cable)

Function

3 3-stage (OFF - enabling - OFF)

Connection

C Tab connector, screw terminal

Enabling switch ZXE

Enabling switch ZSE

Design E	Stages 3	Connection C	Page
●	●	●	10 - 12

Built-in enabling switches ZSE and ZXE

- **3-stage function**
- **Dual-channel version**
- **Optionally with 22.5 mm or 30.5 mm installation dimension**
- **Suitable for installation in hand-held pendant stations HBL or housing G2 or G3, for example**

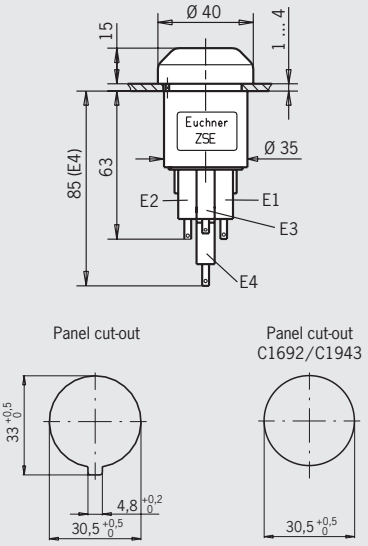
3-stage function
Enabling function is active only in the second stage (center position, actuating point). If the pushbutton is released or pushed further (panic function), the enabling is removed (dependent on the wiring, see function sequence).

Hand-held pendant stations HBL
See catalog for hand-held pendant stations.

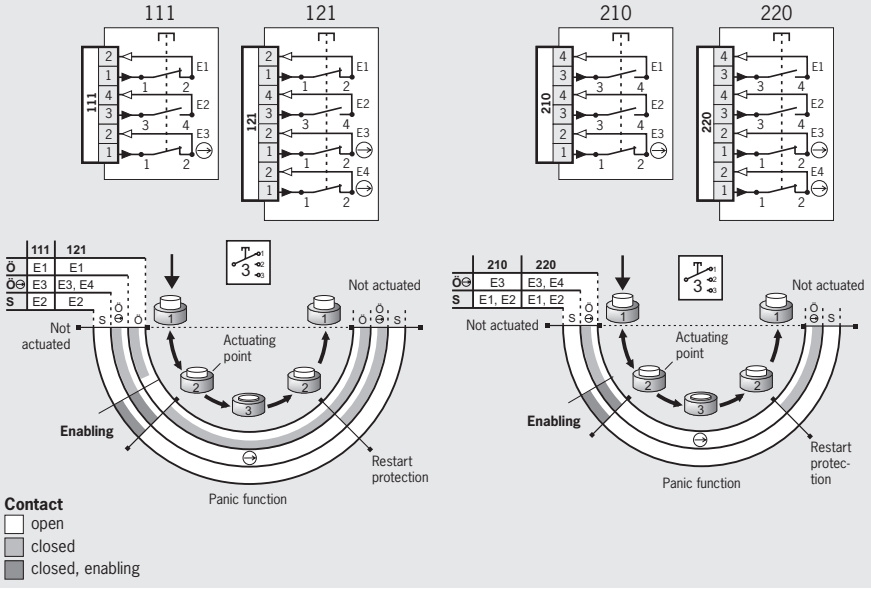
Switching elements (see also page 8)
- **111** 1 NO + 1 NC ⊖ + 1 NC
- **121** 1 NO + 2 NC ⊖ + 1 NC
- **210** 2 NO + 1 NC ⊖
- **220** 2 NO + 2 NC ⊖
- **2202** 2 NO/NC [1)]

ZSE, 3-stage function
Tab connector

Dimension drawings



Wiring diagrams/function sequence

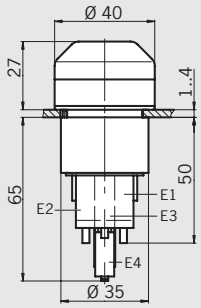


Ordering table

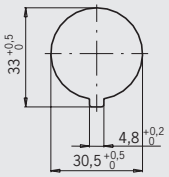
Design	Connection	Version	Switching element			
			111: 1NO+1NC ⊖ +1NC **121**: 1NO+2NC ⊖ +1NC		**210**: 2NO+1NC ⊖	**220**: 2NO+2NC ⊖
Built-in 3-stage **ZSE**	**Tab connector**		**052448** ZSE2-1	**070782** ZSE2-3	**052449** ZSE2-2	**070762** ZSE2-4
		Suitable for hand-held pendant stations HBL, for example	On request	On request	**070752** ZSE2-2C1692	**083477** ZSE2-4C1943

ZSE, 3-stage function
Tab connection, with spacer

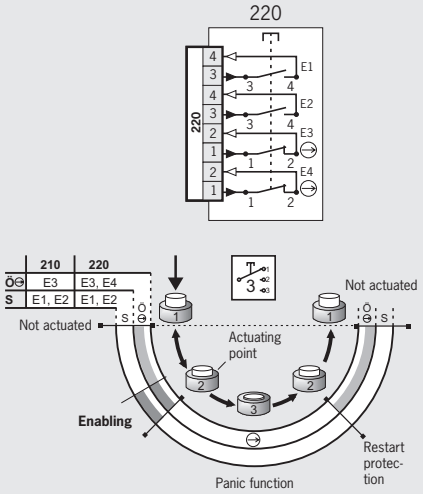
Dimension drawings



Panel cut-out



Wiring diagrams/function sequence



Contact
- open
- closed
- closed, enabling

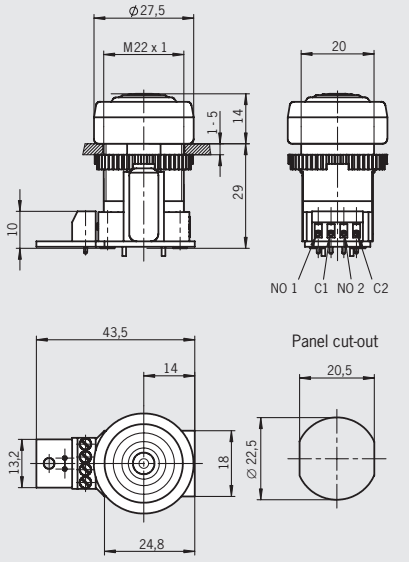
Ordering table

Design	Connection	Version	Switching element			
			111: 1NO+1NC ⊖ +1NC **121**: 1NO+2NC ⊖ +1NC	**210**: 2NO+1NC ⊖	**220**: 2NO+2NC ⊖	
Built-in 3-stage **ZSE**	**Tab connector**	With spacer for installation in housing G2 or G3	On request	On request	On request	**091098** ZSE2-4C1801

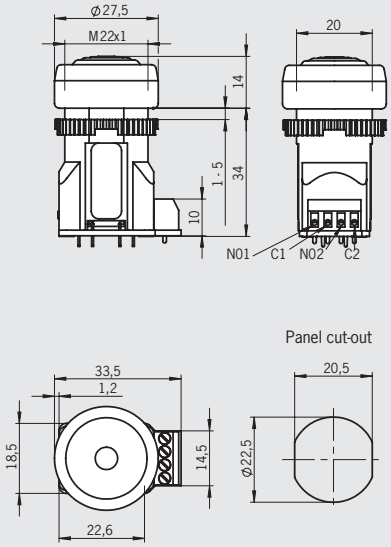
Please turn page

For technical data, see page 71

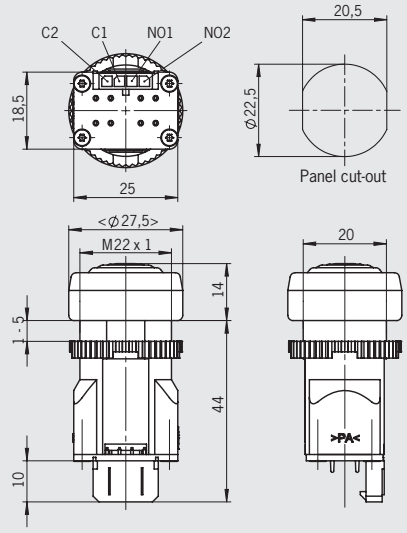
ZXE, 3-stage function
Screw terminals



ZXE, 3-stage function
Screw terminals, with click sound [1)]

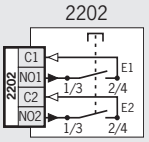


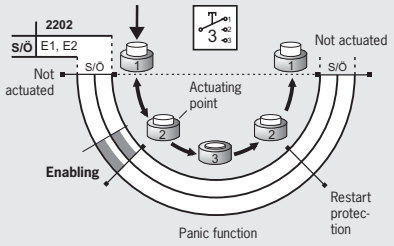
ZXE, 3-stage function
Tab connectors, with click sound [1)]



For connecting cable, see page 68

Wiring diagrams/function sequence



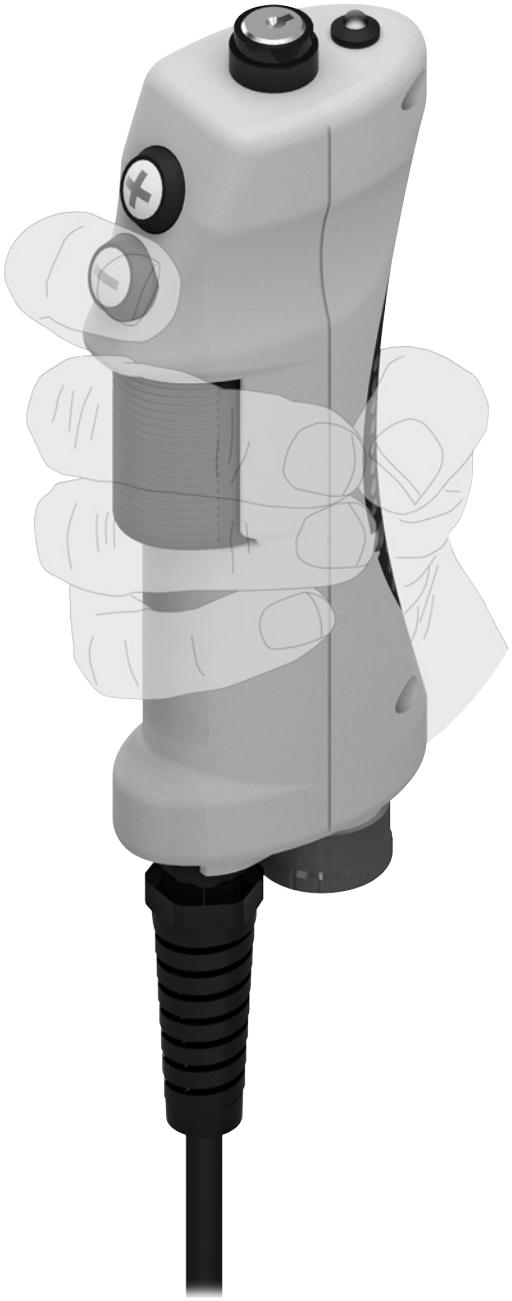


Contact
- open
- closed
- closed, enabling

Ordering table

Design	Connection	Version	Switching element **2202**: 2NO/NC[2)]
Built-in 3-stage **ZXE**	**Screw terminals**	Slow-action switching contact	**091336** ZXE-091336
		Snap-action switching contact	**104833** ZXE-104833
	Tab connectors	Snap-action switching contact	**111276** ZXE-111276

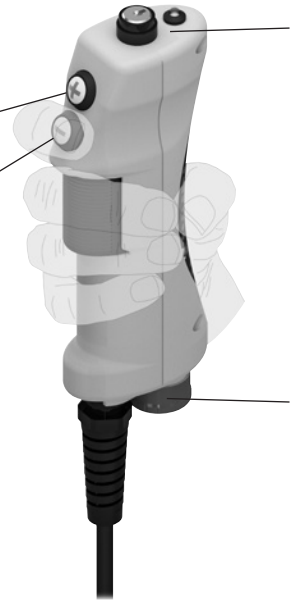
1) With versions ZXE-104833 and ZXE-111276, a click sounds during the change from stage 1 to stage 2 and during the return from stage 2 to stage 1.
2) From position 1 to position 2 ➡ NO contact; from position 2 to position 3 ➡ NC contact.



Item overview for enabling switch ZSM

Order no./item	Top: Selector switch	Top: Key-operated rotary switch	Top: Pushbutton	Top: LED indicator	Top: Stop command device: Machine stop gray 2 NC ⊖	Top: Stop command device: Emergency stop red 2 NC ⊖	Front: Top pushbutton	Front: Bottom pushbutton	Front: Mini joystick	Bottom: Stop command device: Key-operated rotary switch	Bottom: Stop command device: Machine stop gray 2 NC ⊖	Bottom: Stop command device: Emergency stop red 2 NC ⊖	ZS	Vibration signal	Cable length [m]: Straight connecting cable	Cable length [m]: Coiled connecting cable	Plug connector	Page
102966 ZSM4204-102966	–	–	–	●	–	●	–	White	–	–	–	–	3 C	●	5	–	–	**16**
105645 ZSM4204-105645	–	–	–	–	–	●	–	White	–	–	–	–	3 C	–	–	1.88 - 5	–	**16**
138119 ZSM2204-138119	–	–	–	●	–	●	⊕	⊖	–	–	–	–	1 NC + 2 NO	–	–	1.88 - 5	–	**17**
126706 ZSM2201-126706	–	–	–	–	●	–	⊕	⊖	–	–	–	–	2 NO	–	–	2.85- 4.8	–	**17**
103126 ZSM2101-103126	–	●	–	●	–	–	⊕	⊖	–	–	–	●	3 NO	●	5	–	–	**18**
117128 ZSM2204-117128	–	–	Black	●	–	–	⊖	⊕	–	–	–	●	3 NO	●	10	–	–	**18**
123678 ZSM2104-123678	–	–	–	●	–	–	⊕	⊖	–	–	–	●	3 NO	–	5	–	RC12	**19**
110317 ZSM2301-110317	3-stage 1 of 3	–	–	●	–	–	⊕	⊖	–	–	●	–	2 NO	–	–	1.88 - 5	RC17	**19**
111595 ZSM2304-111595	3-stage 1 of 3	–	–	●	–	–	⊕	⊖	–	–	–	●	2 NO	–	–	1.88 - 5	RC17	**19**
10507S ZSM2301-105075	–	–	● Reset	●	–	–	⊖	⊕	–	–	●	–	2 NO	●	–	1.4- 3.8	HAN Q17	**20**
099713 ZSM4200-099713	–	–	–	–	–	–	–	–	–	–	–	–	3 C	–	5	–	–	**21**
121883 ZSM4200-121883	–	–	–	–	–	–	–	–	–	–	–	–	3 C	–	–	3.1 - 9.8		**21**
111871 ZSM2300-111871	–	–	–	2 x ●	–	–	–	–	–	–	–	–	1 C + 1 NO	–	–	1.88 - 5	–	**22**
124156 ZSM4200-124156	–	–	–	–	–	–	–	Black	–	–	–	–	3 C	–	–	1.88 - 5	–	**22**
099714 ZSM2100-099714	–	–	–	●	–	–	⊕	⊖	–	–	–	–	3 NO	●	5	–	–	**23**
109971 ZSM2300-109971	–	–	–	●	–	–	⊕	⊖	–	–	–	–	2 NO	●	5	–	–	**23**
112803 ZSM2300-112803	–	–	–	●	–	–	⊕	⊖	–	–	–	–	2 NO	●	–	3 - 9	–	**23**
127990 ZSM2300-127990	–	–	–	●	–	–	⊕	⊖	–	–	–	–	2 NO	●	–	1.38 - 4.5	–	**24**
111462 ZSM2300-111462	–	–	–	●	–	–	⊕	⊖	–	–	–	–	2 NO	●	–	1.88 - 5	RC12	**24**
099716 ZSM2300-099716	–	–	–	–	–	–	⊕	⊖	–	–	–	–	2 NO	–	5	–	RC12	**25**

113290 ZSM2300-113290	–	–	–	–	–	–	⊕	⊖	–	–	–	–	2 NO	–	13	–	RC12	**25**
100697 ZSM2200-100697	4-stage 1 of 4	–	–	–	–	–	⊕	⊖	–	–	–	–	3 NO	●	10	–	–	**26**
106103 ZSM2100-106103	5-stage Gray code	–	–	●	–	–	⊕	⊖	–	–	–	–	3 NO	–	3	–	–	**26**
105308 ZSM2200-105308	12-stage Gray code	–	–	●	–	–	⊕	⊖	–	–	–	–	3 NO	–	5	–	–	**27**
103462 ZSM3100-103462	12-stage Gray code	–	–	–	–	–	⊕	⊖	–	–	–	–	1 NC + 2 NO	–	–	1.88 - 5	–	**27**
122279 ZSM2200-122279	16-stage Gray code	–	–	–	–	–	⊕	⊖	–	–	–	–	2 NO	–	–	1.88 - 5	RC12	**28**
116714 ZSM2200-116714	–	●	–	–	–	–	–	–	–	–	–	–	3 NO	●	12	–	–	**29**
110338 ZSM2300-110338	–	●	–	●	–	–	⊕	⊖	–	–	–	–	2 NO	–	–	1.55 - 3.5	RC12	**30**
106670 ZSM2300-106670	–	–	● Reset	●	–	–	⊖	⊕	–	–	–	–	2 NO	●	–	1.25 - 3.1	HAN Q17	**30**
157209 ZSM2200-157209	–	–	Black	–	–	–	–		●	–	–	–	3 NO	–	–	1.88 - 5	–	**31**
106374 ZSM2300-106374	–	–	Black	–	–	–	–		●	–	–	–	1 NO + 1 C	–	–	–	RC17	**31**



Top
An emergency stop or machine stop can be installed in the top position for rapid access in an emergency. Alternatively, there is space for various pushbuttons, switches, a selector switch or an LED.

Front top **Front bottom**
There is space for two pushbuttons on the front. The one-touch function can also be installed.

Bottom
An emergency stop, a machine stop or a key-operated rotary switch is integrated here in some pre-assembled versions. The kit has a blind plug here for great flexibility. The cable gland protects the stop command device in the event of a fall.

For technical data, see page 71

Enabling switch ZSM with upper stop command device

- **3-stage function**
- **Stop command device**
- **Vibration signal optional**
- **LED indicator optional**
- **Pushbutton**
- **Coiled connecting cable optional**

3-stage function
Enabling function is active only in the second stage (center position, actuating point). If the pushbutton is released or pushed further (panic function), the enabling is removed (dependent on the wiring, see function sequence).

Stop command device
Dual-channel emergency stop device (red, with pull-to-reset and turn-to-reset button) or machine stop (gray, with pull-to-reset and turn-to-reset button) on the switch housing, for different wiring concepts.

Vibration signal
The vibration signal is used for tactile feedback of the enabling position.

LED indicator
The LED indicator is used for visual feedback directly at the enabling switch.

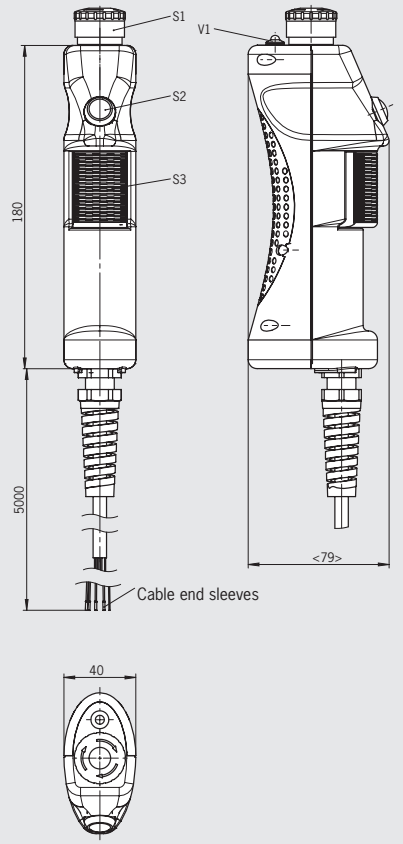
Pushbuttons
Additional functions can be run directly at the enabling switch using the pushbuttons.

+ and – buttons
These pushbuttons can be configured individually. For example, for moving axes in the positive or negative direction.

Cable
The high-quality connecting cables are available in a straight or coiled version.

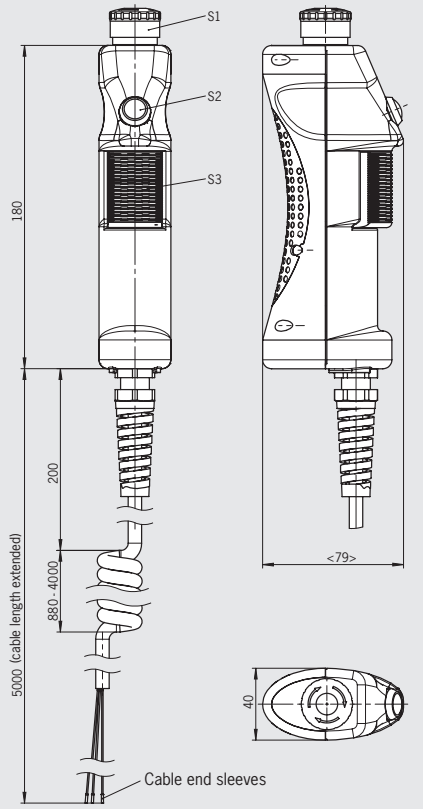
ZSM4204-102966, 3-stage function
Flying lead, emergency stop device

Dimension drawing



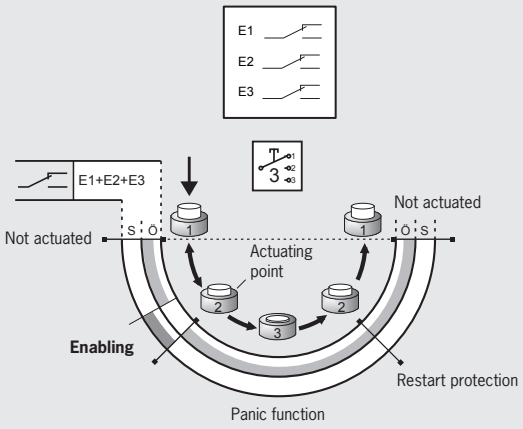
For wiring diagram, see page 72

ZSM4204-105645, 3-stage function
Flying lead, emergency stop device



For wiring diagram, see page 72

Switching element/function sequence



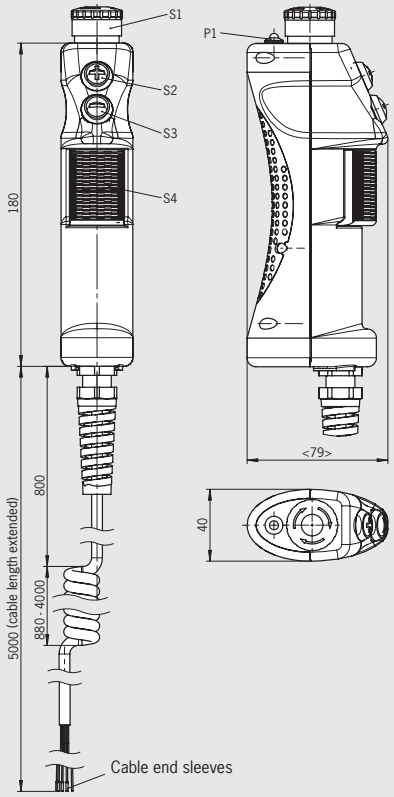
Ordering table

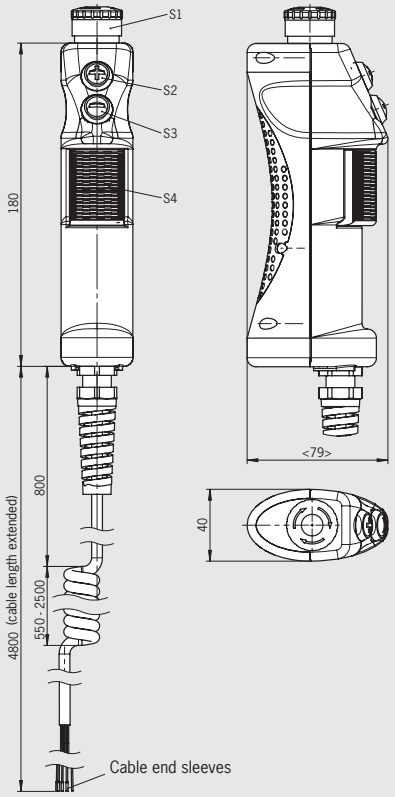
Design	Connection	Cable length	Version	Order no./item
ZSM	Flying lead 23 x 0.14 mm²	5 m straight	Enabling switch with 3 changeover contacts (S3), red emergency stop device (S1), vibration signal, yellow LED indicator (V1), white pushbutton (S2)	**102966** ZSM4204-102966
		1.88 ... 5 m coiled	Enabling switch with 3 changeover contacts (S3), red emergency stop device (S1), white pushbutton (S2)	**105645** ZSM4204-105645

ZSM2204-138119, 3-stage function
Flying lead, emergency stop device

ZSM2201-126706, 3-stage function
Flying lead, machine stop

Dimension drawing

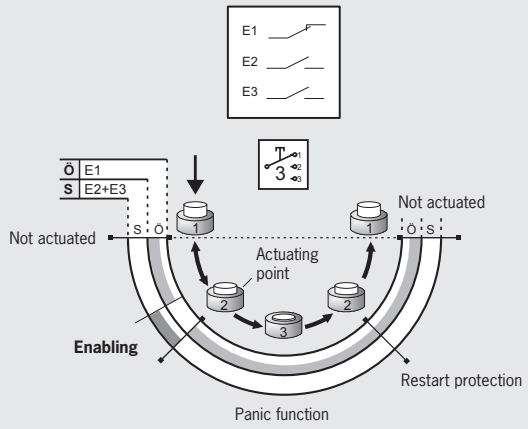


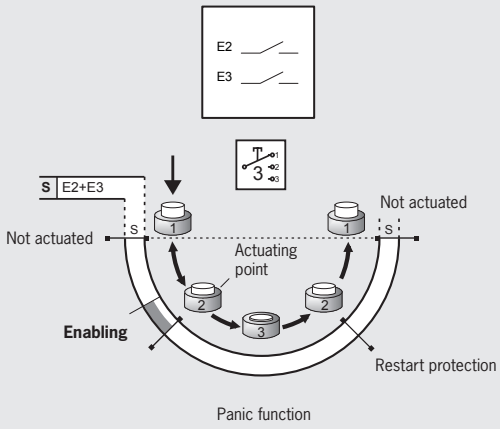


For wiring diagram, see page 72

For wiring diagram, see page 72

Switching element/function sequence





Ordering table

Design	Connection	Cable length	Version	Order no./item
ZSM	**Flying lead 23 x 0.14 mm²**	1.88 ... 5 m coiled	Enabling switch with 1 NC contact and 2 NO contacts (S4), red emergency stop device (S1), yellow LED indicator (P1), +/– buttons (S2/S3)	**138119** ZSM2204-138119
	Flying lead 12 x 0.14 mm²	2.85 ... 4.8 m coiled	Enabling switch with 2 NO contacts (S4), gray machine stop (S1), +/– buttons (S2/S3)	**126706** ZSM2201-126706

For technical data, see page 71

Enabling switch ZSM with lower stop command device

- **3-stage function**
- **Stop command device**
- **Vibration signal optional**
- **LED indicator**
- **Reset button optional**
- **+ and – buttons**
- **Selector switch optional**
- **Key-operated rotary switch optional**
- **Coiled connecting cable optional**
- **Plug connector optional**

3-stage function
Enabling function is active only in the second stage (center position, actuating point). If the pushbutton is released or pushed further (panic function), the enabling is removed (dependent on the wiring, see function sequence).

Stop command device
Dual-channel emergency stop device (red, with pull-to-reset and turn-to-reset button) or machine stop (gray, with pull-to-reset and turn-to-reset button) on the switch housing, for different wiring concepts.
Lower position, protected by anti-kink strain relief in case of a fall.

Vibration signal
The vibration signal is used for tactile feedback of the enabling position.

LED indicator
The LED indicator is used for visual feedback directly at the enabling switch.

Reset button
Pushbutton for reset function directly from the enabling switch. Laser inscription on button head: **C** (cancel).

+ and – buttons
These pushbuttons can be configured individually. For example, for moving axes in the positive or negative direction.

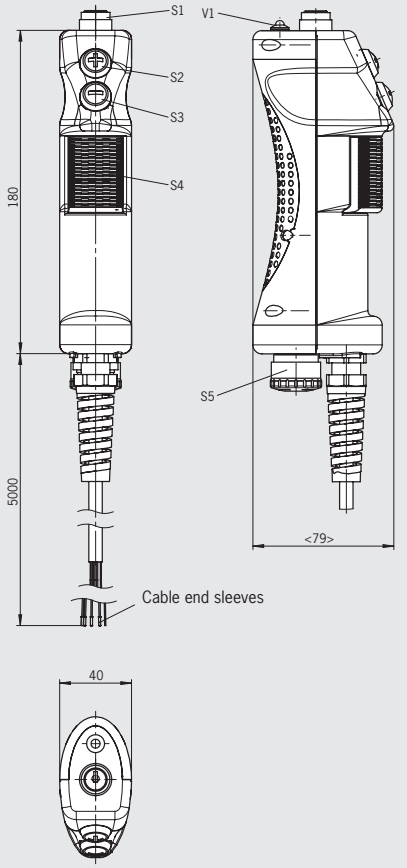
Selector switch
The adjustable detent positions can be used as required for axis, speed or range selection, for example.

Key-operated rotary switch
For individual use, e.g. as operating mode selector.

Cable
The high-quality connecting cables are available in a straight or coiled version.

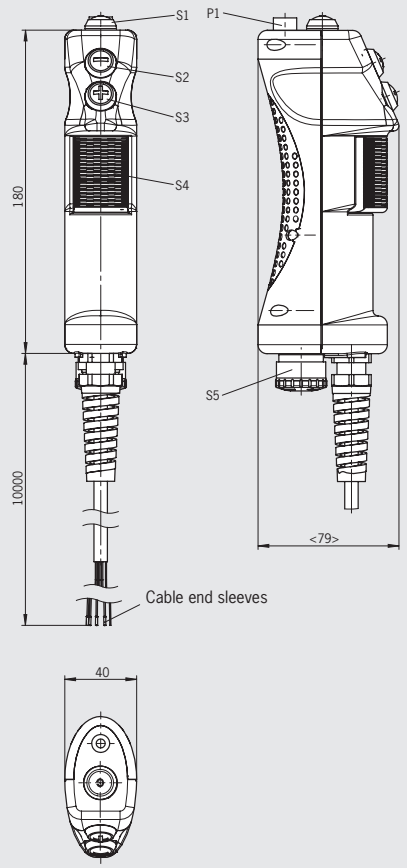
ZSM2101-103126, 3-stage function
Flying lead, emergency stop device

Dimension drawing



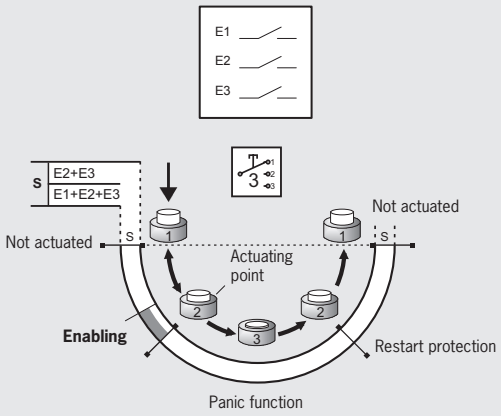
For wiring diagram, see page 73

ZSM2204-117128, 3-stage function
Flying lead, emergency stop device



For wiring diagram, see page 73

Switching element/function sequence



Ordering table

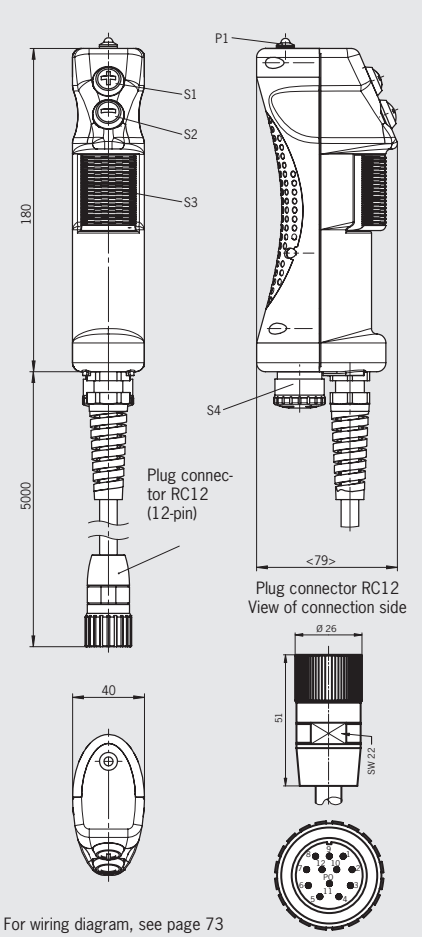
Design	Connection	Cable length	Version	Order no./item
ZSM	Flying lead 23 x 0.14 mm²	5 m straight	Enabling switch with 3 NO contacts (S4), red emergency stop device (S5), vibration signal, yellow LED indicator (V1), +/– buttons (S2/S3), key-operated rotary switch (S1)	**103126** ZSM2101-103126
		10 m straight	Enabling switch with 3 NO contacts (S4), red emergency stop device (S5), vibration signal, red/green LED indicator (P1), +/– buttons (S3/S23), black pushbutton (S1)	**117128** ZSM2204-117128

ZSM2104-123678, 3-stage function
Plug connector RC12, emergency stop device

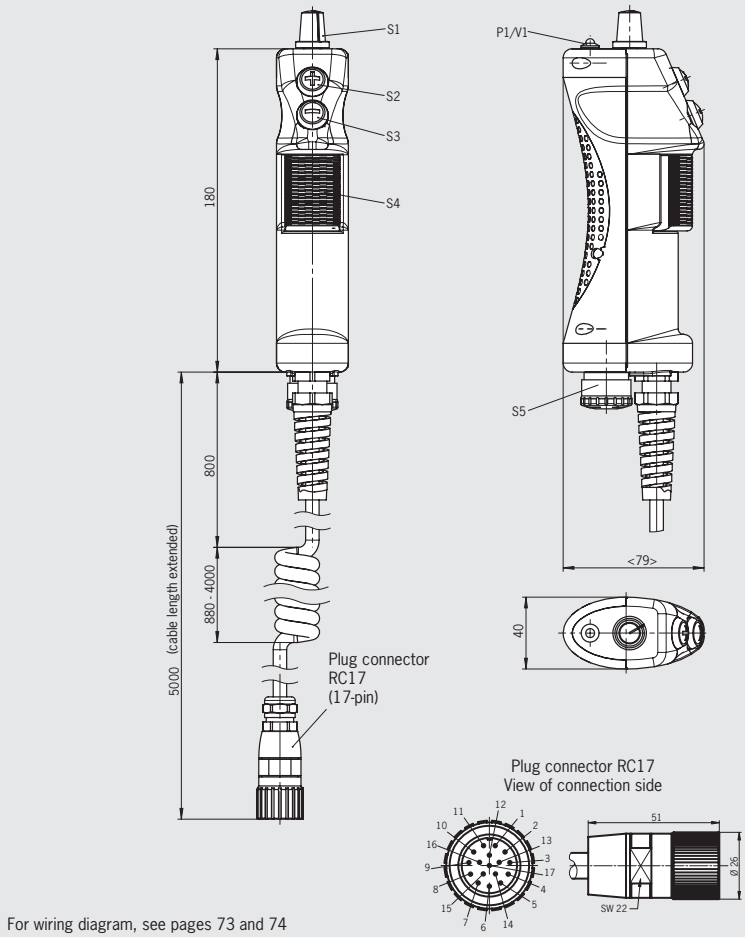
ZSM2301-110317, 3-stage function
Plug connector RC17, machine stop

ZSM2304-111595, 3-stage function
Plug connector RC17, emergency stop device

Dimension drawing

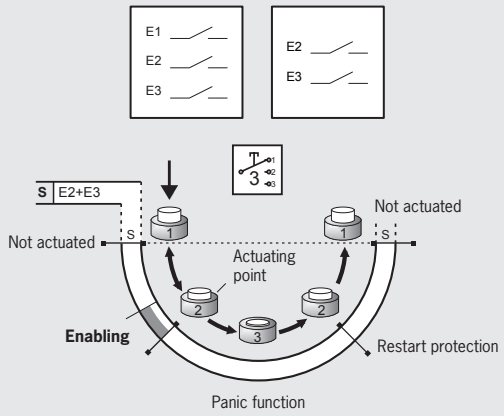


For wiring diagram, see page 73
For mating connector, see page 66



For wiring diagram, see pages 73 and 74
For mating connector, see page 66

Switching element/function sequence



Ordering table

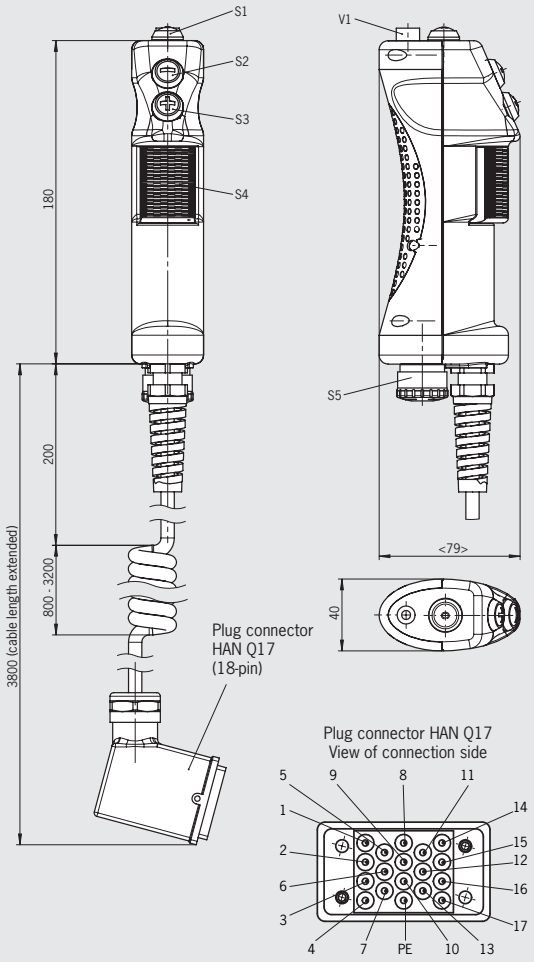
Design	Connection	Cable length	Version	Order no./item
ZSM	**RC12** Plug connector (12-pin)	5 m straight	Enabling switch with 3 NO contacts (S3), red emergency stop device (S4), yellow LED indicator (P1), +/– buttons (S1/S2)	**123678** ZSM2104-123678
	RC17 Plug connector (17-pin)	1.88 ... 5 m coiled	Enabling switch with 2 NO contacts (S4), gray machine stop (S5), yellow LED indicator (V1), +/– buttons (S2/S3), selector switch, 3-stage, 1 of 3 (S1)	**110317** ZSM2301-110317
			Enabling switch with 2 NO contacts (S4), red emergency stop device (S5), yellow LED indicator (P1), +/– buttons (S2/S3), selector switch, 3-stage, 1 of 3 (S1)	**111595** ZSM2304-111595

Please turn page

For technical data, see page 71

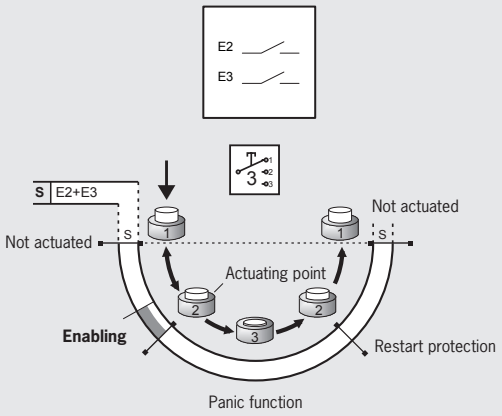
ZSM2301-105075, 3-stage function
Plug connector HAN Q17, machine stop

Dimension drawing



For wiring diagram, see page 74

Switching element/function sequence



Ordering table

Design	Connection	Cable length	Version	Order no./item
ZSM	**HAN Q17** Plug connector (18-pin)	1.4 ... 3.8 m coiled	Enabling switch with 2 NO contacts (S4), gray machine stop (S5), vibration signal, red/green LED indicator (V1), +/– buttons (S3/S2), reset button (S1)	**105075** ZSM2301-105075

Enabling switch ZSM without stop command device

- **3-stage function**
- **Vibration signal optional**
- **LED indicator optional**
- **+ and – buttons optional**
- **Coiled connecting cable optional**
- **Plug connector optional**

3-stage function
Enabling function is active only in the second stage (center position, actuating point). If the pushbutton is released or pushed further (panic function), the enabling is removed (dependent on the wiring, see function sequence).

Vibration signal
The vibration signal is used for tactile feedback of the enabling position.

LED indicator
The LED indicator is used for visual feedback directly at the enabling switch.

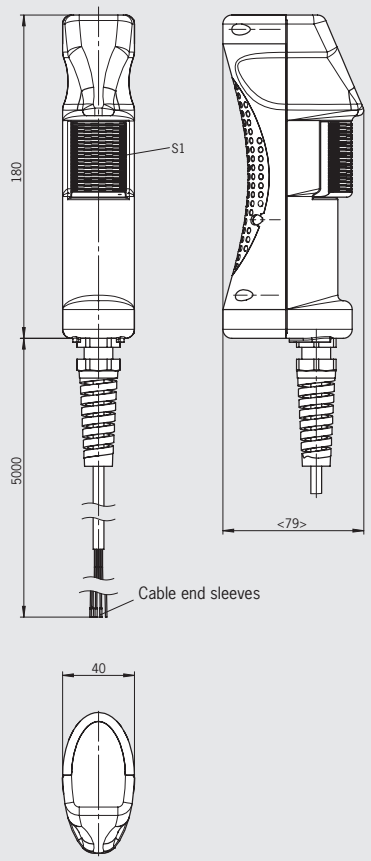
Pushbuttons
Additional functions can be run directly at the enabling switch using the pushbuttons.

+ and – buttons
These pushbuttons can be configured individually. For example, for moving axes in the positive or negative direction.

Cable
The high-quality connecting cables are available in a straight or coiled version.

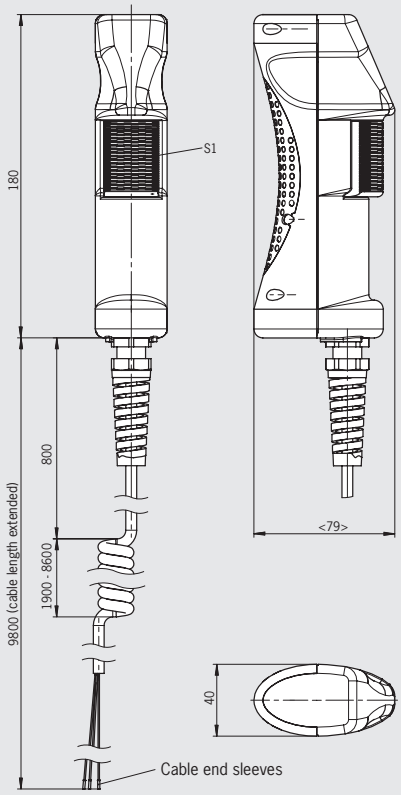
ZSM4200-099713, 3-stage function
Flying lead

Dimension drawing



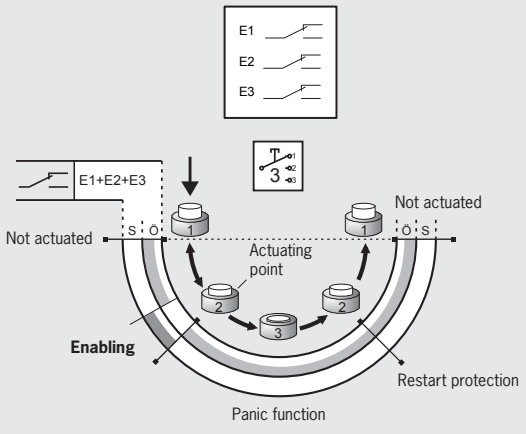
For wiring diagram, see page 74

ZSM4200-121883, 3-stage function
Flying lead



For wiring diagram, see page 74

Switching element/function sequence



Ordering table

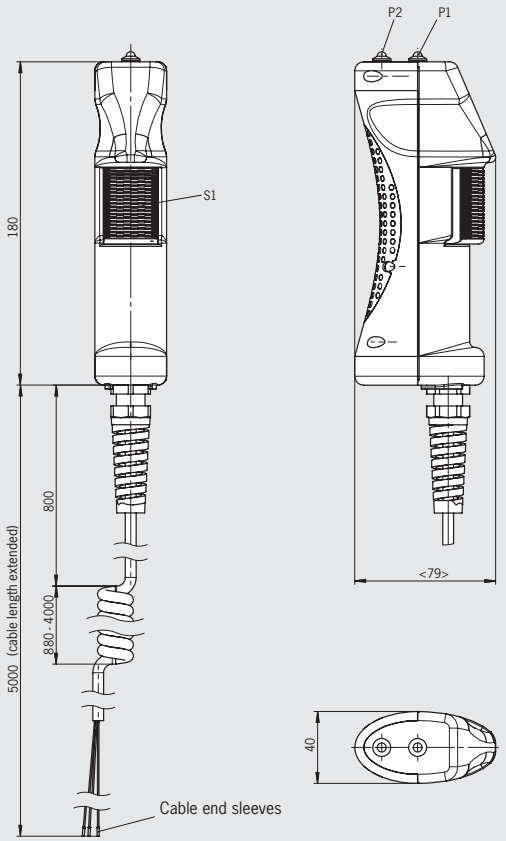
Design	Connection	Cable length	Version	Order no./item
ZSM	**Flying lead 12 x 0.14 mm²**	5 m straight	Enabling switch with 3 changeover contacts (S1)	**099713** ZSM4200-099713
		3.1 ... 9.8 m coiled	Enabling switch with 3 changeover contacts (S1)	**121883** ZSM4200-121883

Please turn page

For technical data, see page 71

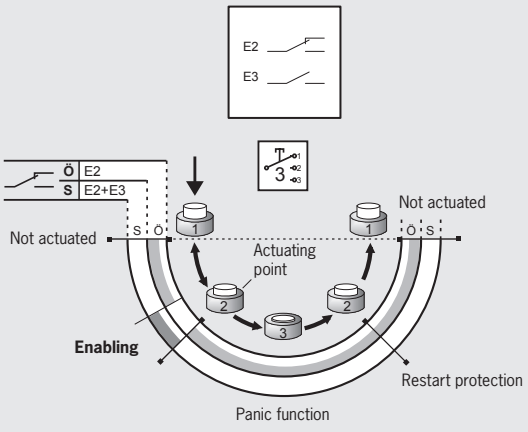
ZSM2300-111871, 3-stage function
Flying lead

Dimension drawing

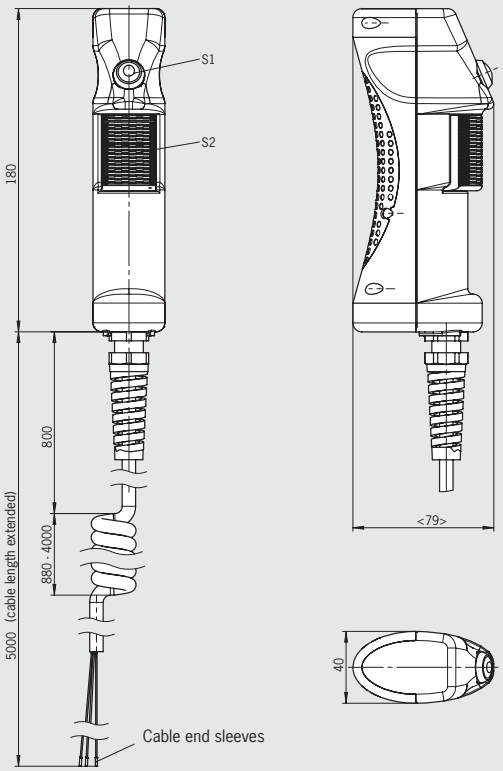


For wiring diagram, see page 75

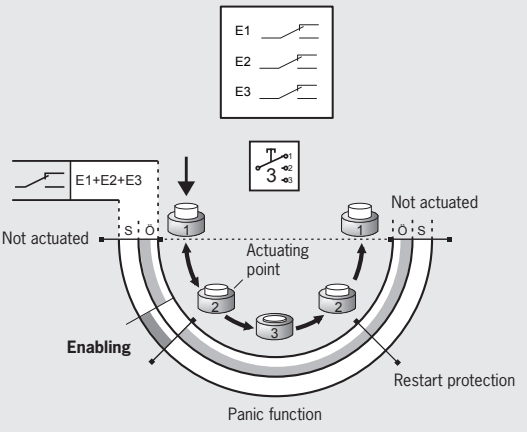
Switching element/function sequence



ZSM4200-124156, 3-stage function
Flying lead



For wiring diagram, see page 75



Ordering table

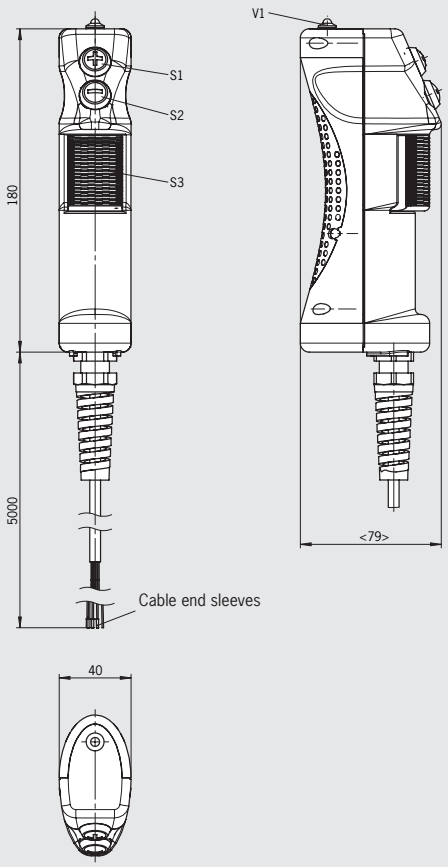
Design	Connection	Cable length	Version	Order no./item
ZSM	Flying lead 12 x 0.14 mm²	1.88 ... 5 m coiled	Enabling switch with 1 changeover contact and one NO contact (S1), 2 green (P1) and yellow (P2) LED indicators	**111871** ZSM2300-111871
			Enabling switch with 3 changeover contacts (S2), black pushbutton (S1)	**124156** ZSM4200-124156

ZSM2100-099714, 3-stage function
Flying lead

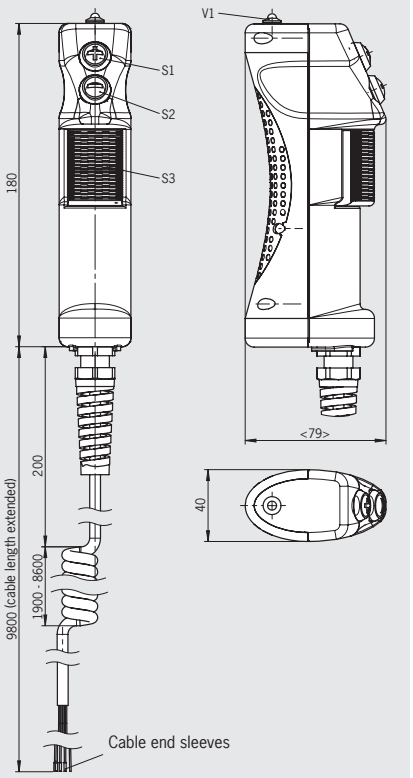
ZSM2300-109971, 3-stage function
Flying lead

ZSM2100-112803, 3-stage function
Flying lead

Dimension drawing

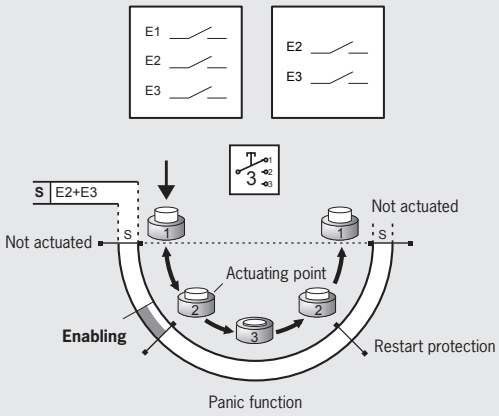


For wiring diagram, see page 75



For wiring diagram, see page 75

Switching element/function sequence



Ordering table

Design	Connection	Cable length	Version	Order no./item
ZSM	**Flying lead 12 x 0.14 mm²**	5 m straight	Enabling switch with 3 NO contacts (S3), vibration signal, yellow LED indicator (V1), +/– buttons (S1/S2)	**099714** ZSM2100-099714
			Enabling switch with 2 NO contacts (S3), vibration signal, yellow LED indicator (V1), +/– buttons (S1/S2), alternative wiring	**109971** ZSM2300-109971
		3 ... 9 m coiled	Enabling switch with 2 NO contacts (S3), vibration signal, yellow LED indicator (V1), +/– buttons (S1/S2), alternative wiring	**112803** ZSM2300-112803

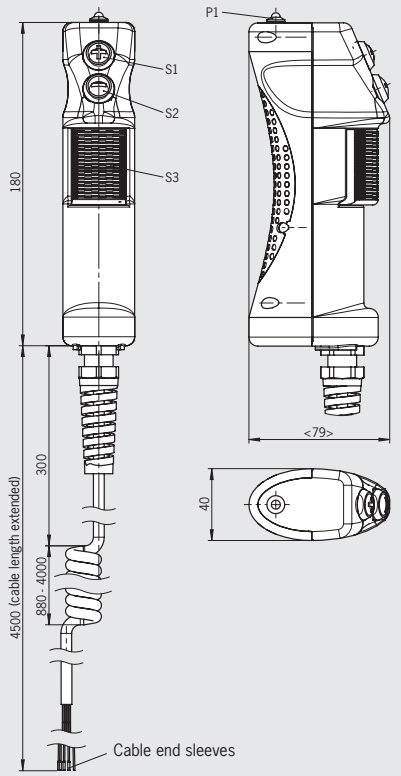
Please turn page

For technical data, see page 71

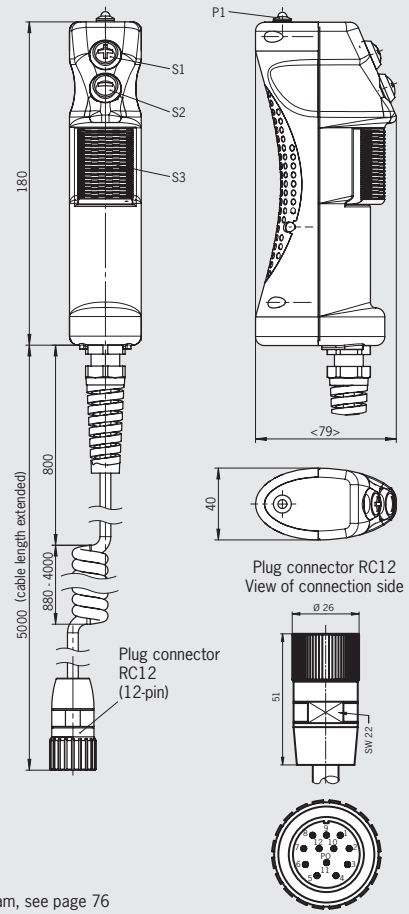
ZSM2300-127990, 3-stage function
Flying lead

ZSM2300-111462, 3-stage function
Plug connector RC12

Dimension drawing

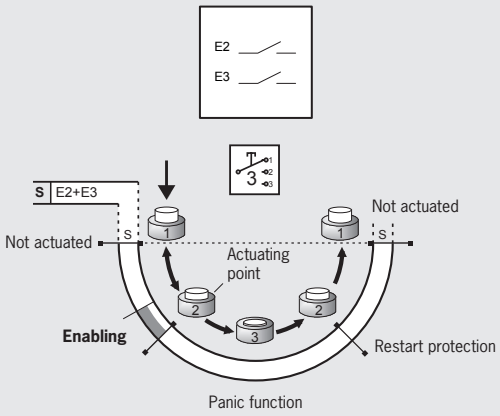


For wiring diagram, see page 76



For wiring diagram, see page 76
For mating connector, see page 66

Switching element/function sequence



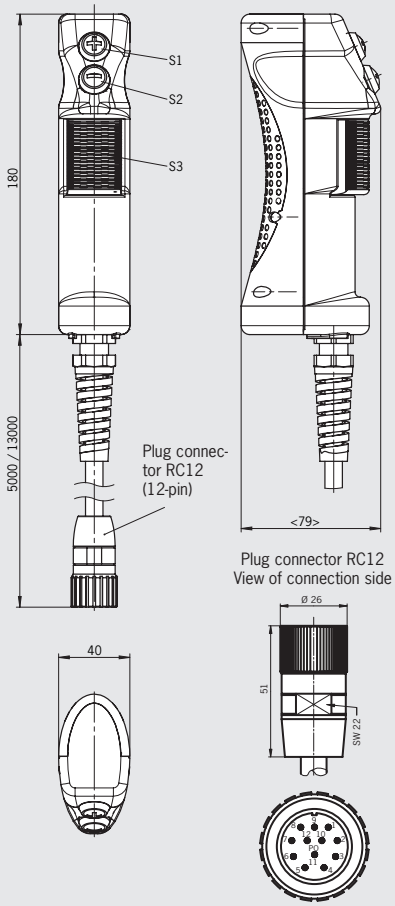
Ordering table

Design	Connection	Cable length	Version	Order no./item
ZSM	**Flying lead 12 x 0.14 mm²**	1.38 ... 4.5 m coiled	Enabling switch with 2 NO contacts (S3), vibration signal, yellow LED indicator (P1), +/– buttons (S1/S2)	**127990** ZSM2300-127990
	RC12 Plug connector (12-pin)	1.88 ... 5 m coiled	Enabling switch with 2 NO contacts (S3), vibration signal, yellow LED indicator (P1), +/– buttons (S1/S2)	**111462** ZSM2300-111462

ZSM2300-099716, 3-stage function
Plug connector RC12

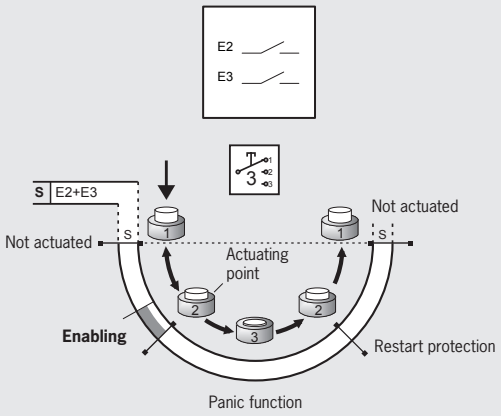
ZSM2300-113290, 3-stage function
Plug connector RC12

Dimension drawing



For wiring diagram, see page 76
For mating connector, see page 66

Switching element/function sequence



Ordering table

Design	Connection	Cable length	Version	Order no./item
ZSM	**RC12** Plug connector (12-pin)	5 m straight	Enabling switch with 2 NO contacts (S3), +/– buttons (S1/S2)	**099716** ZSM2300-099716
		13 m straight	Enabling switch with 2 NO contacts (S3), +/– buttons (S1/S2)	**113290** ZSM2300-113290

For technical data, see page 71

Enabling switch ZSM without stop command device

- **3-stage function**
- **Vibration signal optional**
- **LED indicator optional**
- **+ and – buttons**
- **Selector switch**
- **Coiled connecting cable optional**
- **Plug connector optional**

3-stage function
Enabling function is active only in the second stage (center position, actuating point). If the pushbutton is released or pushed further (panic function), the enabling is removed (dependent on the wiring, see function sequence).

Vibration signal
The vibration signal is used for tactile feedback of the enabling position.

LED indicator
The LED indicator is used for visual feedback directly at the enabling switch.

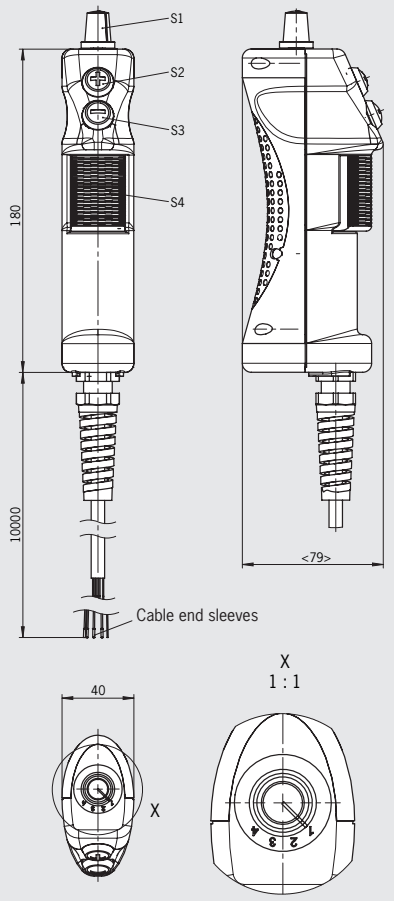
+ and – buttons
These pushbuttons can be configured individually. For example, for moving axes in the positive or negative direction.

Selector switch
The adjustable detent positions can be used as required for axis, speed or range selection, for example.

Cable
The high-quality connecting cables are available in a straight or coiled version.

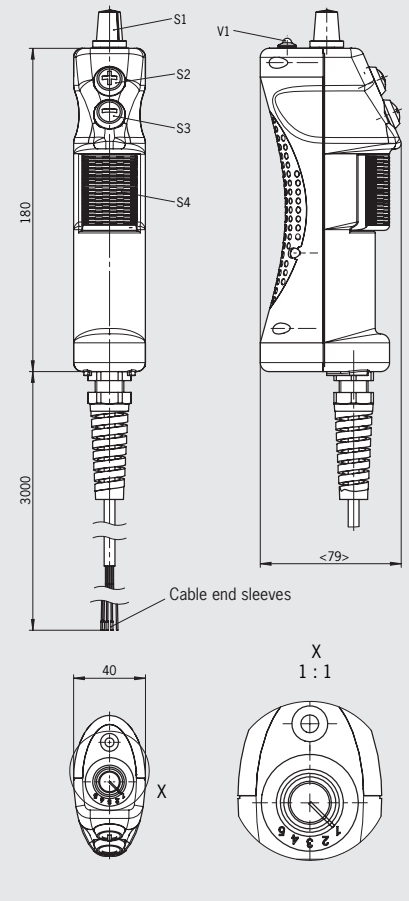
ZSM2200-100697, 3-stage function
Flying lead, selector switch

Dimension drawing



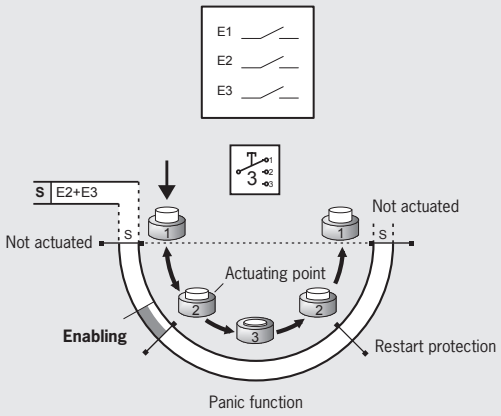
For wiring diagram, see page 76

ZSM2100-106103, 3-stage function
Flying lead, selector switch



For wiring diagram, see page 77

Switching element/function sequence

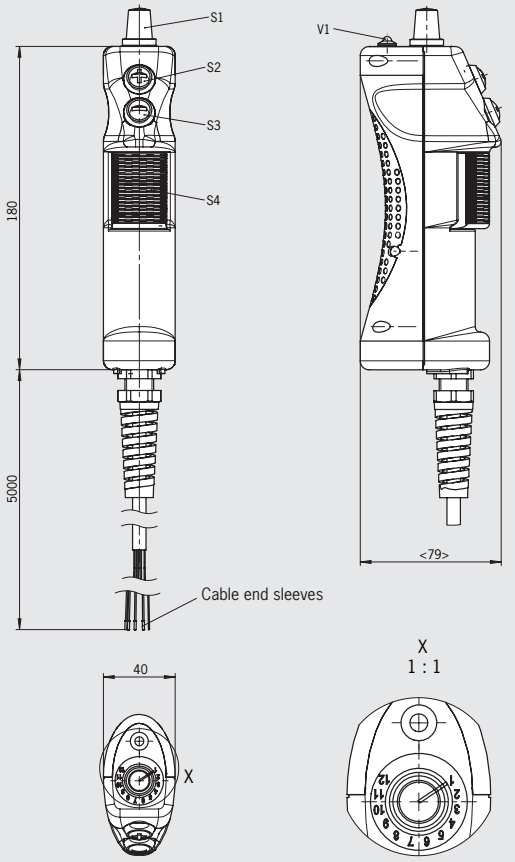


Ordering table

Design	Connection	Cable length	Version	Order no./item
ZSM	**Flying lead 23 x 0.14 mm²**	10 m straight	Enabling switch with 3 NO contacts (S4), vibration signal, +/– buttons (S2/S3), selector switch, 4-stage, 1 of 4 (S1)	**100697** ZSM2200-100697
	Flying lead 12 x 0.14 mm²	3 m straight	Enabling switch with 3 NO contacts (S4), yellow LED indicator (V1), +/– buttons (S2/S3), selector switch, 5-stage, Gray code (S1)	**106103** ZSM2100-106103

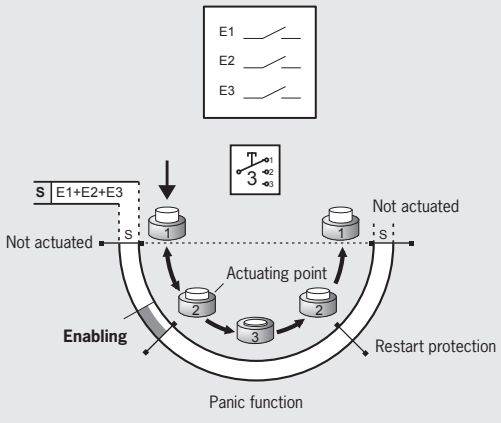
ZSM2200-105308, 3-stage function
Flying lead, selector switch

Dimension drawing

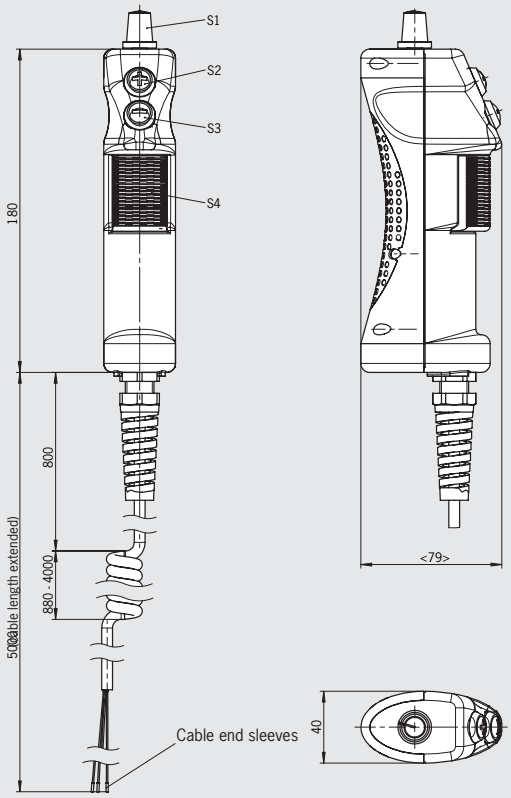


For wiring diagram, see page 77

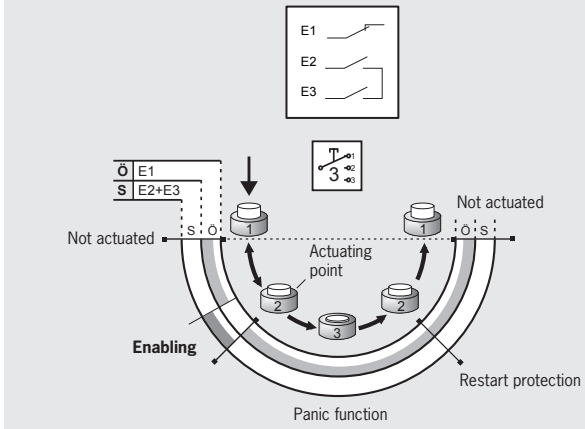
Switching element/function sequence



ZSM3100-103462, 3-stage function
Flying lead, selector switch



For wiring diagram, see page 77



Ordering table

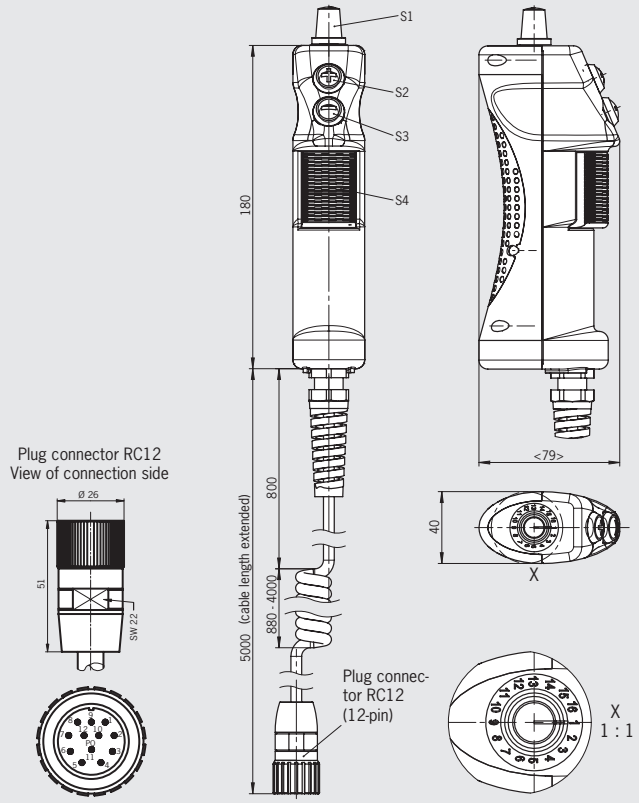
Design	Connection	Cable length	Version	Order no./item
ZSM	**Flying lead 23 x 0.14 mm²**	5 m straight	Enabling switch with 3 NO contacts (S4), yellow LED indicator (V1), +/– buttons (S2/S3), selector switch, 12-stage, Gray code (S1)	**105308** ZSM2200-105308
	Flying lead 12 x 0.14 mm²	1.88 ... 5 m coiled	Enabling switch with 1 NC contact and 2 NO contacts (S4), +/– buttons (S2/S3), selector switch, 12-stage, Gray code (S1)	**103462** ZSM3100-103462

Please turn page

For technical data, see page 71

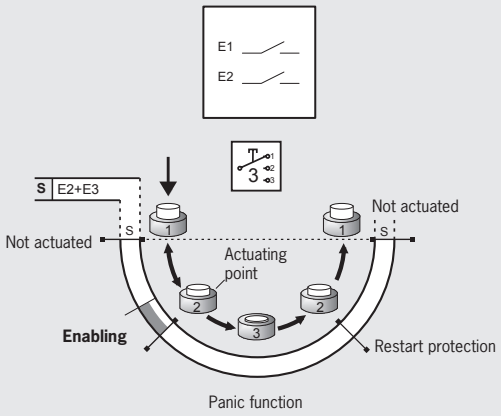
ZSM2200-122279, 3-stage function
Plug connector RC12, selector switch

Dimension drawing



For wiring diagram, see page 77
For mating connector, see page 66

Switching element/function sequence



Ordering table

Design	Connection	Cable length	Version	Order no./item
ZSM	**RC12** Plug connector (12-pin)	1.88 ... 5 m coiled	Enabling switch with 2 NO contacts (S4), +/– buttons (S2/S3), selector switch, 16-stage, Gray code (S1)	**122279** ZSM2200-122279

Enabling switch ZSM without stop command device

- **3-stage function**
- **Vibration signal optional**
- **LED indicator optional**
- **Reset button optional**
- **+ and – buttons optional**
- **Pushbutton optional**
- **Key-operated rotary switch optional**
- **Mini joystick optional**
- **Coiled connecting cable optional**
- **Plug connector optional**

3-stage function
Enabling function is active only in the second stage (center position, actuating point). If the pushbutton is released or pushed further (panic function), the enabling is removed (dependent on the wiring, see function sequence).

Vibration signal
The vibration signal is used for tactile feedback of the enabling position.

LED indicator
The LED indicator is used for visual feedback directly at the enabling switch.

Reset button
Button for reset function directly from the enabling switch. Laser inscription on button head: **C** (cancel).

+ and – buttons
These pushbuttons can be configured individually. For example, for moving axes in the positive or negative direction.

Pushbuttons
Additional functions can be run directly at the enabling switch using the pushbuttons.

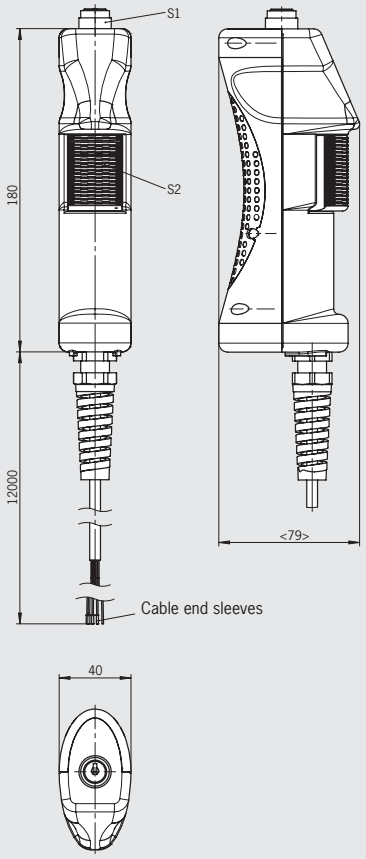
Key-operated rotary switch
For individual use, e.g. as operating mode selector.

Mini joystick
Four different operating directions are possible with the mini joystick. All contacts are optionally connected to a common pin. This permits a one-touch function irrespective of the actuating direction.

Cable
The high-quality connecting cables are available in a straight or coiled version.

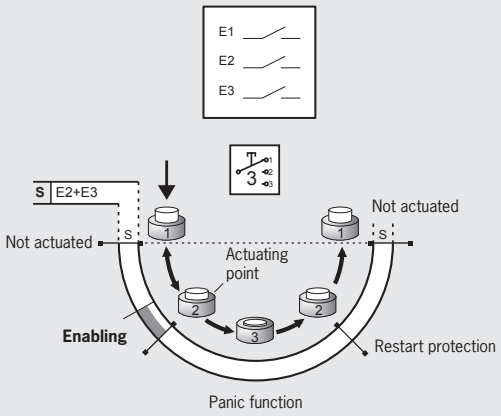
ZSM2200-116714, 3-stage function
Flying lead, key-operated rotary switch

Dimension drawing



For wiring diagram, see page 78

Switching element/function sequence



Ordering table

Design	Connection	Cable length	Version	Order no./item
ZSM	**Flying lead 12 x 0.14 mm²**	12 m straight	Enabling switch with 3 NO contacts (S2), vibration signal, key-operated rotary switch (S1)	**116714** ZSM2200-116714

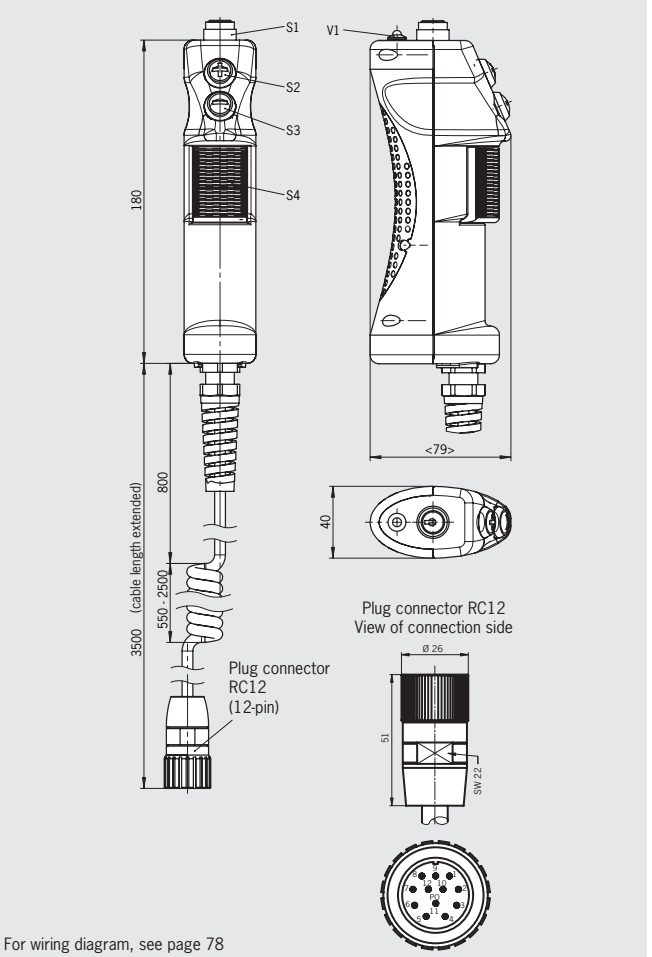
Please turn page

For technical data, see page 71

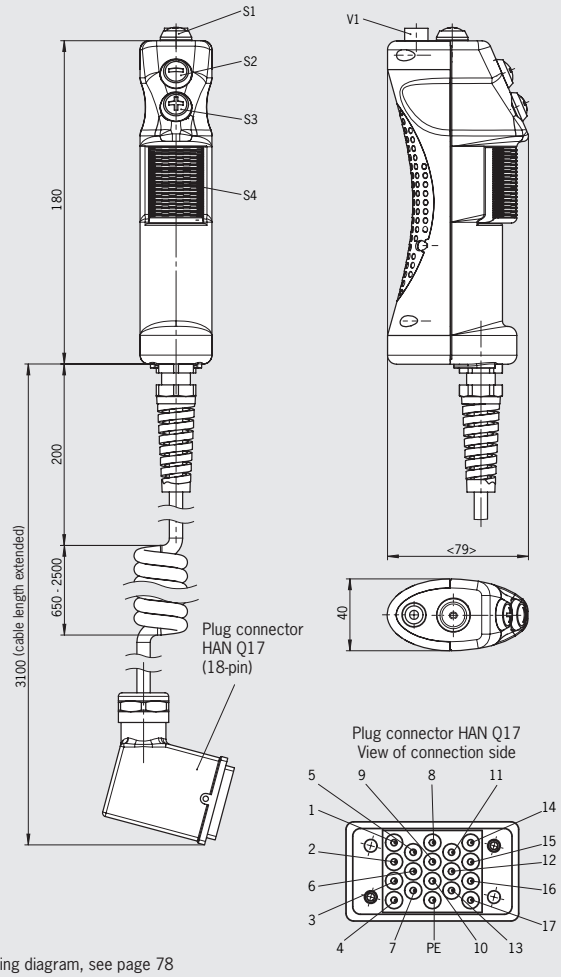
ZSM2300-110338, 3-stage function
Plug connector RC12, key-operated rotary switch

ZSM2300-106670, 3-stage function
Plug connector HAN Q17, reset button

Dimension drawing

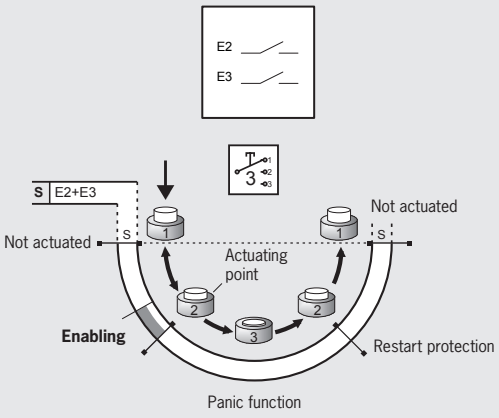


For wiring diagram, see page 78
For mating connector, see page 66



For wiring diagram, see page 78

Switching element/function sequence



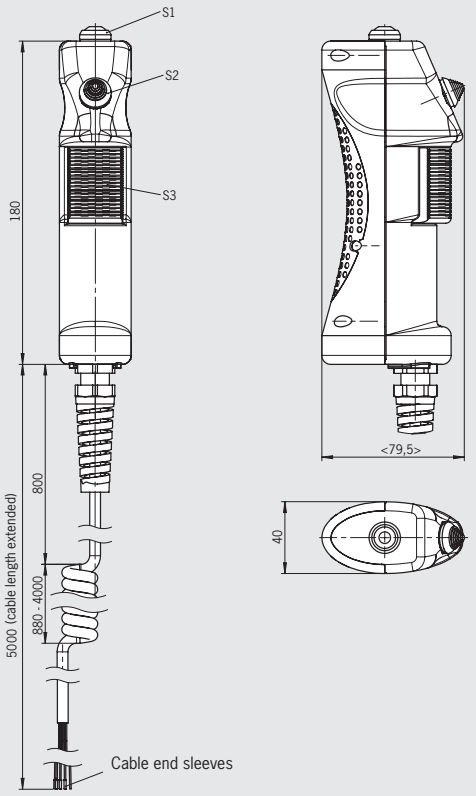
Ordering table

Design	Connection	Cable length	Version	Order no./item
ZSM	**RC12** Plug connector (12-pin)	1.55 ... 3.5 m coiled	Enabling switch with 2 NO contacts (S4), yellow LED indicator (V1), +/– buttons (S2/S3), key-operated rotary switch (S1)	**110338** ZSM2300-110338
	HAN Q17 Plug connector (18-pin)	1.25 ... 3.1 m coiled	Enabling switch with 2 NO contacts (S4), vibration signal, yellow LED indicator (V1), +/– buttons (S3/S2), reset button (S1)	**106670** ZSM2300-106670

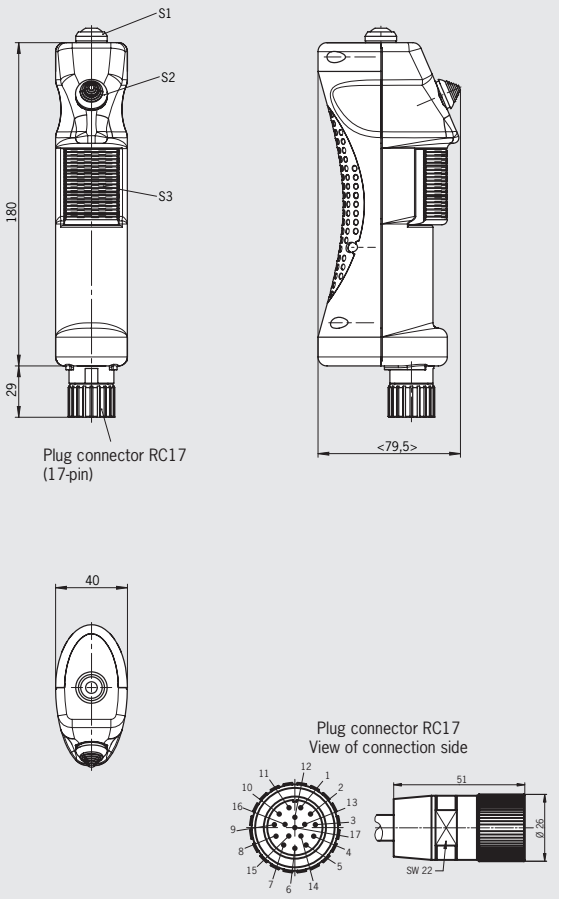
ZSM2200-157209, 3-stage function
Flying lead, mini joystick

ZSM2300-106374, 3-stage function
Plug connector RC17, mini joystick (one-touch function)

Dimension drawing

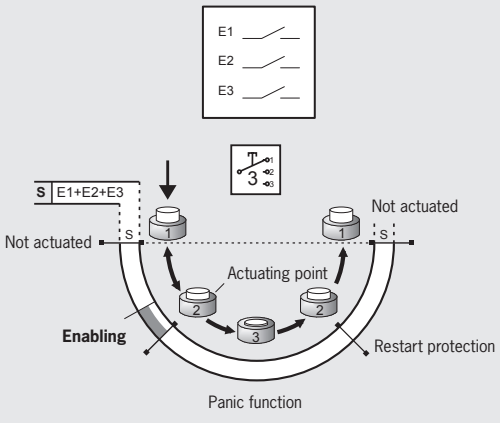


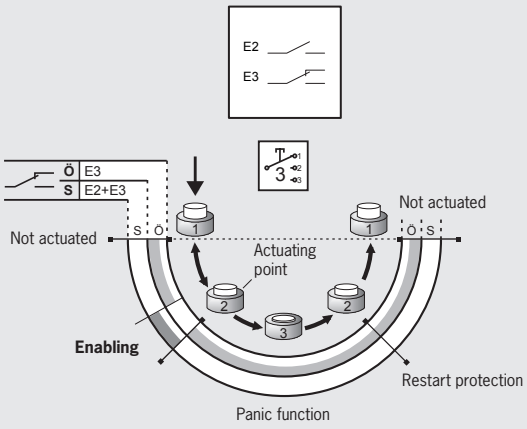
For wiring diagram, see page 78



For wiring diagram, see page 79
For mating connector, see page 66
For connecting cable, see page 68

Switching element/function sequence





Ordering table

Design	Connection	Cable length	Version	Order no./item
ZSM	**Flying lead 12 x 0.14 mm²**	1.88 ... 5 m coiled	Enabling switch with 3 NO contacts (S3), mini joystick (S2), black pushbutton (S1)	**157209** ZSM2200-157209
	RC17 Plug connector (17-pin)	Without cable	Enabling switch with 1 NO contact and 1 changeover contact (S3), one-touch function (S2), black pushbutton (S1)	**106374** ZSM2300-106374

For technical data, see page 71

Selection table for enabling switches ZSA, ZSB and ZSR

Design

- **G1** Housing G1 (black)
- **G2** Housing G2 (yellow)
- **G3** Housing G3 (yellow)

Function

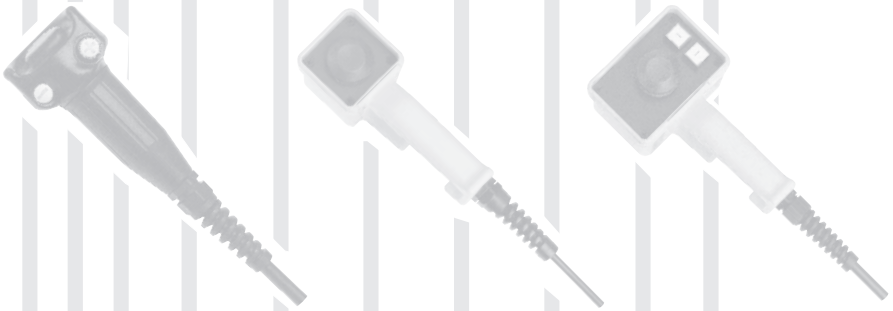
- **3** 3-stage (OFF - enabling - OFF)

Connection

- **C** Flying lead
- **SVM5** Plug connector M12, 5-pin
- **HAN10** Plug connector, 10-pin + PE
- **RC12** Plug connector, 11-pin + PE
- **RC17** Plug connector, 17-pin

Additional elements

- **Z** Additional elements, e.g. pushbuttons, LEDs, key-operated rotary switches, selector switches, etc.



Enabling switch ZSA/ZSB Housing G1

Enabling switch ZSR Housing G2

Enabling switch ZSB Housing G3

			Stages	Connection					Z		Page
G1	G2	G3	3	C	SVM5	HAN10	RC12	RC17			
●			●	●							34/35
●			●		●						36
●			●			●	●				37
●			●	●					●		38/39
●			●				●	●	●		40
●			●			●			●		41
	●		●	●							42
		●	●	●					●		43/44
		●	●				●		●		43/47
		●	●					●	●		45/46

Enabling switch ZSA

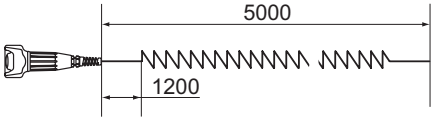
- **Housing G1**
- **3-stage function**
- **Single-channel or dual-channel version**
- **Connecting cable straight or coiled**
- **Wall holder optional**

3-stage function
Enabling function is active only in the second stage (center position, actuating point). If the pushbutton is released or pushed further (panic function), the enabling is removed (dependent on the wiring, see function sequence).

Cable
The high-quality connecting cables (individual shielding of the safety contacts) are available in a straight or coiled version.

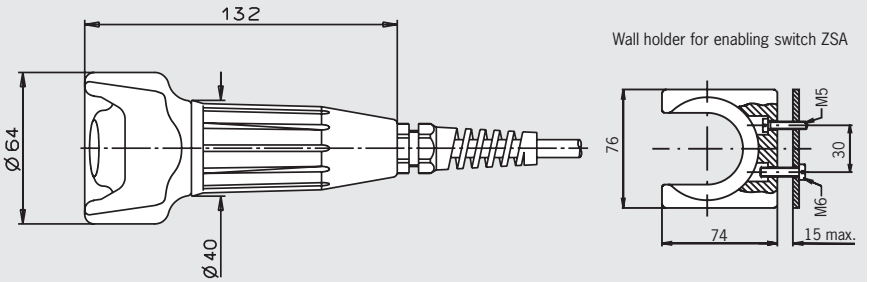
Switching elements (see also page 8)
- **111** 1 NO + 1 NC ⊖ + 1 NC
- **121** 1 NO + 2 NC ⊖ + 1 NC
- **210** 2 NO + 1 NC ⊖
- **220** 2 NO + 2 NC ⊖

Cable lengths (coiled cable pulled out straight)

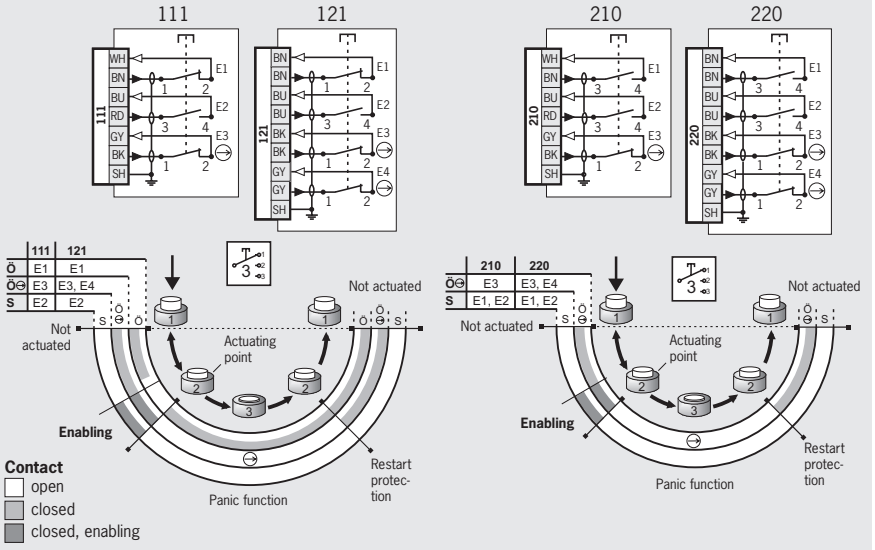


ZSA, 3-stage function
Flying lead

Dimension drawings



Wiring diagrams/function sequence



Ordering table

Design	Connection/ cross-section	Cable length	Version	Switching element			
				111: 1NO+1NC ⊖ +1NC	**121**: 1NO+2NC ⊖ + 1NC	**210**: 2NO+1NC ⊖	**220**: 2NO+2NC ⊖
G1 3-stage	**Flying lead 6 x 0.34 mm²**	2 m straight		On request	-	**099371** ZSA2A2G02A	-
		5 m straight		**055402** ZSA2A1G05A	-	**055406** ZSA2A2G05A	-
		5 m coiled		**055404** ZSA2A1S05A	-	**055408** ZSA2A2S05A	-
		10 m straight		**055403** ZSA2A1G10A	-	**055407** ZSA2A2G10A	-
		15 m straight		On request	-	**057007** ZSA2A2G15A	-
	Flying lead 8 x 0.34 mm²	2.5 m straight	Incl. wall holder	-	On request	-	**086788** [1) 2)] ZSA2A4L25AC1689
		5 m straight		-	On request	-	**070764** ZSA2A4G05A
		5 m coiled		-	On request	-	**070766** ZSA2A4S05A
		10 m straight		-	**070785** ZSA2A3G10A	-	**070765** ZSA2A4G10A
		20 m straight		-	On request	-	**073300** ZSA2A4G20A

1) No BG type examination
2) No cULus type examination

Enabling switch ZSA

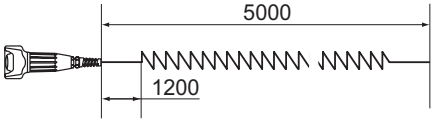
- **Housing G1**
- **3-stage function**
- **Single-channel or dual-channel version**
- **Connecting cable straight or coiled**
- **Plug connector optional**

3-stage function
Enabling function is active only in the second stage (center position, actuating point). If the button is released or pushed further (panic function), the enabling is removed (dependent on the wiring, see function sequence)

Cable
The high-quality connecting cables (individual shielding of the safety contacts) are available in a straight or coiled version.

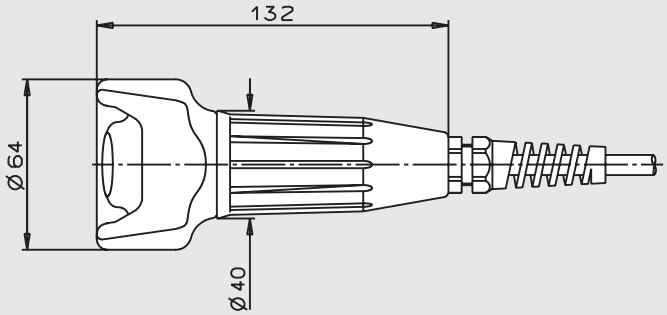
Switching elements (see also page 8)
- **1210** 1 NO/NC ⊖ [1] + 1 NO
- **2210** 1 NO/NC ⊖ [1]
  1 S (additional monitoring contact)
- **2220** 2 NO/NC ⊖ [1]

Cable lengths (coiled cable pulled out straight)

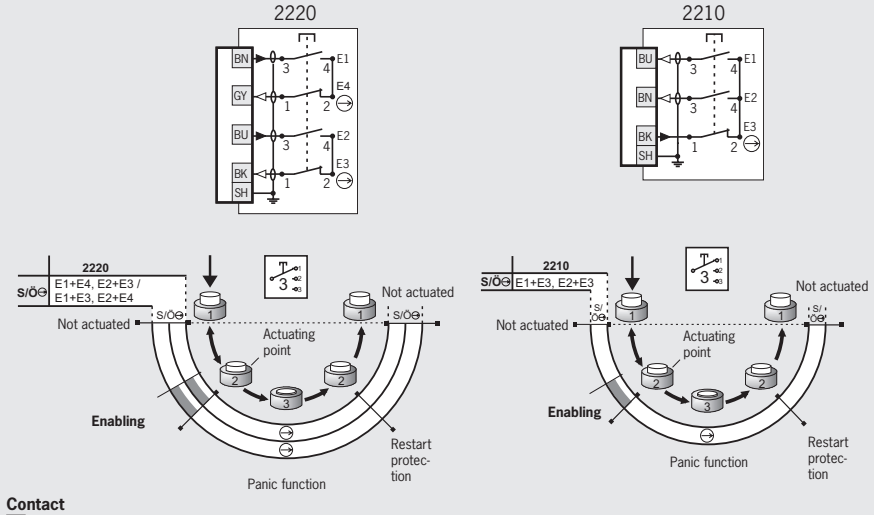


ZSA, 3-stage function
Flying lead

Dimension drawings



Wiring diagrams/function sequence



Contact
- open
- closed
- closed, enabling

Ordering table

Design	Connection/ cross-section	Cable length	Switching element	
			2210: 1NO/NC ⊖ [1] +1NO	**2220**: 2NO/NC ⊖ [1]
G1 3-stage	**Flying lead 8 x 0.34 mm²**	5 m straight	On request	**072961** ZSA2B4G05A
		5 m coiled	On request	**085118** ZSA2B4S05A
	Flying lead 3 x 0.75 mm²	5 m straight	**055410** ZSA2B2G05A	-
		10 m straight	**055411** ZSA2B2G10A	-

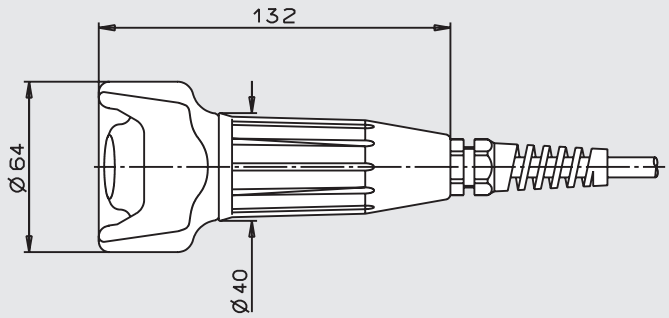
1) Closed only in center position; one NO contact and one positively driven contact are combined internally.

Please turn page

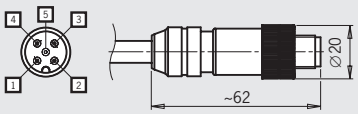
For technical data, see page 71

ZSA, 3-stage function
Plug connector

Dimension drawings



Male plug SVM5 (5-pin)

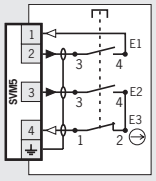


View of connection side

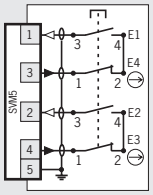
For mating connector, see page 69

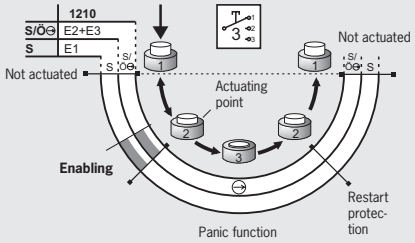
Wiring diagrams/function sequence

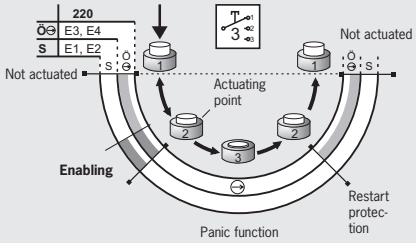
1210 SVM5



2220 SVM5







Contact
- open
- closed
- closed, enabling

Ordering table

Design	Connection	Cable length	Switching element	
			1210: 1NO/NC ⊖ [1] +1NO	**2220**: 2NO/NC ⊖ [1]
G1 3-stage	**SVM5** Plug connector (5-pin)	10 m straight	On request	**110560** ZSA2B4G10CC2322
		15 m straight	**072870** ZSA2B2G15CC1926	On request
		25 m straight	On request	On request

1) Closed only in center position; one NO contact and one positively driven contact are combined internally.

Enabling switch ZSA

- **Housing G1**
- **3-stage function**
- **Single-channel or dual-channel version**
- **Straight connecting cable**
- **Plug connector**
- **Direct connection to safety switch optional**
- **Increased actuating force optional**

3-stage function
Enabling function is active only in the second stage (center position, actuating point). If the pushbutton is released or pushed further (panic function), the enabling is removed (dependent on the wiring, see function sequence).

Cable
The high-quality connecting cables (individual shielding of the safety contacts) are available in a straight version.

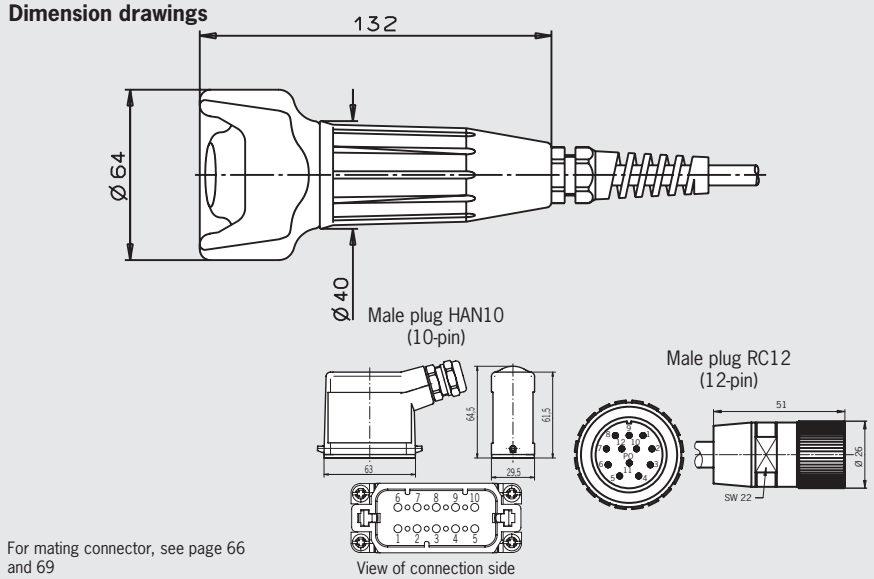
Suitable for direct connection to safety switch
This enabling switch can be connected directly to a safety switch (TZ…C1803) (see catalog for safety switches with metal housing).

Increased actuating force
A higher force is required on pressing through from stage 2 (enabling) to stage 3 (pressed through "panic function").

Switching elements (see also page 8)
- **2220** 2 NO/NC ⊖ [1)]

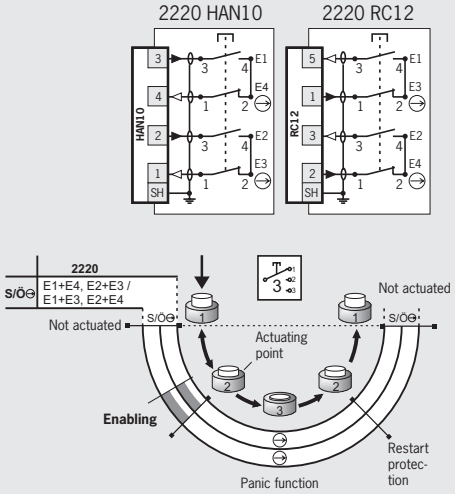
ZSA, 3-stage function
Plug connector

Dimension drawings



For mating connector, see page 66 and 69

Wiring diagrams/function sequence



Contact
- open
- closed
- closed, enabling

Ordering table

Design	Connection	Cable length	Version	Switching element
				2220: 2NO/NC ⊖ [1)]
G1 3-stage	**HAN10** Plug connector (10-pin)	10 m straight	Increased actuating force, shield on plug housing	**077489** [2)] ZSA2B4G10CC1830
	RC12 Plug connector (12-pin)	5 m straight	Direct connection to TZ...C1803, shield on plug housing	**092141** [2) 3)] ZSA092141C2038
		10 m straight	Direct connection to TZ...C1803, shield on plug housing, high actuating force	**098064** [2)] ZSA2B4G10CC1861

1) Closed only in center position; one NO contact and one positively driven contact are combined internally.
2) No BG type examination
3) No cULus type examination

For technical data, see page 71

Enabling switches ZSA and ZSB

- **Housing G1**
- **3-stage function**
- **Dual-channel version**
- **Straight connecting cable**
- **Plug connector optional**
- **LED and/or pushbuttons optional**

3-stage function
Enabling function is active only in the second stage (center position, actuating point). If the pushbutton is released or pushed further (panic function), the enabling is removed (dependent on the wiring, see function sequence).

Cable
The high-quality connecting cables (individual shielding of the safety contacts) are available in a straight version.

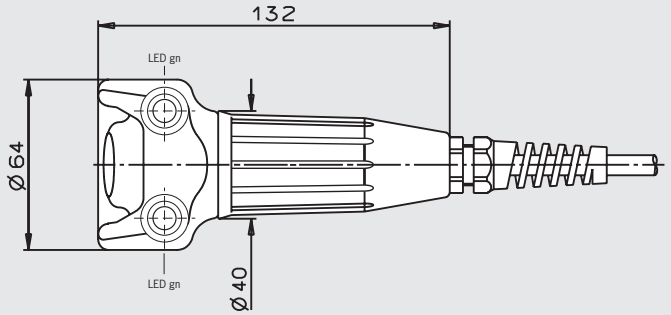
LEDs
The LEDs are used for visual feedback direct at the enabling switch.

+ and – buttons
These pushbuttons can be configured individually. For example, for moving axes in positive or negative direction.

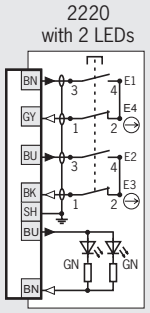
Switching elements (see also page 8)
- **210** 2 NO + 1 NC ⊖
- **220** 2 NO + 2 NC ⊖
- **2220** 2 NO/NC ⊖ 1)

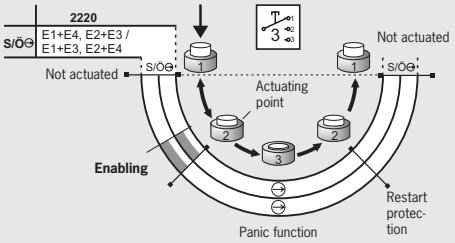
ZSA/ZSB, 3-stage function
Flying lead

Dimension drawings



Wiring diagrams/function sequence





Contact
- open
- closed
- closed, enabling

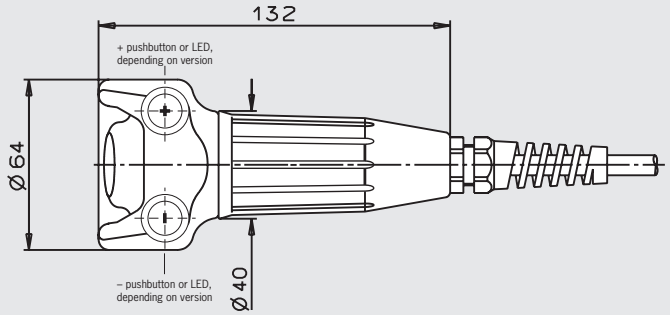
Ordering table

Design	Connection/ cross-section	Cable length	Version	Switching element
				2220: 2NO/NC ⊖ 1)
G1 3-stage	**Flying lead 8 x 0.34 mm²**	10 m straight	2 LEDs (gn)	**086707** ZSA086707C1983

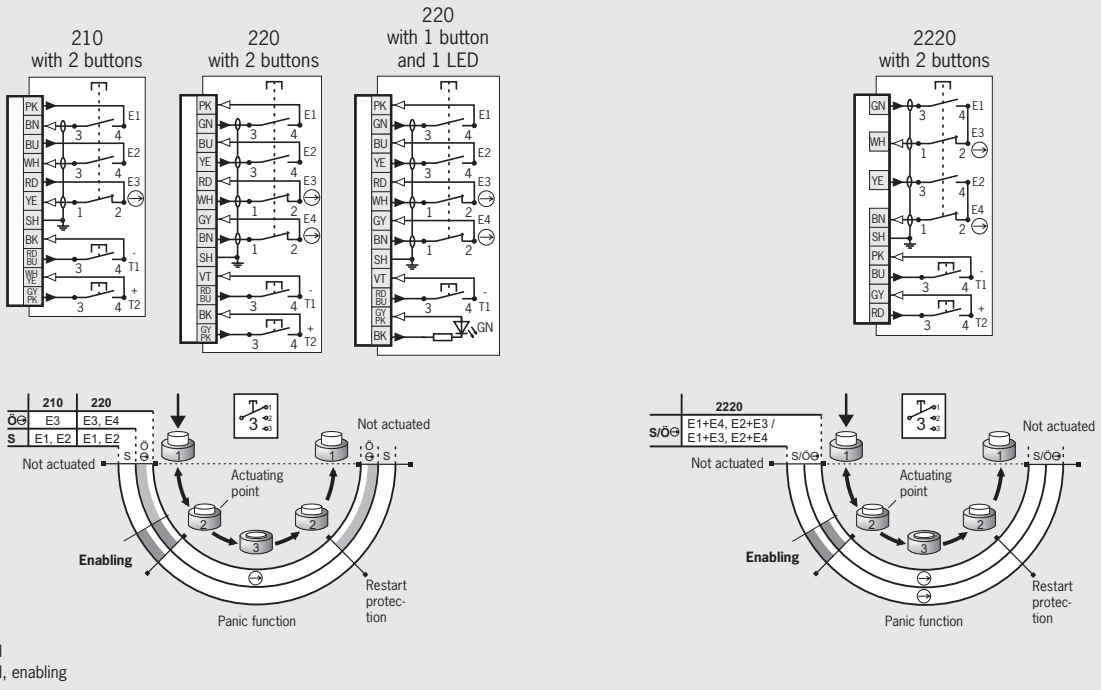
1) Closed only in center position; one NO contact and one positively driven contact are combined internally.

ZSA/ZSB, 3-stage function
Flying lead

Dimension drawings



Wiring diagrams/function sequence



Ordering table

Design	Connection/ cross-section	Cable length	Version	Switching element		
				210: 2NO+1NC ⊖	**220**: 2NO+2NC ⊖	**2220**: 2NO/NC ⊖ 1)
G1 3-stage	**Flying lead 8 x 0.5 mm² + 8 x 0.14 mm²**	5 m straight	1 pushbutton, 1 LED (gn)	On request	**085126** 2) ZSB085126	On request
		6 m straight	1 pushbutton, 1 LED (gn)	On request	**110031** 2) ZSB2A4G06A-C2302	On request
		5 m straight	2 pushbuttons (+ and -)	**073260** ZSB2A2G05A	**083317** 2) ZSB083317	**092378** 2) ZSB092378
		10 m straight	2 pushbuttons (+ and -)	**073261** ZSB2A2G10A	On request	On request
		15 m straight	2 pushbuttons (+ and -)	**095612** ZSB2A2G15A	On request	On request
		20 m straight	2 pushbuttons (+ and -)	On request	**096900** 2) ZSB096900	On request
		8 m coiled	2 pushbuttons (+ and -)	On request	**103161** 2) ZSB103161	On request
		22 m coiled	2 pushbuttons (+ and -)	On request	On request	**109136** ZSB2B4S22A

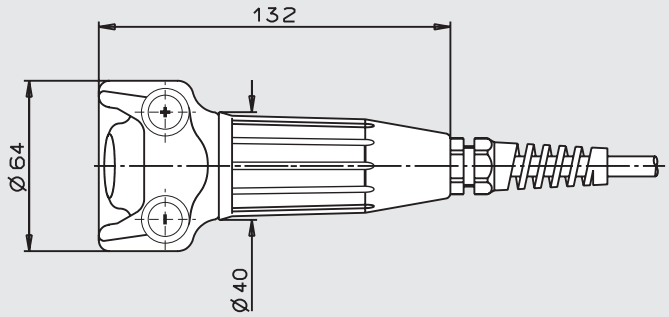
1) Closed only in center position; one NO contact and one positively driven contact are combined internally.
2) No BG type examination

Please turn page

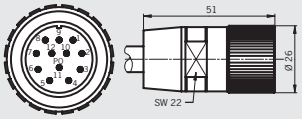
For technical data, see page 71

ZSB, 3-stage function
Plug connector

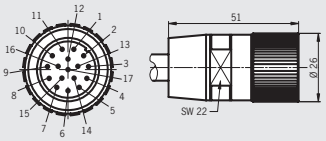
Dimension drawings



Male plug RC12 (12-pin)



Male plug RC17 Y-coded (17-pin)

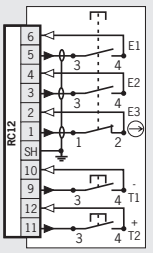


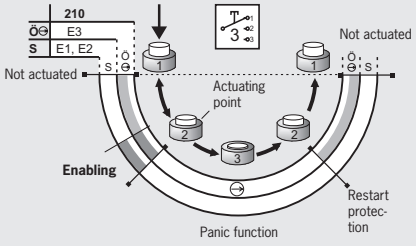
For mating connector, see page 66 and 69

View of connection side

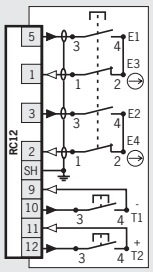
Wiring diagrams/function sequence

210 RC12

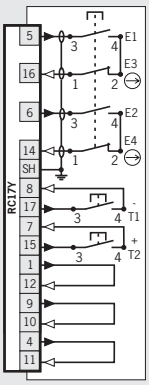


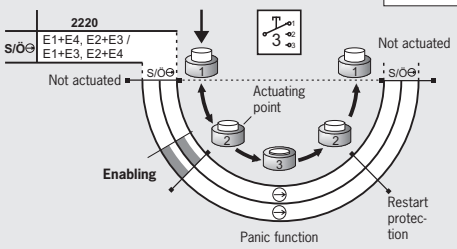


2220 RC12



2220 RC17Y





Contact
- open
- closed
- closed, enabling

Ordering table

Design	Connection	Cable length	Version	Switching element	
				210: 2NO+1NC ⊖	**2220**: 2NO/NC ⊖ 1)
G1 3-stage	**RC12** Plug connector (12-pin)	5 m straight	2 pushbuttons (+ and -), shield on plug housing	**073264** ZSB2A2G05C	On request
		5 m straight	2 pushbuttons (+ and -), direct connection TZ...C1803, shield on plug housing	On request	**077040** 2) ZSB077040
		10 m straight	2 pushbuttons (+ and -), shield on plug housing	**073265** ZSB2A2G10C	On request
	RC17 Plug connector Y-coded (17-pin)	5 m straight	2 pushbuttons (+ and -), shield on plug housing	On request	**092996** 2) ZSB2B4G05C-C2044

1) Closed only in center position; one NO contact and one positively driven contact are combined internally.
2) No BG type examination

Enabling switches ZSA and ZSB

- **Housing G1**
- **3-stage function**
- **Dual-channel version**
- **Straight connecting cable**
- **Plug connector**

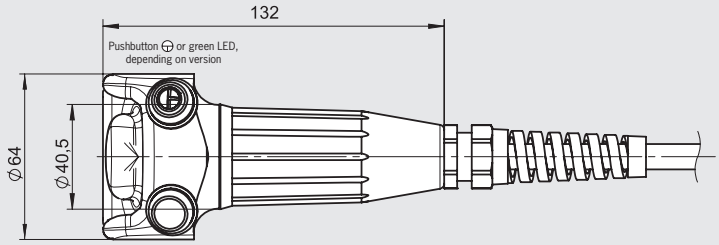
3-stage function
Enabling function is active only in the second stage (center position, actuating point). If the pushbutton is released or pushed further (panic function), the enabling is removed (dependent on the wiring, see function sequence).

Cable
The high-quality connecting cables (individual shielding of the safety contacts) are available in a straight version.

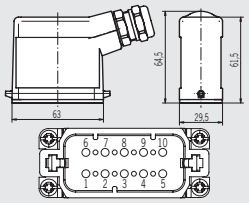
Switching elements (see also page 8)
- **2220** 2 NO/NC ⊖ 1)

ZSB, 3-stage function
Plug connector

Dimension drawings



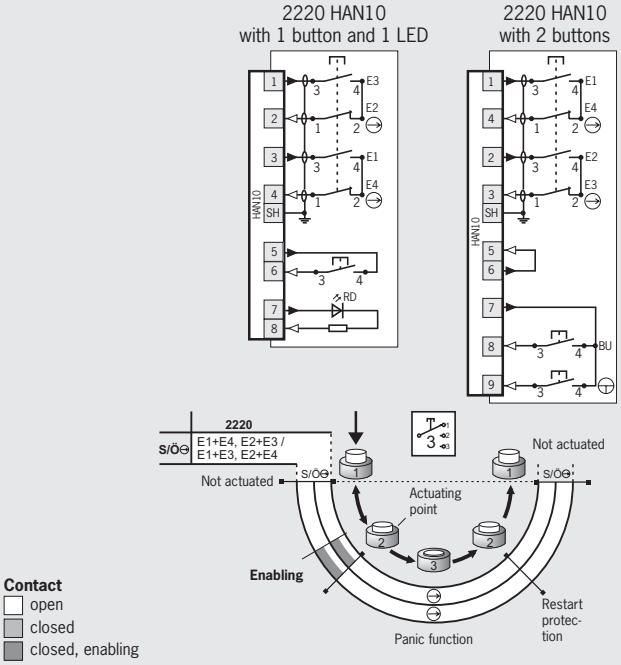
Male plug HAN10 (10-pin)



For mating connector, see page 69

View of connection side

Wiring diagrams/function sequence



Ordering table

Design	Connection	Cable length	Version	Switching element
				2220: 2 NO/NC ⊖ 1)
G1 3-stage	**HAN10** Plug connector (10-pin)	3 m straight	1 blue pushbutton, 1 pushbutton ⊖	**099807** ZSB2B4G03-C2176
		10 m straight	1 pushbutton, 1 green LED	**106277** ZSB2B4G10C-C2281

1) Closed only in center position; one NO contact and one positively driven contact are combined internally.

For technical data, see page 71

Enabling switch ZSR

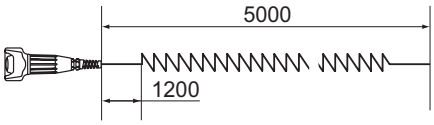
- **3-stage function**
- **Single-channel or dual-channel version**
- **Housing G2**
- **Connecting cable straight or coiled**
- **Including holder**

3-stage function
Enabling function is active only in the second stage (center position, actuating point). If the pushbutton is released or pushed further (panic function), the enabling is removed (dependent on the wiring, see function sequence).

Cable
The high-quality connecting cables (individual shielding of the safety contacts) are available in a straight version.

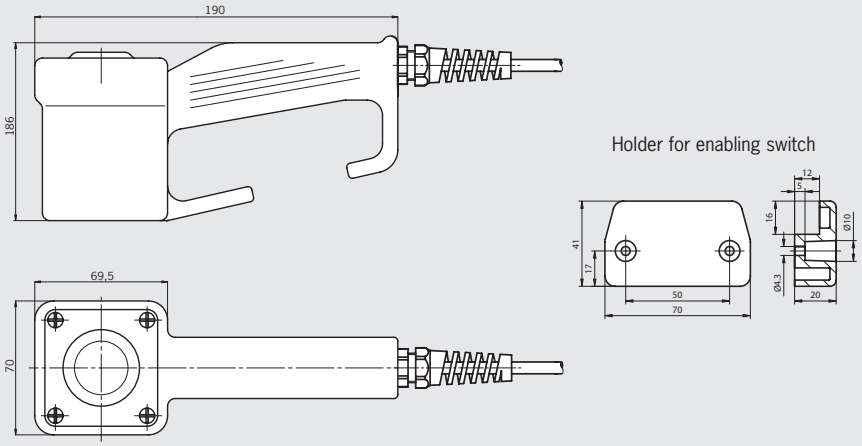
Switching elements (see also page 8)
- **210** 2 NO + 1 NC ⊖
- **220** 2 NO + 2 NC ⊖

Cable lengths (coiled cable pulled out straight)

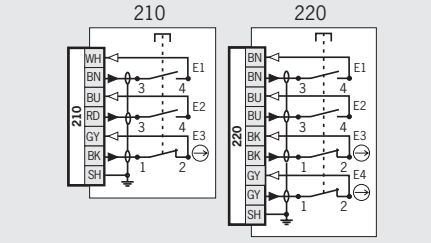


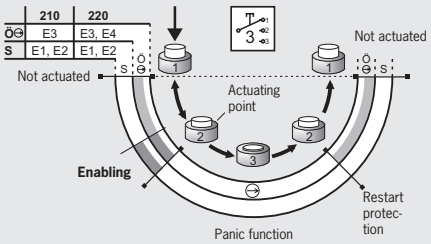
ZSR, 3-stage function
Flying lead

Dimension drawings



Wiring diagrams/function sequence





Contact
- open
- closed
- closed, enabling

Ordering table

Design	Connection/ cross-section	Cable length	Switching element	
			210: 2NO+1NC ⊖	**220**: 2NO+2NC ⊖
G2 3-stage	**Flying lead 6 x 0.34 mm²**	10 m straight	**055428** ZSR2A2G10A	-
		5 m coiled	**055429** ZSR2A2S05A	-
	Flying lead 8 x 0.34 mm²	5 m straight	-	**097609** ZSR2A4G05A
		5 m coiled	-	**104085** ZSR2A4S05A

1) Closed only in center position; one NO contact and one positively driven contact are combined internally.

Enabling switch ZSB

- **3-stage function**
- **Dual-channel version**
- **Housing G3**
- **Connecting cable straight or coiled**
- **Plug connector**
- **Two illuminated pushbuttons**
- **Including holder**

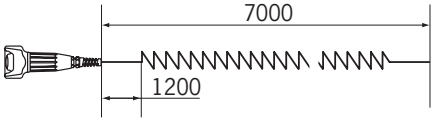
3-stage function
Enabling function is active only in the second stage (center position, actuating point). If the pushbutton is released or pushed further (panic function), the enabling is removed (dependent on the wiring, see function sequence).

Cable
The high-quality connecting cables (individual shielding of the safety contacts) are available in a straight or coiled version.

Illuminated + and – pushbuttons
These pushbuttons can be configured individually. For example, for moving axes in positive or negative direction.

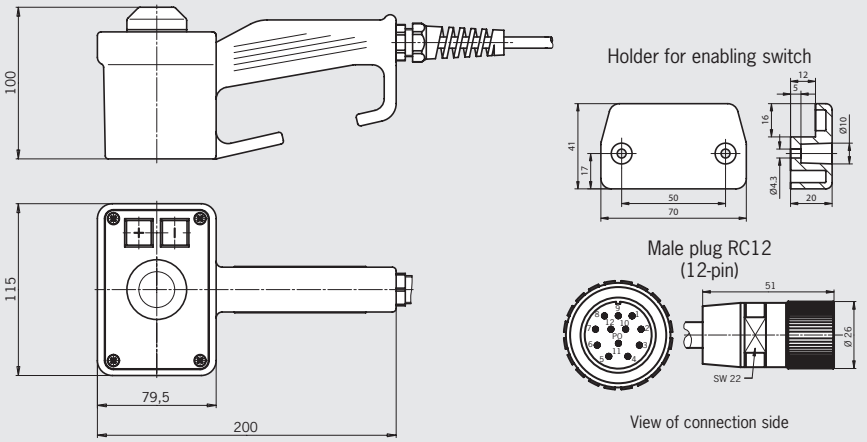
Switching elements (see also page 8)
- **220** 2 NO + 2 NC ⊖
- **2220** 2 NO/NC ⊖ 1)

Cable lengths (coiled cable pulled out straight)



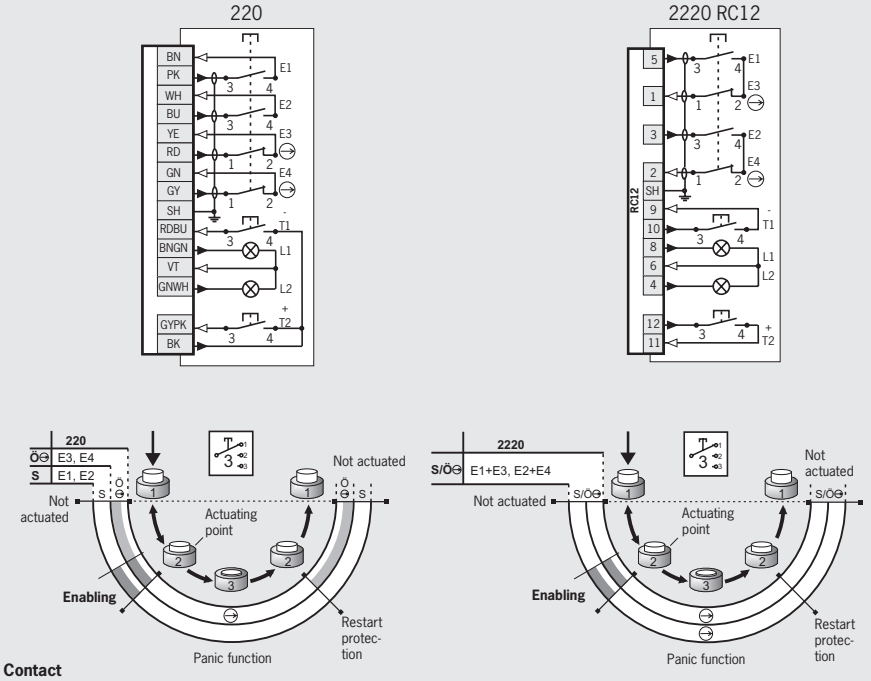
ZSB, 3-stage function
Plug connector

Dimension drawings



For mating connector, see page 66

Wiring diagrams/function sequence



Contact
- open
- closed
- closed, enabling

Ordering table

Design	Connection/ cross-section	Cable length	Version	Switching element	
				220: 2NO+2NC ⊖	**2220**: 2NO/NC ⊖ 1)
G3 3-stage	**Flying lead 4 x 0.5 mm² + 4 x 0.5 mm² + 8 x 0.14 mm²**	7 m coiled	2 illuminated pushbuttons (+ and -)	**100570** ZSB100570	On request
	RC12 Plug connector (12-pin)	5 m straight	2 illuminated pushbuttons (+ and -)	-	**077029** ZSB077029
		12 m straight	2 illuminated pushbuttons (+ and -)	-	**085058** ZSB085058

1) Closed only in center position; one NO contact and one positively driven contact are combined internally.

For technical data, see page 71

Enabling switch ZSB

- **3-stage function**
- **Dual-channel version**
- **Housing G3**
- **Straight connecting cable**
- **Two illuminated pushbuttons**
- **Selector switch**
- **Including holder**

3-stage function
Enabling function is active only in the second stage (center position, actuating point). If the pushbutton is released or pushed further (panic function), the enabling is removed (dependent on the wiring, see function sequence).

Cable
The high-quality connecting cables (individual shielding of the safety contacts) are available in a straight version.

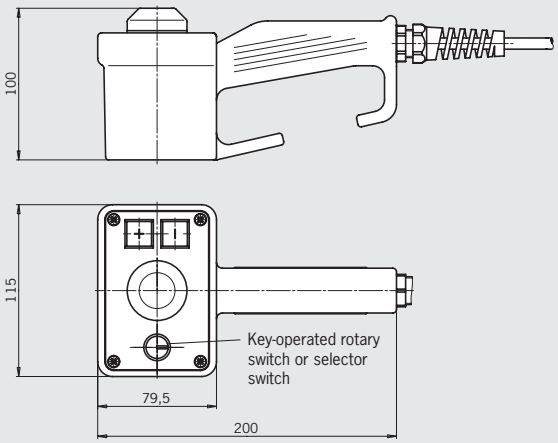
Illuminated + and – pushbuttons
These pushbuttons can be configured individually. For example, for moving axes in positive or negative direction.

Selector switch (12-stage)
For the selection of different axes or ranges. All outputs are open between the switch positions on the selector switch (break-before-make switching)!

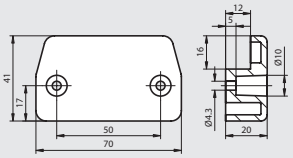
Switching elements (see also page 8)
- **2220** 2 NO/NC ⊖ 1)

ZSB, 3-stage function
Flying lead, key-operated rotary switch or selector switch

Dimension drawings



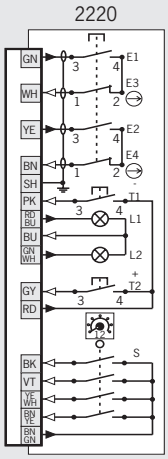
Holder for enabling switch

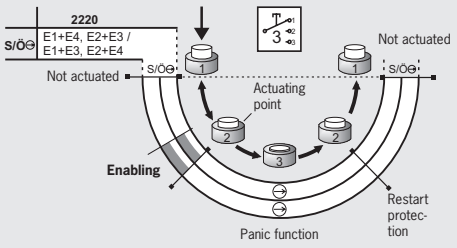


Switching table for selector switches (210 and 2220)

Pos.	BNYE	YEWH	VT	BK
	8	4	2	1
1	0	0	0	0
2	0	0	0	1
3	0	0	1	0
4	0	0	1	1
5	0	1	0	0
6	0	1	0	1
7	0	1	1	0
8	0	1	1	1
9	1	0	0	0
10	1	0	0	1
11	1	0	1	0
12	1	0	1	1

Wiring diagrams/function sequence





Contact
- open
- closed
- closed, enabling

Ordering table

Design	Connection/ cross-section	Cable length	Version	Switching element
				2220: 2NO/NC ⊖ 1)
G3 3-stage	**Flying lead 8 x 0.5 mm² + 8 x 0.14 mm²**	10 m straight	2 illuminated pushbuttons (+ and -), 1 selector switch	**087821** ZSB087821

1) Closed only in center position; one NO contact and one positively driven contact are combined internally.

Enabling switch ZSB

- **3-stage function**
- **Dual-channel version**
- **Housing G3**
- **Straight connecting cable**
- **Plug connector**
- **Two illuminated pushbuttons**
- **Key-operated rotary switch**
- **Including holder**

3-stage function
Enabling function is active only in the second stage (center position, actuating point). If the pushbutton is released or pushed further (panic function), the enabling is removed (dependent on the wiring, see function sequence).

Cable
The high-quality connecting cables (individual shielding of the safety contacts) are available in a straight version.

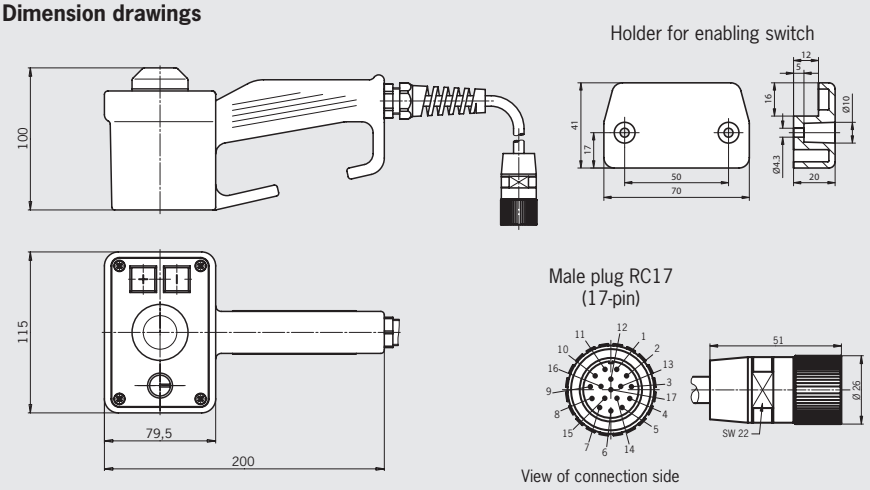
Illuminated + and – pushbuttons
These pushbuttons can be configured individually. For example, for moving axes in positive or negative direction.

Key-operated rotary switch
For individual use, e.g. as operating mode selector.

Switching elements (see also page 8)
- **210** 2 NO + 1 NC ⊖

ZSB, 3-stage function
Plug connector, key-operated rotary switch

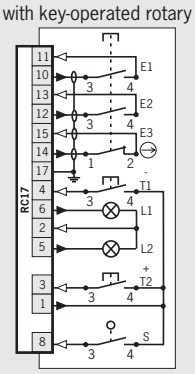
Dimension drawings

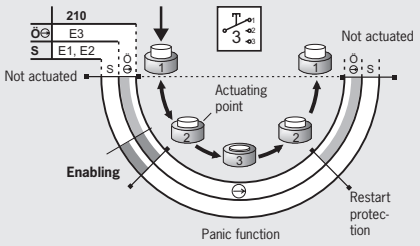


For mating connector, see page 66

Wiring diagrams/function sequence

210 with key-operated rotary switch





Contact
- open
- closed
- closed, enabling

Ordering table

Design	Connection	Cable length	Version	Switching element
				210: 2NO+1NC ⊖
G3 3-stage	**RC17** Plug connector (17-pin)	5 m straight	2 illuminated pushbuttons (+ and -), 1 key-operated rotary switch (1NO)	**072645** ZSB072645
		12 m straight	2 illuminated pushbuttons (+ and -), 1 key-operated rotary switch (1NO)	**072403** ZSB072403

For technical data, see page 71

Enabling switch ZSB

- **3-stage function**
- **Dual-channel version**
- **Housing G3**
- **Straight connecting cable**
- **Plug connector**
- **Two illuminated pushbuttons**
- **Key-operated rotary switch**
- **Emergency stop device**
- **Including holder**

3-stage function
Enabling function is active only in the second stage (center position, actuating point). If the pushbutton is released or pushed further (panic function), the enabling is removed (dependent on the wiring, see function sequence).

Cable
The high-quality connecting cables (individual shielding of the safety contacts) are available in a straight version.

Illuminated + and – pushbuttons
These pushbuttons can be configured individually. For example, for moving axes in positive or negative direction.

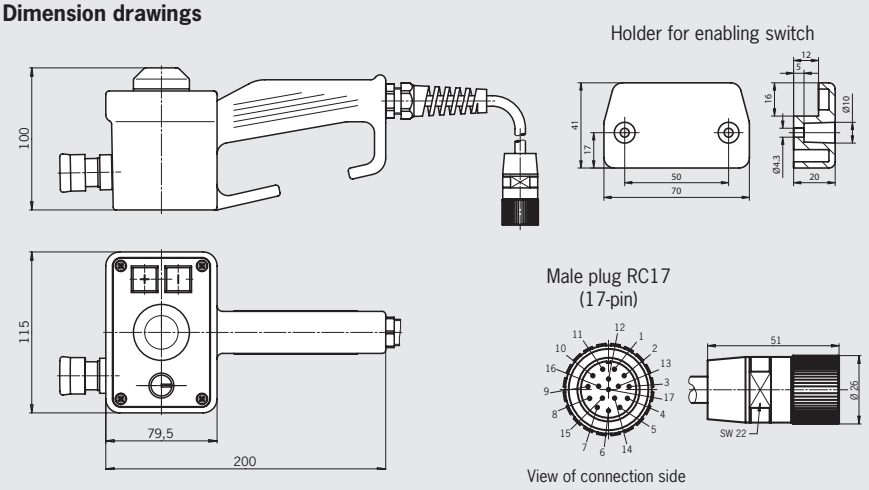
Key-operated rotary switch
For individual use, e.g. as operating mode selector.

Emergency stop device
Enabling switch with dual-channel emergency stop device on the switch housing, for various wiring concepts. Red emergency stop button.

Switching elements (see also page 8)
- **2220** 2 NO/NC ⊖ [1)]

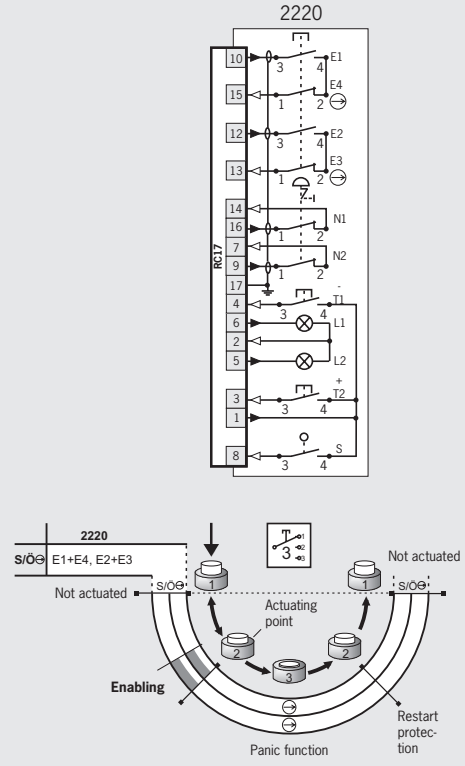
ZSB, 3-stage function
Plug connector, key-operated rotary switch, emergency stop device

Dimension drawings



For mating connector, see page 66

Wiring diagrams/function sequence



Contact
- open
- closed
- closed, enabling

Ordering table

Design	Connection	Cable length	Version	Switching element
				2220: 2 NO/NC ⊖ [1)]
G3 3-stage	**RC17** Plug connector (17-pin)	5 m straight	2 illuminated pushbuttons (+ and -), 1 key-operated rotary switch (1NO), 1 emergency stop device	**090489** ZSB090489

1) Closed only in center position; one NO contact and one positively driven contact are combined internally.

Enabling switch ZSB

- **3-stage function**
- **Dual-channel version**
- **Housing G3**
- **Straight connecting cable**
- **Plug connector**
- **LED indicator**
- **Illuminated pushbutton**

3-stage function
Enabling function is active only in the second stage (center position, actuating point). If the pushbutton is released or pushed further (panic function), the enabling is removed (dependent on the wiring, see function sequence).

Cable
The high-quality connecting cables (individual shielding of the safety contacts) are available in a straight or coiled version.

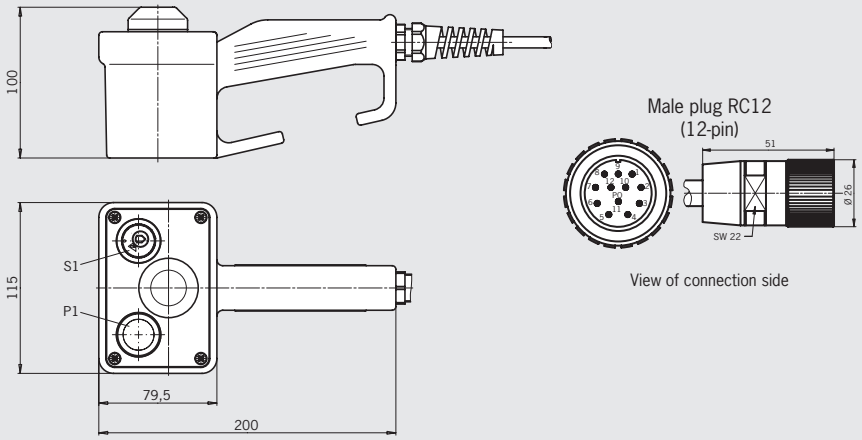
LED indicator
The LED indicator is used for visual feedback directly at the enabling switch.

Illuminated pushbuttons
Additional functions can be run directly at the enabling switch using the pushbuttons.

Switching elements (see also page 8)
- **220** 2 NO + 2 NC ⊖

ZSB, 3-stage function
Plug connector

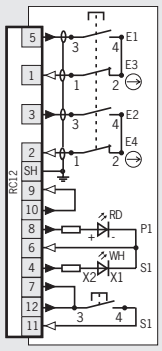
Dimension drawings

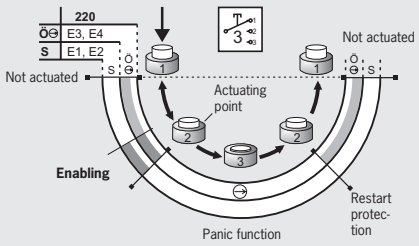


For mating connector, see page 66

Wiring diagrams/function sequence

220 RC12 ZSB122338





Contact
- open
- closed
- closed, enabling

Ordering table

Design	Connection	Cable length	Version	Switching element
				220: 2NO+2NC ⊖
G3 3-stage	**RC12** Plug connector (12-pin)	10 m straight	1 illuminated pushbutton, 1 LED indicator	**122338** ZSB122338

For technical data, see page 71

Selection table for enabling devices ZSG and ZSA

Design

E Built-in version (gray, without cable)

G1 Housing G1 (black)

Function

2 2-stage (OFF – enabling)

Connection

C Tab connector, flying lead

Enabling switch ZSG

Enabling switch ZSA
Housing G1

Design E	Design G1	Stages 2	Connection C		Page
●		●	●		50
	●	●	●		51

Built-in enabling device ZSG

- **Gray housing**
- **2-stage function**
- **Dual-channel version**
- **Suitable for installation in hand-held pendant stations HBL, for example**

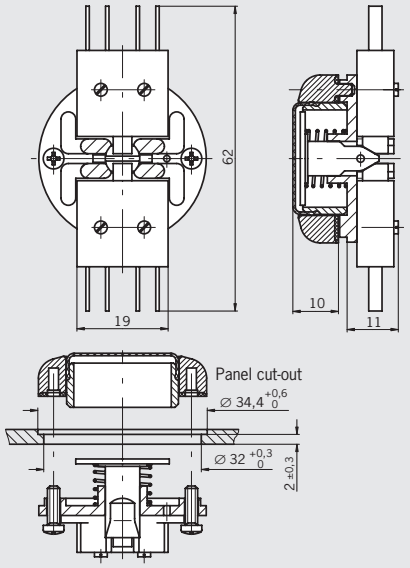
2-stage function [1)]
Enabling function is active in the second stage (pressed position). When the pushbutton is released, the enabling is removed (see function sequence).

Hand-held pendant stations HBL
See catalog for hand-held pendant stations.

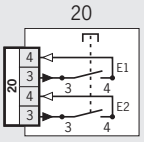
Switching elements (see also page 8)
- **20** 2 NO

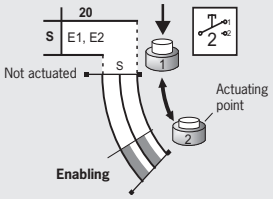
ZSG, 2-stage function [1)]
Tab connector

Dimension drawings



Wiring diagrams/function sequence





Contact
- open
- closed
- closed, enabling

Ordering table

Design	Connection	Version	Switching element
			20: 2NO
Built-in 2-stage [1)] **ZSG**	**Tab connector**	Suitable for hand-held pendant stations HBL, for example	**070793** ZSG1-2

1) As per VDI 2854, a device comparable to an emergency stop device must be fitted!

Enabling devices ZSA

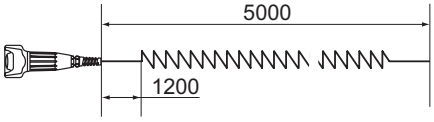
- **Housing G1**
- **2-stage function**
- **Single-channel or dual-channel version**
- **Connecting cable straight or coiled**
- **Wall holder optional**

2-stage function [1]
Enabling function is active in the second stage (pressed position). When the button is released, the enabling is removed (see function sequence).

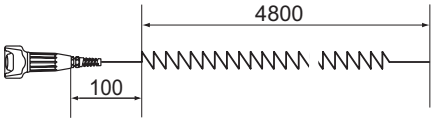
Cable
The high-quality connecting cables (individual shielding of the safety contacts) are available in a straight or coiled version.

Switching elements (see also page 8)
- **10** 1 NO
- **20** 2 NO
- **21** 2 NO + 1 NC

Cable lengths (coiled cable pulled out straight)
- Cable 6 x 0.34 mm²

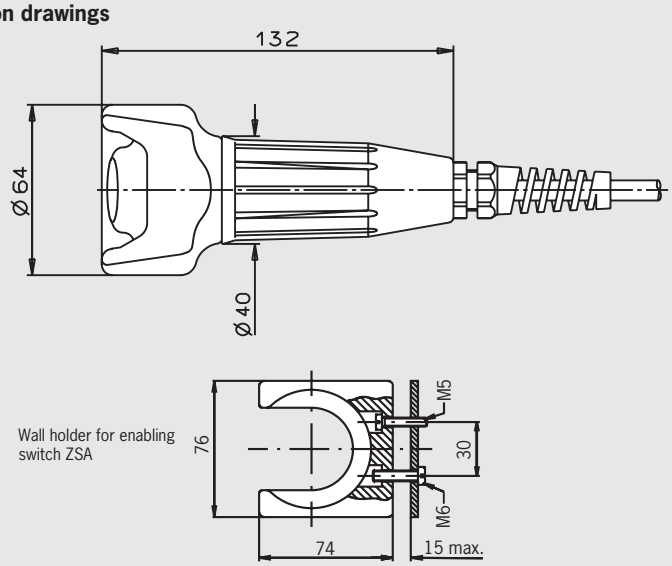


- Cable 8 x 0.34 mm²

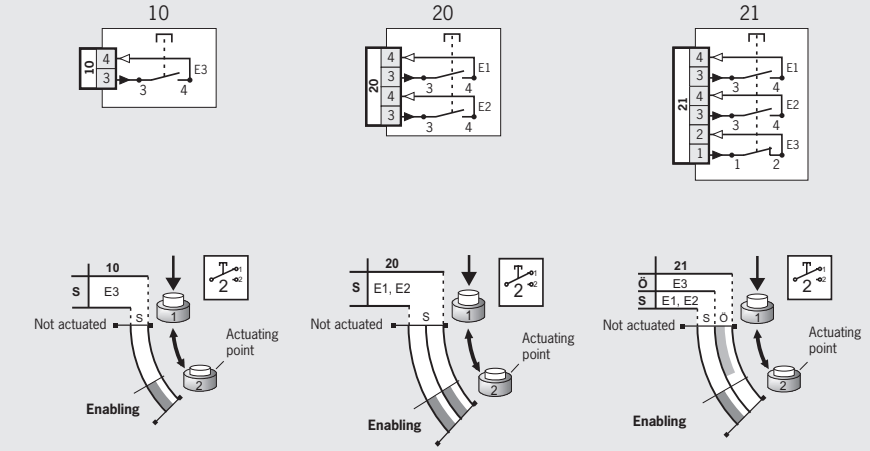


ZSA, 2-stage function [1]
Flying lead

Dimension drawings



Wiring diagrams/function sequence



Contact
- open
- closed
- closed, enabling

Ordering table

Design	Connection/ cross-section	Cable length	Version	Switching element		
				10: 1NO	**20**: 2NO	**21**: 2NO + 1NC
G1 2-stage [1]	**Flying lead 6 x 0.34 mm²**	2.5 m straight	Incl. wall holder	On request	**082557** [2] ZSA1A2L25AC1909	On request
		5 m coiled		On request	On request	**094321** ZSA1A2S05A
	Flying lead 8 x 0.34 mm²	5 m coiled		**110755** ZSA1A5S05AC2325	-	-

1) As per VDI 2854, a device comparable to an emergency stop device must be fitted!
2) No cULus type examination

For technical data, see page 71

Enabling switch/enabling device kits

Kit for enabling switch ZSM	Kit for enabling switch ZSA	Kit for enabling device ZSA	Page
●			54 - 58
	●		60
		●	61

Housing ZSM

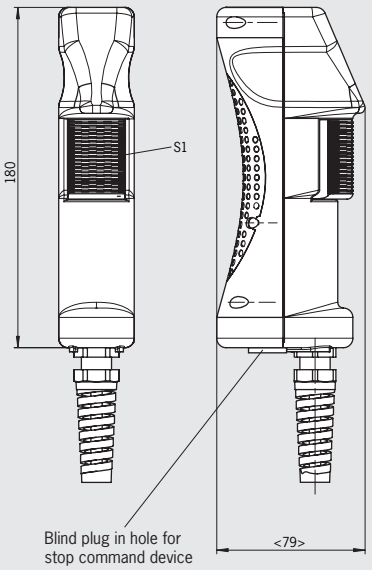
- **3-stage function**
- **+ and – buttons optional**
- **Hole for lower stop command device**
- **Cable gland included**

3-stage function
Enabling function is active only in the second stage (center position, actuating point). If the pushbutton is released or pushed further (panic function), the enabling is removed (dependent on the wiring, see function sequence).

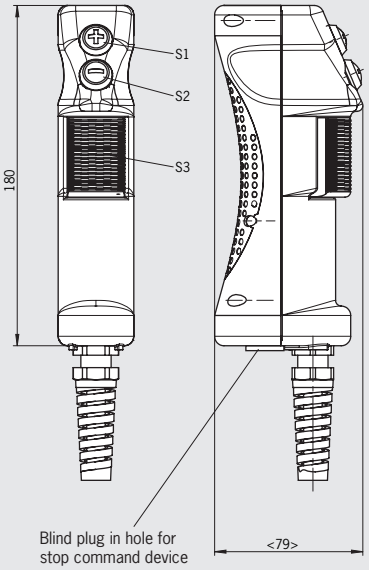
+ and – buttons
These buttons can be individually assigned, e.g. to move axes in positive or negative direction.

ZSM4200-106104, 3-stage function

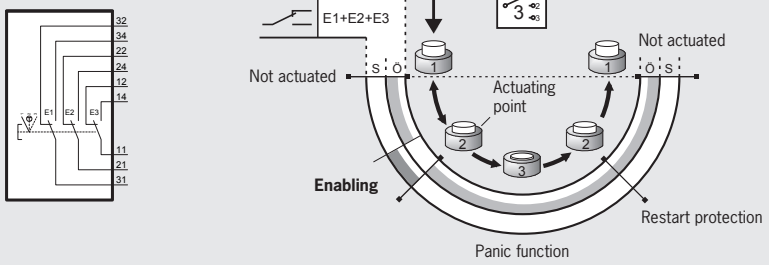
Dimension drawing



ZSM4200-106105, 3-stage function
+ and – buttons



Wiring diagram/function sequence



Ordering table

Design	Version	Order no./item
ZSM	Enabling switch with 3 changeover contacts (S1), cable gland included	**106104** ZSM4200-106104
	Enabling switch with 3 changeover contacts (S3), +/– buttons with one NO contact each (S1/S2), cable gland included	**106105** ZSM4200-106105

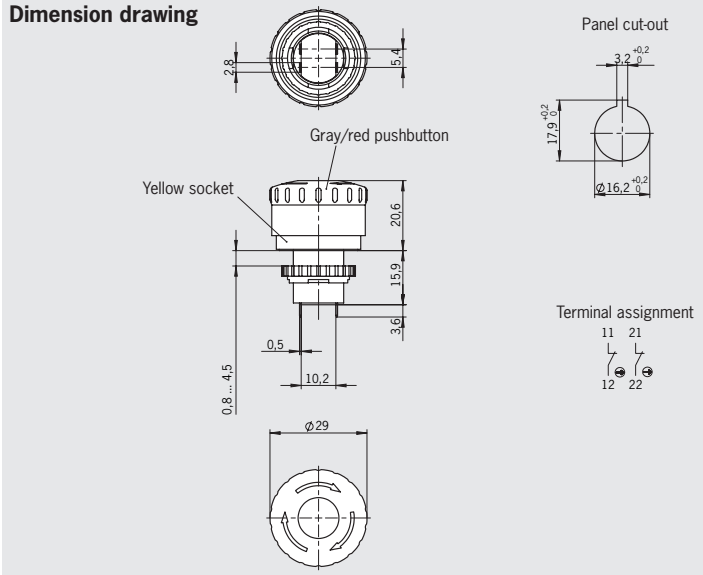
Accessories for installation in housing ZSM

- **Machine stop**
- **Emergency stop device**
- **LED indicator**

Machine stop
Machine stop (gray, with pull-to-reset and turn-to-reset button) for installation in housing ZSM, for different wiring concepts.

Emergency stop device
Two-channel emergency stop device (red, with pull-to-reset and turn-to-reset button) for installation in housing ZSM, for different wiring concepts.

Dimension drawing



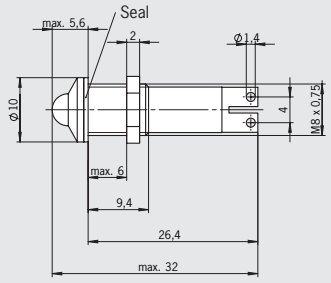
Parameter	Value
Color of actuating head	Gray/red
Color of bottom part	Yellow
Reset	Pull-to-reset and turn-to-reset button
Degree of protection	IP65
Number of switching elements	2
Contact element	2 x positively driven contact
Utilization category acc. to IEC 947-5-1	DC-13 I_e 3 A U_e 24 V

Ordering table

Designation	Version	Order no./item
Machine stop	Installation ∅ 16 mm, gray palm button ∅ 29 mm	**116005**
Emergency stop device	Installation ∅ 16 mm, red palm button ∅ 29 mm	**106435** ES-XA1E-BV3UU02R

LED indicator
The LED indicator is used for visual feedback directly at the enabling switch.

Dimension drawing



Parameter	Value
Housing	Chrome-plated
Operating voltage	24 V
Color	Yellow

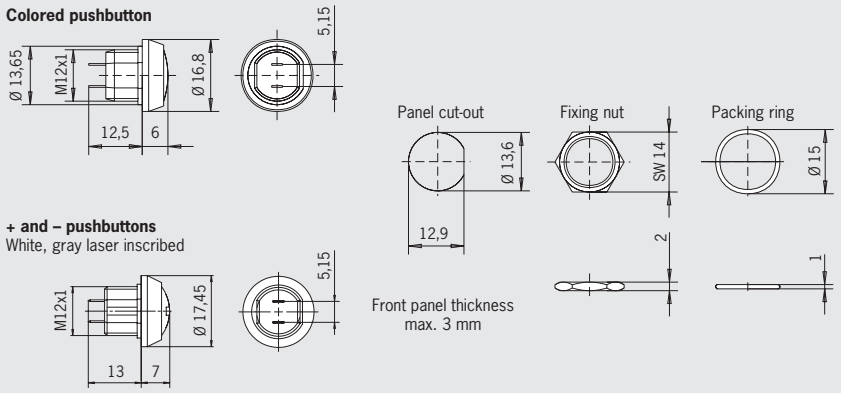
Ordering table

Designation	Version	Order no./item
LED indicator	Color yellow	**106347** LED indicator GE 106347

For technical data, see page 71

- **Pushbutton**
- **Key-operated rotary switch**

Dimension drawing

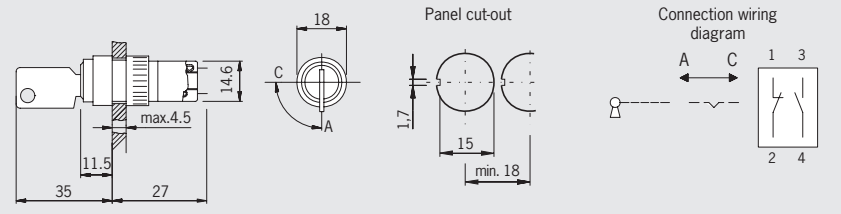


Parameter	Value
Ambient temperature	-25 ... +70 °C
Front degree of protection (integrated in front panel)	IP67
Switching principle	Pushbutton, snap-action switching element
Switching elements	1 NO contact
Switching voltage	DC 30 V
Switching current, max.	100 mA
Connection	Soldered connection

Ordering table

Designation	Button color	Pushbutton inscription	Order no.
Colored pushbutton	Black	-	**083640**
	Red	-	**086753**
	Green	-	**086754**
	Blue	-	**086757**
	White	-	**086755**
	Yellow	-	**086756**
+ and – pushbuttons White, gray laser inscribed	White	⊕	**137981**
	White	⊕	**137984**

Dimension drawing



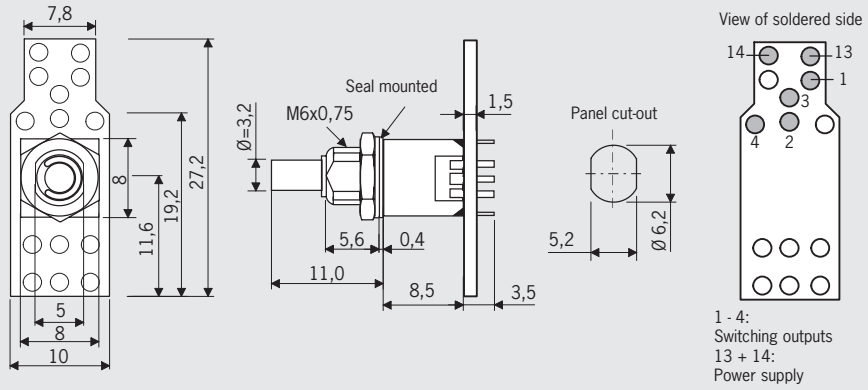
Parameter	Value
Ambient temperature	-25 ... +55 °C
Front degree of protection (integrated in front panel)/NEMA	IP65/250-12
Switching principle	Snap-action switching element
Switching elements	1 NO contact, 1 NC contact
Switching voltage	AC/DC 30 V
Switching current, max.	250 mA
Connection	Soldered connection

Ordering table

Designation	Version	Order no.
Key-operated rotary switch	Key removable in both positions	**083639**
Replacement key	For key-operated rotary switch 083639	**092386**

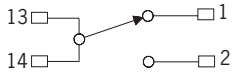
▸ Selector switch 1 of X

Dimension drawing



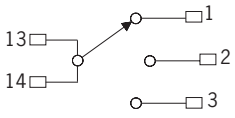
Circuit diagrams switch 1 of X

1 of 2



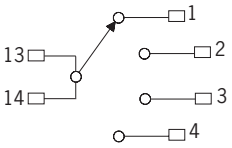
Detent position	Output 1	Output 2
1	1	0
2	0	1

1 of 3



Detent position	Output 1	Output 2	Output 3
1	1	0	0
2	0	1	0
3	0	0	1

1 of 4



Detent position	Output 1	Output 2	Output 3	Output 4
1	1	0	0	0
2	0	1	0	0
3	0	0	1	0
4	0	0	0	1

Technical data

Parameter	Value
Front degree of protection (integrated in front panel)	IP67
Center point fixing	M6 x 0.75
Detent positions	2, 3, 4 depending on item
Detent angle	30°
Output code	1 of 2, 1 of 3, 1 of 4
Breaking capacity, max.	0.2 VA
Switching voltage, max.	25 V AC/DC
Connection	Soldered connection on printed circuit board
Soldering time, max.	≤ 5 (at t ≤ 260 °C)

Ordering table

Designation	Version	Detent angle	Order no.
Selector switch 1 of X	2 detent positions, 1 of 2, break-before-make [1]	30°	**097026**
	3 detent positions, 1 of 3, break-before-make [1]	30°	**097027**
	4 detent positions, 1 of 4, break-before-make [1]	30°	**097028**

1) Break-before-make: all outputs are open between the switch positions.

For technical data, see page 71

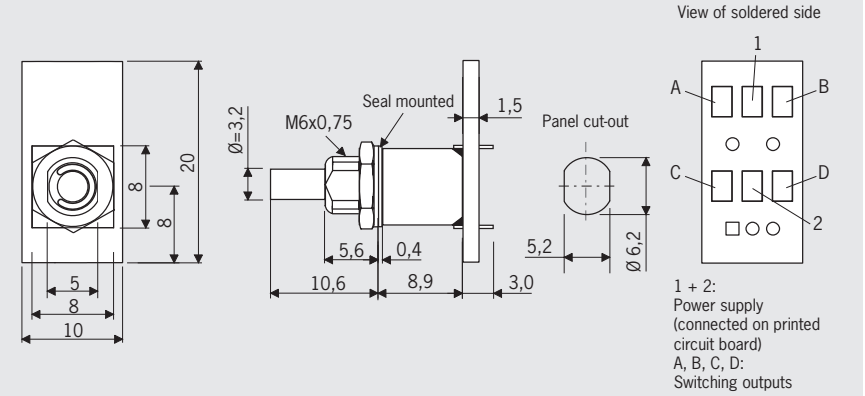
- **Gray code selector switch**
- **Rotary knob for selector switch**

Code table for switches with Gray code

Detent position	Output			
	D	C	B	A
1	0	0	0	0
2	0	0	0	1
3	0	0	1	1
4	0	0	1	0
5	0	1	1	0
6	0	1	1	1
7	0	1	0	1
8	0	1	0	0
9	1	1	0	0
10	1	1	0	1
11	1	1	1	1
12	1	1	1	0
13	1	0	1	0
14	1	0	1	1
15	1	0	0	1
16	1	0	0	0

Connections A - D: switching outputs
Connections 1 - 3: power supply

Dimension drawing



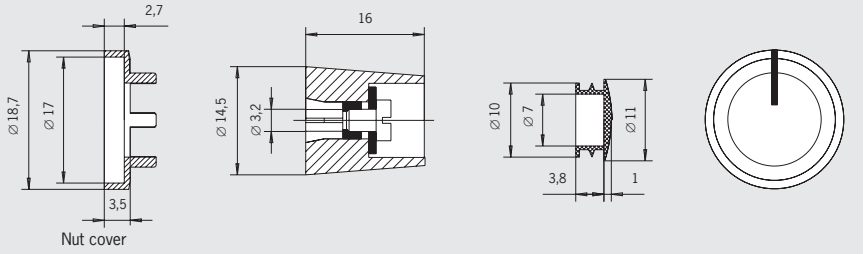
Technical data

Parameter	Value
Front degree of protection (integrated in front panel)	IP67
Center point fixing	M6 x 0.75
Detent positions	5, 6, 7, 8, 12 or 16 depending on item
Detent angle	22.5°
Output code	Gray code
Breaking capacity, max.	0.2 VA
Switching voltage, max.	25 V AC/DC
Connection	Soldered connection on printed circuit board
Soldering time, max.	≤ 5 (at t ≤ 260 °C)

Ordering table

Designation	Version	Detent angle	Order no.
Selector switch Gray code	5 detent positions, Gray code, make-before-break [1]	22.5°	**097029**
	6 detent positions, Gray code, make-before-break [1]	22.5°	**097030**
	7 detent positions, Gray code, make-before-break [1]	22.5°	**097031**
	8 detent positions, Gray code, make-before-break [1]	22.5°	**097032**
	12 detent positions, Gray code, make-before-break [1]	22.5°	**097033**
	16 detent positions, Gray code, make-before-break [1]	22.5°	**097034**

Dimension drawing



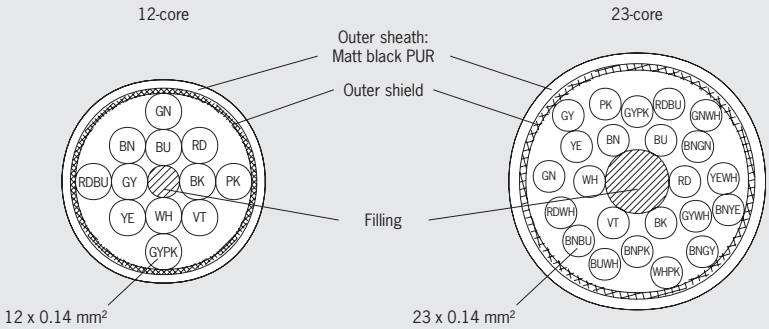
Ordering table

Designation	Version	Order no.
Rotary knob	Matt black with a marking, collet mounting for axis 3.2 mm	**097141**

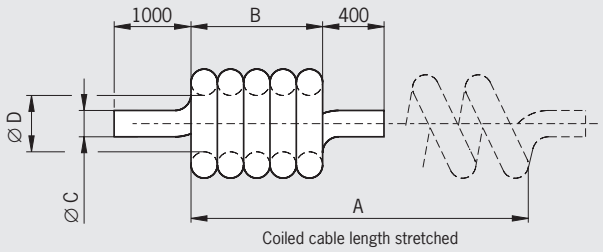
1) Make-before-break: the corresponding outputs are connected between the switch positions.

▸ Straight and coiled connecting cable

View of conductor cross-section



Dimensions of coiled version



Parameter		Value
Cable resistance		≤ 145 Ω/km
Test voltage, core/core		1.0 kV_{rms}
Test voltage, core/shield		1.0 kV_{rms}
Insulation resistance		≥ 200
Operating temperature		-10 ... +70 °C
Bending radius	once	≥ 10 x cable diameter
	several times	≥ 15 x cable diameter

Ordering table

Item	Cable length [mm]	A [mm]	B [mm]	∅ C [mm]	∅ D [mm]	Order no.
12-core, coiled cable	3,900	Approx. 2,500	550 ± 20	6 ± 0.3	8 ± 2	**086721**
12-core, coiled cable	5,400	Approx. 4,000	880 ± 20	6 ± 0.3	8 ± 2	**086722**
12-core, straight cable	3,500	–	–	–	–	**087379**
12-core, straight cable	5,000	–	–	–	–	**087380**
12-core, straight cable	10,000	–	–	–	–	**087381**
23-core, coiled cable	3,900	Approx. 2,500	550 ± 20	7.5 ± 0.3	10 ± 2	**087408**
23-core, coiled cable	5,400	Approx. 4,000	880 ± 20	7.5 ± 0.3	10 ± 2	**087409**
23-core, straight cable	3,500	–	–	–	–	**087382**
23-core, straight cable	5,000	–	–	–	–	**087383**
23-core, straight cable	10,000	–	–	–	–	**087384**

For technical data, see page 71

Enabling switch kit ZSA

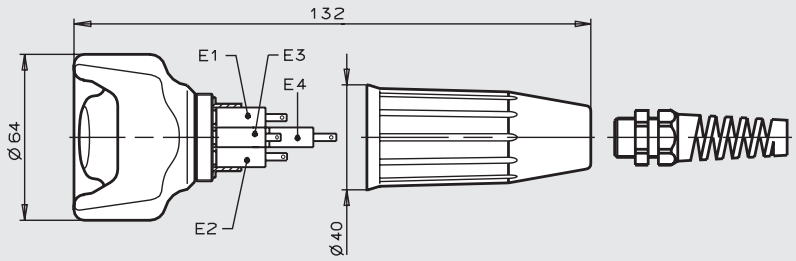
- **Housing G1**
- **3-stage function**
- **Single-channel or dual-channel version**
- **Kit without connecting cable**

3-stage function
Enabling function is active only in the second stage (center position, actuating point). If the pushbutton is released or pushed further (panic function), the enabling is removed (dependent on the wiring, see function sequence).

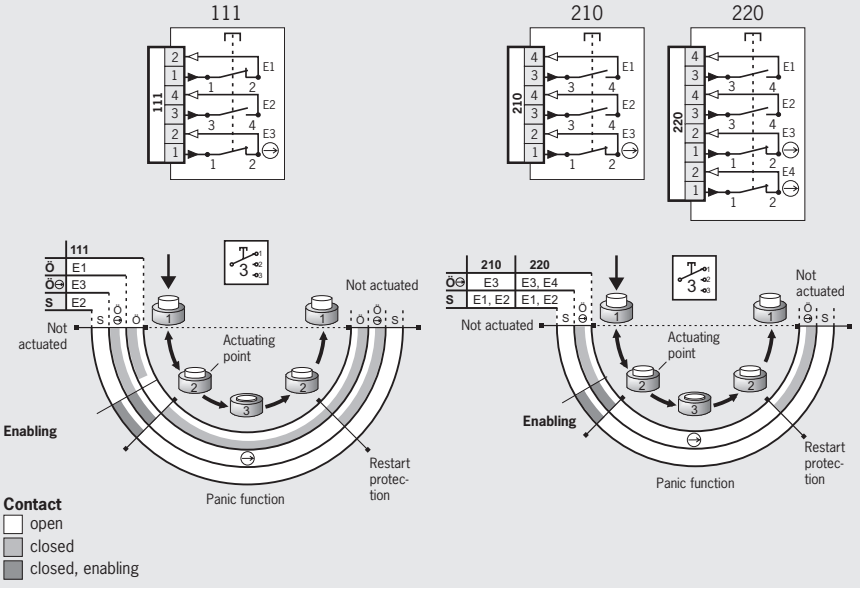
Switching elements (see also page 8)
- **111** 1 NO + 1 NC ⊖ + 1 NC
- **210** 2 NO + 1 NC ⊖
- **220** 2 NO + 2 NC ⊖

ZSA, 3-stage function
Tab connector

Dimension drawings



Wiring diagrams/function sequence



Ordering table

Design	Connection	Version	Switching element		
			111: 1NO+1NC ⊖ +1NC	**210**: 2NO+1NC ⊖	**220**: 2NO+2NC ⊖
Kit 3-stage **G1**	**Tab connector**	Without cable	**070734** ZSA2-1	**070735** ZSA2-2	**070792** ZSA2-4

Enabling device kit ZSA

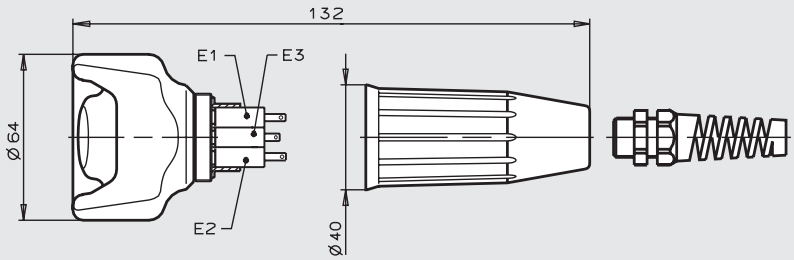
- **Housing G1**
- **2-stage function**
- **Single-channel or dual-channel version**
- **Kit without connecting cable**

2-stage function [1)]
Enabling function is active in the second stage (pressed position). When the button is released, the enabling is removed (see function sequence).

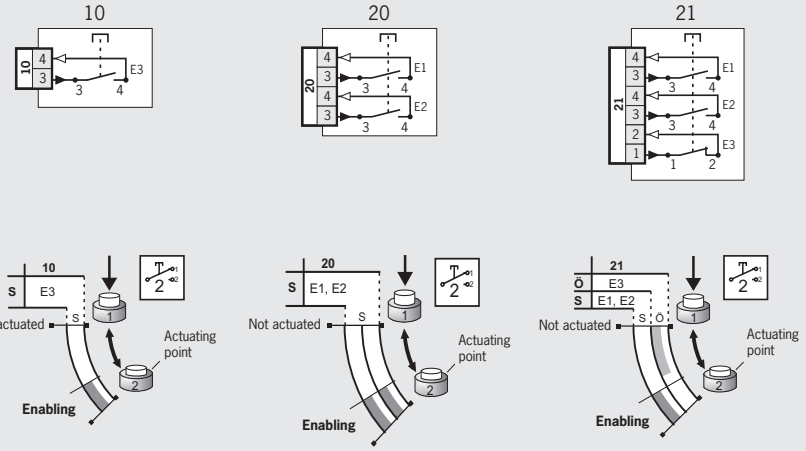
Switching elements (see also page 8
- **10** 1 NO
- **20** 2 NO
- **21** 2 NO + 1 NC

ZSA, 2-stage function [1)]
Tab connector

Dimension drawings



Wiring diagrams/function sequence



Contact
- open
- closed
- closed, enabling

Ordering table

Design	Connection	Version	Switching element		
			10: 1NO	**20**: 2NO	**21**: 2NO + 1NC
Kit 2-stage [1)] **G1**	**Tab connector**	Without cable	**070750** ZSA1-1	**070800** ZSA1-2	**070736** ZSA1-3

For technical data, see page 71

1) As per VDI 2854, a device comparable to an emergency stop device must be fitted!

Selection table for accessories

Holder for hand-held enabling switches

Actuator for type 2 safety switches NZ.VZ and TZ

Plug connector

RC12 12-pin

RC17 17-pin

Connecting cables

Holder		Actuator	Plug connector		Connecting cables		Page
ZSM	ZSA		RC12	RC17			
●							64
	●	●					65
			●	●			66/ 67
					●		68

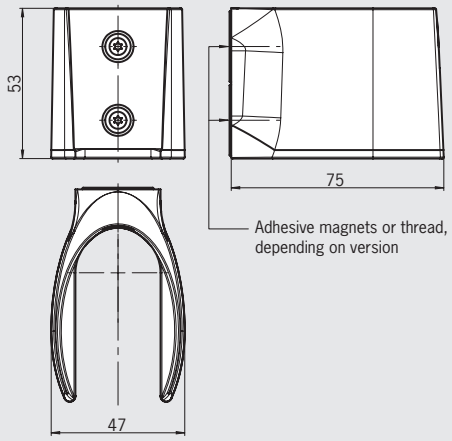
Holder for hand-held enabling switch ZSM

- **Holder for hand-held enabling switch ZSM**

Screw holder for enabling switch ZSM
Depending on version, the holder can be fastened to machine parts either with a magnet or two screws.

Screw holder for enabling switch ZSM

Dimension drawing



Ordering table

Designation	Version	Order no./item
Holder for enabling switch ZSM	Screw mounting	**102969** Holder ZSM
	Magnet fastening	**102965** Holder ZSM with magnet

Holder for hand-held enabling switches ZSA and ZSB / Actuator for type 2 safety switches NZ.VZ and TZ

- **Magnetic holder**
- **Screw holder**
- **Screw holder with cable hook**
- **Actuator for mounting on the hand-held enabling switch**

Magnetic holder for housing G1
The enabling switches can be attached at any time to any part of the machine due to the magnets fastened to the holder. In this way, the enabling switch can be positioned in the activity area as necessary.

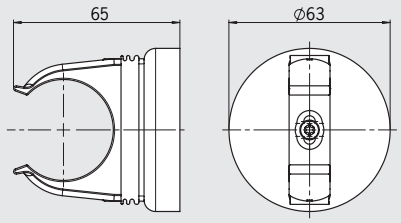
Screw holder for housing G1
The holder can be securely fastened to parts of the machine with a wall thickness of max. 15 mm using two screws.

Screw holder for housing G1 with cable hook
A holder with an additional cable hook for hanging a wound-up cable.

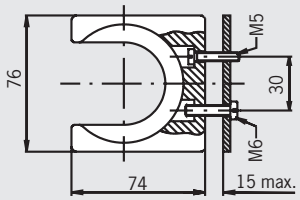
Actuators for safety switches
Suitable for fitting to the hand-held enabling switch kit, for example. Safe position polling of the enabling switch can be achieved by fitting the actuator and using an appropriate safety switch (NZ.VZ or TZ). By suitable integration of this combination, the signal from the safety switch can be used, e.g. as an operating mode selector, when the actuator is removed (removal of the enabling switch). Suitable for the kit ZSA.

Magnetic holder

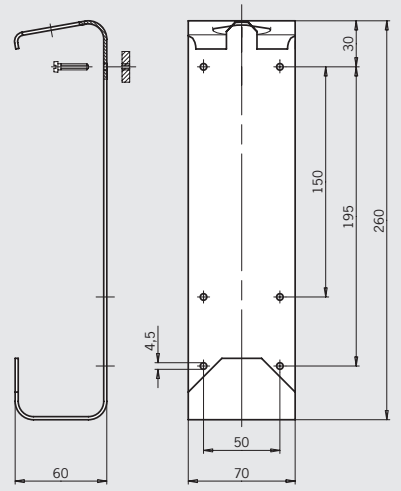
Dimension drawings



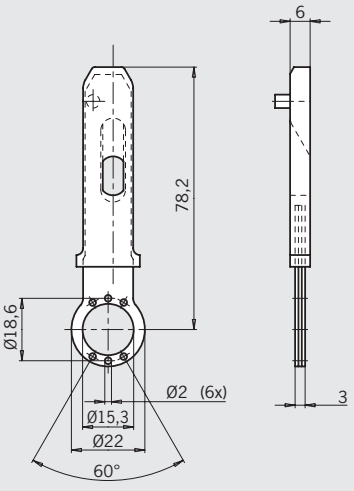
Screw holder



Screw holder with cable hook



Actuator for safety switches series NZ.VZ and TZ



Ordering table

Designation	Version	Order no./item
Magnetic holder		**059340** Magnetic holder
Screw holder	M5 x 25	**052406** Holder complete
	With cable hook M4 x 20	**047820** Cable holder
Actuator NZ/TZ		**084833** Actuator-Z-G-C1932

For technical data, see page 71

Plug connector

- **Female flange connector RC12**
- **Male plug RC12**
- **Blanking plug RC12**
- **Female flange connector RC17**
- **Male plug RC17**
- **Blanking plug RC17**

Female flange connector RC12 [1)]
For front wall mounting for connection of hand-held enabling switches. Fitted with soldered contacts. Rubber seal included.

Male plug RC12 [1)]
For connection to enabling switches, for example.

Blanking plug RC12 [1)]
For covering the flange connector RC12. Optionally, the customer can fit bridges to the individual contacts or use a pre-wired version (coded). Coding: bridge from pin 1 to pin 2 and from pin 9 to pin 10.

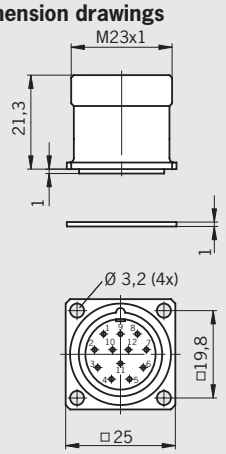
Flange connector RC17 [1)]
For front wall mounting for connection of enabling switches. Rubber seal included. Fitted with soldered contacts.

Male plug RC17 [1)]
For connection to enabling switches, for example.

Blanking plug RC17 [1)]
For covering the flange connector RC17. Optionally, the customer can fit bridges to the individual contacts.

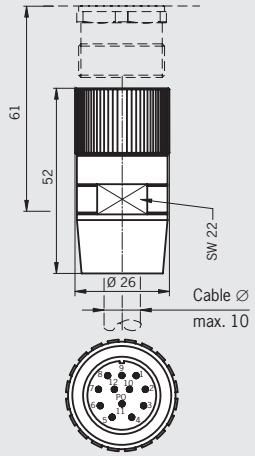
Female flange connector RC12
12-pin

Dimension drawings



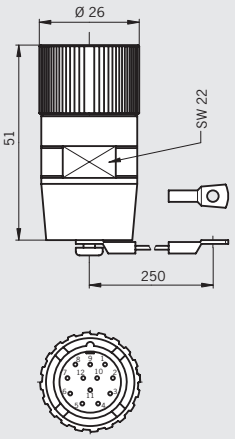
View of connection side, socket

Male plug RC12
12-pin



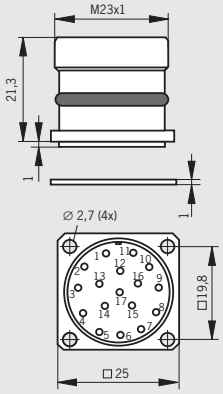
View of connection side, plug

Blanking plug RC12
12-pin



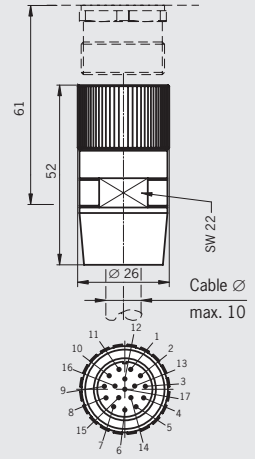
View of connection side, plug

Female flange connector RC17
17-pin



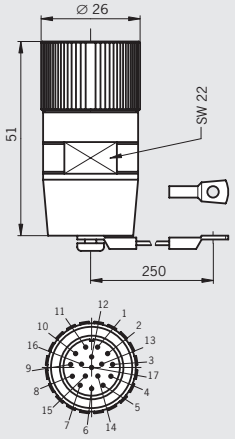
View of connection side, socket

Male plug RC17
17-pin



View of connection side, plug

Blanking plug RC17
17-pin



View of connection side, plug

Ordering table

Designation	Connection	Version	Order no./item
RC12 12-pin	Soldered connection	Female flange connector	**073290** Female flange connector, 12-pin
	Crimp contact [1)]	Male plug	**073294** Plug connector, 12-pin
	Crimp contact [1)]	Blanking plug (with bridges) e.g. in combination with ZSM2104-123678	**073291** Blanking plug, complete, 12-pin
	Crimp contact [1)]	Blanking plug (without bridges)	**073293** Blanking plug, 12-pin
RC17 17-pin	Soldered connection	Female flange connector	**077502** Female flange connector, 17-pin
	Crimp contact [1)]	Male plug	**096481** Plug connector, 17-pin
	Crimp contact [1)]	Blanking plug (without bridges)	**096159** Blanking plug, 17-pin

For information on crimp contacts, see page 69.

1) Crimp contacts are included.

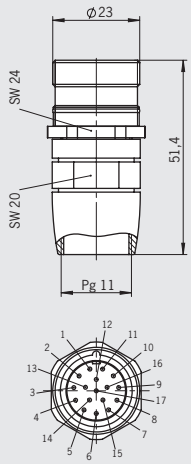
Plug connector

- **Female plug RC17**
- **Male flange connector RC17**

Female plug RC17
Female plug for hand-held enabling switch.

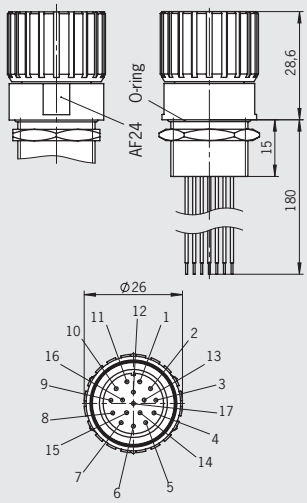
Male flange connector RC17
For connection, e.g. to enabling switches, pre-assembled.

Female plug RC17
17-pin



View of connection side, socket

Male flange connector RC17
17-pin



View of connection side, plug

Parameter	Value	
Housing material	Metal	
Number of pins	17 (shield on the housing)	
	Male plug	Flange connector
Cable diameter, max.	10 mm	-
Connection	Crimp contacts 0.14 ... 0.56 mm²	Soldered connections 1.0 mm²
Rated voltage, max.	230 V AC/DC	
Degree of protection (inserted)	IP67	

Ordering table

Item	Connection	Version	Order no./item
RC17 17-pin	Crimp contact	Female plug	**106349** 1) Female plug,17-pin
		Male flange connector with wires, pre-assembled	**106360** Male flange connector, 17-pin

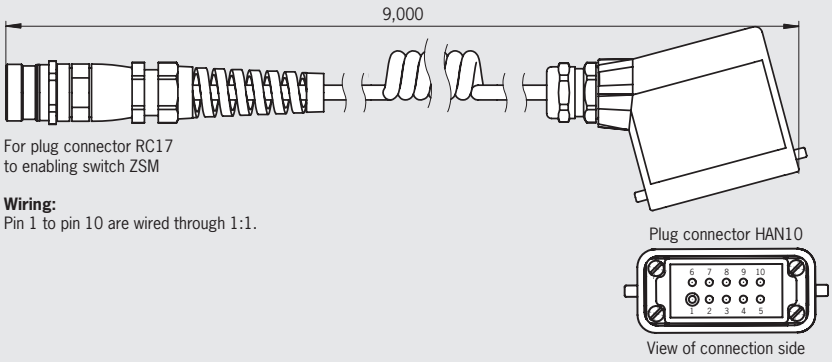
For information on crimp contacts, see page 69.
1) Crimp contacts are included.

For technical data, see page 71

Connecting cables

Connecting cable for enabling switch ZSM with plug connector RC17

Connecting cable for enabling switch ZSM with plug connector RC17
The high-quality connecting cable for the ZSM2300-106374 can be plugged directly into the device.
The corresponding male flange connector is available for the ZSM kit (see page 67).



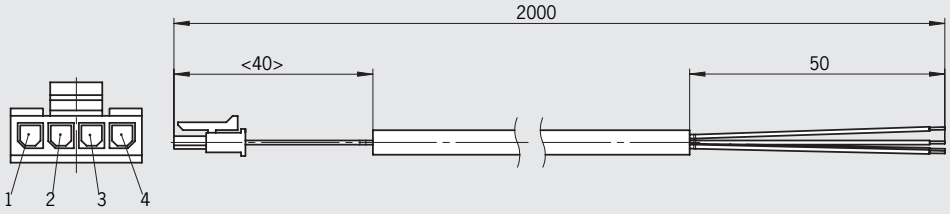
Ordering table

Designation	Version	Order no./item
Connecting cable for enabling switch ZSM with plug connector RC17	Coiled, length 9.0 m	**106392** Coiled cable with plug connector, 9 m

Connecting cable for enabling switch ZXE-111276
4-pin, tab connector

Connector assignment

Pin	Cross-section [mm²]	Conductor coloring
1	0.34	RD
2	0.34	BK
3	0.34	OR
4	0.34	BN



Ordering table

Designation	Connection	Order no./item
Connecting cable for enabling switch ZXE-111276	Tab connector	**115123** Connecting cable for enabling switch ZXE-111276

List of plug connector suppliers

We provide no guarantee for the completeness and correctness of the ordering data given. The data was valid in February 2021. The related manufacturers reserve the right to make changes without notice. The plug connectors and accessories listed are also available from other manufacturers.

▸ Plug connectors and accessories

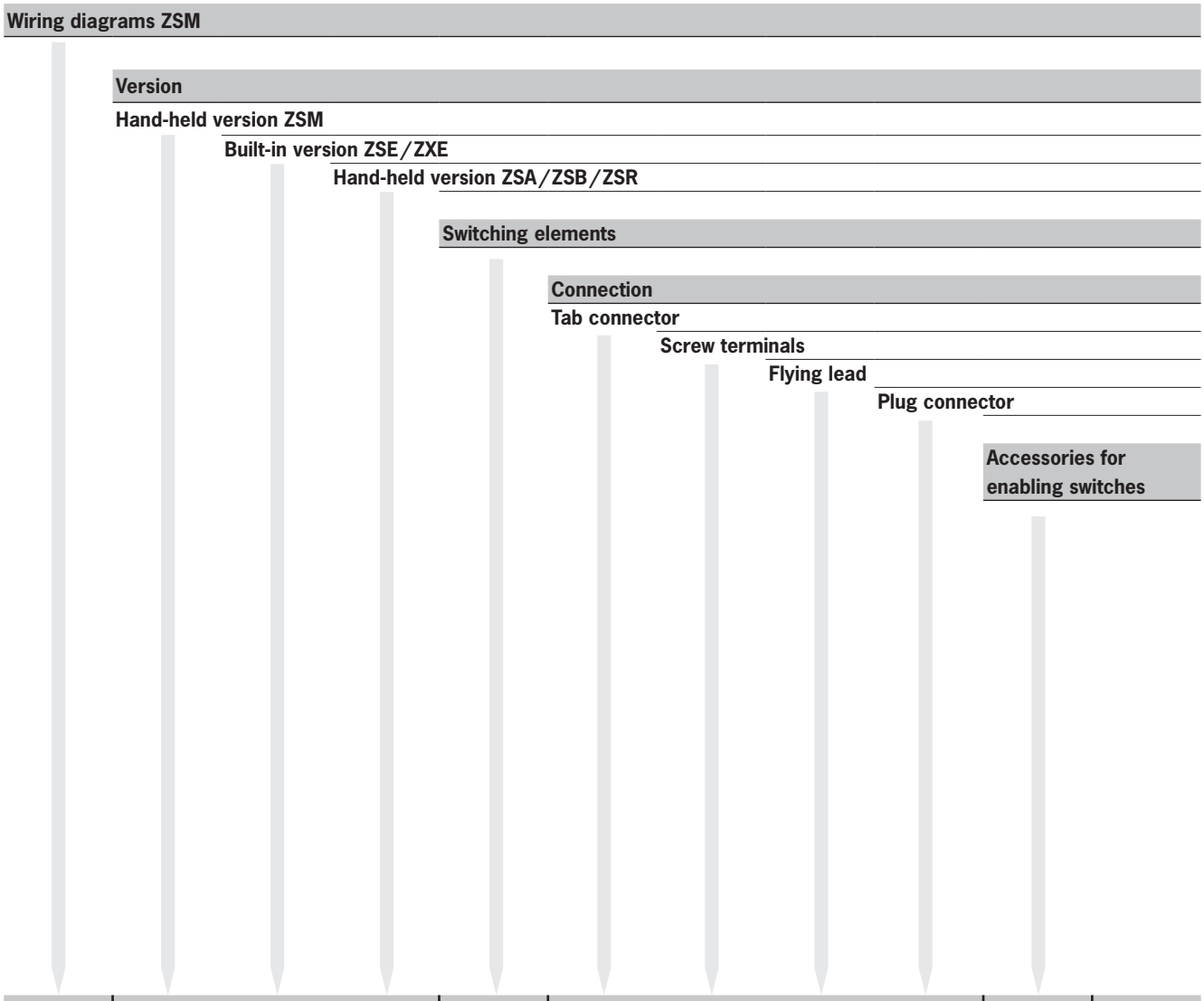
For plug connector	Function	Manufacturer's designation	
SVM5 5 pins	Female plug M12	**99-1436-812-05** Cable socket	**Binder** www.binder-connector.de
	Female flange connector M12	**09-3442-700-05** Flange connector with flexible wires	
	Blanking plug M12	**08-2610-000-000** Protective cap for socket with retaining strap	
HAN10 10 pins + PE	Flange connector, 1 cable exit	**19 20 010 0251** Socket housing, 1 cable exit	**Harting** www.harting.com
	Socket contacts (installation for flange connector)	**09 20 010 3101** Socket contact insert crimp connection	
	Socket contacts for crimping	**09 33 000 6220** Socket crimp contacts, 0.5 mm²	
	Blanking plug	**09 20 010 5425** Cover	
HAN Q17 10 pins + PE	Flange connector	**09 12 008 0303** Metal mounting housing	
	Socket contact (installation for flange connector)	**09 12 017 3101** Socket contact insert crimp connection	
	Socket contacts for crimping	**09 15 000 6204** Socket crimp contacts, 0.14 ... 0.37 mm²	
RC17-Y coded 17 pins	Female flange connector, solderable to male plug RC17	**RC-17S1Y122000** Flange plug connector, 17-pin	**PhoenixContact** www.phoenixcontact.com

▸ Crimp and extraction tools

For plug connector	Function	Manufacturer's designation	
RC12 and RC17	Crimp tool	**RC-Z2504** Crimp pliers for turned contacts	**PhoenixContact** www.phoenixcontact.com
	Extraction tool	**RC-Z2494** Extraction tool/insertion tool	

For technical data, see page 71

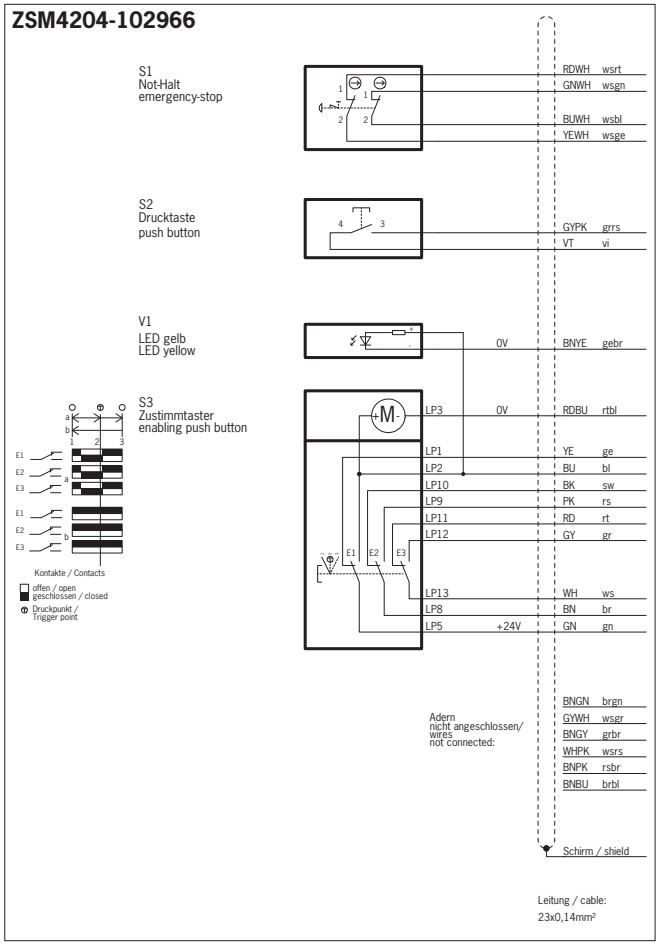
Overview



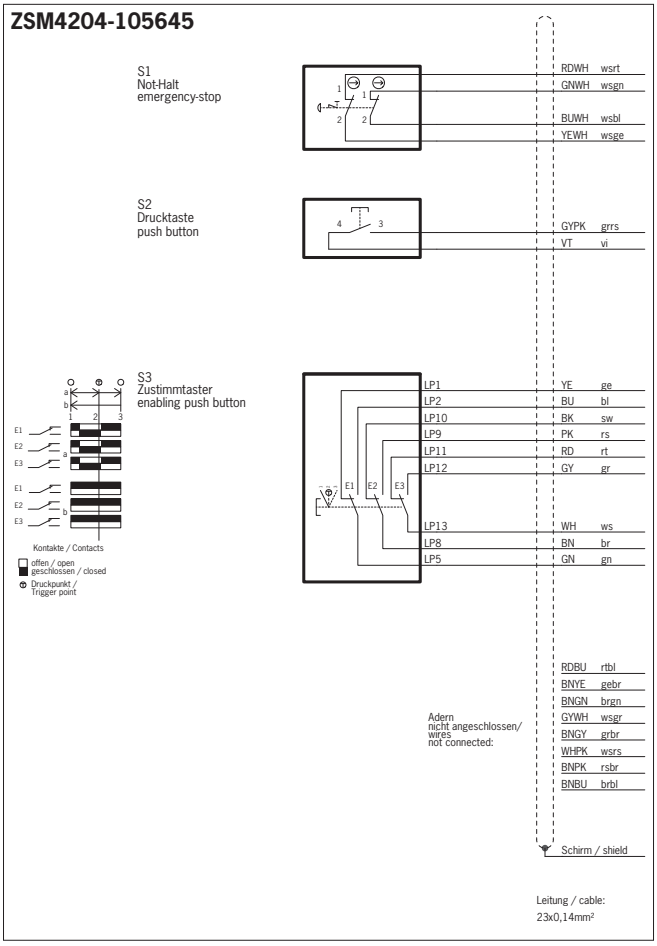
Wiring diagrams ZSM	Version			Switching elements	Connection				Accessories	Page
	ZSM Hand-held	ZSE/ZXE Built-in	ZSA/ZSB/ZSR Hand-held		Tab connector	Screw terminals	Flying lead	Plug connector		
●										72 - 79
	●									80/81
		●								82
			●							82
				●						82
					●					83
						●				83
							●			83
								●		83/78
									●	84/84

Wiring diagrams

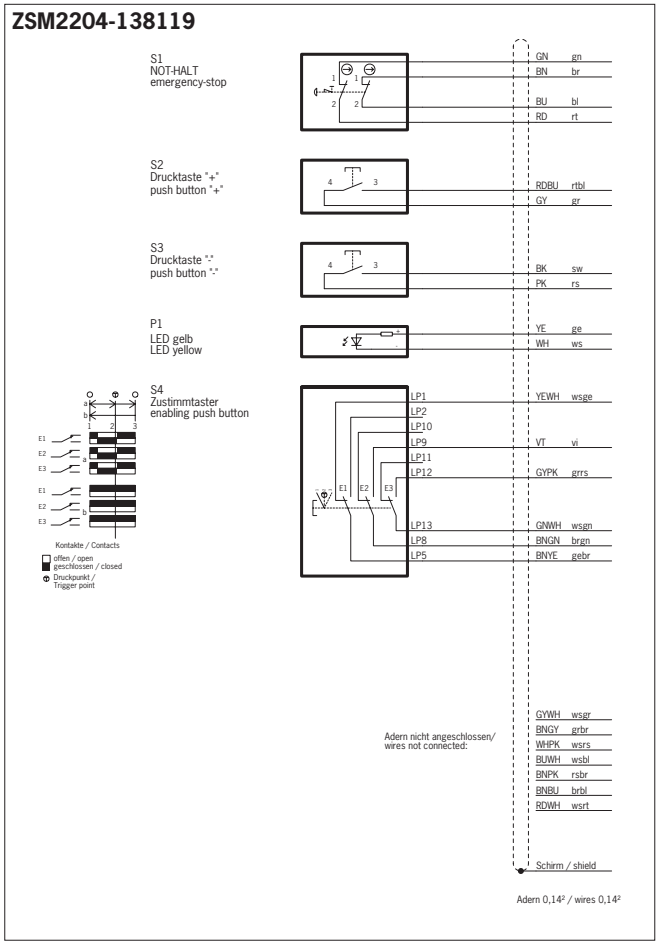
ZSM4204-102966



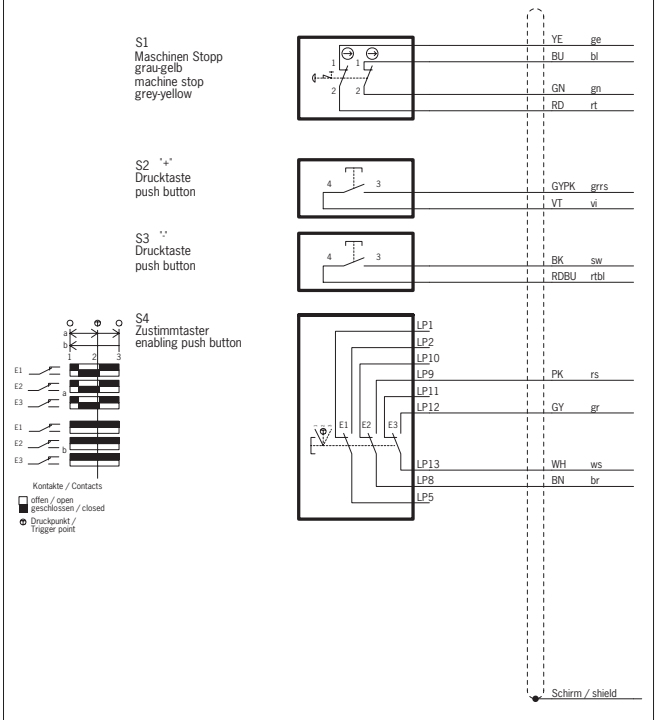
ZSM4204-105645



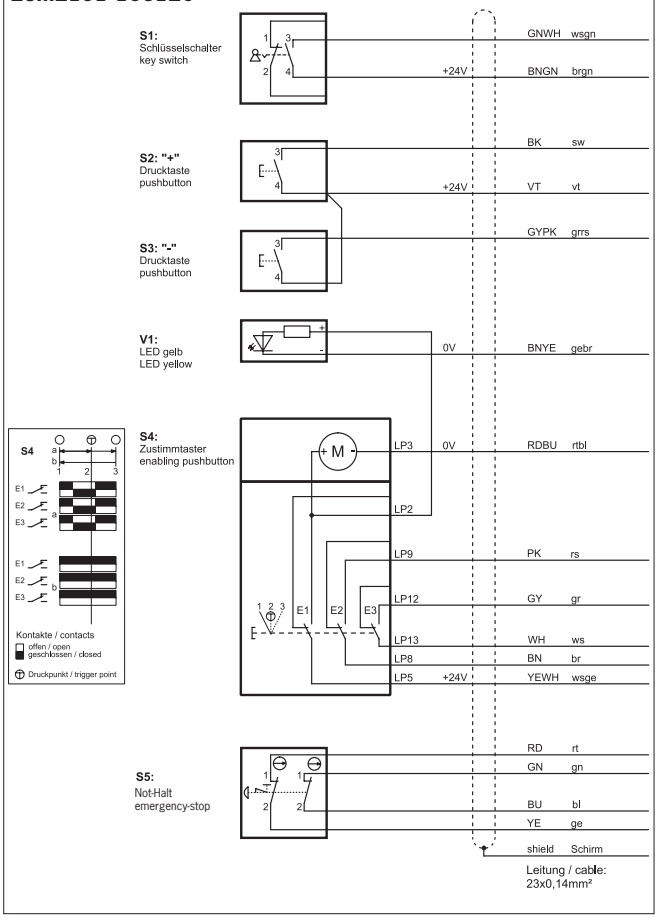
ZSM2204-138119



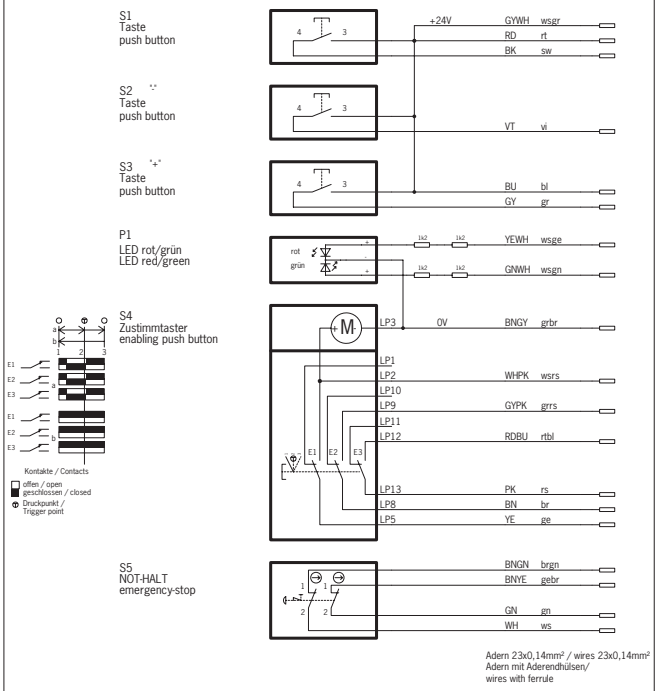
ZSM2201-126706



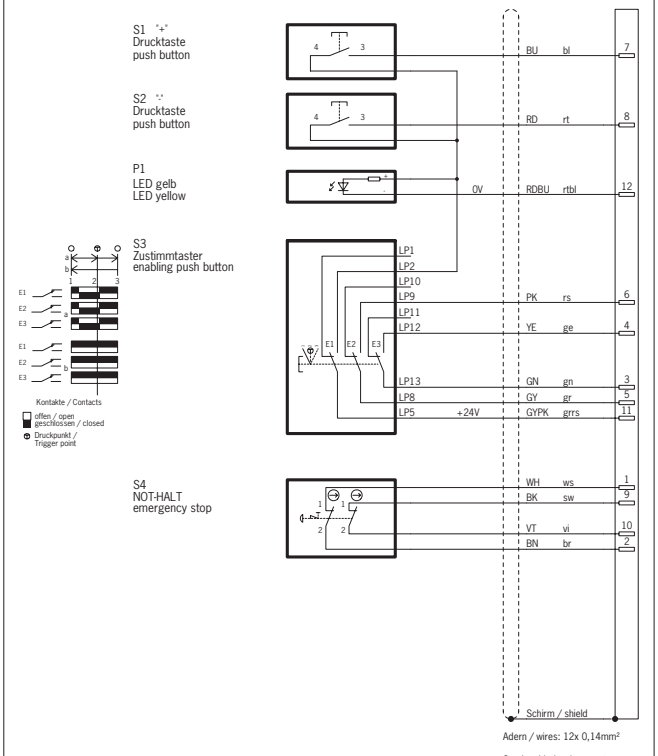
ZSM2101-103126



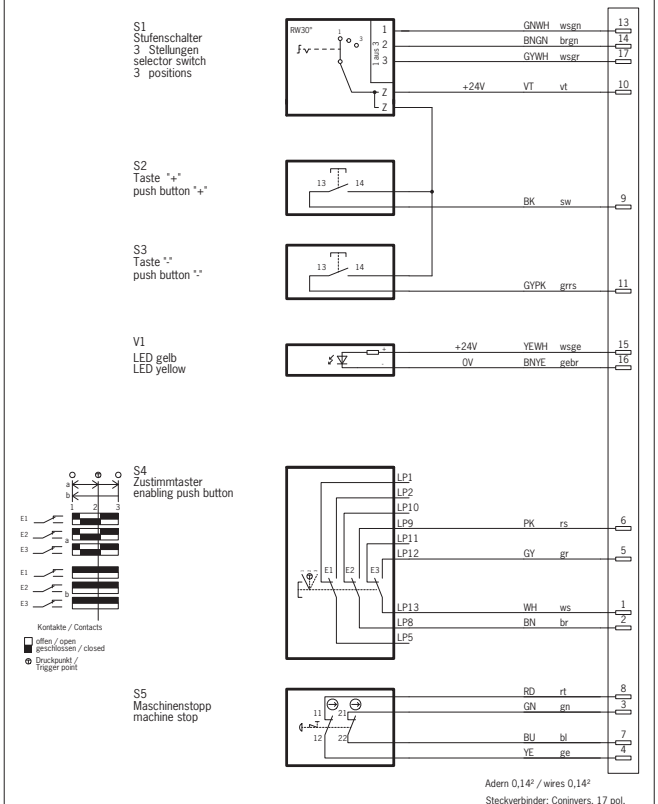
ZSM2204-117128



ZSM2104-123678

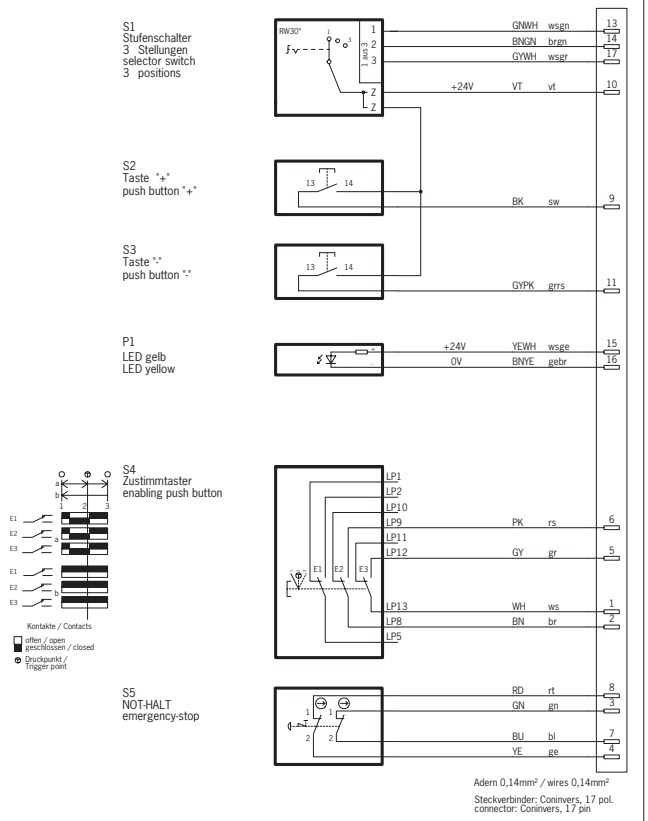


ZSM2301-110317

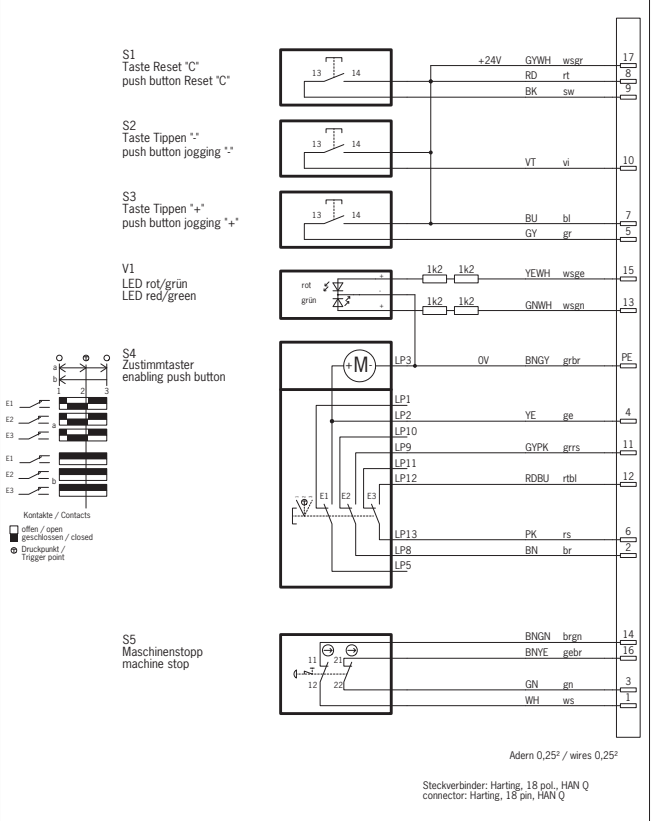


Wiring diagrams

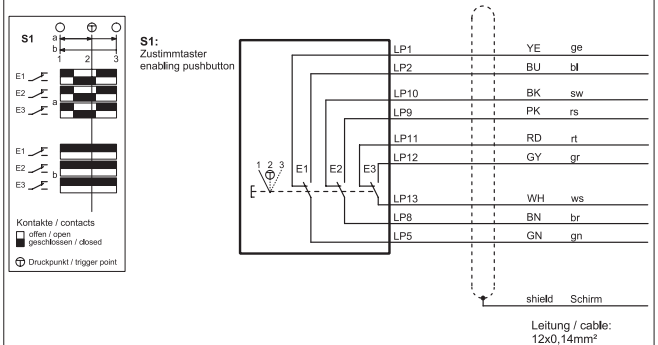
ZSM2304-111595



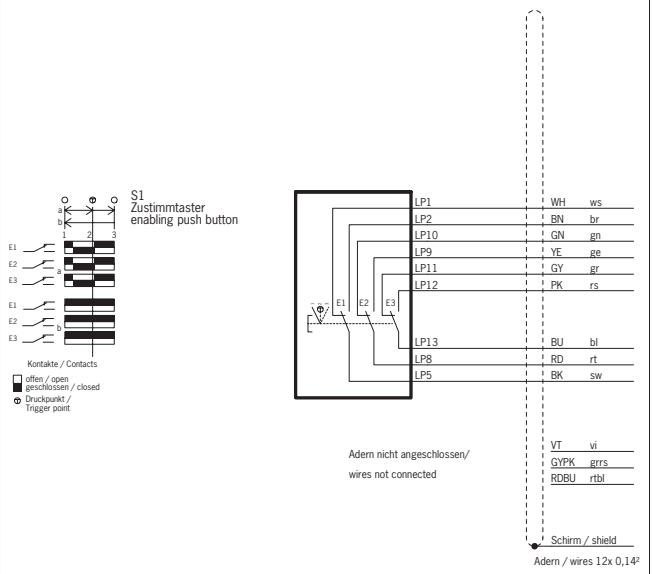
ZSM2301-105075



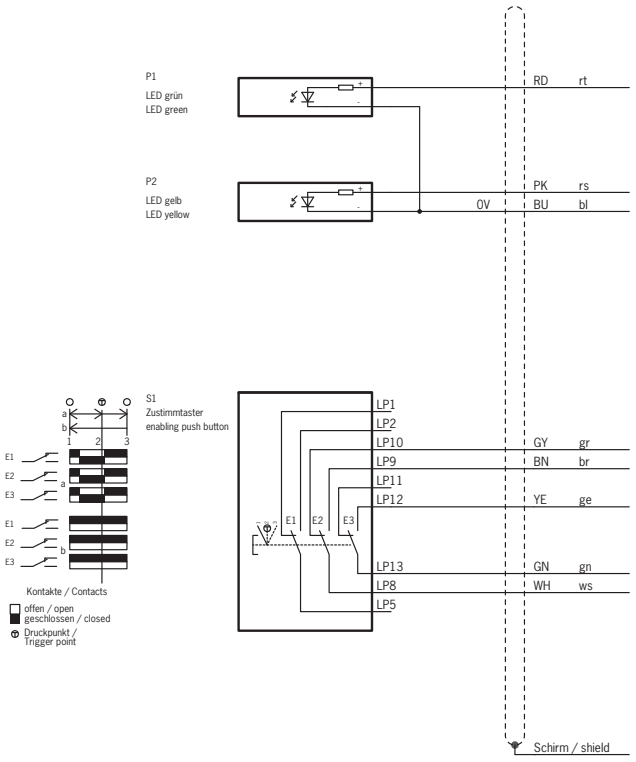
ZSM4200-099713



ZSM4200-121883

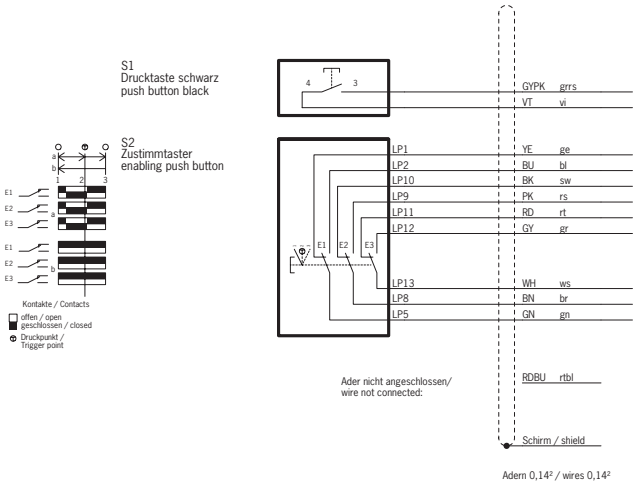


ZSM2300-111871



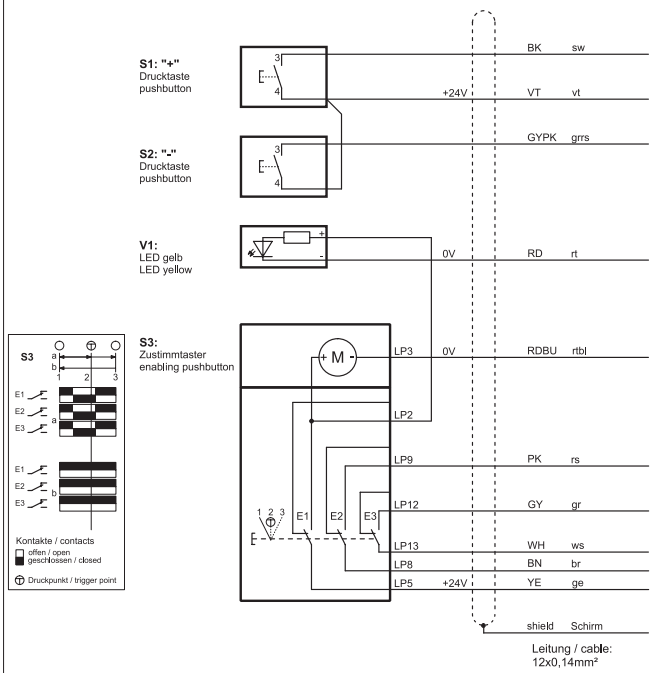
Leitung / cable:
12x0,14mm²

ZSM4200-124156



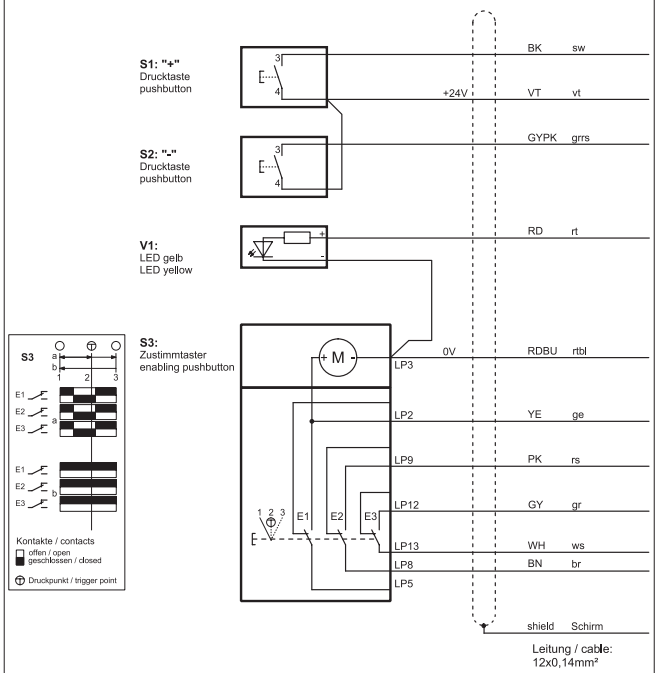
Adern 0,14² / wires 0,14²

ZSM2100-099714



Leitung / cable:
12x0,14mm²

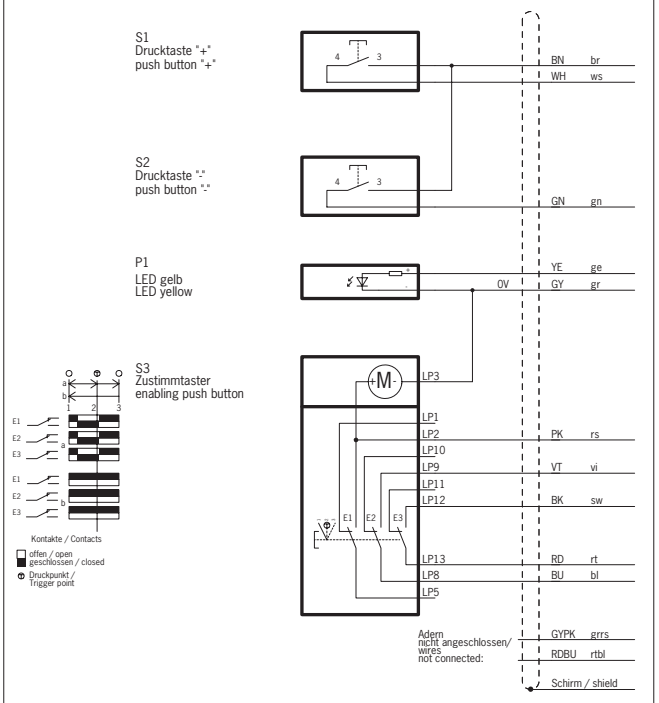
ZSM2300-109971
ZSM2300-112803



Leitung / cable:
12x0,14mm²

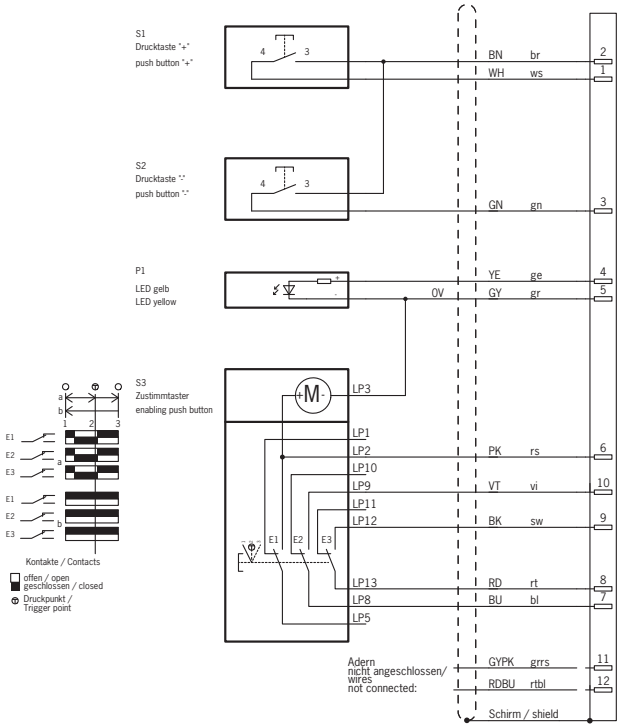
Wiring diagrams

ZSM2300-127990



Adern 0,14² / wires 0,14²

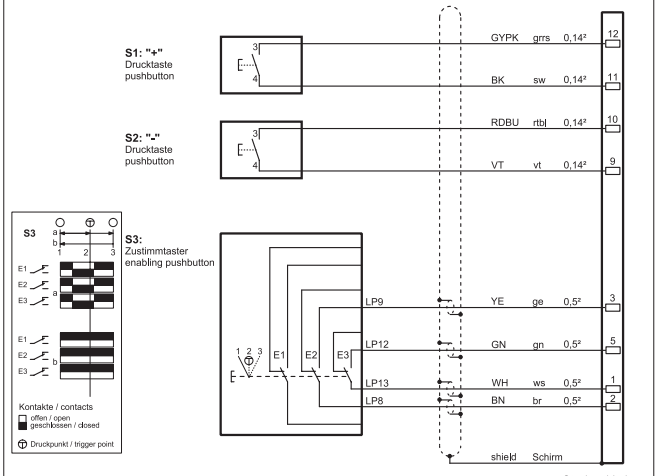
ZSM2300-111462



Adern 0,14² / wires 0,14²

Steckverbinder: Coninvers, 12 pol.
connector: Coninvers, 12 pin

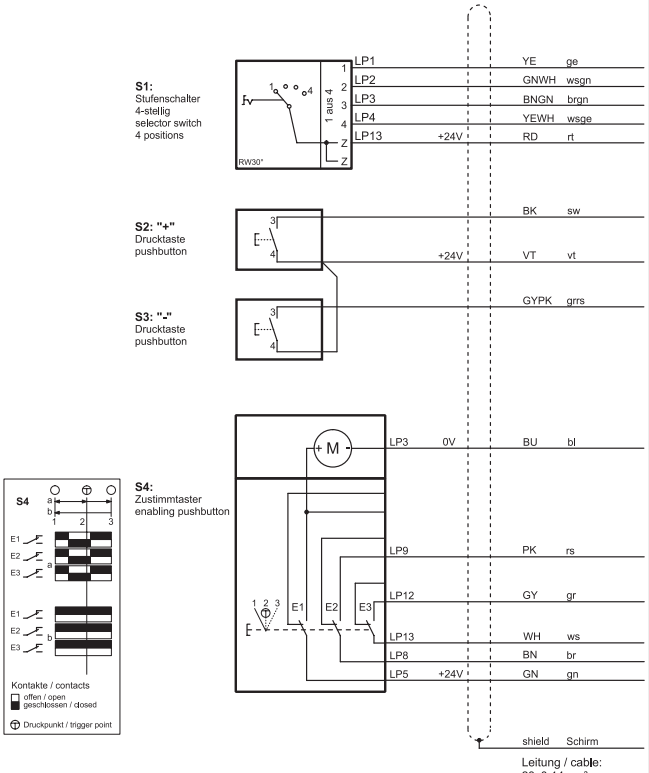
ZSM2300-099716
ZSM2300-113290



Leitung: 16 adrig
cable: 16 wires

Steckverbinder:
Coninvers 12pol.
Connector:
Coninvers 12pin

ZSM2200-100697



Leitung / cable:
23x0,14mm²

ZSM2100-106103

S1	DCBA
1	0000
2	0001
3	0011
4	0010
5	0110

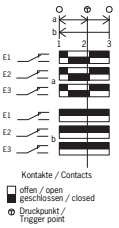
S1
Stufenschalter
5 Stellungen
selector switch
5 positions

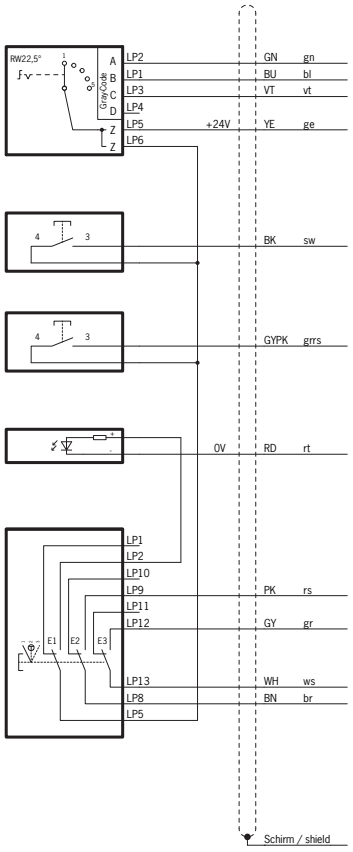
S2
Drucktaste +
push button +

S3
Drucktaste -
push button -

V1
LED gelb
LED yellow

S4
Zustimmtaster
enabling push button





Leitung / cable:
12x0,14mm²

ZSM2200-105308

S1	DCBA
1	0000
2	0001
3	0011
4	0010
5	0110
6	0111
7	0101
8	0100
9	1100
10	1101
11	1111
12	1110

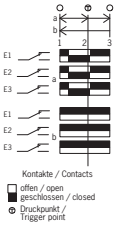
S1
Stufenschalter
12 Stellungen
selector switch
12 positions

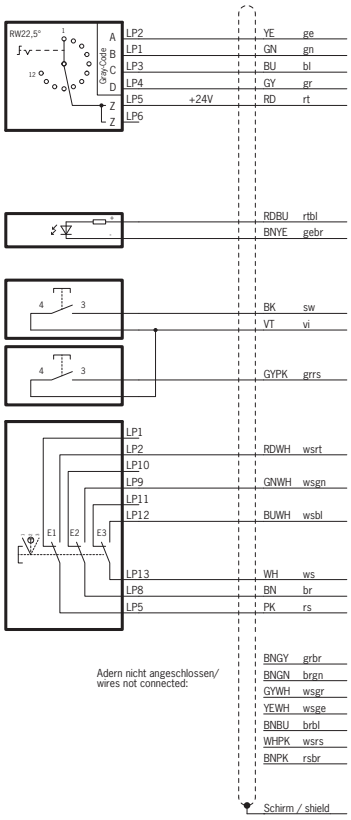
V1
LED gelb
LED yellow

S2
Drucktaste "+"
push button "+"

S3
Drucktaste "-"
push button "-"

S4
Zustimmtaster
enabling push button





Adern nicht angeschlossen/
wires not connected:

Leitung / cable:
23x0,14mm²

ZSM3100-103462

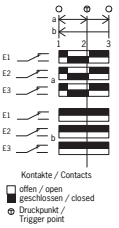
S1	DCBA
1	0000
2	0001
3	0011
4	0010
5	0110
6	0111
7	0101
8	0100
9	1100
10	1101
11	1111
12	1110

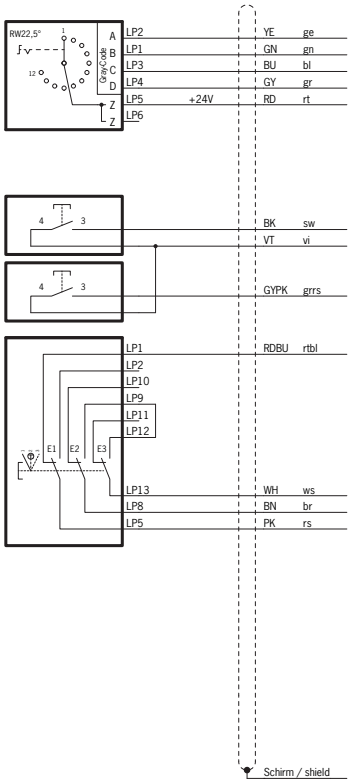
S1
Stufenschalter
12 Stellungen
selector switch
12 positions

S2
Drucktaste "+"
push button "+"

S3
Drucktaste "-"
push button "-"

S4
Zustimmtaster
enabling push button





Leitung / cable:
12x0,14mm²

ZSM2200-122279

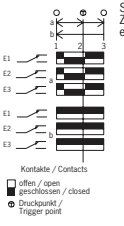
S1	DCBA
1	0000
2	0001
3	0011
4	0010
5	0110
6	0111
7	0101
8	0100
9	1100
10	1101
11	1111
12	1110
13	1010
14	1011
15	1001
16	1000

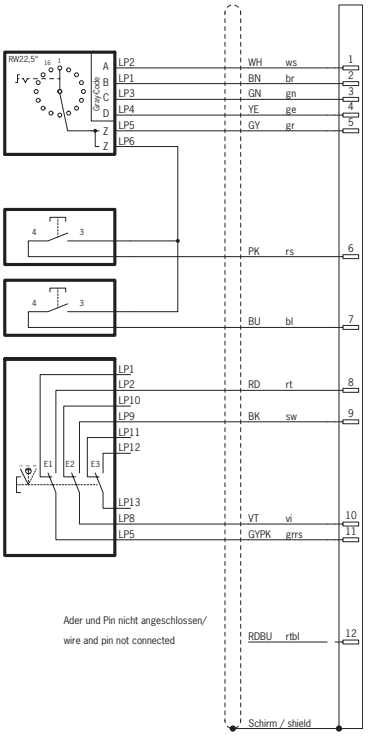
S1
Stufenschalter
16 Stellungen
selector switch
16 positions

S2 "+"
Drucktaste
push button

S3 "-"
Drucktaste
push button

S4
Zustimmtaster
enabling push button



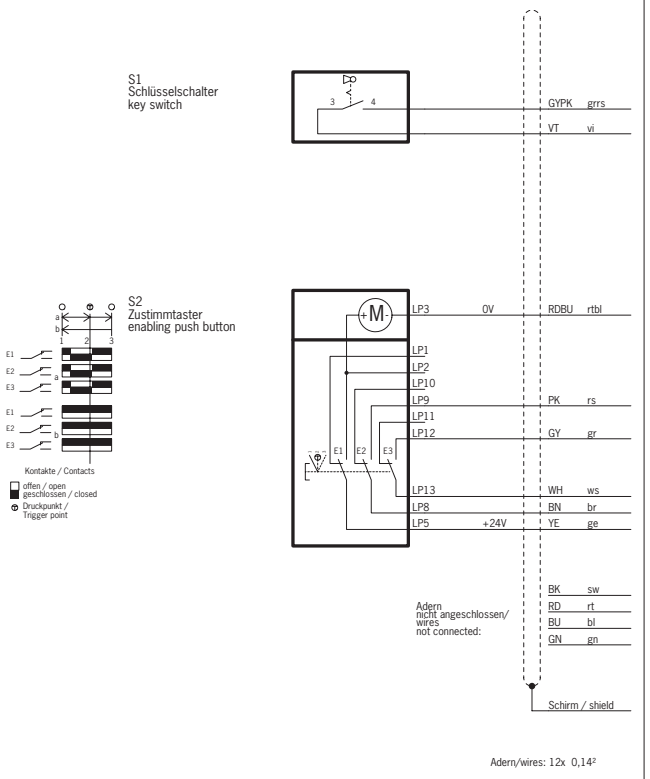


Ader und Pin nicht angeschlossen/
wire and pin not connected

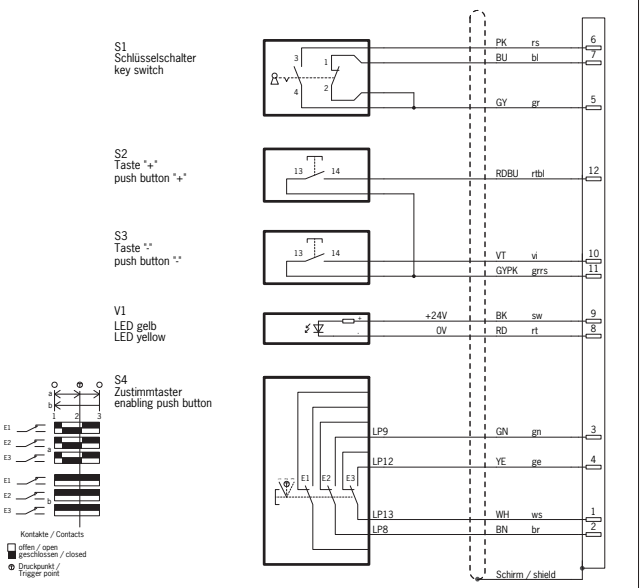
Adern / wires 12x 0,14²
Steckverbinder / connector:
Coninvers 12pol.

Wiring diagrams

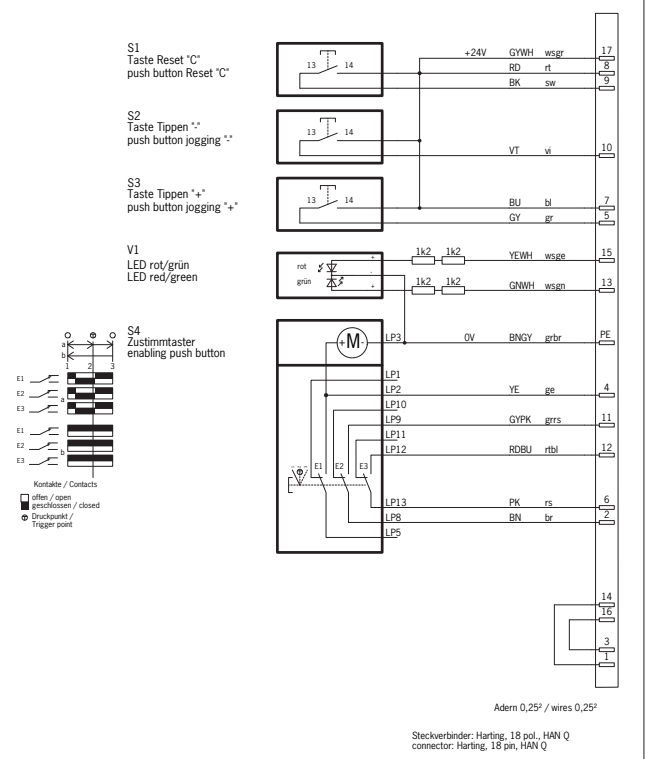
ZSM2200-116714



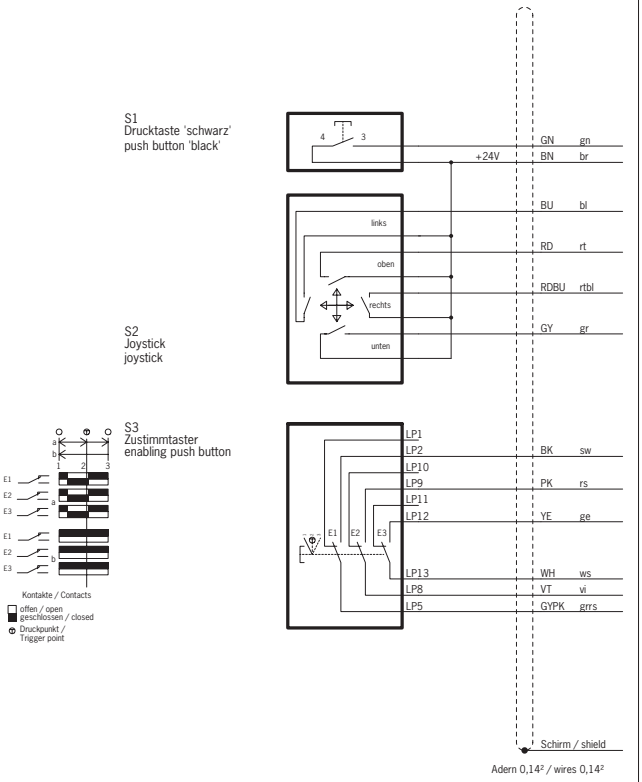
ZSM2300-110338



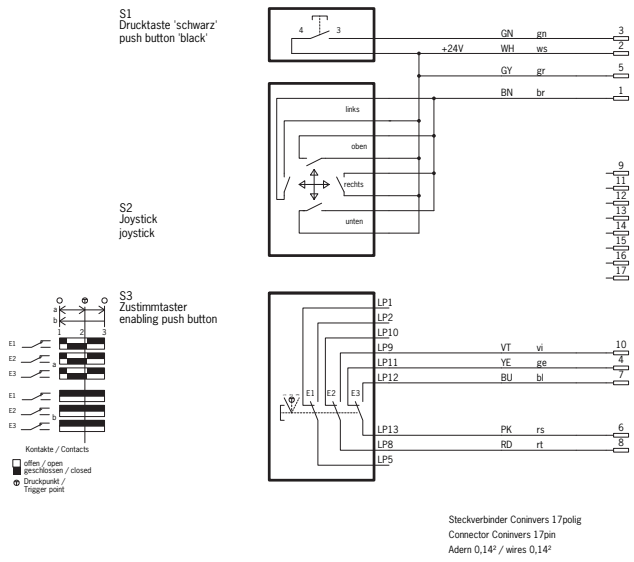
ZSM2300-106670



ZSM2200-157209



ZSM2300-106374



Steckverbinder Coninvers 17polig
Connector Coninvers 17pin
Adern 0,14² / wires 0,14²

Technical data

Basic enabling switch ZSM

Parameter		Value	Unit
Material	Housing	PA	
	Enabling switch	CR	
	Recessed grip/seal	TPE	
Degree of protection		IP54	
Ambient temperature		-5 ... +60	°C
Weight (incl. connecting cable)		Approx. 1.1	kg

Switching element, enabling switch

Parameter	Value	Unit
Switching contacts	3 changeover contacts	
Mechanical life	1 x 10^6 operating cycles	
Utilization category acc. to IEC 60947-5-1 (for enabling switch)	DC13 U_e 24V I_e 1 A	
Reliability values acc. to EN ISO 13849-1		
B_{10D}	1 x 10^5 operating cycles	

Machine stop

Parameter	Value	Unit
Color of actuating head	Gray	
Color of bottom part	Yellow	
Reset	Pull-to-reset and turn-to-reset button	
Degree of protection	IP65	
Max. number of switching elements	2	
Contact element	2 x positively driven contact	
Utilization category acc. to IEC 60947-5-1	DC-13 U_e 24 V I_e 3 A	

Emergency stop device

Parameter	Value	Unit
Standard	EN ISO 13850/EN 60947-5-5	
Color of actuating head	Red	
Color of bottom part	Yellow	
Reset	Pull-to-reset and turn-to-reset button	
Degree of protection	IP65	
Number of switching elements	2	
Contact element	2 x positively driven contact	
Utilization category acc. to IEC 60947-5-1	DC-13 U_e 24 V I_e 3 A	
Reliability values acc. to EN ISO 13849-1		
B_{10D}	0.1 x 10^6 operating cycles	

Selector switch

Parameter	Value	Unit
Output code	See wiring diagrams	
Switching voltage, max.	25	V AC/DC
Breaking capacity, max.	0.2	VA

Key-operated rotary switch

Parameter	Value	Unit
Switching voltage, max.	30	V AC/DC
Switching current, max.	0.25	A

Reset button/pushbutton

Parameter	Value	Unit
Switching voltage, max.	30	V DC
Switching current, max.	0.1	A

Single-color LED indicator

Parameter	Value	Unit
Housing	Chrome-plated	
Operating voltage	24	V
Color	Yellow or red	

Two-color LED indicator

Parameter	Value	Unit
Forward current typ.	0.02	A
Voltage red	1.85	V
Voltage green	2.2	V

Mini joystick

Parameter	Value	Unit
Utilization category acc. to IEC 60947-5-1	DC-13 U_e 24 V I_e 0.3 A	

Connection using flying lead

Parameter		Value		Unit
Connection		Cable 12 x 0.14 mm"	Cable 23 x 0.14 mm"	
Short circuit prot. acc. to IEC 60269-1 (control circuit fuse)		2		A gG
Utilization category acc. to EN 60947-5-1				
Enabling switch	DC-13	I_e 1 A U_e 24 V		
Pushbuttons and LEDs	DC-13	I_e 0.3 A U_e 24 V		

Plug connector RC12 connection

Parameter		Value	Unit
Connection		Male connector	
Version		RC12 (11-pin + PE)	
Conductor cross-section		0.14	mm²
Rated insulation voltage U_i		0.8	kV
Utilization category acc. to EN 60947-5-1			
Enabling switch	DC-13	I_e 1 A U_e 24 V	
Pushbuttons and LEDs	DC-13	I_e 0.3 A U_e 24 V	

Plug connector RC17 connection

Parameter		Value	Unit
Connection		Male connector	
Version		RC17 (17-pin)	
Conductor cross-section		0.14	mm²
Rated insulation voltage U_i		0.8	kV
Utilization category acc. to EN 60947-5-1			
Enabling switch	DC-13	I_e 1 A U_e 24 V	
Pushbuttons and LEDs	DC-13	I_e 0.3 A U_e 24 V	

Plug connector connection HAN Q17

Parameter		Value	Unit
Connection		Male connector	
Version		HAN Q17 (17-pin)	
Conductor cross-section		0.14	mm²
Rated insulation voltage U_i		0.8	kV
Utilization category acc. to EN 60947-5-1			
Enabling switch	DC-13	I_e 1 A U_e 24 V	
Pushbuttons and LEDs	DC-13	I_e 0.3 A U_e 24 V	

Built-in version

Parameter		Value		Unit
Housing material		Polyamide, black		
Protective cap material		CR (neoprene), black		
Degree of protection	on the front	IP65		
Ambient temperature		- 5 to + +60		°C
Installation orientation		Any		
Weight		ZSE/ZSG: approx. 0.1	ZXE: approx. 0.03	kg
Reliability values acc. to EN ISO 13849-1				
B_{10D}	ZSE	5×10^5 operating cycles		
	ZXE	0.75×10^6 operating cycles		

Hand-held version G1

Parameter		Value	Unit
Housing material		Polyamide, black	
Protective cap material		CR (neoprene), black	
Degree of protection		IP67/IP65 with additional function (pushbutton, LED)	
Ambient temperature		- 5 to + 50	°C
Weight		Approx. 0.4 (without cable)	kg
Reliability values acc. to EN ISO 13849-1			
B_{10D}	ZSA	5×10^5 operating cycles	
	ZSB	5×10^5 operating cycles	

Hand-held version G2

Parameter		Value	Unit
Housing material		Polyamide, yellow	
Protective cap material		CR (neoprene), black	
Degree of protection		IP65	
Ambient temperature		- 5 to + 50	°C
Weight		Approx. 1.1 (with 5 m straight cable)	kg
Reliability values acc. to EN ISO 13849-1			
B_{10D}	ZSR	5×10^5 operating cycles	

Hand-held version G3

Parameter		Value	Unit
Housing material		Polyamide, yellow	
Protective cap material		CR (neoprene), black	
Degree of protection		IP65	
Ambient temperature		- 5 to + 50	°C
Weight		Approx. 1.5 (with 5 m straight cable)	kg
Reliability values acc. to EN ISO 13849-1			
B_{10D}	ZSB	5×10^5 operating cycles	

Switching elements

Parameter	Value				Unit
Switching principle	Slow-action switching contact				
Mechanical life	1×10^5 cycles				
Function sequence	2-stage	3-stage			
Switching element with 1 switching contact	**10** 1 NO	**1110** 1 NO/NC ⊖			
Switching element with 2 switching contacts	**20** 2 NO	**1210** 1 NO/NC ⊖ + 1 NO	**2202** 2 NO/NC	**2220** 2 NO/NC ⊖	
Switching element with 3 switching contacts	**21** 2 NO + 1 NC	**111** 1 NO+1 NC ⊖+1 NC	**210** 2 NO + 1 NC ⊖	**300** 3 NO	
Switching element with 4 switching contacts	-	**121** 1 NO + 2 NC ⊖ +1 NC	**220** 2 NO + 2 NC ⊖		
Min. switching current at 24 V	1 mA (ZXE switching element 2202: 5 mA)				

Tab connector connection, hand-held kit ZSA

Parameter		Value	Unit
Connection		Tab connector	
Version acc. to IEC 60760		2.8 x 0.8 mm	
Degree of protection	Connections	IP00	
Rated impulse withstand voltage U_{imp}		2.5	kV
Rated insulation voltage U_i		250	V AC/DC
Conventional thermal current I_{th}		3	A
Short circuit prot. acc. to IEC 60269-1 (control circuit fuse)		4	A gG
Utilization category acc. to EN 60947-5-1	AC-15	I_e 4 A U_e 230 V	
	DC-13	I_e 3 A U_e 24 V	

Screw terminal connection ZXE

Parameter		Value	Unit
Connection		Screw terminals	
Version		4-pin	
Tightening torque, max.		0.15	Nm
Conductor diameter	Single cond.	0.3 - 1.4 mm, AWG 22 - 16	
Conductor nominal diameter	Single cond.	1.5	mm^2
	Flex. cond.	1 mm^2, AWG 16	
Conductor insulation stripping		5	mm
Degree of protection	Connections	IP00	
Rated impulse withstand voltage U_{imp}		1.5	kV
Rated insulation voltage U_i		30	V AC/DC
Conventional thermal current I_{th}		0.1	A
External fuse U (+LA)/U (+LB)		0.1	A gG
Utilization category acc. to EN 60947-5-1	DC-13	I_e 0.1 A U_e 24 V	

Connection via flying lead

Parameter		Value				Unit
Connection		Cable 3 x 0.75 mm^2	Cable 6 x 0.34 mm^2	Cable 8 x 0.34 mm^2	Cable 8 x 0.5 mm^2 + 8 x 0.14 mm^2	
Version	Individual shielding	2 x 0.75	3 x 0.34	4 x 0.34	4 x 0.5	mm^2
	Without shield	1 x 0.75	3 x 0.34	4 x 0.34	4 x 0.5	mm^2
	Additional elements	-	-	-	8 x 0.14	mm^2
Rated impulse withstand voltage U_{imp}		2.5	2.5	2.5	2.5	kV
Rated insulation voltage U_i		250	250	250	250	V AC/DC
Short circuit prot. acc. to IEC 60269-1 (control circuit fuse)		4	2	2	2	A gG
Utilization category for enabling switch acc. to EN 60947-5-1	AC-15	I_e 4 A U_e 230 V	I_e 2 A U_e 230 V	I_e 2 A U_e 230 V	I_e 2 A U_e 230 V	
	DC-13	I_e 3 A U_e 24 V	I_e 2 A U_e 24 V	I_e 2 A U_e 24 V	I_e 2 A U_e 24 V	
Utilization category for pushbuttons and LEDs acc. to EN 60947-5-1	AC-15	-	-	I_e 400 mA U_e 32 V	I_e 400 mA U_e 32 V	
	DC-13	-	-	I_e 100 mA U_e 50 V	I_e 100 mA U_e 50 V	

Plug connector SVM5 connection

Parameter		Value	Unit
Connection		Male connector	
Version		SVM5 (5-pin)	
Connecting cable conductor cross-section		8 x 0.34	mm^2
Degree of protection		IP67 [1]	
Rated impulse withstand voltage U_{imp}		0.8	kV
Short circuit prot. acc. to IEC 60269-1 (control circuit fuse)		2	A gG
Utilization category acc. to EN 60947-5-1	AC-15	I_e 2 A U_e 230 V	
	DC-13	I_e 2 A U_e 24 V	

Plug connector HAN10 connection

Parameter		Value	Unit
Connection		Male connector	
Version		HAN10 (10-pin + PE)	
Connecting cable conductor cross-section		8 x 0.34	mm^2
Degree of protection		IP65 [1]	
Rated impulse withstand voltage U_{imp}		0.8	kV
Short circuit prot. acc. to IEC 60269-1 (control circuit fuse)		2	A gG
Utilization category acc. to EN 60947-5-1	AC-15	I_e 4 A U_e 24 V	
	DC-13	I_e 4 A U_e 24 V	

[1] Only screwed tight with the related plug connector from page 69

Plug connector RC12 connection

Parameter		Value		Unit
Connection		Male connector		
Version		RC12 (11-pin + PE)		
Connecting cable conductor cross-section		8 x 0.5 + 8 x 0.14	6 x 0.34	mm²
Degree of protection		IP67 /IP65 with additional elements [1]		
Rated impulse withstand voltage U_{imp}		0.8		kV
Short circuit prot. acc. to IEC 60269-1 (control circuit fuse)		2		A gG
Utilization category for enabling switch acc. to EN 60947-5-1	AC-15	I_e 2 A U_e 24 V		
	DC-13	I_e 2 A U_e 24 V		
Utilization category for pushbuttons and LEDs acc. to EN 60947-5-1	AC-15	24 V 400 mA	-	
	DC-13	24 V 100 mA	-	

Plug connector RC17 connection

Parameter		Value		Unit
Connection		Male connector		
Version		RC17 (17-pin)		
Connecting cable conductor cross-section		8 x 0.34	8 x 0.5 + 8 x 0.14	mm²
Degree of protection		IP67 or IP65 with additional elements [1]		
Rated impulse withstand voltage U_{imp}		0.8		kV
Short circuit prot. acc. to IEC 60269-1 (control circuit fuse)		2		A gG
Utilization category for enabling switch acc. to EN 60947-5-1	AC-15	I_e 2 A U_e 24 V		
	DC-13	I_e 2 A U_e 24 V		
Utilization category for pushbuttons and LEDs acc. to EN 60947-5-1	AC-15	24 V 400 mA		
	DC-13	24 V 100 mA		

Plug connector RC17 Y-coded connection

Parameter		Value	Unit
Connection		Male connector	
Version		RC17 Y-coded (17-pin)	
Connecting cable conductor cross-section		8 x 0.5 + 8 x 0.14	mm²
Degree of protection		IP67 or IP65 with additional elements [1]	
Rated impulse withstand voltage U_{imp}		0.8	kV
Short circuit prot. acc. to IEC 60269-1 (control circuit fuse)		2	A gG
Utilization category for enabling switch acc. to EN 60947-5-1	AC-15	I_e 2 A U_e 24 V	
	DC-13	I_e 2 A U_e 24 V	
Utilization category for pushbuttons and LEDs acc. to EN 60947-5-1	AC-15	24 V 400 mA	
	DC-13	24 V 100 mA	

Key-operated rotary switch for housing G3

Parameter	Value	Unit
Housing material	PA black	
Ambient temperature	-25 to + 70	°C
Front degree of protection (installed)	IP65	°C
Switching principle	Slow-action contact elements	
Switching element	1 x NC contact + 1 x NO contact	A
Max. switching current	250	mA
Switching voltage	30	V
Contact resistance	≤ 200	mΩ
Connection	Tinned circuit board connection	mΩ

Selector switch for housing G3

Parameter	Value	Unit
Front degree of protection (installed)	IP65	
Center point fixing	M7 x 0.75	
Detent position	Max. 12, end stop can be adjusted as required from 2 to 12 detent positions	°C
Output code	Binary-coded	
Max. switching current	0.5	A
Max. switching voltage	AC 115 V, DC 24 V on installation in G3 or HB.. housing	
Max. breaking capacity	10	VA
Contact resistance	≤ 6	mΩ
Connection	Soldered connection	mΩ

[1] Only screwed tight with the related plug connector from page 66ff

Illuminated pushbutton for housing G3

Parameter	Value	Unit
Housing material	PA6 black	
Cover material	PC, transparent	
Ambient temperature	-25 to +70	°C
Front degree of protection (installed)	IP65	
Switching principle	Snap-action contact elements	
Switching element	NC + NO	
Max. switching current	4	A
Switching voltage	250 V, 12 ... 24 V on installation in G3 or HB.. housing	V
Contact resistance	≤ 200	mΩ
Connection	Soldered connection	
Lighting	Incandescent lamp, white, 21 mA 24 V	

Emergency stop button for housing G3

Parameter	Value	Unit
Color of actuating head	Red	
Color of bottom part	Yellow	
Ambient temperature	-25 to +60	°C
Max. number of switching elements	2	
Degree of protection	IP65	

Index by item designation

Index by order number

Representatives

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