

Sub-assemblies for two-hand control consoles

ZHS/03 Catalogue



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Subject to technical modifications and error. The data specified in this catalogue are carefully checked typical standard values.

Or as the ancient Greeks already knew:

The Gods do not reveal everything to mortals from the very beginning. But during the course of time our search will show us what is better.

Xenophanes
(Greek philosopher,
580/577 B.C.)

Descriptions of technical correlations, details on external control units, installation and operating instructions or similar have been provided to the best of our knowledge. However, this does not mean that warranted characteristics or other properties under liability law may be assumed which extend beyond the "General Terms of Delivery of

Products and Services of the Electrical Industry". We trust you will understand that the user must therefore check our information and recommendations before using our equipment.

Sub-assemblies for two-hand consoles

General remarks/background

Function/application

Two-hand control consoles (ZHS) belong to the group of non separating protective devices. Used for machines and plants with hazardous areas, they compel an operator to use both hands to perform a control instruction for a hazardous movement.

Two-hand control consoles are protective devices which require the simultaneous use of both hands as a minimum to be operated, i.e. hands are kept away from the hazardous area through the necessity to keep them both on the operating panel to initiate the operation of a machine or plant and keep it going as long as danger exists.

These consoles must satisfy the safety requirements specified in particular in EN 574 "Safety of machinery – two-hand control consoles".

As hand-actuated command devices, two-hand control consoles must also satisfy all ergonomic requirements so that frequent use does not tire the operator, i.e. the design must be such as to present no strain to hands and wrists.

Last but not least, the sub-assemblies used should be designed in such a way that in addition to safety needs, operational requirements can also be satisfied in the form of simple assembly and commissioning and the provision of additional functionalities.

Two-hand control consoles are used preferably as protective devices in setting-up and single stroke operations near to the hazardous area as well as for manual feed and withdrawal work in a hazardous area. This will include the following.

- Metal presswork and similar
- Printing and paper processing machines
- Punching and similar metal working machines
- Machines of the chemicals industry
- Machines of the rubber and plastics industry etc.

Types of two-hand control consoles

From the aspect of control technology, i.e. in terms of the degree of safety, EN 574 : 1997 distinguishes between different types of two-hand control consoles.

The choice of type will depend on the application and its risk assessment.

Refer to EN 574 : 1997 for additional information.



Product overview

Even if two-hand control consoles may be integrated into a machine or plant structure, the discrete composition of individual sub-assemblies will usually be the more advantageous choice.

Advantages are to be derived both under aspects of safety and of design, logistics and cost. For example, the very fact that the proof of conformity required by EN 574 : 1997 covers 20 requirements to be satisfied by two-hand control consoles underlines the advantage of simply being able to fall back on ready-to-use sub-assemblies.

This catalogue shows a broad and perfected range of sub-assemblies for two-hand control consoles. It covers

- two-hand operating panels, either supplied already fitted with control devices or as an empty enclosure (in the case of primed panels the control devices are enclosed loosely);
- control actuating devices;
- stands, either with or without spacer ring, height-adjustment, foot-pedal switch, rollers;
- two-hand relay modules;

- customised versions and services as follows:
 - additional bore holes, special paint finishes etc.
 - the installation of additional control devices and illuminated indicator lights (and other electrical and electronic versions depending on design)
 - pre-wiring of the sub-assemblies, also on terminal strips (version SEPG...)
 - installation of two-hand relay modules in the operating panel of the type SEPG05.3... and SEPK02.0... for an additional change upon request
- complete assembly of operating panel and stand.



Two-hand operating panels SEP... type series

Versions

Two basic versions of operating panels are offered. One version is made of plastic (Lexan 503R1) and the other of die cast aluminium (Al-226). The range includes different operating panel versions made of sand-cast aluminium which are particularly suitable for special tasks.

All operating panel versions usually have a BG prototype test certificate, UL and CSA approval and satisfy the conformity requirements of EN 574 (up to 20 criteria depending on the manner of counting).

The two hinged basic versions SEPK... and SEPG... are hinged, therefore providing more favourable wiring and equipment conditions. They are characterised by a number of design features as follows:

- special ergonomic arrangement or integration of the control actuating devices
- the possibility to integrate up to 8 control and signalling devices in the central part of the panel in addition to the emergency-stop control device (in the case of SEPK02.0... additional punch-out bore holes)
- the operating panels on stands can be mounted with or without
 - spacer ring
 - height-adjustment
 - foot actuation
 - rollers

- favourable assembly options due to the divided enclosure
- “punch-out” cable outlets
- integration of relay modules of the type SRB-ZHK... with optional assembly brackets possible

The die cast aluminium versions also feature

- an ergonomically designed shelf area to support the edge of hands when actuating mushroom buttons
- the possibility to install terminal strips in the inside part
- a divided enclosure, with long hinges and additional bracket for fitting into the bottom part of the panel.

The two-hand operating panels of the SEP... type series comply with all safety requirements. They have protective hoods above the actuating buttons to protect against accidental actuation. Their design also avoids defeating the protective function by simple means, e.g. actuating with only one hand, with an elbow, a knee, hip, thigh or stomach.

Special features of the operating panels include the tough and ergonomic version made of die cast aluminium and plastic as well as the prototype test certificate from the test and certification office of the iron and metal technical committee of the mechanical engineering employers' liability insurance association (Fachausschuss Eisen + Metall III der Maschinenbau BG), Düsseldorf. This will not cover customised versions.

SEP... operating panels are suitable for actuation both by fingers and hands. They are intended for stationary installation on a machine or for mobile use in combination with stands of the STP... type series.

Pre-equipment/pre-wiring

Two-hand operating panels of the SEP... type series are supplied either as empty enclosures or with integrated control devices (in the case of the primed operating panels the control devices are enclosed loosely). Standard bore holes are 22.3 mm (30.5 mm upon request). A choice can be made between the different contact arrangements of the control devices as well as between different makes (Elan, Siemens). Refer also to the chapter on control actuating devices.



1) Only oil- and drill-emulsion-resistant to a certain extent. Chemicals resistance table available on request.

Upon request it is also possible to install additional switching devices and/or to provide pre-wiring. It is similarly possible to integrate the two-hand relay module of the type SRB-ZHK into the operating panels of the type SEPG05.3... and SEPK02.0. Customised requests concerning command and signalling devices must adhere to general and machine-related standards and regulations.

Special versions

The operating panels of the types SEPG05.3..., SEPK02.0... and SEP05... with a large centre part are particularly suitable for the installation of additional switching devices for extended functions.

SEP07... is particularly suitable if two-hand control operations are performed predominantly in a seated position.

Separate assembly of a two-hand control console is possible using the sub-assemblies SEP09... (observe minimum distance in accordance with EN 574:1997, Annex A, Point A.1 et. seq.).

Remarks

In operating panels of the type series SEP05... and SEP07... the emergency-stop control device is generally supplied with an installation diameter of 22.3 mm. In the case of empty panels the bore hole is also generally 22.3 mm.

A two-hand operating panel is supplied as standard with one control actuating device under each cover hood and one emergency-stop control device (in the case of primed operating panels the control devices are enclosed loosely).

Two-hand operating panels with installation bore holes of 30.5 mm diameter continue to be available as special versions upon request.

Design features

Ergonomically designed, tough aluminium or plastic enclosure with covers above the two-hand operating buttons to protect against unintentional actuation.

Anodised aluminium cover plate on the bottom and rear side.

The two-hand operating panels of the type SEPG05.3... and SEPK02.0... are hinged and do not have a removable aluminium cover plate.

Age-resistant neoprene seals between the aluminium cover plate and enclosure protect the integrated devices from dust, oil and splashwater.

Two fixing bore holes are provided outside the area intended for the installation of the control actuating devices.

The class of protection is IP 65.

Enclosure colour: standard RAL 7004 (signal grey powder coated) for two-hand operating panels made of die cast aluminium and RAL 7035 (dyed light grey) for two-hand operating panels made of plastic. Primed versions and other colours upon request.

Due to the large number of connection possibilities the product is delivered without glands for cable entries.

All operating panels are suitable for permanent installation to a machine or for mobile use in combination with our STP... stands.

Customisations

Please describe all customisations in writing and using sketches.

Examples:

- No paint finish, just primed
- Special paint finishes
- Fewer or more bore holes
- Additional control and signalling devices
- Name plates or name strips
- Metric threaded bore holes
- Installation of two-hand relay modules of the type SRB-ZHK (only possible in operating panels of the type SEPG05.3... and SEPK02.0...).
- Installation of sensor buttons of the type BWT...



Type series SEPK02.0...



Type series SEPG05.3...



Type series SEP01.0...



Type series SEP01.4...



Type series SEP05.1...



Type series SEP05.2...

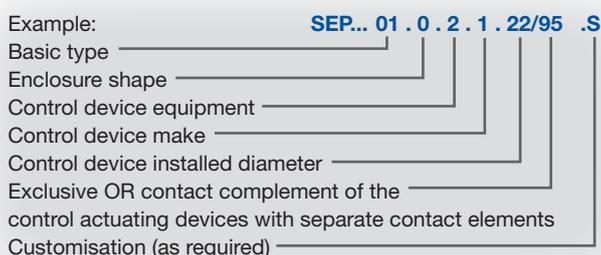


Type series SEP07.0...



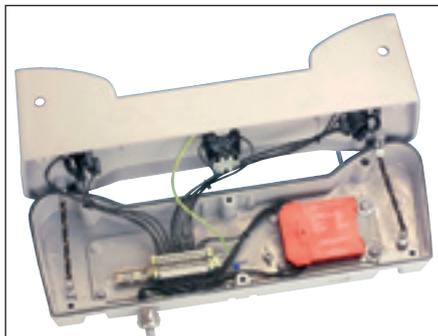
Type series SEP09.0...

Type designation



Two-hand operating panels

Examples of two-hand operating panels and stands as customised versions



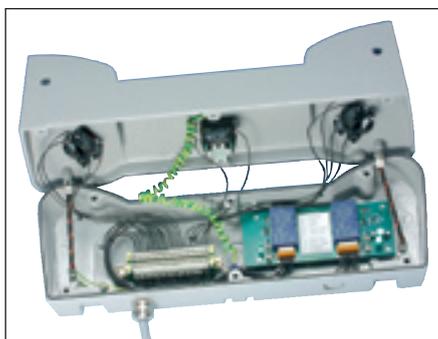
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1 Type
SEPG05.3.1.0.22/95.S
Version with integrated two-hand relay module of the type SRB-ZHK (installation of assembly bracket) and pre-wiring on the terminal strip.



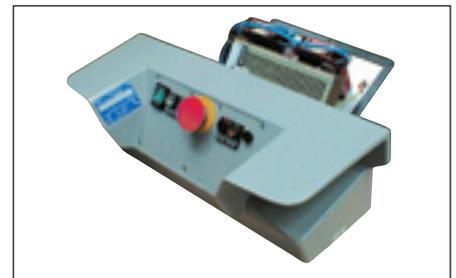
5

2 Type
SEPG05.3.1.0.22/95.S
Version as 1, but relay module integrated without separate enclosure.



2

3 Type **SEP05.2.3.0.22/95.S**
Customised version with keypad, display and variety of control and signalling devices.



6

4 Type **SEP01.0.4.0.22/95.S**
Customised version with 8 installation bore holes in the centre part, equipped with various control devices, name plates and signalling devices.



3

5 Customised version
(for LVD Co.)
Two-hand operating panel with large centre part to accommodate a complete control unit as well as various control devices and signalling devices. Similar enclosure designs can be developed at customer request.



7

The enclosure type shown (without built-in components in the centre part, but with large removable aluminium plate) will be available upon request as from mid 2003: type SEP06.2....



4

6 Type **SEP05.2.1.0.22.S**
Customised version for BMW AG, concept E65 including control and wiring for hand welding device.

7 Types **STPSK-1.S** and **STPLC-1.S**
Customised stand with 2-pedal foot switches and protective hoods.

Control actuating devices

General remarks

Three alternatives are available in the ZHS product range for use as control actuating device:

- Mushroom button with shortened actuating lift and minimised actuating forces (AP55/3SW...): refer to page 8.
- Non-contact (BG tested) sensor buttons (BWT...): refer to page 8.
- Traditional mushroom button (EDPSW...): refer to page 9.

Since the EN 574 came into force the design of the control actuating devices has assumed a special position because for safety reasons it requires the switching signals per control actuating device to be generated in 2 channels, preferably in non equivalent manner.

When using traditional control devices as control actuating devices this additional requirement necessitated an increase in the actuating forces due to the need to double the contact elements per control actuating device and thus led to a conflict with the requirement for operation which was as ergonomic as possible.

Non-contact actuating devices also have their limits if they are not tailored to the special requirements of two-hand control consoles and the lack of tactile feedback can be accepted. Devices of this type are also required to have a prototype test certificate because they fall under the heading of a logic unit of a two-hand control console due to their complex electronic design and thus come within the scope of Annex IV of the EC Machine Directive with its special rules for placing the products shown here on the market.



* Please refer also to the safety-instructions for BWT-sensor buttons in our installation manual for SEP..., SEPK..., SEPG...

Control actuating devices

Special versions

Three types of control actuating devices are available:

1) Mushroom button of the type ADP55/3SW... with shortened actuating lift and minimised actuating forces



- Ergonomic design, 55 mm actuating area, 22.3 mm installation bore hole
- Actuating forces
 - 10.5 N for ADP55/3SW¹ and
 - 7 N for ADP55/3SW o.F².
- Soft-feel plastic surface
- Actuating stroke only 3 mm
- Class of protection IP 65
- In connection with the order no. supplement ...E1/...E2, available without extra charge for all operating panel versions.

2) Non-contact sensor button of the type BWT... (BG tested)



- Capacitive principle of operation using the human body as dielectric
- BG prototype tested to EN 954-1 control category 4 and EN 574 type III/C
- With impurity and dirt control (recognises moist dirt)
- Tough, impact-resistant, oil and water proof (class of protection IP 68), sensor cast complete with cast resin

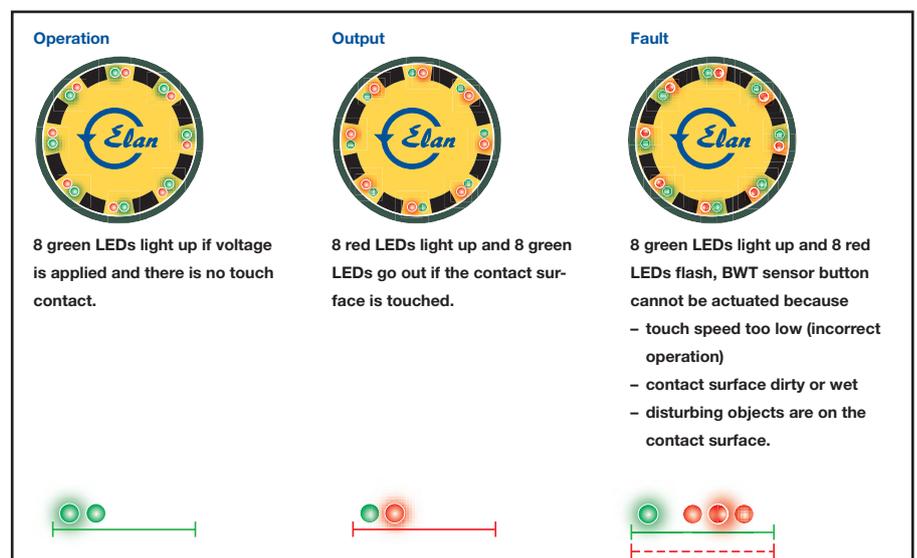
- Switches upon touch or approach, i.e. wrists are not strained
- No exertion of force, no pressure, i.e. comfortable work with high operating comfort
- Extremely long serviceable life: over 100 million switching cycles.

The high level of safety is also guaranteed by the fact that the two sensors must be interconnected with a function safety line which secures the use of the two different sensors BWT-SCA4-185Z-E and BWT-SCB4-185Z-E within the two-hand control console. The concept is supported by two non interchangeable plug-in connections with connection cable in black (A) and yellow (B) sheath colour for the connection with the operating voltage and the two-hand safety relay SRB-ZHK-24VDV or SRB 201ZH-24VDC. These have an enclosure width of only 22.5 mm and are to be fixed to standard rails.

The BWT sensor buttons differ from traditional capacitive proximity switches in the unique linking of the static and dynamic principle of operation, coupled with a high degree of diversification between the two sensor buttons A and B. The two sensors have completely different switching principles and thus react differently to any faults, e.g. failure of an electronic component. This leads to the operation of the machines being stopped immediately by the two-hand safety relay.

Monitoring displays for the operating state

- 1) In connection with two contact elements (1 x 1 NC/1 x 1 NO): shock resistance tested up to 36 g (order no. supplement E1), standard complement in operating panel SEPK0...
- 2) In connection with two contact elements (1 x 1 NC/1 x 1 NO), but without resetting spring in the device head: shock resistance tested up to 18 g. Restricted use, i.e. only in the case of installation conditions with low shock and vibrations (order no. supplement E2).



Using the order no. supplements BWT-1 and BWT-2, the BWT sensors can be installed in the two-hand operating panels of the type SEPG05.3..., SEPK02.0... and SEP09.0... in the factory.

The order no. supplement BWT-1 contains the following:

- Sensor A including connection cable (type BWT-SCA4-185Z-E)
- Sensor B (type BWT-SCB4-185Z-E)
- Cable box with 2 m cable, black, for sensor A to connect sensor A and two-hand safety relay (SRB-ZHK-24VDC or SRB 201ZH-24VDC), M12, 5-pole (type BWT-LKW-SCA-2)
- Cable box with 2 m cable, black, for sensor B to connect sensor B and two-hand safety relay (SRB-ZHK-24VDC or SRB 201ZH-24VDC), M12, 5 pole (type BWT-LKW-SCB-2).

The order no. supplement BWT-2 contains the following:

- Sensor A including connection cable (type BWT-SCA4-185Z-E)
- Sensor B (type BWT-SCB4-185Z-E)
- Cable box with 5 m cable, black, for sensor A to connect sensor A and two-hand safety relay (SRB-ZHK-24VDC or SRB 201ZH-24VDC), M12, 5-pole (type BWT-LKW-SCA-5)
- Cable box with 5 m cable, black, for sensor B to connect sensor B and two-hand safety relay (SRB-ZHK-24VDC or SRB 201ZH-24VDC), M12, 5 pole (type BWT-LKW-SCB-5).

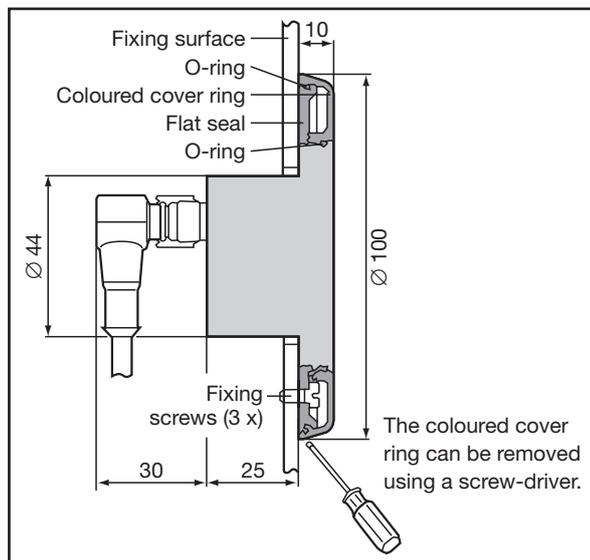
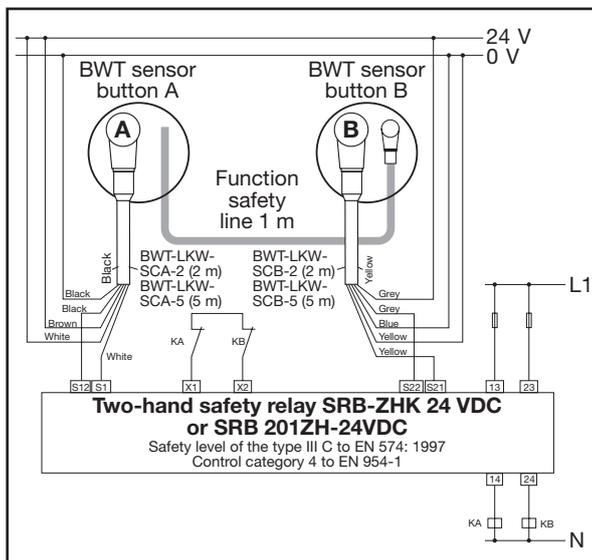
The costs of installation per sensor pair BWT-1/-2 will depend on the unit numbers (1-2 units, 5-10 units, ...) and will be charged separately. The two-hand safety relay of the type SRB-ZHK-24VDC or SRB 201ZH-24VDC (refer to pages 41 et seq. and 47 et seq.) must be ordered separately.

For further information please refer to the assembly instructions enclosed with every delivery.

3) Mushroom button of the type EDPSW... (traditional version)



- Ergonomic design, 42/55 mm actuating surfaces, installation bore hole of 22.5 mm
- Tough metal version
- For heavy-duty applications
- Standard in all metal two-hand operating panels fitted with Elan control devices of the type SEP...0.22/95.



Stands

Type series STP...

Versions

Stands of the type series STP... enable the location of a two-hand operating panel to be freely selected independent of the machine body. The stands come as tough welded or plate bent structures with low point of gravity and with bore holes for floor fixing.

If the stands are to be used for mobile two-hand control consoles, spacer rings provide safety from the danger area. Special attention is to be paid to the subject of safety distances. Spacer rings also provide protection from damage if a stand is pushed over.

Stands of the versions STP02... and STPSK... also have the added advantage of being height-adjustable.



Stands of the type series STPSK... are new to the product range. These are tough mobile plate bent designs with threaded bore holes for floor fixing and integrated height-adjustment. The spacer ring not only serves to guarantee a safety distance to the hazardous movement of a machine but can also be used as carry and push device whilst protecting the two-hand operating panel from damage should it tip over. Foot-pedal switches with protective cover can also be installed on the ground plate (similarly possible for stands of the type STPLC...). Scanner recognition is provided by means of the U-profile in the centre part ($\geq 80 \times 80 \text{ mm}$) (refer to page 28).

Please describe all customisations in plain text and using sketches.

Example:

- No paint finish, only primed
- Special paint finish
- Connection dimensions for plug-in device H-24E.

All stands come primed as standard with a structure paint finish of RAL 7016 (anthracite grey) or with a powder coating.

Design features

Tough welded or plate bent structures with low point of gravity.

Either with or without spacer ring, height adjustment, pull or carry device. With fixing bore holes in the floor plate.

Operating panels SEP... can be connected inside or outside the stand upright.

Some screw-on cover and threaded bore holes M25 x 1.5 in the lower part of the stand for the inside connection.

The bore holes for fixing this cover and the cut-out in the square tube below comply with the connection

dimensions of the quick disconnect device H-16E and H-40D (does not apply to STPSK... stands).

Please observe the special installation and assembly instructions when assembling with SEPK02.0... and SEPG05.3... (when fitting stand with operating panel SEPK02.0... three (and for operating panel SEPG05.3... two) grounding bolts are to be punched out by the user on the ZPL-1-intermediate plate. This is not necessary if the stands are ordered with operating panels already mounted).

Note: Repositioning of the two-hand operating panel towards the hazard area must be restricted by adequate measures, i.e. by a spacer-ring welded to the stand (ref. to DIN EN 574/11.96, No. 9.7.3).

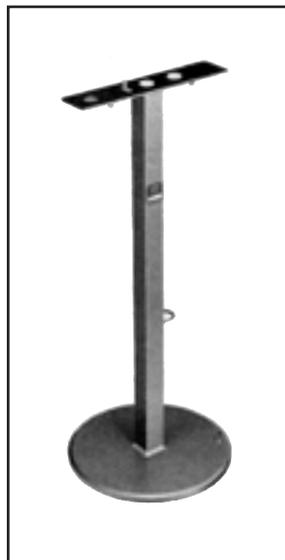
Type designation

Example: STP... 02 . 1 . 1 . S
 Basic type _____
 Version _____
 Intermediate plate _____
 Customisation (upon request) _____

Type series STPSK...



Type series STP01.1.../STP01.4...



Type series STP02.1.../STP02.4...



Type series STPLC...



Two-hand relay modules

Type series SRB-ZHK.../SRB 201ZH...

Key features

- (highest) control category III/C to EN 574:1997
- 2 safety enabling outputs/1 auxiliary NC contact
- Top-hat rail assembly to EN 50 022
- EC prototype testing

Special features

The special feature of the new two-hand relay modules of the type series SRB-ZHK and SRB 201ZH is the simple and inexpensive circuitry which essentially consists of two safety relays so that the enclosure can be designed to snap on to a top-hat rail to DIN 50 022 and takes up only 22.5 mm (24 VDC version) and 45 mm (AC version) in the switching cabinet.

The circuitry functions in a special way so that the structure is simpler whilst still fully conforming with the highest control category III/C to EN 574 : 1997.

An EC prototype test has already been successfully passed according to MRL Article 8 by the Electrical Engineering Test Office of the Berufsgenossenschaft Feinmechanik und Elektrotechnik, Cologne.

Mode of function of the circuitry

The main feature of the circuitry is that polarised safety relays are used which are triggered with reverse poling when the circuitry is in release state (i.e. when the control actuating devices have not been actuated).

This causes capacitors to be charged via the relay coils whose energy is required to start the circuitry. When the control actuating devices are actuated the reverse poling is first cancelled, i.e. the safety relays are contacted with correct assignment of plus and minus conductors. The capacitors discharge their stored energy in this way in order to enable the safety relay.

The special mode of function of the circuitry also ensures that the basic functions of a two-hand control device (in accordance with control category III/C to EN 574 : 1997) are guaranteed. This refers in particular to the synchronous actuation of the control actuating devices, i.e.

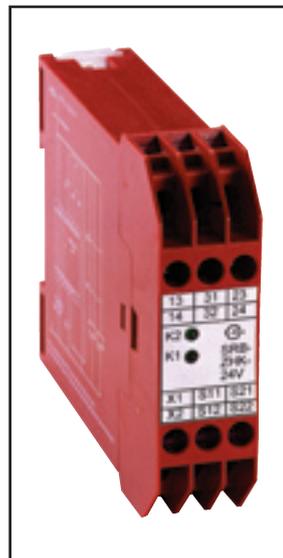
- both control actuating devices must be actuated simultaneously within a specific period ≤ 0.5 s, and
- if the time is exceeded both control actuating devices must be released before a restart can be initiated.

Version

The two-hand relay modules of the type SRB-ZHK and SRB 201ZH are designed for the connection of two control actuating devices each with an NC and an NO contact.

On the output side the module has 2 safety enabling outputs and an auxiliary contact. The supply voltage is 24 VDC, 24 VAC, 48 VAC, 115 VAC or 230 VAC (depending on version).

By contrast with commercially available two-hand relay modules, the SRB-ZHK 24 VDC module is supplied externally via the contacts of the control actuating devices. Other types of control actuating devices cannot be connected in any of the versions.



Operating panel SEPK02.0...

for exclusive installation of devices with a diameter of 22.3 mm



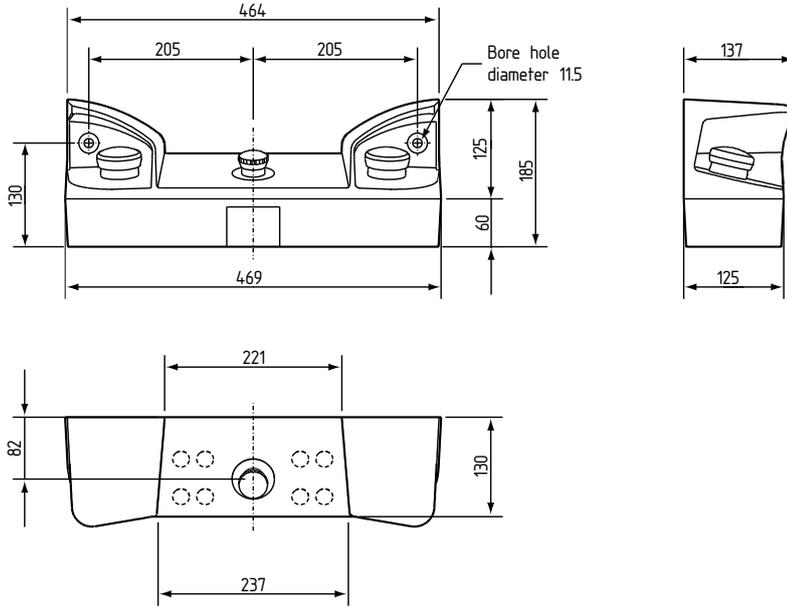
Design features

- Plastic enclosure (reinforced heavy-duty plastic Lexan 503R)
- Operating field with 8 additional bore holes to be “punched out” by the user if required
- Two-part enclosure version, making assembly easier
- Equipped as standard with ergonomic mushroom buttons (ADP55/3SW) with only 10.5 N actuating force (type E1)

Type SEPK02.0.4.0.22/95, version dyed RAL 7035

Type	Order No.	Button installation on diameter (mm)	Complement	Mushroom button diameter (mm)	Contacts	Diagram No.	Button make
SEPK02.0.4.0.22/95	502 0032	22.3	1 red emergency stop button 2 black control actuating devices	38.5 55	1 NO + 1 NC	1.1	Elan
SEPK02.0.3.1.22/95	502 0052	22.3	1 red emergency stop button 2 black control actuating devices	40 40	1 NO + 1 NC	2.1	Siemens
SEPK02.0.L.22	502 0202	22.3	Empty enclosure dyed in RAL 7035 with 3 bore holes				
SEPK02.0.S	502 0999	22.3	Please specify for all special versions: all desired deviations from the standard types in plain text.				
Supplement to type designation	Product						
.Z1 (2 NO + 2 NC)	Emergency stop control device with contact complement 2 NO + 2 NC to DIN VDE 0113 part 1, point 5.7 (EN 60204 Part 1)						
.Z2 (1 NO + 1 NC) .Z3 (2 NO + 2 NC)	Lockout device = yellow impact button with latching instead of red emergency stop control device (incl. type plate “lockout device”) to safety rules ZH1/456 Point 3.5 (description of lockout device)						
.Z4 (1 NO + 1 NC) .Z5 (2 NO + 2 NC)	Lockout device = yellow impact button with latching additional to red emergency stop control device (incl. type plate “lockout device”) to safety rules ZH1/456 Point 3.5 (description of lockout device)						
.E2 (1 NO + 1 NC)	Ergonomic mushroom button (without spring in device head) ADP55/3SW o.F., 7.0 N actuating force (refer to page 8)						
.BWT-1 .BWT-2	Complete set: sensor buttons A + B, output cable 2 m, including connection cable, without two-hand relay modules Complete set: sensor buttons A + B, output cable 5 m, including connection cable, without two-hand relay modules (refer to pages 11 and 41 et seq. for two-hand relay modules)						
Installation costs per unit per button pair BWT-1/-2 will be separately charged depending on unit numbers, e.g. 1–4 units or 5–10 units.							

Dimensions



"Punch out" 2 x M25 x 1.5 outlets for cable glands on bottom and rear side.

NEW: Operating panel SEPG05.3...

for exclusive installation of devices with a diameter of 22.3 mm
(variable additional bore holes for the centre part)



Design features

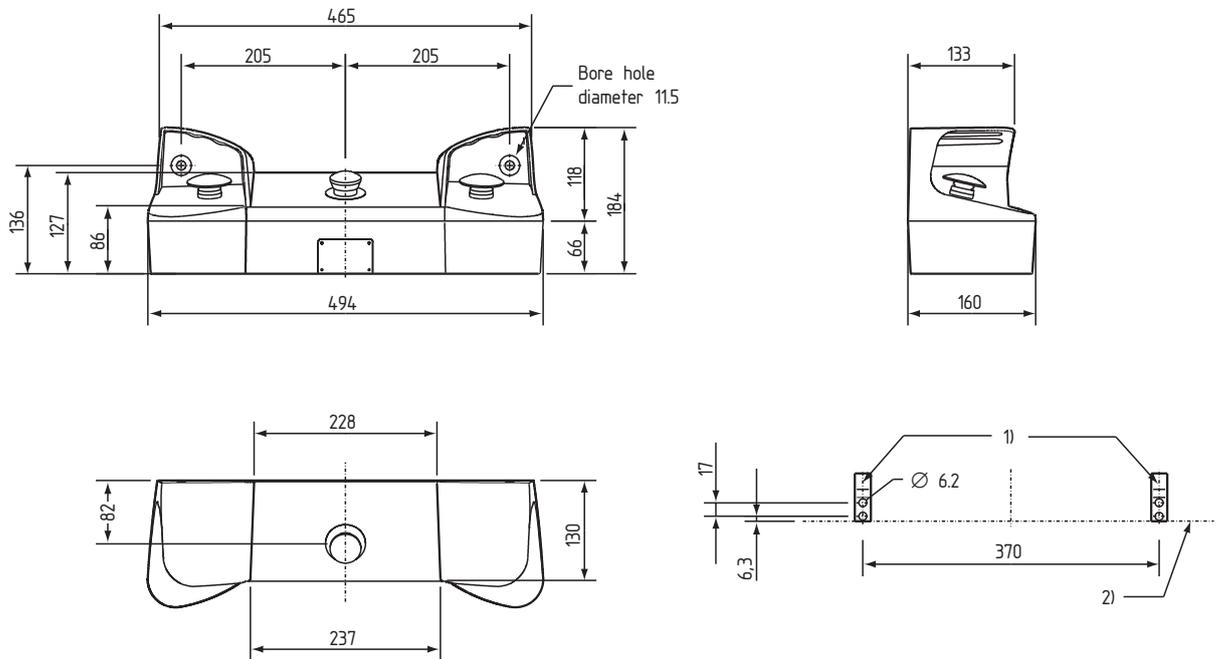
- Aluminium die-cast enclosure (Al-226)
- Operating field suitable to accommodate at least 8 additional signalling and command devices
- Two-part, hinged enclosure, making assembly easier, with strip hinge, including bracket for the bottom part
- Ergonomic operation of the mushroom buttons due to additional area/support for the hand
- Terminal strip and relay assembly possible in the interior

Type **SEPG05.3.1.0.22/95**, version powder coated RAL 7004

Type	Order No.	Button installation on diameter (mm)	Complement	Mushroom button diameter (mm)	Contacts	Diagram No.	Button make
SEPG05.3.1.0.22/95	506 2002	22.3	1 emergency stop button 2 black control actuating devices	49 55	1 NO + 1 NC	1.1	Elan
SEPG05.3.2.0.22/95	506 2012	22.3	1 emergency stop button 2 black control actuating devices	49 42	1 NO + 1 NC	1.1	Elan
SEPG05.3.3.0.22/95	506 2022	22.3	1 emergency stop button 2 black control actuating devices	38,5 42	1 NO + 1 NC	1.1	Elan
SEPG05.3.4.0.22/95	506 2032	22.3	1 emergency stop button 2 black control actuating devices	38,5 55	1 NO + 1 NC	1.1	Elan
SEPG05.3.2.1.22/95	506 2042	22.3	1 emergency stop button ¹ 2 black control actuating devices	49 40	1 NO + 1 NC	2.1	Elan/ Siemens
SEPG05.3.3.1.22/95	506 2053	22.3	1 emergency stop button 2 black control actuating devices	40 40	1 NO + 1 NC	2.1	Siemens
SEPG05.3.L.22	506 2202	22.3	Empty enclosure powder coated with 3 bore holes				
SEPG05.3.S	506 0999	22.3	Please specify for all special versions: all desired deviations from the standard types in plain text.				
Supplement to type designation	Product						
.Z1 (2 NO + 2 NC)	Emergency stop control device with contact complement 2 NO + 2 NC to DIN VDE 0113 Part 1, Point 5.7 (EN 60204 Part 1)						
.Z2 (1 NO + 1 NC) .Z3 (2 NO + 2 NC)	Lockout device = yellow impact button with latching instead of red emergency stop control device (incl. type plate "lockout device") to safety rules ZH1/456 Point 3.5 (description of lockout device)						
.Z4 (1 NO + 1 NC) .Z5 (2 NO + 2 NC)	Lockout device = yellow impact button with latching additional to red emergency stop control device (incl. type plate "lockout device") to safety rules ZH1/456 Point 3.5 (description of lockout device)						
.E1 (1 NO + 1 NC) .E2 (1 NO + 1 NC)	Ergonomic mushroom button (with spring in device head) ADP55/3SW, 10,5 N actuating force Ergonomic mushroom button (without spring in device head) ADP55/3SW o.F., 7,0 N actuating force (refer to page 8)						
.BWT-1 .BWT-2	Complete set: sensor buttons A + B, output cable 2 m, including connection cable, without two-hand relay modules Complete set: sensor buttons A + B, output cable 5 m, including connection cable, without two-hand relay modules (refer to pages 11 and 41 et seq. for two-hand relay modules)						
Installation costs per button pair BWT-1/-2 will be separately charged depending on unit numbers, e.g. 1–4 units or 5–10 units.							

1) Fitted with Elan emergency stop control device.

Dimensions



"Punch out" 2 x M25 x 1.5 outlets for cable glands on bottom and rear side (thread length of the connections 10 mm minimum).

- 1) Assembly for the bracket for bottom part of panel (rear)
- 2) Lower side of panel SEPG05.3...

Operating panel SEP01.0...

for installation of devices with a diameter of 22.3 mm (30.5 mm diameter upon request)



Design features

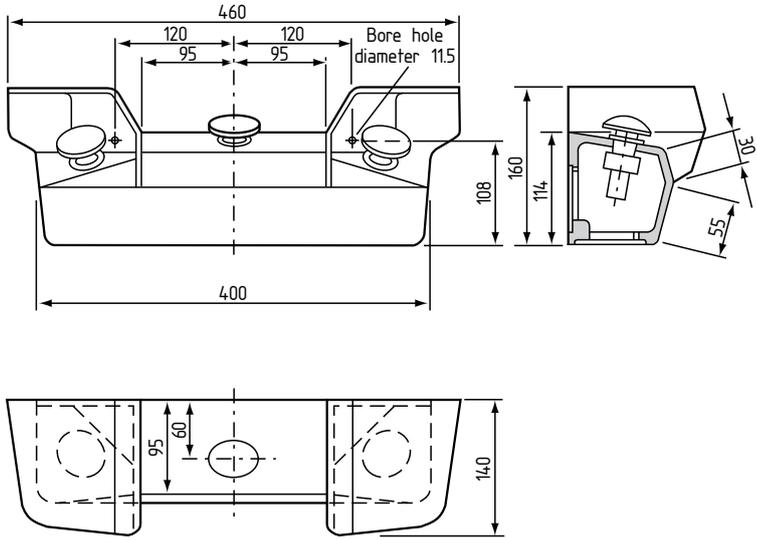
- Aluminium enclosure
- With removable aluminium cover on the bottom and rear side

Type SEP01.0.1.0.22/95, version powder coated RAL 7004

Type	Order No.	Button installation on diameter (mm)	Complement	Mushroom button diameter (mm)	Contacts	Diagram No.	Button make
SEP01.0.1.0.22/95	501 0002	22.3	1 emergency stop button 2 black control actuating devices	49 55	1 NO + 1 NC	1.1	Elan
SEP01.0.2.0.22/95	501 0012	22.3	1 emergency stop button 2 black control actuating devices	49 42	1 NO + 1 NC	1.1	Elan
SEP01.0.3.0.22/95	501 0022	22.3	1 emergency stop button 2 black control actuating devices	38.5 42	1 NO + 1 NC	1.1	Elan
SEP01.0.4.0.22/95	501 0032	22.3	1 emergency stop button 2 black control actuating devices	38.5 55	1 NO + 1 NC	1.1	Elan
SEP01.0.2.1.22/95	501 0042	22.3	1 emergency stop button ¹ 2 black control actuating devices	49 40	1 NO + 1 NC	2.1	Elan/ Siemens
SEP01.0.3.1.22/95	501 0052	22.3	1 emergency stop button 2 black control actuating devices	40 40	1 NO + 1 NC	2.1	Siemens
SEP01.0.L.22	501 0202	22.3	Empty enclosure powder coated with 3 bore holes				
SEP01.0.S	501 0999	22.3	Please specify for all special versions: all desired deviations from the standard types in plain text.				
Supplement to type designation	Product						
.Z1 (2 NO + 2 NC)	Emergency stop control device with contact complement 2 NO + 2 NC to DIN VDE 0113 Part 1, Point 5.7 (EN 60204 Part 1)						
.Z2 (1 NO + 1 NC) .Z3 (2 NO + 2 NC)	Lockout device = yellow impact button with latching instead of red emergency stop control device (incl. type plate "lockout device") to safety rules ZH1/456 Point 3.5 (description of lockout device)						
.Z4 (1 NO + 1 NC) .Z5 (2 NO + 2 NC)	Lockout device = yellow impact button with latching additional to red emergency stop control device (incl. type plate "lockout device") to safety rules ZH1/456 Point 3.5 (description of lockout device)						
.E1 (1 NO + 1 NC) .E2 (1 NO + 1 NC)	Ergonomic mushroom button (with spring in device head) ADP55/3SW, 10.5 N actuating force Ergonomic mushroom button (without spring in device head) ADP55/3SW/o.F., 7.0 N actuating force (refer to page 8)						

1) Fitted with Elan emergency stop control device

Dimensions



Operating panel SEP01.4...

for installation of devices with a diameter 22.3 mm (30.5 mm diameter upon request)



Design features

- Aluminium enclosure with dome for emergency stop control device,
- With removable aluminium cover on the bottom and rear side.

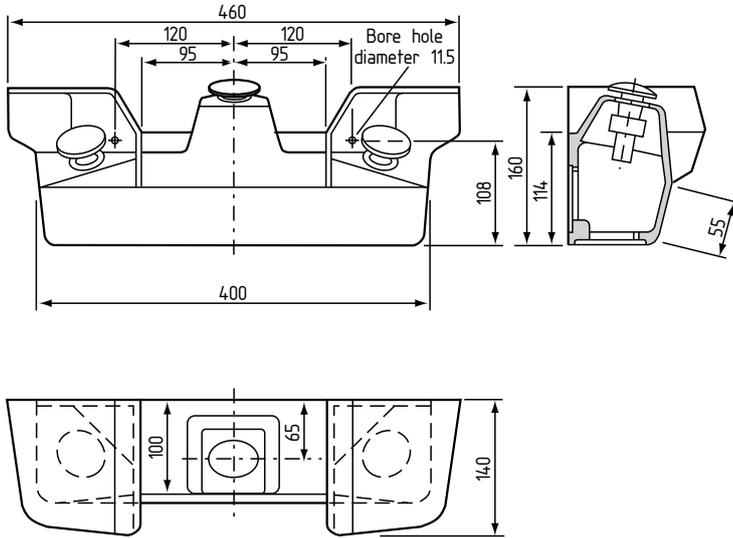
Type SEP01.4.1.0.22/95, version powder coated RAL 7004

Type	Order No.	Button installation on diameter (mm)	Complement	Mushroom button diameter (mm)	Contacts	Diagram No.	Button make
SEP01.4.1.0.22/95	501 4002	22.3	1 emergency stop button 2 black control actuating devices	49 55	1 NO + 1 NC	1.1	Elan
SEP01.4.2.0.22/95	501 4012	22.3	1 emergency stop button 2 black control actuating devices	49 42	1 NO + 1 NC	1.1	Elan
SEP01.4.3.0.22/95	501 4022	22.3	1 emergency stop button 2 black control actuating devices	38.5 42	1 NO + 1 NC	1.1	Elan
SEP01.4.4.0.22/95	501 4032	22.3	1 emergency stop button 2 black control actuating devices	38.5 55	1 NO + 1 NC	1.1	Elan
SEP01.4.2.1.22/95	501 4042	22.3	1 emergency stop button ¹⁾ 2 black control actuating devices	49 40	1 NO + 1 NC	2.1	Elan/ Siemens
SEP01.4.3.1.22/95	501 4052	22.3	1 emergency stop button 2 black control actuating devices	40 40	1 NO + 1 NC	2.1	Siemens
SEP01.4.L.22	501 4202	22.3	Empty enclosure powder coated with 3 bore holes				
SEP01.4.S	501 4999	22.3	Please specify for all special versions: all desired deviations from the standard types in plain text.				
Supplement to type designation	Product						
.Z1 (2 NO + 2 NC)	Emergency stop control device with contact complement 2 NO + 2 NC to DIN VDE 0113 Part 1, Point 5.7 (EN 60204 Part 1)						
.Z2 (1 NO + 1 NC) .Z3 (2 NO + 2 NC)	Lockout device = yellow impact button with latching instead of red emergency stop control device (incl. type plate "lockout device") to safety rules ZH1/456 Point 3.5 (description of lockout device)						
.Z4 (1 NO + 1 NC) .Z5 (2 NO + 2 NC)	Lockout device = yellow impact button with latching additional to red emergency stop control device (incl. type plate "lockout device") to safety rules ZH1/456 Point 3.5 (description of lockout device)						
.E1 (1 NO + 1 NC) .E2 (1 NO + 1 NC)	Ergonomic mushroom button (with spring in device head) ADP55/3SW, 10.5 N actuating force Ergonomic mushroom button (without spring in device head) ADP55/3SW o.F., 7.0 N actuating force (refer to page 8)						

1) Fitted with Elan emergency stop control device



Dimensions



Operating panel SEP05.1...

for installation of devices with a diameter of 22.3 mm (30.5 mm diameter upon request)



Design features

- Aluminium enclosure,
- Operating field for additional command and signalling devices, b x h = 240 x 125 mm

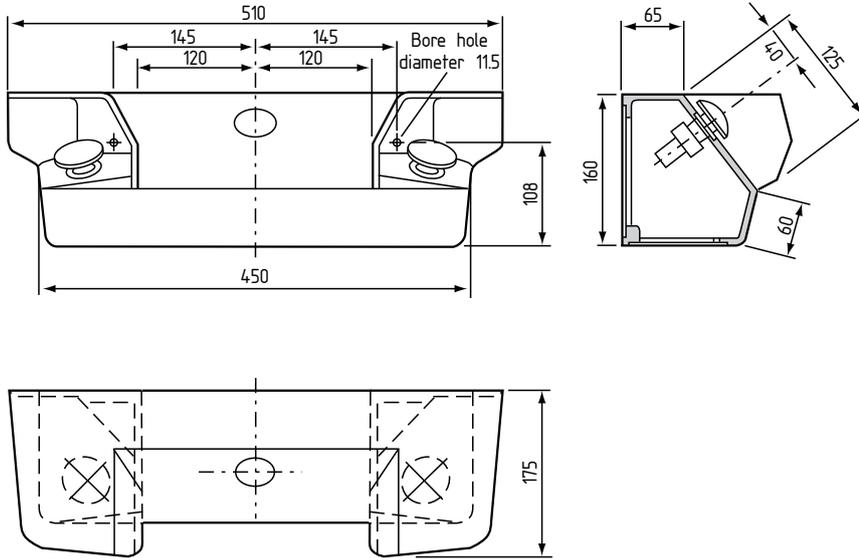
Type SEP05.1.1.0.22/95, version powder coated RAL 7004

Type	Order No.	Button installation on diameter (mm)	Complement	Mushroom button diameter (mm)	Contacts	Diagram No.	Button make
SEP05.1.1.0.22/95	505 1002	22.3	1 emergency stop button 2 black control actuating devices	49 55	1 NO + 1 NC	1.1	Elan
SEP05.1.2.0.22/95	505 1012	22.3	1 emergency stop button 2 black control actuating devices	49 42	1 NO + 1 NC	1.1	Elan
SEP05.1.3.0.22/95	505 1022	22.3	1 emergency stop button 2 black control actuating devices	38.5 42	1 NO + 1 NC	1.1	Elan
SEP05.1.4.0.22/95	505 1032	22.3	1 emergency stop button 2 black control actuating devices	38.5 55	1 NO + 1 NC	1.1	Elan
SEP05.1.2.1.22/95	505 1042	22.3	1 emergency stop button ¹ 2 black control actuating devices	49 40	1 NO + 1 NC	2.1	Elan/ Siemens
SEP05.1.3.1.22/95	505 1052	22.3	1 emergency stop button 2 black control actuating devices	40 40	1 NO + 1 NC	2.1	Siemens
SEP05.1.L.22	505 1202	22.3	Empty enclosure powder coated with 3 bore holes				
SEP05.1.S	505 1999	22.3	Please specify for all special versions: all desired deviations from the standard types in plain text.				
Supplement to type designation	Product						
.Z1 (2 NO + 2 NC)	Emergency stop control device with contact complement 2 NO + 2 NC to DIN VDE 0113 Part 1, Point 5.7 (EN 60204 Part 1)						
.Z2 (1 NO + 1 NC) .Z3 (2 NO + 2 NC)	Lockout device = yellow impact button with latching instead of red emergency stop control device (incl. type plate "lockout device") to safety rules ZH1/456 Point 3.5 (description of lockout device)						
.Z4 (1 NO + 1 NC) .Z5 (2 NO + 2 NC)	Lockout device = yellow impact button with latching additional to red emergency stop control device (incl. type plate "lockout device") to safety rules ZH1/456 Point 3.5 (description of lockout device)						
.E1 (1 NO + 1 NC) .E2 (1 NO + 1 NC)	Ergonomic mushroom button (with spring in device head) ADP55/3SW, 10.5 N actuating force Ergonomic mushroom button (without spring in device head) ADP55/3SW o.F., 7.0 N actuating force (refer to page 8)						

1) Fitted with Elan emergency stop control device



Dimensions



Operating panel SEP05.2...

for installation of devices with a diameter of 22.3 mm (30.5 mm diameter upon request)



Design features

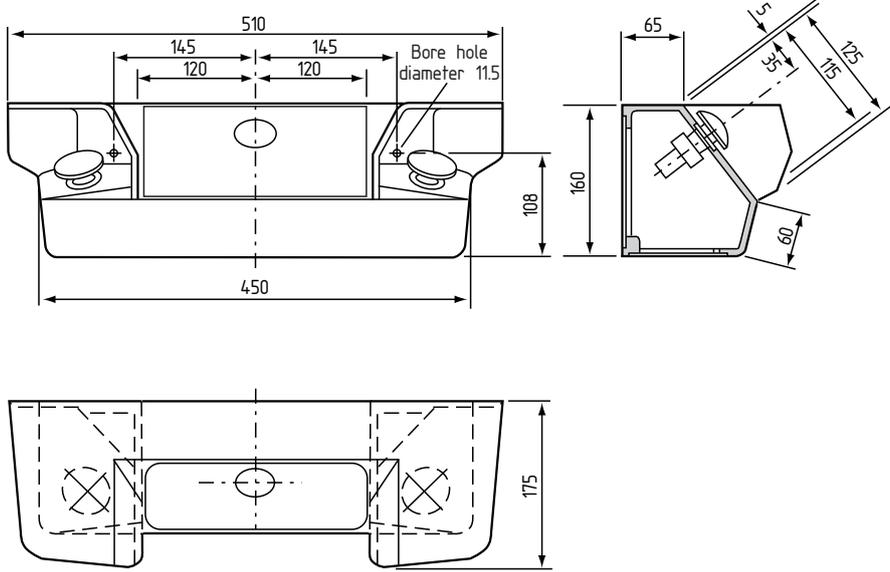
- Aluminium enclosure,
- Operating field for additional command and signalling devices,
- Removable aluminium plate
b x h = 230 x 115 mm

Type SEP05.2.4.0.22/95, version powder coated RAL 7004

Type	Order No.	Button installation on diameter (mm)	Complement	Mushroom button diameter (mm)	Contacts	Diagram No.	Button make
SEP05.2.1.0.22/95	505 2002	22.3	1 emergency stop button 2 black control actuating devices	49 55	1 NO + 1 NC	1.1	Elan
SEP05.2.2.0.22/95	505 2012	22.3	1 emergency stop button 2 black control actuating devices	49 42	1 NO + 1 NC	1.1	Elan
SEP05.2.3.0.22/95	505 2022	22.3	1 emergency stop button 2 black control actuating devices	38.5 42	1 NO + 1 NC	1.1	Elan
SEP05.2.4.0.22/95	505 2032	22.3	1 emergency stop button 2 black control actuating devices	38.5 55	1 NO + 1 NC	1.1	Elan
SEP05.2.2.1.22/95	505 2042	22.3	1 emergency stop button ¹ 2 black control actuating devices	49 40	1 NO + 1 NC	2.1	Elan/ Siemens
SEP05.2.3.1.22/95	505 2052	22.3	1 emergency stop button 2 black control actuating devices	40 40	1 NO + 1 NC	2.1	Siemens
SEP05.2.L.22	505 2202	22.3	Empty enclosure powder coated with 3 bore holes				
SEP05.2.S	505 2999	22.3	Please specify for all special versions: all desired deviations from the standard types in plain text.				
Supplement to type designation	Product						
.Z1 (2 NO + 2 NC)	Emergency stop control device with contact complement 2 NO + 2 NC to DIN VDE 0113 Part 1, Point 5.7 (EN 60204 Part 1)						
.Z2 (1 NO + 1 NC) .Z3 (2 NO + 2 NC)	Lockout device = yellow impact button with latching instead of red emergency stop control device (incl. type plate "lockout device") to safety rules ZH1/456 Point 3.5 (description of lockout device)						
.Z4 (1 NO + 1 NC) .Z5 (2 NO + 2 NC)	Lockout device = yellow impact button with latching additional to red emergency stop control device (incl. type plate "lockout device") to safety rules ZH1/456 Point 3.5 (description of lockout device)						
.Z6 .Z7	Pre-punched, removable aluminium plate with a total of 11 bore holes of 22.3 mm diameter As above, but with additional bore holes closed with round blanks						
.E1 (1 NO + 1 NC) .E2 (1 NO + 1 NC)	Ergonomic mushroom button (with spring in device head) ADP55/3SW, 10.5 N actuating force Ergonomic mushroom button (without spring in device head) ADP55/3SW o.F., 7.0 N actuating force (refer to page 8)						

1) Fitted with Elan emergency stop control device

Dimensions



Operating panel SEP07.0...

for installation of devices with a diameter of 22.3 mm (30.5 mm diameter upon request)



Design features

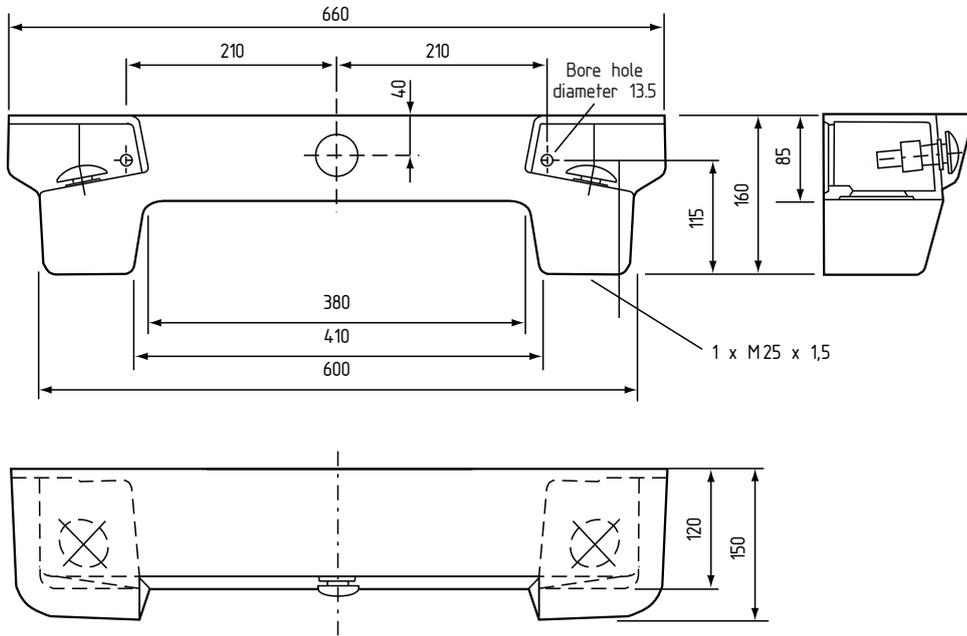
- Aluminium enclosure,
- Ergonomic enclosure shape for predominantly seated work,
- Front operating field b x h = 350 x 80 mm

Type SEP07.0.1.0.22/95, version powder coated RAL 7004

Type	Order No.	Button installation on diameter (mm)	Complement	Mushroom button diameter (mm)	Contacts	Diagram No.	Button make
SEP07.0.1.0.22/95	507 0002	22.3	1 emergency stop button 2 black control actuating devices	49 55	1 NO + 1 NC	1.1	Elan
SEP07.0.2.0.22/95	507 0012	22.3	1 emergency stop button 2 black control actuating devices	49 42	1 NO + 1 NC	1.1	Elan
SEP07.0.3.0.22/95	507 0022	22.3	1 emergency stop button 2 black control actuating devices	38.5 42	1 NO + 1 NC	1.1	Elan
SEP07.0.4.0.22/95	507 0032	22.3	1 emergency stop button 2 black control actuating devices	38.5 55	1 NO + 1 NC	1.1	Elan
SEP07.0.2.1.22/95	507 0042	22.3	1 emergency stop button ¹ 2 black control actuating devices	49 40	1 NO + 1 NC	2.1	Elan/ Siemens
SEP07.0.3.1.22/95	507 0052	22.3	1 emergency stop button 2 black control actuating devices	40 40	1 NO + 1 NC	2.1	Siemens
SEP07.0.L.22	507 0202	22.3	Empty enclosure powder coated with 3 bore holes				
SEP07.0.S	507 0999	22.3	Please specify for all special versions: all desired deviations from the standard types in plain text.				
Supplement to type designation	Product						
.Z1 (2 NO + 2 NC)	Emergency stop control device with contact complement 2 NO + 2 NC to DIN VDE 0113 Part 1, Point 5.7 (EN 60204 Part 1)						
.Z2 (1 NO + 1 NC) .Z3 (2 NO + 2 NC)	Lockout device = yellow impact button with latching instead of red emergency stop control device (incl. type plate "lockout device") to safety rules ZH1/456 Point 3.5 (description of lockout device)						
.Z4 (1 NO + 1 NC) .Z5 (2 NO + 2 NC)	Lockout device = yellow impact button with latching additional to red emergency stop control device (incl. type plate "lockout device") to safety rules ZH1/456 Point 3.5 (description of lockout device)						
.E1 (1 NO + 1 NC) .E2 (1 NO + 1 NC)	Ergonomic mushroom button (with spring in device head) ADP55/3SW, 10.5 N actuating force Ergonomic mushroom button (without spring in device head) ADP55/3SW o.F., 7.0 N actuating force (refer to page 8)						

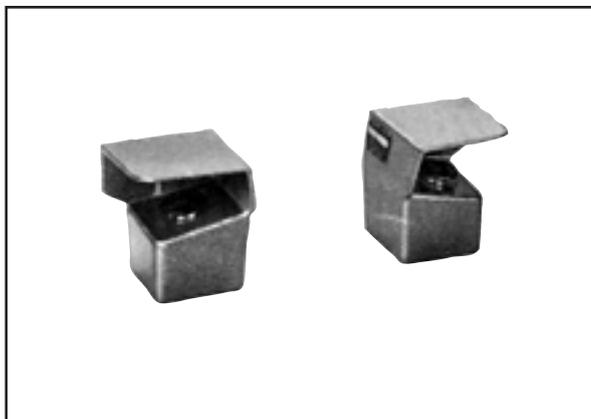
1) Fitted with Elan emergency stop control device

Dimensions



Operating panel SEP09.0...*

for installation of devices with a diameter of 22.3 mm (30.5 mm diameter upon request)



Design features

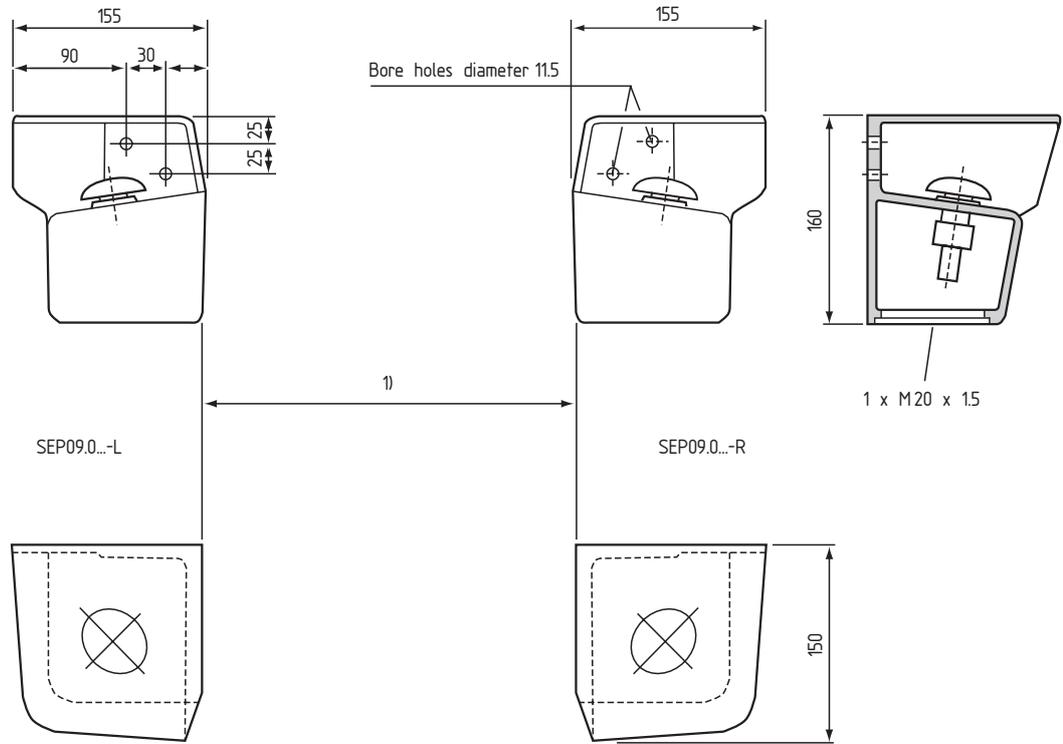
- Aluminium enclosure,
- For separate assembly of the control actuating devices for two-hand operation

Type SEP09.0.1.0.22/95, version powder coated RAL 7004

Type	Order No.	Button installation on diameter (mm)	Complement	Mushroom button diameter (mm)	Contacts	Diagram No.	Button make
SEP09.0.1.0.22/95	509 0002	22.3	2 black control actuating devices	55	1 NO + 1 NC	1.1	Elan
SEP09.0.3.0.22/95	509 0022	22.3	2 black control actuating devices	42	1 NO + 1 NC	1.1	Elan
SEP09.0.3.1.22/95	509 0052	22.3	2 black control actuating devices	40	1 NO + 1 NC	2.1	Siemens
SEP09.0.L.22	509 0202	22.3	Empty enclosure powder coated with 1 bore hole each				
SEP09.0.S	509 0999	22.3	Please specify for all special versions: all desired deviations from the standard types in plain text.				
The two-hand operation consists of a left (SEP09.0...-L) and a right (SEP09.0...-R) part. When installing on a machine special attention must be paid to EN 574 and the distance between the control actuating devices of the two-hand operation.							
Supplement to type designation	Product						
.E1 (1 NO + 1 NC) .E2 (1 NO + 1 NC)	Ergonomic mushroom button (with spring in device head) ADP55/3SW, 10.5 N actuating force Ergonomic mushroom button (without spring in device head) ADP55/3SW/o.F., 7.0 N actuating force (refer to page 8)						
.BWT-1 .BWT-2	Complete set: sensor button A + B, output cable 2 m, including connection cable, without two-hand relay modules Complete set: sensor button A + B, output cable 5 m, including connection cable, without two-hand relay modules (refer to pages 11 and 41 et seq. for two-hand relay modules)						
Installation costs per button pair BWT-1/-2 will be separately charged depending on unit numbers, e.g. 1–4 units or 5–10 units.							

* Without prototype test because the conditions for use are to be ensured by the user.

Dimensions



1) Distance to EN 574 : 1997 to be set by user.

NEW: Stand STPSK-1/STPSK-2**



Design features

- Mobile plate bent structure with bore holes for floor fixing
- With height adjustment and spacer ring
- Can be combined with operating panel SEP... and foot-pedal switches with protective cover for use as two-hand foot-pedal operating station (for further details refer to page 10)

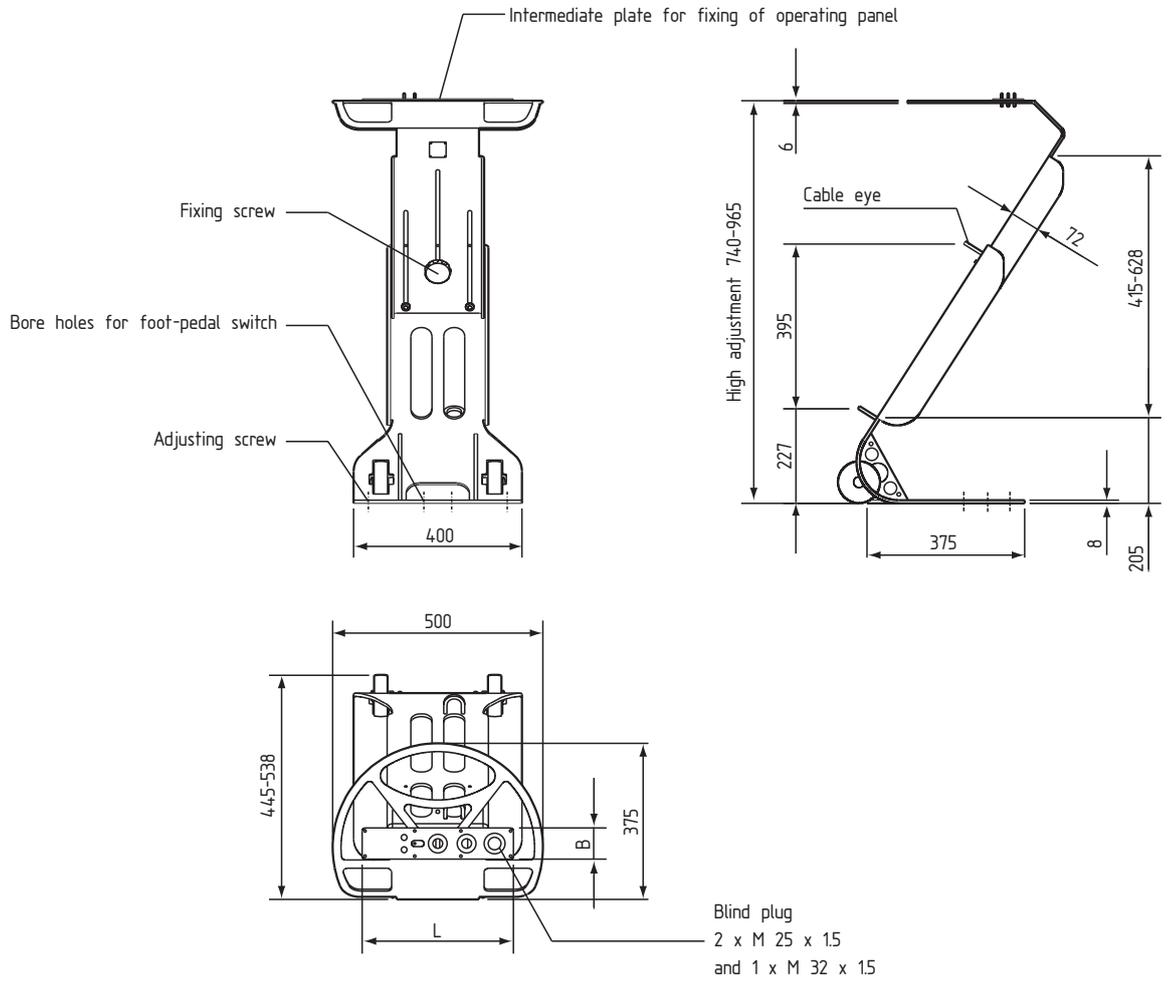
Type STPSK... (including threaded pins M 10 x 16), version RAL 7016 powder coated

Type	Order No.	Spacer ring	Version	Use for the two-hand operating panels
STPSK-1	520 5030	yes	<p>Tough mobile plate bent structure with 2 x M 25 x 1.5/1 x M 32 x 1.5 outlets in the ZPL intermediate plate for the two-hand operating panel.</p> <p>The semi-circular spacer ring can be used as carry/pull device.</p> <p>Stand height: 740-965 mm height adjustable (from foot plate – underside of operating panel).</p> <p>The bottom part of the stand has two eyes for outer cables.</p> <p>The facility exists to additionally mount 1- and 2-pedal foot switches.</p> <p>Suitable for scanner recognition because the U profile in the centre part $\geq 80 \times 80$ mm.</p> <p>The ring running around the upper part of the stand provides protection for the two-hand operating panel from damage should the stand fall over.</p>	<p>SEPG05.3... SEPK02.0... SEP01.0... SEP01.4... (not possible for SEP07.0...) with intermediate plate ZPL1* Dimensions: l = 360 mm; b = 75 mm</p>
STPSK-2	520 5031	yes	ditto	<p>SEP05.1... SEP05.2... with intermediate plate ZPL-2 Dimensions: l = 410 mm, b = 100 mm</p>

* For assembly with SEPG05.3... or SEPK02.0... two or three grounding bolts must be punched out by the user on the ZPL intermediate plate (this step is not necessary for the user if stands are ordered with operating panels already fitted).

** see also note on page 10, last paragraph

Dimensions



Stand STPLC-1/STPLC-2**



Design features

- Welded structure with threaded bore holes for floor fixing
- Without height adjustment/without spacer ring
- Can be combined with operating panel SEP... for use as two-hand foot-pedal operating station

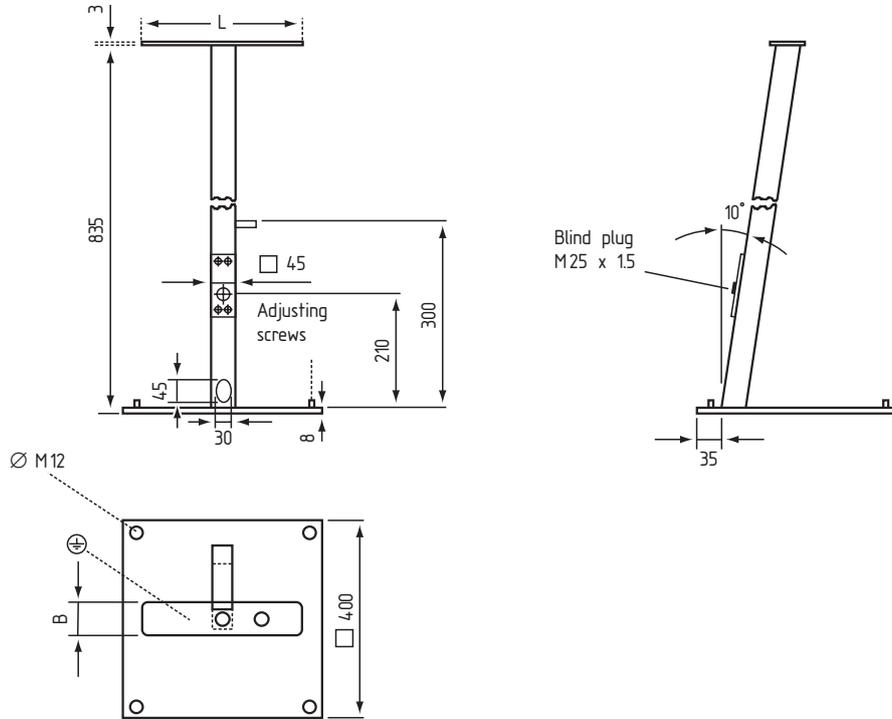
Type STPLC-... (including threaded pins M 12 x 10), version RAL 7016 powder coated

Type	Order No.	Version	Use for the two-hand operating panels
STPLC-1	520 5010	Steel welded structure 2 x M 25 x 1.5/1 x M 32 x 1.5 outlets in the ZPL intermediate plate for the two-hand operating panel, powder coating: RAL 7016 Stand height: 835 mm (from foot plate – underside of operating panel). Suitable for retrofitting of foot-pedals. With 1 x M 25 x 1.5 cable outlet in the lower part of the upright – within a screw-on flanged cover; it covers a recess for a plug-in connection H-16E.	SEPG05.3... SEPK02.0... SEP01.0... SEP01.4... SEP07.0... with intermediate plate ZPL1* Dimensions: l = 360 mm; b = 75 mm
STPLC-2	520 5020	dto.	SEP05.1... SEP05.2... with intermediate plate ZPL2 Dimensions: l = 410 mm; b = 100 mm

* For assembly with SEPG05.3... or SEPK02.0... two or three grounding bolts must be punched out by the user on the ZPL intermediate plate (this step is not necessary for the user if stands are ordered with operating panels already fitted).

** see also note on page 10, last paragraph

Dimensions



Low-cost stand with square steel floor plate (400 x 400 x 8 mm) instead of a cast circular plate. The floor plate is suitable for the retrofitting of one or several pedalled foot switches. Bore holes for fixing the foot operation are not provided due to the many variations but can be provided upon request.

Four threaded pins on the corners of the plate serve to level out the floor plate and to fix to the floor. A square tubular upright with corresponding ZPL adapter plate fitted to the floor plate at an angle of 10° permits the installation of all SEP two-hand operating panels.

The wiring can be run through the square tubular upright over the rear flanged cover or through the side cable outlet on the lower side of the operating panel next to the upright (side cable eye exists). Two openings with diameter of 30 mm are provided on the front and rear side for the cable outlet.

Stand STP01.1.../STP01.4...**



Design features

- Welded structure with threaded bore holes for floor fixing
- Without height adjustment
- STP01.1... without spacer ring
- STP01.4... with spacer ring

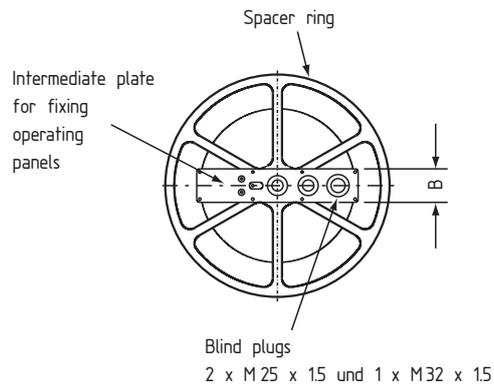
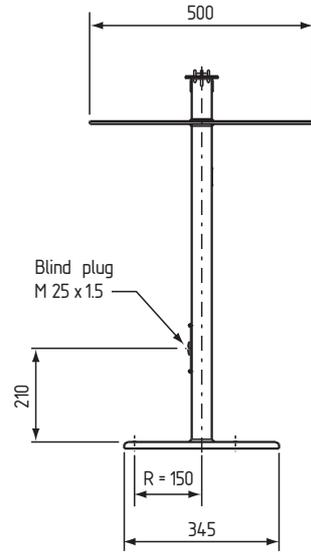
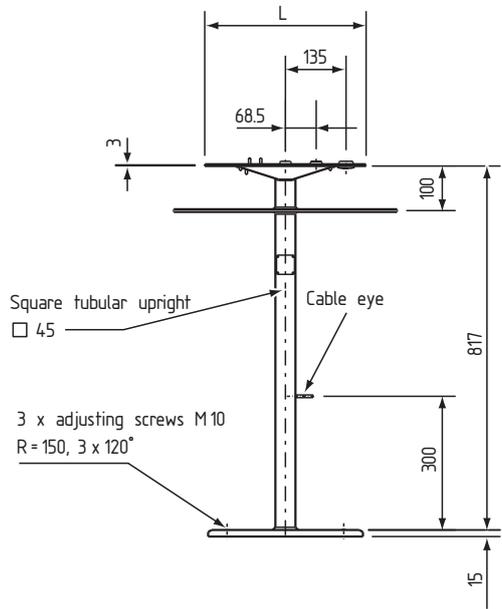
Type STP01.1... (including threaded pins M 10 x 16), version RAL 7016 powder coated

Type	Order No.	Spacer ring	Version	Use for the two-hand operating panels
STP01.1.1	510 1001	no	Steel welded structure with 2 x M 25 x 1.5/1 x M 32 x 1.5 outlets in the ZPL intermediate plate for the two-hand operating panel. With 1 x M 25 x 1.5 cable outlet in the lower part of the upright – within a screw-on flanged cover; it covers a recess for a plug-in connection H-16E. With eye for outer laying of cables.	SEPG05.3... SEPK02.0... SEP01.0... SEP01.4... SEP07.0... with intermediate plate ZPL1* Dimensions: l = 360 mm; b = 75 mm
STP01.1.2	510 1002	no	Stand height: 835 mm (from foot plate – underside of operating panel).	SEP05.1... SEP05.2... with intermediate plate ZPL2 Dimensions: l = 410 mm; b = 100 mm
STP01.4.1	510 4001	yes		SEPG05.3... SEPK02.0... SEP01.0... SEP01.4... SEP07.0... with intermediate plate ZPL1* Dimensions: l = 360 mm; b = 75 mm
STP01.4.2	510 4002	yes		SEP05.1... SEP05.2... with intermediate plate ZPL2 Dimensions: l = 410 mm; b = 100 mm

* For assembly with SEPG05.3... or SEPK02.0... two or three grounding bolts must be punched out by the user on the ZPL intermediate plate (this step is not necessary for the user if stands are ordered with operating panels already fitted).

** see also note on page 10, last paragraph

Dimensions



Stand STP01.5...**



Design features

- Welded structure with threaded bore holes for floor fixing
- Without height adjustment
- Spacer ring to be fixed and welded by the user

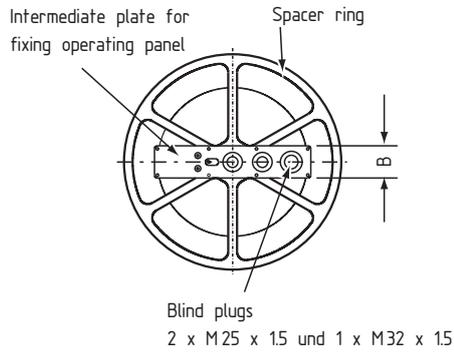
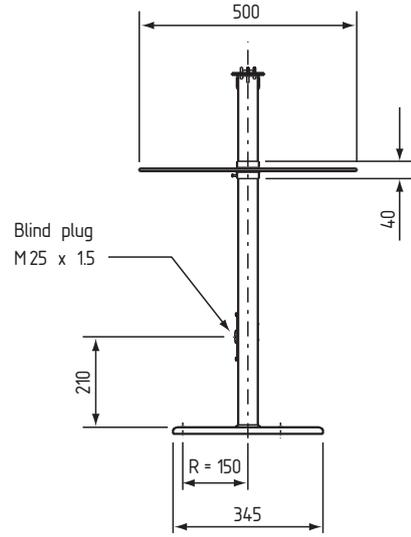
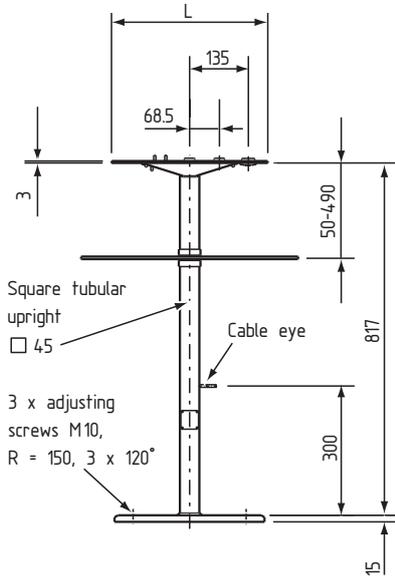
Type STP01.5... (including threaded pins M 10 x 16), spacer ring not fixed, version primed only

Type	Order No.	Spacer ring	Version	Use for the two-hand operating panels
STP01.5.1	510 5001	yes	Steel welded structure with 2 x M 25 x 1.5/1 x M 32 x 1.5 outlets in the ZPL intermediate plate for the two-hand operating panel. In order to adapt the spacer ring to the different machine table heights it can be moved up and down the tubular upright. The user provides welding down of the spacer ring. The ring running around the upper part of the stand provides protection for the two-hand operating panel from damage should the stand fall over.	SEPG05.3... SEPK02.0... SEP01.0... SEP01.4... SEP07.0... with intermediate plate ZPL1* Dimensions: l = 360 mm; b = 75 mm
STP01.5.2	510 5002	yes	The complete stand is supplied in primed state only. The remaining features correspond to the stands STP01.4 and STP01.4.2.	SEP05.1... SEP05.2... with intermediate plate ZPL2 Dimensions: l = 410 mm; b = 100 mm

* For assembly with SEPG05.3... or SEPK02.0... two or three grounding bolts must be punched out by the user on the ZPL intermediate plate (this step is not necessary for the user if stands are ordered with operating panels already fitted).

** see also note on page 10, last paragraph

Dimensions



Stand STP02.1.../STP02.4...**



Design features

- Welded structure with threaded bore holes for floor fixing
- With height adjustment
- STP02.1... without spacer ring
- STP02.4... with spacer ring

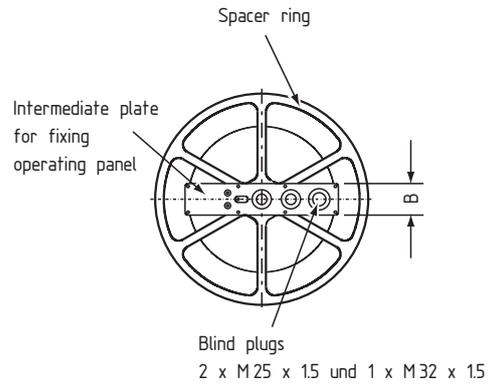
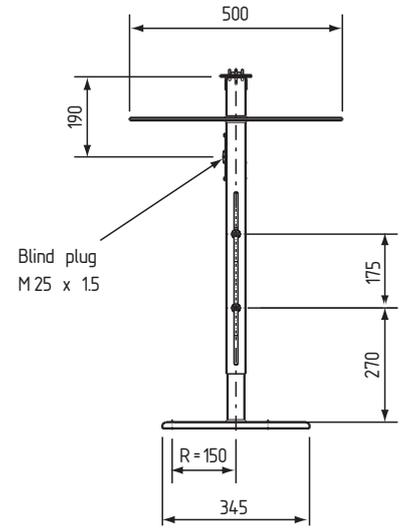
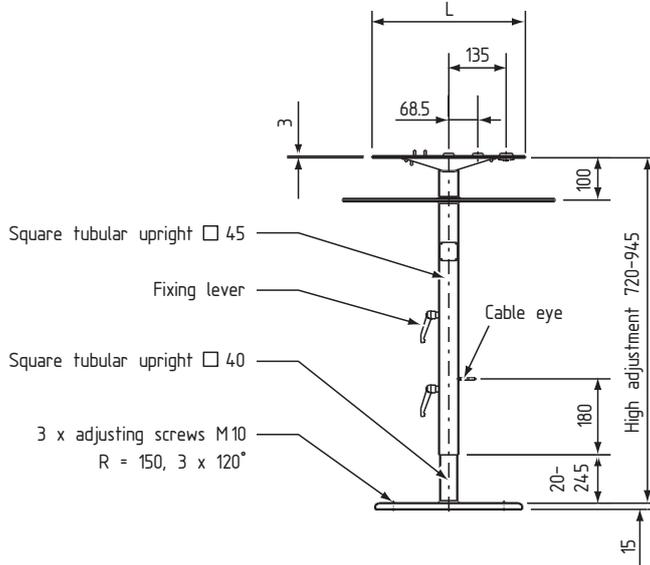
Type STP02.4... (including threaded pins M 10 x 16), spacer ring welded, version RAL 7016 powder coated

Type	Order No.	Spacer ring	Version	Use for the two-hand operating panels
STP02.1.1	520 1001	no	Steel welded structure with 2 x M 25 x 1.5/1 x M 32 x 1.5 outlets in the ZPL intermediate plate for the two-hand operating panel. With 1 x M 25 x 1.5 cable outlet in the lower part of the upright – within a screw-on flanged cover; it covers a recess for a plug-in connection H-16E. With eye for outer laying of cables.	SEPG05.3... SEPK02.0... SEP01.0... SEP01.4... SEP07.0... with intermediate plate ZPL1* Dimensions: l = 360 mm; b = 75 mm
STP02.1.2	520 1002	no	The ring running around the upper part of the stand provides protection for the two-hand operating panel from damage should the stand fall over. Stand height:740–965 mm adjustable (from foot plate – underside of operating panel).	SEP05.1... SEP05.2... with intermediate plate ZPL2 Dimensions: l = 410 mm; b = 100 mm
STP02.4.1	520 4001	yes		SEPG05.3... SEPK02.0... SEP01.0... SEP01.4... SEP07.0... with intermediate plate ZPL1* Dimensions: l = 360 mm; b = 75 mm
STP02.4.2	520 4002	yes		SEP05.1... SEP05.2... with intermediate plate ZPL2 Dimensions: l = 410 mm; b = 100 mm

* For assembly with SEPG05.3... or SEPK02.0... two or three grounding bolts must be punched out by the user on the ZPL intermediate plate (this step is not necessary for the user if stands are ordered with operating panels already fitted).

** see also note on page 10, last paragraph

Dimensions



Standard control devices

Elan make

Application

Elan control devices are tough even under difficult industrial conditions. For example, the device buttons are made of anodised

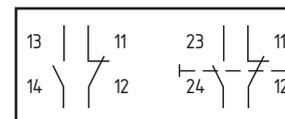
aluminium without Cu or made of high-quality plastics. The sealing of the devices with special bellows-type seals corresponds to a class of protection of IP 65.

The relative flatness of the devices and the design permit ergonomic operation even under conditions of frequent use.

Circuit diagrams (standard equipment):

Left: for mushroom buttons
Right: for emergency stop

Circuit diagram no. 1.1:



Description

Name	Colour	Installed diameter (mm)	Mushroom diameter (mm)	Type designation	Contacts
Control actuating device	black	22.3	42	EDP42SW + EF03.1 + EF10.1	1 NO + 1 NC (in separate model)
Control actuating device	black	22.3	55	EDP55SW + EF03.1 + EF10.1	1 NO + 1 NC (in separate model)
Control actuating device	black	22.3	55	ADP55/3SW + AF02 + AF10	1 NO + 1 NC (in separate model)
Control actuating device	black	22.3	55	ADP55/3SW o.F. + AF02 + AF10	1 NO + 1 NC (in separate model)
Emergency stop button	red	22.3	38.5	EDRR40RT + EFR + EF303.1	1 NO + 1 NC
Emergency stop button	red	22.3	49	EDRR50RT + EFR + EF303.1	1 NO + 1 NC
Emergency stop button	red	22.3	38.5	KDRRK40RT + EFR + EF303.1	1 NO + 1 NC
Contact blocks				EF033.1 + EF110.1	2 NO + 2 NC (in separate model)
Contact blocks				EF303.1 + EF303.2	2 NO + 2 NC (for emergency stop)

Technical data (refer to catalogues D-22.G and D-22.A)

Contacts	NC contact elements positively opening, high contact stability due to double contact pieces
Related insulation voltage U_i	E program: 440 V, test voltage 2,500 V A program: 500 V, test voltage 2,500 V
Air and creeping distances according to pollution degree	Class III to DIN VDE 0110
Rated operating current I_e depending on utilisation category and test voltage	E program: 8 A, AC 15, 250 VAC/5 A, DC 13, 24 VDC A program: 6 A, AC 15, 250 VAC/3 A, DC 13, 24 VDC
Short circuit protection	gG 10 A slow-blowing
Mechanical serviceable life to DIN VDE 0660 Part 200	E program: 10×10^6 operating cycles A program: 5×10^6 operating cycles
Temperature range	E program: $-25 \dots +80^\circ\text{C}$ A program: $-25 \dots +60^\circ\text{C}$
Installed position	Optional
Connection cross-section	E program: screwed connection up to $2 \times 0,5 \dots 1,5 \text{ mm}^2$ (also with wire-end ferrule) A program: screwed connection up to $2 \times 0,5 \dots 2,5 \text{ mm}^2$ (with wire-end ferrules up to $1,5 \text{ mm}^2$)
Actuating force (until the NO contact closes)	Mushroom button EDP55SW + EF03.1 + EF10.1 (1 NO + 1 NC): approx. 26 N Mushroom button EDP55SW + EF033.1 + EF110.1 (2 NO + 2 NC): approx. 27 N Mushroom button ADP55/3SW + AF02 + AF10 (1 NO + 1 NC): 10.5 N Mushroom button ADP55/3SW o.F. + AF02 + AF10 (1 NO + 1 NC): 7.0 N

Standard control devices

Siemens make

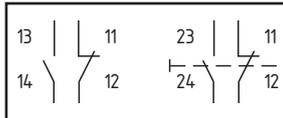
Circuit diagrams

(standard equipment):

left: for mushroom buttons;

right: for emergency stop

Circuit diagram no. 2.1:



Description

Name	Colour	Installed diameter (mm)	Mush-room diameter (mm)	Type designation	Contacts
Control actuating device	black	22.3	40	3SB1000-1RB20 + 3SB1400-OB + 3SB1400-OC	1 NO + 1 Ö
Emergency stop button	red	22.3	40	3SB3000-1HA20 + 3SB3400-OB + 3SB3400-OC	1 NO + 1 Ö
Contact block				3SB1400-OG + 3SB1400-OH	2 NO + 2 NC (in separate model)
Contact block				3SB3400-OD + 3SB3400-OE	2 NO + 2 Ö

Technical data

Contacts	NC contact elements positively opening, high contact stability due to double contact pieces				
Rated insulation voltage U_i	For screwed connection 660 V (3SB1...), 400 V (3SB3...)				
Air and creeping distances according to pollution degree	Class III to DIN VDE 0110				
Rated operating current U_E	For screwed connection 3SB1...: UC 660 V For screwed connection 3SB3...:				
	Alternating current 50 ... 60 Hz			Direct current	
	AC 12 screwed/soldered connection	I_e /AC 15 screwed connection	Soldered connection	I_e /DC 12 screwed/soldered connection	I_e /DC 13 screwed/soldered connection
	A	A	A	A	A
at 24 V	10	6	4	10	3
at 48 V	10	6	4	5	1.5
at 110 V	10	6	4	2.5	0.7
at 230 V	10	6	4	1	0.3
at 400 V	10	3	–	–	–
Short circuit protection	10TDZ, 16ADZ				
Mechanical serviceable life	10 x 10 ⁶ operating cycles				
Ambient temperature	–25 ... +60° C				
Installed position	Optional				
Connection cross-section	For screwed connection: 2 x 0.5 ... 1.5 mm ² (also with wire-end ferrules), 2 x 1 ... 2.5 mm ² (single wire), 2 x 0.5 ... 0.75 mm ² (single wire-end ferrules to DIN 46 228)				
Actuating forces (until the NO contact closes)	Mushroom button 3SB1000-1RB20 + 3SB1400-OB + 3SB1400-OC (1 NO + 1 NC): approx. 13 N				

Standard control devices

BWT sensor buttons (BWT-1/-2)

Description

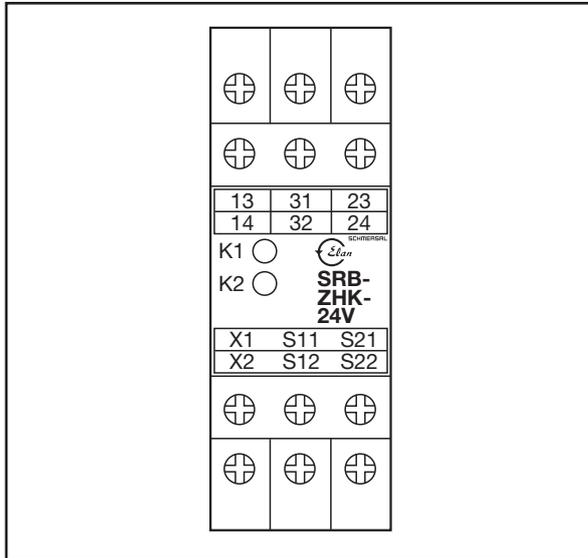
Name	Installed diameter (mm)	Actuating surface (mm)	Type designation	Contacts/ outputs
Sensor A including connection cable	45–60	63	BWT-SCA4-185Z-E	1 NO + 1 NC
Sensor B	45–60	63	BWT-SCB4-185Z-E	1 NO + 1 NC
Cable box with 2 or 5 m cable, black, for sensor A to connection sensor A to the two-hand relay SRB-ZHK-24VDC or SRB 201ZH-24VDC, M12, elbow type, 5 pole			BWT-LKW-SCA-2 or -5	
Cable box with 2 or 5 m cable, black, for sensor B to connection sensor B to the two-hand relay SRB-ZHK-24VDC or SRB 201ZH-24VDC, M12, elbow type, 5 pole			BWT-LKW-SCB-2 or -5	

Technical data

Input	
Operating voltage	24 VDC ± 10%
Residual ripple	max. 10%
Power consumption	< 65 mA
Switching frequency	1 Hz
Touch speed	> 50 mm/s
Output	
Contact complement	1 NO contact, 1 NC contact
Relay type	PhotoMOS relay, electronic
Minimum current	> 10 mA per contact
Switching capacity	200 mA/24 VDC per contact
Life and reliability	> 100 x 10 ⁶ switching cycles semiconductor level
General data	
Sensor principle	Capacitive static-dynamic
Temperature range	0° C ... +55° C
Class of protection	IP 68, plug IP 67
Enclosure material	Polycarbonate (PC)
EMC	
Static discharge (ESO)	8 kV EN 61 000-4-2
RF interference	10 V/m EN 61 000-4-3
Fast transients (burst)	4 kV EN 61 000-4-4
RF cabling	10 V EN 61 000-4-6
Radio interference suppression	Class B EN 55 011

Two-hand relay module SRB-ZHK-24 VDC

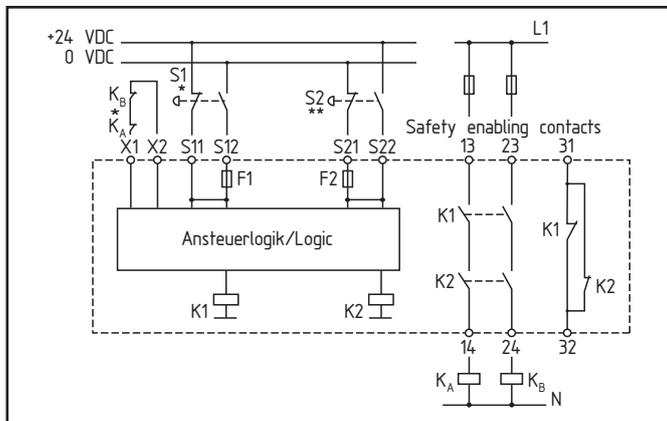
according to EN 574 : 1997 Type III C for signal processing in safety circuits



Design features

- Relay outputs 2 NO contacts and 1 auxiliary NC contact with exclusive-OR mode of operation (auxiliary contacts may not be used in safety circuits)
- Feedback circuit
- Green LED displays for relay K1 and K2
- 22.5 m enclosure made of thermoplastics to UL-94-V-O, signal red RAL 3000
- Top-hat rail assembly DIN EN 50 022

Version/description	Enabling outputs	Operating voltage	Prototype tests	Order No.
SRB-ZHK-24 VDC	2 NO/1 NC	24 VDC	02047	610 0698
SRB-NA-R-C.ZHK-24 VDC	2 NO/1 NC	24 VDC	02047, c(U) _{us} E 54284	610 0699



* Feedback circuit

** N.B.: The NC contact of button S1 and S2 must have opened before the NO contact closes. No overlapping contacts because otherwise the fuses F1 and F2 would trigger.

Power level:

Dual-channel triggering, suitable for contact amplification and contact multiplication through relay or contactor with positively driven contacts.

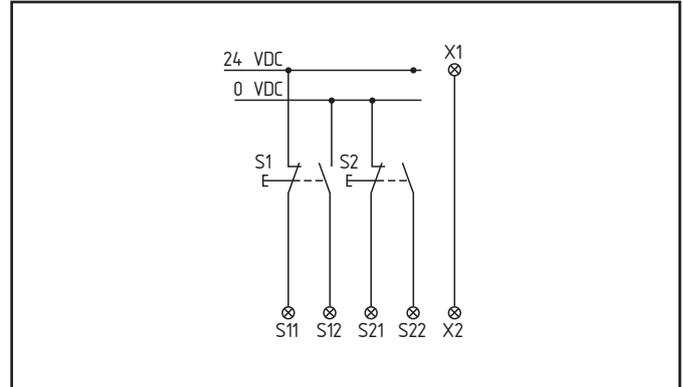
Technical data

Operating voltage	24 VDC -15%/+10%, residual ripple max. 10%
Fusing, internal	F1 + F2: 250 mA
Power consumption	1.2 VA
Switching capacity of the enabling contacts	230 VAC, 6 A ohmic (inductive with suitable protective circuitry)
Fusing of the enabling contacts	6 A slow blowing
Switching capacity of the auxiliary contacts	24 VDC, 2 A ohmic (inductive with suitable protective circuitry)
Fusing of the auxiliary contacts	2 A slow blowing
Utilisation categories	to VDE 0660 Part 200: AC 15/DC 13
ON period	100% c.d.f.
Pick-up delay	< 10 ms
Response time	< 20 ms
Contact material/contacts	AgSnO, self-cleaning, positively driven
Contact resistance	max. 100 mOhm in new condition
Air and creepage distances	DIN VDE 0110 Part I/Part 2, 4 kV/2
Cable connections	Self-lifting screw terminals; min. 0.5 mm ² ; max. 2 x 2.5 mm ² , strand or multi-core conductor with wire-end ferrule
Noise suppression measures	Integrated noise suppression diodes, electronic EMC protective circuitry if necessary
Indication	LEDs
Dimensions	h/w/d 82 mm/22.5 mm/98.8 mm
Weight	200 g
Enclosure material	Glass-fibre-reinforced thermoplastic with self-extinguishing properties in accordance with UL-94-V-0
Colour	Signal red RAL 3000
Protection class of the enclosure	IP 40
Protection class of the terminal area	IP 20
Fixing	Top-hat rail DIN EN 50 022
Oscillations	Frequency 10–55 Hz, amplitude 0,35 mm
Installed position	Optional
Operating temperature	0–40° C (derating curve upon request)
Storage temperature	-25 ... +70° C
Mechanical serviceable life	10 ⁶ switching cycles

Trigger level

Two-hand operation to EN 574 and EN 60 204-1

- Fault of each pushbutton contact as well as earth-faults and cross shorts are detected.
- Feedback circuit: The safety function of external positively driven contactors is monitored by a series connection of the NC contacts with the terminals X1 and X2. This circuit must be closed in release condition.
- Control category III/C to EN 574

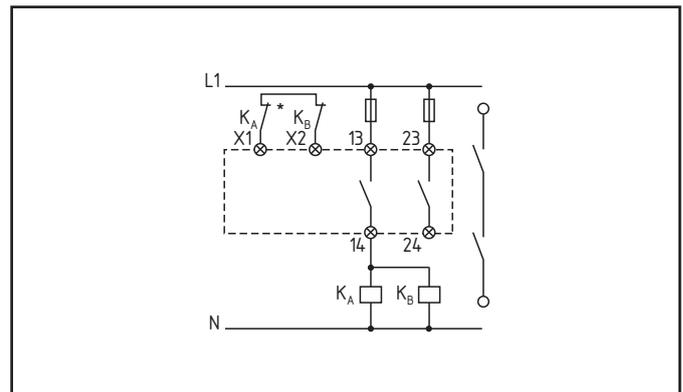


Power level

Single-channel triggering

- Suitable for contact amplification and multiplication
- If the feedback circuit (linking of X1-X2) is not required this must be replaced by a jumper.

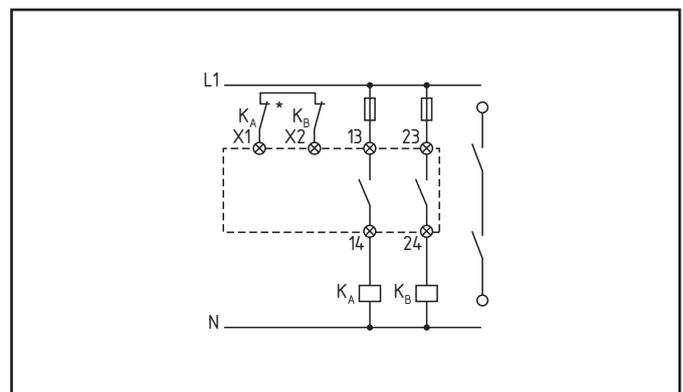
* Feedback circuit



Dual-channel triggering

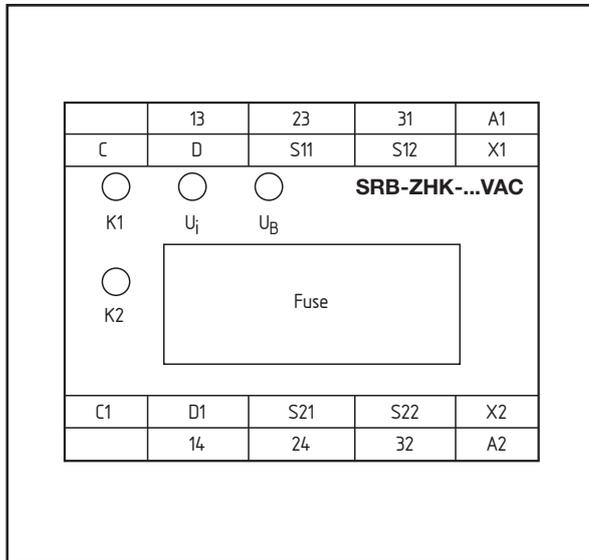
- Suitable for contact multiplication
- If the feedback circuit (linking of X1-X2) is not required this must be replaced by a jumper.

* Feedback circuit



Two-hand relay module SRB-ZHK-230 VAC

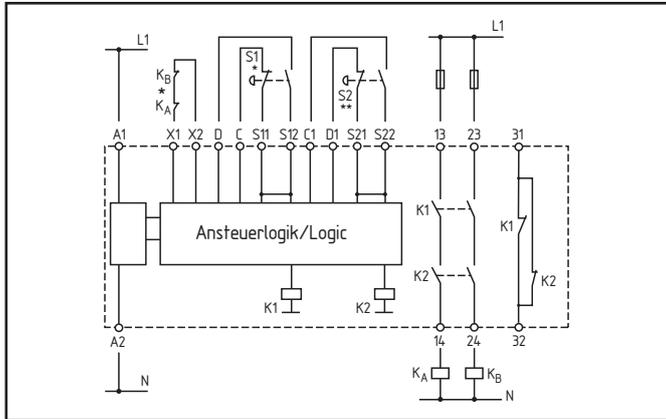
according to EN 574 : 1997 Type III C for signal processing in safety circuits



Design features

- Relay outputs 2 NO contacts and 1 auxiliary NC contact with exclusive-OR mode of operation (auxiliary contacts may not be used in safety circuits)
- Feedback circuit
- Green LED displays for relay K1 and K2, UB and Uj
- 45 mm enclosure made of thermoplastics to UL-94-V-O, signal red RAL 3000
- Top-hat rail assembly DIN EN 50 022

Version/description	Enabling outputs	Operating voltage	Prototype tests	Order No.
SRB-ZHK-230 VAC	2 NO/1 NC	230 VAC	02047	610 0697
SRB-ZHK-115 VAC	2 NO/1 NC	115 VAC	02047	610 0695
SRB-ZHK-48 VAC	2 NO/1 NC	48 VAC	02047	610 0693
SRB-ZHK-24 VAC	2 NO/1 NC	24 VAC	02047	610 0691



* Feedback circuit

** N.B.: The NC contact of buttons S1 and S2 must have opened before the NO contact closes. No overlapping contacts because otherwise the fuse Si2 would trigger.

Power level:

Dual-channel triggering, suitable for contact amplification and contact multiplication through relay or contactor with positively driven contacts

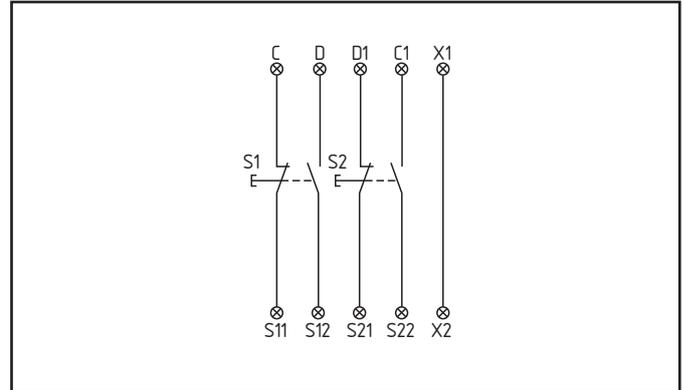
Technical data

Operating voltage	24 VAC, 48 VAC, 115 VAC, 230 VAC -15%/+6%, 50/60 Hz
Fusing of the operating voltage	Si1 (internal): 125 mA; Si2: 80 mA
Power consumption	4 VA
Switching capacity of the enabling contacts	230 VAC, 6 A ohmic (inductive with suitable protective circuitry)
Fusing of the enabling contacts	6 A slow blowing
Switching capacity of the auxiliary contacts	24 VDC, 2 A ohmic (inductive with suitable protective circuitry)
Fusing of the auxiliary contacts	2 A slow blowing
Utilisation categories	AC 15/DC 13
ON period	100% c.d.f.
Pick-up delay	< 10 ms
Response time	< 20 ms
Contact material/contacts	AgSnO, self-cleaning, positively driven
Contact resistance	max. 100 mOhm in new condition
Air and creepage distances	DIN VDE 0110 Part I/Part 2, 4 kV/2
Cable connections	Self-lifting screw terminals; min. 0.5 mm ² ; max. 2 x 2.5 mm ² , strand or multi-core conductor with wire-end ferrule
Noise suppression measures	Integrated noise suppression diodes, electronic EMC protective circuitry if necessary
Indicators	LEDs
Dimensions	h/b/d 83 mm/45 mm/140 mm
Weight	360 g
Enclosure material	Glass-fibre-reinforced thermoplastic with self-extinguishing properties in accordance with UL-94-V-0
Colour	Signal red RAL 3000
Protection class of the enclosure	IP 40
Protection class of the terminal area	IP 20
Fixing	Top-hat rail DIN EN 50 022
Oscillations	Frequency 10–55 Hz, amplitude 0.35 mm
Installed position	Any
Operating temperature	0–40°C (derating curve upon request)
Storage temperature	-25 ... +70°C
Mechanical serviceable life	10 ⁶ switching cycles

Trigger level

Two-hand operation to EN 574 and EN 60 204-1

- Fault of each pushbutton contact as well as earth-faults and cross shorts are detected.
- Feedback circuit: The safety function of external positively driven contactors is monitored by a series connection of the NC contacts with the terminals X1 and X2. This circuit must be closed in release condition.
- Control category III/C to EN 574

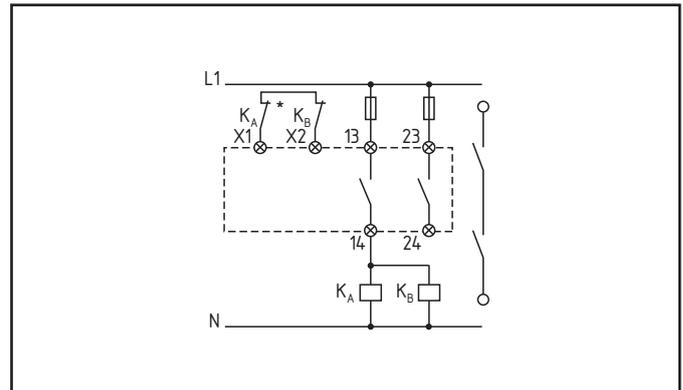


Power level

Single-channel triggering

- Suitable for contact amplification and multiplication
- If the feedback circuit (linking of X1-X2) is not required this must be replaced by a jumper.

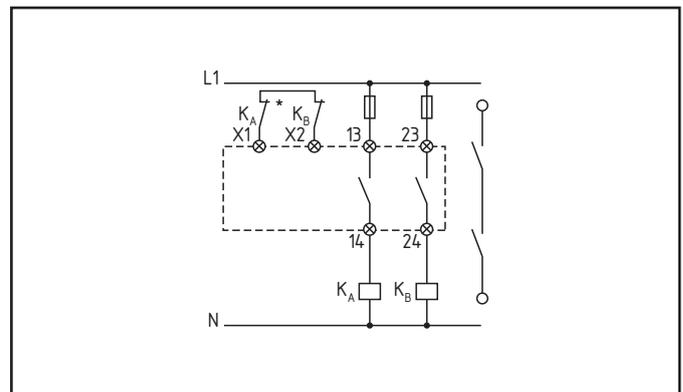
* Feedback circuit



Dual-channel triggering

- Suitable for contact multiplication
- If the feedback circuit (linking of X1-X2) is not required this must be replaced by a jumper.

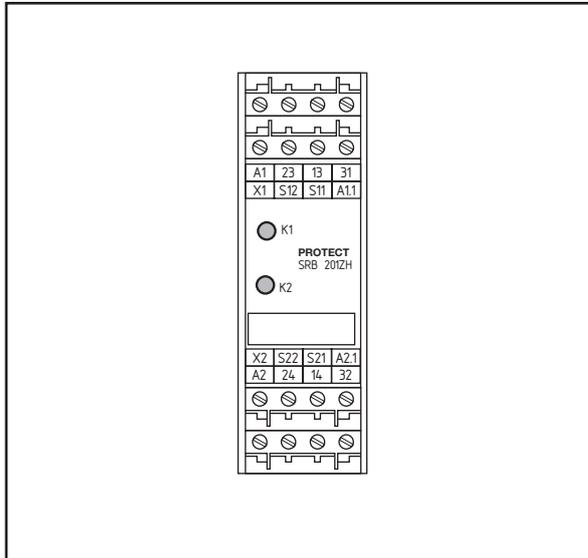
* Feedback circuit



Refer to page 50 for sequence chart

Two-hand relay module SRB 201ZH-24VDC

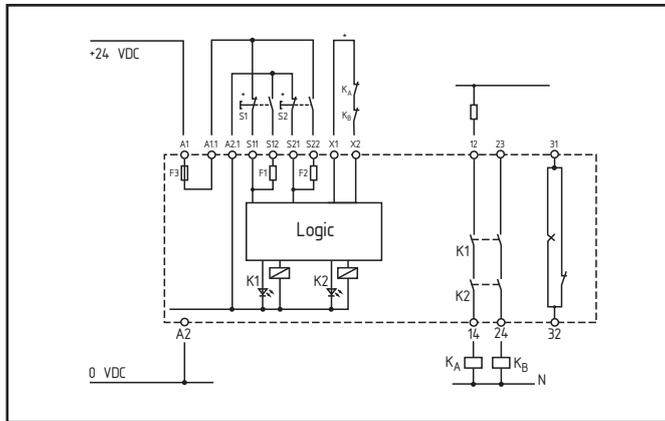
according to EN 574 : 1997 Type III C for signal processing in safety circuits



Design features

- Plug-in terminals
- 2 safety enabling outputs
- Feedback output with NC function (isolated)
- Feedback circuit
- Green LED indicators for relay K1 and K2
- 22.5 mm enclosure made of thermoplastic
- Top-hat rail assembly DIN EN 50022

Version/description	Enabling outputs	Operating voltage	Prototype tests	Order No.
SRB 201ZH	2 NO/1 NC	24 VDC	02187, , (in preparation)	610 0686



* Feedback circuit (this is to be replaced by a jumper if the feedback circuit is not required)

** N.B.: The NC contact of button S1 and S2 must have opened before the NO contact closes. No overlapping contacts because otherwise the fuses F1 and F2 would trigger.

Power level:
Dual-channel triggering, suitable for contact amplification and contact multiplication through relay or contactor with positively driven contacts

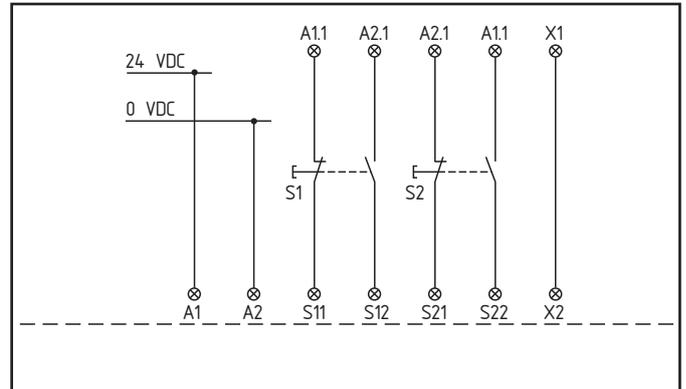
Technical data

Rated operating voltage	24 VDC $-15\%/+20\%$, residual ripple max. 50%
Power consumption	max. 1.2 W
Fusing of the operating voltage	Internal electronic fusing F1, F2, tripping current > 0.2 A, internal electronic fusing F3, tripping current > 0.6 A
Switching capacity of the enabling contacts	230 VAC, 6 A ohmic (inductive with suitable protective circuitry)
Fusing of the enabling contacts	6 A slow blowing
Switching capacity of the auxiliary contacts	24 VDC, 2 A
Fusing of the auxiliary contacts	2 A slow blowing
Utilisation categories	AC 15: 230 VAC, 6 A; DC 13: 24 VDC, 6 A; EN 60947-5
Pick-up delay	≤ 50 ms
Response time	≤ 30 ms
Contact material/contacts	AgSnO, self-cleaning, positively driven
Contact resistance	max. 100 mOhm in new condition
Air and creepage distances	DIN VDE 0110-1 (04.97), 4 kV/2
Cable connections	Self-lifting screw terminals; min. 0.2 mm ² ; max. 2.5 mm ²
Dimensions	h/b/d 100 mm/22.5 mm/121 mm
Weight	200 g
Operating ambient temperature	$-25^{\circ}\text{C} \dots 45^{\circ}\text{C}$ (derating curve upon request)
Mechanical serviceable life	10^7 switching cycles
Terminal labelling	DIN EN 50 005/DIN 50 013

Start – sensor configuration

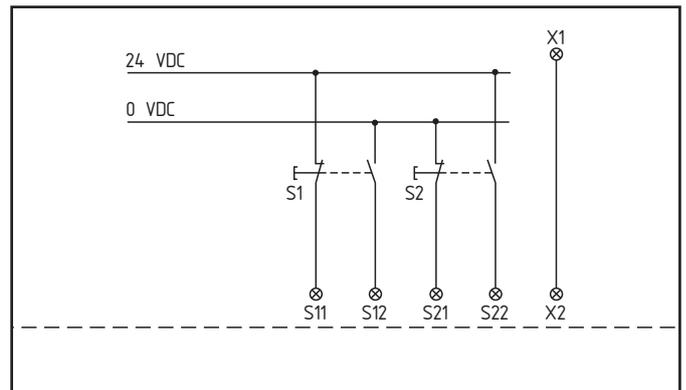
Two-hand operation to DIN EN 574 and EN 60 204-1 (internal supply)

- The supply voltage of the module is fed in via the terminals A1 (+24 VDC) and A2 (0 VDC)
- Fault of each pushbutton contact as well as earth-faults and cross shorts are detected.
- *Feedback circuit:* The safety function of external positively driven contactors is monitored by a series connection of the NC contacts with the terminals X1 and X2. This circuit must be closed in release condition.



Two-hand operation to DIN EN 574 and EN 60 204-1 (external supply)

- The supply voltage of the module is fed in via the two-hand pushbutton.
- Fault of each pushbutton contact as well as earth-faults and cross shorts are detected.
- *Feedback circuit:* The safety function of external positively driven contactors is monitored by a series connection of the NC contacts with the terminals X1 and X2. This circuit must be closed in release condition.



Actuator configuration

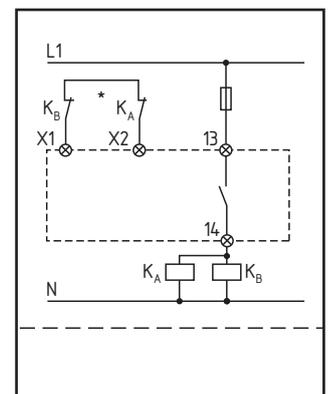
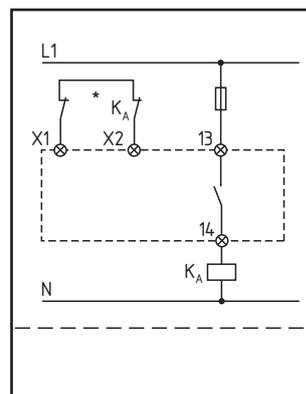
Left: Single-channel triggering

- Suitable for contact amplification and multiplication by relay or contactor with positively driven contacts.
- If the feedback circuit (linking of X1-X2) is not required this must be replaced by a jumper.

Right: Dual-channel triggering

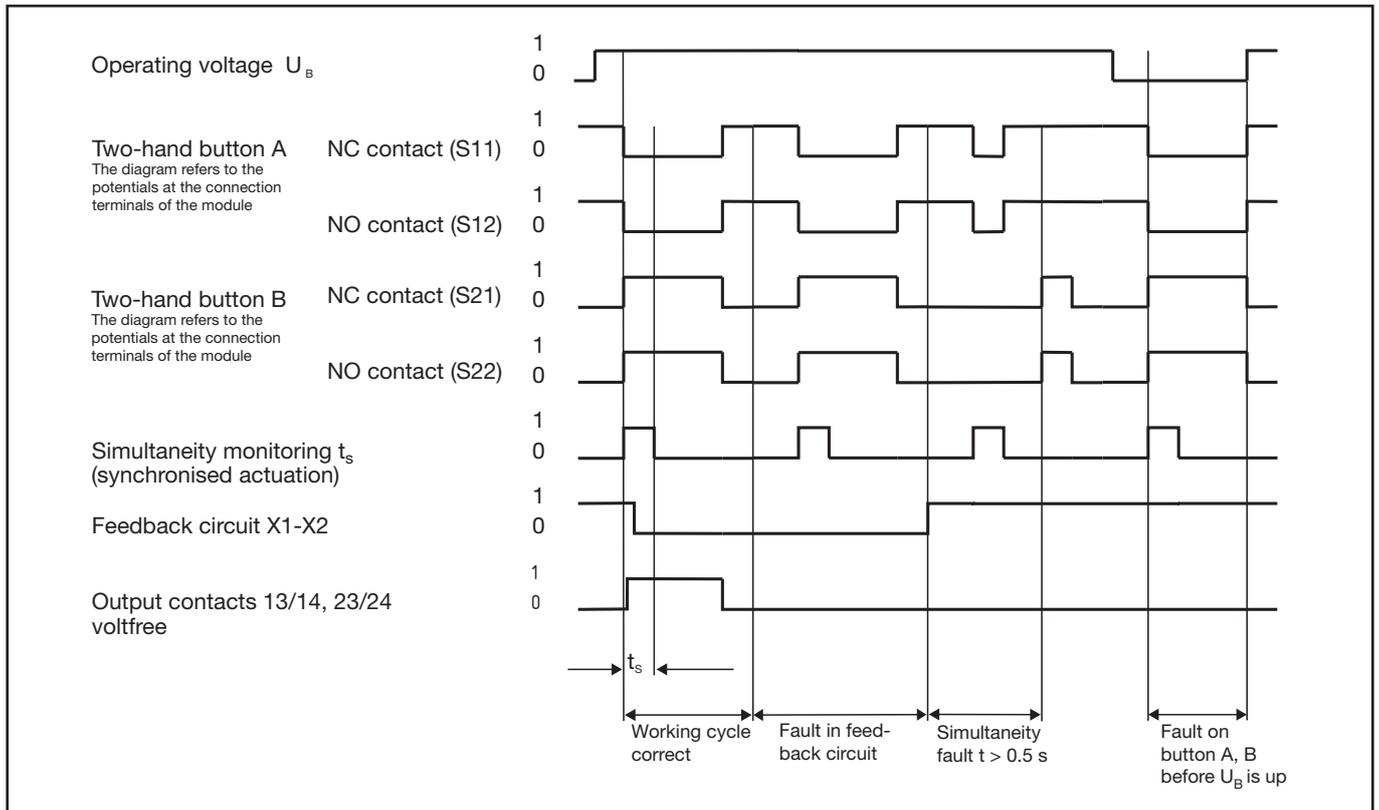
- Suitable for contact amplification and multiplication by relay or contactor with positively driven contacts.
- If the feedback circuit (linking of X1-X2) is not required this must be replaced by a jumper.

* Feedback circuit



Sequence diagram and terminal description for SRB-ZHK... and SRB 201ZH

Sequence chart



Terminal designation

Voltages	SRB 201ZH	A1	=> 24 VDC (L1 bei AC)
	SRB-ZHK – AC version	A2	=> 0 VDC (N bei AC)
	SRB 201ZH	A1.1	=> Output supply voltage (24 VDC)
		A2.1	=> Output supply voltage (0 VDC)
SRB-ZHK – AC version	C	=> Output supply voltage pushbutton S1	24 VDC
	D	=> Output supply voltage pushbutton S1	0 VDC
	C.1	=> Output supply voltage pushbutton S2	24 VDC
	D.1	=> Output supply voltage pushbutton S2	0 VDC
Inputs	S11/S12	=> Input channel 1	
	S21/S22	=> Input channel 2	
Outputs	13/14	=> First safety enable (STOP 0)	
	23/24	=> Second safety enable (STOP 0)	
	31/32	=> Auxiliary NC contact	
Start	X1/X2	=> Feedback circuit	

For additional information, please refer to the installation and assembly instructions (package leaflet).

Assembly instructions

for SRB-ZHK... and SRB 201ZH..., status: November 2002

Safety remarks

- It is essential to connect the relay modules SRB-ZHK.../SRB 201ZH... according to the circuit diagram which is to be found on the device itself. Mix up of the feed lines to the buttons can lead to destruction in the device.
- Observe the subject of "safety distance" according to the pertinent standards (refer to assembly and installation instructions).
- For downstream switch-gear use contactors or relays with positively driven contacts only.

Assembly

- The modules of the type series SRB... can be assembled on a top-hat rail DIN EN 50 022.
- If the device is subject to vibrations it is advisable to install them on shock absorbing washers.

Technical data

- Relay modules SRB-ZHK-24V, SRB-ZHK-230V, SRB 201ZH-24VDC; refer to pages 41 et seq., 44 et seq., 47 et seq.

Where applicable further standards for the machine control need to be observed

- (including safety level/connections between two-hand control console and machine control: refer to safety, technical or product standard (c standards), e.g.
- prEN 692 : 1995 – Mechanical Presses
 - prEN 693 : 1995 – Hydraulic Presses
 - EN 201 – Injection Moulding Machines for Rubber and Plastics
 - prEN 1010 : 1993: Pressure and Paper Processing Machines
 - Otherwise, refer to EN 954-1 : 1997.

Other safety remarks

Refer to assembly and installation instructions enclosed with every delivery.

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