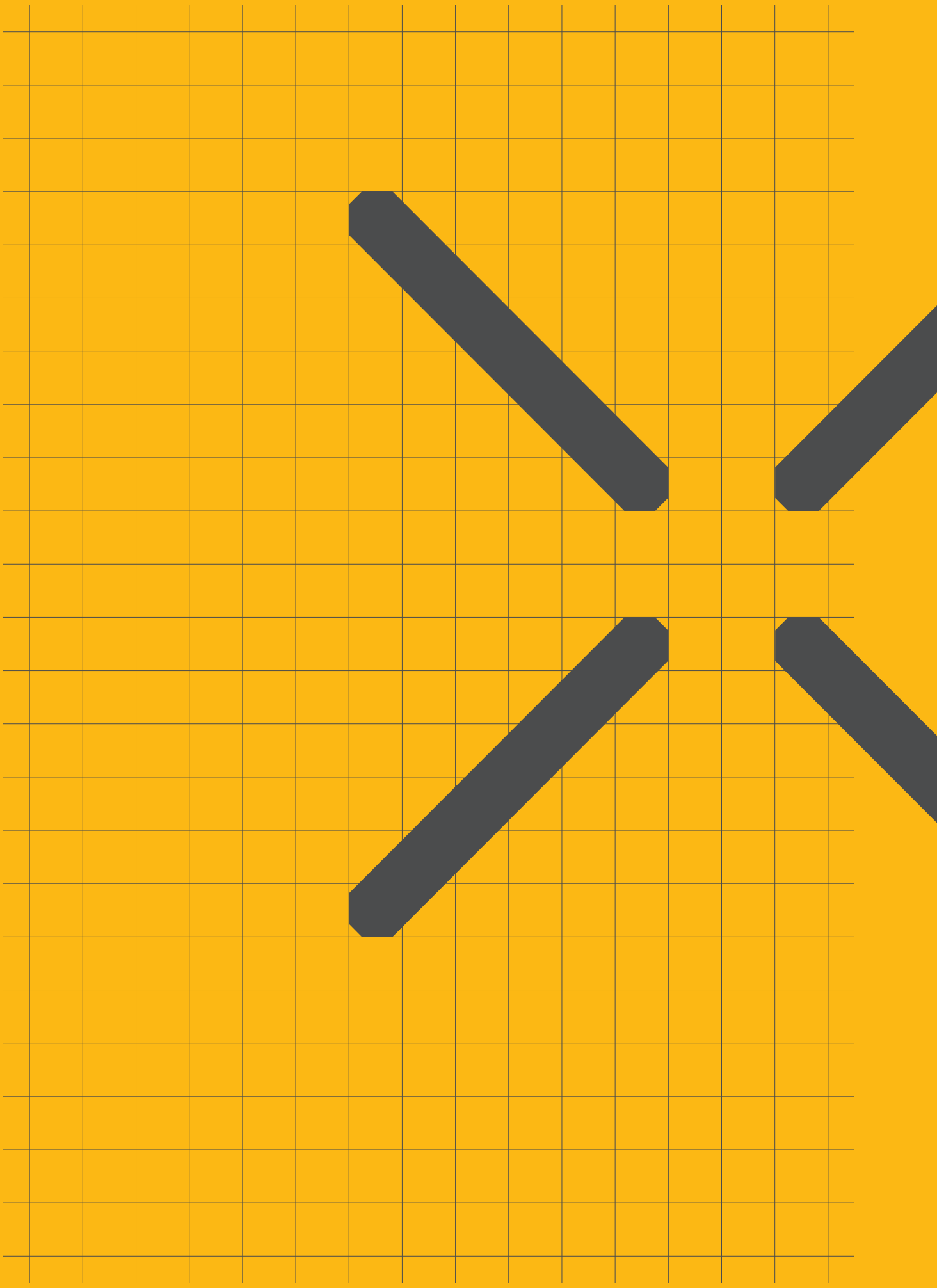
EWELLIX

MAKERS IN MOTION

# Operating switches and accessories for Ewellix Actuation Systems



# Contents



**⚠ WARNING**

Please read this manual before installing, operating or maintaining this control unit.
Failure to follow safety precautions and instructions could cause control units failure and result in serious injury, death or property damage. Keep this manual nearby for future reference.

# 1.0 General information

## 1.1 Information on this manual

This manual provides important information on how to work with the Operating elements and Accessories (also called the device) safely and eficiently. The devices discussed in this manual are an electrical and pneumatic hand switch, foot switch and desk switch and also electrical locking- and divider device box. The Manual is part of the device, must always be kept nearby and should be available for personnel to read at any time. All personnel working with the device must read and understand this manual before starting any work. Strict compliance with all speciied safety notes and instructions is a basic requirement for safety at work.

Moreover, the accident prevention guidelines and general safety regulations applicable at the place of use of the device must also be complied with.

For better representation of circumstances, the illustrations in this manual are not necessarily to scale and may vary from the actual design of the device.

## 1.2 Explanation of symbols and signal words

Safety precautions are identiied by symbols and signal words deined on the right hand side of this page.

These signal words indicate the severity of the hazard. Adhere to these safety precautions and take caution in order to avoid accidents that may result in personal injuries or damage to property.

**⚠ DANGER**

Indicates a dangerous situation, which will lead to death or serious personal injury, if the precautionary measures are ignored.

**⚠ WARNING**

Indicates a dangerous situation, which can lead to minor or moderate injury or property damage, if the precautionary measures are ignored.

**⚠ CAUTION**

Indicates a dangerous situation, which can lead to minor or moderate injury the precautionary measures are ignored.

**NOTICE**

Indicates information considered important, but not hazard-related (e.g. messages relating to property damage).

**NOTE**

Emphasizes useful hints and recommendations as well as information for efficient and trouble-free operation.

# 1.3 Limitation of liability

All information and notes in this manual were compiled under due consideration of valid standards and regulations, the present status of technology and our years of knowledge and experience. The manufacturer will not be responsible for damage resulting from:

- disregarding this manual
- unintended use
- employment of untrained personnel
- unauthorized conversions
- unauthorized technical modifications
- manipulation or removal of the screws on the device

## 1.3.1 Validity

The instructions in this manual refer to the Operating elements and Accessories with the following identification:

- Manufacturer: Ewellix
- Product name: Operating elements and Accessories
- Type designation: EH..., ST..., PHC, PFP, PAM (Operating elements), SPP, ZVB (Accessories)
- Year of manufacture: 2017

When the device has been customized by Ewellix, the actual product delivered may be different from what is described in the manual. In this case, ask Ewellix for any additional instructions or safety precautions relevant to these operating elements and accessories. We reserve the right to make technical modifications to the device units to improve usability.

# 1.4 Copyright

This manual is protected by copyright law and to be used exclusively by Ewellix customers for internal purposes. Passing this manual on to third parties, duplication of any kind – even in the form of excerpts – as well as the use and/or disclosure of the contents without the written consent of the manufacturer is not permitted.

Violation of Ewellix's copyright may become the subject of a future claim for damages.

# 1.5 Spare parts

The Operating elements and Accessories must only be repaired by authorized, trained personnel (↳ **2.3 Personnel requirements, page 9**).

All warranty and service claims become void without notice if any screws or housing on the device have been manipulated, thus indicating an unauthorized repair has been performed.

### No spare parts are available

If the device cannot be repaired on site by authorized personnel, it must be dismantled and sent to the manufacturer.

# 1.6 Warranty terms

The applicable and effective warranty terms are those contained in the manufacturer's terms and conditions of sale contained in the Ewellix sales contract that governs this sale.

# 1.7 Customer service

Ewellix Customer Service is always available to provide technical information and to answer questions. The contact information for Ewellix Customer Service can be found on www.ewellix.com.

# 2.0 Safety

This section provides an overview of important safety aspects of installing, operating and maintaining this device.

Disregarding this Manual and safety regulations specified therein may result in considerable danger and possible serious injury or death or damage to device or equipment.

**⚠ WARNING**

The electrical operating elements and Accessories should always be connected to a control unit with a secondary circuit, separated from main supply by double insulation (2MOPP acc. requirement Standard IEC60601-1)

**⚠ WARNING**

The requirement for the legibility (Standard IEC 60601-1) of the markings on the electrical hand switch, desk switch and pneumatic devices are not fulilled. It is responsibility of the end user to mark these devices with their own marking if needed (acc. IEC 60601-1 clause 7.1.2). The content of the marking simply consists of the model identification and the product date.

## 2.1 Use

### Purpose of the Operating elements and Accessories

The Operating elements and Accessories have been designed and built to be operated in accordance with their intended use.

If you use the units for any device other than that cited, the manufacturer cannot be held responsible for any damage or injury.

**NOTE**

Use the operating elements and the Acessories only with Ewellix actuators and Ewellix control units

### 2.1.1 Intended use

The Operating elements and Accessories have been specifically designed for controlling and adjusting beds, seats and reclining furniture in the medical and healthcare sectors in connection with control units from Ewellix Actuation System.

#### Electrical operating elements (foot switch, hand switch and desk switch):

EHA1, STF, STA: The devices are intended to operate 1 to 5 actuation Ewellix drives with the control units KOM1, KOM3, KOM3T, MCU or to operate MAX6 linear actuator with integrated control unit.

EHA2, STG, STC: The devices are intended to operate 1 to 5 actuation Ewellix drives with the control unit KOM2.

EHA3, STJ, STE: The devices are intended to operate 1 to 5 actuation Ewellix drives with the control units BCU, VCU, SCU or to operate TFG column with integrated control unit.

EHA4, STL, STK: The devices are intended to operate the column CPMA/CPMB with integrated control unit.

EHE1: The devices are intended to operate the column TXG and control unit SEM.

#### Pneumatic operating elements:

**Hand switch:**

**PHC:** The devices are intended to operate 1 to 5 Ewellix columns TGC, THC, TLC or Ewellix linear actuator MAX with integrated pneumatic interface.

**Foot switch:**

**PFP:** Same as for PHC, but only use for 1 actuator.

**Desk switch:**

**PAM:** Same as for PHC, but only use for 1 actuator.

### Accessories (electrical):

**SPP:** This device is connected between the Operating element EHA1 (STF, STA) and the corresponding control units and actuators. With the box the operator, user, can lock or unlock the drives individual or all together.

**ZVB:** This device is also connected between the Operating element and the corresponding control unit. It provides the opportunity to connect several operating elements to control the actuators.

### Product life time

**NOTE**

The Operating elements and Accessories are designed for a service life of 10 years or 100 000 switching cycles.

### Danger zones

**NOTE**

For operations data, please see the Appendix of this manual (↳ **11.1 Technical data, page 38; ↳ 11.2 Plans and diagrams, page 40**).

Depending on the user role, two danger zones have been identified.

**Persons:** The danger zone that can result in personal injury risk includes the actual user, third parties (other personnel, visitors, patients etc.).

**Device:** The danger zone which could result in risk of damage to the device involves the processor and technician user groups. It covers the control units KOM1, KOM3, KOM3T, KOM2, TFG, TXG, BCU, VCU, SCU and the actuators TFG, TXG and any elements that have been attached.

## 2.1.2 Unintended use

**⚠ WARNING**

The electrical foot switches are not intended for normal use in areas where liquids are likely to be found (such as emergency rooms and operating theatres), due to not fulilling the IPX6 acc. IEC 60529.

The Operating elements and Accessories are suitable for indoor use except for use in the following locations:

- Environment of flammable anesthetic items or other flammable substances.
- Environment of corrosive or explosive atmospheric media.
- Strong radiation fields

## 2.1.3 Essential performance

**⚠ WARNING**

Any unauthorized use of the device can cause personal injury and property damage. Always adhere to the instructions given in this manual.

Operate and control of electromechanical actuators (with internal or external control unit)

# 2.2 Responsibility of the owner and processor

The device is designed for commercial applications by the device owner or processor. The processor is the contracting partner of the reseller or the manufacturer. The processor installs the device in a complete system (application). The owner or processor of the system is therefore subject to the requirements of the Occupational Health and Safety Act. In addition to the safety instructions in this manual, the owner or processor must follow these safety and accident prevention guidelines and environmental protection regulations applicable to the site of the system's installation:

- Inform themselves of applicable industrial safety regulations. They must also determine additional hazards that arise due to the specific working conditions prevailing at the site where the device is installed using risk assessment. The risk assessment must be implemented in the form of work instructions for device operation.
- Confirm that the work instructions created for the system, including the device, satisfy current legal requirements and alter the instructions accordingly.
- Clearly regulate and specify the responsibilities for installation, operation, maintenance, and cleaning.
- Ensure that all employees who deal with the device have read and understood this manual.
- Provide personnel with the required protective equipment.
- Provide training for personnel at regular intervals and inform personnel of the hazards.
- Ensure that the product is used within the specified technical data

In addition, the owner or processors must ensure that the device is in adequate working condition. They must do the following:

- Ensure that the maintenance intervals described in these instructions are complied with.
- Have all safety devices inspected regularly for function and completeness.

# 2.3 Personnel requirements

**⚠ WARNING**

Improper installation, operation and maintenance can result in serious injury, death or property damage. Use only qualified, instructed, or trained personnel (as described below) who have read, understand and follow these instructions.

## 2.3.1 Qualifications

The following qualifications are specified for different areas of activity listed in this manual:

- **An instructed person (operator):** Instructed by the customer in an orientation session on the assigned tasks and possible dangers arising in case of improper behavior.
- **Qualified personnel:** Based on their professional training, know-how and experience as well as knowledge of the applicable standards and regulations are able to independently perform assigned work activities and to detect and avoid possible dangers
- **Professional electrician:** Based on his/her professional training, know-how and experience as well as knowledge of the applicable standards and regulations is able to independently perform work on electrical systems and to detect and avoid possible dangers. In addition, the professional electrician has been trained for the special location where he/she works and knows the relevant standards and regulations.

Only persons who can be expected to perform their tasks reliably are permitted as personnel. Persons whose reaction capabilities are impaired, e.g. through the use of drugs, alcohol or medication for example, are not permitted.

# 2.4 Specific dangers

The following section lists the residual risks that have been determined by a risk assessment.

The manufacturer has constructively, and with protective measures, minimized the effects of existing hazards. Pay attention to the residual hazards and potential countermeasures described in the following chapters.

**⚠ WARNING**

The Operating elements and Accessories are not first-failure-safe. Due to a defect of a component like a switch or cable, an uncontrollable movement of actuator(s) can occur

### Specific dangers washing the Operating elements and Accessories

**⚠ WARNING**

Take care not to damage the Operating elements and Accessories from very strong water jets. The hand switches and Accessories are protected against powerful water jets according to IP67, resp. IPX7 (EHE).

The devices EHA (EHE), SPP, ZVB and PHC are designed to conform to IP 66 (IPX7). This satisies current “washing line resistance” requirements for beds in accordance with IEC 60601-2-52.

The washing water including chemical additives must be pH neutral. Excessively acidic or alkaline washing water can destroy metal and plastic components of the devices. Manually and mechanically operated high-pressure steam cleaners must not be used. Only isopropyl alcohol cleansing agent may be used for disinfecting by manual wiping.

An operating device or Accessories must never be washed in a washing machine or other equipment unless the control unit is properly connected. The control unit and the Operating element or Accessories would be destroyed by the penetration of liquid.

The plastic housing must be checked periodically (every six months) for mechanical damage (cracks).

**⚠ CAUTION**

Please be aware of damage to people or property as the result of incorrect operation. Incorrect operation can endanger people in the danger zone or objects.

- Before pressing a button on the operating unit, ensure that you press the right button.
- Take appropriate measures to ensure that unintended operation is prevented.

**⚠ CAUTION**

Take care and please be aware to use electrical foot switches on wet loors! These devices do not fulill IPX6 according to IEC 60529 for normal use like areas where liquids are likely to be found (such as emergency rooms and operating theaters).

**⚠ WARNING**

- The Operating elements and Accessories must not be operated in potentially explosive environments
- The devices are only approved for use indoors
- Connected Ewellix actuators in the final application should be operated in accordance with the application specified on the type label
- The nominal data for the actuators and the control unit must be verified at the same time of installation. The ratings on the data should not be exceeded. If this information is disregarded, the actuator, the control unit and the operating elements will be irreparably damaged. Risk of personal injury.
- Any overload on the connected control unit will trip a temperature switch in the mains transformer. The control unit must be disconnected from the mains and allowed to cool to room temperature.
- Signals indicating operation of the device. That for a LED on the operating device electrical (hand switch, desk switch) display the movement of the actuator by pushing, activating the button. In case of foot switches and pneumatic operating elements there is no signal indicating a movement. So depending on the application, it is recommended to have operational signal installed in the third party control unit.

**⚠ WARNING**

Danger of injury caused by moving components Rotating and/or linearly moving components can cause serious injury during the operating element and when the connected control unit is active.
Therefore:

- Do not work on, or place hands, arms or any other parts of the body, close to moving components.
- The operator must always have direct visibility to the movement of the actuator(s) when activating a button on the operating element.

**NOTICE**

The operating devices do not contain indicator lights to show connection to the power supply.

**NOTICE**

Failure of the connected control unit due to an interruption to the mains power supply or an electronics defect should not pose any hazard to the patient, to the operator or to the servicing personnel.

**NOTICE**

Prolonged overload will result in irreparable damage to the control unit.

# 2.5 Safety equipment

**⚠ WARNING**

The operating elements and the connected control units do not have an on/off switch and if required to be switched off, for example in an emergency, the control unit must be disconnected from the power supply.
Only this measure will de-energize the control units.
Applications where the control units are built in must provide an emergency stop switch or isolation from the mains supply on all poles.
Additional protective means might be necessary in case of battery options.

**NOTE**

The processor decides if the installation of one of the following safety systems is required.

- Emergency shut-off system
- Patient release system
- Anti-pinching protection
- Indicator for operating conditions

# 2.6 Safeguard against restart

**⚠ WARNING**

**Hazardous situation through unauthorized restart**
For work in hazard zones, there is a risk that the power supply could be turned on without prior authorization. This presents a potentially hazardous situation for people in the danger zone.

- Read the information contained in this manual, concerning safeguarding against any unintentional restart of the power supply.
- Always follow the procedure as described below.

1. Pull the power line plug out of the power outlet.
2. In case the control unit is equipped with a battery, be sure to remove the battery.

# 2.7 Modification of device

**⚠ WARNING**

**Danger of injury because of illegible symbols**
Over time, warning labels may become dirty or illegible.
Therefore:

- Keep any safety, warning and operation related decals in legible condition at all times.
- Replace damaged, illegible decals or stickers immediately

## 2.7.1 Warning labels

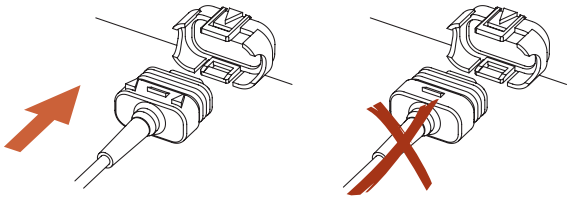
Warning labels must be applied by the owner or processor to the product that is using the device.

## 2.7.2 Information labels

### Electrical operation elements

Fig. 1

*Instruction banner: Adhesive label folding near the connectors, yellow background black graphics.*



**⚠ CAUTION**

Connecting cable from Operating device to the control unit and Accessories. Be Aware that the three arrows at the top are in line, otherwise the plug will be damaged are not connectable any more.

### Pneumatic Operating elements

### General information for PHC, PFP, PAM

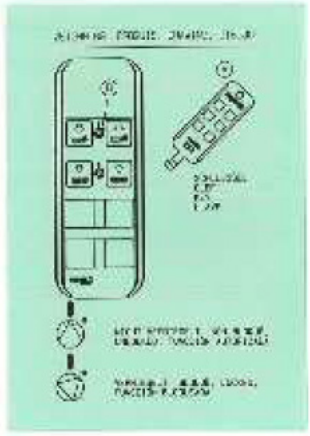
Service instruction for pneumatic switch with coiled-air-tube (Drawing number 120607 ):

**Please notice:** The control unit is based on a system which is resistant to luctuations in temperature. To facilitate transport and a possible exchange, the switch is delivered separately from the control unit.

**Important:** When reassembling, always arrange notch to notch!

Never stretch spiral air tube to its full length or leave it stretched out for a long time. The coils would suffer and no longer close fully. This, however, would not inluence the functioning of the actuator in any way.

Instruction leaflet (front side)



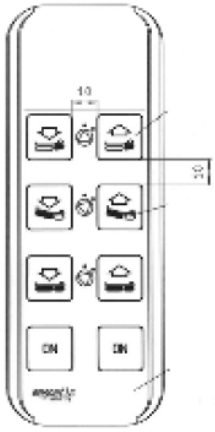
Instruction leaflet (back side)

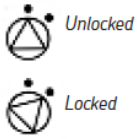
**Additional information for PHC (Drawing number 130445):**

Locking system

- With the use of this hand switch, you are able to lock off particular functions on a motorized bed.
- To lock (position point):
  – Turn the triangle with key thus locking the 2 buttons and immobilizing the relevant section of the bed.
- To unlock (position line):
  – Turn the key in the opposite direction.

Fig. 2






## 2.8 Safety EMC

The Operating elements and Accessories fulfill the EMC-requirements with Ewellix products control unit and actuators (ME-System). It is mandatory to test the EMC-requirements in the final application.

# 3.0 Technical data

## 3.1 Operating conditions

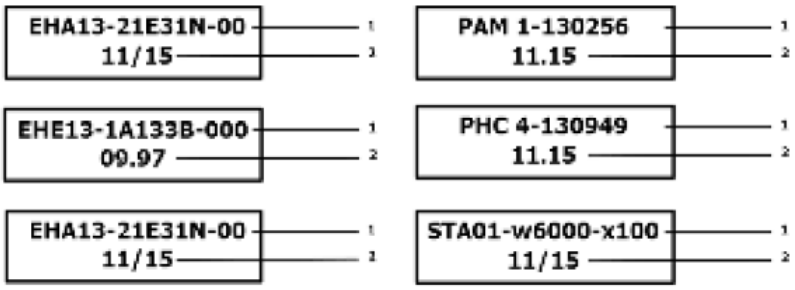
Ambient conditions:

- Temperature range: +10 to +40 °C
- Atmospheric humidity: 0 to 85%
- Non-condensing
- Atmospheric pressure: 700 to 1 060 hPa
- Height above sea level: 3 000 m (MOPP)
- Overvoltage category: I
- Pollution degree: 2

The Operation elements and Accessories are suitable for indoor use only and must not be exposed to weathering, strong radiation ields or corrosive or explosive atmospheric media.

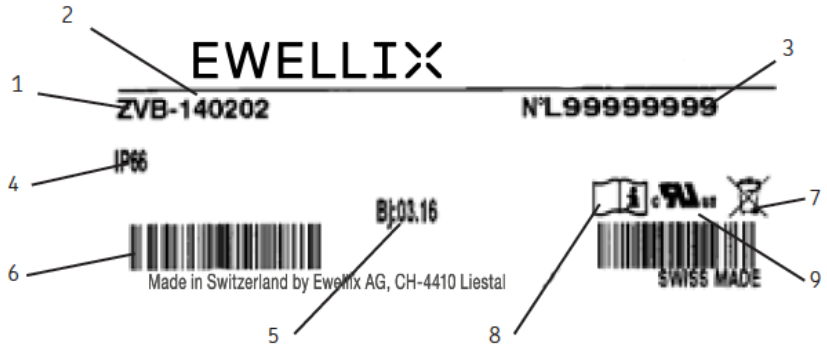
## 3.2 Product label

### EHA, EHE, ST (desk switch), PHC, PFP, PAM




1. Type designation
2. Manufacturer

### ST (foot switch), SPP, ZVB




1. Type designation
2. Manufacturer
3. Serial number
4. IP protection class
5. Date of manufacture
6. Manufacturer's address
7. Disposal information
8. Recommendation to read operating manual
9. UL mark

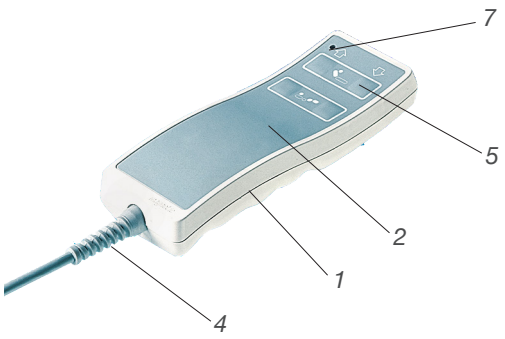
# 4.0 Structure and function

## 4.1 Overview

The following pictures provide an overview of the Operating elements and Accessories (for the abbreviations of the type ↳ **4.2 Brief description, page 18**).

### EHA

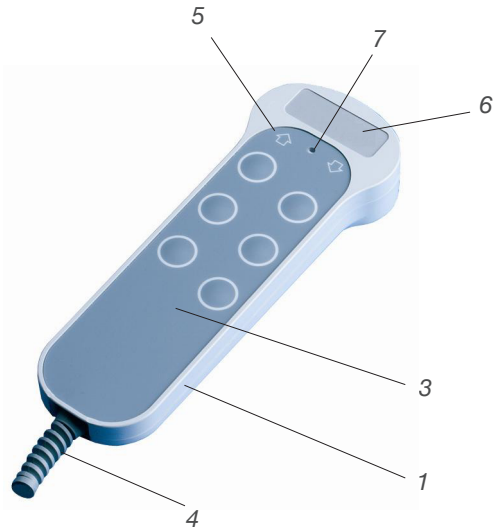
Fig. 3




1. Housing
2. Protective foil with warmly pressed ields
3. Keypad with warmly pressed ields
4. Connection cable
5. Symbols
6. Place for customer logo
7. Indicator for operating condition (LED)

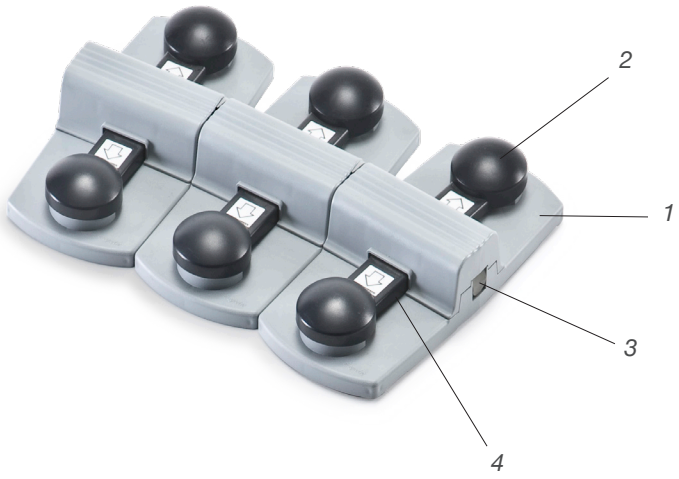
### EHE

Fig. 4



## STF, STG, STJ, STL:

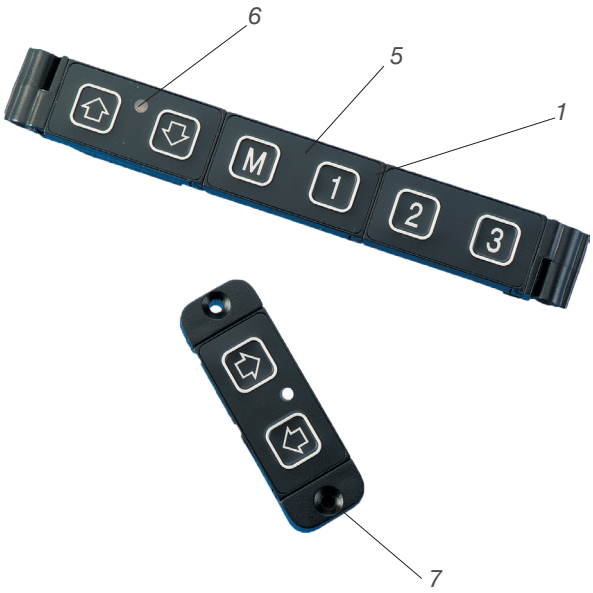
Fig. 5




- Housing
- Pedal button
- Connecting cable
- Symbols
- Protective foil with warmly pressed ields
- Indicator for operating condition
- Installation holes

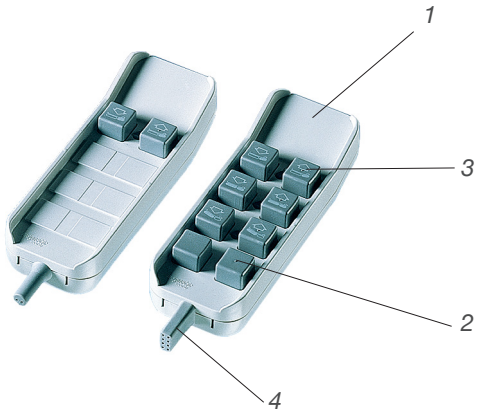
## STA, STC, STE:

Fig. 6



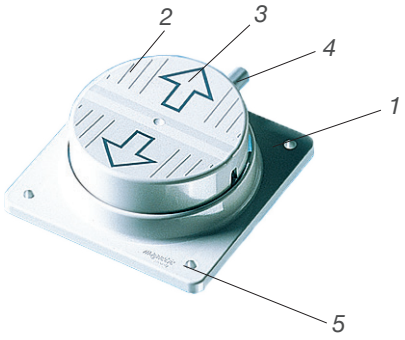
## PHC:

Fig. 7




## PFP:

Fig. 8



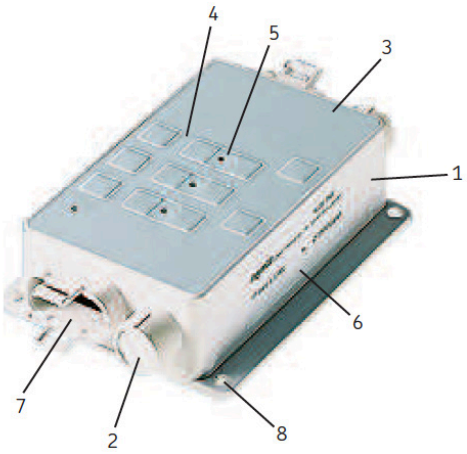

1. Housing
2. Push button
3. Symbols
4. Air tube hoses
5. Installation holes

## PAM:

Fig. 9

## SPP:

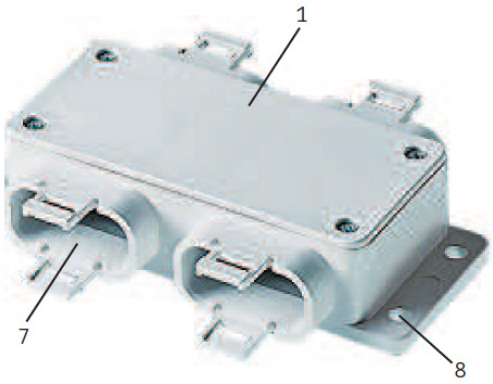
Fig. 10




1. Housing
2. Blind
3. Protective foil with warmly pressed ields
4. Symbols
5. Indicator for operating condition resp. locking condition
6. Type label
7. Connection to Operating elements and control units
8. Installation holes

## ZVB:

Fig. 11



# 4.2 Brief description

The Ewellix operating devices are available as Accessories for control units and actuators. The desk switch is designed to be fixed on a table, and the foot switch is designed to be placed on the loor or fixed on a lat surface close to the loor. The hand set is shaped so that unintentional pushing is avoided.

Ewellix differentiates 3 categories of Operating elements (hand switch, foot switch, and desk switch) in 2 technologies (electrical and pneumatic) and several Accessories.

Tab. 1

*Overview*

| Hand switch | Foot switch | Desk switch | Acces-sories | KOM 1 | KOM 3 | KOM 3T | MCU | KOM 2 | BCU | VCU | SCU | MAX 6/7 | TXG | TFG | CPMA/B | TGC, THC, TLC | SPP | ZVB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EHA1 | STF | STA | | x | x | x | x | | | | | x | x | | | | x | x |
| EHE | | | | | | | | | | | | | x | | | | | |
| EHA2 | STG | STC | | | | | | x | | | | | | | | | | |
| EHA3 | STJ | STE | | | | | | | x | x | x | | | x | | | | |
| EHA4 | STL | STK | | | | | | | | | | | | | x | | | |
| PHC | PFP | PAM | | | | | | | | | | x | | | | x | | |
| | | | SPP | x | x | x | x | | | | | x | x | | | | | |
| | | | ZVB | x | x | x | x | | | | | x | x | | | | | |

For further information, ↳ **4.8 Accessories, page 24.**

## 4.2.1 Electric operating elements

### Hand-held switch EHA, EHE

The hand-held switch actuates one or several linear drives.

There is a pushbutton field on the front panel on the hand-held switch for each drive to be actuated. This consists of two pushbuttons arranged at the same height. The drive is put into operation by pressing on one of these pushbuttons. It runs as long as the pushbutton is pressed. The relevant function (Up/Down) is determined and triggered by the button actuation. A green pilot lamp indicates the actuation. The function symbols for movement of the individual units are printed on request on the front panel. Up to 5 drives can be actuated separately. A suspension clip can be attached subsequently to the switch.

## Foot switches

Foot switches are fitted to desks, couches and chairs for simple, ergonomic control of adjustment actuators. The modular design of these stylish foot switches allows control of 1-3 actuator functions (e.g. with 2 adjustment levels) and up to 3 memory positions.

Foot switches are ergonomically positioned so that they can be operated easily both by standing and seated persons. The arrangement of the buttons has been specially selected to ensure easy foot control.

## Desk switches

Desk switches are simple, unobtrusive control elements for adjusting actuators in desks, chairs, couches and other applications. They can be fitted easily to a desk without compromising the desk design. Desk switches are available in versions for operation of 1-3 drive function functions (e.g. with 2 adjustment levels) and with up to 3 memory positions. Depending on the particular version, they can be secured visibly to the edge of the desk or may be concealed beneath it.


## Locking device SPP

The operator can lock or unlock individual or all linear drives with the locking unit for the MATRIX KOM 1 and 3 control unit. Drives which are locked cannot be activated with the handheld switch. All movement functions which are also possible with the hand-held switch can be performed with the buttons of the locking device.

The buttons numbered 1-4 are located on the front panel. A green LED on the left lights up when a drive is activated. A separate activation button with two function symbols for UP or DOWN is assigned to each motor. A yellow LED between the buttons indicates locking of the drive.

Locking the drives: e.g. motor 1

Press and hold the symbol button (lock CLOSED) – press motor button 1

- yellow LED in the keypad lights up – drive can no longer be actuated with the hand-held switch.

Unlocking the drives: e.g. motor 1

Press and hold the symbol button (lock OPEN) – press motor button 1

- yellow LED in the keypad goes out – drive can be actuated again.

The connection cable to the KOM control unit and the hand-held switch cable are connected to the corresponding plug-in points.

The cables are strain-relieved and sealed in the plugged-in condition.

The cams of the plugs engage in two detent clips on the locking device.

The cables are removed with the special key. In the case of control units in which the additional round connections for limit switches are not used, these are provided with water-proof stoppers in the factory. These must not be removed. The degree of protection corresponds to IP 66.

### Distributor box ZVB

The linear drives are actuated as a rule using hand-held switches or foot-switches. If several Operating elements are required for actuating the drives, a distributor box must be connected in between.

The distributor box is available in two versions. ZVB-140202 for several Operating elements or ZVB-140206 for several outputs. Several hand-held switches or foot-switches can be connected in parallel at the distributor box ZVB-140206.

Three MATRIX AC can be controlled with one 3-channel handheld switch with the distributor box ZVB-140 206.

**ZVB-140202** is used, if you have more than one operating unit, e.g. two foot switches

**ZVB-140206** is used, if you have, for example, three MAX64 (low voltage control) and a EHA13 (3-channel) hand switch

**ZVB-140212** Is used for operating a KOM2 and a KOM1 with an EHA2 hand switch. All channels i parallel. (Schematics 171436)

## 4.2.2 Pneumatic operating elements

### Description

To achieve a high degree of operating comfort and safety, Ewellix actuators such as the Telemag, Matrix, Magforce, and Magpush are also available with integrated pneumatic control. The suitable Operating elements have been developed for this control unit. Thanks to the currentless pneumatic pulse control, the user never comes into contact with live parts, which enhances safety in the hospital sector.

### Function

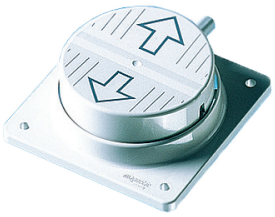
An air pulse is generated by pressing a button on the control element. This pulse is transmitted through the air hose to the pneumatic receiver built into the linear actuator. The air pulse actuates the micro switch in its unit, which triggers the electrical control of the linear actuator. A locking mechanism ensures that if two buttons are actuated simultaneously, only one button pulse is detected. The special pressure compensation system offers a high degree of safety. Temperature changes have no influence on safe operation.

## Hand switch PHC

According to type of channels, up to 4 linear actuators can be controlled individually with this elegant hand switch. The buttons are printed with corresponding function symbols. Individual functions can be disabled on the switch. The individual interlocks for the motor function can be locked or unlocked with a key. To position the hand switch, this can be delivered with a clip for hooking on to your belt or with a holder.

## Foot switch PFP

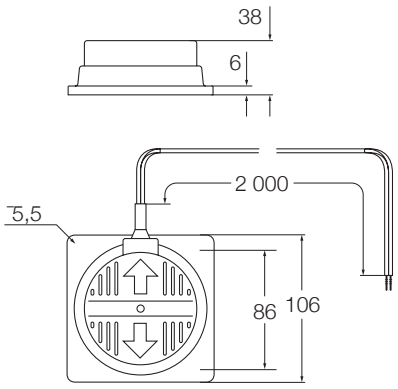
This switch has large size operating buttons as well as sturdy housing for foot operation. PFP foot switches can be delivered in 3 different versions. PFP in standard version are delivered for single motor operation with single pressure plates. The anthracite color is standard. PFP foot switches have new rocker push buttons. The space saving 1-motor switch has a rocker pressure plate for the motor functions of UP/DOWN.
The 2-motor switch has two double rockers with which one can control two separate actuators from one position.



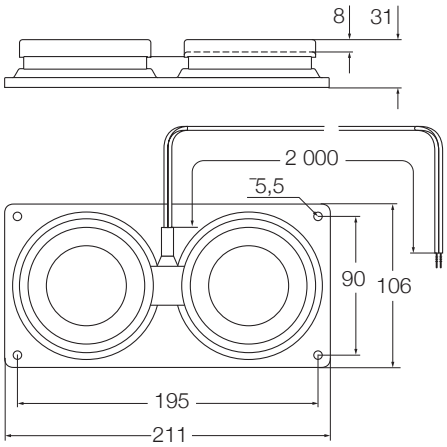
## Desk switches PAM (surface mounted switch)

This manual switch for controlling a single linear actuator is an especially small and compact design. This surface mounted switch can be permanently mounted in different orientations using screws inserted in through-holes. This switch is also suitable for installation in control panels.

Fig. 12




PFP 1KĐ130652




PFP 1Đ121545

# 4.3 Special features (additional information)

The operaling elements and accessories have integrated indicator lights to indicate that the button of the device has just been pushed. Exception: Foot switches and pneumatic switches are not provided with lights. For these switches, indicators have to be installed in the final ME-equipment system.

# 4.4 Requirements for 3rd party control units and actuators

The Operating elements and Accessories are developed to operate Ewellix control units and actuators. Connected control units and actuators NOT approved by Ewellix are treated as third party units.

- The third party control unit must have isolation between the primary and secondary circuit according to 2 MOPP and provide a non-grounded secondary circuit.
- When using a third party control unit, please make sure that it is equipped with an overcurrent shutdown so that in case of a hanging button or if a button is pressed too long, the drive is protected from overload. The drive has to be shutdown immediately if the maximum current is exceeded or unintended movements are occurring.

**NOTE**

It is strongly recommended that you use Ewellix control units and actuators to connect Operating elements. If third party units are used, appropriate actions must be taken to assure compliance with applicable regulations.

**NOTE**

Failure of the connected control unit to an interruption to the mains power supply or an electronic defect should not pose any hazard to the patient, to the operator or to the servicing personnel.

# 4.5 Connections

The operating elements and Accessories are equipped with clearly marked plugs for

- Control units
- Actuators

**NOTICE**

The connector must be inserted in the correct position in order to prevent possible displacement and irreparable damage to the socket outlet in the control unit. Note the shape of the connector and the positioning arrows.

## 4.5.1 Electric operating elements

### Connection to control units KOM and actuators MAX

Depending of the required configuration, the hand switch cable can be connected to the control unit, to the locking device or to the distribution box (Sub-D connector).

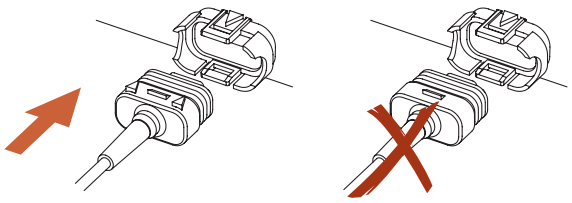
Once it has been plugged into the mains socket, the two cables are strain-relieved and sealed by means of the integrally-cast cams. The cams engage with the two integra retaining clips on the socket outlet of the control unit.

It is important to ensure that the connector for the hand switch cable is inserted in the correct position in order to prevent possible displacement and permanent damage to the socket outlet in the control outlet in the control unit (note the connector configuration).

**NOTICE**

The retaining clips may break if excessive force is applied or if will try to plug in the cable in the wrong way, with consequent loss of strain relief and sealing capacity.
Strain relied and water tightness are no longer guaranteed. The cables should only be detached from the control box KOM, from the actuator MAX6 and from the Accessories ZVB and SPP by spreading the retaining clip using the Ewellix special plug disassembling tool, part no. ZBG-140375, and then withdrawing the connector (see page 27).The retaining clips may break if excessive force is applied, with consequent loss of strain relief and sealing capacity.
Strain relief and water tightness are no longer guaranteed.

Fig. 13



Put in the cable into the socket in the correct way (left: three arrows on the top have to be in line); otherwise the plug in the device will damaged (↳ **2.7.2 Information labels, page 11**).

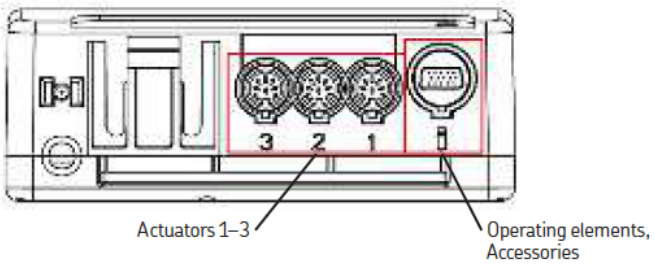
**⚠ WARNING**

Damaged, stripped, bent or clamped cables or broken plugs may cause malfunctions in the application due to an electrical short circuit; the an uncontrolled or unintended movement in the application can could result in an unacceptable risk like cause damage, injury to person.
Stripped plugs and cables may destroy the operating elements. To avoid such risks all cables must be secured so that no forces are exerted on the plug connection on the device.

When connecting the foot switch to the relevant equipment, please observe the technical instructions for that equipment.

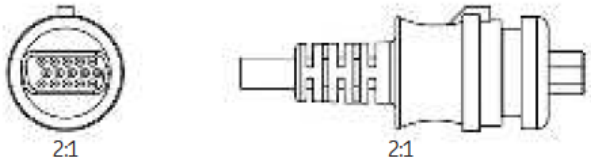
### Connection to control unit BCU Plug DIN 8pol and DSUB 15pol

Fig. 14




### Operating system standard plug (DSUB 15pol)

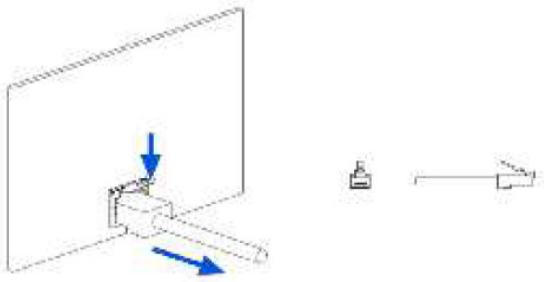
Fig. 15




### Connection to TXG or SEM

Plug FCC 10pol (ex. TXG)

Fig. 16



## 4.5.2 Pneumatic operating elements

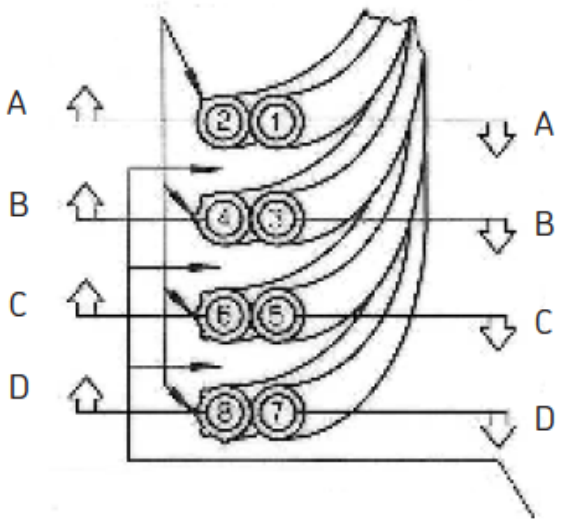
### Connection/Installation

The air hoses can be separated in each case at the adapters of the actuators as well as the operating elements. When coupling the hoses at the adapter, make sure that the marking notches are fitted correctly into one another. Individual hoses can also be separated for connection to different actuators.

These must be nicked with a knife and then pulled apart by hand to the wanted length. The air hoses can be shortened as required by the customer. Here you must make sure that the connection pins are fitted correctly again. On installing the air hoses, ensure that these can neither kink nor be jammed.

High functional safety can be achieved only by running hoses correctly and proper handling. The operating elements are easy to look after and maintenance-free. Defective operating elements may be repaired only in our factory.

Fig. 17




# 4.6 Operating elements

Not applicable (only for actuators and control units)

# 4.7 Options

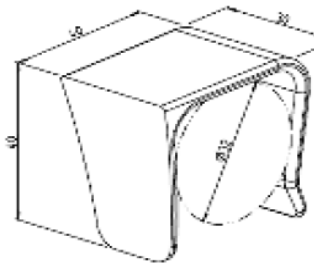
Not applicable

# 4.8 Accessories

## 4.8.1 Electric operating elements

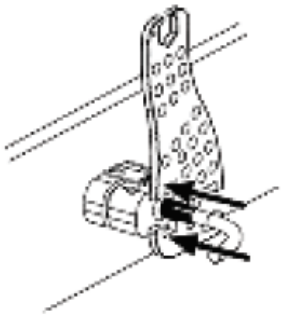
### Hook for EHA, EHE:

**ZBG-145300-0001 0125767** grey
**ZBG-145361-0001 0125538** grey, complete
**ZBG-145377-0001 0125282** grey, small



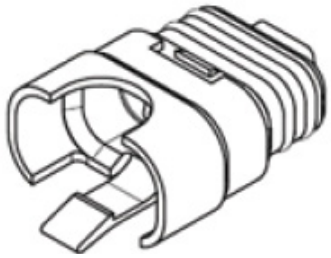
### Tool for plugs (Mains, DSUB, Jack):

**ZGB-140375 (0125322)**



### Adapter plug operating device (DSUB):

**140420 (0106977)**



DSUB socket sealing cap:

**ZBE-140343 (0125400)**

**Jack socket sealing cap:**

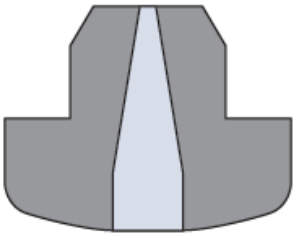
**ZBE-140305-0001 (0125398)**

**Expanding threaded inserts (foot switch):**

**ZBE-521122**

**Rubber stops (foot switch):**

**ZBE-135310**



### Cable:

### Connecting Cable:

| | | |
|---|---|---|
| **ZKA-145318-1850** | 0121733 | grey DSUB |
| **ZKA-145318-2500** | 0121734 | grey DSUB |

**Adapter cable:**

| | | |
|---|---|---|
| **ZKA-145446-0060** | 0132201 | DSUB, not 1:1 wired |
| **ZKA-147319-0100** | 0121736 | EHE – KOM |
| **ZKA-147324-0601** | 0120475 | EHE – KOM (2 in 1) |
| **ZKA-149203-1500** | 0125302 | Desk switch |
| **ZKA-149203-2500** | 0125303 | Desk switch |

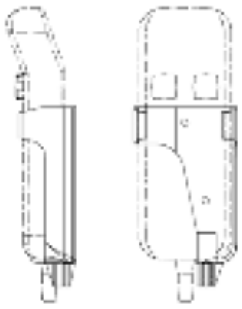
The D-SUB connection cable is used for the KOM control unit's, locking device as well as for the switch distributor. The corresponding interconnections between the drives and control units can be produced with this accessory cable. Please refer to the information on the control units for further details.

### Sealing rings:

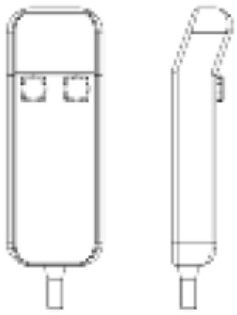
| Spare parts: item | Order No |
|---|---|
| Sealing rings for | |
| • Mains and control connectors (520991; 25.07 x 2.62) | 0102927 |
| • Motor and limit switch connectors (520992; 10.78 x 2.62) | 0102928 |

## 4.8.2 Pneumatic operating elements

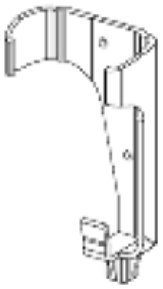
- Suspension clip for hand switch can be attached later. Spacing width 26 mm or 32 mm diameter (see hand switch dimension drawing)
- Holders for hand switches with drilled holes for wall installation or thread for lexible tube installation.
- Key for function blocking for hand switch



**Holder**



**Hand switch 1-4 actuators**



**Holder for PHC**

**Suspension clip for PHC**

### Security key for PHC

**ZWS-130394 (0125395)**

**Important:** Ewellix will not be liable for any damage caused if the control units are not used with a suitable Ewellix operating device.

# 5.0 Transport, packaging and storage

## 5.1 Safety information for transportation

**⚠ CAUTION**

To prevent damage due to improper transport

- Proceed carefully during delivery and unloading of the packaged items, as well as during transport to inal destination. Comply with the symbols and information shown on the packaging.
- Do not remove the Operating elements and Accessories from its packaging until just before installation.
- Note storage requirements for return transport of the device to the manufacturer.

**NOTE**

Report any damage as soon as possible, as damage claims can only be submitted within the transporter's applicable complaint period.

## 5.2 Transport inspection

The devices are delivered as one packaged unit in a plastic bag, box or on pallets. Check the delivery immediately upon receipt of the delivery, for completeness and any signs of damage incurred during transport.

Check delivery for:

- A complete device, with all packaged parts present.
- Any signs of damage to the plastic casing, such as cracks. If there is a crack or damage evident, the protection will not be in accordance with standard IEC 60529, so the IP class is not guaranteed and the relevant device must be returned to the manufacturer.

If exterior transport damage is evident:

- Do not accept delivery or accept with exceptions (due to fulill orders)
- Record scope of damage on the transport documents or bill of delivery of the shipping company
- Initiate complaint

## 5.3 Return to the manufacturer

If device is damaged, arrange for return transport as follows:

- Dismantle the device if necessary (↳ **10.0 Dismantling, page 37**).
- Pack device in its original packaging. Follow storage conditions.
- Send to manufacturer. The address is listed on the back cover.

## 5.4 Packaging

**Requirements:**

All parts are packaged appropriately for anticipated transport conditions, using only environmentally-friendly packaging materials. The packaging is intended to protect the individual components from damage caused during transport, or by corrosion and other potential hazards, until the components are ready for installation. Only remove packaging shortly before installation. Handling with packaging: The packaging should not be destroyed, but kept for possible return shipment to the manufacturer.

If the packaging is provided as disposal, reuse or recycle please note and adhere to the notices.

**NOTE**

Packaging material consist of valuable raw materials, much of which can effectively be recycled and reused.
Therefore:

- Dispose of packaging material in an environmentally correct way
- Comply with locally applicable disposal regulations.

**NOTE**

In case of dispose packaging material respect the following rules:

- Dispose of packaging material in an environmentally correct way
- Comply with locally applicable disposal requirement

## 5.5 Storage

**NOTE**

There may be notices on the packaging concerning additional storage requirements not listed here. If so, follow these.

Ewellix products can be stored during a shipment from the manufacturer to the customer in an intermediate storage or/ and finally at the customer on the storage. Pack the device in its original packaging for storage

- Do not store outside.
- Dry and dust-free storage.
- Keep away from any aggressive media.
- Protect from UV radiation.
- Avoid mechanical vibrations.
- Observe the following values when selecting a storage location:
- Storage temperature: +5 to +40 °C
  - Atmospheric humidity: 5 to 85%, non-condensing
  - Pressure: 700 to 1 060 hPa
  - For storage longer than three months, check the general condition of all parts of the packaging on a regular basis.

For specific storage conditions contact Ewellix Actuation System.

# 6.0 Installation and first operation

**⚠ WARNING**

**Electric shock and moving parts hazards**
Serious injury or death can be caused by touching live electrically connected control units and by unexpected movement of a drive. Be sure the system's power supply is off and the drives are locked out before installing the Operating elements and Accessories.

**⚠ WARNING**

**Danger if restarted**
When correcting faults in the system, there is a risk of the energy supply being switched on without authorization. This poses a life threatening hazard for persons in the danger zone (↳ **2.0 Safety, page 7**).
Therefore:

- Prior to starting work, switch off the system and be sure it is locked out.

This chapter is intended for technicians and those involved with further processing. It provides the information needed to assemble, connect and start up the Operating elements and Accessories.
Qualification (↳ **2.3.1 Qualifications, page 9**)

### Authorized personnel

- The installation and first start of operation may only be conducted by qualified persons.
- Work on the electrical system may only be performed by trained professional electricians.

## 6.1 Installation location

Adhere to the technical data in accordance with operating conditions.

Install in a location according to the ambient operating conditions and where the Operating elements and Accessories are not exposed to strong UV radiation or corrosive or explosive air media.

**⚠ WARNING**

The use of operating elements and accessories with other control units or actuators than designed can degrade electromagnetic EMISSIONS and IMMUNITY performance.

## 6.2 Inspections prior to first operation

Perform an installation check before you start up the system with operating devices for the first time.

- To be performed by a professional electrician
- Prior to first operation, a professional electrician must perform and document the following tests and readings:
  – Visual condition check
  – Function check of operating features and safety features
  – Reading of leakage currents from the system
  – Reading of insulation resistance from the system

**⚠ WARNING**

Risk of injury and device damage due to incorrect installation of the optional devices (like additional Operating elements or locking box or distribution box)
Therefore:

- Optional devices, in particular components that are part of a retroit, may only be installed in accordance with their respective instructions (circuit diagram).

## 6.3 Installation

### Installation

The Operating elements and Accessories must be attached using the mounting holes provided (↳ **11.2 Plans and diagrams, page 40**).

The devices can be installed in the provided positions.

The erection and alignment of the device and connections are shown in the following sections.

### Erection and alignment

The following points must be kept in mind as regards the erection and alignment of the device.

Make sure that

- The device cable cannot be bent or squashed.
- The connecting cables between Operating elements and Accessories cannot get crushed or squashed.
- Never stretch spiral air tube to its full length or leave it
- stretched out for a long time (pneumatic elements).

Take care! Assemble the spiral air tube notch over notch.

### Interfaces and connections

**NOTICE**

To prevent damage to the devices owing to tilted plugs or damaged cables, ensure that the plugs remain freely accessible and all cables remain safe and hidden.

**NOTICE**

Tilted plugs could cease to be watertight, which would lead to the destruction of the connected control unit.

**NOTICE**

The Operating elements are connected to a control unit or an actuator and can therefore be replaced if necessary.
Once they have been plugged into the connector, the two cables are strain-relieved and sealed by means of the integrally-cast cams. The cams engage with the two integral retaining clips on the socket outlet of the control unit or the actuator. It is important to ensure that the connector for the Operating element cable is inserted in the correct position in order to prevent possible displacement and permanent damage to the socket outlet in the connected device (↳ **4.5 Connections, page 22**).

## 6.4 Connection of actuators

**NOTE**

The rated IP protection is only guaranteed if the connecting sockets not being used are closed with a sealing stopper.

The following operating elements can be directly connected to the specified drives (↳ **4.5 Connections, page 22**).

| | |
|---|---|
| **EHA1, STF, STA** | ↳ MAX6, TXG |
| **EHA3, STJ, STE** | ↳ TFG5, TFG9 |
| **EHE1** | ↳ TXG4, TXG 5, TXG 8, TXG |
| **PHC, PFP, PAM** | ↳ MAX6 |
| | ↳ TLC, TGC, THC |

Before each connection is made, the sealing rings of the control switch connector should be checked for damage and, if necessary, must be replaced.

## 6.5 Connection to the control units

The following operating elements can be connected to the following control units (↳ **4.5 Connections, page 22**)

| | |
|---|---|
| **EHA1, STF, STA** | ↳ KOM1, KOM3, KOM3T |
| **EHA2, STG, STC** | ↳ KOM2 |
| **EHA3, STJ, STE** | ↳ BCU, VCU, SCU |
| **EHE** | ↳ SEM |

## 6.6 Connection to power (main supply)

There is no connection between Operating element and the power (main supply).

## 6.7 Requirements concerning the installation of the control unit with options

No options

**NOTE**

Additional information concerning inspections and readings (↳ **8.0 Maintenance, page 32**).

## 6.8 Initial start-up

Before initial start-up, check that the following points have been dealt with:

- All instructions followed in the above sections of this chapter.
- All cables secured against pinching and trapping, and properly connected.
- Electrical supply secured.
- Operating device connected to the control unit.
- No persons or obstacles near any movement.

### Initial start-up:

Prior to first operation, a professional electrician must perform and document the following test and readings:

- Visual condition check
- Function check of operating features and safety features
- Reading of leakage currents
- Reading of insulation resistance

After the installation check has been completed, you can startup control unit KOM.

With the LED on the operating light green, press the corresponding operating button of the operating device. Make sure that all functions are correctly operational.

# 7.0 Operations

This chapter is intended for the user groups, operator and owner. It provides all the information required for safe and proper operation of Operating elements and Accessories under normal operating conditions.

## 7.1 Safety

**⚠ WARNING**

There is a risk of injury through crushing in the operating environment of the device.
Therefore:

- Ensure that no persons are in the stroke area of the device while it is in operation.
- Take note of maximum permissible performance specifications for the device (↳ **11.1 Technical data, page 38**).
- Never tamper with the elements connected to the device while the device is in operation.
- Make sure that Operating elements cannot be activated unintentionally. Park the devices during no activities in a protected standby position.

**⚠ WARNING**

Risk of injury due to cracks and related openings in the housing of Operating elements and Accessories. If the housing is damaged
due to shock, breakage or heavy wear, cease using the device and follow the dismantling instructions.

## 7.2 Turn on

After the installation and first operation, a comprehensive function check should be done before operation, by activating the corresponding functions via the connected hand, foot or desk switch.

## 7.3 Turn off

The operating elements do not have an on/off switch. To de-energize the connected control unit or actuator, it must be disconnected from the main supply.

## 7.4 Actions before use

Operating elements and accessories must be correctly installed and connected to the control unit or actuator (with internal control unit).

**⚠ WARNING**

**Electric shock**
Beware of electric shock due to squeezed cable. Ensure that cables cannot get pinched or damaged. Ensure that the cabling is correctly installed in the cable channel.

## 7.5 Actions during the operation

The Operating elements and Accessories have been designed for normal use. To use the device in the final application (↳ **11.1 Technical data, page 38** and also the operating manual and datasheet from the Ewellix control units, Ewellix columns and Ewellix linear actuators).

### 7.5.1 Normal operation

Use the directional buttons up and down on the operating device to operate the actuators.

**Button up:** The actuator extends

**Button down:** The actuator retracts

On the operating device there is a green LED indicating norma operation. The actuators will stop if both buttons are pressed at the same time.

**⚠ WARNING**

Control the functionality (press button up and down) of the operating elements to check the correct moving direction of the actuator.
In the force needed to activate a push button significantly changes, this can be an early warning of an unintended movement.
Replace switch device immediately.

**⚠ WARNING**

In case there is no actuator movement after pressing the button, do not increase the force on the button.
The cause for no movement can be a thermal issue, an open fuse in the control unit or actuator and not a defect in the operating element.
That for shut down the system and check each device.

### 7.5.2 Operation options

Details of specific operations can be found in the following sections:

- Installation and irst operation
- Maintenance
- Malfunctions
- Dismantling

**NOTE**

In case of unintended operation, push the opposite button of the electric operating element to stop the movement of the actuator.

## 7.6 Emergency disengagement

Pull the mains power cable from the socket of the control unit.

In hazardous situations, all movements of the application must be stopped as quickly as possible and the power supply turned off.

Procedure in hazardous situations:

- Immediately engage emergency shut-off if present, or cut off power to the control unit.
- Evacuate people from the danger zone, initiate any necessary first aid measures.
- Notify doctor and fire department, if necessary.
- Notify responsible person on-site.
- Keep access paths open for rescue vehicles or personnel.
- Based on severity of emergency, notify the authorities if necessary.
- Order appropriate personnel to repair malfunction.
- Check the device and the application that uses the device, prior to restarting the operation. Ensure that all safety equipment is installed and fully functional.

**NOTE**

The Operating elements and Accessories do not have an on /off switch and must be disconnected from the control unit or actuator. Only this measure will de-energize the devices.

**NOTE**

The application in which Operating elements and Accessories are installed may need to be equipped with an emergency stop switch or isolation from the mains supply on all poles.

**⚠ WARNING**

Do not restart until all persons are outside the danger zone.

## 7.7 Action after use

Locate the operating elements to avoid unintentional activation of a function switch.

# 8.0 Maintenance

### Personnel

- The maintenance work described in this chapter can be performed by the operator unless otherwise indicated.
- Some maintenance tasks should only be carried out by especially trained, qualified personnel, or exclusively by the manufacturer. This will be indicated in the description of the respective maintenance tasks.
- Only professional electricians should perform work on the electrical Equipment.
- Only professional trained personnel can substitute any operations elements, accessories and cables in the application.

**⚠ WARNING**

**Electric shock hazard**

Incorrect maintenance can result in serious injury, death or damage. Only professional electricians should work on electrical systems.

**⚠ WARNING**

**Danger if restart is unintentional**

When correcting faults, there is a risk of the energy supply being switched on without authorization. This poses a life threatening hazard to persons in the danger zone.

- Prior to starting fault repair work, switch off the system and be sure it is locked out.

## 8.1 Maintenance plan

**NOTE**

It is recommended that you comply with IEC 62353 regarding maintenance.

Maintenance tasks which are required for optimal and trouble-free operation are described in the sections below. If increased wear is detected during regular inspections, shorten the required maintenance intervals according to the actual indications of wear.

## 8.2 Maintenance work

**NOTICE**

If the Operating elements and Accessories are used outside the environmental conditions specified earlier in this manual, check the device once a month for any changes, such as oxidation, sedimentation or cracks.

**⚠ WARNING**

Control the functionality (press button up and down) of the operating elements to check the correct moving direction of the actuator.
In the force needed to activate a push button significantly changes, this can be an early warning of an unintended movement.
Replace switch device immediately.

**⚠ WARNING**

Damaged housing does not provide IP protection specified in the technical data (↳ **11.1 Technical data, page 38**). Damaged cables could result in a short circuit or unintended movement.

The devices are maintenance-free for their lifetime (↳ **2.1.1.1 Product life time, page 8**). Connection cables and housing must be checked for wear and tear at regular intervals. In compliance with applicable regulations, safety inspections must be carried out on location, at regular intervals. Check grounding and substitute leakage currents annually.

The housing, foils, keypads and the cables connected must be examined at regular intervals (every six months) for signs of mechanical damage. If any damage is revealed, the devices must be isolated from the control unit or actuator and any defective parts must be replaced.

Every six months, the devices must be checked by monitoring the actuators as they are retracted and extended.

The following points have to be checked regularly:

- Plug
- Housing
- Cable
- Protective foil/Key pads (with symbols)
- Leakage current
- Function
- Spiral air tube (pneumatic elements)

This regular check includes checking of all functions and safety measurements and if the buttons and the foil are still unimpaired.

**⚠ WARNING**

Replace the hand switch/foot switch/ desk switch immediately if you experience:

- A slow reaction of the actuator
- No tactile sound (no click)
- Loose switch

This can be early warning of unintended movement.

**⚠ WARNING**

**Pneumatic operating elements:**
After maintenance work, when reassembling the air tube, always arrange notch over notch.
Otherwise an incorrect operation or unintended movement can occur.

## 8.2.1 Cleaning

The Operating elements and Accessories are manufactured to comply with the followed degree of protection. For the devices with IP67, IPX7 and IP66, it is suitable for use with machine washing devices. Those satisfy current “washing line resistance” requirements for beds in accordance with IEC 60601-2-52.

| IP Protection | Device | Type of device |
|---|---|---|
| IP67 | EHA | Electrical hand switch |
| IPX7 | EHE | Electrical hand switch |
| IP66 | PHC | Pneumatic hand switch |
| | | |
| IP66 | SPP, ZVB | Accessories |
| IPX2 | STF, STG, STJ, STL | Electrical hand switch |
| IP21 | PFP | Pneumatic hand switch |
| | | |
| IPX0 | STA, STC, STE | Electrical hand switch |
| PX0 | PAM | Pneumatic hand switch |
| IP32 | STK | Electrical hand switch |

The Operating elements and Accessories should be cleaned as soon as possible after use, in order to prevent any accretion of unwanted material.

The device should be cleaned with a damp cloth and water, to which isopropyl alcohol has been added.

**NOTICE**

The devices should never be washed using a washing machine or similar device unless the motors, control unit and mains cable have been properly connected.
The ingress of luids could cause irreparable damage to the system.

**NOTICE**

The plastic housing must be checked periodically (every six months) for mechanical damage (cracks).

**NOTICE**

**Washing / cleaning:**
High pressure steam cleaning machines must not be used.
Wash water containing chemical additives must be pH-neutral. Excessively acidic or alkaline wash water can cause irreparable damage to the metal and plastic parts of the device. Only isopropyl alcohol should be used for wiping over the control unit to disinfect it.

Observe the following points when cleaning:

- Separate device from control unit or actuator. Unplug the cables from the socket
- Clean soiled parts immediately
- Use a damp cloth
- Wash water, including added chemicals, must be pH-neutral
- Acidic or alkaline wash water can destroy metallic and synthetic parts
- Disinfect by hand washing exclusively with isopropyl alcohol

## 8.2.2 Inspections and readings

- To be performed by a professional electrician.
- To be conducted according to the applicable standards and regulations.
- To be fully documented.

Complete the following entries in the service log:

- Name of the executing body (company, department)
- Names of the staff on duty
- Identification of the device/system (type, serial number, inventory number) and the respective Accessories
- Completed inspections and readings
- Scope and results of the inspections
- Measuring method, measuring device, measurement readings
- Overall assessment / verification of all functions compared to specifications
- Date and signature of the assessor; personal coding is a viable alternative for IT applications.

## 8.3 Measures following completed maintenance

Upon completion of the maintenance work, the following steps must be performed prior to restarting the device.

- Check all previously loosened screw connections for a tight fit.
- Ensure that all used tools, materials and other equipment have been removed from the work area.
- Clean work area and remove potential spills such as liquids, processing materials or similar substances.
- Ensure that all the system's safety measures are working satisfactorily.
- Check all functions against the product specifications.
- Document the inspections in the service log.

# 9.0 Malfunctions

This chapter describes potential causes for malfunctions and the work required to restore operation. In the event of more frequent malfunctions, shorten the maintenance intervals.

For any malfunction not resolved using the information provided here, contact the manufacturer. See service contact details listed on www.ewellix.com or back cover.

## Personnel

- Unless otherwise indicated, the work required to solve malfunctions may be performed by the operator.
- Some work may only be carried out by qualified personnel, which is indicated in the description of the specific malfunction.
- Work on the electrical system may only be performed by professional electricians.

## Actions during malfunctions

- In the event of a malfunction that may present an immediate danger to persons or assets, turn off the actuator or control unit immediately and safeguard against a restart
- Determine cause of malfunction.
- Depending on the type of a malfunction, have it repaired by qualified personnel.
- Inform responsible party on-site concerning malfunction.

**⚠ WARNING**

**Danger if restart is unintentional**
When correcting faults, there is a danger of the energy supply being switched on without authorization. This poses a life threatening hazard to persons in the danger zone.
Therefore:

- Prior to starting fault repair work, switch off the system and safeguard it by activating lockout.

**⚠ WARNING**

**There is a risk of injury through crushing in the operating environment of the device.**
Therefore:

- Ensure that no persons are in the stroke area of the device while it is in operation.
- Take note of maximum permissible performance specifications for the device (↳ **11.1 Technical data, page 38**).
- Never tamper with the elements connected to the device while the device is in operation.

# 9.1 Malfunction table

**NOTE**

The following malfunction table provides information as to the personnel authorized to peform the repair.

| Malfunction | Possible cause | To check or To repair | To do by |
|---|---|---|---|
| the actuator does not move | no mains power at the control unit or actuator | check mains power connection | trained personnel |
| | no or bad connected control cable | check control cable connection | qualified personnel |
| | no LED light on the operating element | check connection and the user manual of the control unit or actuator | qualified personnel |
| | switches on the operating element defective | replace operating device (operating element) | qualified personnel |
| | cable on the operating element defective | replace operating device | qualified personnel |
| | control unit defective | check or replace control unit | qualified personnel |
| | actuator defective | check or replace actuator | qualified personnel |
| the actuator moves unintentionally | short at operating element (switches or cable) | push emergency stop | operator |
| | | activate opposite button to stop the movement | operator |

# 9.2 Start of operation after malfunction repair

To restart device following repair of the malfunction, perform the steps described in **6.3 Installation, page 28**.

# 10.0 Dismantling

This chapter is intended for technicians and those carrying out further processing. It provides all the information needed for removal of Operating elements and Accessories from service, including dismantling and disposal.

### Personnel

- Dismantling may only be carried out by specifically qualified personnel.
- Work on the electrical system may only be performed by professional electricians.

**⚠ WARNING**

**Electric shock and moving parts hazards:**
Serious injury or death can be caused by touching live electrical components and by unexpected movement of connected drives. Be sure power supply is off and actuators are locked out before dismantling.

**⚠ WARNING**

**Risk of injury due to incorrect dismantling**
Stored residual power, sharp-edged components pins and corners on the individual components or on required tools can all cause serious injury or death.
Therefore:

- Ensure there is ample space for dismantling prior to starting work.
- Use caution when working with open, sharp-edged structural components
- Ensure order and cleanliness at the dismantling site. Loosely stacked structural components, or structural components and tools on the loor increase risk of accidents
- Dismantle structural components professionally, in accordance with applicable local regulations
- Secure structural components carefully, to ensure they cannot fall or tip over
- Contact the manufacturer if you have any questions or concerns

## 10.1 Dismantling

- Separate device from energy supply.
- Secure elements of the application such that no loads can impact the actuator and the control unit.
- Loosen and remove fastening bolts from the mounting of the Operating elements and Accessories
- Separate devices from application elements.
- Pull the plug of the operating device out of its corresponding terminal.
- Clean the device.
- Carefully package for shipment to the manufacturer.
- For disposal, disassemble device according to applicable local occupational health and environmental regulations.

## 10.2 Disposal

Provided that no take-back or disposal agreement has been put in place, the disassembled components should be recycled.

- Dispose of metals and plastic components at an appropriate recycling center.
- Sort remaining components based on the respective materials and dispose of according to applicable local occupational health and environmental regulations. The local municipal authorities or specialized waste management companies can provide information concerning environmentally appropriate disposal.

**NOTE**

Damage can be caused to the environment by incorrect disposal. Electronic waste, electronic components, lubricants and other additives are subject to special waste treatment regulations and may only be disposed of by approved specialized companies.

# 11.0 Appendix

This chapter enables the user to conveniently find technical data, directories, diagrams and plans.

## 11.1 Technical data

### Equipment and operating data

The equipment and operating data can be found on the current data sheet:

- Data sheets for hand switches: EHA1 PUB MT/P8 10433 EN
  EHA2
  EHA3 PUB MT/P8 10434 EN
  EHA4
  EHE PUB MT/P8 10435 EN
  PHC
- Data sheets for foot switches: STF PUB MT/P8 10440 EN
  STG
  STJ
  STL (for CPMA/B)
  PFP
- Data sheet for desk switches: STA PUB MT/P8 10441 EN
  STC
  STE
  STK (for CPMA/B)
  PAM

Current data sheets are available on the Ewellix website (↳ **www.actuators.ewellix.com**)

| Hand switch<br>Technical data | Unit | EHA1 | EHA2 | EHA3 | EHA4 | EHE | PHC |
|---|---|---|---|---|---|---|---|
| Type of element | | Low voltage | L.V. | L.V. | L.V. | L.V. | Pneum. |
| Max. operating channels | | 5 | 5 | 5 | 1 | 4 | 4 |
| Control unit connection | | 1 | 1 | 1 | 1 | 1 | 1 |
| Voltage | U (V DC) | 12 | 5 | 12 | 5 | 38 | n/a |
| Current (switches) | I (mA) | 50 | 50 | 50 | | 50 | n/a |
| Ambient temperature | °C | +10 / +40 | | | | | |
| Degree of protection | IP | 67 | 67 | 67 | 67 | X7 | 66 |
| Color | | Grey | Grey | Grey | Grey | Grey | Grey |
| Weight | kg | 0,25 | 0,25 | 0,25 | 0,25 | 0,2 | 0,25 |

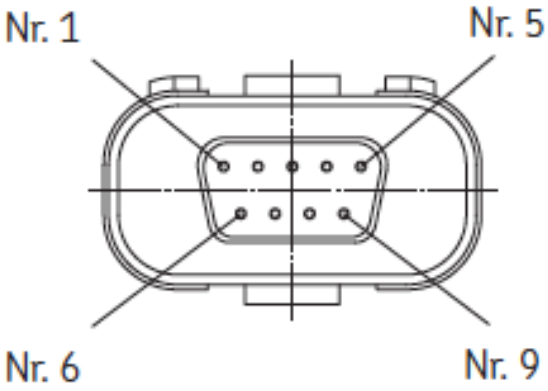
| Foot switch<br>Technical data | Unit | STF | STG | STJ | STL | PFP |
|---|---|---|---|---|---|---|
| Type of element | | Low voltage | L.V. | L.V. | L.V. | Pneum. |
| Max. operating channels | | 3 | 5 | 5 | 1 | 1 |
| Control unit connection | | 1 | 1 | 1 | 1 | 1 |
| Voltage | U (V DC) | 12 | 5 | 12 | 5 | n/a |
| Current (switches) | I (mA) | 50 | 50 | 50 | 20 | n/a |
| Ambient temperature | °C | +10 / +40 | | | | |
| Degree of protection | IP | X2 | X2 | X2 | X2 | 21 |
| Color | | Grey / Blue | Grey | Grey | Grey | Grey |
| Fixing screws (Thread) | | M5 | M5 | M5 | M5 | |
| Weight | kg | 0,4 | 0,4 | 0,4 | 0,4 | 0,15 |

| Desk switch<br>Technical data | Unit | STA | STC | STE | STK | PAM |
|---|---|---|---|---|---|---|
| Type of element | | Low voltage | L.V. | L.V. | L.V. | Pneum. |
| Max. operating channels | | 5 | 5 | 5 | 1 | 1 |
| Control unit connection | | 1 | 1 | 1 | 1 | 1 |
| Voltage | U (V DC) | 12 | 5 | 12 | 5 | n/a |
| Current (switches) | I (mA) | 50 | 50 | 50 | 20 | n/a |
| Ambient temperature | °C | +10 / +40 | | | | |
| Degree of protection | IP | X0 | X0 | X0 | X0 | X0 |
| Color | | Grey | Grey | Grey | Grey | Grey |
| Weight | kg | 0,15 | 0,15 | 0,15 | 0,15 | 0,1 |

| Accessories:<br>Technical data | Unit | SPP | ZVB |
|---|---|---|---|
| Type of element | | Low voltage | L.V. |
| Max. operating channels | | 4 | 2 (3) |
| Control unit connection | | 1 | 1 |
| Voltage | U (V DC) | 12 | 12 |
| Current (switches) | I (mA) | 50 | 50 |
| Ambient temperature | °C | +10 / +40 | |
| Degree of protection | IP | 66 | 66 |
| Color | | Grey | Grey |
| Weight | kg | 0,25 | 0,15 |

# 11.2 Plans and diagrams

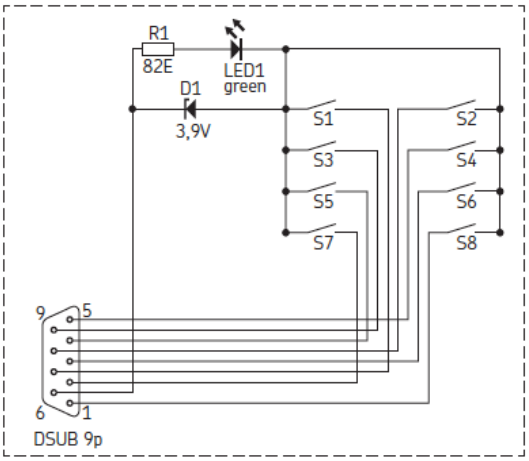
## 11.2.1 Connection diagrams



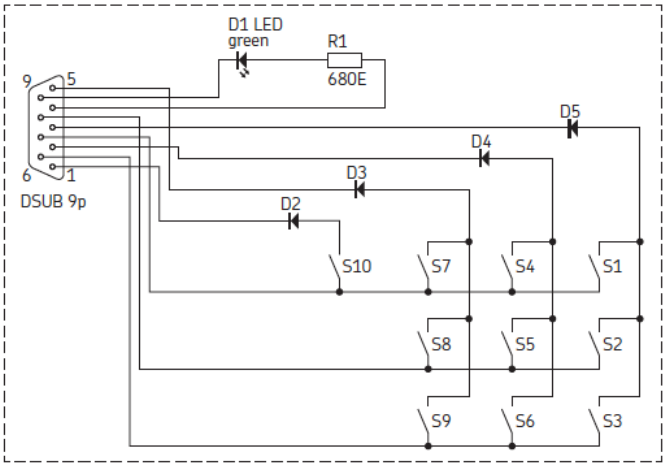

**Nr. Colour**

1. Black
2. Brown
3. Red
4. Orange
5. Yellow
6. Green
7. Blue
8. Violet
9. Grey

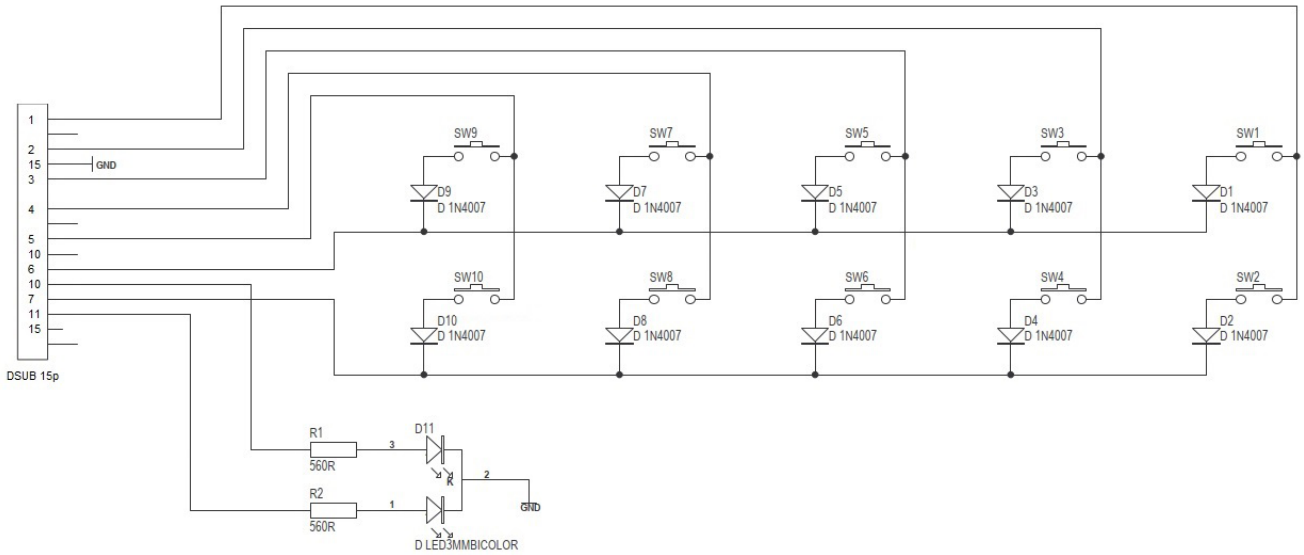
**EHA1:**



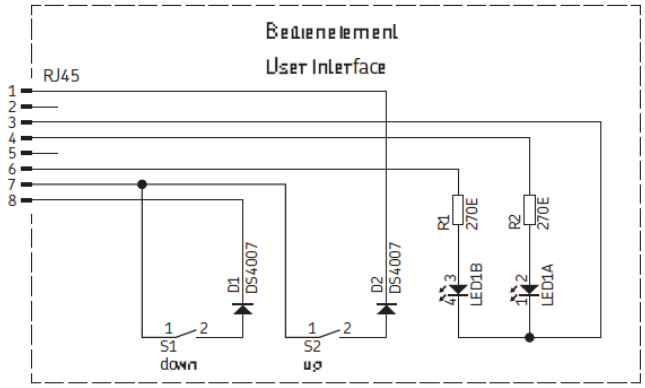

**EHA2:**



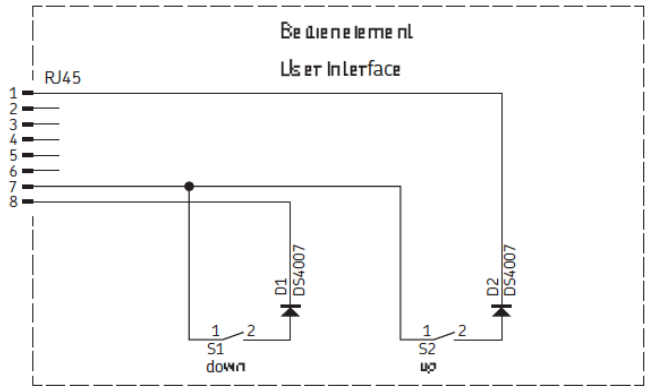
## EHA3:




## EHA4 (hand switch), STK (desk switch):

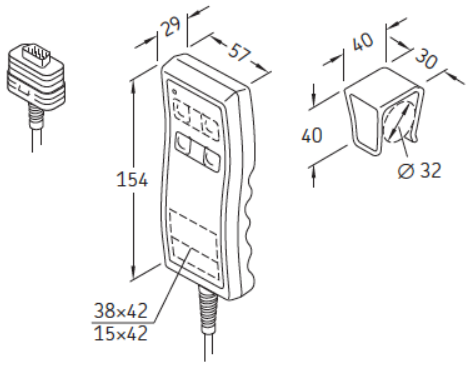



## STL (foot switch):

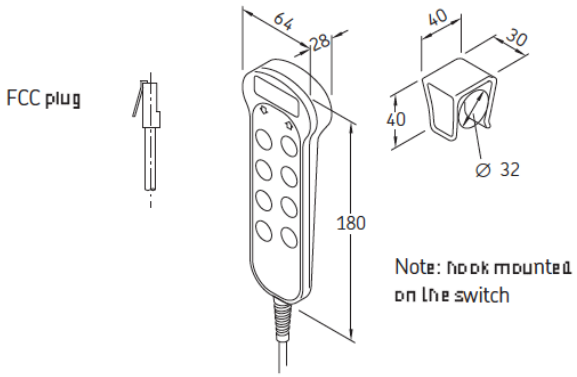


## 11.2.2 Dimensional drawing

### EHA:




### EHE:

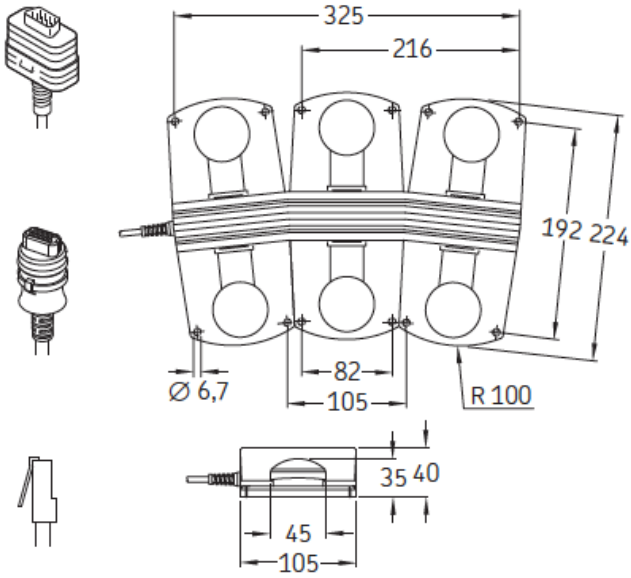



### Foot switch (STF & STG):

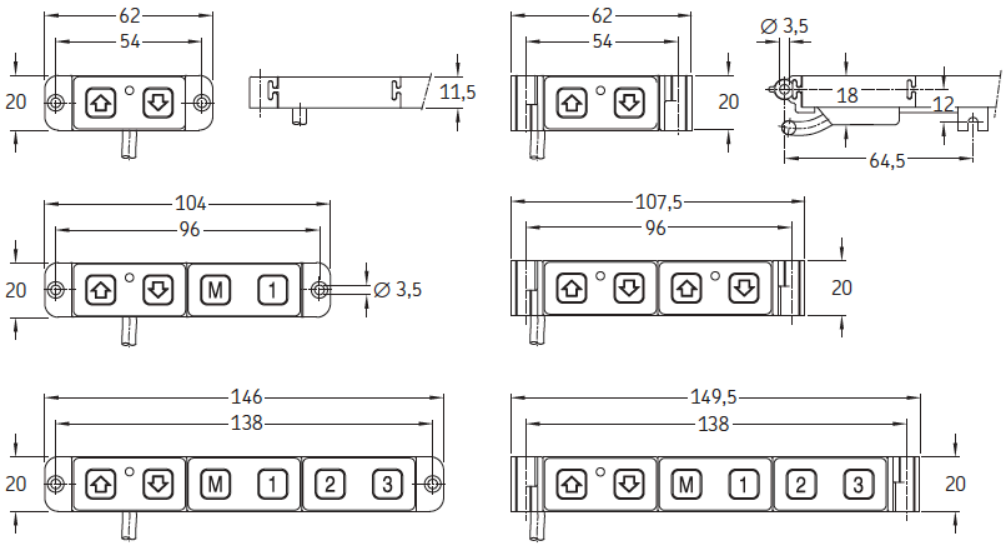
D - S ub 9 plug

HD 15 plug

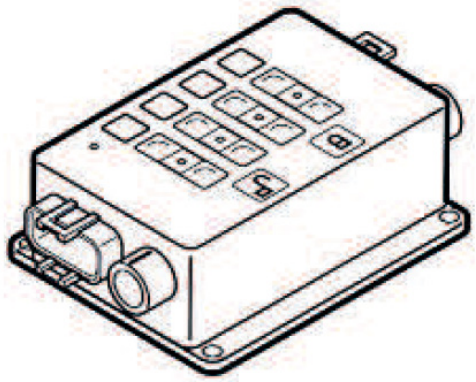
FCC plug




### Desk switch:

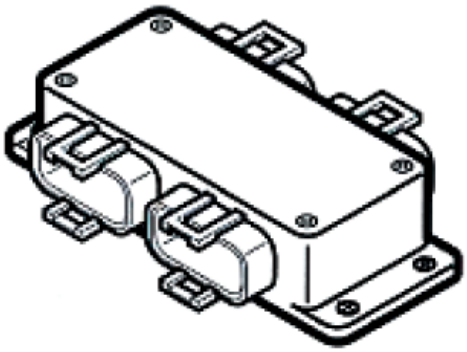


## Locking box SPP:



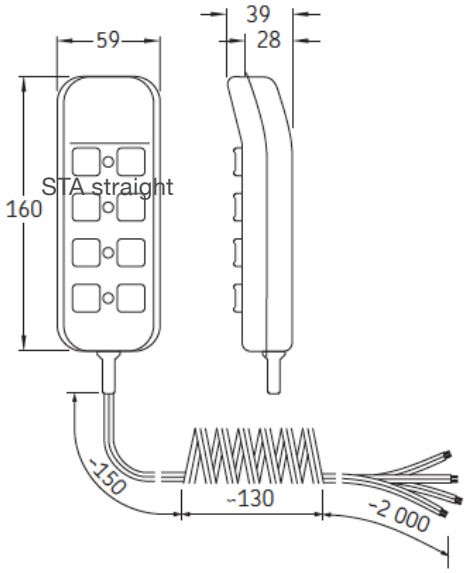
Dimensions: 138 x 109 x 45 mm
Mounting holes: 125 x 97 mm / $d_m$ = 5,5 mm

## Distribution box ZVB:



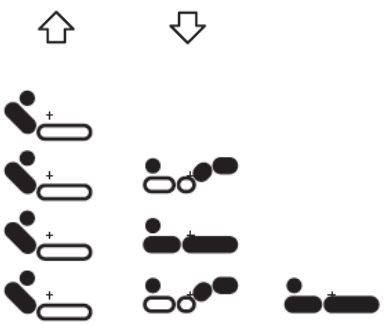
Dimensions: 132 x 50 x 30 mm
Mounting holes: 120 x 30 mm / $d_m$ = 5,5 mm

## Pneumatic hand switch:



## 11.2.3 Symbols

### Electrical hand switch:



Up / down

Head

Head Foot

Head Level

Head Foot Level

### Electrical foot switch:

Up

Down

Level up

Level down

Head selection up

Head selection down

Base up

Base down

Trendelemburg

Trendelemburg

Anti trendelemburg

Anti trendelemburg


Memory


Memory Channel 1


Memory Channel 2


Memory Channel 3

## Electrical desk switch:


Up Down

Memory Channel 1


Channel 2 Channel 3

## Pneumatic hand switch:

Head down Head up

Foot down Foot up

Level height down Level height up

## 11.2.4 Type keys

### Hand switch:

EHA3 - 23M N - 000

**Type**

**Number of channels**

| | |
|---|---|
| 1 channel | 1 |
| 2 channels | 2 |
| 3 channels | 3 |
| 4 channels | 4 |
| 5 channels | 5 |
| 1 channel with 3 memory positions (only for SCU) | A |
| 2 channels with 3 memory positions (only for SCU) | B |
| 3 channels with 3 memory positions (only for SCU) | C |

**Symbols**

| | | |
|---|---|---|
| None | | 00 |
| 1 channel: 2nd row from top | Arrow up/down | 10 |
| | Head | 11 |
| | Foot | 12 |
| | Level | 13 |
| | Anti-Trendelenburg | 14 |
| 2 channels: 1st-2nd row from top | Arrow up/down | 20 |
| | Head/foot | 21 |
| | Head/level | 22 |
| | Level/head | 23 |
| | Level/Anti-Trendelenburg | 29 |
| 3 channels: 1st-3rd row from top | Arrow up/down | 30 |
| | Head/foot/level | 31 |
| | Level/head/foot | 32 |
| | Level/Anti-Trendelenburg/Head | 39 |
| 4 channels: 1st-4th row from top | Arrow up/down | 40 |
| | Level/Anti-Trendelenburg/Head/Foot | 47 |
| 5 channels: 1st-5th row from top | Arrow up/down | 50 |

Options written in red are only available on demand. Please contact Ewellix.

EHE1 - 1B1 B - 000

**Type**

**Number of channels**

| | |
|---|---|
| 1 channel | 1 |
| 2 channels | 2 |

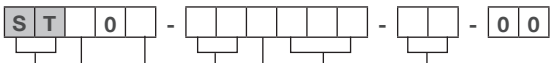
**Symbols**

| | | |
|---|---|---|
| 1 channel: | Arrow up/down | 10 |
| 2 channels: | Arrow up/down | 20 |

There is no type key for the pneumatic hand switch PHC.

To get technical information, contact the Ewellix Business Support or Customer Service on www.ewellix.com

## Foot switch:




**Type**

**Product group:**

| | |
|---|---|
| Classic, D-Sub9 or FCC plug | F |
| Standard, single-fault safety, HD15 plug | J |

**Number of channels:**

| | |
|---|---|
| One (1) channel | 1 |
| Two (2) channels | 2 |
| Three (3) channels | 3 |

**Cable / connecting plug:**

| | |
|---|---|
| Coiled cable 1,3-2,5 m / D-sub plug | LU |
| Coiled cable 1,3-2,5 m / HD15 plug | LW |
| Straight cable 2,5 m / D-sub plug | 0U |
| Straight cable 2,5 m / FCC plug (only for STF01 and STF02) | 0V |
| Straight cable 2,5 m / HD15 plug | 0W |

**Color:**

| | |
|---|---|
| Anthracite | 1 |
| Blue | 4 |

**Option:**

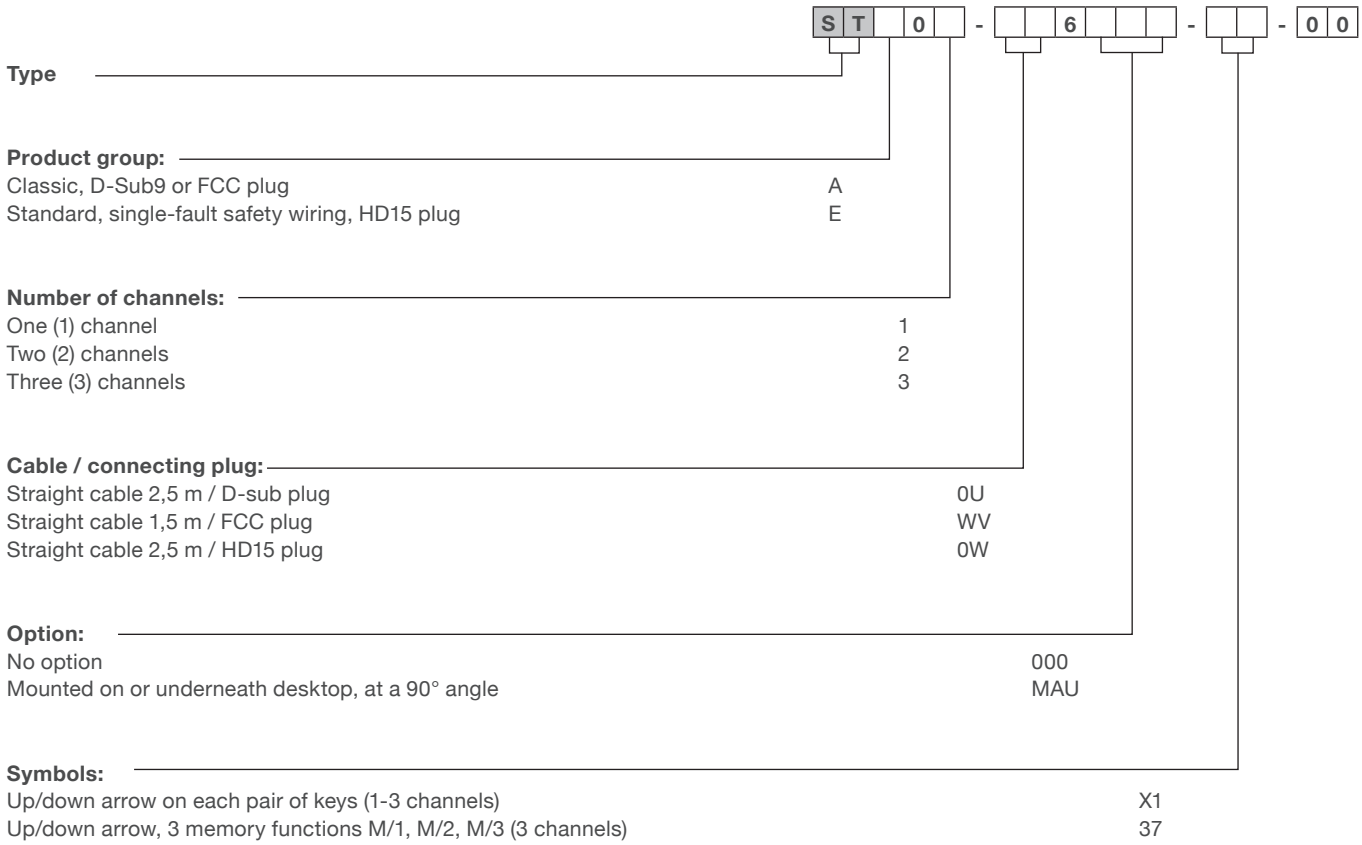
| | |
|---|---|
| None | 000 |
| Mounted with rubber feet | MAY |

**Symbols:**

| | |
|---|---|
| Arrow up/down (on each pair of buttons), 1–3 channels | X1 |
| Arrow up/down, M/1, 2/3 (3 memory buttons) only for STJ03 | 37 |

There is no type key for the pneumatic foot switches PFP.
To get technical information contact the Ewellix Business Support or Customer Service on www.ewellix.com

## Desk switch:




There is no type key for the pneumatic desk switches PAM.
To get technical information contact the Ewellix Business Support or Customer Service on www.ewellix.com

## 11.3 Approved accessories

See chapter 4.8 Accessories, page 24

## 11.4 Standards compliance

| | | |
|---|---|---|
| **IEC 60601-1: 1998**<br>**EN 60601-1: 1990** | Medical electrical Equipment, IEC<br>Part 1: General Requirements for Safety | 2nd ed. |
| **IEC 60601-1: 2005**<br>**EN 60601-1: 2006** | Medical Electric Equipment, IEC<br>Part 1: General Requirements for Safety | 3rd ed. |
| **UL 60601-1:** | 1st edition Medical Electrical Equipment,<br>Part 1: General Requirements for Safety | |
| **CSA C22.2 no.601.1:** | 1st edition Medical Electrical Equipment,<br>Part 1: General Requirements for Safety | |
| **ANSI/AAMI ES60601-1 (2005)**<br>**CAN/CSA – C22.2 No. 60601-4 (2008)** | | 3rd ed. |
| **EN 60601-1-2** | Medical Electrical Equipment,<br>Part 1-2: General Requirements for Safety<br>Additional standard: electromagnetic<br>Compatibility – requirements and test | |
| **IEC/EN 60529** | Degrees of Protection provided by<br>Enclosures (IP codes) | |
| **RoHS II Directive 2011/65/EC**<br>**WEE Directive 2002/96/EC** | Restriction of Hazardous Substances<br>Waste of electrical and Electronic Equipment | |

## 11.5 Certification of conformity

A certification of conformity can only be stated in combination with Ewellix control units and Actuators.

**ewellix.com**



**PUB NUM TC-08030/1-EN-September 2022**