



Actuators

Series 8602/3

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1 General Information

1.1 Manufacturer

R. STAHL Schaltgeräte GmbH
Am Bahnhof 30
74638 Waldenburg
Germany

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Fax: +49 7942 943-4333
Internet: www.r-stahl.com
E-Mail: info@stahl.de

1.2 Information about the manual

ID-No.: 229711 / 8602612300
Publication Code: 2017-07-26-HB00-III-en-01

1.3 Further documents




- Data sheet
 - Operating instructions
- For documents in further languages, see www.r-stahl.com.

1.4 Conformity with standards and regulations

See certificates and EU Declaration of Conformity: www.stahl-ex.com.

2 Explanation of the symbols




2.1 Symbols used in this manual

Symbol	Meaning
	Tips and recommendations on the use of the device
	Danger due to explosive atmosphere
	Danger due to live components


2.2 Warning notes

Warnings must be observed under all circumstances, in order to minimize the risk due to construction and operation. The warning notes have the following structure:

- Signalling word: DANGER, WARNING, CAUTION, NOTICE
- Type and source of danger/damage
- Consequences of danger
- Taking countermeasures to avoid the danger or damage

	DANGER
	Danger to persons Non-compliance with the instruction results in severe or fatal injuries to persons.
	WARNING
	Danger to persons Non-compliance with the instruction can result in severe or fatal injuries to persons.
	CAUTION
	Danger to persons Non-compliance with the instruction can result in light injuries to persons.
NOTICE	
Avoiding material damage Non-compliance with the instruction can result in material damage to the device and / or its environment.	

2.3 Symbols on the device

Symbol	Meaning
NB 0158 <small>16338E00</small>	Notified body for quality control.
 <small>02198E00</small>	Device certified for hazardous areas in accordance with the marking.

3 Safety notes

3.1 Storage of the manual

- Read the manual carefully.
- Store the manual at the mounting location of the device.
- Observe applicable documents and operating instructions of the devices to be connected.

3.2 Safe use

Before assembly

- Read and observe the safety notes in this manual.
- Ensure that the contents of this manual are fully understood by the personnel in charge.
- Use the device in accordance with its intended and approved purpose only.
- Always consult with R. STAHL Schaltgeräte GmbH if using the device under operating conditions not covered by the technical data.
- Make sure that the device is not damaged.
- We are not liable for damage caused by incorrect or unauthorised use of the device or by non-compliance with this manual.

For assembly and installation



- Observe national assembly and installation regulations (e.g. IEC/EN 60079-14).
- Observe national safety and accident prevention regulations.
- During installation and operation, observe the information (characteristic values and rated operating conditions) on the type plates and data plates and information signs located on the device.
- Before installation, make sure that the device is not damaged.

- Do not use coated metal protective collars in areas where high charge-generating processes, machine friction and separation processes, electron spraying (e.g. around electrostatic coating systems) and pneumatically conveyed dust occur.


Maintenance, repair, commissioning

- Before commissioning, make sure that the device is not damaged.
- Work on the device, such as installation, maintenance, overhaul, repair, may only be carried out by appropriately authorised and trained personnel.
- Perform only maintenance work or repair described in this manual.

3.3 Modifications and alterations

	DANGER
	<p>Explosion hazard due to modifications and alterations to the device! Non-compliance results in severe or fatal injuries.</p> <ul style="list-style-type: none"> • Do not modify or alter the device.
	<p>No liability or warranty for damage resulting from modifications and alterations.</p>

4 Function and device design

	DANGER
	<p>Explosion hazard due to improper use! Non-compliance results in severe or fatal injuries.</p> <ul style="list-style-type: none"> • The device may only be used according to the operating conditions described in this manual. • Use the device only for the intended purpose specified in this manual.

4.1 Function

Application range

The actuators 8602/3 are designed for installation in enclosure walls and enclosure covers of electrical equipment or of panels of the type of protection Increased safety "e" and Protection by enclosure "tb". The components are approved for use in hazardous areas of Zones 1, 2, 21 and 22.

5 Technical data

Explosion Protection

Global (IECEX)

Gas and dust	IECEX PTB 13.0047U Ex eb IIC Gb Ex tb IIIC Db
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Europe (ATEX)

Gas and dust	PTB 13 ATEX 1019 U ⊕ II 2 G Ex eb IIC Gb ⊕ II 2 D Ex tb IIIC Db
--------------	---

Certifications and certificates

Certificates	IECEX, ATEX
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Technical Data

Ambient conditions

Operating temperature	Silicone-free (NBR)	-20 to +60 °C
	Silicone:	-60 to +70 °C
Maximum relative humidity	max. 50% (+40 °C)	
	max. 90% (+20 °C)	
Storage temperature	Silicone-free (NBR):	-25 to +60 °C
	Silicone:	-60 to +70 °C
	Actuators with silicone seals have coloured labels on the bottom.	
Use at the height of	< 2,000 m	

Mechanical data

Material	polyamide
Degree of protection	IP66 (IP68 on request)
Service life	≥ 100,000
Degree of pollution	3
Impact strength	7 J (EN 60079-0)
	min. IK08 (EN 62208)
	4 J (EN 60079-0: illuminated pushbutton and indicator lamp bezel)
Dimensions	see dimensional drawings
Tightening torque of the locknut	3 Nm

For further technical data, see www.r-stahl.com.

6 Transport and storage

- Transport and store the device only in the original packaging.
- Store the device in a dry place (no condensation) and vibration-free.
- Do not drop the device.

7 Mounting and installation

The actuators can be installed up to a maximum wall thickness of 5 mm.

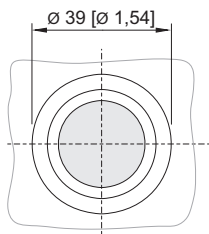
Exception

The rotary actuators with radial drive can be installed up to a wall thickness of 3 mm. The actuators (8602/3) cannot be used together with the LED indicator lamps (8010/x-xx-ws)

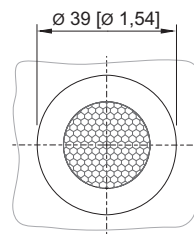
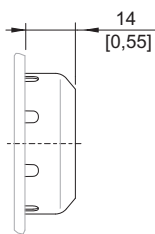
7.1 Dimensions / fastening dimensions

Dimensional drawings (all dimensions in mm [inches]) – subject to modification

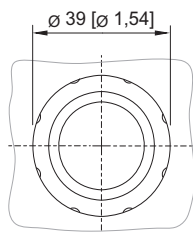
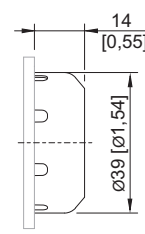
Actuators with axial actuation



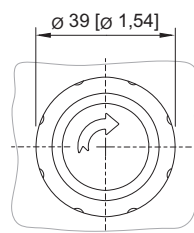
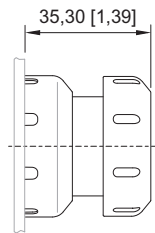
8602/3-001 pushbutton



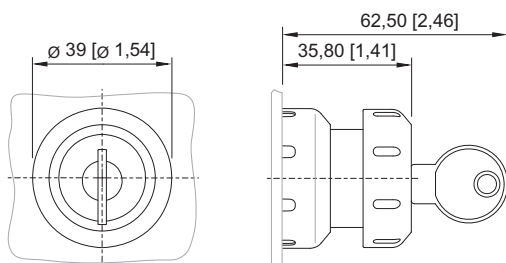
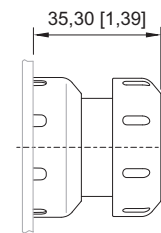
8602/3-735 illuminated pushbutton



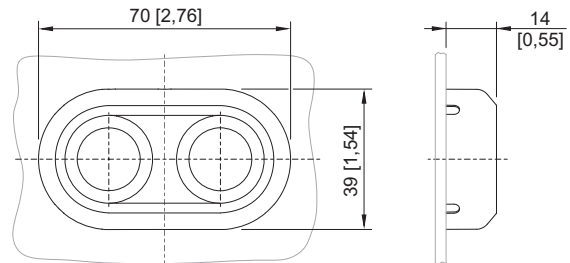
8602/3-003 mushroom pushbutton, black
8602/3-004 mushroom pushbutton, red / black



8602/3-010 mushroom stay-put button, red / yellow
8602/3-012 mushroom stay-put button, black / black

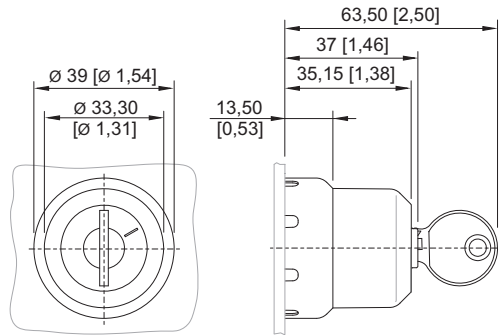


8602/3-006 mushroom stay-put button with key lock, red / black
8602/3-009 mushroom stay-put button with key lock, red / yellow

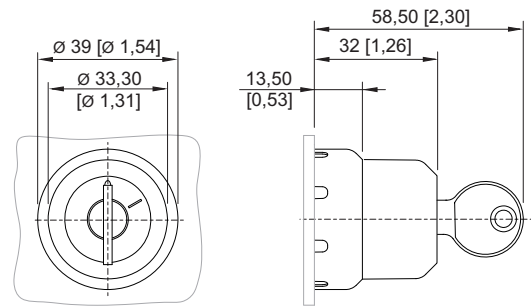


8602/3-023 twin pushbutton

Dimensional drawings (all dimensions in mm [inches]) – subject to modification



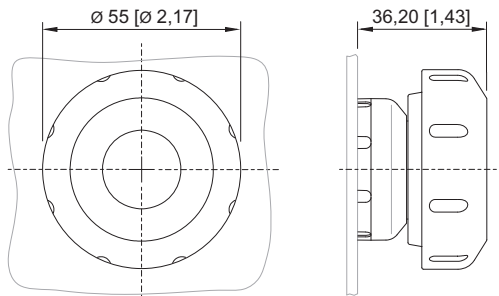
17180E00



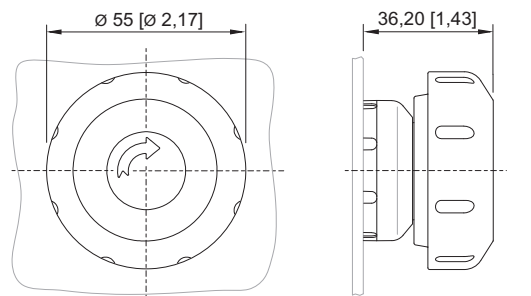
17349E00

8602/3-008 KMS key-operated switch

8602/3-008 MS key-operated switch



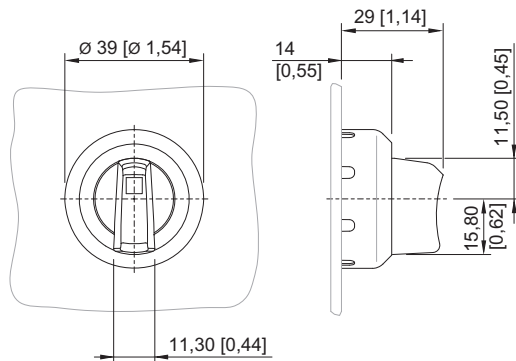
17179E00



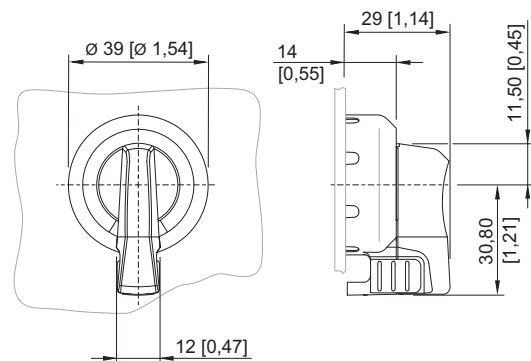
17178E00

8602/3-014 mushroom pushbutton,
red / black
8602/3-703 mushroom pushbutton,
black / black

8602/3-015 mushroom stay-put button,
red / yellow
8602/3-712 mushroom stay-put button,
black / black



17175E00



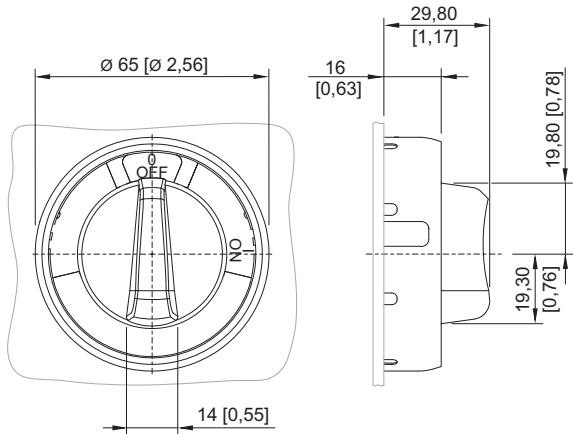
17174E00

8602/3-726 rotary actuator, axial

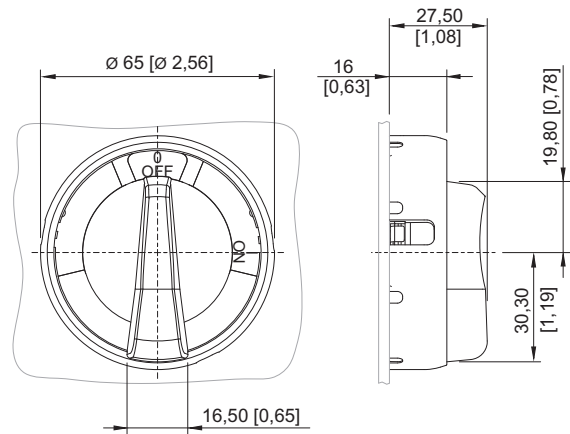
8602/3-727 rotary actuator, axial

Dimensional drawings (all dimensions in mm [inches]) – subject to modification

Actuators with radial actuation



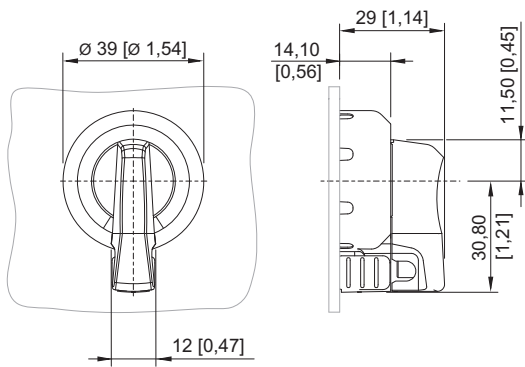
17184E00



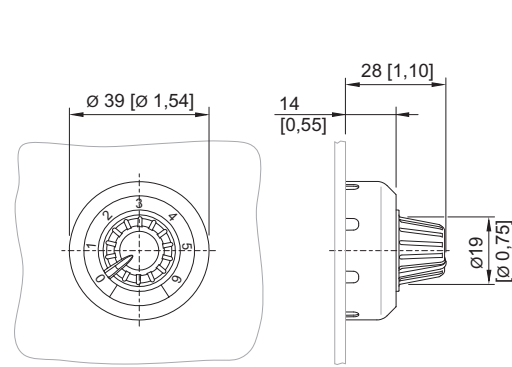
17182E00

8602/3-728 rotary actuator, black handle, black protective collar
 8602/3-729 rotary actuator, red handle, yellow protective collar

8602/3-730 rotary actuator, red handle, yellow protective collar
 8602/3-731 rotary actuator, black handle, black protective collar



17183E00

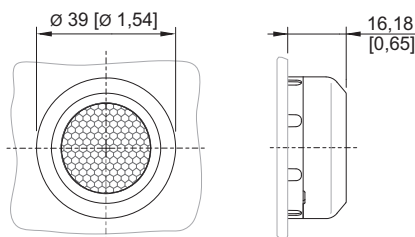


17176E00

8602/3-734 rotary actuator, padlockable using 1 lock

8602/3-092 potentiometer bezel

Actuators without actuation

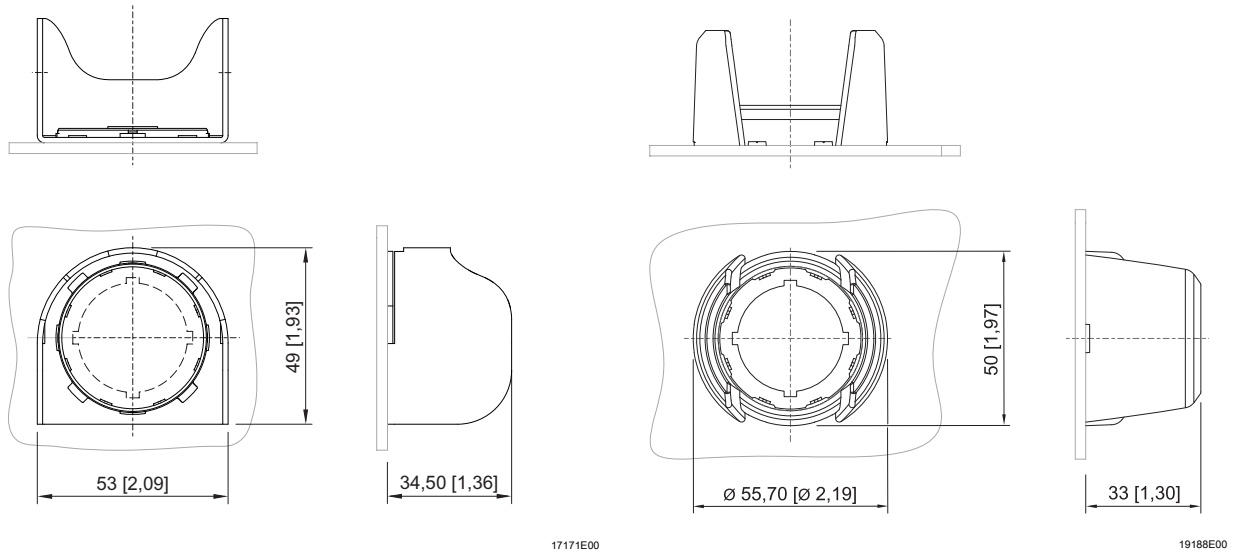


17185E00

8602/3-054 indicator lamp bezel

Dimensional drawings (all dimensions in mm [inches]) – subject to modification

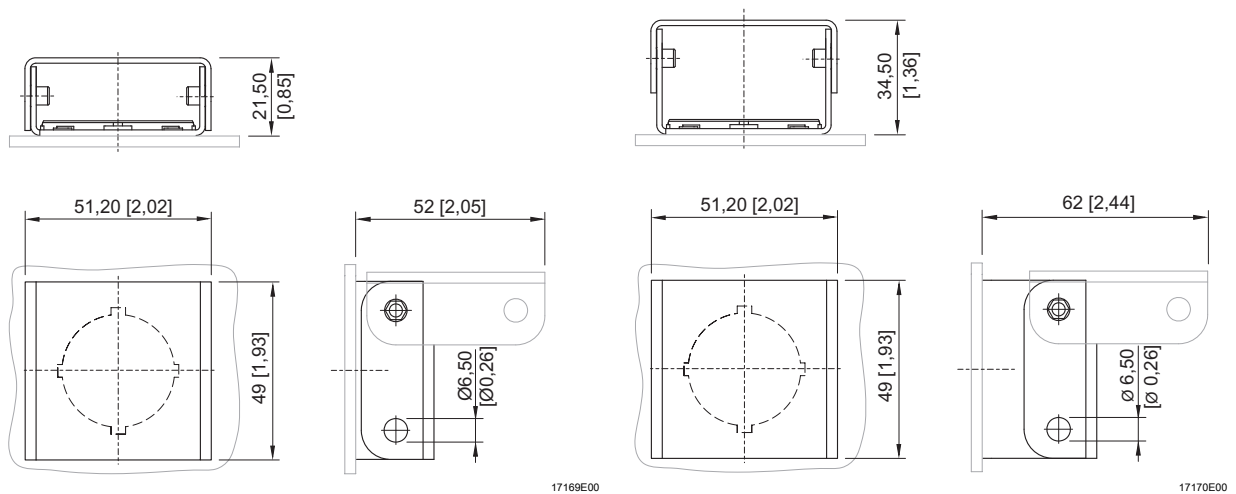
Protective collars



17171E00
8602/3-751 protective collar 1.4571 for mushroom stay-put button EM-STOP

19188E00
8602/3-751 protective plastic collar for mushroom stay-put button EM-STOP

Locking device

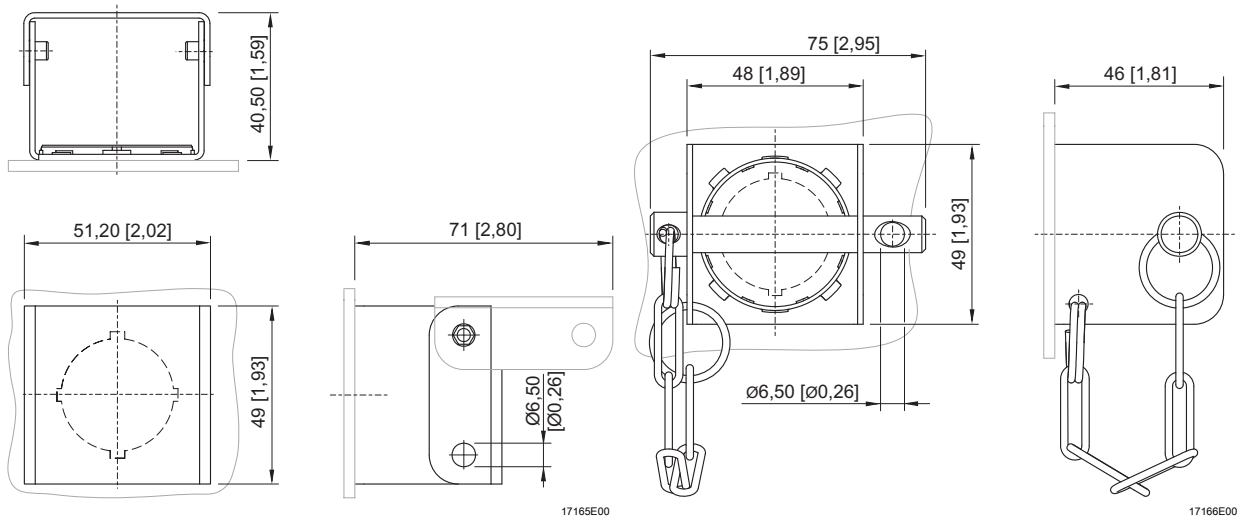


17169E00
8602/3-753 locking device protective flap H19

17170E00
8602/3-752 locking device protective flap H29

Dimensional drawings (all dimensions in mm [inches]) – subject to modification

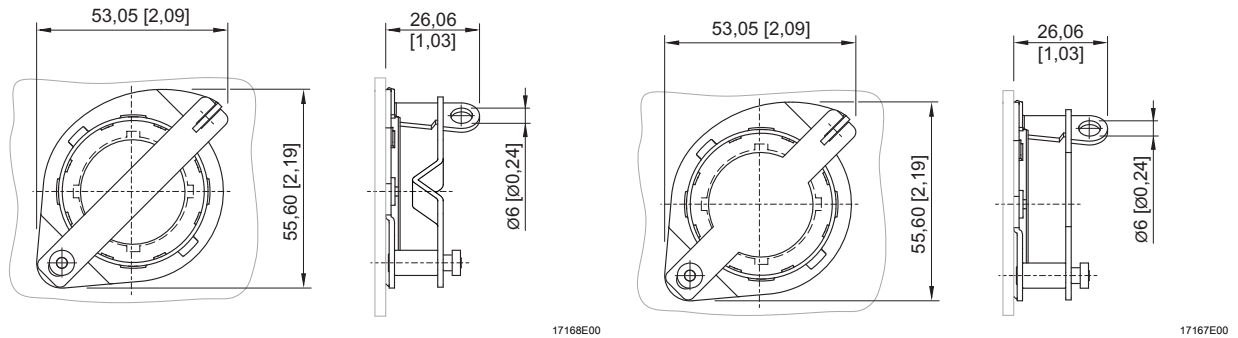
Locking device



8602/3-758 locking device protective flap H38

8602/3-756 locking device for actuated mushroom stay-put button

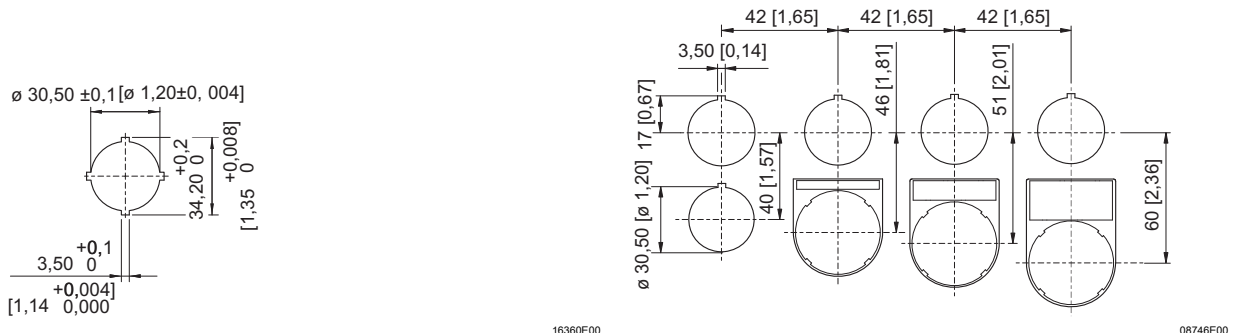
Locking device



8602/3-754 locking device for actuated pushbutton

8602/3-755 locking device for unactuated pushbutton

Punch patterns

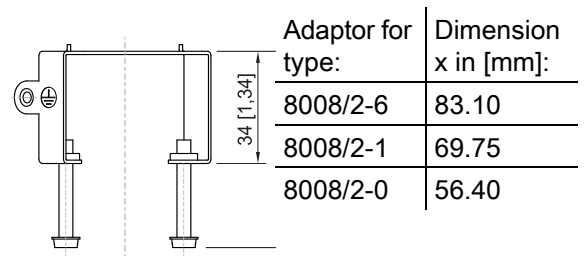
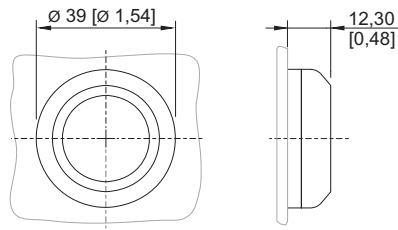


Single punch pattern

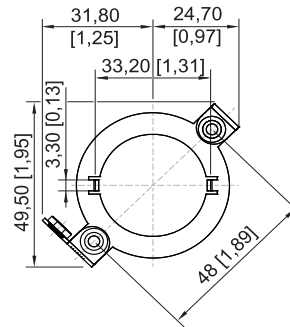
Label holder

Dimensional drawings (all dimensions in mm [inches]) – subject to modification

Accessories



Adaptor for type:	Dimension x in [mm]:
8008/2-6	83.10
8008/2-1	69.75
8008/2-0	56.40

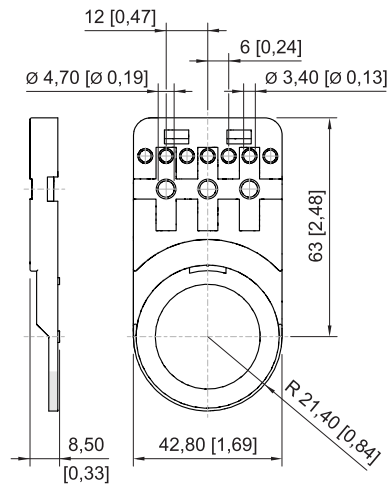
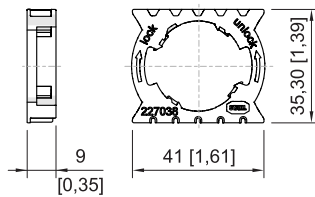


17173E00

19516E00

8602/3-733 closing part

Adaptor for front installation type 8008/2-



18719E00

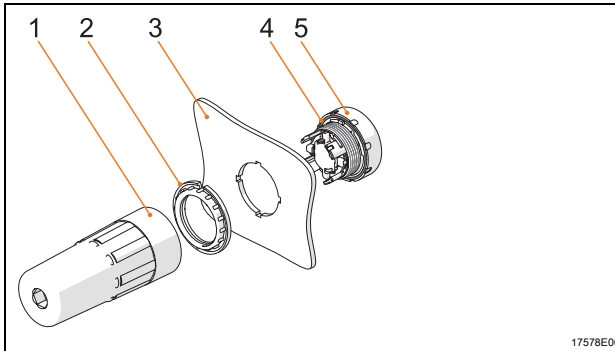
18720E00

Adaptor for front installation

Cable duct support for front installation

7.2 Mounting / dismounting, operating position

7.2.1 Installation information valid for all actuators



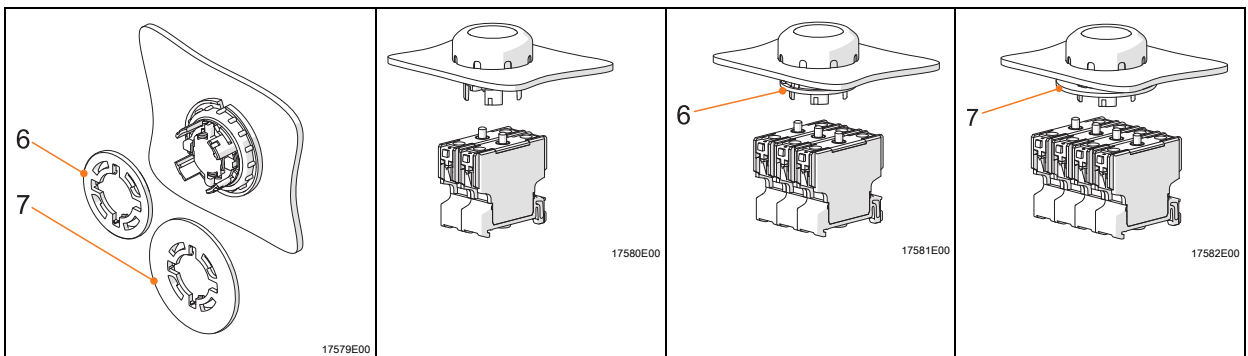
- Ensure correct fit of the seal (4).
- Align the actuator (5) with the punch pattern in the installation wall (3).
- Tighten the jam nut (2) to a torque of 3 Nm.

Legend

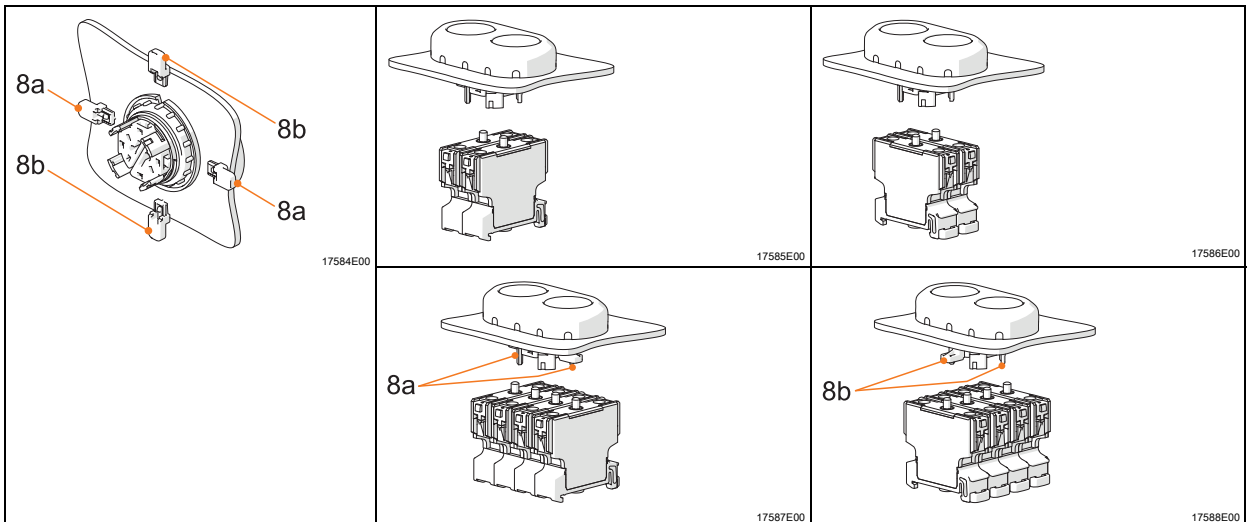
- 1 = Special key (order no. 169101)
- 2 = Jam nut (order no. 205592)
- 3 = Installation wall
- 4 = Seal
- 5 = Actuator

7.2.2 Assembly of pressure plates

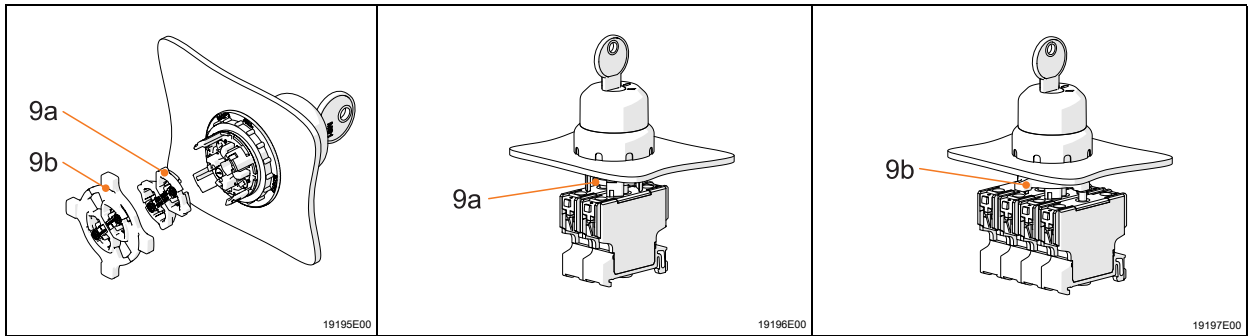
Actuators 8602/3-001 / -003 / -004 / -006 / -009 / -010 / -012 / -014 / -015 / -703 / -712 / -735



8602/3-023 actuator



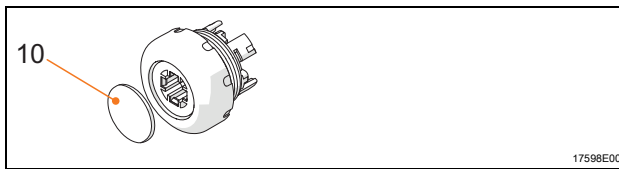
Actuators 8602/3-008 / -726 / -727



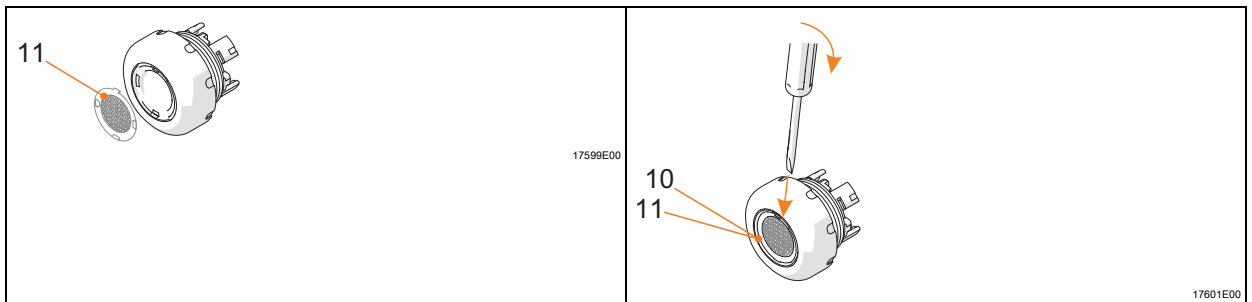
Legend

- 6 = Pressure plate (order no. 215436)
- 7 = Pressure plate (order no. 215437)
- 8a, 8b = Pressure plate L (order no. 221706)
- 9a = Pressure plate for 1 and 2 contact elements (order no. 253627)
- 9b = Pressure plate for 3 and 4 contact elements (order no. 221707)

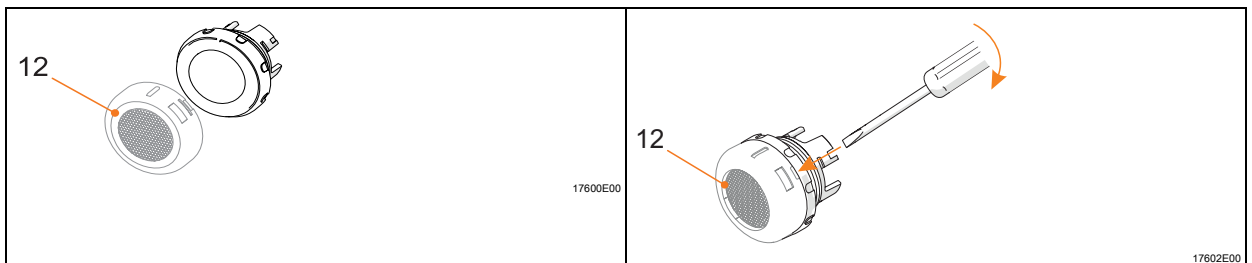
**7.2.3 Mounting and dismounting of button label, colour filter and colour cap
Actuators 8602/3-001 / -003 / -004 / -014 / -703 / -023**



Actuator 8602/3-735



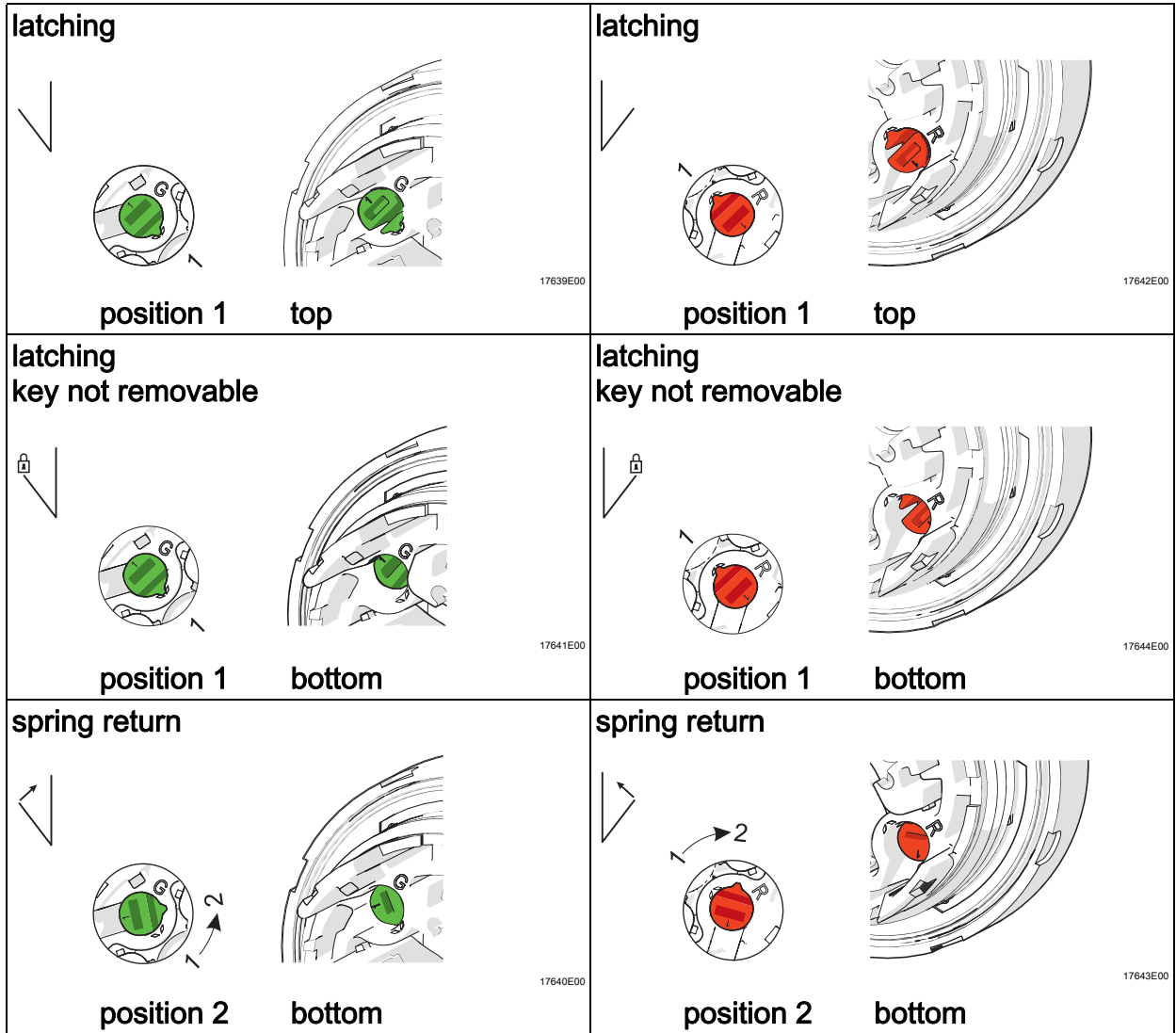
Actuator 8602/3-054



Legend

- 10 = Button label (order no. see data sheet)
- 11 = Colour filter (order no. see data sheet)
- 12 = Colour cap (order no. see data sheet)

7.2.4 Coding of axial rotary actuator 8602/3-726 / -727 and key-operated switch 8602/3-008

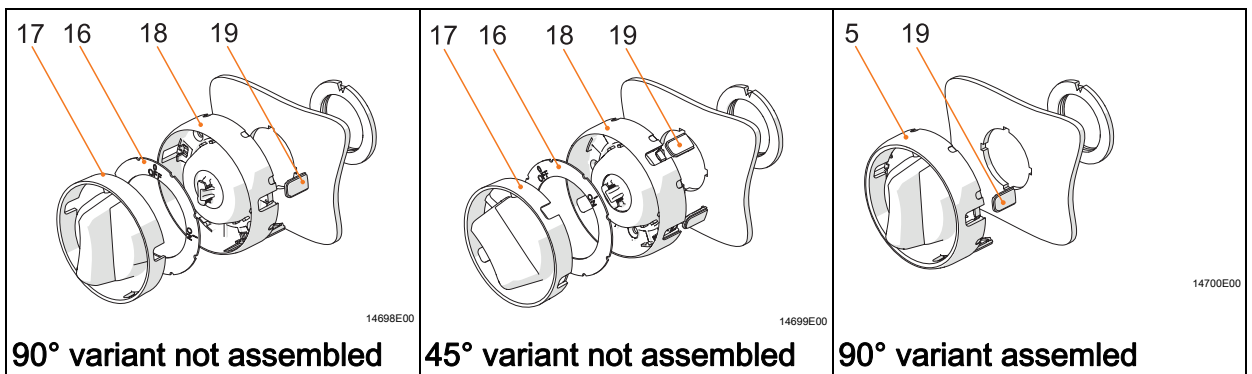


Basic position: position 1

3 switching positions			3 switching positions			2 switching positions	
✓	M03 r/r/r	✓	M01 r/r	✓	✓	M01 r/r	✓
✓	M04 r/r/t	↗	M02 r/t	↗	✓	M02 r/t	↗
↗	M05 t/r/r	✓			↗	M03 r/r*	↗ [🔒]
↗	M06 t/r/t	↗			↗		
					🔒	M08 r*/r/r	✓
					✓	M09 r/r/r*	✓ [🔒]
					🔒	M10 r*/r/r*	✓ [🔒]
					🔒	M11 r*/r/t	↗
					↗	M12 t/r/r*	✓ [🔒]

04464E00

7.2.5 Assembly of rotary actuators
Actuators 8602/3-728 / -729 / -730 / -731



90° variant not assembled

45° variant not assembled

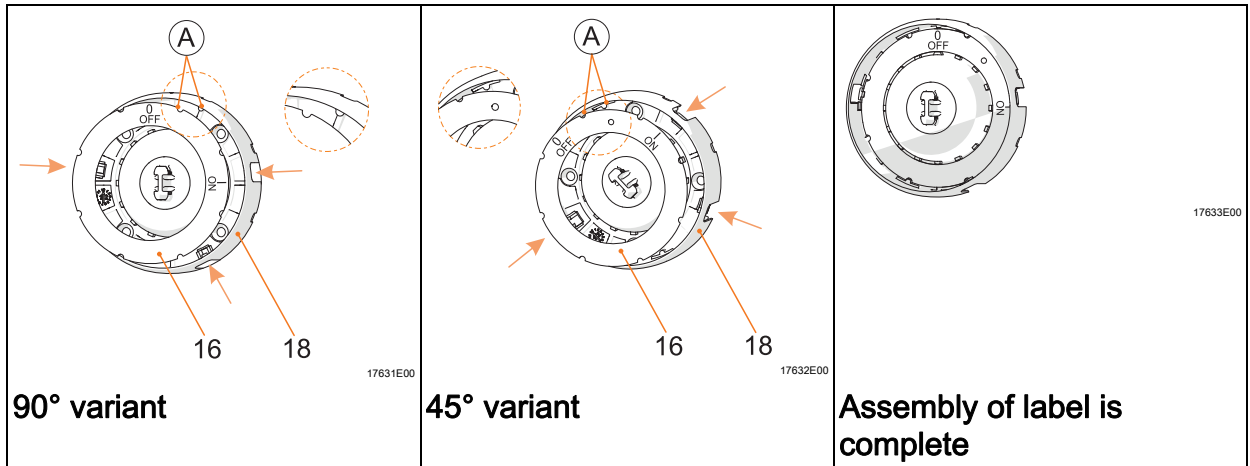
90° variant assembled

14698E00

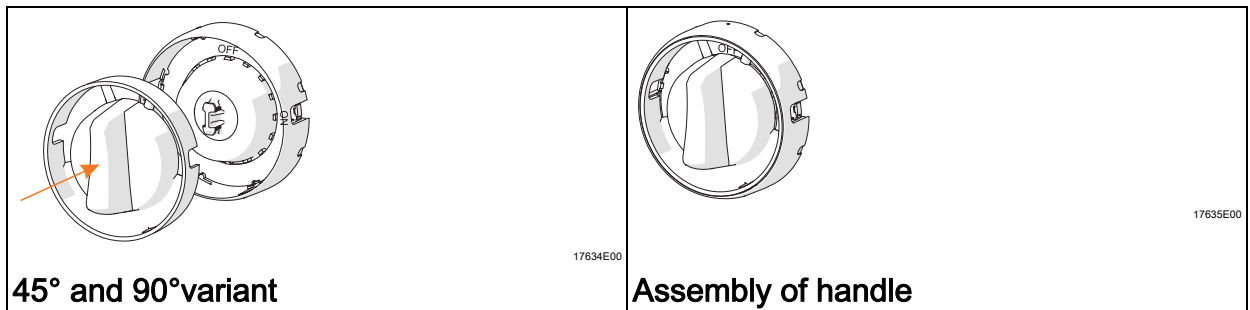
14699E00

14700E00

Assembly of label



Assembly of handle

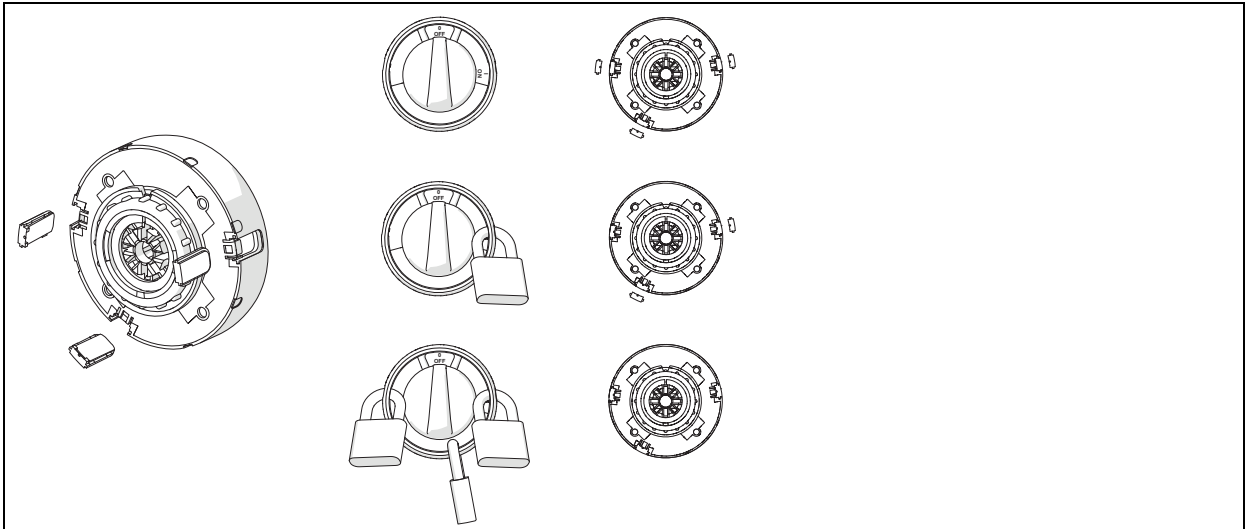


Legend

- 5 = Actuator
- 16 = Label
- 17 = handle
- 18 = Coupler
- 19 = Closing part

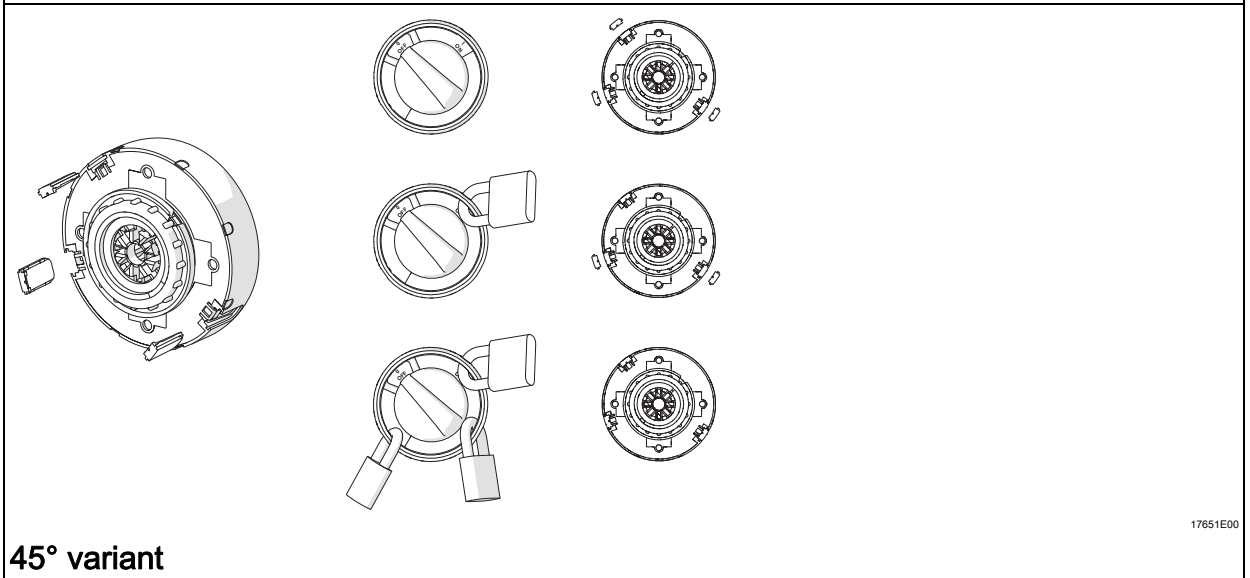
i After the handle is mounted, it can no longer be removed and the alignment of the plate can no longer be changed.

Determining padlockability using closing parts



17650E00

90° variant



17651E00

45° variant

Machining the actuator to hold the switch

Actuators 8602/3-091 / -728 / -729 / -730 / -731 / -734

<p>20</p> <p>17653E00</p>	<p>17659E00</p>	<ul style="list-style-type: none"> • Break off two opposing fillets so that positions of switch (20) and handle correspond. • Remove broken-off fillets.
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Legend

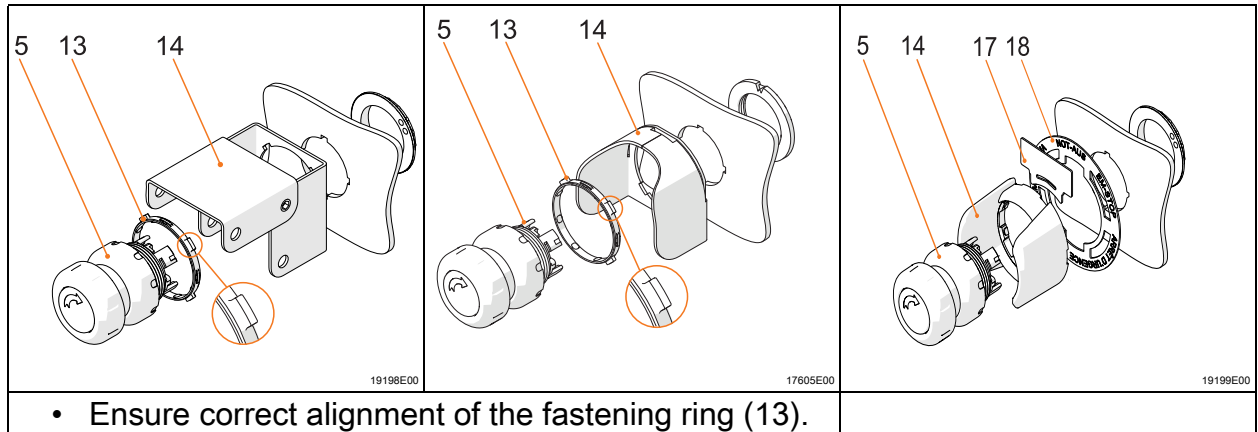
20 = Switch

7.2.6 Mounting of accessories

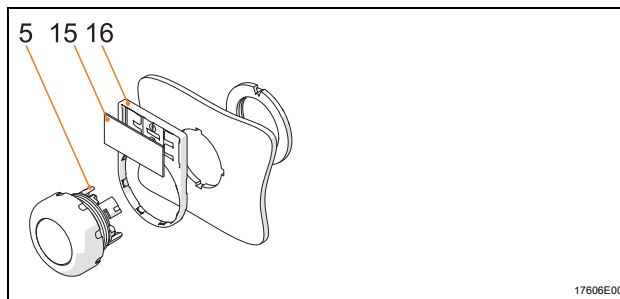
Locking devices 8602/3-752 /-753 /-754 /-755 /-756 /-758

8602/3-751 protective collar 1.4571

8602/3-751 plastic protective collar



Label holders, SZ 1, 2, 3

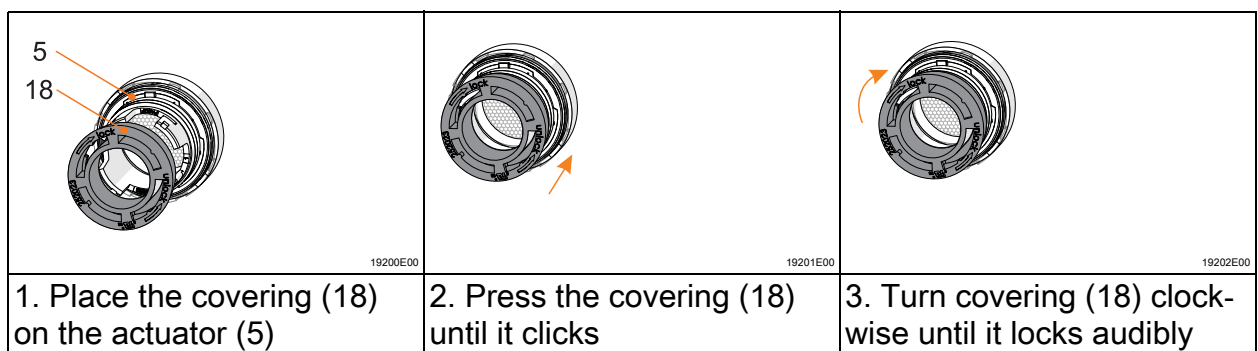


Legend

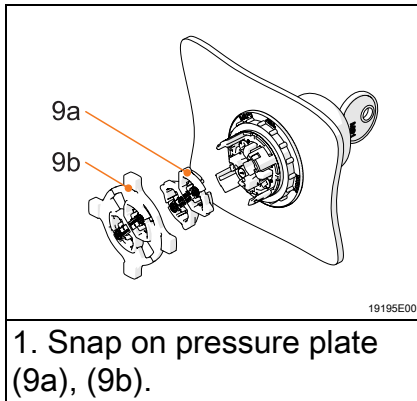
- 5 = Actuator
- 13 = Fastening ring
- 14 = Locking device or protective collar (see data sheet for order no.)
- 15 = Label (see data sheet for order no.)
- 16 = Label holder (see data sheet for order no.)
- 17 = Label for 8602/3-751 plastic protective collar (see data sheet for order no.)
- 18 = Label for 8602/3-751 plastic protective collar (small 260311)

7.2.7 Assembly of accessories for UL version

Assembly accessories for 8602/3-054 /-092 UL version



Assembly accessories for 8602/3-008 UL version



1. Snap on pressure plate (9a), (9b).

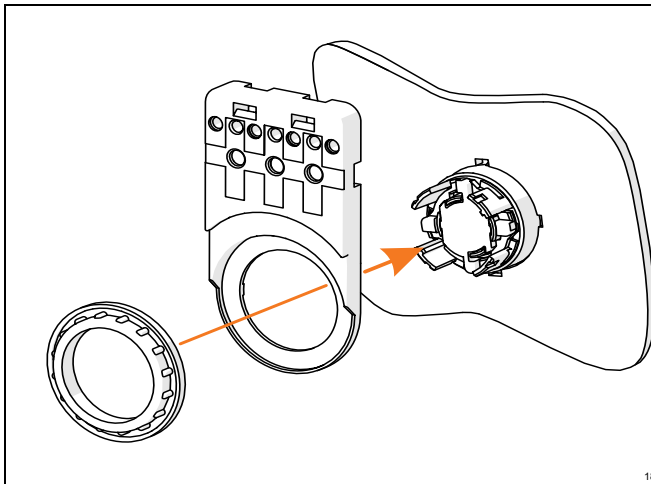
Legend

- 5 = Actuator
- 9a = Pressure plate (SAP no.: 253627)
- 9b = Pressure plate (SAP no.: 221707)
- 18 = Covering (SAP no.: 252023)

7.2.8 Front installation assembly

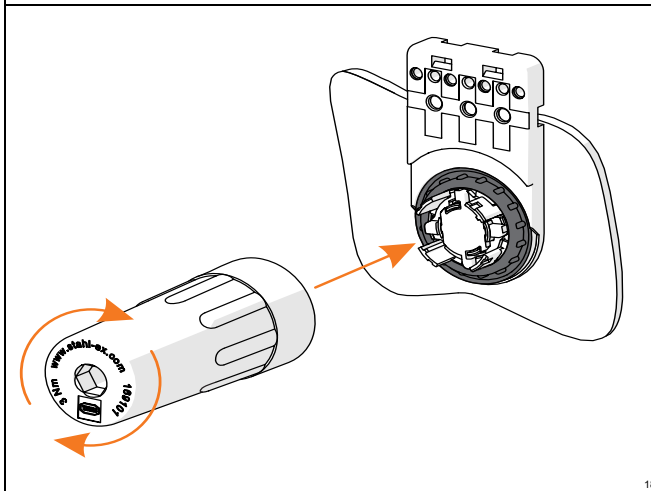
Front installation assembly for type 8082/8010 front installation elements

<p>18177E00</p>	<ol style="list-style-type: none"> 1. 8602/3 actuator 2. Enclosure (max. wall thickness 5 mm) 3. Support for cable duct (optional) (order no. 248673) 4. Jam nut (order no. 205592) 5. Adaptor (order no. 227038) 6. Built-in elements: <ul style="list-style-type: none"> 6a. 8010/6 LED element 6b. 8082/3 contact element
<p>18047E00</p>	<ul style="list-style-type: none"> • Insert and align the actuator (1) in the opening in the enclosure (2). • Ensure that the seal fits correctly in the actuator.



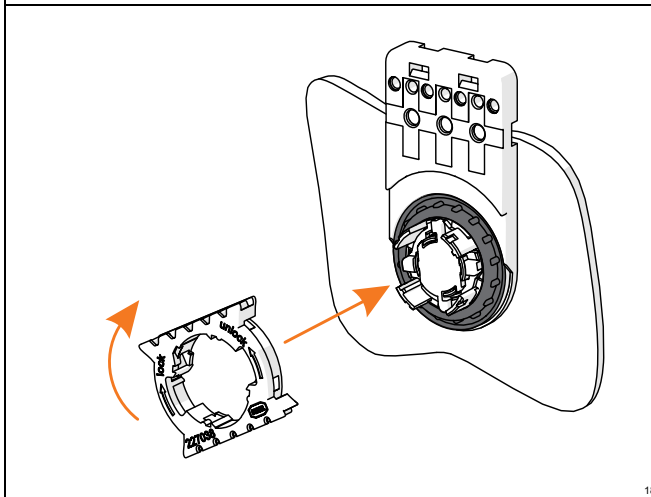
18173E00

- The support (3) can be installed and used to mount the cable ducts or lead clips. It must be installed before mounting the jam nut (4) by attaching it to the reverse side of the actuator (1).



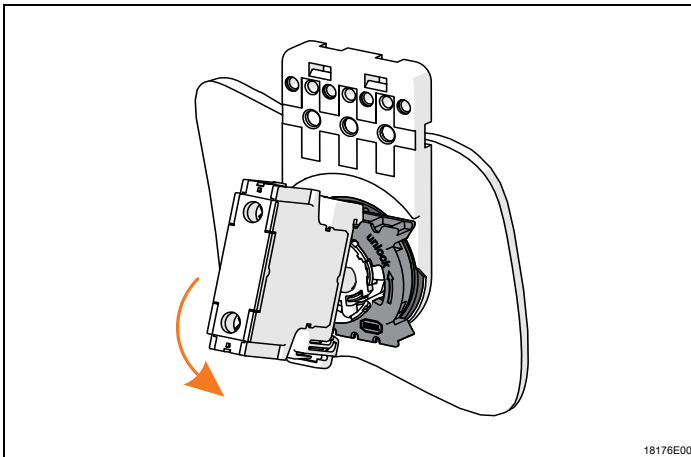
18174E00

- Fasten the actuator (1) and support (3) to a torque of 3 Nm using the jam nut (4) and a suitable tool. To complete this task, you must use the original key from R. STAHL (order no. 169101).



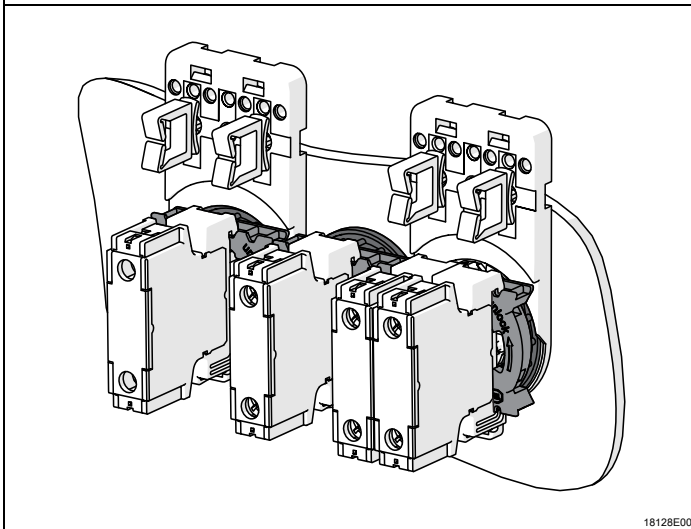
18175E00

- Connect the adaptor (5) to the actuator (1).
- Turn the adaptor (5) clockwise until you hear it snap into place.
- Check that the adaptor (5) is seated securely.
- The adaptor (5) can be installed in 4 positions.

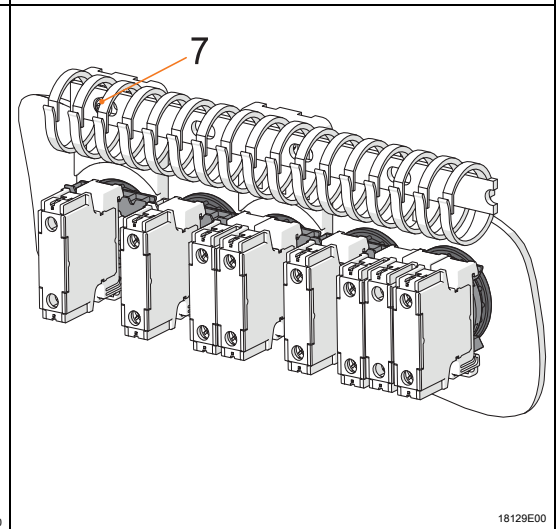


18176E00

- Snap the built-in element (6) onto the adaptor (5).
- Check that the built-in element (6) is seated securely.
- A maximum of 3 built-in elements (6) can be snapped onto the adaptor (5).
- The LED element (6a) must always be positioned in the centre of the actuator (1).



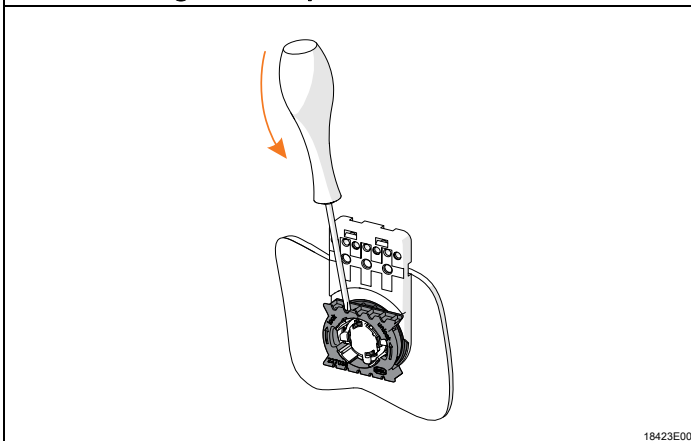
18128E00



18129E00

- Wiring clamps, cable ties or cable ducts can be mounted directly on the support (3) and the electric lines can be secured to simplify installation of the lines.
- Tighten the screw (7) for the support to a torque of 1.5 Nm (order no. 110407)

Dismounting the adaptor

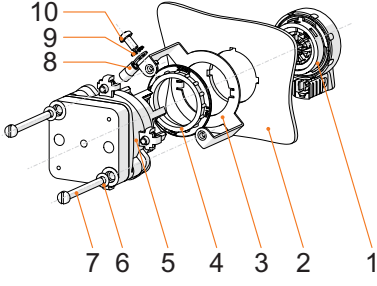


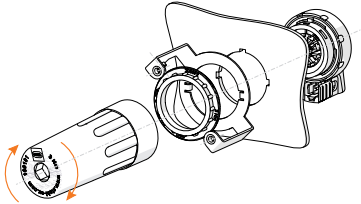
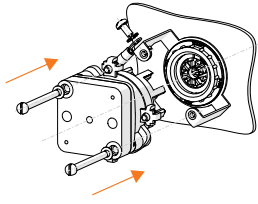
18423E00

- Insert a screwdriver into the opening of the adaptor (5).
- Turn the adaptor (5) anticlockwise to loosen it.


7.2.9 Front installation assembly

Front installation assembly with control switch type 8008/2.

 <p style="text-align: right; font-size: small;">19613E00</p>	<ol style="list-style-type: none"> 1. 8602/3 actuator 2. Enclosure 3. 8602/3 adaptor for front installation for type 8008 4. Jam nut (order no. 205592) 5. 8008/2- control switch 6. Disc M4 7. Screw M4x. 8. Earth conductor with 2.5 to 4 mm² cable lug 9. Toothed washer A 4.2 (order no. 110662) 10. Combined screw M4x8 (order no.: 110906)
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 <p style="text-align: right; font-size: small;">19614E00</p>	 <p style="text-align: right; font-size: small;">19615E00</p>
<ul style="list-style-type: none"> • Insert actuator (1) through the enclosure (2). Make sure that the actuator (1) has been correctly inserted into the cut-out in the enclosure (2). • Attach the adaptor (3) to the actuator (1) from the rear. When doing so, also make sure that it correctly fits the cut-outs. • Screw the jam nut (4) onto the thread of the actuator (1) to a torque of 3 Nm from the rear. To do so, you must use the original key from R. STAHL (order no.: 169101). 	<ul style="list-style-type: none"> • Align the control switch (5) on the adaptor (3) so that the screws (7) fit into the threaded bores in the adaptor (3) intended for them. • Insert the screw (7) with the disc (6) into the control switch (5) and tighten it in the adaptor. • For plastic enclosures, screw the earth conductor (8) onto the adaptor (3) laterally using the toothed washer (9) and the combined screw (10).


8 Commissioning

	DANGER
	<p>Explosion hazard due to incorrect installation! Non-compliance results in severe or fatal injuries.</p> <ul style="list-style-type: none"> • Check the device for proper installation before commissioning. • Comply with national regulations.

Before commissioning, ensure the following:

- Check the mounting and installation.
- Actuators must not be damaged.
- Check if all screws and nuts have been tightened firmly.
- Check that the seal is correctly positioned and aligned.

9 Maintenance, Overhaul, Repair

	CAUTION
	<p>Risk of electric shock or malfunction of the device due to unauthorized work! Non-compliance can result in light injuries!</p> <ul style="list-style-type: none"> • Before carrying out work on the device, switch off voltage supply. • Work performed on the device must only be carried out by authorized and appropriately trained qualified electricians.


9.1 Maintenance

- Consult the relevant national regulations to determine the type and extent of inspections.
- Adapt inspection intervals to the operating conditions.


During maintenance of the device, check at least:

- if the device enclosure and / or protective enclosure have cracks or other visible signs of damage,
- compliance with the permissible temperatures (according to EN 60079),
- if the nut is held securely in place
- use only care products from CES for locking cylinders

9.2 Overhaul

	Observe the relevant national regulations in the country of use.
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9.3 Repair

	DANGER
	<p>Explosion hazard due to improper repair! Non-compliance results in severe or fatal injuries.</p> <ul style="list-style-type: none"> • Repair work on the devices must be performed only by R. STAHL Schaltgeräte GmbH.

9.4 Returning the device

- ▷ Only return or package the devices after consulting R. STAHL! Contact the responsible representative at R. STAHL for this.

R. STAHL's customer service is available to handle returns if repair or service is required.

- ▷ Contact customer service personally.

or

- ▷ Go to the www.r-stahl.com website.
- ▷ Select "Support" > "RMA" > "RMA Request".
- ▷ Fill out the form.
Wait for confirmation. R. STAHL's customer service will contact you.
You will receive an RMA slip after speaking with customer service.
- ▷ Send the device along with the RMA slip in the packaging to R. STAHL Schaltgeräte GmbH (refer to Section 1.1 for the address).

10 Disposal

- Observe national and local regulations and statutory regulation regarding disposal.
- Separate materials when sending it for recycling.
- Ensure environmentally friendly disposal of all components according to the statutory regulations.

11 Accessories and Spare parts

NOTICE

Malfunction or damage to the device due to the use of non-original components.
Non-compliance can result in material damage.

- Use only original accessories and spare parts from R. STAHL Schaltgeräte GmbH.



For accessories and spare parts, see data sheet on our homepage
www.r-stahl.com.