

OPTIMA Compact Actuators SA-series incl. Spring Return DN50-DN300

Application

Actuator, proportional 0-10 V, 4-20 mA or 2/3-point floating modulating control of OPTIMA Compact valves in heating, ventilating and air conditioning systems.

Due to the self adaption of stroke length, the actuator provides full utilization of the OPTIMA Compact valve modulation.

Can be supplied for OPTIMA Compact PICV valves (DN50-DN300)



Features

- Spring return function, stem up or stem down version
- Self calibrating
- 2/3-point floating, 4-20 mA or 0-10 V modulating control within the same actuator
- Linear or EQ% characterization available on the same actuator
- Auto zero detection
- 0-10 V or 4-20 mA feedback signal
- IP 66 protection EN60529
- Direct mounting with automatic spindle connection.
- Manual operation by use of handle
- Auxiliary switch as accessory
- 24 V power supply as standard and 230 V power supply as accessory
- Possibility to add relay control for failsafe operation

Approvals

- Conforms to: EMC directive 2004/108/EC
- Low voltage directive 2006/95/EC
- UL approved

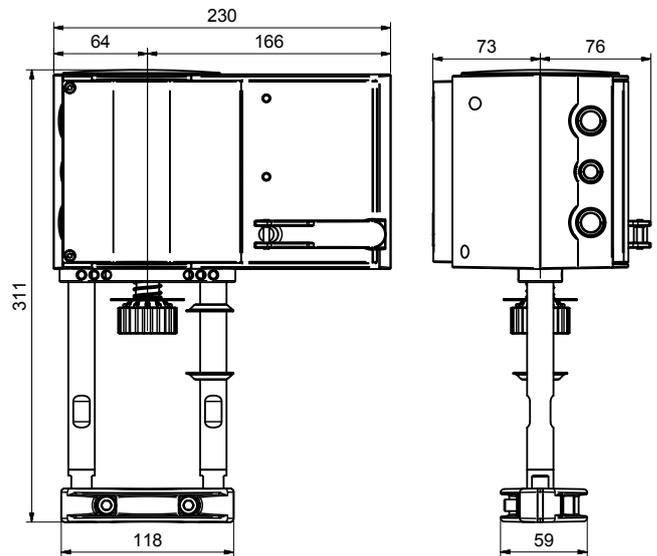


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Technical Data

Characteristics:	Motoric, modulating
Variant:	Spring Return
Protection class:	IP 66 to EN 60529
Frequency:	50/60 Hz
Supply voltage	24 V AC/DC 230 V AC (with accessory)
Control signal:	0-10V DC, 4-20 mA DC or 3-point/2point floating
Control signal impedance:	Min. 100 kΩ (0-10 V)
Stroke max:	48 mm
Running time:	288 sec (Factory setting)
Ambient operating conditions:	0 °C to 55 °C
Manual operation:	Handle
Cable:	Not included
	Cable glands 2 x M20 x 1.5 shall be used (Not included)
Weight:	4.20 kg Standard 5.90 kg Spring Return

Dimensions



Types and Operation Data 24 V actuators - 0-10 V Feedback signal

Type [Item no.]	Valve Dimension	Control signal	Function	Actuator force	Supply voltage	Power Consumption
Type-08 [53-1954]	DN50-DN200	0-10 V/4-20 mA 2/3-point	Spring Return Stem up	1100 N	24 V AC ±20% 24 V DC ±15%	10 W/ (20 VA*)
Type-09 [53-1955]	DN50-DN200	0-10 V/4-20 mA 2/3-point	Spring Return Stem down	1100 N	24 V AC ±20% 24 V DC ±15%	10 W/ (20 VA*)
Type-10 [53-1299]	DN150-DN300	0-10 V/4-20 mA 2/3-point	Standard	2500 N	24 V AC ±20% 24 V DC ±15%	10 W/ (18 VA*)
Type-11 [53-1956]	DN150-DN300	0-10 V/4-20 mA 2/3-point	Spring Return Stem up	2000 N	24 V AC ±20% 24 V DC ±15%	10 W/ (20 VA*)
Type-12 [53-1957]	DN150-DN300	0-10 V/4-20 mA 2/3-point	Spring Return Stem down	2000 N	24 V AC ±20% 24 V DC ±15%	10 W/ (20 VA*)

*) Design transformer for this value

Types and Operation Data 230 V actuators - 4-20 mA Feedback signal

Type [Item no.]	Valve Dimension	Control signal	Function	Actuator force	Supply voltage	Power Consumption
Type-08 [53-1954-230F]	DN50-DN200	4-20 mA	Spring Return Stem up	1100 N	230 V AC ±20%	10 W/ (20 VA*)
Type-09 [53-1955-230F]	DN50-DN200	4-20 mA	Spring Return Stem down	1100 N	230 V AC ±20%	10 W/ (20 VA*)
Type-10 [53-1299-230F]	DN150-DN300	4-20 mA	Standard	2500 N	230 V AC ±20%	10 W/ (18 VA*)
Type-11 [53-1956-230V]	DN150-DN300	4-20 mA	Spring Return Stem up	2000 N	230 V AC ±20%	10 W/ (20 VA*)
Type-12 [53-1957-230F]	DN150-DN300	4-20 mA	Spring Return Stem down	2000 N	230 V AC ±20%	10 W/ (20 VA*)

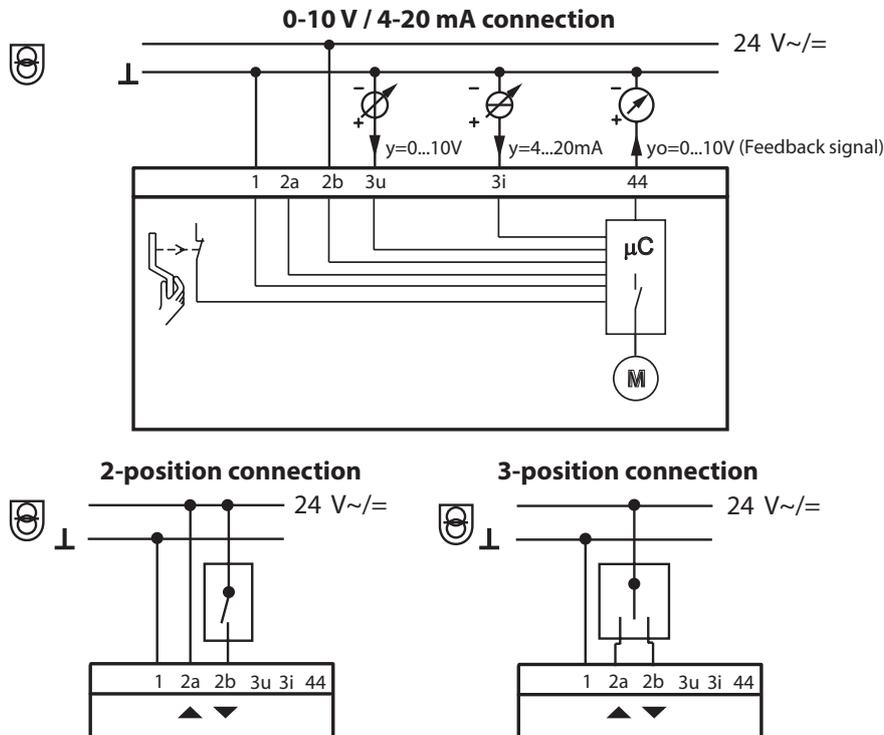
*) Design transformer for this value

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Connection Diagrams · Standard Actuator

24 V AC/DC

53-1299



Connection Diagrams · Spring Return Actuator

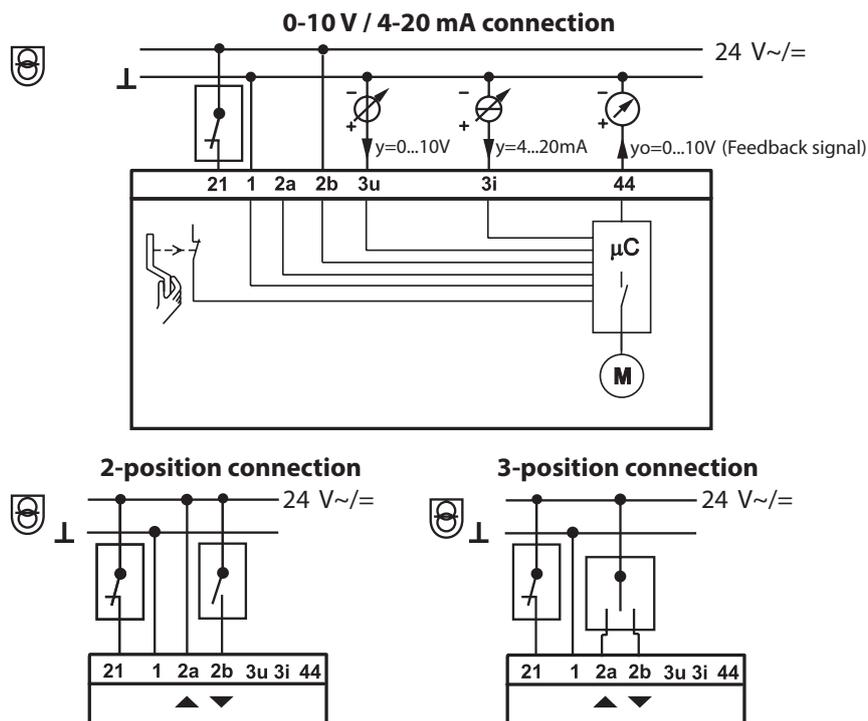
24 V AC/DC

53-1954

53-1955

53-1956

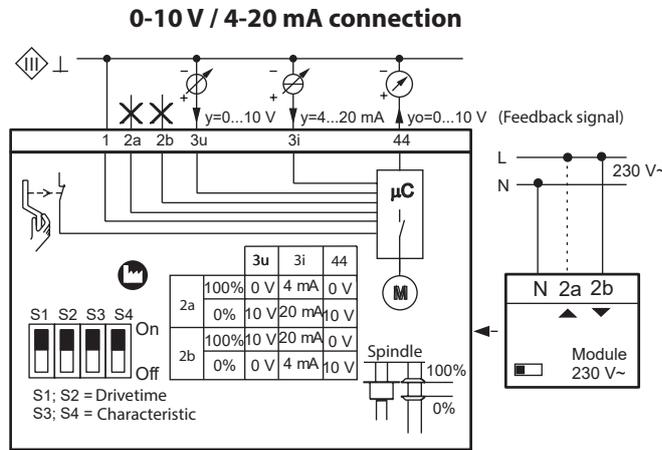
53-1957



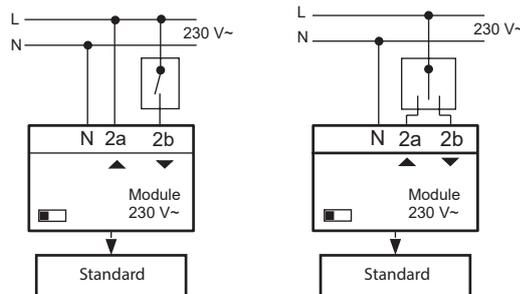
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Connection Diagrams · Standard Actuator

53-1299
With 230 V
Accessory Module

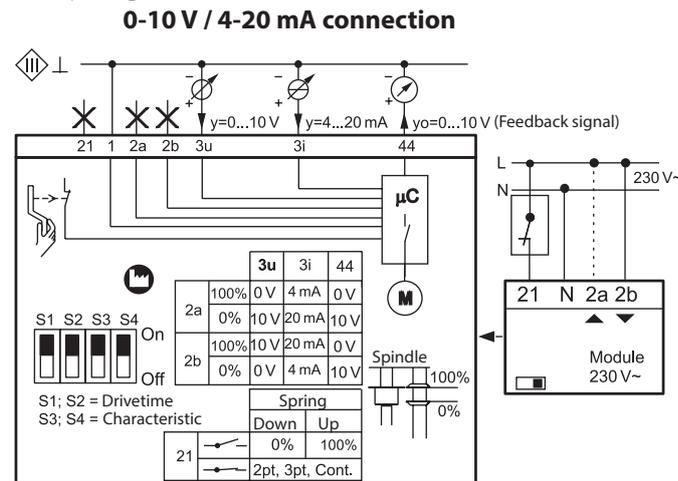


2-position connection 3-position connection

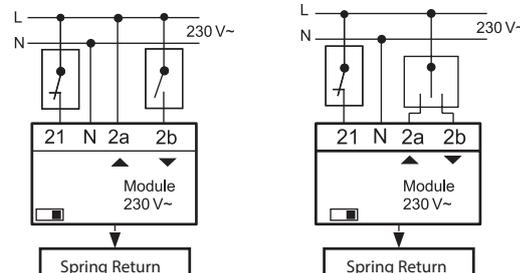


Connection Diagrams · Spring Return Actuator

53-1954
53-1955
53-1956
53-1957
With 230 V
Accessory Module



2-position connection 3-position connection

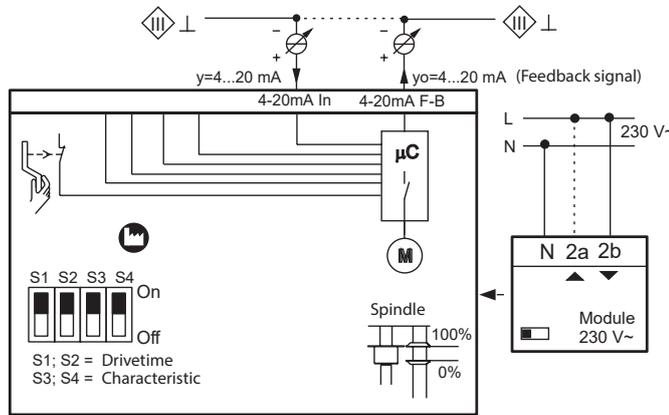


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Connection Diagrams · Standard Actuator

230 V AC
53-1299-230F

4-20 mA connection - Please note: The 4-20 mA control and feedback signal must have power supply



The feedback signal is calibrated from factory. But if necessary, the feedback signal can be fine tuned by the potentiometers on the feedback Module.

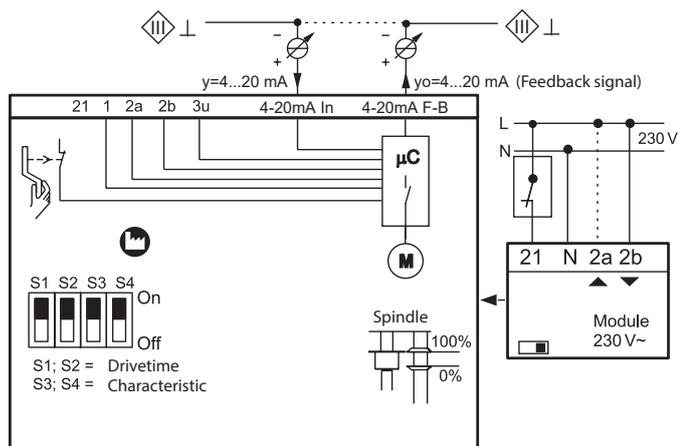
It is recommend to start with open valve and adjust the 4 mA-value by the **GAIN**-potentiometer.

Then the valve can be closed and the 20 mA-value can be adjusted by the **OFFSET**-potentiometer.

Connection Diagrams · Spring Return Actuator

230 V AC
53-1954-230F
53-1955-230F
53-1956-230F
53-1957-230F

4-20 mA connection - Please note: The 4-20 mA control and feedback signal must have power supply



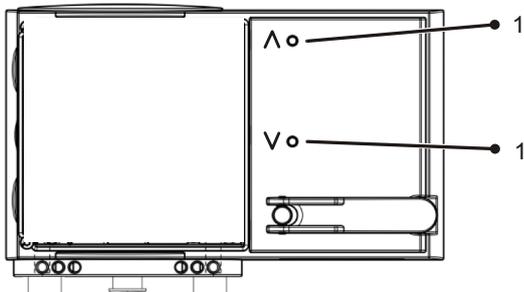
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It is recommend to start with open valve and adjust the 4 mA-value by the **GAIN**-potentiometer.

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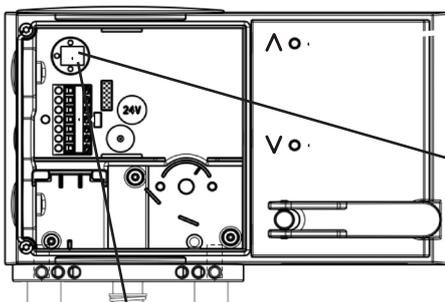
LED Indication Actuators



1 Status and acting direction indication (LED)

- The display consists of two dual-colour LEDs (red / green).
- Both LEDs flashing red: Initialisation procedure
- Upper LED lit red: Upper limit stop or "OPEN" position reached
- Lower LED lit red: Lower limit stop or "CLOSED" position reached
- Upper LED flashing green: drive running, moving towards "OPEN" position
- Upper LED lit green: drive stationary, last direction of running "OPEN"
- Lower LED flashing green: drive running, moving towards "CLOSED" position
- Lower LED lit green: drive stationary, last direction of running "CLOSED"
- No LED lit: No voltage supply (terminal 2b)
- Both LEDs are flashing red and green: drive is in manual mode

Actuator Settings



= factory setting

Run time per mm	Switch coding (Black is position of Dip-switch)	Run time for 48 mm stroke												
2s	<table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td>On</td><td>On</td><td>Off</td><td>Off</td></tr> </table>	1	2	3	4	On	On	Off	Off	96s ± 2				
1	2	3	4											
On	On	Off	Off											
4s	<table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td>On</td><td>Off</td><td>Off</td><td>Off</td></tr> </table>	1	2	3	4	On	Off	Off	Off	192s ±				
1	2	3	4											
On	Off	Off	Off											
6s	<table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td>On</td><td>Off</td><td>Off</td><td>Off</td></tr> <tr><td>On</td><td>Off</td><td>Off</td><td>Off</td></tr> </table>	1	2	3	4	On	Off	Off	Off	On	Off	Off	Off	288s ± 8
1	2	3	4											
On	Off	Off	Off											
On	Off	Off	Off											

Desired character. curve	Switch coding (Black is position of Dip-switch)	Characteristic curve for valve	Characteristic curve for drive	Effective on valve								
Equal percentage	<table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td>Off</td><td>Off</td><td>On</td><td>On</td></tr> </table>	1	2	3	4	Off	Off	On	On			
1	2	3	4									
Off	Off	On	On									
Linear	<table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td>Off</td><td>Off</td><td>On</td><td>On</td></tr> </table>	1	2	3	4	Off	Off	On	On			
1	2	3	4									
Off	Off	On	On									

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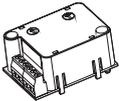
Feedback signal

When the actuator is connected according to the connection diagrams at page 3, with power supply at terminal 2b, the relation between the input signal, valve position and the feedback signal is according to the table.

Feedback signal in relation to input signal and valve position

Input signal [V]	Input signal [mA]	Valve position 100% fully open 0% fully closed [%]	Feedback signal 0-10 V [V]	Feedback signal 4-20 mA [mA]
0	4	0	10	20
5	12	50	5	12
10	20	100	0	4

Accessories

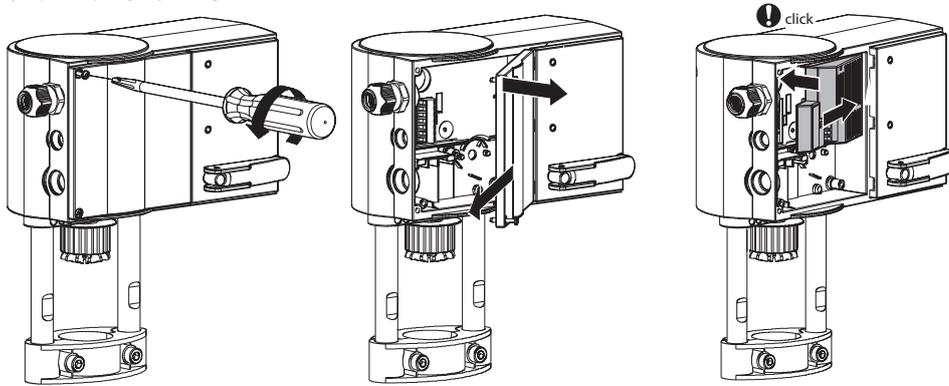
	Frese no.	Type
	07-2925	230V transformer Module
	07-21301	Auxiliary switch

The transformer (07-2925) can be installed in the actuator to enable a 230 V power supply instead of a 24 V power supply.

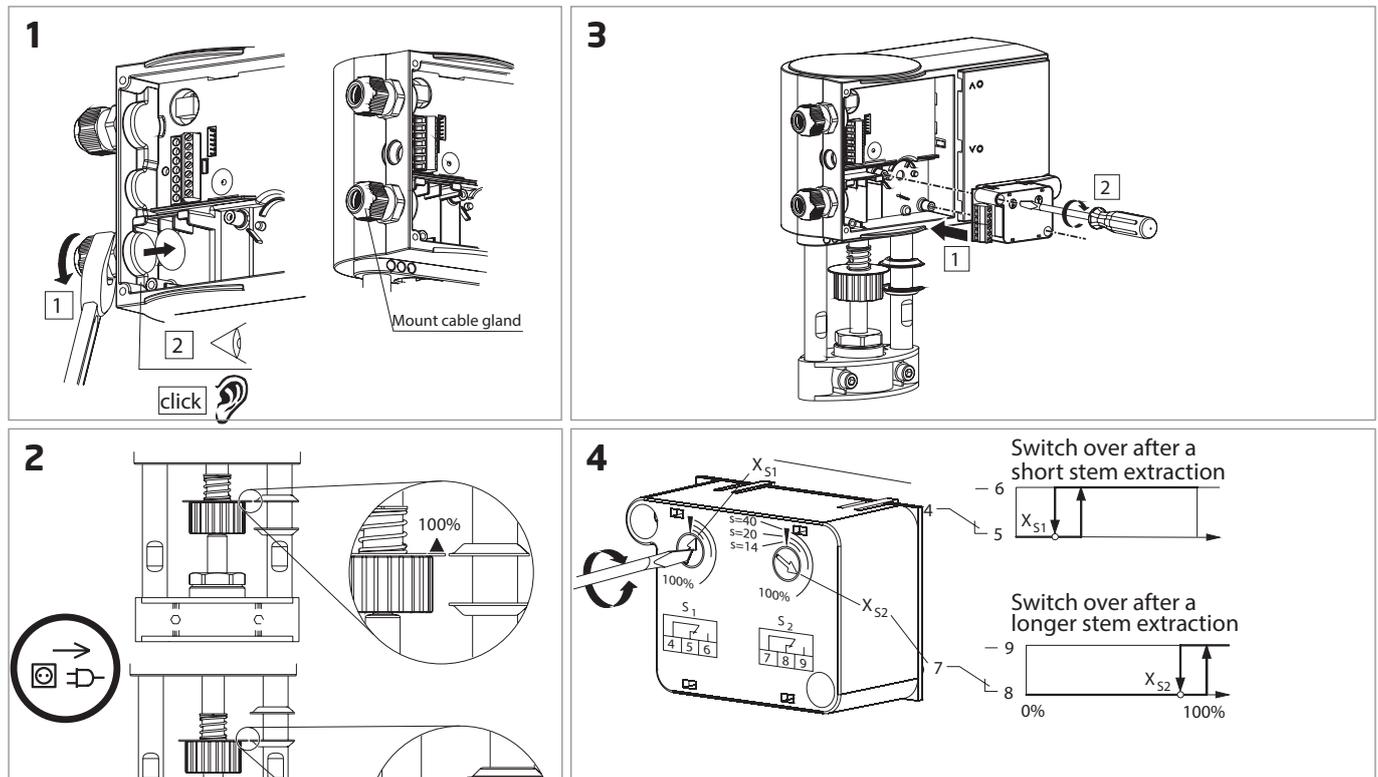
The Auxiliary switch (07-21301) can be installed in the actuator to enable switching on/off external equipment, e.g. indication lamps or feedback to other control systems.

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Mounting 230 V Transformer



Mounting & Setting Auxiliary switch



Please note:
Max Current: 3 A/250 V (for auxiliary switch)

- Steps for installing and calibrating the auxiliary switch.**
1. Open and remove cover plate and mount cable gland
 2. Calibrate actuator by connecting power to the actuator after mounted on valve
 3. Mount auxiliary switch with screw driver
 4. Calibrate the auxiliary switch by turning the dial by a screwdriver to set the valve position, at which relay shall switch over between the two contacts in relation to the opening/closing of the valve. s = stroke in mm.
- s1** is typically used for providing a closed contact between terminal 4 and 5 for fully closed valve.
- s2** for providing a closed contact between terminal 7 and 8 for fully open valve.
- Please note:** For precise setting of the switch over position, please use a multimeter for verification of the resistance.

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