

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 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

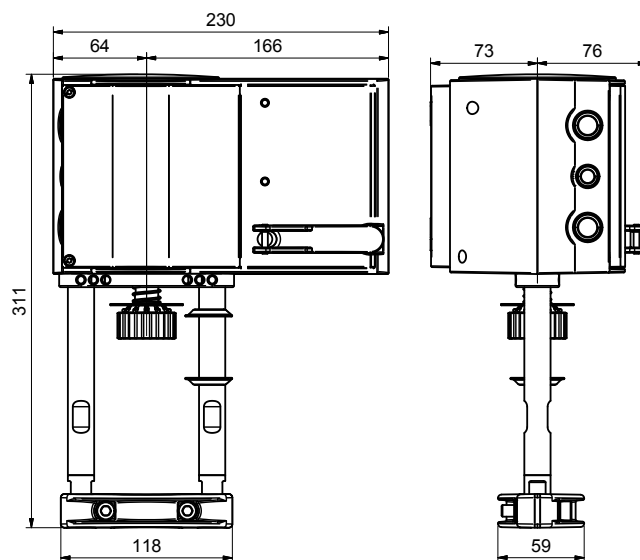


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Technical Data

| | |
|--------------------------------------|---|
| 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 k Ω (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

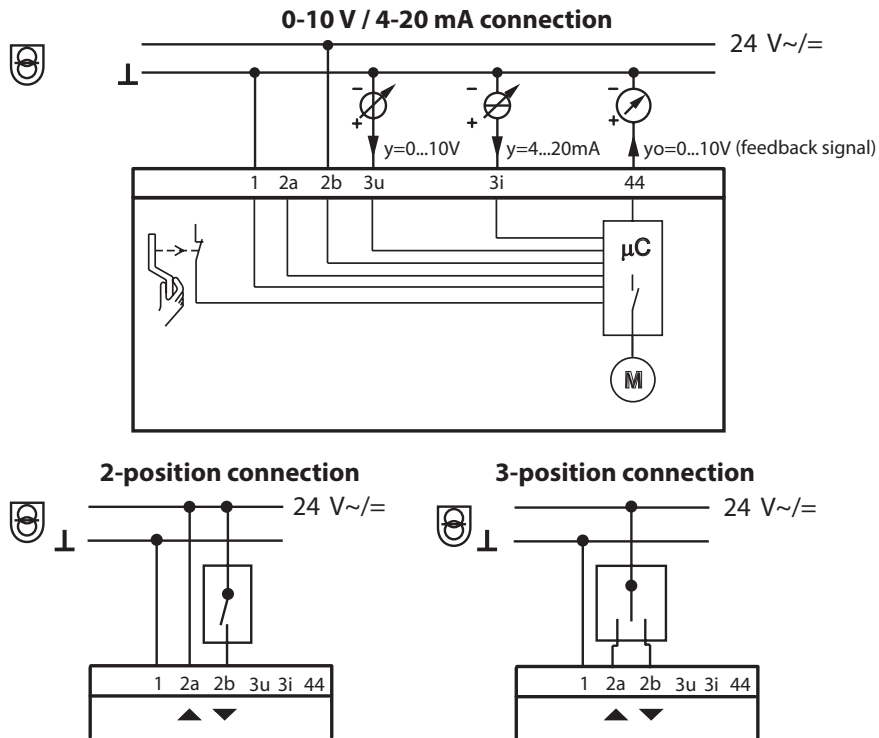
| Type [Item no.] | Valve Dimension | Control signal | Function | Actuator force | Supply voltage | Power Consumption |
|----------------------|--------------------|-----------------------------|----------------------------|-------------------|--|----------------------|
| Type-08 [53-1954] | DN50-DN200 | 0-10 V/4-20 mA 2/3-point | Spring Return Stem up | 1100 N | 24 V AC $\pm 20\%$ 24 V DC $\pm 15\%$ | 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 $\pm 20\%$ 24 V DC $\pm 15\%$ | 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 $\pm 20\%$ 24 V DC $\pm 15\%$ | 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 $\pm 20\%$ 24 V DC $\pm 15\%$ | 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 $\pm 20\%$ 24 V DC $\pm 15\%$ | 10 W/ (20 VA*) |

*) Design transformer for this value

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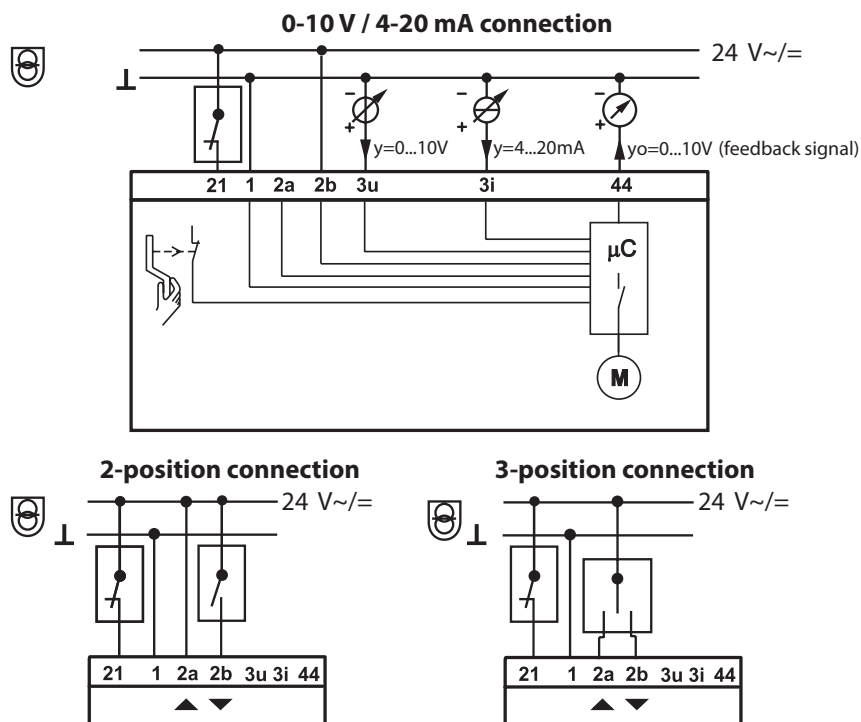
Connection Diagrams · Standard Actuator

24 V AC/DC



Connection Diagrams · Spring Return Actuator

24 V AC/DC

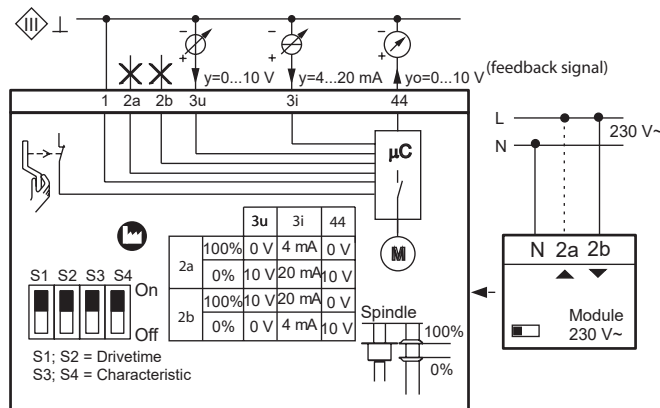


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Connection Diagrams · Standard Actuator

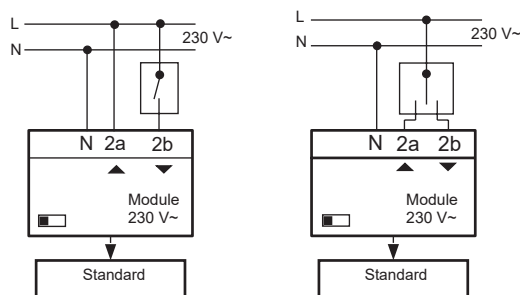
230 V AC

0-10 V / 4-20 mA connection



2-position connection

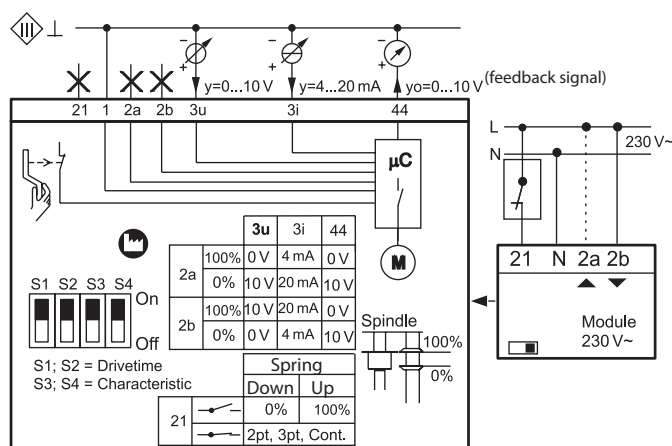
3-position connection



Connection Diagrams · Spring Return Actuator

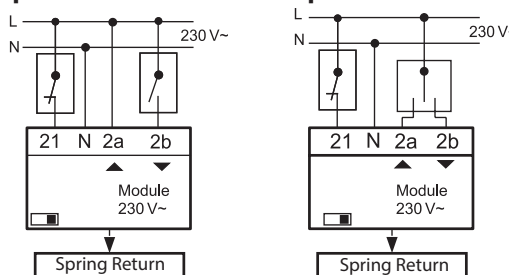
0-10 V / 4-20 mA connection

230 V AC



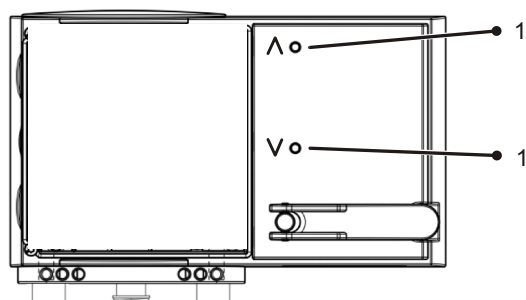
2-position connection

3-position connection



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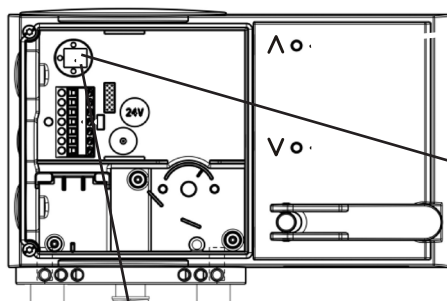
LED Indication Actuators




















1 Status and acting direction indication (LED)





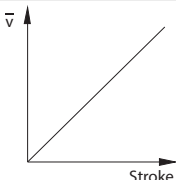
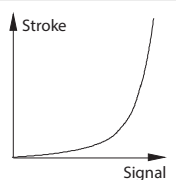
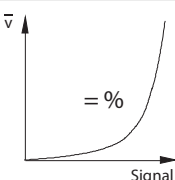





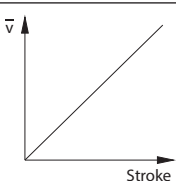
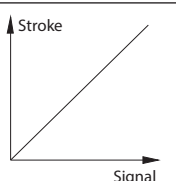
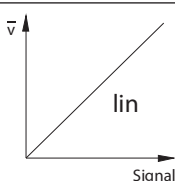
- The display consists of two dual-colour LEDs (red / green).
- Both LEDs flashing red: Initialisation procedure
- Upper LED lit red: Upper limit stop or "OPEN" position reached
- Lower LED lit red: Lower limit stop or "CLOSED" position reached
- Upper LED flashing green: drive running, moving towards "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 | Run time for 48 mm stroke |
|-----------------|---|---------------------------|
| 2s | <div>1 2 3 4</div> <div>     </div> <div>On</div> <div>Off</div> | 96s ± 2 |
| 4s | <div>1 2 3 4</div> <div>     </div> <div>On</div> <div>Off</div> | 192s ± |
| 6s | <div>1 2 3 4</div> <div>     </div> <div>On</div> <div>Off</div> <div>  </div> <div>     </div> <div>On</div> <div>Off</div> | 288s ± 8 |

| Desired character. curve | Switch coding | Characteristic curve for valve | Characteristic curve for drive | Effective on valve |
|--------------------------|---|---|---|---|
| Equal percentage | <div>1 2 3 4</div> <div>     </div> <div>On</div> <div>Off</div> |  |  |  |
| Linear | <div>1 2 3 4</div> <div>     </div> <div>On</div> <div>Off</div> <div>  </div> |  |  |  |

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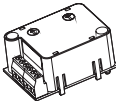
Feedback signal

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 0-10V [V] |
|---------------------|----------------------|---|---------------------------------|
| 0 | 4 | 0 | 10 |
| 5 | 12 | 50 | 5 |
| 10 | 20 | 100 | 0 |

Accessories

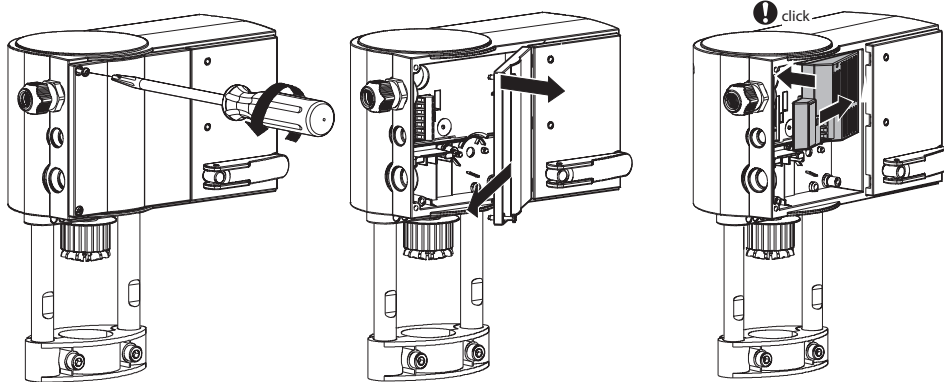
| | Frese no. | Type |
|---|-----------|------------------|
|  | 07-2925 | 230V transformer |
|  | 07-21301 | Auxiliary switch |

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

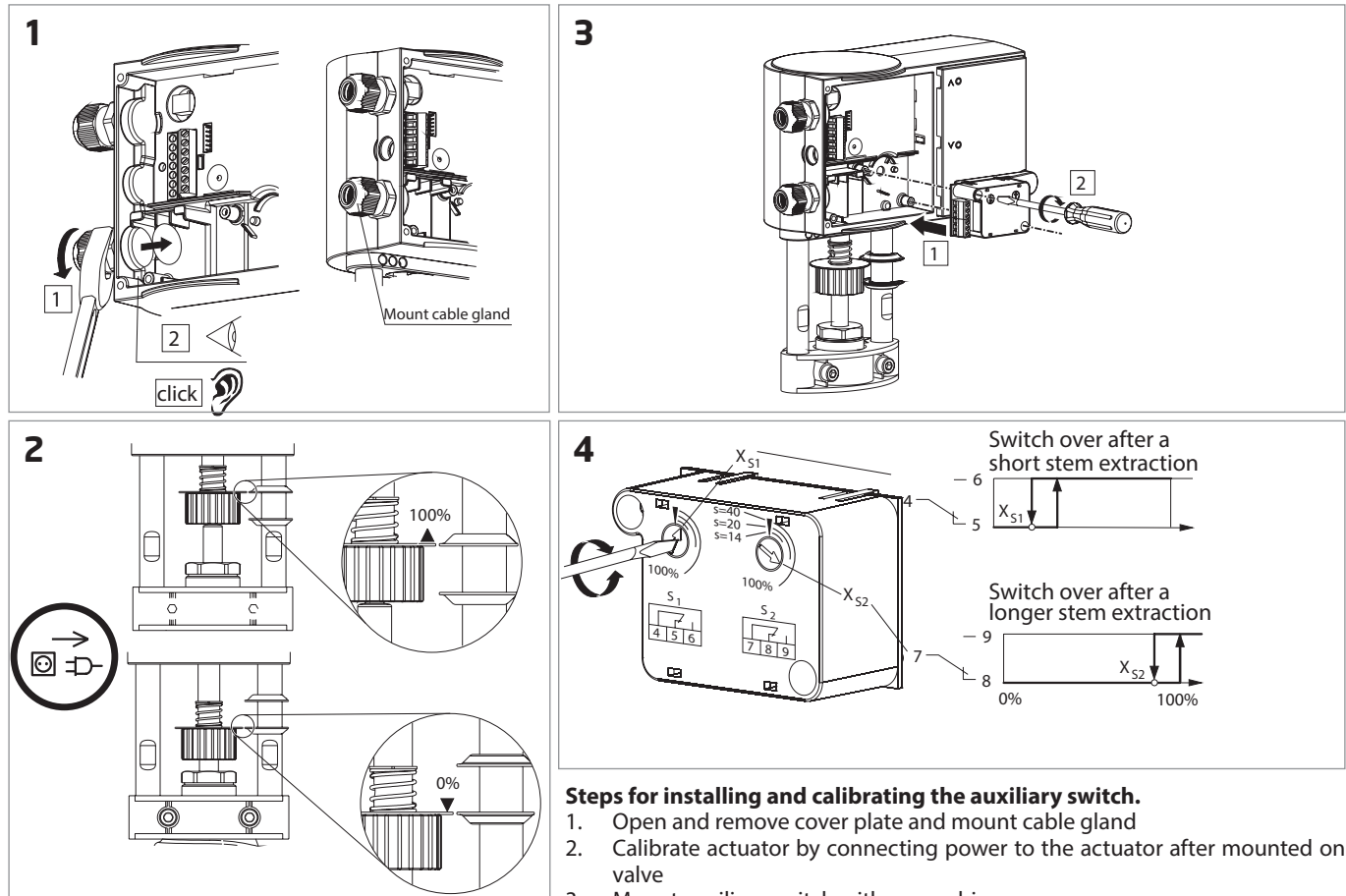
The Auxiliary switch (07-21301) can be installed in the actuator to enable switching on/off external equipment, e.g. indication lamps or feedback to other control systems.

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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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