

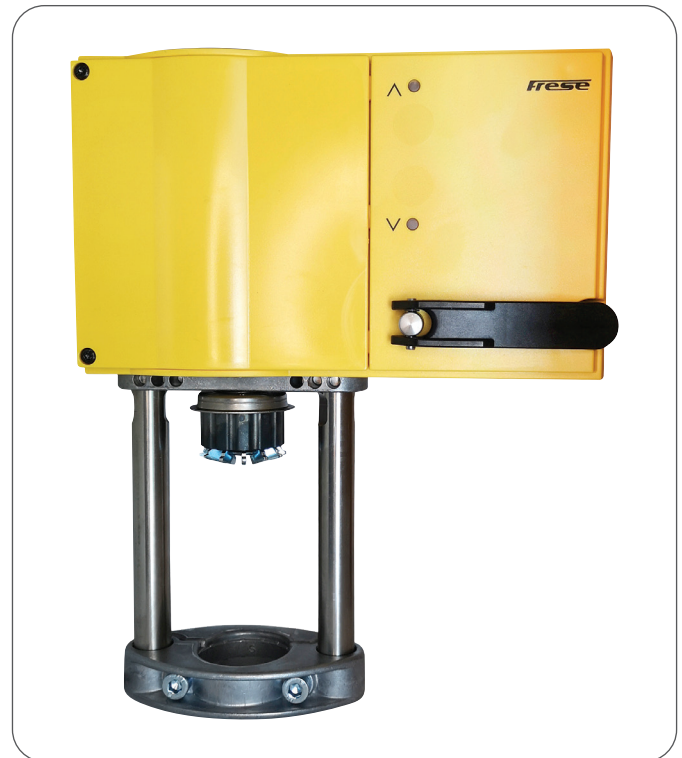
## OPTIMA Compact Actuators SA-series incl. Spring Return DN50-DN300

### 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
- 0-10V 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

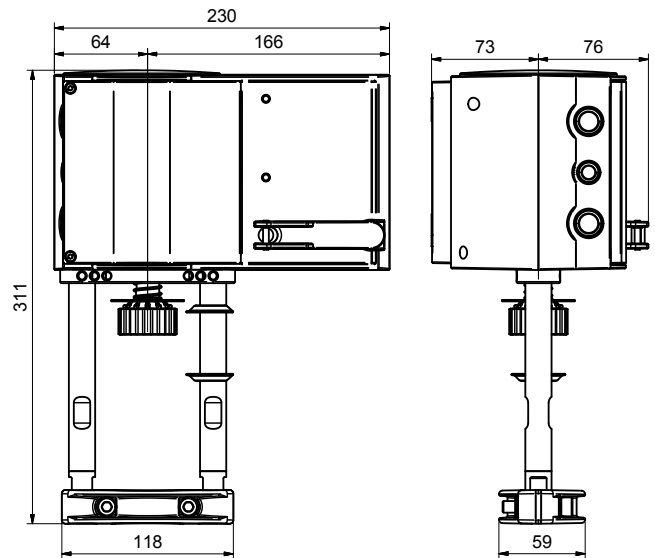


# OPTIMA Compact Actuators SA-series incl. Spring Return DN50-DN300

## Technical Data

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

## Dimensions



## Types and Operation Data

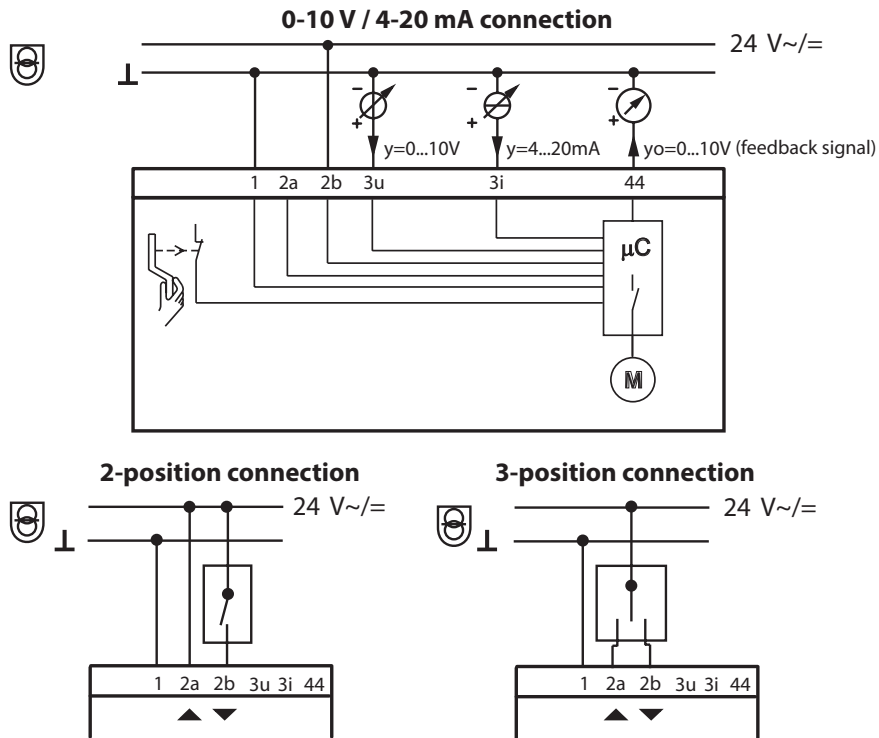
| Type<br>[Item no.]   | Valve<br>Dimension | Control signal              | Function                   | Actuator<br>force | Supply voltage               | Power<br>Consumption |
|----------------------|--------------------|-----------------------------|----------------------------|-------------------|------------------------------|----------------------|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

\*) Design transformer for this value

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

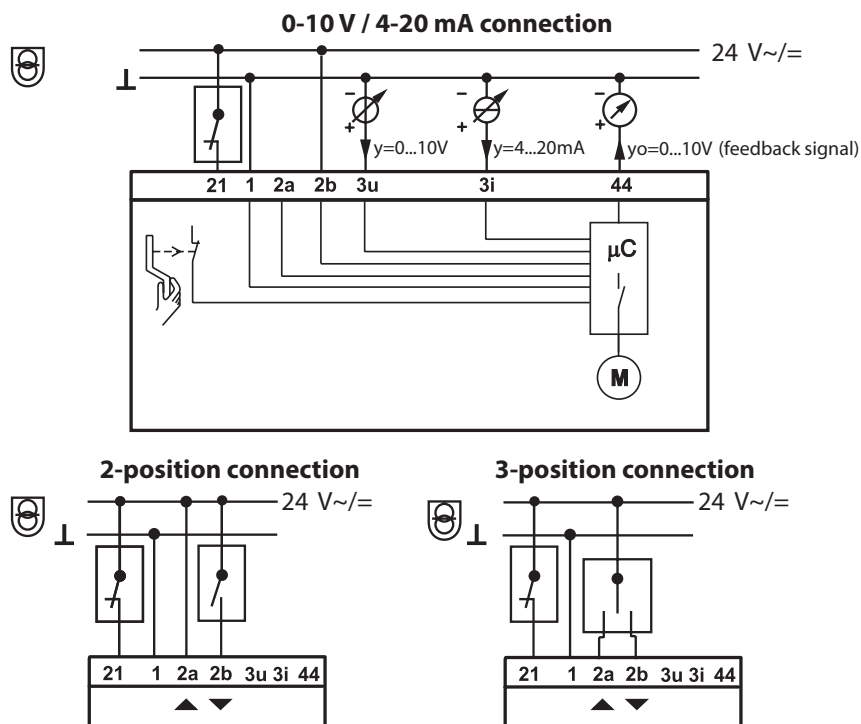
## Connection Diagrams · Standard Actuator

### 24 V AC/DC



## Connection Diagrams · Spring Return Actuator

### 24 V AC/DC

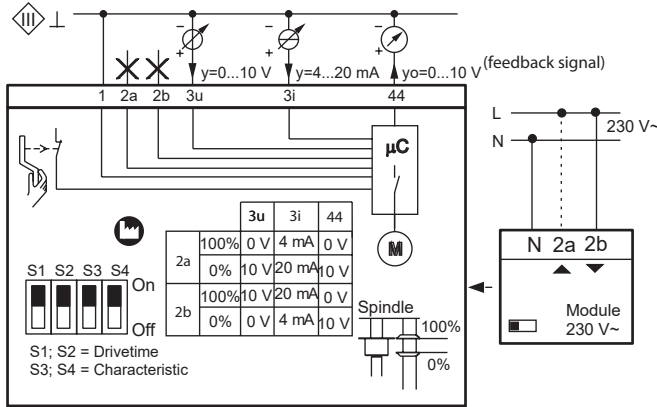


# OPTIMA Compact Actuators SA-series incl. Spring Return DN50-DN300

## Connection Diagrams · Standard Actuator

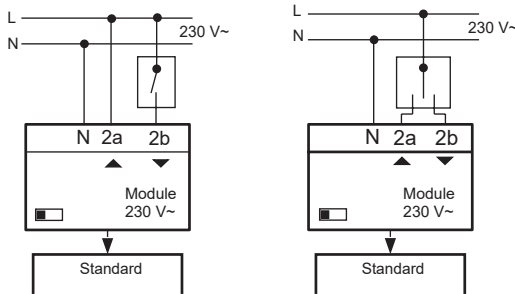
230 V AC

0-10 V / 4-20 mA connection



2-position connection

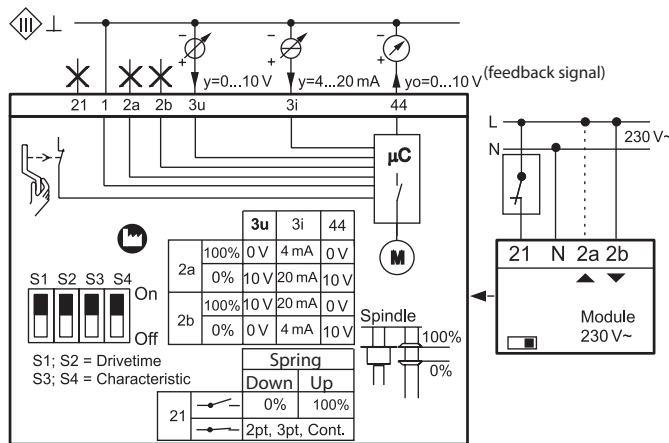
3-position connection



## Connection Diagrams · Spring Return Actuator

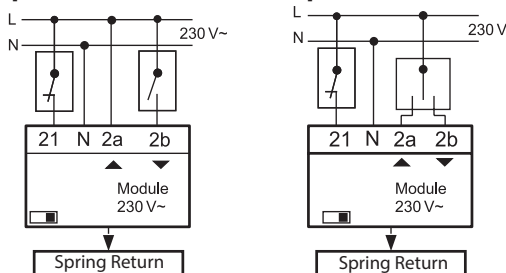
0-10 V / 4-20 mA connection

230 V AC



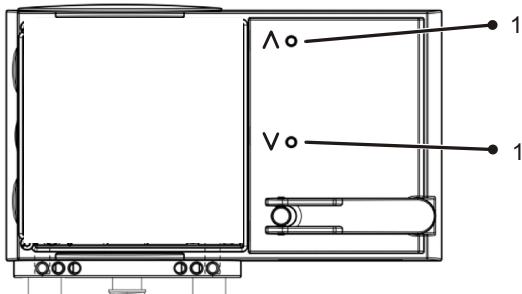
2-position connection

3-position connection



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

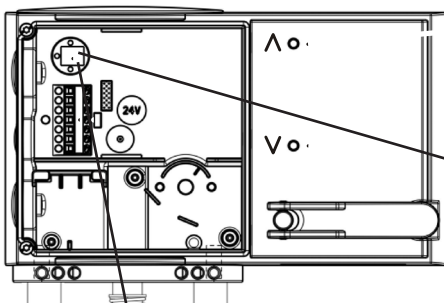
## LED Indication Actuators



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              | <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>On</td><td>Off</td><td>Off</td></tr> </table>   | 1                         | 2   | 3 | 4 | On | On | Off | Off | 192s ±  |    |     |     |          |
| 1               | 2   | 3                         | 4   |   |   |    |    |     |     |         |    |     |     |          |
| On              | On  | 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>On</td><td>Off</td><td>Off</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 | On      | On | Off | Off | 288s ± 8 |
| 1               | 2   | 3                         | 4   |   |   |    |    |     |     |         |    |     |     |          |
| On              | On  | Off                       | Off |   |   |    |    |     |     |         |    |     |     |          |
| On              | On  | Off                       | Off |   |   |    |    |     |     |         |    |     |     |          |

| Desired character. curve | Switch coding   | 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                             |                    |   |     |     |    |    |  |  |  |

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


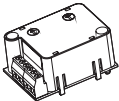
## Feedback signal

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<br>100% fully open<br>0% fully closed [%] | Feedback signal<br>0-10V [V] |
|------------------|-------------------|--|------------------------------|
| 0                | 4                 | 0  | 10                           |
| 5                | 12                | 50   | 5                            |
| 10               | 20                | 100  | 0                            |

## Accessories

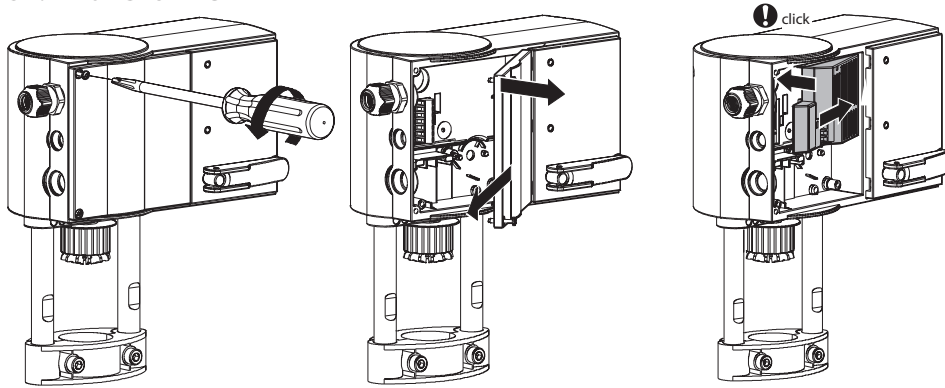
|   | Frese no. | Type             |
|---|-----------|------------------|
|  | 07-2925   | 230V transformer |
|  | 07-21301  | Auxiliary switch |

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

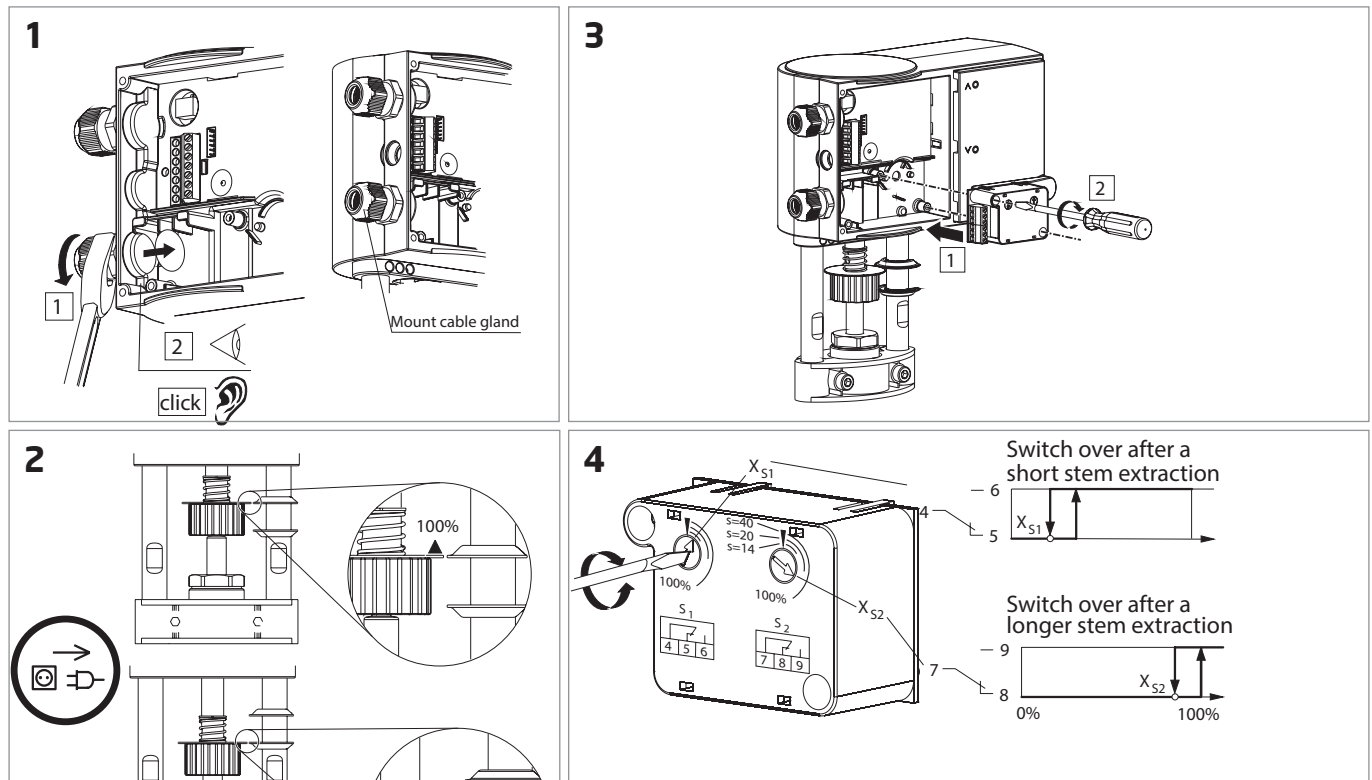
The Auxiliary switch (07-21301) can be installed in the actuator to enable switching on/off external equipment, e.g. indication lamps or feedback to other control systems.

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

## 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.

Frese A/S assumes no responsibility for errors, if any, in catalogues, brochures, and other printed matter. Frese A/S reserves the right to modify its products without prior notice, including already ordered products, if this does not alter existing specifications. All registered trademarks in this material are the property of Frese A/S. All rights reserved.

Frese A/S  
Tel: +45 58 56 00 00  
info@frese.dk