

## Frese OPTIMA Compact Actuators Spring Return · DN40-DN125

### Application

Spring return actuator proportional 0-10V or 3-point floating modulating control of Frese 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 Frese OPTIMA Compact PICV valves (DN40-DN125)



### Features

- Spring return function, stem up or stem down version
- Self calibrating stroke up to 40 mm
- 3-point floating or 0..10 V modulating control within the same actuator
- Voltage control signal range can be selected by use of dip switches.
- Linear or EQ% characterization available on the same actuator
- Small outer dimensions
- Removable cable
- Auto zero detection
- Feedback signal
- IP 54 protection
- The electronic circuit of the actuator ensures that the running time is the same, regardless of the stroke of the valve
- Manual operation by use of hexagonal key

### Approvals

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

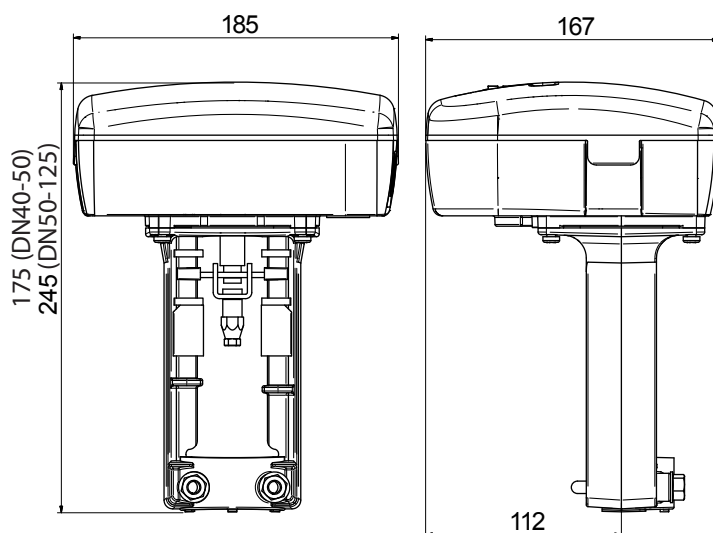


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### Technical Data

<b>Characteristics:</b>	Motoric, modulating, spring return
<b>Protection class:</b>	IP 54 to EN 60529
<b>Frequency:</b>	50/60 Hz
<b>Control signal:</b>	0-10V DC or 3-point
<b>Control signal impedance:</b>	Min. 100 kOhm (0-10V)
<b>Actuating force:</b>	600N/900 N
<b>Stroke max:</b>	40mm
<b>Running time: DN40-DN125</b>	20 s (0-10V) 60 s or 300 s, (3-pos)
<b>Ambient operating conditions:</b>	-10°C to 50°C
<b>Manual operation:</b>	Hexagonal key (Included)
<b>Cable:</b>	Not included
<b>Weight:</b>	2.80 kg

### Dimensions






### Types and Operation Data

Type [Item no.]	Valve Dimension	Function	Supply voltage	Power Consumption
Type-04 [53-1950]	DN40-DN50 Threaded	0..10 V / 3-point Stem up	24V AC +/-20% 50-60 Hz 24V DC +/-20%	30 VA (*50 VA)
Type-05 [53-1951]	DN40-DN50 Threaded	0..10 V / 3-point Stem down	24V AC +/-20% 50-60 Hz 24V DC +/-20%	30 VA (*50 VA)
Type-06 [53-1952]	DN50-DN125 Flanged	0..10 V / 3-point Stem up	24V AC +/-20% 50-60 Hz 24V DC +/-20%	30 VA (*50 VA)
Type-07 [53-1953]	DN50-DN125 Flanged	0..10 V / 3-point Stem down	24V AC +/-20% 50-60 Hz 24V DC +/-20%	30 VA (*50 VA)

\*) Max consumption - for transformer sizing

### Combination matrix: Frese OPTIMA Compact DN40-125 / Actuators

Frese OPTIMA Compact DN40-125 can be combined with the following spring return actuators.

				 Spring return			
	Type	Stroke	Actuator force	Type-04 Stem up	Type-05 Stem down	Type-06 Stem up	Type-07 Stem down
	DN40 threaded	15	600	•	•		
	DN50 threaded	15	600	•	•		
	DN50 flanged	20	900			•	•
	DN65 flanged	20	900			•	•
	DN80 flanged	20	900			•	•
	DN100 flanged	40	900			•	•
	DN125 flanged	40	900			•	•

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### Actuator Settings

		Function in the		Description
		"OFF" pos.	"ON" position	
2-10 Vdc		1 2-10 Vdc	0-5 Vdc	Feed back signal
PROP		2 Proportional	3-point floating	Control mode
---		3 -	Sequence	Sequence control
0-10		4 0-10 V	2-10 V	Input voltage range
0-5, 2-6		5 0-5 V, 2-6 V	5-10 V, 6-10 V	Part of voltage range
60 s		6 60 s	300 s	Running time (Floating control only)
NORM		7 Normal	Inverted	Direction of movement
LIN		8 Linear	EQ%	Valve characteristic
OP		9 Operation	Calibration	Operation/End position calibration

There are nine switches in a row on the circuit board.  
On delivery ('Factory'), all switches are in OFF" position.

#### 1 Feedback signal

Select between 2-10V and 0-5V feedback voltage output .

#### 2 Control signal — PROP/FLOAT

Actuator can either be controlled by a variable direct voltage, known as a proportional modulating signal (PROP), or by a 3-point floating signal (FLOAT).

#### 3 Sequence or parallel control — -- / SEQ

With sequence (or parallel) control (SEQ), two actuators/valves can be controlled by only one control signal.

For each of these you can choose which part of the voltage range to use, the upper one, 5-10 V (6-10 V) or the lower one, 0-5 V (2-6 V).

If the switch NORM / INV is in the NORM position, the higher voltage corresponds to 100% flow and the lower one to 0%.

With NORM / INV in the INV position you will get the opposite function.

**Note! If sequence or parallel control is not used, the switch -- / SEQ must be in the OFF position, as the switch MOD / INC is not valid during sequence or parallel control.**

#### 4 Voltage range — 0-10 / 2-10

You can choose whether to use the control signal voltage range 0-10 V or 2-10 V.

#### 5 Part of voltage range — 0-5, 2-6 / 5-10. 6-10

You can choose which part of a voltage range to use, the lower one 0-5 V (2-6 V) or the upper one 5-10 V (6-10 V).

If the switch is in the NORM position, the higher voltage corresponds to 100% flow and the lower one to 0%. To achieve the opposite function, the switch should be put in its INV position.

#### 6a Running time — 60 s / 300 s

With 3-point floating control, you can choose a running time between 60 s or 300 s.

With modulating control, the running time is 20 s.

#### 7 Direction of movement — NORM / INV

Actuators direction of movement according to the control signal. In normal 'NORM' mode the actuator directly follows the control signal and closes the valve downwards against a 0V control signal.

In inverse 'INV' mode, the actuator reverses the direction of travel against the control signal and will open the valve upwards against a 0V control signal.

#### 8 Linearization — LIN /EQ%

The total valve characteristics can be modified from linear to EQ%.

#### 9 End position adjustment — OP / ADJ

This switch is only used to adjust the end positions when the actuator is commissioned.

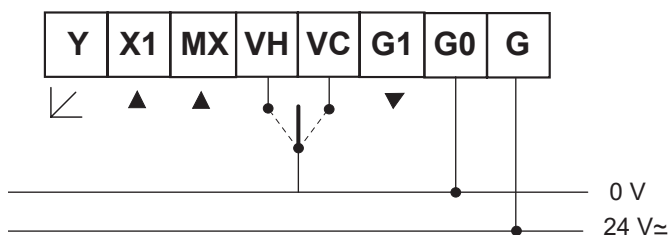
Momentarily put the switch in the ON position. The actuator will automatically find the end positions of the valve.

Stroke calibration will only be initiated once power is applied to the actuator and the user has triggered this switch.

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### Connection Diagrams

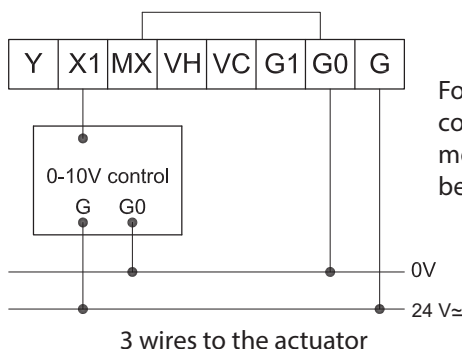
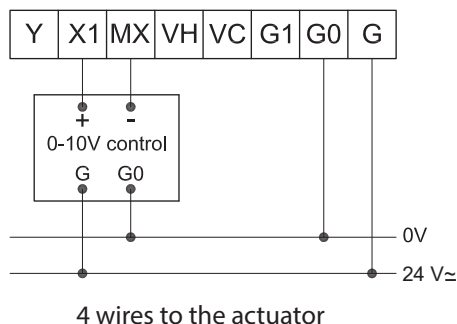
G, G0= Max 100 m 1.5 mm<sup>2</sup> (AWG 16)  
X1, MX, Y, VH, VC = Max 200 m 0,5 mm<sup>2</sup> (AWG 20)



Block	Function	Description
G	24 V AC/DC	Supply voltage
G0	0 V	
X1	Input (0-10 V)	Control signals (VH, VC short-circuited to G0)
MX	Input, neutral	
VH	Increase	
VC	Decrease	
G1	16 VDC,	External supply 25 mA max
Y	0-100% (2-10V)	
		Feedback signal

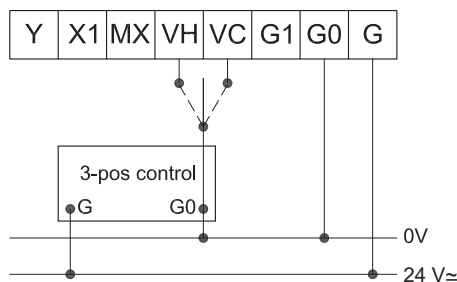
### Wiring Examples

#### 0-10V, 2-10V..... control signal

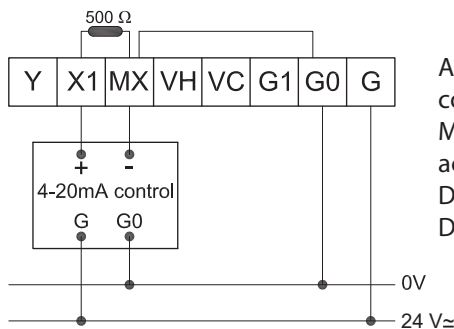


For 0-10V control with 3 wire connection, it is needed to mount an internal wiring between MX and G0

#### 3-pos control signal



#### 4-20 mA control signal



A 500  $\Omega$  resistor must be connected between X1 and MX. (Not delivered with the actuator)  
Dip switch 2 must be OFF and Dip switch 4 must be ON

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