

Multi-functional linear actuators for 2-way and 3-way globe valves

- Actuating force 2500 N
- Nominal voltage AC/DC 24 V
- Control: modulating DC 0 ... 10 V
- Position feedback DC 2 ... 10 V
- including bracket and valve stem coupler
- Adapter sets for third-party valves as accessories



#### Overview of types

Type	Description
AV24-MFT-R	Standard actuator
AV24-MFT2-R	Actuator with Y module
AV24-MFT2-R-C105	Actuator with Y module and auxiliary switch

#### Technical data

<b>Electrical data</b>	Nominal voltage	AC 24 V, 50/60 Hz / DC 24 V	
	Nominal voltage range	AC 19.2 ... 28.8 V / DC 21.6 ... 28.8 V	
	Power consumption	In operation	6 W @ nominal force
		For wire sizing	12 VA
	Connection	Cable 1 m, 5 x 0.75 mm <sup>2</sup>	
	Parallel connection	Yes (note performance data for supply!)	
<b>Functional data</b>	Actuating force	Closing force	2500 N
		Inhibiting force	1700 N
	Control	Control signal Y	DC 0 ... 10 V, input impedance 100 kΩ
		Operating range	DC 2 ... 10 V
	Position feedback (Measuring voltage)	DC 2 ... 10 V, max. 0.5 mA	
	Position accuracy	±5%	
	Manual override	With hexagonal key, temporary	
	Nominal stroke	50 mm	
	Running time	150 s	
	Sound power level	Max. 35 dB (A)	
	Position indication	mechanical 8 ... 50 mm stroke	
<b>Safety</b>	Protection class	III Safety extra-low voltage	
	Degree of protection	IP54	
	EMC	CE according to 2004/108/EC	
	Mode of operation	Type 1 (EN 60730-1)	
	Rated impulse voltage	0.33 kV (EN 60730-1)	
	Control pollution degree	3 (EN 60730-1)	
	Ambient temperature	0 ... +50 °C	
	Non-operating temperature	-40 ... +80 °C	
	Ambient humidity	95% r.H., non-condensating (EN 60730-1)	
	Maintenance	Maintenance-free	
	<b>Dimensions / Weight</b>	Dimensions	See «Dimensions» on page 5
		Weight	Approx. 2.9 kg

Safety notes



- The actuator has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.
- It may only be installed by suitably trained personnel. Any legal regulations or regulations issued by authorities must be observed during assembly.
- The device does not contain any parts that can be replaced or repaired by the user.
- The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.

Product features

<b>Mode of operation</b>	The actuator is activated with a standard modulating signal DC 0 ... 10 V.
<b>Simple attachment</b>	A suitable adapter set ZAV.. is required for mounting the actuator on the third-party valve (see «Accessories»). The adapter set is comprised of a valve neck adapter and a valve stem coupling. The valve neck adapter makes it possible to mount the actuator on the neck of the valve to the bracket with a clamping strap. The actuator spindle is coupled to the valve stem with the valve stem coupling. The actuator can be rotated through 360° ↺ on the neck of the valve.
<b>Manual override</b>	The stroke can be adjusted in a voltage-free state by using a hexagonal key (5 mm), which is plugged into the actuator at the top. If the hexagonal key is turned in a clockwise direction, then the actuator spindle will extend from the actuator housing (pushing) and maintain the position until a nominal voltage is applied (the controller has first priority).
<b>High functional reliability</b>	The actuator is protected against short circuits, polarity reversal and overloading. The stroke is adapted automatically.
<b>Function indication</b>	The stroke is indicated mechanically on the bracket. The indicator adjusts itself automatically. A two-coloured LED status display is located below the cover of the housing.
<b>Combination valve/actuator</b>	Refer to the valve documentation for suitable valves, their permitted media temperatures and closing pressures.
<b>Y Module</b>	Passive sensors can also be linked to the actuators <b>AV24-MFT2-R</b> and <b>AV24-MFT2-R-C105</b> , in addition to the active ones.
<b>Auxiliary switch</b>	The <b>AV24-MFT2-R-C105</b> actuator is equipped with an auxiliary switch for interrupting the supply voltage.

Accessories

	Description	Data sheet
<b>Mechanical accessories</b>	Adapter sets, Type ZAV-..	T6 - UNV-../ZNV-../ZAV-..

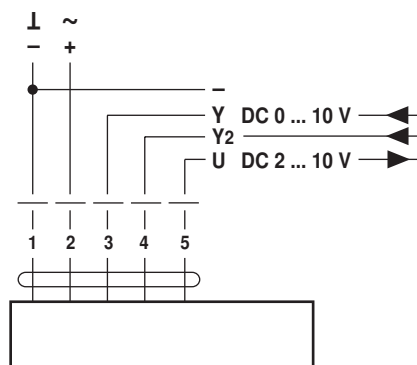
Electrical installation

Wiring diagram

**Note**

- Connect via safety isolation transformer.
- Other actuators can be connected in parallel.

Note performance data for supply.



**Cable colours:**  
 1 = black  
 2 = red  
 3 = white  
 4 = white  
 5 = white

**Functions**

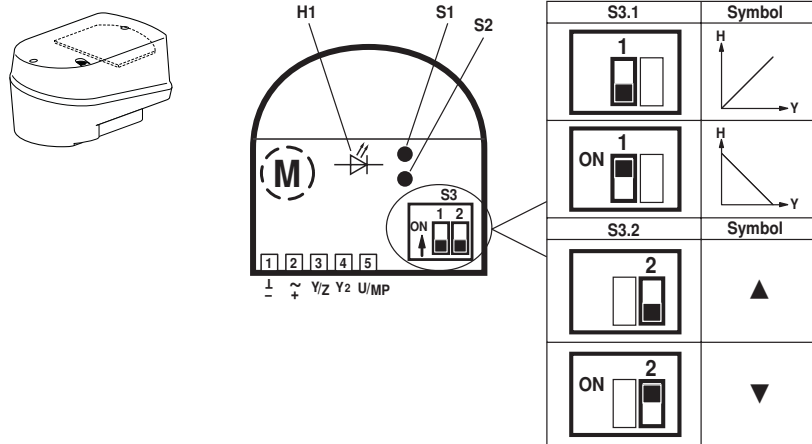
**Alignment of the operating elements**

The terminals for the cable connection, the operating elements S1, S2, S3 and the H1 LED indicator are located under the cover of the actuator.

By setting slide switch S3 or pressing pushbuttons S1 and S2, it is possible to configure the actuator very simply on site to suit actual requirements, if changes are necessary from the factory settings.

S3.1 Direction of stroke

S3.2 Valve closing point



**Functional description**

Function	Description	Switch		
Test	The valve effects full stroke with maximum running time and checks the adapted stroke to determine whether the two end-points (H=0% and H=100%) are reached.	Press S1		
Init (Adaptation)	The possible stroke effected (between the two mechanical end stops of the valve) is detected a 100% stroke and stored in the microcontroller. The control signal and the running time are then matched to this 100% stroke.	Press S2		
Direction of stroke	Direction of stroke relative to the control signal	S3.1	<b>Symbol</b>	
direct <sup>1)</sup>	0% control signal corresponds to 0% position feedback. (The actuator spindle is retracted or extended according to the selected closing point.)	OFF		
inverted	0% control signal corresponds to 100% position feedback. (The actuator spindle is extended or retracted according to the selected closing point.)	ON		
Valve closing point	Closing point with actuator spindle retracted or extended.	S3.2	<b>Symbol</b>	<b>Consequence</b>
up <sup>1)</sup>	The actuator spindle is retracted into the actuator and the valve stem is extended from the fitting. The position feedback indicates 0% if the stroke direction is «direct».	OFF	▲	
down	The actuator spindle is extended from the actuator and the valve stem is retracted into the fitting. The position feedback indicates 0% if the stroke direction is «direct».	ON	▼	

<sup>1)</sup> Factory settings

**LED display H1**

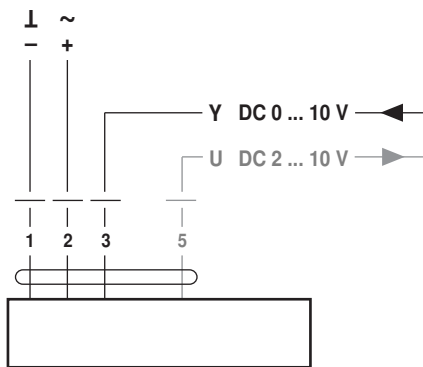
The LED display is two-coloured (red/green) and shows the current status of the actuator.

Green steady light	Actuator working properly
Green flashing light	Test run or adaptation with synchronisation in progress
Red steady light	A fault is present Possible causes of malfunctions: – Actuator installed incorrectly – Valve stem blocked – No valve installed The adaptation must be repeated by pressing pushbutton S2 after the malfunction has been eliminated.
Red flashing light	After every voltage interruption (>2 s). The valve is automatically synchronized at the selected closing point the next time it closes, and the LED indicator changes from a red flashing light to a green steady light.
Alternating red/green flashing light	Addressing via the control system and operation of the adaptation pushbutton S2 in progress

Functions

(continued)

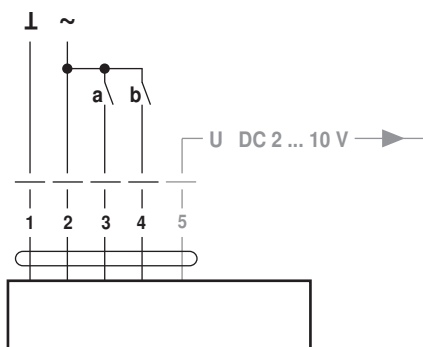
Modulating control



Symbols										Actuator spindle moves	
Direction of stroke	Closing point Valve	Signal direct	Signal inverted	Closing point up	Closing point down	Control signal min. (e.g. Y = 2 V)	Control signal max. (e.g. Y = 10 V)	Measuring signal min. (e.g. U = 2 V)	Measuring signal max. (e.g. U = 10 V)		
										S3.1	S3.2
	▲	OFF		OFF		X	X	X		ON	OFF
	▼	OFF			ON	X	X	X		ON	OFF
	▲		ON <sup>1)</sup>	OFF		X	X	X		ON	OFF
	▼		ON <sup>1)</sup>		ON	X	X	X		ON	OFF

<sup>1)</sup> If the controller generates a negative signal (<0.15 V), slide switch S3.1 must not be set to «ON», if the operating range of the actuator is set to 2 ... 10 V (Exception: start point in the parameterized operating range of 0.5 V).

3-point control



**Note**  
Only works with a nominal voltage of AC 24 V!

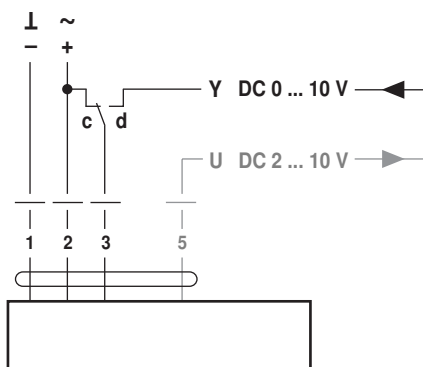
The linear actuator must be accordingly parameterized and equipped with a 3-wire connector for 4-point applications.

Symbols										Actuator spindle moves	
Direction of stroke	Closing point Valve	Signal direct	Signal inverted	Closing point up	Closing point down	Relay contact a (Y1)	Relay contact b (Y2)	Measuring signal min. (e.g. U = 2 V)	Measuring signal max. (e.g. U = 10 V)		
										S3.1	S3.2
	▲	OFF		OFF		0	0	<sup>1)</sup>	<sup>1)</sup>	stops	stops
	▼	OFF			ON	1	0	m <sup>2)</sup>	m <sup>2)</sup>	ON	OFF
	▲		ON	OFF		0	1	m <sup>2)</sup>	m <sup>2)</sup>	ON	OFF
	▼		ON		ON	1	0	m <sup>2)</sup>	m <sup>2)</sup>	ON	OFF

<sup>1)</sup> Measuring signal U according to position

<sup>2)</sup> m = if relay contact a or b is in switch position 150 for longer than the running time (1 s)

Override control 100%

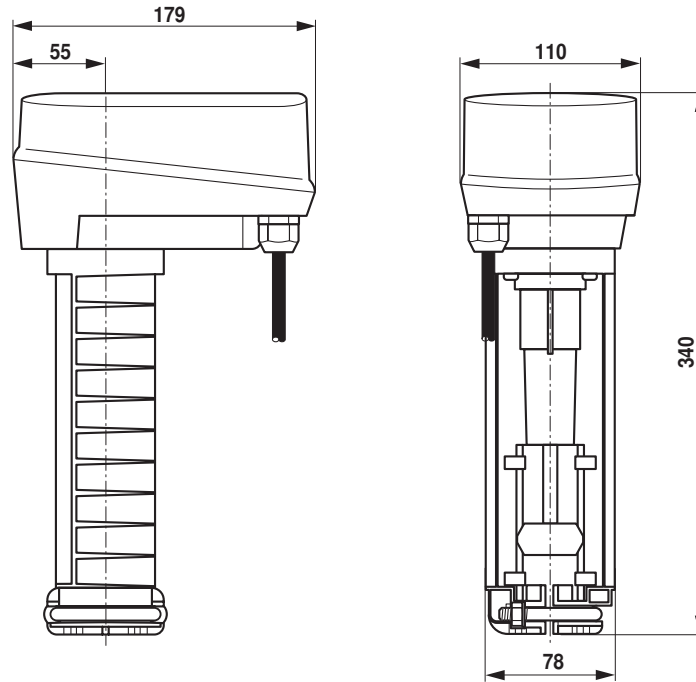


A typical use for 100% override control is in a frost protection circuit. Whether or not the frost thermostat has to interrupt the signal conductor to the controller «d» depends on the make of controller being used (not necessary, if the signal output at the controller is short circuit proof and protected against polarity reversal).

Symbols										Actuator spindle moves	
Direction of stroke	Closing point Valve	Signal direct	Signal inverted	Closing point up	Closing point down	Control signal min. (e.g. Y = 2 V)	Control signal max. (e.g. Y = 10 V)	Measuring signal min. (e.g. U = 2 V)	Measuring signal max. (e.g. U = 10 V)		
										S3.1	S3.2
	▲	OFF		OFF		1	0		X		OFF
	▼	OFF			ON	1	0	X	X	ON	ON
	▲		ON	OFF		1	0	X			OFF
	▼		ON		ON	1	0	X			OFF

## Dimensions [mm]

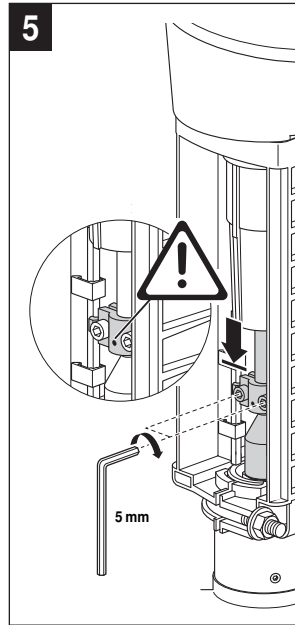
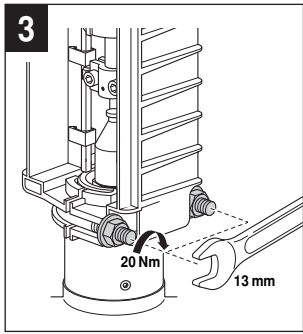
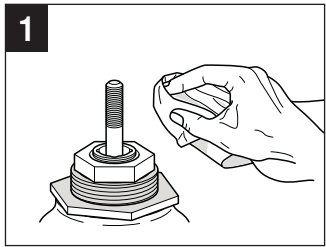
Dimensional drawings



## Further documentations

- Overview of brackets and adapter sets
- Installation instructions for actuators
- Notes for project planning (hydraulic characteristic curves and circuits, installation regulations, commissioning, maintenance etc.)

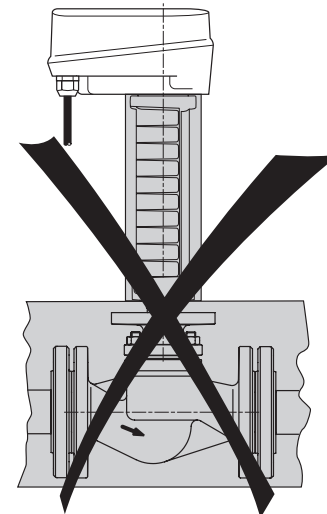
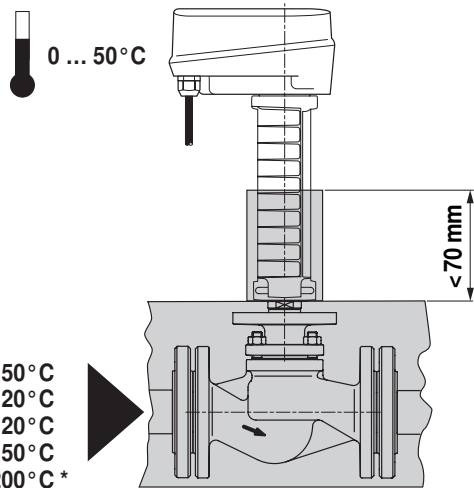
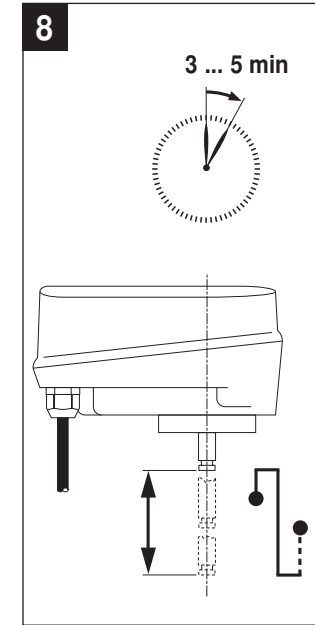
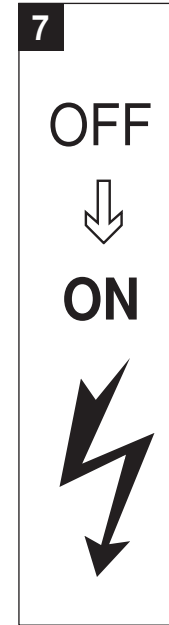
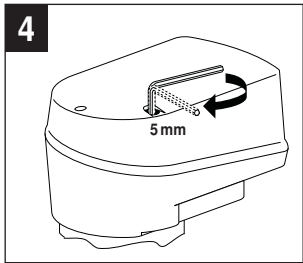
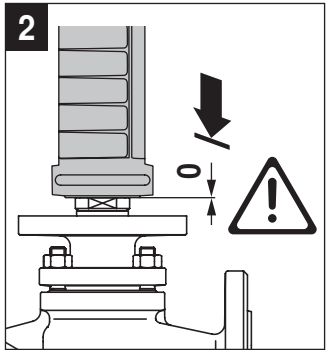




**6**

S3.1	Symbol
	H Y
ON 1	H Y
S3.2	Symbol
	H6/7..N H6/7..R H7..X..S2 H7..Y..S2
ON 2	H6..S H6..SP H6..X..S(P)2

⚠



- H6..S / H6..SP max. 150 °C
- H6..N / H7..N max. 120 °C
- H6..R / H7..R max. 120 °C
- H6..X..S2 max. 150 °C
- H7..X..S2 max. 200 °C \*
- H7..Y..S2 max. 200 °C \*

