oventrop

Valves, controls + systems

EN

Electromotive actuator "Aktor M ST L ", 24 V, 0 - 10 V

Operating instructions

Contents

1. General information

The original operating instructions were drafted in German.

The operating instructions in other languages were translated from German.

1.1 Validity of the operating instructions

These operating instructions are valid for the electromotive actuator "Aktor M ST L", 24 V, modulating proportional actuator, 0-10 V, with electric emergency control function and automatic recognition of neutral point.

1.2 Type plate

The type plate is located on the bottom of the product.

1.3 Extent of supply

Items included in the delivery:

- "Aktor M ST L", 24 V, modulating proportional actuator, 0-10 V
- Operating instructions

1.4 Contact

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1.5 EU Declaration of conformity

Oventrop GmbH & Co. KG hereby declares that this product complies with the basic requirements and other relevant provisions of the EC Directives concerned.

The declaration of conformity can be obtained from the manufacturer.

1.6 Used symbols

	Important information and further explanations.
▶	Action required
•	Enumeration
1. 2.	Fixed order. Steps 1 to X.
▷	Result of action

2. Safety-related information

2.1 Correct use

Safety in operation is only guaranteed if the product is used correctly.

The Aktor may be used as actuator with electric emergency control function and automatic recognition of neutral point in indoor heating, ventilation and air conditioning systems.

Any other use of the product will be considered incorrect use.

Claims of any kind against the manufacturer and/or his authorised representatives, due to damages caused by incorrect use cannot be accepted.

The observance of the operating instructions is part of the compliance terms.

2.2 Warnings

Each warning contains the following elements:

Warning symbol SIGNAL WORD
Type and source of danger Possible consequences if the danger occurs or the warning is ignored. ▶ Possibilities of avoiding the danger.

The signal words identify the severity of the danger arising from a situation.

⚠ DANGER
Indicates an imminent danger with high risk. The situation will lead to death or serious injury if not avoided.

⚠ WARNING
Indicates a possible danger with moderate risk. The situation may lead to death or serious injury if not avoided.

⚠ CAUTION
Indicates a possible danger with low risk. It may lead to minor and reversible injury if the situation is not avoided.

NOTICE
Indicates a situation which may lead to damage to property if not avoided.

2.3 Safety notes

We have developed this product in accordance with current safety requirements.

Please observe the following notes concerning safe use.

2.3.1 Danger in case of inadequate personnel qualification

Any work on this product must only be carried out by qualified tradespeople.

As a result of their professional training and experience as well as their knowledge of the relevant legal regulations, qualified tradespeople are able to carry out any work on the described product professionally.

User

The user must be informed how to operate the product by qualified tradespeople.

2.3.2 Risk of burns due to hot components and surfaces

▶ Wear suitable protective clothing to avoid unprotected contact with hot system components and fittings.

2.3.3 Availability of the operating instructions

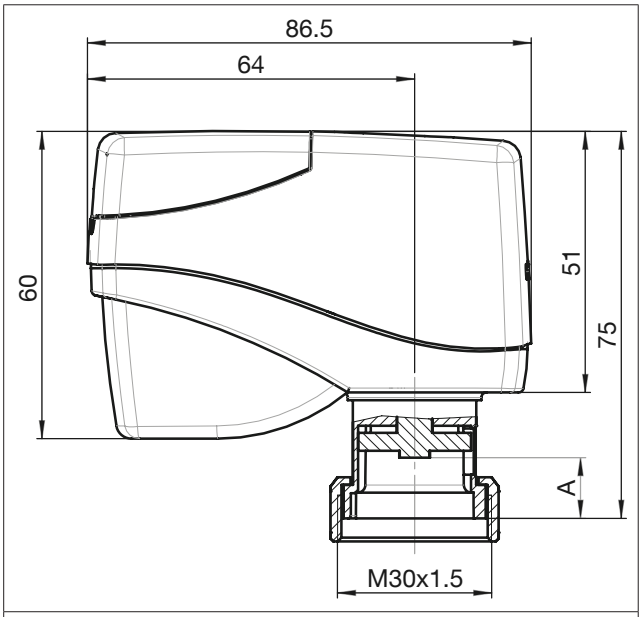
Any person working on the product has to read and apply these operating instructions and all other valid documents.

The operating instructions must be available at the installation location of the product.

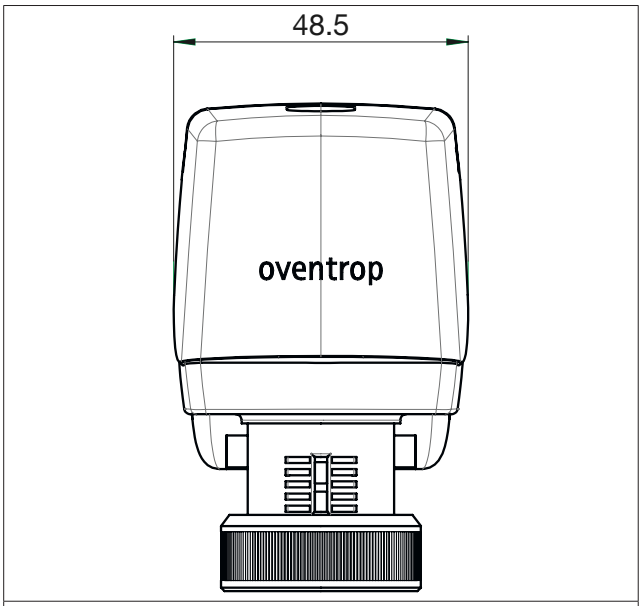
▶ Hand these operating instructions and all other valid documents over to the user.

3. Technical description

3.1 Construction



Illust. 1: Side view



Illust. 2: Front view

3.2 Functional description

3.2.1 Normal operation

The actuator opens or closes the valve depending on the applied control voltage.

The actuator can be adapted to the specific parameters of the valve used with the help of DIP switches.

3.2.2 Emergency end position

The actuator features an energy store.

If the operating voltage fails, the stem of the actuator will move to the emergency end position (see section 6.3 on page 10).

3.3 Technical data

Operating voltage	24 V AC ±10 %; 50/60 Hz; 24 V DC ±10 %
Power consumption	Dimensioning: 6.8 VA (24 V AC); 3.3 W (24 V DC) nominal: 5.3 VA (24 V AC); 2.7 W (24 V DC)
Start up load	For short periods max. 12 A
Drive	Steady control 0 - 10 V DC; < 0.5 mA
Connection	Fixed pre-assembled cable 1.5 m; 5 x 0.5 mm²
Display	LED display for operating voltage and status
Motor deactivation	Drive stem: - extending = load-dependent - retracting = travel-dependent
Piston stroke	Max. 4 mm
Floating time	22 s/mm
Emergency floating time	about 5 s/mm
Operating power	Nominal 150 N
Position indicator	Stroke scale
Position feedback	2 - 10 V; DC, 5 mA for 0 -100 % travel
Emergency control function	Emergency end position adjustable
Valve anti-blocking function	Active
Permissible fluid temperature in the valve	0 °C - 120 °C
Ambient temperature	0 °C - 50 °C
Ambient humidity	0 - 85% r.h., not condensing
Protection class	IP54
Protective system	Degree of protection
Installation position	360°
Maintenance	maintenance-free
Weight	250 g

4. Transport and storage

Temperature range	0 °C - 50 °C
Relative air humidity	0 - 85% r.h., not condensing
Particles	Store dry and free from dust
Mechanical influences	Protected from mechanical agitation
Weather influences	Do not store outdoors
	Protect from direct sunlight
Chemical influences	Do not store together with aggressive fluids

5. Installation

5.1 Initial installation

Make sure that there is enough space for the installation of the actuator when installing the valve.

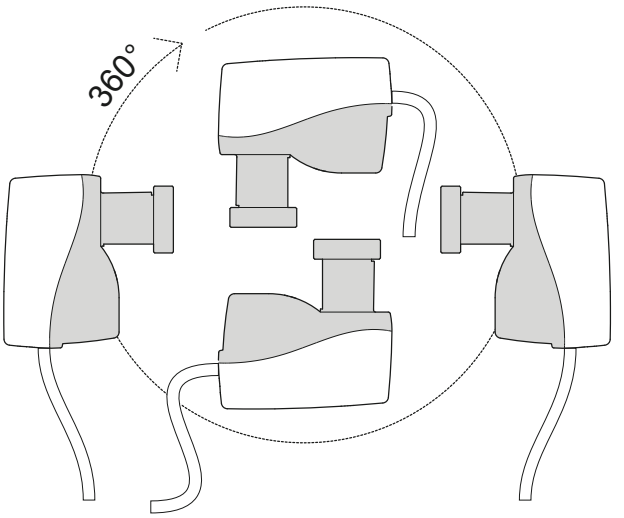
The actuator must only be connected to the power supply after installation!

CAUTION

Risk of burns due to hot components

An unprotected contact with hot components may lead to burns.

- ▶ Allow the installation to cool down before working on it.
- ▶ Wear safety gloves.



Illust. 3: Installation position

1. Fit the actuator to the connection thread of the valve.
2. Hand tighten the collar nut.

Avoid cross threading.

NOTICE

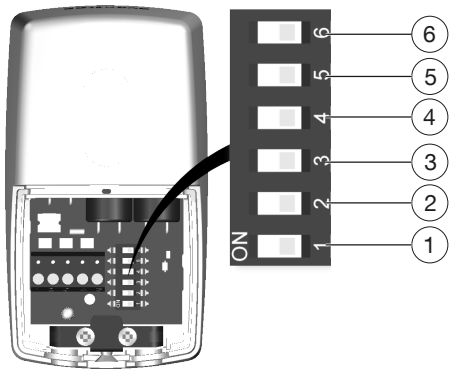
Damage to the actuator when tightening the collar nut with excessive torque

The actuator can be damaged and its be function impaired if the collar nut is over-tightened.

- ▶ Hand tighten the collar nut.

5.2 Configuration of the DIP switches

- ▶ Remove the casing cover.
- ▶ Configure the DIP switches according to the valve used (see section 10 on page 12).



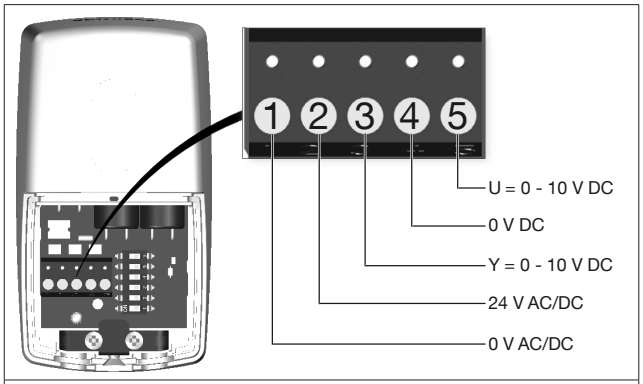
Illust. 4: DIP switches

(1)	S1 ON/ OFF	**Setting of the required stroke behaviour in accordance with the characteristic lines of the valve used.**
(2)	S2 ON/ OFF	
(3)	S3 ON/ OFF	
(4)	S4 ON/ OFF	
(5)	S5 ON/ OFF	
(6)	Setting of the emergency end position	
	ON = Stem in retracted position	OFF = Stem in extended position

5.3 Connection of the power supply

NOTICE
Damage to the stem in unmounted state If you operate the actuator electrically without valve, the stem may be damaged by exceeding the defined range of extension. ▶ Only operate the product in mounted state

After having connected the power supply, the internal energy store will be charged first before the actuator reacts. Charging of the energy store generally has priority over the actuator functions.



Illust. 5: Connection assignment

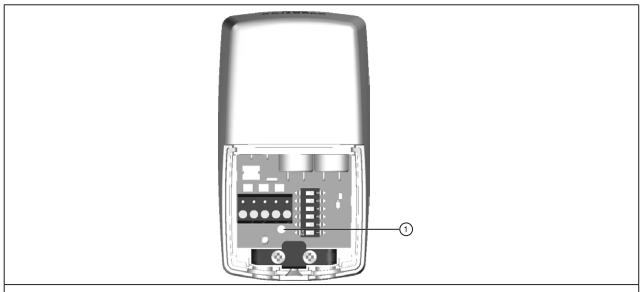
(1)	0 V AC/DC - blue (BU)
(2)	24 V AC/DC - brown (BN)
(3)	Control 0 - 10 V DC - grey (GY)
(4)	Position feedback 0 V DC - yellow (YE)
(5)	Position feedback 0 -10 V DC - green (GN)

- ▶ Connect the power supply according to the desired assignment in Illust. 5 on page 9.
- ▷ The energy store will be charged.
- ▷ After about 2.5 minutes, the actuator will carry out an initialisation run and is ready for operation.

The supply voltage must not be interrupted during the initialisation run.

6. Operation

6.1 Status LED



Illust. 6: Status LED

(1)	Status LED

The status LED is located under the casing cover and displays the operating status of the actuator.

Status-LED	Bedeutung
Flashing red	Charging of the capacitors after switching on
Flashing green	Initialisation run, recognition of neutral point active
Lit green	Operating voltage applied, normal operation
Off	Emergency control mode triggered, no operating voltage

6.2 Normal operation

The actuator is automatically controlled via the control technology.

6.3 Emergency control function

▷ If the operating voltage fails, the actuator will move to the set emergency end position.

▷ Once the operating voltage has been restored, the energy store will be charged first.

▷ After that, the actuator will follow the signals of the control technology.

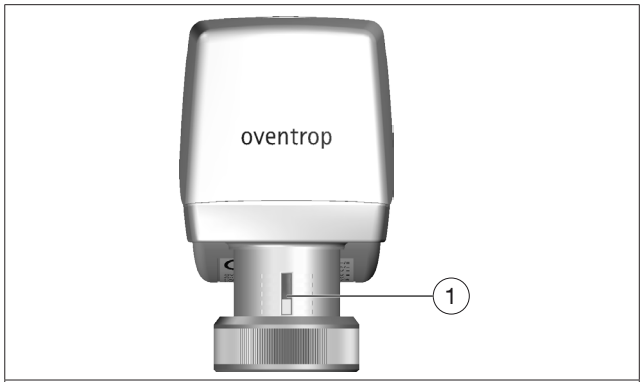
	The emergency control function will only be available after successful completion of the initialisation run (displayed by a constantly lit green LED).

7. Maintenance

The actuator is maintenance-free.

8. Removal and reinstallation

8.1 Removal



Illust. 7: Stroke position indicator

(1)	Stroke position indicator of the actuator

CAUTION

Risk of burns due to hot components

An unprotected contact with hot components may lead to burns.

▶ Allow the valve to cool down before working on it.

NOTICE

It may not be possible to unscrew the collar nut by hand

Without operating voltage, the actuator may close the valve with the maximum actuating power of 200 N. In this case, the collar nut can no longer be unscrewed by hand.

▶ Do not use pliers or similar to loosen the collar nut!

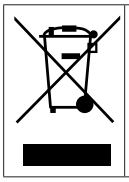
1. Set the DIP switch 6 to "ON" (see section 5.2 on page 9).
2. Disconnect the actuator from the power supply.

▷ The actuator will move to the upper stroke position.

3. Disconnect all electrical connections.
4. Loosen the collar nut.
5. Remove the actuator from the valve.

9. Disposal

Guideline 2012/19/EU WEEE:



Waste electrical and electronic equipment (WEEE) must not be disposed of with domestic waste, but must be dropped off at a collection point for the recycling of electrical and electronic appliances.

NOTICE

Risk of environmental pollution

Incorrect disposal (for instance with the domestic waste) may lead to environmental damage.

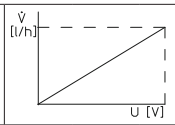
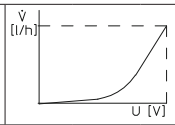
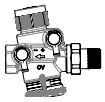
- ▶ Packaging material is to be disposed of in an environmentally friendly manner.
- ▶ Components are to be disposed of professionally.

If no return or disposal agreement has been made, the product has to be disposed of.

- ▶ If possible, the components are to be recycled.
- ▶ Components, which cannot be recycled, are to be disposed of according to the local regulations. Disposal with the domestic waste is inadmissible.

10. Appendix

Settings of the DIP switches

Valve + actuator =														
Valve type	Model	Control range	DIP switches						DIP switches					
			S1	**S2**	**S3**	**S4**	**S5**		**S1**	**S2**	**S3**	**S4**	**S5**	
 Cocon QTZ **PN 25**	DN 10/15 30 - 210 l/h	30 - 90 l/h	ON	OFF	ON	OFF	OFF							
		91 - 150 l/h	OFF	ON	ON	OFF	OFF		OFF	ON	ON	OFF	ON	
		151 - 210 l/h	ON	ON	ON	OFF	OFF		ON	ON	ON	OFF	ON	
	DN 10/15 150 - 700 l/h	150 - 250 l/h	OFF	OFF	OFF	ON	OFF							
		251 - 500 l/h	ON	OFF	OFF	ON	OFF		OFF	OFF	OFF	ON	ON	
		501 - 700 l/h	OFF	ON	OFF	ON	OFF		ON	OFF	OFF	ON	ON	
	DN 15 200 - 1300 l/h	200 - 300 l/h	ON	ON	OFF	ON	OFF							
		301 - 500 l/h	ON	ON	ON	OFF	OFF		ON	ON	ON	OFF	ON	
		501 - 900 l/h	OFF	OFF	ON	ON	OFF		OFF	ON	OFF	ON	ON	
		901 - 1300 l/h	ON	OFF	ON	ON	OFF		ON	ON	OFF	ON	ON	
	DN 20 250 - 1800 l/h	250 - 400 l/h	ON	ON	OFF	ON	OFF							
		401 - 800 l/h	OFF	ON	ON	OFF	OFF		OFF	ON	ON	OFF	ON	
		801 - 1100 l/h	OFF	OFF	ON	OFF	ON		OFF	ON	ON	ON	ON	
		1101 - 1500 l/h	OFF	ON	ON	ON	OFF		OFF	OFF	ON	ON	ON	
		1501 - 1800 l/h	ON	ON	ON	ON	OFF		ON	ON	OFF	ON	ON	
	DN 25 400 - 2500 l/h	400 - 700 l/h	OFF	OFF	OFF	OFF	ON							
		701 - 1100 l/h	OFF	ON	ON	OFF	OFF		OFF	ON	ON	OFF	ON	
		1101 - 2100 l/h	ON	OFF	OFF	OFF	ON		ON	OFF	ON	ON	ON	
		2101 - 2500 l/h	OFF	ON	OFF	OFF	ON		ON	ON	OFF	ON	ON	
	DN 32 600 - 4800 l/h	600 - 800 l/h	ON	ON	OFF	OFF	ON							
		801 - 2800 l/h	OFF	OFF	ON	OFF	ON		OFF	ON	ON	ON	ON	
		2801 - 4800 l/h	ON	OFF	ON	OFF	ON		ON	ON	ON	ON	ON	
 Cocon 2TZ	kvs = 0.45	0.25 U.	OFF	ON	OFF	OFF	OFF							
		0.26 - 4 U.	ON	OFF	OFF	OFF	OFF							
	kvs = 1.0	0.5 - 1U.	OFF	ON	OFF	OFF	OFF							
		1.1 - 4.5 U	OFF	OFF	ON	OFF	ON							
	kvs = 1.8	0.5 - 7 U.	OFF	ON	OFF	OFF	OFF							
	kvs = 4.5	0.75 - 1 U.	OFF	OFF	ON	OFF	ON							
		1.1 - 7 U.	ON	OFF	ON	OFF	ON							
 Hycocon HTZ	DN 15 kvs = 1.7	0.5 - 0.75 U.	ON	ON	OFF	OFF	OFF							
		0.76 - 3 U.	OFF	ON	OFF	OFF	OFF							
	DN 20 kvs = 2.7	0.5 - 0.75 U.	ON	ON	OFF	OFF	OFF							
		0.76 - 1.5 U.	OFF	OFF	ON	OFF	ON							
		1.6 - 3 U.	ON	OFF	ON	OFF	ON							
	DN 25 kvs = 3.6	0.5 - 0.75 U.	OFF	OFF	ON	OFF	OFF							
		0.76 - 1.0 U.	ON	ON	OFF	OFF	OFF							
		1.1 - 1.5 U.	OFF	ON	OFF	OFF	OFF							
		1.6 - 3.0 U.	OFF	OFF	ON	OFF	ON							
		3.1 - 3.5 U.	OFF	OFF	OFF	OFF	OFF							
	DN 32 kvs = 6.8	0.5 U.	OFF	OFF	ON	OFF	OFF							
		0.6 - 1.0 U.	ON	ON	OFF	OFF	OFF							
		1.1 - 2.0 U.	OFF	ON	OFF	OFF	OFF							
		2.1 - 3.0 U.	ON	OFF	OFF	OFF	OFF							
		3.1 - 4.0 U.	OFF	OFF	OFF	OFF	OFF							
	DN 40 kvs = 10	0.5 - 0.75 U.	ON	ON	OFF	OFF	OFF							
		0.76 - 1.5 U.	OFF	ON	OFF	OFF	OFF							
		1.6 - 2.5 U.	ON	OFF	OFF	OFF	OFF							
		2.6 - 4.0 U.	OFF	OFF	OFF	OFF	OFF							
Products of other manufacturers (M30x1.5, s=11.8mm)	Valve stroke h	h = 0.5 mm	OFF	OFF	ON	OFF	OFF							
		h = 1.0 mm	ON	ON	OFF	OFF	OFF							
		h = 2.0 mm	OFF	ON	OFF	OFF	OFF							
		h = 3.0 mm	ON	OFF	OFF	OFF	OFF							
		h = 4.0 mm	OFF	OFF	OFF	OFF	OFF							

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