

AVF 125S: Valve drive SUT with spring return

How energy efficiency is improved

Electric cut-off and auto-adjustment to save energy.

Areas of application

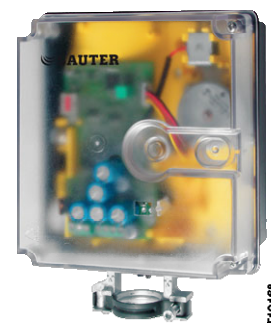
Actuation of through and three-way valves in the VXN/BXN, VUD/BUD and VUE/BUE, DN15 to DN50 series. For controllers with continuous output (0 - 10 V) or switching output (2-point or 3-point control).

Features

- Actuator with spring return and pushing force of 500 N
- The return spring moves the actuator back to a pre-determined end position in the event of a power failure or the power being switched off or whenever a limiter is activated
- Two versions; NC closes the valve, NO opens the valve if the spring is activated
- Stepping motor with SUT (Sauter Universal Technology) electronic control unit and electronic load-dependent cut-off
- Automatic detection of control signal applied (continuous or switching)
- The type of characteristic curve (linear, quadratic or equal percentage) can be adjusted in the drive
- Direction of travel can be selected via screw terminals when making electrical connection or remotely
- Coding switch for selection of characteristic and running time (60 or 120 sec.)
- Maintenance-free gearbox and holding magnet
- LED display

Technical description

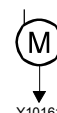
- 24 V~ power supply
- Two-part housing made of self-extinguishing plastic, lower section black, cover transparent
- Body of gearbox and mounting bracket for fitting valve made of cast zinc
- Electrical connections (max. 1.5 mm²) with screw terminals
- Cable entry M20 × 1.5
- Installation position: vertical to horizontal, but not upside down



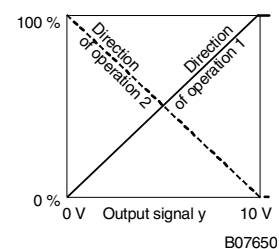
T10168



Y02158



Y10161



B07650

Type	Running time sec		Reset func- tion	Pushing force ¹⁾ N	Power	Weight kg
	Motor	Spring				
For valves with equal-percentage characteristic, can be switched over to linear						
AVF 125S F132	60 / 120	18 ± 10	closed (NC)	500	24 V~	2,4
AVF 125S F232	60 / 120	18 ± 10	open (NO)	500	24 V~	2,4

Positioner:				
Control signal 1	0...10V, R _i = 100 kΩ	Starting point U ₀	0 or 10 V	
Control signal 2	4...20 mA, R _i = 50 Ω	Control span ΔU	10 V	
Position feedback signal	0...10V, load > 2,5 kΩ	Switching range X _{Sh}	200 mV	
Power supply	24 V~ ²⁾	± 20%, 50...60 Hz	Degree of protection ³⁾	IP 54 (EN 60529)
			Protection class	III as per IEC 60730
Power consumption			Wiring diagram AVF 125	A10455
AVF 12 . S F. 32	5 W	8,4 VA	Dimension drawing	M07429
on starting	30 VA (max. 1s) ⁴⁾		Fitting instructions AVF 125	MV 506067
Nominal stroke ⁵⁾			Declaration on materials	MD 51.368
AVF 125S	8,0 mm			
Max. media temperature	100 °C			
Permissible ambient temp.	-10...55 °C			
Ambient humidity	< 95 %rh without condensation			

1) Max. pushing force: 550 N or, with spring return, 1500 N

2) 24V= not possible

3) Degree of protection IP 54 only with M20 cable screw fitting

4) On starting or after spring return operation

5) Maximum stroke of drive = 10.0 mm

Accessories

0313529 001*	Split-range unit for settings sequences. MV 505671; A09421
0370880 001	Mechanical stroke indicator; MV 505517
0370881 001*	Auxiliary change-over contacts ¹⁾ , simple; MV 505517
0370882 001*	Auxiliary change-over contacts ¹⁾ , simple, and pot. 2000 Ω, 1 W; 24 V; MV 505517
0370882 006*	Auxiliary change-over contacts ¹⁾ , simple, and pot. 1000 Ω, 1 W; 24 V; MV 505517
0370883 001*	Potentiometer 2000 Ω, 1 W; 24 V; MV 505517
0370883 006*	Potentiometer 1000 Ω, 1 W; 24 V; MV 505517
0372249 001*	Intermediate piece required for media temperature >100 °C for BXN / VXN (recommended for temperature < 10 °C); MV 505932
0372460 001	Cable screw fitting (plastic M20×1,5) incl. locking nut and gasket, max. 2 pcs.

*) Dimension drawing or wiring diagram are available under the same number

1) Infinitely variable; max. load 2 (1) A, 12...250 V~, min. load 250 mA, 12 V~

Operation

On starting the unit for the first time (after applying power), or on re-starting the unit after the reset function has been triggered, there is a wait of 45 seconds for the reset function to become operable.

Depending on how it is connected (see wiring diagram), the actuator can be used as a continuous drive (0...10V and/or 4...20 mA), a 2-point drive (open/close) or a 3-point drive (open/stop/close) with intermediate position. When control signals 1 (3u / 03) and 2 (3i / 04) are connected simultaneously, the input with the higher value has priority.

The running time can be matched to the requirements of the task using switches S1 and S2. The characteristic (equal-percentage, linear or quadratic) can be selected via switches S3 and S4. The AVF 124S is combined with valves that have a linear basic characteristic such as the VXN and BXN valves. The AVF 125S is combined with valves that have an equal-percentage basic characteristic such as the VUD, BUD, VUE and BUE valves. The AVF 125S can be fitted on a valve with a linear characteristic (e.g. VUE 050F200), but you must pay attention to the position of the coding switches.

Connected as a 2-point actuator

Opening/closing can be effected via two wires. Power is applied to the drive via terminals 1 / MM and 2a / 01. When power is connected to terminal 2b / 02, the valve's control passage opens. When power is switched off, the drive goes to the opposite end position and closes the valve.

Connected as a 3-point control unit

By connecting power to terminal 2a / 01 or 2b / 02, the valve can be moved to any position. The coupling rod extends and opens the valve if power is applied to terminals 1 / MM and 2b / 02. It retracts and closes the valve if the power circuit is closed via terminals 1 / MM and 2a / 01.

In the end positions (on hitting a stop in the valve or reaching the maximum stroke) or in the event of an overload, the electronic motor cut-off responds (no end switches). The direction of the stroke can be changed by swapping the power-supply wires over (2a, 2b / 01, 02).

Connections for control voltage 0...10V and/or 4...20 mA

The integrated positioner controls the drive as a function of the controller's positioning signal y.

The voltage signal of 0...10 V~ is connected via terminal 3u / 03 and the current signal is connected via terminal 3i / 04.

Direction of operation 1 (mains power to internal connection 2a / 01):

the coupling rod extends and opens the valve (control passage) as the positioning signal rises.

Direction of operation 2 (mains power to internal connection 2b / 02):

the coupling rod retracts and closes the valve (control passage) as the positioning signal rises.

The starting point and the control span are both permanently set.

There is a split-range unit available (as an accessory) for setting partial ranges (only for control signal 1).

After the emergency position has been implemented, or when there is a power failure, the drive re-adjusts itself automatically. If an adjustment is needed, it can be triggered via the pushbutton on the electronic circuit board (top left).

After power has been applied, the stepping motor moves to the lower stop, connects to the valve spindle and moves to the upper stop in the valve, thereby determining the closed position. Depending on the control voltage, any stroke between 0 and 8 mm can then be obtained. Thanks to the electronics unit, no steps can be lost, and the drive needs no periodical re-adjustment. Parallel operation of more than one drive of the same type is guaranteed.

If the power supply fails or is switched off, or a monitoring contact is triggered, the retention magnet releases the gears and the pre-tensioned spring moves the drive – depending on the variant – into the end position. In so doing, the drive's control function is blocked for 45 seconds so that the end position is always attained. The reset function is retarded depending on the speed, so that no pressure surges can occur in the line.

The feedback signal $y_0 = 0...10V$ corresponds to the effective stroke of 0 to 8 mm.
 If the control signal (0...10V) is interrupted and direction of operation 1 is connected, the valve closes fully (0% position).

The valve's characteristic can be selected using the coding switch. The characteristics can be generated only if the drive is used as a continuous drive. Other switches enable the running times to be set. These can be applied irrespective of whether the 2-point, 3-point or the continuous function has been chosen.

Coding switches for running time selection

AVF 124S, AVF 125S

Run time per mm	Switch coding	Run time for 8 mm stroke															
7,5 s	<table border="0"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td><td></td> </tr> <tr> <td></td><td></td><td></td><td></td><td>On</td> </tr> <tr> <td></td><td></td><td></td><td></td><td>Off</td> </tr> </table>	1	2	3	4						On					Off	60 s ± 2
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1	2	3	4														
				On													
				Off													
= factory setting																	

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Coding switches for characteristics selection

AVF 125S

Desired character. curve	Switch coding	Characteristic curve for valve	Characteristic curve for drive	Effective on valve
Equal percentage				
Quadratic				
Linear				
Equal percentage				
Linear				

= factory setting

B10711a

LED indicator: normal operation

AVF 125S



grün
vert
green
verde
grön
groen

auto-reset (initialisation)	
at a standstill (setpoint=actual-position, manual handling)	
drive moves in setpoint direction	
to much force detected	

B10105a

LED indicator: safety function

after spring return (40...55s)	
normally	

B10106a

Split-range unit (accessory 0313529)

The starting point U_0 and the control span ΔU can be set using the potentiometer. This makes it possible to activate several regulating units in sequence or in cascade using the controller's control signal. If this accessory is fitted, it is not possible to fit any auxiliary contacts or a potentiometer.

Engineering and fitting notes

The ingress of condensate, drops of water etc. along the valve spindle and into the drive should be prevented.

The drive and valve are fitted together by hand, then the screws are tightened; no further adjustment is necessary. The drive is delivered ex works in the open or middle position.

On the 'normally closed' version, the spacer on the lifting rod has to be removed when the valve is fitted.

The idea of having a stepping motor and an electronics unit ensures that several actuators of the same type can be run in parallel.

The maximum number of accessories that can be fitted is one stroke indicator plus one additional accessory: auxiliary contacts, potentiometer or combination, or split-range unit.

The power consumption on starting is relatively high. It occurs only on a cold start or after the spring return has been activated and lasts max. 1s. A random delay of up to 20s is fitted in the drive so that, if several drives are run in parallel, they do not all cut in at the same time. Depending on the length of the cable, the cross-section of the cable or the transformer rating should be chosen accordingly:-

Length of cable	Cross-section of cable	Transformer rating
Max. 30 m	0,75 mm ²	30 VA
Max. 60 m	1,5 mm ²	30 VA
Max. 100 m	1,5 mm ²	50 VA

Fitting outdoors. If the devices are fitted outdoors, we recommend that additional measures be taken to protect them against the effects of the weather.

Additional technical information

Transparent cover without lever for manual adjustment. The black housing holds the stepping motor and the electronic control unit. Underneath is the maintenance-free gear unit, the spring and the retention magnet. By breaking out a pre-scored circle in the housing, it is possible to create an aperture to fit a second M20 cable screw fitting.

Auxiliary change-over contacts

Switch rating: max. 230 V a.c.; min. current 20 mA at 20V

Switch rating: 4...30 V d.c.; current 1...100 mA

CE conformity

EMC directive 2004/108/EC Machine directive 98/37/EEC//B

EN 61000-6-1

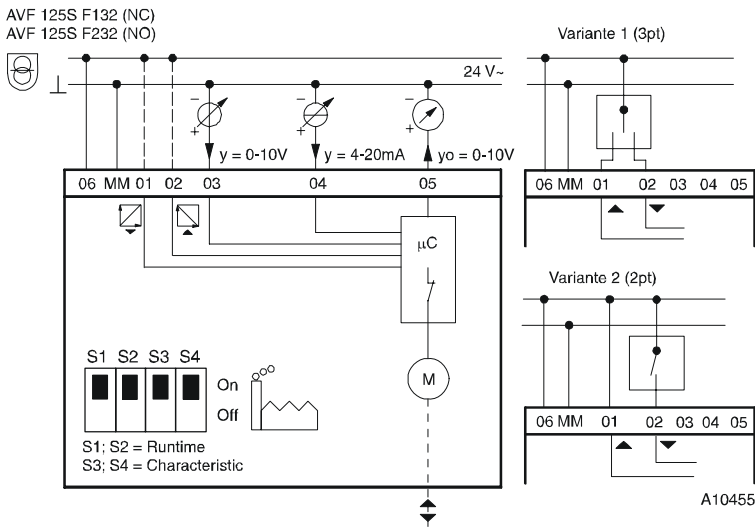
EN 1050

EN 61000-6-2

EN 61000-6-3

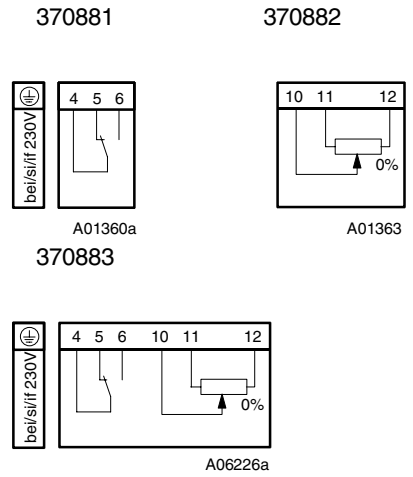
EN 61000-6-4

Wiring diagram

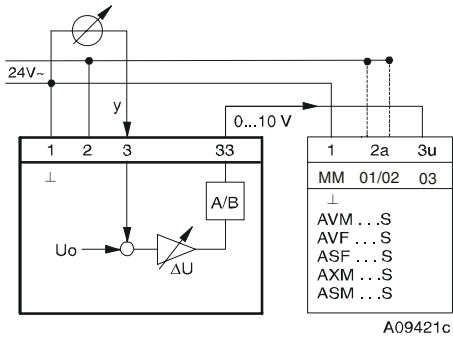


NC = normally closed
NO = normally open

Accessories



0313529



Dimension drawing

