

## AVM 105S, 115S: Actuator with SAUTER Universal Technology (SUT)

### How energy efficiency is improved

Automatic adaptation to valve, precision control and high energy efficiency with minimal operating noise.

### Areas of application

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

### Features

- Pushing force 250 N (AVM 105S) or 500 N (AVM 115S)
- 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 set in the actuator
- Independent adaptation to valve stroke
- Direction of travel can be set on cable
- Coding switch for selection of characteristic and running time (35, 60 or 120 s)
- Maintenance-free transmission with magnetic clutch
- Transmission can be disengaged for positioning the valve manually (Allen key included)
- Assembly with valve is done automatically after control voltage is applied

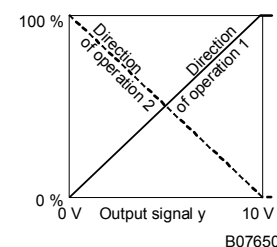
### Technical description

- 24 V~ or 24 V~/= power supply
- Two-part housing made of fire-retardant plastic; lower section black, upper section yellow
- Console made of glass-fibre-reinforced plastic
- Brass box nut for fitting valve
- Connecting cable 1.2 m long, 5 × 0.75 mm<sup>2</sup>
- Installation position: vertical to horizontal, but not upside down



Y07552

T10876



B07650

Type	Running time [s]	Stroke <sup>2)</sup> [mm]	Pushing force [N]	Power	Weight [kg]
For valves with equal-percentage characteristic, can be switched over to linear					
<b>AVM 105S F132</b>	35/60/120	8.0	250	24 V~/=	0.7
<b>AVM 115S F132</b>	60/120	8.0	500	24 V~/=	0.7

Positioner <sup>1)</sup>			
Control signal	0...10 V, R <sub>i</sub> > 100 kΩ	Starting point U <sub>0</sub>	0 or 10 V
Positional feedback signal	0...10 V, load > 10 kΩ	Control span ΔU	10 V
		Switching range X <sub>sh</sub>	200 mV
Power supply	24 V~ ± 20%, 50/60 Hz 24V= +20% / -10%	Degree of protection (horizontal)	IP 54 as per EN 60529
Power consumption		Protection class	III as per IEC 60730
AVM 105S F132	4.8 W 8.5 VA	Response time <sup>1)</sup>	200 ms
AVM 115S F132	4.9 W 8.7 VA	Wiring diagram	<a href="#">A09673</a>
Max. media temperature	100 °C	Dimension drawing	<a href="#">M09743</a>
Ambient temperature	-10...55 °C	Fitting instructions	1.5S MV 506065
Ambient humidity	5...95% rh without condensation	Material declaration	MD 51.362

For control valve type KTM512 / TA-Regulator DN 15...50

Type	Running time [s]	Stroke [mm]	Pushing force [N]	Power	Weight [kg]
<b>AVM 115S F901</b>	80/160	10.0	500	24 V~	0.7

Deviation from standard type: inverse scale therefore inverse direction of operation. Adaptor for control valve available on the valve or from TA-Regulator, stating reference no. 52 757 003.

1) Also for 2-point or 3-point, depending on type of connection

2) Maximum stroke of drive = 10.0 mm

**Accessories**

<b>0313529 001*</b>	Split-range unit for setting sequences; to be fitted in separate distribution box as per MV 505671
<b>0372145 001*</b>	Single auxiliary change-over contacts <sup>1)</sup> ; MV 505795
<b>0372145 002*</b>	Double auxiliary change-over contacts <sup>1)</sup> ; MV 505795
<b>0372249 001*</b>	Intermediate piece required for media temperature >100 °C (recommended for temperature < 10 °C); MV 505932
<b>0372273 001*</b>	Adaptor for Siemens VVG/VXG 44 and 48 valves; MV 505848
<b>0372286 001</b>	Potentiometer <sup>2)</sup> 130 Ω; MV 505795
<b>0372286 002</b>	Potentiometer <sup>2)</sup> 1000 Ω; MV 505795
<b>0372286 003</b>	Potentiometer <sup>2)</sup> 5000 Ω; MV 505795
<b>0372462 001</b>	CASE Drives PC tool for configuration of actuators per computer; MV 506101

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

1) Fully variable from 0...100%; max. loading 5 (2) A. 24...230 V

2) Only one potentiometer or one set of auxiliary contacts can be fitted to each drive

**Operation**

Depending on how it is connected (see wiring diagram), the actuator can be used as a continuous 0...10 V, a 2-point (open/close) or a 3-point (open/stop/close) drive with intermediate position. The running time can be matched to requirements using switches S1 and S2 (AVM 105, S1 only). The characteristic (equal-percentage or linear) can be selected using switch S3. The AVM 105/115 is combined with valves that have an equal-percentage basic characteristic such as the VUD/BUD and VUE/BUE valves. The AVM 115 can be fitted to a valve with a linear characteristic (e.g. VUE 050F200), but the position of the coding switches is important. With the AVM 105, it is not possible to create an equal-percentage characteristic for a valve with a linear characteristic.

Manual adjustment is performed by disengaging the transmission (sliding switch next to the power cable) and simultaneously turning, using an Allen key in the insert on the upper part of the drive. 8 mm of stroke is attained with 1½ turns.

N.B.: After manual adjustment, re-set the sliding switch (engage the transmission).

**Connected as a 2-point actuator**

Open/close activation can be effected via two wires. Power is applied to the drive via the blue and the brown wires. On connecting power to the black wire, the valve's control passage opens. When power is switched off, the drive goes to the opposite end position and closes the valve.

The unused red and grey wires should not be connected, nor should they come into contact with other wires. We recommend that you insulate them.

**Connected as a 3-point control unit**

By connecting power to the wires (brown or black), the valve can be moved to any position. The coupling rod extends and opens the valve if power is applied to the black wire. It retracts and closes the valve if power is applied to the blue and the brown wires.

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 (BN/BK). The unused red and grey wires should not be connected, nor should they come into contact with other wires. We recommend that you insulate them.

**Connections for control voltage 0...10 V**

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

Direction of operation 1 (mains power on brown wire): the coupling rod extends and opens the valve (control passage) as the positioning signal rises.

Direction of operation 2 (mains power on black wire): 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.

After manual adjustment or in the event of a power failure for longer than 5 minutes, the drive re-adjusts itself automatically, always with the following running times:

AVM 105	35 s
AVM 115	60 s

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.


The feedback signal  $y_0 = 0...10\text{ V}$  corresponds to the effective stroke of 0 to 8 mm.

If the control signal (0...10 V) 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 which function (2-point, 3-point or continuous) has been chosen.



**Coding switch for setting the running time**

AVM 105S

Run time per mm	Switch coding	Run time for 8 mm stroke															
4,375 s	<table border="0"> <tr><td>1</td><td>2</td><td>3</td><td>4</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	35 s ± 1					
1	2	3	4	On													
█	█			Off													
7,5 s	<table border="0"> <tr><td>1</td><td>2</td><td>3</td><td>4</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					
1	2	3	4	On													
█				Off													
15 s	<table border="0"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>On</td></tr> <tr><td>█</td><td>█</td><td></td><td></td><td>Off</td></tr> <tr><td>█</td><td></td><td></td><td></td><td>Off</td></tr> </table>	1	2	3	4	On	█	█			Off	█				Off	120 s ± 4
1	2	3	4	On													
█	█			Off													
█				Off													
 = factory setting																	

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
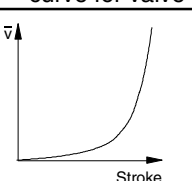
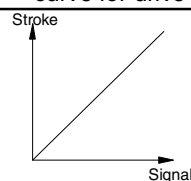
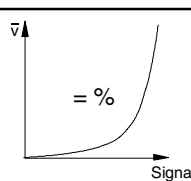
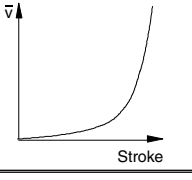
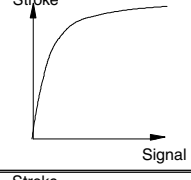
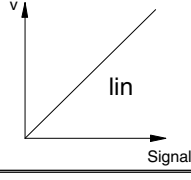
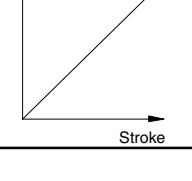
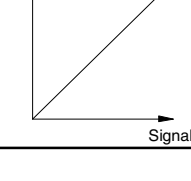
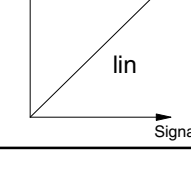

AVM 115S

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>On</td></tr> <tr><td>█</td><td></td><td></td><td>Off</td></tr> </table>	1	2	3	On	█			Off	60 s ± 2
1	2	3	On							
█			Off							
15 s	<table border="0"> <tr><td>1</td><td>2</td><td>3</td><td>On</td></tr> <tr><td>█</td><td></td><td></td><td>Off</td></tr> </table> 	1	2	3	On	█			Off	120 s ± 4
1	2	3	On							
█			Off							
 = factory setting										

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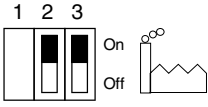
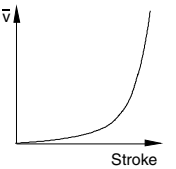
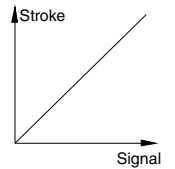
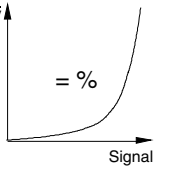

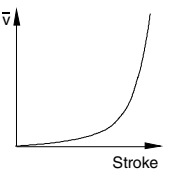
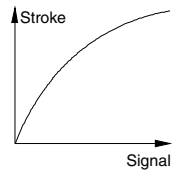
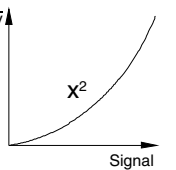

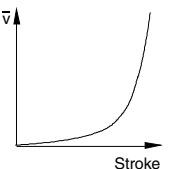
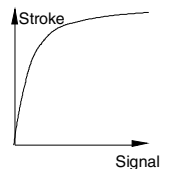
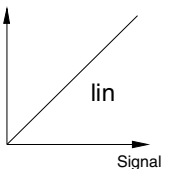
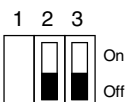
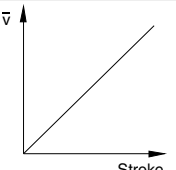
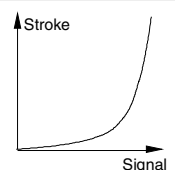
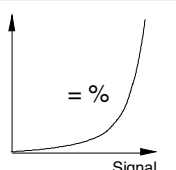

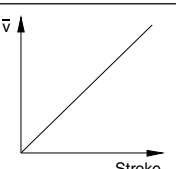
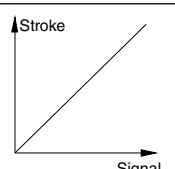
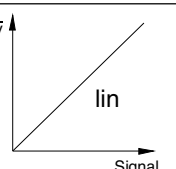
**Coding switch for selecting the characteristic**


AVM 105S

Desired character. curve	Switch coding	Characteristic curve for valve	Characteristic curve for drive	Effective on valve								
Equal percentage	<table border="0"> <tr><td>1</td><td>2</td><td>3</td><td>On</td></tr> <tr><td></td><td></td><td>█</td><td>Off</td></tr> </table> 	1	2	3	On			█	Off			
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		█	Off									
Linear	<table border="0"> <tr><td>1</td><td>2</td><td>3</td><td>On</td></tr> <tr><td></td><td></td><td>█</td><td>Off</td></tr> </table>	1	2	3	On			█	Off			
1	2	3	On									
		█	Off									
Linear	<table border="0"> <tr><td>1</td><td>2</td><td>3</td><td>On</td></tr> <tr><td></td><td></td><td>█</td><td>Off</td></tr> </table>	1	2	3	On			█	Off			
1	2	3	On									
		█	Off									
 = factory setting												

## Coding switch for selecting the characteristic

AVM 115S

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

B10705

**Split-range unit, accessory 0361529 001**

The starting point  $U_0$  and the control span  $\Delta U$  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. The input signal (partial range) is amplified into an output signal of 0...10 V. This accessory cannot be fitted in the actuator, but should be located externally in an electric distribution box.

**CASE Drives PC tool, accessory 0372462 001**

*CASE Drives* enables all the actuator's parameters to be set and viewed on site. Connection is via a serial port on the PC (laptop) and a socket on the actuator. The set comprises: software including installation and operating instruction, fitting instructions, connectors, cable (1.2 metres in length) and an interface converter for the PC. The application is designed for commissioning/ service technicians and for experienced users.

The last setting (i.e. whether with coding switch or *CASE Drives*) has priority. This setting is active when the valve's running time or characteristic is changed via the coding switch. To ensure that the settings with *CASE Drives* cannot be overwritten, the coding switch should be removed before setting values through *CASE Drives* (special tool included).

### Engineering and fitting notes

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

With the electrical connection, you must also make sure that the cross-section of the supply line is adapted to the power and length. In any case, however, we recommend that the cross-section should not be less than a minimum of 0.75 mm<sup>2</sup>.

The assembly of actuator and valve is done by fitting and tightening the cap nut without further adjustment; no tools should be used. The valve spindle and the drive spindle are coupled together automatically, either by using the manual adjustment facility or by applying power. When dismantling, first release the drive/valve spindle, then loosen the cap nut.

The actuator is supplied ex works in the middle position.

The combination of stepping motor and electronics unit allows several actuators of the same SUT type to be run in parallel.

The following accessories can be fitted to each actuator: one set of auxiliary contacts.

The coding switches are accessible via an opening with black lid in the housing cover.

The auxiliary contacts should be screwed onto the drive's top cover. Before the mechanical connection can be established, the indicator knob should be removed. A new indicator is then visible on the lid of the auxiliary contacts.

N.B.: The housing should not be opened.

### 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 data

The upper part of the housing, with the lid, indicator knob and the cap, contains the stepping motor and the SUT electronic control unit. The lower part contains the maintenance-free transmission.

#### Auxiliary change-over contacts

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

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

Power consumption:

Type	Running time [s]	Condition	Active power P [W]	Apparent power S [VA]
AVM 105S F132	35	Operating	2.45	4.75
		Standstill	0.35	0.8
	60	Operating	4.8	8.5
		Standstill	0.35	0.8
	120	Operating	2.2	4.25
		Standstill	0.35	0.8
AVM 115S F132	60	Operating	4.9	8.7
		Standstill	0.35	0.75
	120	Operating	2.25	4.3
		Standstill	0.35	0.75

### CE conformity

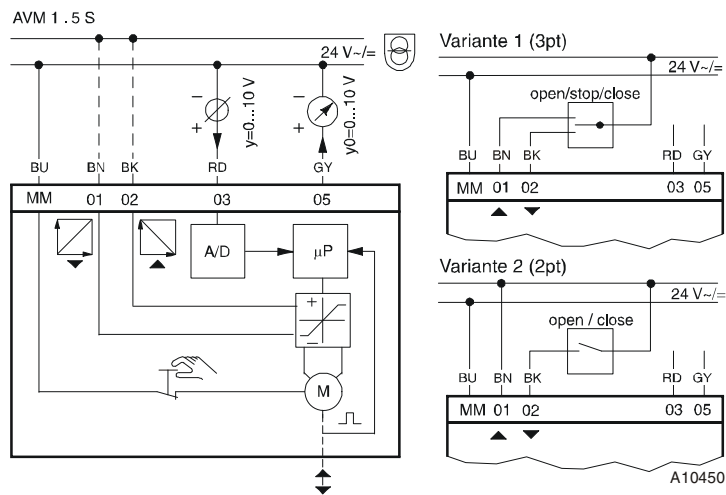
EMC Directive 2004/108/EC

EN 61000-6-1

EN 61000-6-3

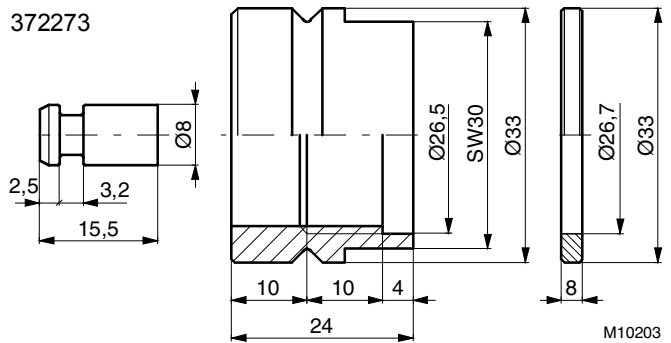
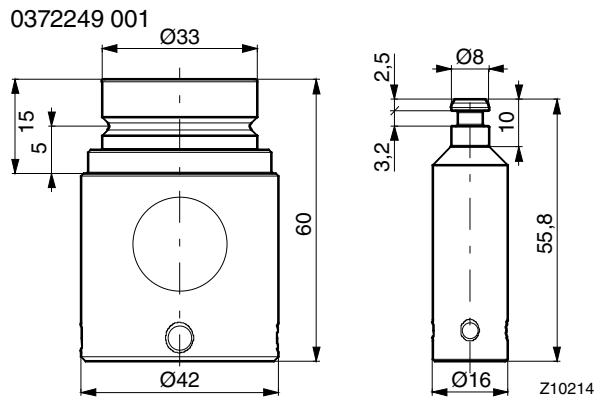
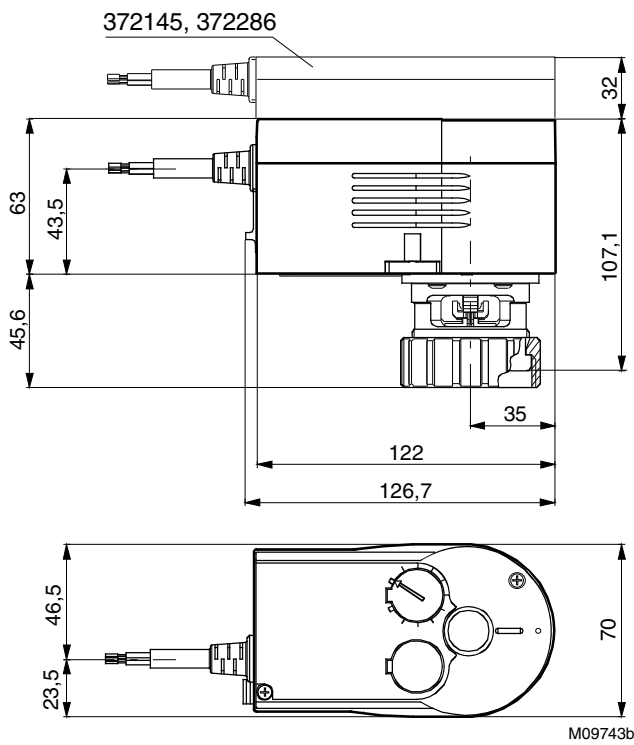
EN 61000-6-4

**Wiring diagram**

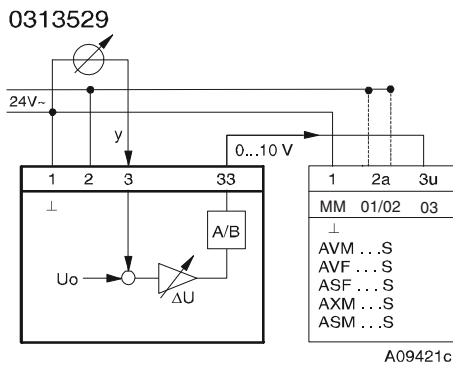


RD = red  
BN = brown  
BK = black  
BU = blue  
GY = grey

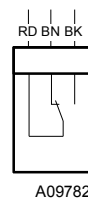
**Dimension drawing**



**Accessories**

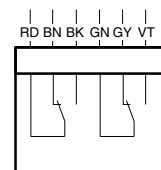


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