

## AVM 321, 322: Valve actuator

### How energy efficiency is improved

Automatic adaptation to valve, optimal operator convenience, precision activation and high energy efficiency with minimal operating noise

### Features

- In ventilation air conditioning units<sup>1)</sup> for actuation of 2- and 3-way valves of type series AVM 321: VUD, VUE, VUN, BUD, BUE, BUN and AVM 322: V6R, VQD, VQE, VUG, VUP, VUS, B6R, BQD, BQE, BUG, BUS
- For controllers with a switching output (2-point or 3-point control)
- Synchronous motor with electronic control unit and load-dependent cut-off
- Direction of operation and running time can be set using coding switches
- Crank handle for external manual adjustment with motor cut-off
- Low operating noise
- Simple assembly with valve; spindle is automatically connected after nominal voltage is applied
- Numerous adapters enable the unit to be fitted onto non-SAUTER valves
- Electrical parallel operation of five actuators
- Three-piece housing made of flame-retardant yellow/black plastic and seals with type of protection IP54
- Maintenance-free gearbox made of plastic; threaded spindle and gearbox base-plates made of steel
- Patented actuator-valve coupling
- Mounting column made of aluminium
- Fixing bracket made of cast light alloy for valve fitting with 20 mm stroke and made of plastic for valve fitting with 8 mm stroke
- Electrical connections (max. 1.5 mm<sup>2</sup>) with screw terminals
- Two break-out cable inlets for metric cable gland made of plastic M20 × 1.5
- Fitting vertically upright to horizontal, not suspended



AVM321\*F1\*\*



### Technical data

#### Power supply

Power supply 24 V~	±20%, 50...60 Hz
Power supply 24 V=	-10...20%
Power supply 230 V~	±15%
Power consumption <sup>2)</sup>	< 2.4 W, < 4.0 VA (at nominal voltage, with movement)

#### Parameters

Nominal force <sup>3)</sup>	1000 N
Operating noise <sup>4)</sup>	< 30 dB (A) at nominal force
Response time	> 200 ms
Temperature of medium <sup>5)</sup>	0...100 °C

#### Ambient conditions

Operating temperature	-10...55 °C
Storage and transport temperature	-40...80 °C
Humidity without condensation	5...85% rh

#### Standards and directives

Type of protection	IP54 (EN 60529)
Protection class	II (EN 60730), III (EN 60730)

<sup>1)</sup> To be used outside HVAC applications only after consultation with the manufacturer

<sup>2)</sup> For power consumption in combination with accessory 0500570001, see section "Power consumption at nominal voltage"

<sup>3)</sup> Actuating power 1000 N under nominal conditions (24 V or 230 V, 25 °C ambient temperature, 50 Hz). With boundary conditions (19.2 V~ / 28.8 V~ / 21.6 V= / 28.8 V=, -10 °C / 55 °C, 60 Hz) and running time, the actuating/tensile force is minimised to 800 N

<sup>4)</sup> Operating noise with the slowest running time, measuring distance 1 m

<sup>5)</sup> At media temperature > 100 °C appropriate accessory must be used (temperature adapter); at media temperature < 0 °C appropriate accessory must be used (stuffing box heater)



CE conformity according to	EMC Directive 2014/30/EU	EN 61000-6-1, EN 61000-6-2 EN 61000-6-3, EN 61000-6-4
	Low-Voltage Directive 2014/35/EU	EN 60730-1, EN 60730-2-14 (AVM32*F110 and F120)
	Over-voltage categories	III
	Degree of contamination	II
	Max. altitude	2000 m
	Machinery Directive 2006/42/EC (according to Appendix II, 1B)	EN ISO 12100

#### Overview of types

Type	Nominal voltage	Nominal stroke	Running time [s/mm]	Power consumption	Dimensions W x H x D	Weight
AVM322F120	230 V~	20 mm	6 (12)	< 2.4 W, < 4.0 VA	160 × 241 × 88 mm	1.6 kg
AVM322F122	24 V~/=	20 mm	6 (12)	< 2.0 W, < 3.0 VA	160 × 241 × 88 mm	1.6 kg
AVM321F110	230 V~	8 mm	12 (6)	< 2.4 W, < 4.0 VA	160 × 187 × 88 mm	1.5 kg
AVM321F112	24 V~/=	8 mm	12 (6)	< 2.0 W, < 3.0 VA	160 × 187 × 88 mm	1.5 kg

💡 *AVM32\*F1\*2: CSA-certified actuators on request (only for devices with supply voltage 24 V~/=). Accessory is not CSA-certified.*

💡 *Power consumption: at nominal voltage and with movement; for more power consumption data, see table "Power consumption for supply voltage".*

#### Accessories

##### AVM 321, 322

Type	Description
0500570001	Energy module for reset function
0510600001	Cable module, 1.2 m, 3-wire, PVC
0510600002	Cable module, 1.2 m, 3-wire, halogen-free
0510600003	Cable module, 1.2 m, 6-wire, PVC
0510600004	Cable module, 1.2 m, 6-wire, halogen-free
0510600005	Cable module, 5 m, 3-wire, PVC
0510600006	Cable module, 5 m, 3-wire, halogen-free
0510600007	Cable module, 5 m, 6-wire, PVC
0510600008	Cable module, 5 m, 6-wire, halogen-free


##### AVM 321

Type	Description
0372249001	Adapter required when temperature of the medium is 100...130 °C (recommended for temperatures < 10 °C) DN 15...50
0372249002	Adaptor required when temperature of the medium is 130...150 °C, DN 15...50
0510480003	Dual auxiliary switch for 8 mm stroke

##### AVM 322

Type	Description
0372336180	Temperature adaptor for media temperature > 100...150 °C
0372336240	Temperature adaptor for media temperature > 130...200 °C
0510240012	Mounting set V6... / B6... up to 20 mm stroke
0510390006	Adapter set for non-SAUTER valves (Siemens) with stroke up to 20 mm and spindle diameter of 10 mm
0510390007	Adapter set for non-SAUTER valves (JCI): VBD-4xx4 DN 15...40, VBD-4xx8 DN 15...40, VBF-2xx4, VBF-2xx8, VBB-2xxx, VG82xx VG84xx, VG88xx VG89xx
0510390008	Adapter set for non-SAUTER valves (Honeywell): V5025A DN 15...80, V5049A or B DN 15...65, V5050A DN 15...80, V5095A DN 15...80, V5328A DN 15...80, V5329A DN 15...80
0510390009	Adapter set for non-SAUTER valves (LDM): RV113 R/M, DN15-80
0510390010	Adapter set for ITT-Dräger: PSVF DN 15...32, PSVD DN 15...32, SVF DN 15...32, SVD DN 15...32
0510390012	Adapter set for non-SAUTER valves (Belimo): H6..R DN 15...65, H7..R DN 15...65, H4..R DN 15...50, H5..B DN 15...50, H6..N DN 15...65, H7..N DN 15...65

Type	Description
0510390028	Adapter set for non-SAUTER valves (Frese), stroke 20 mm
0510480004	Dual auxiliary switch for 20 mm stroke

 Accessory is not CSA-certified.

### Description of operation

This actuator is used to operate 2- and 3-way valves in ventilation and air conditioning units and must only be used for these purposes. Use outside of HVAC installations is only permitted after consultation with the manufacturer.

The actuator can be used as a 2-point (OPEN/CLOSE) or 3-point actuator (OPEN/STOP/CLOSE). The running time of the actuator can be set with switch S1 according to the respective requirements. Switch S2 can be used to change the direction of operation.

In the end positions (valve limit stop or when the maximum stroke is reached) or upon overload, the electronic motor cut-off (no limit switch) responds and turns off the motor.

The external crank handle enables manual positional setting. After the crank handle is folded back, the actuator can be started again normally. When the crank handle is folded out, the actuator remains in this position.

### Connection as 2-point valve actuator (24 V or 230 V)

The OPEN/CLOSE activation is via two wires.

The actuator is connected to a permanent voltage via terminals MM or N and terminal 01.

When voltage is applied to terminal 02, the actuator spindle retracts to the end position.

After the voltage is switched off at terminal 02, the actuator spindle extends to the opposite end position.

### Connection as 3-point valve actuator (24 V or 230 V)

If voltage is applied to terminals MM or N and 01 (or 02), the valve can be moved to any desired position.

If voltage is applied to terminal MM or N and 01, the actuator spindle extends.

If the electrical circuit is closed via terminal MM or N and 02, the actuator spindle retracts.

If there is no voltage on terminals 01 and 02, the actuator remains in the respective position until voltage is applied again.

#### Note



AVM 321, 322 with 230 V

A load connected in parallel to terminal 2 can falsify the result of the direction detection of the actuator.

The following parameters must be maintained for correct direction detection:

- Only ohmic loads are admissible.
- At U = 230 V, the load's resistance must be greater than 20 kΩ.
- At U = 264 V (230 V +15%) the load's resistance must be greater than 30 kΩ.

### Intended use

This product is only suitable for the purpose intended by the manufacturer, as described in the "Description of operation" section.

All related product regulations must also be adhered to. Changing or converting the product is not admissible.

### Engineering and fitting notes

The concept of synchronous motor/electronics ensures electrical parallel operation of up to five valve actuators of the same type.

The actuator is mounted directly on the valve and fixed with screws (no further adjustments are required). The actuator is connected with the valve spindle automatically.

As delivered ex works, the actuator spindle is in the middle position.

Condensate, dripping water, etc. must be prevented from entering the actuator along the valve spindle.

There are two break-out cable inlets in the housing for two metric plastic cable glands M20 × 1.5 which automatically break out when a cable inlet is screwed in.

The cross-section of the power cable must be selected based on the cable length and the number of actuators. With five actuators wired in parallel and a cable length of 50 m, we recommend a cable cross-section of 1.5 mm<sup>2</sup> (power consumption of the actuator × 5).

According to building installation regulations, the lines must be protected from overload or short circuit.



Note for UL-CSA applications:

The installed lines and cross-sections which are to be connected by the customer must comply with the requirements of NFPA70 (NEC) in the USA, and in Canada with the requirements of the standard C22.1-12 (CE Code).

The coding switches are accessible via an opening in the connection area of the actuator. Before the conversion, the equipment must be disconnected from the electricity supply.



**CAUTION!**

Always disconnect the device from the mains before removing the plastic cover of the connection area. The housing must not be opened.

Specific standards such as IEC/EN 61508, IEC/EN 61511, EN ISO13849 and the like have not been taken into account.

Local requirements regarding installation, usage, access, access rights, accident prevention, safety, dismantling and disposal must be taken into account.

**Place of installation**

The devices may only be used indoors.

It is not admissible to use them in the following locations:

- in outdoor areas
- in potentially explosive atmospheres
- on ships or in vehicles
- in plants or machines with required functional safety.

**Additional information**

Fitting instructions	P100011900
Declaration on materials and the environment	MD 51.374
Declaration of incorporation	P100012470

**Power consumption at nominal voltage**

Running time (s/mm)	Type	Status	Active power P (W)	Apparent power S (VA)
12 (6)	AVM321F110	Operation	< 2.4	< 4.0
6 (12)	AVM322F120	Standstill <sup>6)</sup>	< 0.35	–
		Sizing	–	≥ 5.0
12 (6)	AVM321F112	Operation	< 2.0	< 3.0
6 (12)	AVM322F122	Standstill <sup>7)</sup>	< 0.3	–
		Sizing	–	≥ 4.0
Max. power consumption with accessory 0500570001 for all types		24 V=	5.2	–
		24 V~	6.2	11

**Energy module with super caps for reset function, accessory 0500570001**

The energy module enables automatic movement to an adjustable end position in the event of a power supply failure. This is performed by the stored energy in the super caps. The super caps are continuously charged during normal operation via the connected power supply by means of a fitness function. This function ensures that the super caps are always charged with the necessary capacity during their stand-by time. The desired end position after a reset process can be set using a DIP switch (see MV 0510240012).

When using the energy module, the actuator must be configured to a running time of 6 s/mm. In the event of a power failure, the actuator moves at 6 s/mm to the specified end position.

The reset function is triggered when the system detects a voltage < 13.2 V= or < 12 V~. The system switches back to normal operation at > 16.7 V= or > 15 V~.

An LED on the energy module indicates the current operating status of the actuator.

<sup>6)</sup> Standstill = actuator in the end position, voltage applied to terminal 1 or 2, motor switched off

<sup>7)</sup> Standstill = actuator in the end position, voltage applied to terminal 1 or 2, motor switched off

## Energy module LED

LED	Description
Flashes green	Charging process active
Lights up green	Actuator in normal operation
Flashes red-green	Charging process and reset process active
Off	System is off and super caps empty
Lights up red	System has detected and triggered reset function. Reset function active
Flashes red (T2s)	Life expectancy of super caps reached. Module must be replaced

### Note



The current consumption of the energy module (accessory 0500570001) for its charging processes (up to 0.6 A) must be considered. The conductor cross-sections must be dimensioned accordingly.

- The voltage drop in the MM conductor must be considered and, if necessary, the wiring of the positioning and feedback signals must be optimised.
- Accessory 0500570001 changes the mode of operation of the actuator from 1AB to 1AA (EN 60730).
- Accessory 0500570001 cannot be used for safety and TÜV applications.
- Unsuitable for plants of categories 1 to 4 according to Directive 2014/68/EU for pressure equipment.
- After commissioning, the system is charged before normal operation is activated. This can take up to four minutes, depending on the state of charge of the super caps.
- When retrofitting existing actuators, an additional power supply must be provided.
- 230 V actuators cannot be equipped with the energy pack.

## Disposal

When disposing of the product, observe the currently applicable local laws.

More information on materials can be found in the Declaration on materials and the environment for this product.

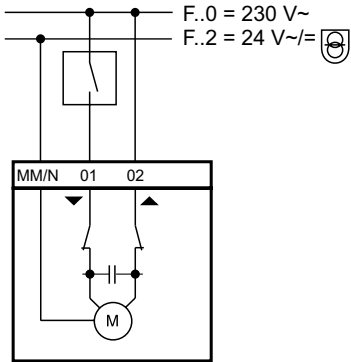
**Coding switch**

AVM321F110, AVM321F112		
<p>1 2 On Off</p>	12 s/mm	
<p>1 2 On Off</p>	6 s/mm	
<p>1 2 On Off</p>		
AVM322F120, AVM322F122		
<p>1 2 On Off</p>	6 s/mm	
<p>1 2 On Off</p>	12 s/mm	
<p>1 2 On Off</p>		

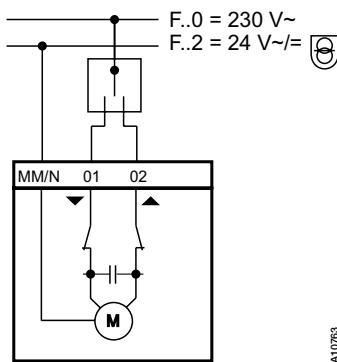
**Connection diagram**

2pt/3pt multi-position action

2pt



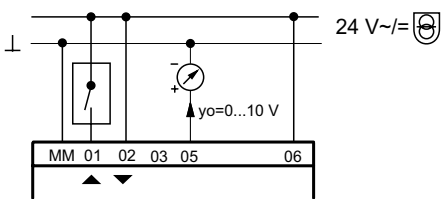
3pt



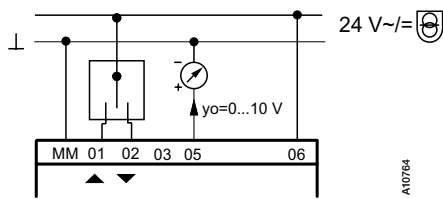
A10763

With accessory 0500570001

2pt

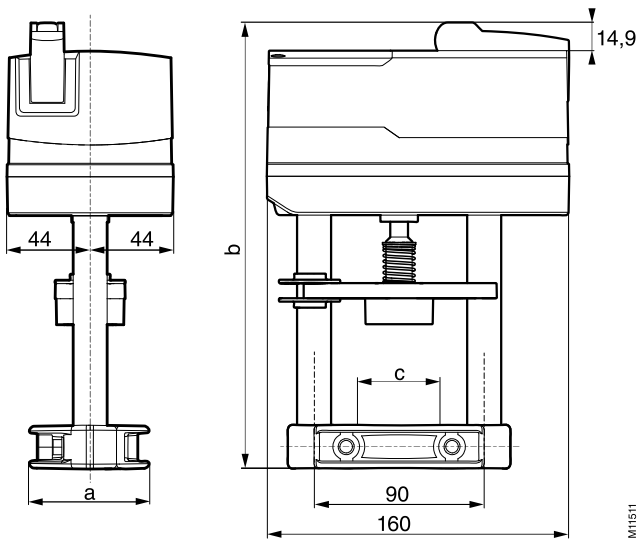


3pt



A10764

**Dimension drawing**



M11511

Type	a	b	c
AVM 321	53	187.4	33
AVM 322	64	241	44

**Accessories**

0500570001

