

Data sheet

Actuators for 3-point control

AMV 655 – without safety function

AMV 658 SU, AMV 658 SD – with safety function (spring up/down)

Description



Actuators are primarily designed to control the valve in response to the demand of a controller in District Heating/cooling, Heating, Ventilating and Air conditioning systems.

Actuators AMV 655 and 658 can be controlled by electronic controllers with 3-point output.

Actuators can be used without any adapter in combination with:

- Valve types VFM, VFS (DN 65-100), VF (DN 100-150) and VL (DN 100)
- Self-acting flow controller AFQM 6 and AFQM*.

* With adapter 065B3527 for AFQM 6 or AFQM PN 25, if produced before March 2015.



Used with adapter 065B3527 in combination with:

- Valve types VFG(S) and VFU.

Features:

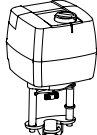
- Manual operation mechanical and/or electrical
- Position indication, LED signalization
- Selectable speed 2 or 6 s/mm
- Integrated auxiliary switch
- External reset button
- 3-point control regulation
- Thermal and overload protection
- Precise control and fast response in 3-point mode (0.01 s)

Main data:

- Nominal voltage (ac or dc):
 - 24 V, 50 Hz/60 Hz
 - 230 V, 50 Hz/60 Hz
- Control input signal: 3-point
- Force: 2000 N
- Stroke: 50 mm
- Speed (selectable): 2 or 6 s/mm
- Max. medium temperature: depends on valve type. (from 150°C up till 300°C)

Ordering

Actuator

| Picture | Type | Power supply (V) | Code No. |
|---|------------|------------------|----------|
|  | AMV 655 | 24 | 082G3440 |
| | | 230 | 082G3441 |
| | AMV 658 SU | 24 | 082G3446 |
| | | 230 | 082G3447 |
| | AMV 658 SD | 24 | 082G3444 |
| | | 230 | 082G3445 |

Accessories – Stem heater

| Type | DN | Code No. |
|---------------------------|--------|----------|
| Stem heater for VFM valve | 65-250 | 065Z7022 |

Accessories – Adapter

| Type | Code No. |
|---|----------|
| Adapter for VFG/S, VFU and AFQM 6 & AFQM PN 25 if produced before March 2015. | 065B3527 |

Accessories – Stem clutch

| Type | Code No. |
|---|----------|
| Stem clutch for all AMV (E) 65x actuators | 003G6398 |

Technical data



Please check power supply and power consumption prior connection!

Note:
Do not use safety activations for ON/OFF regulation.

| Actuator type | | AMV 655 | AMV 658 SD | AMV 658 SU |
|---|------|---|----------------------------------|-----------------------------------|
| Power supply | V | 24 or 230 ; +10 ... -15 % ; ac or dc | | |
| Power consumption | VA | 12 (24 V) 21 (230 V) | 19 (24 V) 28 (230 V) | |
| Frequency | Hz | 50/60 | | |
| Control input | | 3-point | | |
| Closing force | N | 2000 | | |
| Max. stroke | mm | 50 | | |
| Speed (selectable) | s/mm | 2 or 6 | | |
| Max. medium temperature | °C | Depends on valve type. No limitations for 150°C (VFS, VF 125 & 150 up to 200°C), for higher temperature see page 3, INSTALLATION | | |
| Ambient temperature | | 0 ... +55 | | |
| Storage and transport temperature | | -40 ... +70 (storing for 3 days) | | |
| Humidity | | 5-95% (no condensing) | | |
| Protection class | | II | | |
| Grade of enclosure | | IP 54 | | |
| Weight | kg | 5.3 | 8.6 | 8.6 |
| Safety function | | - | Yes | Yes |
| Safety function runtime/50 mm stroke | s | - | 120 | 120 |
| Manual operation | | Mechanical | Electrical and mechanical | Electrical and mechanical |
| Power failure response | | Stem remains in last position | Safety function extends the stem | Safety function retracts the stem |
| CE – marking in accordance with the standards | | Low Voltage Directive (LVD) 2014/35/EU: EN 60730-1, EN 60730-2-14 Electromagnetic Compatibility Directive (EMC) 2014/30/EU: EN 61000-6-2, EN 61000-6-3 | | |

Commissioning

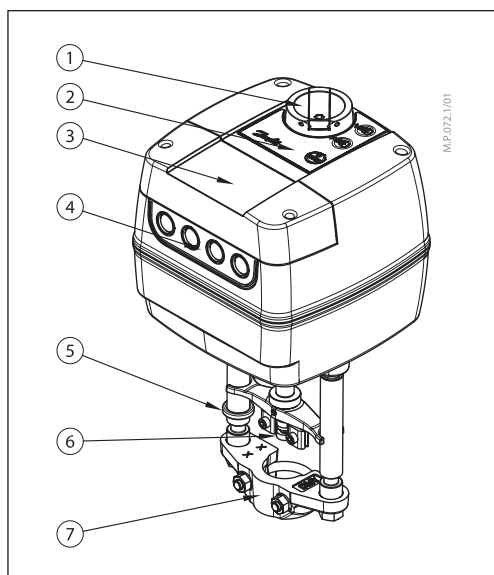
Complete the mechanical and electrical installation (see instructions) and perform the necessary checks and tests:

- Turn on the power
- Set the appropriate control signal and check that the valve stem direction is correct for the application.

The unit is now fully commissioned.

Design

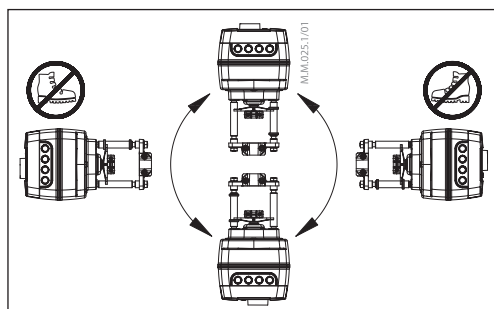
1. Manual operation knob
2. Function buttons
3. Service cover
4. Removable gland support
5. End position indication ring
6. Stem connector
7. Valve connector (yoke)



Installation

Mechanical

Please check the allowed installation positions for the valve and actuator. The actuator can be installed in all positions (see below).



Use a M8/SW13 key (not supplied) to fit the actuator to the valve body. Allow for necessary clearance for maintenance purposes. To link valve and actuator stems use a 4mm Allen key (not supplied). The actuator has position indication rings which should be pushed together before el. connection; after self-stroking they indicate end positions of the stroke.

Electrical connection

Electrical connections can be accessed by removing the service cover.

Four cable entries are provided for M 16x1.5 or M 20x1.5 cable glands. Note that in order to maintain the enclosure's IP rating, appropriate cable glands must be used.

| | Code No. |
|------|----------|
| ZF 4 | 003G1394 |
| ZF 5 | 003G1396 |

| <150°C | 150-200°C ZF4 200-350°C ZF5 |
|--|--|
| <p>VFU 2 + adapter 065B3527</p> | <p>VFU 2 + adapter 065B3527 + ZF4/5</p> |
| <p>VFG/S + adapter 065B3527</p> | <p>VFG/S + adapter 065B3527 + ZF4/5 VFG/S + adapter 065B3527 + ZF5 (DN 15-125)</p> |

Wiring



Do not touch anything on the PCB! Do not remove the service cover before the power supply is fully switched off.
Max. allowed current output on terminals 4 and 5 is 4A.
Min. power is 3W.

Recommended cross-sectional area of the wiring is 1.5 mm²

AMV 658

AMV 658

**24V
230V**

| SN | 0 V | Neutral |
|------|-----------------|---------------------------------|
| SP | 24, 230 V ac/dc | Power supply |
| 4, 5 | SP(ac) | SP output -max 4A -min 3W |
| 1 | | Input |
| 3 | | |

AMV 655

AMV 655

**24V
230V**

| SN | 0 V | Neutral |
|------|-----------------|---------------------------------|
| 1, 3 | 24, 230 V ac/dc | Power supply |
| 4, 5 | | SP output -max 4A -min 3W |
| 1 | | Input |
| 3 | | |

Actuator operating modes

LED operating mode indicator

The three-colour (green/yellow/red) LED function indicators are located on the actuator cover. They indicate different operating modes.

RESET button (versions AMV 658)

Actuators AMV 658 have external RESET button which is located on top cover of the actuator next to LED indicators. With this button you can enter or exit Stand-By mode (press once) See next paragraph for mode details.

Operating modes

- **Stand-By mode** (versions AMV 658)
Press the RESET button for 1 sec. to enter Stand-By mode. The actuator stops in current position and stops responding to any control signal. Red light is constantly lit. You can manually operate the actuator with mechanical handle (version AMV 655/658) or control buttons (versions AMV 658). This mode can be very useful during the commissioning of other equipment, or for service purposes. To exit Stand-By mode press the RESET button again.

Positioning mode

The actuator is operating automatically. The stem is extending or retracting according to the control signal. When positioning is finished the actuator goes to Stationary mode.

Stationary mode

The actuator is operating without errors.

Error mode



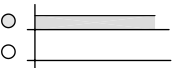
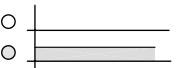
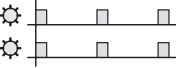
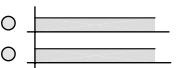
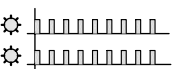
Working temperature is too high - check the ambient temperature.
Stroke is too short - check the connection with valve and valve operation or check if valve is blocked.

LED signalling

LED indication for AMV 655/658

NOTE! LED signalling is a direct indicator of the signal from controller therefore lengths of LED indication can vary and sometimes even look like a short flash if the controlling signal is present for a very short period.

Actuator type AMV 655 doesn't have constant power supply and operates only when the controller provides a signal. Therefore limited LED indication possibilities are available.

| LED | Indication type | | Operating mode | Actuator type |
|--------|---|----------------|---|--------------------|
| Green |  | Constantly lit | Positioning mode - Actuator is retracting the stem | AMV 655 AMV 658 |
| |  | Constantly lit | Positioning mode - Actuator is extending the stem | AMV 655 AMV 658 |
| Yellow |  | Constantly lit | Stationary mode - Actuator has reached upper end position (retracted stem) | AMV 655 AMV 658 |
| |  | Constantly lit | Stationary mode - Actuator has reached bottom end position (extending stem) | AMV 655 AMV 658 |
| |  | Flashing | Stationary mode | AMV 658 |
| Red |  | Constantly lit | Stand - By mode | AMV 658 |
| |  | Flashing | Error Mode | AMV 655 AMV 658 |
| Dark | No indication | | No power supply | AMV 655 AMV 658 |
| | | | No control signal | AMV 655 |

DIP switch setting

The actuator has a selection of DIP switches (Fig. 1) under the service cover.

DIP1: FAST/SLOW – Speed selection

- FAST; 2 s/mm
- SLOW; 6 s/mm

DIP2: DIR/INV – Direct or inverse acting selector (Fig. 2):

- DIR position; the actuator is direct acting to input signal.
- INV position; the actuator is (reverse) inverse acting to input signal.

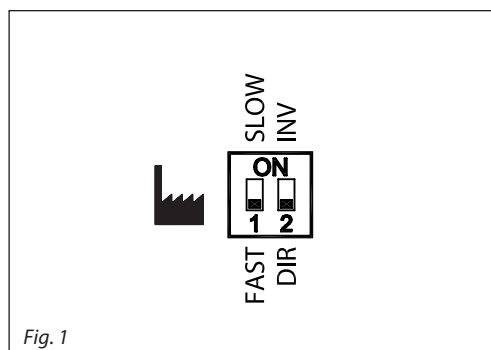


Fig. 1

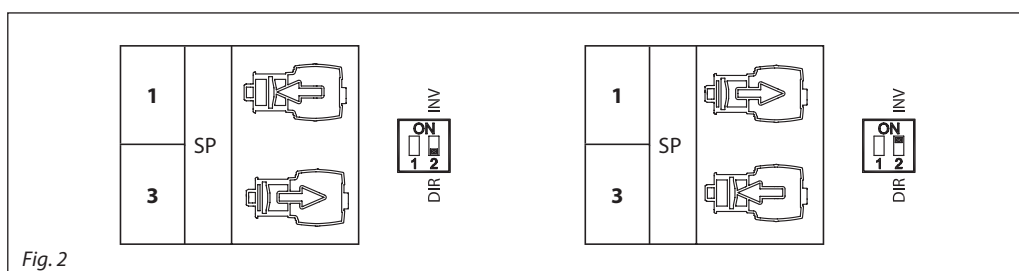


Fig. 2

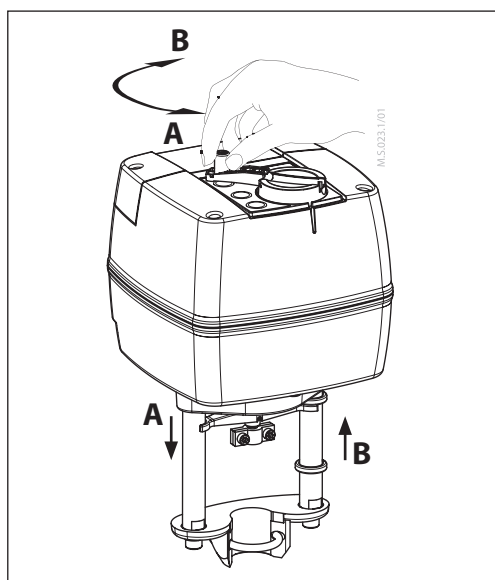
Manual operation

⚠ Mechanical and electrical operation are not allowed to be used at the same time!

The actuator AMV 655 can be manually positioned and remains in selected position until it receives signal from the controller.

The actuator AMV 658 can be manually positioned when in Stand-By mode or when there is no power supply (mechanically).

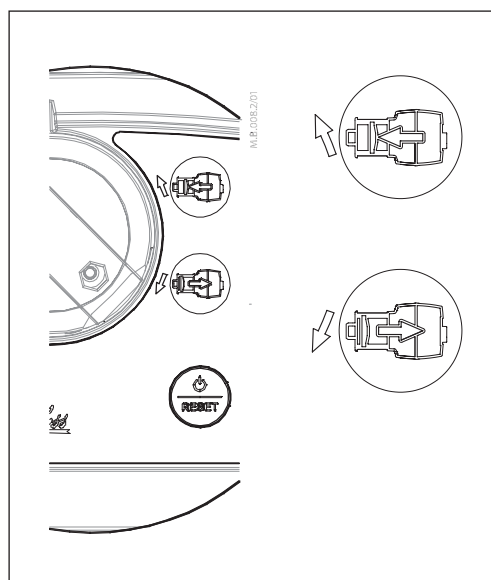
| Actuator type | Mechanical operation | Electrical operation |
|---------------|----------------------|----------------------|
| AMV 655 | ✓ | ✗ |
| AMV 658 | ✓ | ✓ |





Mechanical manual operation

Actuators AMV 655/658 have a knob & crank on the top of the housing which enables hand positioning of the actuator.

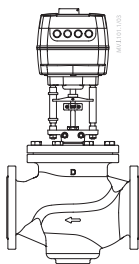
Use Mechanical manual operation only when the power is disconnected.



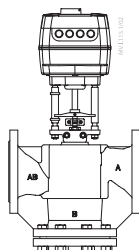
Electrical manual operation

The actuator AMV 658 has two buttons on the top of the housing that are used for electrical manual positioning (up or down) if the actuator is in Stand-By mode. First press the RESET button until the actuator goes to Stand-By mode (red LED is lit). By pressing the upper button  the stem will be extending and by pressing the lower button  the stem will be retracted.

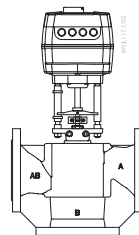
Actuator – valves combinations



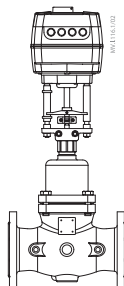
AMV 65x +
VFM 2



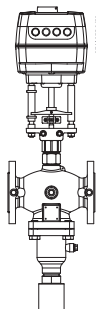
AMV 65x +
VF 2 (DN 100-150)
VL 2 (DN 100)
VFS 2 (DN 65-100)



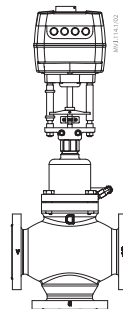
AMV 65x +
VF 3 (DN 100-150)
VL 3 (DN 100)



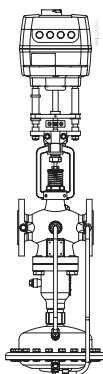
AME 65x +
VFG + adapter **065B3527** + ZF 4/5
VFGS + adapter **065B3527**
+ ZF5 (DN 15-125)



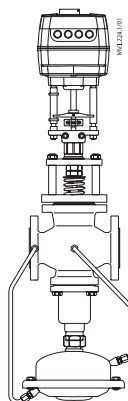
AMV 65x +
VFU +
adapter:
065B3527 (DN 15-125)



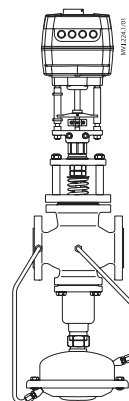
AMV 65x +
VFG 3 +
adapter:
065B3527 (DN 25-125)



AMV 65x +
AFQM 6 *



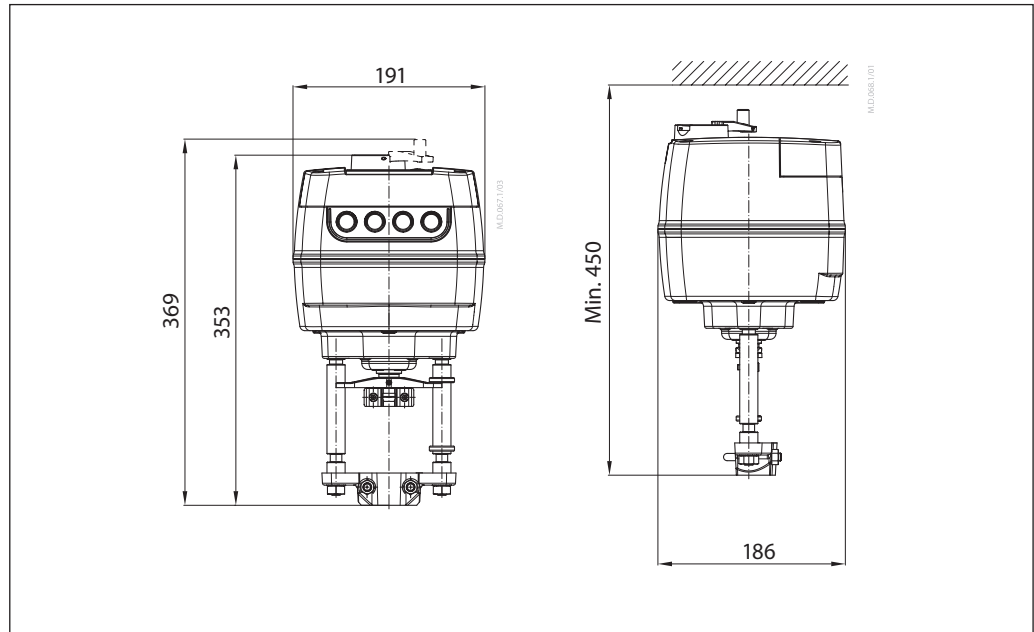
AMV 65x +
AFQM PN 16 (DN 65-125)



AMV 65x +
AFQM PN 25 *

* Please use adapter 065B3527 for combination with AFQM PN25 & AFQM 6 if produced before March 2015.

Dimensions



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