



# Electrical actuators

## AME 13SU / AME 23SU

Actuators for modulating control



Description

The actuators with safety function are mainly used with VZ valve (AME 13SU) or with VS, VM and VB valves (AME 13SU, AME 23SU) or AVQM (AME 23 SU). Safety version is activated automatically in case of power failure or if the power supply is switched off by the safety thermostat.

Features & benefits

- The advanced design incorporates load related ‘switch-off’ to ensure that actuators and valves are not exposed to overload
- The advanced design incorporates a diagnostic LED, operational data capture and self stroking feature
- Low weight and robust
- Safety function (spring up)

Ordering

Product code numbers

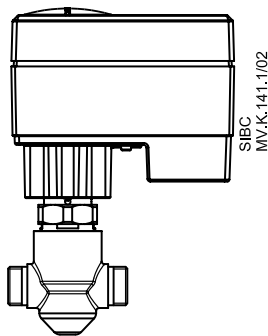
| Type      | Supply voltage [V] AC | Code number | VVS DK    |
|-----------|-----------------------|-------------|-----------|
| AME 23 SU | 24                    | 082G3042    |           |
| AME 13 SU | 24                    | 082H3044    | 460946413 |

Overview

Product portfolio

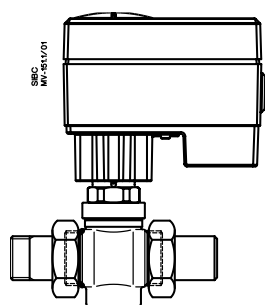
Actuator - valve combinations

- which close port A-AB if safety version is activated"

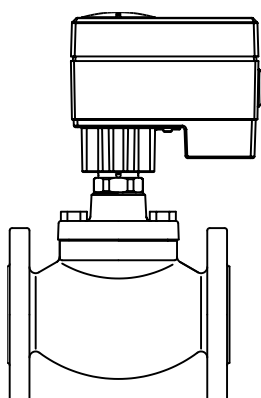


AME 13 SU + VZ (DN 15-20)

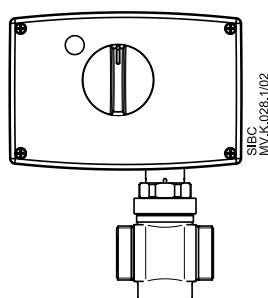
- which open port A-AB if safety version is activated:



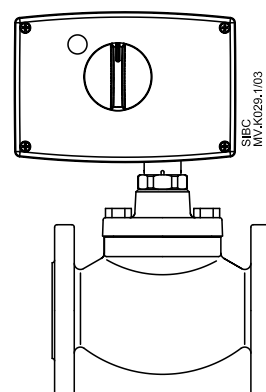
AME 13 SU +  
VS2 (DN 15-25)  
VM2 (DN 15-25)



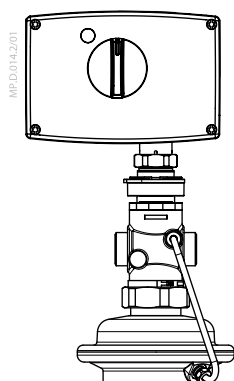
AME 13 SU +  
VB2 (DN 15-20)



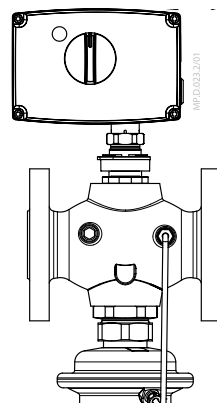
AME 23 SU +  
VS2 (DN 15-25)  
VM2 (DN 15-25)



AME 23 SU +  
VB2 (DN 15-20)



AMV(E) 2./3. +  
AVQM (DN 15-50)



AMV(E) 2./3. +  
AVQM (DN 32-50)

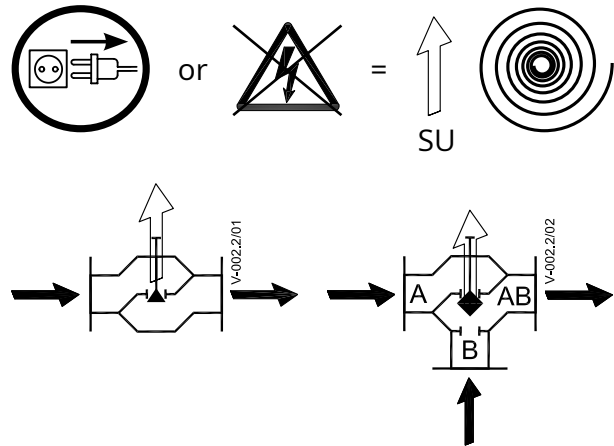
## Functions

### Safety function

The safety function will fully open or close the valve when the power is removed, depending upon the spring action selected. Valve selection will also affect the spring action. The safety function unit is factory fitted to the rear of the actuator.

| Valve Type | If safety version is activated, then port A-AB will be |
|------------|--------------------------------------------------------|
| VZ         | CLOSED                                                 |
| VS         | OPENED                                                 |
| VM         | OPENED                                                 |
| VB         | OPENED                                                 |

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



## Operation

### Commissioning

Complete the mechanical and electrical installation and perform the necessary checks and tests:

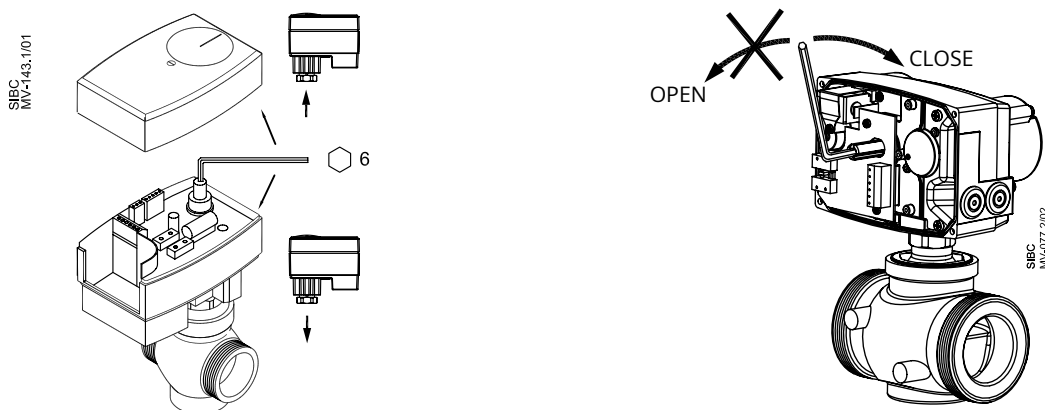
- Isolate control medium. (e.g. self-adjusting in a steam application without suitable mechanical isolation could cause a hazard).
- Apply the power. Note that the actuator will now perform the self-adjusting function.
- Apply the appropriate control signal and check the valve stem direction is correct for the application.
- Ensure that the actuator drives the valve over its full stroke, by applying the appropriate control signal. This action will set the valve stroke length.

The unit is now fully commissioned.

### Commissioning/testing feature

The actuator can be driven to the fully open or closed positions (depending on valve type) by connecting SN to terminals 1 or 3.

### Manual override

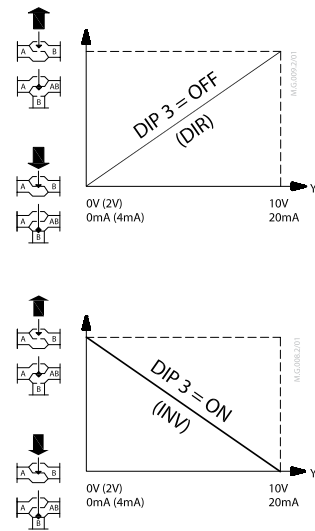
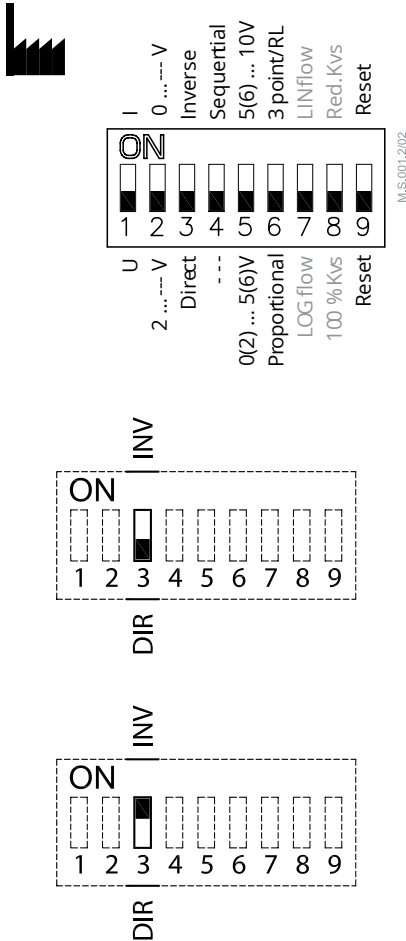


On spring versions manual override is achieved by disconnecting the power supply, removing the cover and inserting a 6 mm Allen key for AME 13 SU, a 5 mm Allen key for AME 23 SU (not supplied) into the top of the positioning spindle and turning the key against the spring. Observe the direction of rotation symbol. To hold a manual override position, the key must be wedged.

**If manual override has been used then X and Y signal are not correct until the actuator reaches its end position. If this is not accepted reset the actuator.**

## Settings

### DIP switch setting



The actuator has a selection of DIP switches under the removable cover.

The switch provides the following functions:

- **DIP1: U/I - Input signal type selector:**
  - If set to OFF position, input signal Y is set to voltage (Y).
  - If set to ON position, input signal Y is set to be current (mA).
- **DIP2: 0/2 - Input signal range selector:**
  - If set to OFF position, the input signal is in the range from 2 V to 10 V (voltage input) or from 4 mA to 20 mA (current input).
  - If set to ON position, the input signal is in the range from 0 V to 10 V (voltage input) or from 0 mA to 20 mA (current input).
- **DIP3: D/I - Direct or inverse acting selector:**
  - If set to OFF position, the actuator is direct acting (actuator's stem extends by voltage increase).
  - If actuator is set to ON position the actuator is inverse acting (actuator's stem retracts by voltage increase).
- **DIP4: —/Seq - Normal or sequential mode selector:**
  - Two actuators can be set to work parallel with one control signal. If the SEQUENTIAL is set then an actuator responds to split control signal (see 0(2) V ... 5(6) V / 5(6) V ... 10 V).

**Note:** This combination works in combination with DIP 5: 0(2) V ... 5(6) V / 5(6) V ... 10 V

**DIP5: 0-5 V/5-10 V - Input signal range in sequential mode:**

- This function is available if DIP 4: --- / Sequential is set. Actuator can be set to match the range of the control signal:

2 ... 6 V (DIP 2: 2 V ... 10)  
 0 ... 5 V (DIP 2: 0 V ... 10)  
 4 ... 12 mA (DIP 2: 2 V ... 10)  
 0 ... 10 mA (DIP 2: 0 ... 10)  
 OR  
 6 ... 10 V (DIP 2: 2 V ... 10)  
 5 ... 10 V (DIP 2: 0 V ... 10)  
 12 ... 20 mA (DIP 2: 2 V ... 10)  
 10 ... 20 mA (DIP 2: 0 ... 10)

**DIP6: Prop./3-pnt - Modulating or 3-point mode selector:**

- Actuator can operate in modulating (DIP 6 to OFF) or in "simple" 3-point mode, if the 3-point function is selected (DIP 6 to ON). **Modulating mode;** DIP 6 set to OFF (factory setting).
- After the actuator has been connected to power supply, the actuator will start the self-adjustment procedure. The indicator LED flashes until self-adjustment is finished.
- Actuator's stem will run to its totally extended or retracted position by bridging SN signal to terminals 1 or 3 and will remain in this position as long as potential is present.

**It is not allowed to bridge SP to terminal 1 or 3 when DIP 6 is set to OFF.**

**3-point mode;** DIP 6 set to On.

**Look carefully wiring diagrams as wiring is different for controllers with triacs output (ECL) in comparison to controllers with relay output.**

- Connect SN (Neutral) and power supply (24Vac) via controller to terminals 1 or 3.
- Return signal X (depends on DIP 2, 3, 4 & 5) is possible if connected power supply to SP and SN.

**DIP7: LOG/LIN** - Not in use.

**DIP8: 100 %  $K_{vs}$  / Reduced  $K_{vs}$**  - Not in use.

**DIP9: Reset:**

- Changing this switch position will cause the actuator to go through a self-adjustment procedure.

## Product details

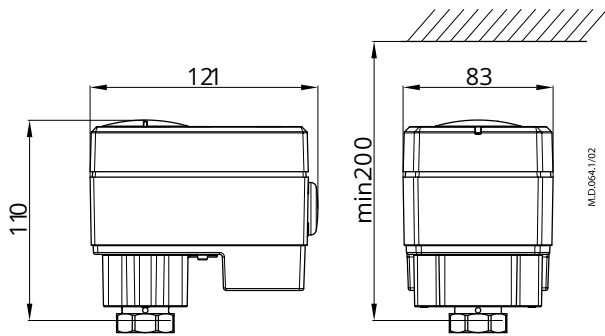
### General data

#### Technical data

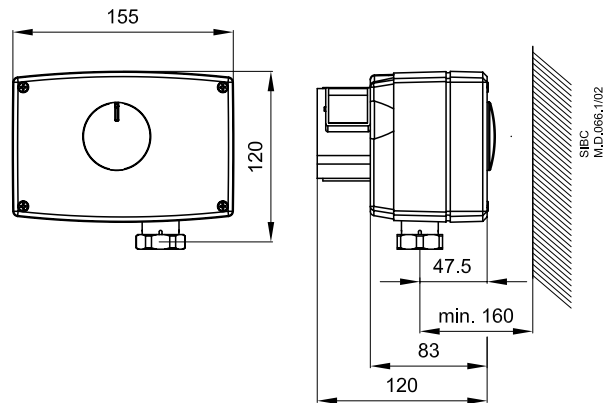
| Type                             | AME 13SU                    | AME 23SU                    |
|----------------------------------|-----------------------------|-----------------------------|
| Power supply (Vac)               | 24; +10 to -15 %            | 24; +10 to -15 %            |
| Power consumption (VA)           | 9                           | 9                           |
| Frequency (Hz)                   | 50/60                       | 50/60                       |
| Control input Y (Vdc)            | 0-10 (2-10)                 | 0-10 (2-10)                 |
| Control input Y (mA)             | 0-20 (4-20)                 | 0-20 (4-20)                 |
| Output signal X (Vdc)            | 0-10 (2-10)                 | 0-10 (2-10)                 |
| Closing force (N)                | 300                         | 450                         |
| Max. stroke (mm)                 | 5.5                         | 10                          |
| Speed (s/mm)                     | 14                          | 15                          |
| Max. medium temperature (°C)     | 130                         | 130                         |
| Ambient temperature (°C)         | 0 ... 55                    | 0 ... 55                    |
| Storage and transport temp. (°C) | -40 ... 70                  | -40 ... 70                  |
| Ambient humidity                 | 5-95 % r.h., non-condensing | 5-95 % r.h., non-condensing |
| Protection Class                 | II                          | I (230V); III(24V)          |
| Grade of enclosure               | IP 54                       | IP 54                       |
| Weight (kg)                      | 0.8                         | 1.45                        |

## Dimensions

AME 13 SU

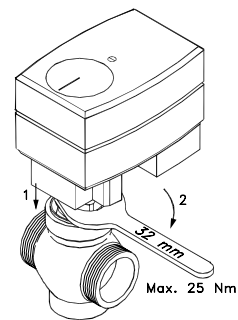
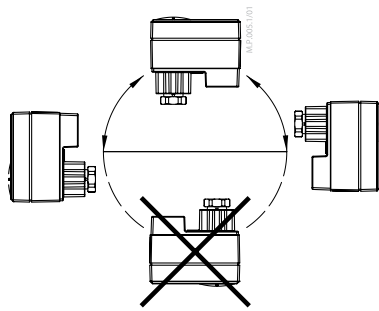


AME 23 SU

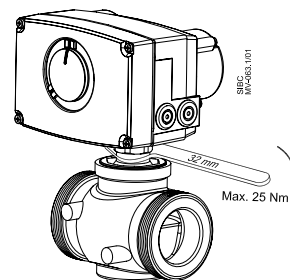
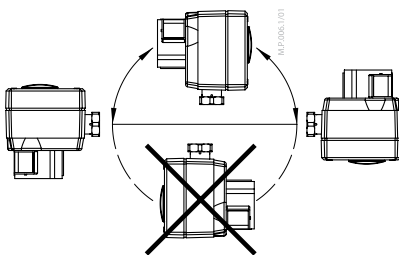


## Installation

AME 13 SU



AME 23 SU



## Mechanical

The actuator should be mounted with the valve stem in either horizontal position or pointing upwards.

The actuator is fixed to the valve body by means of a mounting ring, which requires no tools for mounting. The ring should be tightened by hand.

## Electrical

**Important:** It is strongly recommended that the mechanical installation is completed before the electrical installation.

**Note:** Two cable entries are provided for M 16×1.5 cable glands. One entry is provided with a rubber grommet. Note that in order to maintain the enclosure's IP rating, appropriate cable glands must be used.

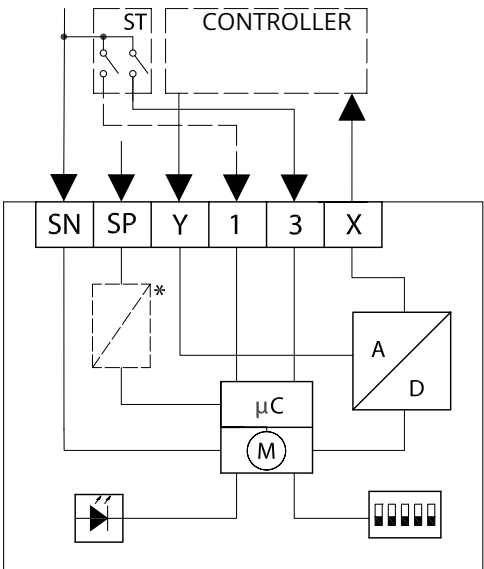
Wiring



24 Vac only.

DIP 6 = OFF

Wiring for modulating mode



IME2302/03

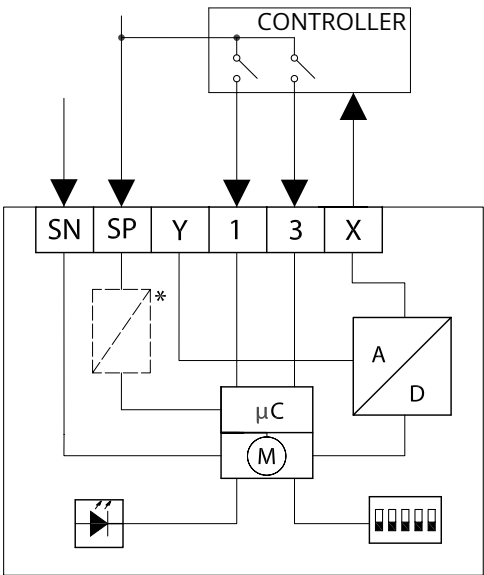
|    |                           |  |              |
|----|---------------------------|--|--------------|
| SN | 0 V                       |  | Neutral      |
| SP | 24 Vac                    |  | Power supply |
| Y  | 0(2)-10 Vdc<br>0(4)-20 mA |  | Input        |
| 1  | SN                        |  | Input        |
| 3  |                           |  |              |
| X  | 0(2)-10 Vdc               |  | Output       |

\* Only for actuators with safety function

Actuator needs to perform Self stroking prior changing DIP 6 to ON. Output signal depends on DIP 2, 3&5 setting.

DIP 6 = ON

Wiring for 3-point floating mode / Controller with relay output



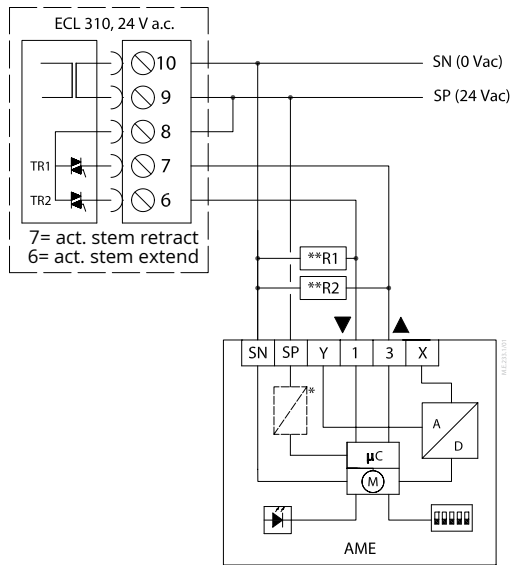
IME232/05

|    |             |  |              |
|----|-------------|--|--------------|
| SN | 0 V         |  | Neutral      |
| SP | 24 Vac      |  | Power supply |
| 1  | SP          |  | Input        |
| 3  |             |  |              |
| X  | 0(2)-10 Vdc |  | Output       |

\* Only for actuators with safety function



Wiring for 3-point floating mode / Controller with triacs output



|    |             |              |
|----|-------------|--------------|
| SN | 0 V         | Neutral      |
| SP | 24 Vac      | Power supply |
| 1  | SP          | Input        |
| 3  |             |              |
| X  | 0(2)-10 Vdc | Output       |

\* Only for actuators with safety function

\*\*R1, \*\*R2=2.6 k $\Omega$  (0.5W)

Automatic self-adjustment feature

When power is first applied, the actuator will automatically adjust to the length of the valve stroke. Subsequently, the self-adjustment feature can be re-initialised by changing position of SW9.

| Wiring Length | Recommended Square of the Wiring |
|---------------|----------------------------------|
| 0 - 50 m      | 0.75 mm <sup>2</sup>             |
| > 50 m        | 1.5 mm <sup>2</sup>              |

Diagnostic LED

The red diagnostic LED is located on the pcb under the cover. It provides indication of three operational states:

- Actuator Healthy (Permanently ON),
- Self Stroking (Flashes once per second),
- Error (Flashes 3 times per second - seek technical assistance).

Certificates, declarations and approvals

The list contains all certificates, declarations, and approvals for this product type. Individual code number may have some or all of these approvals, and certain local approvals may not appear on the list.

When you click on the link you will be directed to the latest version of the 'Declaration of Conformity'. Products developed and sold before this date of issue conform to the directives/standards in force at the time of their sale.

| Approval type              | Title                                   | Certification body | Approval topic |
|----------------------------|-----------------------------------------|--------------------|----------------|
| UA Declaration             | <a href="#">UA Actuators 2024-06-27</a> | Danfoss            | LVD            |
| Export Control Declaration | <a href="#">Electrical actuators</a>    | Danfoss            |                |

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