



RN with actuator



EN (Generation 2) with actuator

# Constant volume flow control CAV terminal unit

## B72



### For motorised setpoint value adjustment on CAV terminal units and flow adjustment dampers, e.g. switching between $q_{vmin}$ and $q_{vmax}$

Actuators for mechanically automatic CAV terminal units of the types EN, RN, VFC and flow adjustment damper of the type RN as well as the older version of the EN type (Generation 2)

- Motorised, variable setpoint adjustment on the CAV terminal unit
- 24 V AC/DC supply voltage
- Control input signal: Voltage signal 2 – 10 V DC
- Specification of setpoint value range by mechanical stops
- Positive lock connection with CAV terminal unit
- With potential-free auxiliary switches for end position monitoring
- Retrofit possible

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## General information

### Application

- Variable setpoint adjustment for mechanically automatic CAV terminal unit RN
- Variable setpoint adjustment for mechanically automatic CAV terminal unit EN in generation 2 (with setpoint adjustment on angle scale)
- Variable control: Setpoint signal 2 - 10 V DC, corresponds to the total angle of rotation (0 - 95°)
- Min-max switching (2-point operation) with alternative wiring possible
- Working range min-max mechanically adjustable

### Application (auxiliary switch)

- Auxiliary switch S2A for capturing damper blade positions (positions reached through actuator)
- Volt-free contacts for signalling or activating switch functions
- Two integrated switches, for example setpoint value min and max

### Variants

- B72 modulating actuator with additional auxiliary switch
- Alternatively:
  - B70 modulating actuator without auxiliary switch

### Parts and characteristics

- Overload-proof actuator LM24A-SR-F TR
- Release button to allow for manual operation
- Positive lock connection with the scale adjustment
- Mechanical stops for setting the volume flow rate setpoints
- Switch for reversing the direction of the drive
- 24 V AC/DC supply voltage
- Setpoint and position signal 2 - 10 V DC (related to 0 - 95°)
- Factory-fitted auxiliary switch S2A, adjustment by potentiometer

### Commissioning

- Set the mechanical stops according to the minimum and maximum volume flow rates
- For further information on setting and control, see installation manual, e.g. CAV terminal unit RN

## Function

Actuators for CAV terminal units make it possible to motorise the setpoint adjustment, which would otherwise have to be carried out manually on the setting scale.

For this purpose, the actuator B70, B72 moves the scale adjustment variably between a minimum and a maximum position.

The setpoint adjustment on the scale is controlled by a 2 - 10 V DC voltage signal.

In the B70/B72 actuator, this voltage signal is mapped to the entire angle of rotation 0 - 95° of the actuator.

The scale range to be used for the setpoint specification must be determined during commissioning of the CAV controller using mechanical stops.

This limits the scale range that can actually be used.

The level of the setpoint signal must be adjusted to the mechanically selected angle range.

The 2 - 10 V DC output signal of the CAV actuator is merely a position feedback and not a volume flow rate actual value.

The output signal is mapped to the entire rotation angle 0 - 95° of the actuator.

In the B72 variant, two individual setpoint positions can be defined on site using auxiliary switch S2A and as switching contacts be read out electrically.

### LM24A-SR-F TR with auxiliary switch S2A TR



- 1 Rotary knobs for setting the auxiliary switch
- 2 Auxiliary switches S2A TR (factory-fitted on actuator)
- 3 Connecting cable auxiliary switch S2A
- 4 Gear release
- 5 Control component LM24A-SR-F TR
- 6 Connecting cable control component LM24A-SR-F TR

## Technical data

### Actuators for air terminal units of the types RN and EN (Generation 2)

Order code detail	Actuator			Auxiliary switch	
	Part number	Type	Supply voltage	Part number	Type
B72	M466DT6	LM24A-SR-F TR	24 V AC/DC	MM536AI3	S2A TR

#### Actuator LM24A-SR-F

Supply voltage (AC)	24 V AC $\pm$ 20%, 50/60 Hz
Supply voltage (DC)	24 V DC $\pm$ 20 %
Power consumption operation	1 W
Power consumption – when idle	0.4 W
Power rating for cable sizing	2 VA
Control signal	2 – 10 V DC, Ra > 100 k $\Omega$
Position feedback	2 – 10 V DC, 1 mA
Torque	5 Nm
Runtime for 90°	150 s
Connecting cable	4 $\times$ 0.75 mm <sup>2</sup> , approx. 1 m long
IEC protection class	III (Protective extra-low voltage)
Protection level	IP 54
EC conformity	EMC according to 2014/30/EU, RoHS according to 2011/65/EU
Operating temperature (depends on the operating range of the control unit)	10 – 50 °C
Weight	0.5 kg

#### Auxiliary switch S2A

Type of contact	2 changeover contact *1
Max. switching voltage (AC)	250 V AC
Max. switching current (AC)	3 A (resistive load); 0.5 A (inductive load)
Max. switching voltage (DC)	110 V DC
Max. switching current (DC)	0.5 A (resistive load); 0.2 A (inductive load)
Connecting cable	6 $\times$ 0.75 mm <sup>2</sup> , 1 m long
IEC protection class	II (protective insulation)
Protection level	IP 54
EC conformity	EMC according to 2014/30/EU, low voltage according to 2014/35/EU, RoHS according to 2011/65/EU
Operating temperature (depends on the operating range of the control unit)	10 – 50 °C
Weight	0.250 kg

1) If both auxiliary switches are used, the switching voltages must be the same

## Specification text

This specification text describes the general properties of the product. Texts for variants can be generated with our Easy Product Finder design programme.

### Category

- Continuous actuator with auxiliary switches

### Application

- Variable setpoint specification for constant volume flow controllers with capturing of the end positions

### Supply voltage

- 24 V AC/DC

### Interface/signalling

- 2 – 10 V DC for setpoint position
- 1-wire control for min/max position
- 2-wire control for min/max position

### Connection

- 4-wire connecting cable (actuator)
- 6-core connection cable (auxiliary switch)

### Interface information

- Min / Max setpoint position can be set on site with mechanical stops

### Hilfsschalter

- Switch contacts for monitoring two positions:
  - Stop position 1 - switching position adjustable 0 - 100 %
  - Stop position 2 - switching position adjustable 0 - 100 %

### Factory condition

- Actuator and auxiliary switch factory-mounted on CAV terminal unit

## Order code

NR-VAV – RN-B72

|        |  
1        2

### 1 Type

**NR-VAV** Retrofit kit

### 2 Variant

**RN-B72** modulating actuator 24 V AC/DC with auxiliary switch for CAV terminal unit RN

**EN-B72** modulating actuator 24 V AC/DC for CAV terminal unit EN Generation 2 (setpoint value adjustment with angle scale)

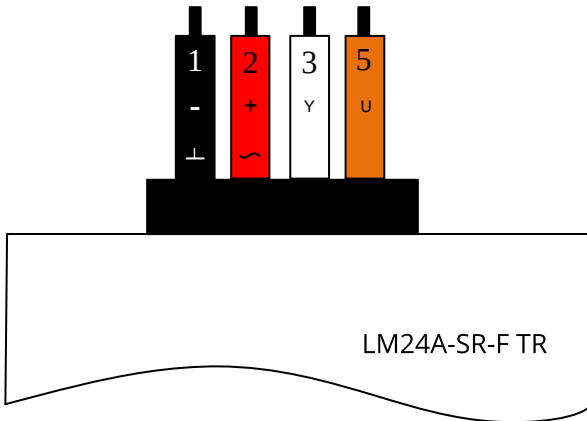
### Note:

This is the order code for retrofitting the actuator for a CAV terminal unit.

As a rule, the actuator is specified in the initial order via the order code of the basic device under the section Actuator for setpoint adjustment with the order codes B72.

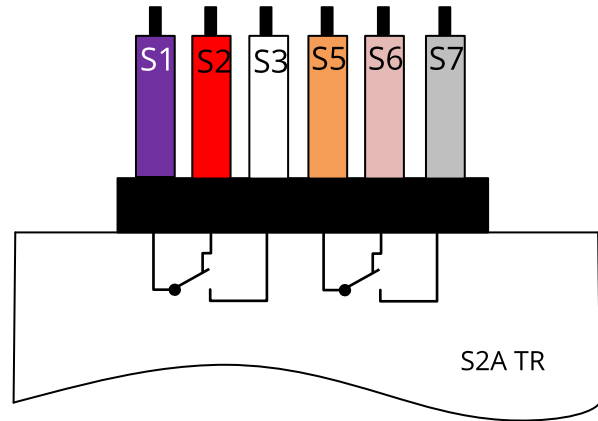
## Wiring

### LM24A-SR-F TR, Terminal assignment



- 1 ⊥, -: Ground, Zero
- 2, ~, +: Supply voltage
- 3, Y: Setpoint value signal
- 5, U: Position feedback

### S2A, terminal assignment

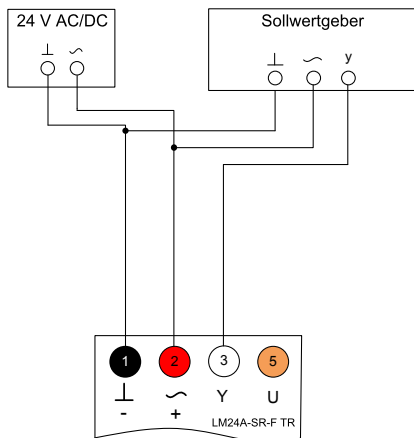


- S1 Common contact
- S2 Travel stop 1 < x
- S3 Travel stop 1 > x
- S4 Common contact
- S5 Travel stop 2 < x
- S6 Travel stop 2 > x

**Note:**

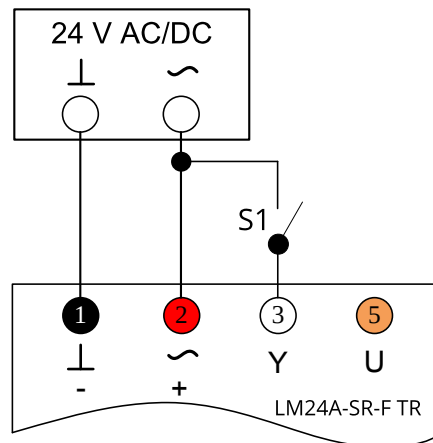
x corresponds to set switching point 0 - 100 %

### Variable control initiated by a voltage signal



- 1 ⊥, -: Ground, Zero
- 2, ~, +: Supply voltage
- 3, Y: Setpoint value signal
- 5, U: Position feedback

### 1-wire control of modulating actuators (min-max switching)



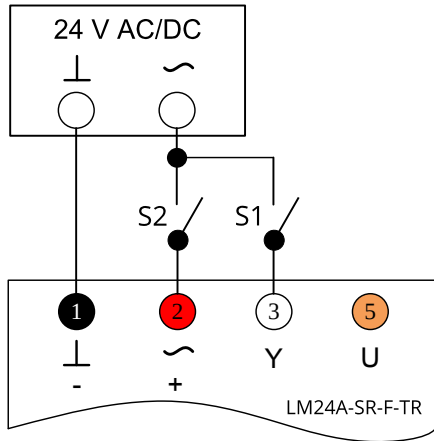
Switch S1 open:

- Actuator moves to scale stop 1
- Direction of rotation switch 0 =  $V_{min}$
- Direction of rotation switch 1 =  $V_{max}$

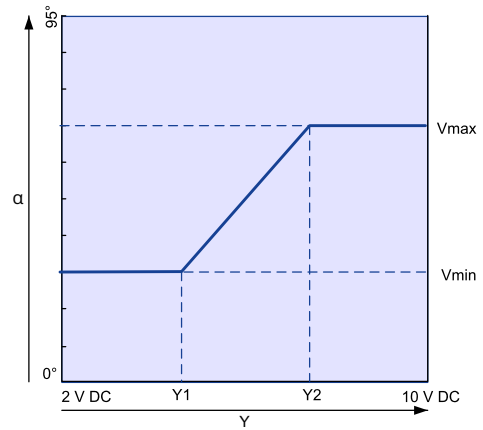
Switch S1 closed:

- Actuator moves to scale stop 2
- Direction of rotation switch 0 =  $V_{max}$
- Direction of rotation switch 1 =  $V_{min}$

2-wire control (3-point) for modulating actuators



Characteristic curve setpoint value signal Y to angle of rotation



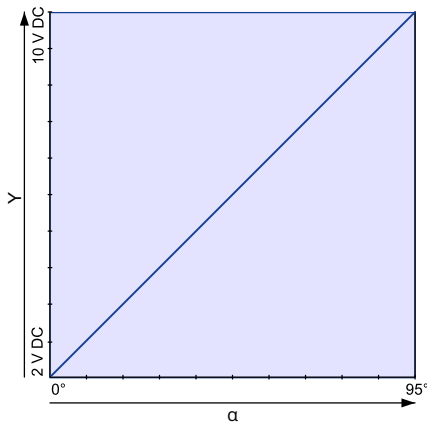
**Note:**

Alternatively, the so-called 2-wire control (3-point operation) can be realised by inserting an additional switch S2. When switch S2 is closed, the actuator functions the same way as with 1-wire control. The actuator can also be stopped at any point by opening switch S2.

**Note:**

Angle assignment depends on the setting of the direction of rotation switch.  $V_{min}$  and  $V_{max}$  here referring to the setting potentiometers on the actuator.

Characteristic curve for position feedback U



**Note:**

Angle assignment depends on the setting of the direction of rotation switch.



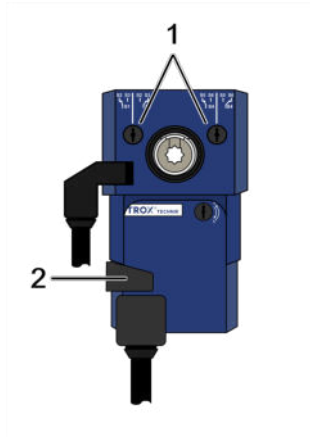
## Product details

### Installation and commissioning:

To set the auxiliary switch, turn the clamping device of the actuator to the desired switching position of the auxiliary switch using the release mechanism. Turn the first rotary knob until the arrow points to the vertical line, observing the direction of the arrow on the rotary knob. Repeat the process for the second rotary knob.

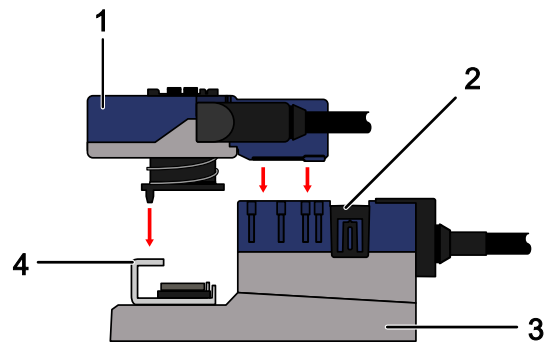
The auxiliary switch is factory assembled. If installation is required on site, the auxiliary switch must be installed according to the following diagram.

### Setting the switching points of the auxiliary switch S2A on a control component



1 auxiliary switch for 2 switching points  
2 Gear release

### Installation of the S2A TR auxiliary switch on a control component



1 Auxiliary switch S2A  
2 Gear release  
3 Control component (LM24-SR-F TR)  
4 Clamping bracket on the positive locking of the control component