Actuators for CAV controllers

Min/Max actuators

For constant volume flows with $\dot{V}_{min}/\dot{V}_{max}$ switching in air conditioning systems

Actuators for mechanical self-powered CAV controllers Type EN, RN, or VFC, and for flow adjustment dampers Type VFR

- Switching between two volume flow setpoint values, e.g. for daytime and night-time operation
- Supply voltage 24 V AC/DC or 230 V AC
- Control input signal: 1-wire control or 2-wire control (3-point)
- Potentiometer or mechanical stops
- Positive lock connection with CAV controller
- Retrofit possible

Application

Application

- Actuators for min/max switching
- Switching between volume flow setpoint values of mechanical self-powered CAV controllers Type RN, EN or VFC
- Change of the damper blade positions of flow adjustment dampers Type VFR

Description

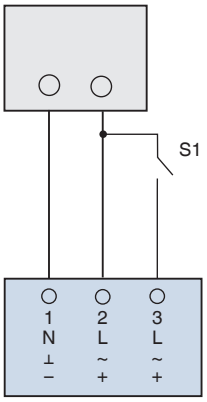
Parts and characteristics

- Potentiometer or mechanical stops for setting the volume flow rate setpoints
- Supply voltage 24 V AC/DC or 230 V AC
- Overload protection
- 1-wire control or 2-wire control (3-point)
- Optional auxiliary switch for capturing the end positions

Functional description

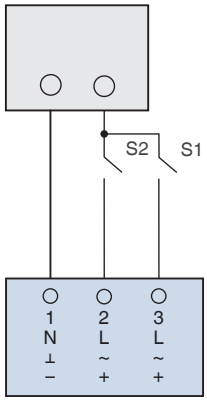
The actuator moves a damper blade or a damper blade mechanism to the minimum or maximum position.
Minimum and maximum positions can be set on potentiometers or using mechanical stops.
1-wire control or 2-wire control (3-point) can be used.
1-wire control is the same as open/close control or min/max control.

1-wire control



Switch functions
S1 open: Direction of rotation 1
S1 closed: Direction of rotation 2

2-wire control (3-point)



Switch functions
S1 open
S2 open: Actuator has stopped (any position)
S2 closed: Direction of rotation 1

S1 closed
S2 open: Direction of rotation 2
S2 closed: Direction of rotation 2

Control options and effect of actuator action in case of factory setting

Order code detail	Function	Control	Direction of rotation	
			1	2
B50, B52	Min/Max	1-wire control, 2-wire control	$\dot{V}_{min}$	$\dot{V}_{max}$
B60, B62	Min/Max	1-wire control, 2-wire control	$\dot{V}_{min}$	$\dot{V}_{max}$
E01	Min/Max	1-wire control, 2-wire control	$\dot{V}_{min}$	$\dot{V}_{max}$
E02	Min/Max	1-wire control, 2-wire control	$\dot{V}_{min}$	$\dot{V}_{max}$
M01	Min/Max	1-wire control, 2-wire control	$\dot{V}_{max}$	$\dot{V}_{min}$
M02	Min/Max	1-wire control, 2-wire control	$\dot{V}_{max}$	$\dot{V}_{min}$

Actuators LM24A and LM24A-F

Supply voltage (AC)	24 V AC ± 20 %, 50/60 Hz
Supply voltage (DC)	24 V DC ± 20 %
Power consumption – when running	1 W
Power consumption – when idle	0.2 W
Power rating for cable sizing	1.5 VA
Torque	5 Nm
Running time for 90°	150 s
Control input signal	1-wire control or 2-wire control (3-point)
Connecting cable	3 × 0.75 mm², 1 m long
IEC protection class	III (protective extra-low voltage)
Protection level	IP 54
EC conformity	EMC to 2014/30/EU, RoHS 2011/65/EU
Operating temperature	–30 to 50 °C
Weight	0.5 kg

Actuators LM230A and LM230A-F

Supply voltage	100 to 240 V AC –15 % +10 %, 50/60 Hz
Power consumption – when running	1.5 W
Power consumption – when idle	0.5 W
Power rating	3.5 VA
Torque	5 Nm
Running time for 90°	150 s
Control input signal	1-wire control or 2-wire control (3-point)
Connecting cable	3 × 0.75 mm², 1 m long
IEC protection class	II (protective insulation)
Protection level	IP 54
EC conformity	EMC to 2014/30/EU, low voltage to 2014/35/EU, RoHS to 2011/65/EU
Operating temperature	–30 to 50 °C
Weight	0.5 kg

Auxiliary switch S2A

Type of contact	2 changeover contacts[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 × 0.75 mm², 1 m long
IEC protection class	II (protective insulation)
Protection level	IP 54
EC conformity	EMC to 2014/30/EU, low voltage to 2014/35/EU, RoHS to 2011/65/EU
Operating temperature	–30 to 50 °C
Weight	0.250 kg

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

Actuator 224-24-03-001

Supply voltage (AC)	24 V AC ± 20 %, 50/60 Hz
Supply voltage (DC)	24 V DC ± 20 %
Power rating (AC)	4.5 VA
Power rating (DC)	3 W
Torque	2.5 Nm
Running time for 90°	20 – 60 s
Control input signal	1-wire control or 2-wire control (3-point)
Connecting cable	3 × 0.75 mm², 1 m long
IEC protection class	III (protective extra-low voltage)
Protection level	IP 42
EC conformity	EMC to 2014/30/EU, RoHS 2011/65/EU
Operating temperature	0 to 50 °C
Weight	0.32 kg

Actuator 224-230-03-002

Supply voltage	230 V AC, 50/60 Hz
Power rating	4.5 VA
Torque	2.5 Nm
Running time for 90°	20 – 60 s
Control input signal	1-wire control or 2-wire control (3-point)
Connecting cable	3 × 0.75 mm², 1 m long
IEC protection class	II (protective insulation)
Protection level	IP 42
EC conformity	EMC to 2014/30/EU, low voltage to 2014/35/EU, RoHS to 2011/65/EU
Operating temperature	0 to 50 °C
Weight	0.32 kg

Actuator CM24-F

Supply voltage (AC)	24 V AC ± 20 %, 50/60 Hz
Supply voltage (DC)	24 V DC ± 20 %
Power rating (AC)	1 VA max.
Power rating (DC)	0.5 W max.
Torque	2 Nm
Running time for 90°	75 s
Control input signal	1-wire control or 2-wire control (3-point)
Connecting cable	3 × 0.75 mm², 1 m long
IEC protection class	III (protective extra-low voltage)
Protection level	IP 54
EC conformity	EMC to 2014/30/EU, RoHS 2011/65/EU
Operating temperature	–30 to 50 °C
Weight	0.185 kg

Actuator CM230-F

Supply voltage	100 to 240 V AC –15 % +10 %, 50/60 Hz
Power rating	3 VA
Torque	2 Nm
Running time for 90°	75 s
Control input signal	1-wire control or 2-wire control (3-point)
Connecting cable	3 × 0.75 mm², 1 m long
IEC protection class	II (protective insulation)
Protection level	IP 54
EC conformity	EMC to 2014/30/EU, low voltage to 2014/35/EU, RoHS to 2011/65/EU
Operating temperature	–30 to 50 °C
Weight	0.185 kg

Actuator LM24A-F

Actuator LM230A-F

Auxiliary switch S2A

Actuator 224-024-03-001

Actuator 224-230-03-002

Actuator CM24-F

Actuator CM230-F

Any attachments are to be defined with the order code of the CAV controller.

B5*

Application

- Actuator LM24A-F for the min/max switching of volume flow setpoint values of mechanical self-powered volume flow controllers Type RN

Variants

- B52: with auxiliary switch for capturing the end positions

Parts and characteristics

- Supply voltage 24 V AC/DC
- 1-wire control or 2-wire control (3-point)
- Mechanical stops for setting the volume flow rate setpoints
- Switch for setting the direction of rotation
- Positive lock connection with damper blade shaft
- Release button to allow for manual operation

Commissioning

- Set the mechanical stops according to the minimum and maximum volume flow rates
- Change the direction of rotation if necessary, using the switch, to switch between $\dot{V}_{min}$ and $\dot{V}_{max}$

B6*

Application
- Actuator LM230A-F for the min/max switching of volume flow setpoint values of mechanical self-powered volume flow controllers Type RN

Variants
- B62: with auxiliary switch for capturing the end positions

Parts and characteristics
- Supply voltage 230 V AC
- 1-wire control or 2-wire control (3-point)
- Mechanical stops for setting the volume flow rate setpoints
- Switch for setting the direction of rotation
- Positive lock connection with damper blade shaft
- Release button to allow for manual operation

Commissioning
- Set the mechanical stops according to the minimum and maximum volume flow rates
- Change the direction of rotation if necessary, using the switch, to switch between $\dot{V}_{min}$ and $\dot{V}_{max}$

B*2

Application
- Auxiliary switch S2A for capturing damper blade end positions (end positions reached through actuator operation)
- Volt-free contacts for signalling or activating switch functions
- Two integral switches, e.g. for damper blade OPEN and damper blade CLOSED
- Potentiometer for setting any switch point

E01

Application
- Actuator 224-024-03-001 for min/max switching
- Min/Max switching between volume flow setpoint values of mechanical self-powered CAV controllers the types VFC and EN (only up to 300 mm)
- Min/Max change of the damper blade positions of flow adjustment dampers Type VFR

Parts and characteristics
- Supply voltage 24 V AC/DC
- 1-wire control or 2-wire control (3-point)
- Potentiometer for setting the volume flow rate setpoints
- Positive lock connection with damper blade shaft
- Functional test button: Motor drives first to minimum position, then to maximum position, then returns to the set position
- Indicator light: Actuator has reached setpoint, actuator in motion, actuator blocked

Commissioning
- Use the potentiometer to set the minimum or maximum volume flow rate or the damper blade position

E02

Application
- Actuator 224-230-03-002 for min/max switching
- Min/Max switching between volume flow setpoint values of mechanical self-powered CAV controllers Type VFC
- Min/Max change of the damper blade positions of flow adjustment dampers the types VFC and EN (only up to 300 mm)

Parts and characteristics
- Supply voltage 230 V AC
- 1-wire control or 2-wire control (3-point)
- Potentiometer for setting the volume flow rate setpoints
- Positive lock connection with damper blade shaft
- Functional test button: Motor drives first to minimum position, then to maximum position, then returns to the set position
- Indicator light: Actuator has reached setpoint, actuator in motion, actuator blocked

Commissioning
- Use the potentiometer to set the minimum or maximum volume flow rate or the damper blade position

M01

Application
- Actuator CM24-F for min/max switching
- Min/Max switching between volume flow setpoint values of mechanical self-powered CAV controllers Type VFC
- Min/Max change of the damper blade positions of flow adjustment dampers Type VFR

Parts and characteristics
- Supply voltage 24 V AC/DC
- 1-wire control or 2-wire control (3-point)
- Mechanical stops for setting the volume flow rates
- Positive lock connection with damper blade shaft
- Gear release magnet

Commissioning
- Set the mechanical stops according to the minimum and maximum volume flow rates or the damper blade position

M02

Application
- Actuator CM230-F for min/max switching
- Min/Max switching between volume flow setpoint values of mechanical self-powered CAV controllers Type VFC
- Min/Max change of the damper blade positions of flow adjustment dampers Type VFR

Parts and characteristics
- Supply voltage 230 V AC
- 1-wire control or 2-wire control (3-point)
- Mechanical stops for setting the volume flow rate setpoints
- Positive lock connection with damper blade shaft
- Gear release magnet

Commissioning
- Set the mechanical stops according to the minimum and maximum volume flow rates or the damper blade position

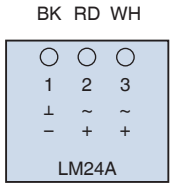
Actuators for volume flow controllers Type RN

Order code detail	Actuator			Auxiliary switch	
	Part number	Type	Supply voltage	Part number	Type
B50	M466DT4	LM24A-F	24 V	–	–
B52	M466DT4	LM24A-F	24 V	M536AI3	S2A
B60	M466DT5	LM230A-F	230 V	–	–
B62	M466DT5	LM230A-F	230 V	M536AI3	S2A

Actuators for volume flow controllers of types VFC, EN and for flow adjustment dampers Type VFR

Order code detail	Part number	Type	Setpoint value adjustment	Supply voltage
E01	A00000038358	224-024-03-001	Potentiometer	24 V
M01	M466EP4	CM24-F	Mechanical stops	24 V
E02	M466EP8	224-230-03-002	Potentiometer	230 V
M02	A00000038359	CM230-F	Mechanical stops	230 V

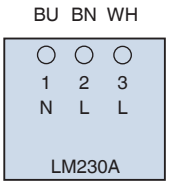
LM24A, connecting cable core identification



1 ⊥, –: Ground, neutral
2 ~, +: Control voltage for direction of rotation 1
3 ~, +: Control voltage for direction of rotation 2

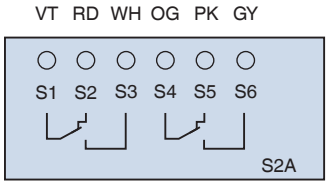
LM24A and LM24A-F

LM230A, connecting cable core identification



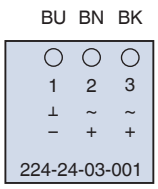
1 N: Neutral
2 L: Control voltage for direction of rotation 1
3 L: Control voltage for direction of rotation 2

S2A, connecting cable core identification



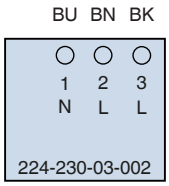
S1: Common contact
S2: Mechanical stop 1 < x
S3: Mechanical stop 1 > x
S4: Common contact
S5: Mechanical stop 2 < x
S6: Mechanical stop 2 > x
x: 0 – 100 % Switching point (adjustable)

224-24-03-001, connecting cable core identification



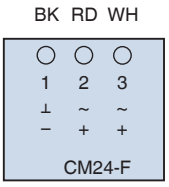
1 ⊥, –: Ground, neutral
2 ~, +: Control voltage for direction of rotation 1
3 ~, +: Control voltage for direction of rotation 2

224-230-03-002, connecting cable core identification



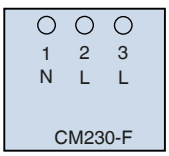
1 N: Neutral
2 L: Control voltage for direction of rotation 1
3 L: Control voltage for direction of rotation 2

CM24-F, connecting cable core identification



1 ⊥, –: Ground, neutral
2 ~, +: Control voltage for direction of rotation 1
3 ~, +: Control voltage for direction of rotation 2

CM230-F connecting cable core identification



1 N: Neutral
2 L: Control voltage for direction of rotation 1
3 L: Control voltage for direction of rotation 2