

Technical data sheet

227CM-024-05-MB Rotary actuator

Description

Rotary actuator for adjusting dampers in HVAC installations

- Running time 100 s / 90°
- Torque 5 Nm
- Nominal voltage 24 VAC/DC
- Control continuous control (0)2...10 VDC
- Damper size up to approx. 1 m²
- Communication Modbus RTU
- Shaft coupling clamp \diamond 8-14 mm / \varnothing 8-20 mm



Technical data

Electrical data	Nominal voltage	24 VAC/DC, 50/60 Hz
	Nominal voltage range	19...29 VAC/DC
	Power consumption motor (motion)	2,0 W
	Power consumption standby (end position)	1,0 W
	Wire sizing	3,0 VA
	Control	Modbus RTU / analog (0)2...10 VDC / Ri > (100 k Ω) 50 k Ω (0)4...20 mA / Rext. = 500 Ω
	Feedback signal	Modbus RTU / analog (0)2...10 VDC, max. 0,5 mA
Connection motor	cable 1000 mm, 4 x 0,75 mm ² (halogen free)	
Modbus	Protocol	Modbus RTU
	Medium	cable 1000 mm, 2 x 0,38 mm ² (halogen free) RS-485, not electrically isolated
	Number of nodes	max. 128

Technical data

Modbus	Baud rates	1200/2400/4800/9600/19200/38400 Bd
	Byte sequence	MSB / LSB
	Byte format	1 start bit, 8 data bits, 2 stop bits, none parity 1 start bit, 8 data bits, 1 stop bit, even parity 1 start bit, 8 data bits, 1 stop bit, odd parity
	Termination	external (120 Ω)
	Response time	≤ 10 ms + delay
	Standard parameter	19200 Bd 1 start bit, 8 data bits, 1 stop bit, even parity delay 0 ms
	Functional data	Torque
	Damper size	up to approx. 1 m ²
	Synchronised speed	±5%
	Direction of rotation	adjustable
	Manual override	Gearing latch disengaged with pushbutton, self-resetting
	Angle of rotation	0°...max. 95° can be limited with adjustable mechanical end stops
	Running time	100 s / 90° (adjustable 20...120 s / 90°)
	Sound power level	< 35 dB(A)
	Shaft coupling	clamp ∅ 8-15 mm / ∅ 8-20 mm
	Position indication	mechanical with pointer
	Service life	> 100 000 cycles (0°...95°...0°) > 1 500 000 partial cycles (max. ±5°)
Safety	Protection class	III (safety extra-low voltage)
	Degree of protection	IP 54 (cable downwards)
	EMC	CE (2014/30/EU)
	LVD	CE (2014/35/EU)
	RoHS	CE (2011/65/EU - 2015/863/EU - 2017/2102/EU)
	Mode of operation	Typ 1 (EN 60730-1)
	Rated impulse voltage	0,8 kV (EN 60730-1)
	Control pollution degree	3 (EN 60730-1)
	Ambient temperature normal operation	-30°C...+50°C
	Storage temperature	-30°C...+80°C
	Ambient humidity	5...95% r.H., non condensing (EN 60730-1)
	Maintenance	maintenance free
	Dimensions / Weight	Dimensions

Technical data

Dimensions / Weight	Weight	450 g
---------------------	--------	-------

Functionality / Properties

Operating mode

Connect power supply to wire 1+2 and a reference signal Y to wire 3 in range of (0)2...10 VDC, actuator drives to its specified position.

The actual damper position (0...100%) is a feedback signal U on wire 4 for example to share with other actuators.

The actuator is overload-proof, requires no limit switches and automatically stops, when the end stop is reached.

Direct mounting

Simple direct mounting on the damper shaft with a clamp, protection against rotating with enclosed anti-rotation lock or rather at intended attachment points.

Manual override

Manual override with self-resetting pushbutton possible (the gear is disengaged as long as the button is pressed).

Edit

The selector allows the changing of values. The position of the arrow shows the value set. The changes are displayed as soon as the selector is moved $\pm 10^\circ$ from the position.

Status

Shows the actual position of the damper in percent, calculated to the adapted angle of rotation.

I/O

u...voltage input signal
r...resistance input signal

Diag

Diagnostic menu:
oP - open the damper
cL - close the damper
Ai1 - activate analog input (0...10 VDC)
Ao1 - activate analog output (sawtooth signal, 0...10...0 VDC)
on - diagnostic mode is on, motor off
off - diagnostic mode is off
Adp - adaption drive

Control

Input signal:
0-n...0-10 VDC normal
2-n...2-10 VDC normal
0-i ...0-10 VDC invers
2-i ...2-10 VDC invers
b-n...Modbus normal
b-i...Modbus invers

Adr

Setting the address of the Modbus (1...247).

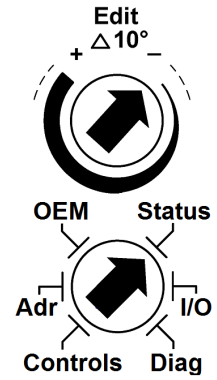
OEM

Allows selecting preset values.

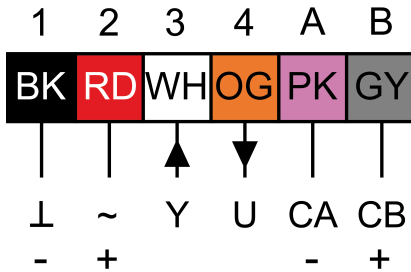
Adaption drive

- Actuator power off
- Setting the mechanical end stops
- Actuator power on
- Adaption enable
- Actuator drive to position 0
- Actuator drive to position 1
- Adaption disable, if desired angular range reached or rather

- if actuator reached endstop
- “Y” refers to the measured angular range



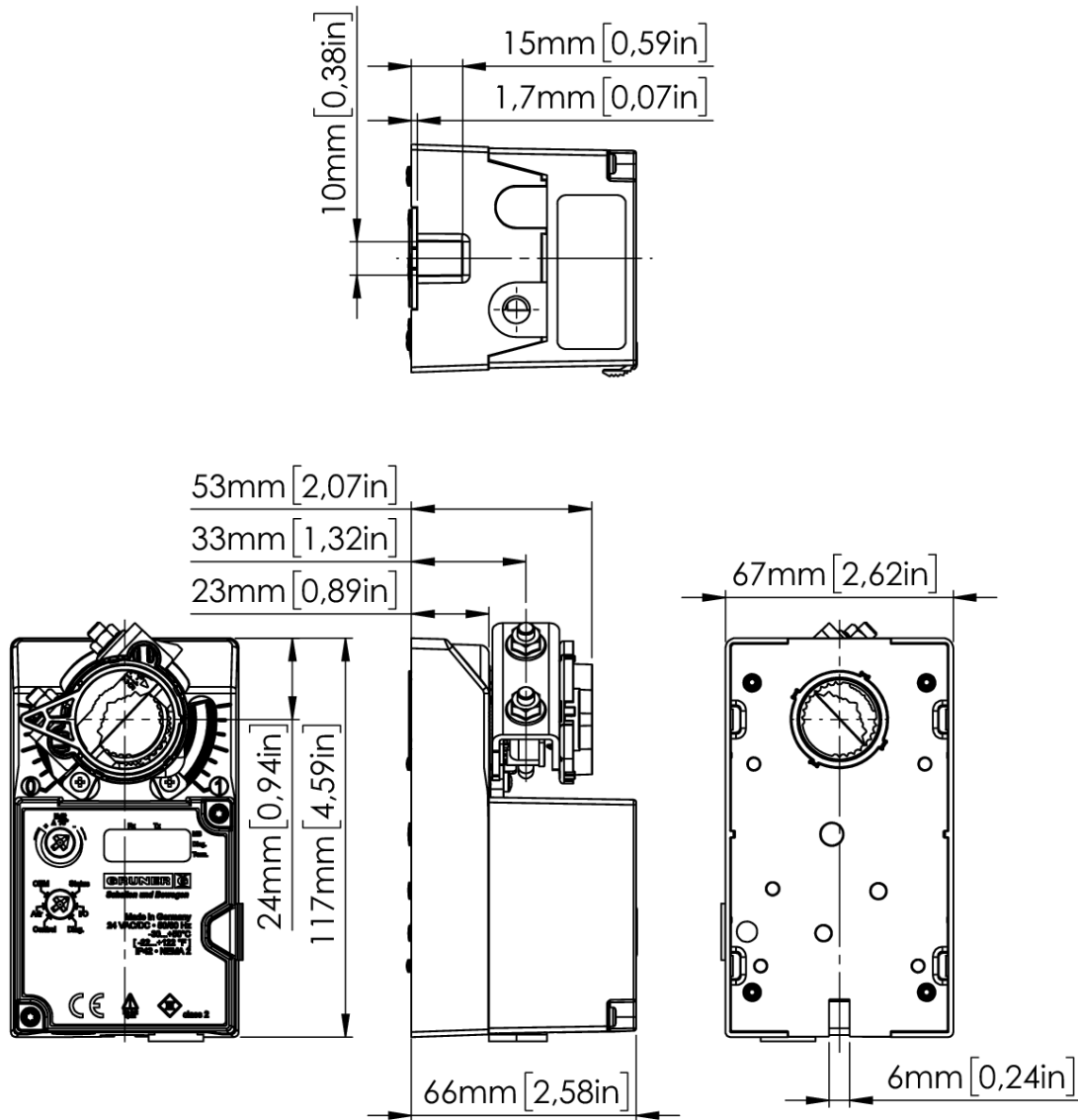
Connector / Security Note



Safety remarks

- Connect via safety isolation transformer!
- The device is not allowed to be used outside the specified field of application, especially in airplanes.
- It may only be installed by suitably trained personnel. Any legal regulations or regulations issued by authorities must be observed during assembly.
- The device may only be opened at the manufacturer's site.
- The device is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.
- When calculating the required torque, the specifications supplied by the damper manufacturer's (cross-section, design, installation site), and the air flow conditions must be observed.

Technical Drawing



Modbus register

No.	Register	Memory
0	Setpoint 0...100.00 [%]	RAM
1	Override control	RAM
2	Command	RAM
3	Actuator type	EEPROM
4	Relative position 0...100.00 [%]	RAM
5	Absolute position 0...650.00 [°][mm]	RAM
10	Feedback signal 0...10000 [mV]	RAM
103	Software version	EEPROM
122	Interface mode	EEPROM
130	Address 1 - 247	EEPROM
551	Mode	EEPROM
568	Modbus settings	EEPROM
569	Modbus response time	EEPROM

- Registers in bold can be written
- RAM registers are non-permanent
- EEPROM registers are permanent (max. 1 Mio. write cycles)

Register 1:

Override control	
0	-
1	Open
2	Close
3	-
4	-

Register 2:

Command	
0	-
1	Adaption drive
2	-
3	-
4	Controller reset

Register 3:

Actuator type	
0	No actuator
1	HVAC / water actuator
2	VAV actuator
3	Fire protection actuator
4	GUAC VAV
5	GUAC CM
6	GT

Modbus register

Register 122:

Interface mode		
Value	Signal input	Feedback signal
0	Analog (0)2...10 V	(0)2...10 V
1	Modbus via register 0	(0)2...10 V
2	Modbus via register 0	Register 10
3	Analog (0)2...10 V	Register 10

Register 551:

Mode	
Bit	Function
0	-
1	-
2	-
3	-
4	-
5	-
6	1 = option reversal activ (change direction of rotation)
7	1 = Motor off
8	-

Register 568:

Modbus parameter				
Display	Value	Baudrate	Parity	Stop bits
1	0	1200	none	2
2	1	1200	even	1
3	2	1200	odd	1
4	3	2400	none	2
5	4	2400	even	1
6	5	2400	odd	1
7	6	4800	none	2
8	7	4800	even	1
9	8	4800	odd	1
10	9	9600	none	2
11	10	9600	even	1
12	11	9600	odd	1
13	12	19200	none	2
14¹⁾	13	19200	even	1
15	14	19200	odd	1
16	15	38400	none	2
17	16	38400	even	1
18	17	38400	odd	1
19 ²⁾	18	1200	none	1
20 ²⁾	19	2400	none	1
21 ²⁾	20	4800	none	1

Modbus register

Modbus parameter				
Display	Value	Baudrate	Parity	Stop bits
22 ²⁾	21	9600	none	1
23 ²⁾	22	19200	none	1
24 ²⁾	23	38400	none	1

1) default setting

2) not Modbus standard, only Gruner

Register 569: **Response time:** 10 ms + "delay"

"Delay": 3 ms x 0...255