

Technical data sheet

227CM-024-10-MB Rotary actuator

Description

Rotary actuator for adjusting dampers in HVAC installations

- Running time 150 s / 90°
- Torque 10 Nm
- Nominal voltage 24 VAC/DC
- Control continuous control (0)2...10 VDC
- Damper size up to approx. 2 m²
- Communication Modbus RTU
- Shaft coupling clamp
◇ 8-14 mm / Ø 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 | 3,5 VA |
| | Control | Modbus RTU / analog (0)2...10 VDC / Ri > (100 kΩ) 50 kΩ (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 | 10 Nm |
| | Damper size | up to approx. 2 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 | 150 s / 90° (adjustable 70...420 s / 90°) |
| | Sound power level | < 35 dB(A) |
| | Shaft coupling | clamp ∅ 8-15 mm / ∅ 8-20 mm |
| | Position indication | mechanical with pointer |
| | Service life | > 60 000 cycles (0°...95°...0°) > 1 000 000 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 | 115 x 65 x 66 mm |

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).

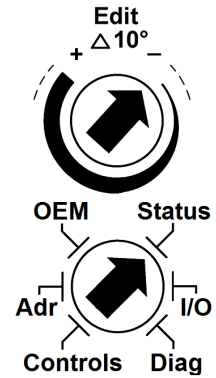
OEM

Allows selecting preset values.

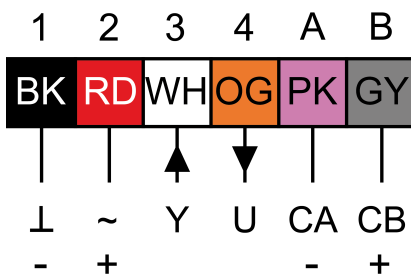
Adaption drive

- 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

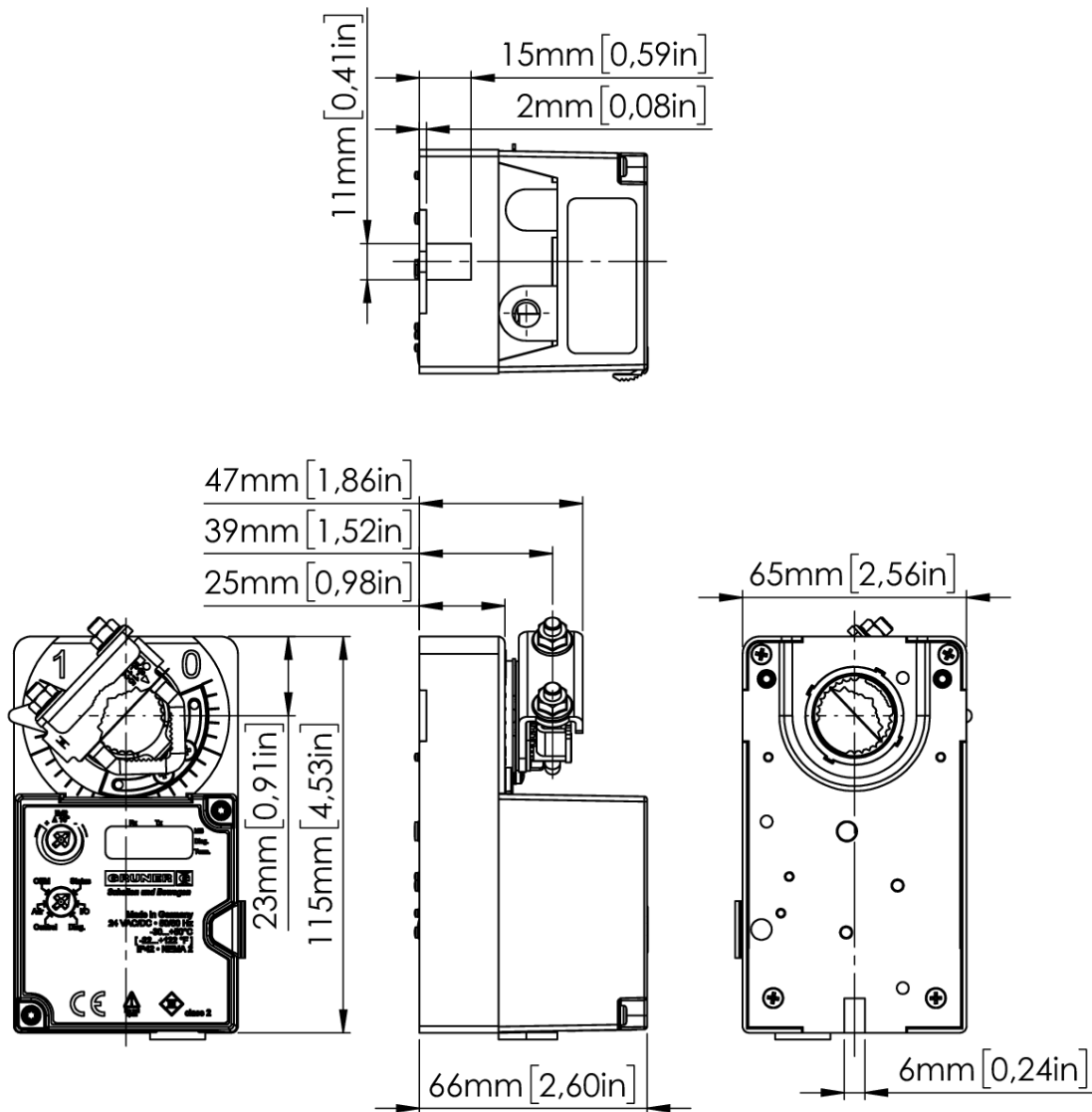
- Connect via safety isolation transformer!
- The device is not allowed to be used outside the specified field of application, especially in airplanes.
- It may only be installed by suitably trained personnel. Any legal regulations or regulations issued by authorities must be observed during assembly.
- 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.

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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 |
| 14 ¹⁾ | 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: **Repsonse time:** 10 ms + "delay"

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