**ExMax** Multiturn actuators – size S

Electrical, explosion proof rotary actuators

On-off / 3-pos. control mode, 24…240 VAC/DC, multiturn 360° angle of rotation, 5/10 – 15 Nm

ATEX tested in acc. with directive 2014/34/EU for zone 1, 2, 21, 22

**Compact. Easy installation. Universal. Cost effective. Safe.**

<table>
<thead>
<tr>
<th>Type</th>
<th>Torque</th>
<th>Supply</th>
<th>Motor running time</th>
<th>Spring return</th>
<th>Control mode</th>
<th>Feedback</th>
<th>Wiring diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>ExMax - 5/10 - R</td>
<td>5/10 Nm</td>
<td>24…240 VAC/DC</td>
<td>60 / 120 / 240 / 480 s/360°</td>
<td>–</td>
<td>On-off, 3-pos.</td>
<td>–</td>
<td>SB 1.0</td>
</tr>
<tr>
<td>ExMax - 15/30 - R</td>
<td>15/30 Nm</td>
<td>24…240 VAC/DC</td>
<td>60 / 120 / 240 / 480 s/360°</td>
<td>–</td>
<td>On-off, 3-pos.</td>
<td>–</td>
<td>SB 1.0</td>
</tr>
<tr>
<td>ExMax - ... - CTS</td>
<td>Types as above with aluminium housing and seawater resistant coating (cable glands brass nickel-plated)</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ExMax - ... - VAS</td>
<td>Types as above with stainless steel housing for aggressive ambient (cable glands brass nickel-plated)</td>
<td></td>
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</tbody>
</table>

**Product views and applications**

**Description**

The ExMax actuators are a revolution for safety, control and shut-off dampers, VAV systems, rotation valves with angle of rotation > 90° and other motorized applications for HVAC systems in chemical, pharmaceutical, industrial and offshore/onshore plants, for use in Ex-areas zone 1, 2, 21, 22. Highest protection class (ATEX) and IP66 protection, small dimensions, only 3.5 kg weight, universal functions and technical data, an integrated heater and an optional stainless steel housing guarantee safe operation even under difficult environmental conditions. High quality brushless motors guarantee long life.

All actuators are programmable and adjustable on site. Special tools or equipment are not required. Motor running times, according to the actuator type, are selectable or adjustable on site. The integrated universal power supply is self adaptable to input voltages in the range of 24…240 VAC/DC. The actuators are 100 % overload protected and self locking.

Standard shaft connection is a double square direct coupling with 12 × 12 mm.

**Highlights**

> For all type of gas, mists, vapours and dust for use in zone 1, 2, 21 and 22
> Universal supply unit from 24…240 VAC/DC
> Motor running times 60–120–240–480 s/360° adjustable on site
> On-off and 3-pos. control
> 5–10–15–30 Nm actuators in the same housing size
> 100 % overload protected and self locking
> Compact design and small dimension (L × W × H = 210 × 95 × 80 mm)
> Direct coupling to the damper shaft with double square connection 12 × 12 mm
> n × 360° angle of rotation
> Robust aluminium housing (optional with seawater resistant coating) or in stainless steel
> IP66 protection
> Simple manual override included + preparation for comfortable manual override
> Gear made of stainless steel and sinter metal
> Weight only ~ 3.5 kg
> Integrated heater for ambient temperatures down to −40 °C
> Integrated safety temperature sensor
> Integrated equipment for manual adjustment (push button, lamp, switch)
### Technical data

<table>
<thead>
<tr>
<th></th>
<th>ExMax- 5.10 - R</th>
<th>ExMax- 15.30 - R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Torque motor (min.)</td>
<td>5 / 10 Nm selectable on site</td>
<td>15 / 30 Nm</td>
</tr>
<tr>
<td>Supply voltage / frequency</td>
<td>24...240 VAC/DC, ± 10 %, self adaptable, frequency 50...60 Hz ± 20 %</td>
<td></td>
</tr>
<tr>
<td>Power consumption</td>
<td>max. starting currents see</td>
<td>Extra information (in acc. with voltage, $I_{\text{start}} &gt; I_{\text{rated}}$). approx. 5 W holding power, approx. 16 W for heater</td>
</tr>
<tr>
<td>Protection class</td>
<td>Class I (grounded)</td>
<td></td>
</tr>
<tr>
<td>Angle of rotation and indication</td>
<td>$n \times 360^\circ$ multturn, mechanical value indication</td>
<td></td>
</tr>
<tr>
<td>Working direction</td>
<td>Selectable by left/right mounting to the damper/valve shaft</td>
<td></td>
</tr>
<tr>
<td>Motor running times</td>
<td>60 / 120 / 240 / 480 s / $360^\circ$ selectable on site</td>
<td></td>
</tr>
<tr>
<td>Motor</td>
<td>Brushless DC motor</td>
<td></td>
</tr>
<tr>
<td>Control mode</td>
<td>On-off and 3-pos. in acc. with wiring, selectable on site</td>
<td></td>
</tr>
<tr>
<td>Axle of the actuator</td>
<td>Double square 12 × 12 mm, direct coupling, 100 % overload protected and self locking up to 15 Nm</td>
<td></td>
</tr>
<tr>
<td>Electrical connection</td>
<td>Cable ~ 1 m, wire cross section 0.5 mm², equipotential bonding 4 mm². Connections in hazardous areas require an Ex-e terminal box!</td>
<td></td>
</tr>
<tr>
<td>Diameter of cable</td>
<td>~ Ø 7.1 mm</td>
<td>~ Ø 7.1 mm</td>
</tr>
<tr>
<td>Cable gland</td>
<td>M16 × 1.5 mm</td>
<td></td>
</tr>
<tr>
<td>Manual override</td>
<td>Use delivered socket wrench, max. 4 Nm</td>
<td></td>
</tr>
<tr>
<td>Heater</td>
<td>Integrated, controlled heater for ambient temperature down to −40 °C</td>
<td></td>
</tr>
<tr>
<td>Housing material</td>
<td>Aluminium die-cast housing, coated. Optional with seawater resistant coating (…-CTS) or stainless steel housing, N r 1.4581 / UNS-J92900 / similar AISI 316Nb (…-VAS)</td>
<td></td>
</tr>
<tr>
<td>Dimensions (L × W × H)</td>
<td>210 × 95 × 80 mm, for diagrams see</td>
<td>Extra information</td>
</tr>
<tr>
<td>Weight</td>
<td>~ 3.5 kg aluminium housing, stainless steel ~ 7 kg</td>
<td></td>
</tr>
<tr>
<td>Ambiants</td>
<td>Storage temperature −40...+70 °C, working temperature −40...+40 °C at T6 and −40...+50 °C at T5</td>
<td></td>
</tr>
<tr>
<td>Humidity</td>
<td>0...90 % RH, non condensing</td>
<td></td>
</tr>
<tr>
<td>Operation mode</td>
<td>100 % of ED is permitted (ED = duty cycle)</td>
<td></td>
</tr>
<tr>
<td>Maintenance</td>
<td>Maintenance free relative to function, maintenance must comply with regional standards, rules and regulations</td>
<td></td>
</tr>
<tr>
<td>Wiring diagrams</td>
<td>SB 1.0</td>
<td>SB 1.0</td>
</tr>
<tr>
<td>Scope of delivery</td>
<td>Actuator with 1 m cable, 4 screws M4 × 100 mm, 4 nuts M4, Allen key for simple manual override</td>
<td></td>
</tr>
<tr>
<td>Parameter at delivery</td>
<td>5 Nm, 120 s / $360^\circ$</td>
<td>15 Nm, 120 s / $360^\circ$</td>
</tr>
</tbody>
</table>

### Approbations

- **ATEX directive**: 2014/34/EU
- **EC type-approved**: PTB 04 ATEX 1028 X
- **IECEEx certified**: IECEx PTB 07.0057X
- **Approval for gas**
  - II 2 (1) G Ex d ia IIIC T6, T5
  - Types…-CTS
  - II 2 (1) G Ex d ia IIB T6, T5
- **Approval for dust**
  - II 2 (1) D Ex d iaD A21 IP66 T80, T95°C
- **CE identification**: CE Nr 0158
- **EMC directive**: 2014/30/EU
- **Low voltage directive**: 2014/35/EU
- **Enclosure protection**: IP66 in acc. with EN 60529

### Special solutions and accessories

- **…-CTS**: Types in aluminium housing with seawater resistant coating, parts nickel-plated
- **…-VAS**: Types in stainless steel housing, parts nickel-plated
- **ExBox-…**: Ex-e terminal boxes for zone 1, 2, 21, 22
- **MKK-S**: Mounting bracket for boxes type…-Box… directly on actuator
- **HV-S**: Comfortable manual override for…Max actuators size S
- **KB-S**: Clamp for damper shafts Ø 10...20 mm and □10...16 mm
- **AR-12-xx**: Reduction part for 12 mm square connection to 11, 10, 9 or 8 mm shafts
- **Kit-S8**: Cable glands nickel-plated
- **Adaptions** for dampers and valves on request

### Electrical connection

- **On-off / 3-pos.**
  - 24...240 VAC/DC
  - PE
  - a
  - b
  - 1 2 3 4
  - PA

### Accessory ExBox – adaptable Ex-e terminal box

For electrical connection of …Max actuators inside the hazardous area an Ex-e terminal box is required. ExBoxes are appropriate terminal boxes and placed at the disposal. To adapt the…Box directly to the actuator housing a mounting bracket type MKK-S is required.

ExBox- 3P for …-Max…-R
Important information for installation and operation

A. Installation, commissioning, maintenance
All national and international standards, rules and regulations for hazardous Ex-areas must be complied. Certified apparatus must be installed in accordance with manufacturer instructions. If the equipment is used in a manner not specified by the manufacturer, the safety protection provided by the equipment may be impaired. For electrical installations design, selection and erection, EN/IEC 60079-14 can be used. For electrical connection an Ex-e terminal box is required (e.g. ExBox-...).

Attention: If the actuator is put out of operation all Ex rules and regulations must be applied. You have to cut the supply voltage before opening the terminal box!

The cables of the actuator must be installed in a fixed position and protected against mechanical and thermal damage. Connect potential earth. Avoid temperature transfer from armature to actuator! Close all openings with min. IP66.

For outdoor installation a protective weather shield against sun, rain and snow should be applied to the actuator as well as a constant supply at terminal 1 and 2 for the integrated heater.

Actuators are maintenance free. An annual inspection is recommended. For electrical installations inspection and maintenance, EN/IEC 60079-17 can be used. Ex-actuators must not be opened by the customer.

B. Manual override
Manual override only if supply voltage is cut. Use delivered socket wrench with slow motions, usage can be tight.

Attention: Releasing or letting go the Allen key too fast at manual operating actuators with spring return causes risk of injury!

C. Shaft connection, selection of running time
Actuators are equipped with a direct coupling double square shaft connection of 12 × 12 mm. For round shafts adaptors/clamping connection (accessories, e.g. KB-S) are available. The housing of the actuator is axially symmetrically built to select Open-close direction of the spring return function by left-right mounting. Using the 10-position switch different motor running times and spring return running times can be selected on site in acc. to the actuator type.

D. 3-position control mode
Max actuators are in the best way suitable for the 3-pos. operation. To protect such elements as gears and mounting elements against harmful influences like minimum pulse time, ...Max actuators are protected via internal electronics. It ignores impulses < 0.5 s, the cyclic duration must be min. 0.5 s. At changing direction the pause is 1 s.

E. Operation at ambient temperatures below ~20 °C
All actuators are equipped with a regulated integrated heating device designed for employment down to ~40 °C ambient temperature. The heater will be supplied automatically by connecting the constant voltage supply on the clamps 1 and 2.

1. After mounting the actuator must be immediately electrically connected.
2. The heater switches on automatically when actuator reaches internally ~20 °C. It heats up the actuator to a proper working temperature, then heater switches off automatically. Actuator will not run during heating process.
3. The adjustment options are only ensured after this heating up period.

F. Excess temperatures
In acc. to the ATEX rules and regulations Ex actuators must be protected against excess temperature. The internal thermostat works as a maximum limiter and, in the event of failure at incorrect temperatures, shuts off the actuator irreversible. An upstream connected temperature sensor stops the actuator before reaching its max. temperature. This safety feature is reversible, after cooling down the actuator is completely functional again. In this case the failure must be eliminated immediately on site!

G. Synchron mode
Do not connect several actuators to one shaft or link mechanically together.

Extra information (see additional data sheet)

Additional technical information, dimensions, installation instruction, illustration and failure indication

Parameters, adjustments and failure indication

Switch – Push button – Lamp for adjustment (behind the blanking plug)
10-position switch (S)
Push button (T)
3-colour LED

B) Selection of running time and torque:

- 3-colour LED
- 10-position switch (S) (behind the blanking plug)
- for adjustment

Switch – Push button – Lamp – Switch position

Ex area – zone 1, 2, 21, 22

Supplementary information (see additional data sheet)

Additional technical information, dimensions, installation instruction, illustration and failure indication

ExMax-S-R-en
V01 – 27-Jun-2017

Extra information (see additional data sheet)

Additional technical information, dimensions, installation instruction, illustration and failure indication

ExMax-S-R-en
V01 – 27-Jun-2017