



ExMax ¼ turn actuators – size S

Electrical, explosion proof rotary actuators

On-off / 3-pos. control mode, 24...240 VAC/DC, 95° angle of rotation incl. 5° pretension

5/10 Nm, 15/30 Nm without and 5/10 Nm, 15 Nm with safety operation (spring return)

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

ExMax - ...

ExMax - ... - F

ExMax - ... - S

ExMax - ... - SF

ExMax - ... - CTS

ExMax - ... - VAS

Subject to change!

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

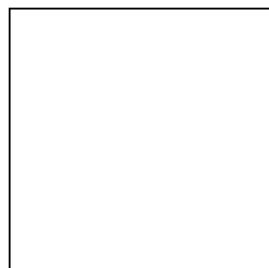
Type	Torque	Supply	Motor running time	Spring return	Control mode	Feedback	Wiring diagram
ExMax- 5.10	5 / 10 Nm	24...240 VAC/DC	3 / 15 / 30 / 60 / 120 s/90°	–	On-off, 3-pos.	–	SB 1.0
ExMax-15.30	15 / 30 Nm	24...240 VAC/DC	3 / 15 / 30 / 60 / 120 s/90°	–	On-off, 3-pos.	–	SB 1.0
ExMax- 5.10 - F	5 / 10 Nm	24...240 VAC/DC	3 / 15 / 30 / 60 / 120 s/90°	3 or 10 s/90°	On-off, 3-pos.	–	SB 2.0/2.1
ExMax- 15 - F	15 Nm	24...240 VAC/DC	3 / 15 / 30 / 60 / 120 s/90°	3 or 10 s/90°	On-off, 3-pos.	–	SB 2.0/2.1
ExMax- ... - S/SF	Types as above with 2 integrated, potential free auxiliary switches, 5° and 85° angle of rotation					2 × aux. switches	SB 3.0
ExMax- ... - CTS	Types as above with aluminium housing and seawater resistant coating (cable glands brass nickel-plated)						
ExMax- ... - VAS	Types as above with stainless steel housing for aggressive ambient (cable glands brass nickel-plated)						

Product views and applications

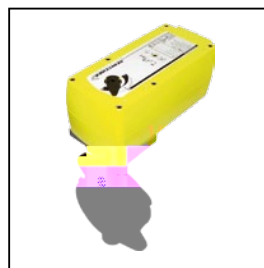
Safety damper



Ball valve



Throttle valve



Description

The ExMax actuators are a revolution for safety, control and shut-off dampers, VAV systems, ball valves, throttle valves and other motorized applications for HVAC systems in chemical, pharmaceutical, industrial and offshore/onshore plants, for use in Ex-areas zone 1, 2 (gas) and zone 21, 22 (dust).

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 and torques as well as spring return 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.

...Max-...F actuators are equipped with spring return fail safe function. Standard shaft connection is a double square direct coupling with 12 × 12 mm.

Different accessories are available to adapt auxiliary switches, terminal boxes or adaptations for ball valves and throttle valves and other armatures.

Highlights

- For all types of gases, mists, vapours and dusts in zones 1, 2, 21 and 22
- Universal supply unit from 24...240 VAC/DC
- 5 different motor running times 3–15–30–60–120 s/90°, adjustable on site
- 2 different spring return running times ~ 3–10 s/90°, selectable on site
- On-off and 3-pos. control with or without spring return function
- 2 integrated auxiliary switches, switching at 5° and 85° (option ...-S)
- 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
- 95° angle of rotation inclusive 5° pretension
- 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)
- Preparation for adaptable and adjustable auxiliary switches type ...Switch



ExMax-...

ExMax-...-F

ExMax-...-S

ExMax-...-SF

SCHISCHEK
 EXPLOSIONPROOF

Special options

... -CTS

... -VAS

Technical data	ExMax- 5.10	ExMax- 15.30	ExMax- 5.10 -F	ExMax- 15 -F
Torque motor (min.)	5 / 10 Nm selectable on site	15 / 30 Nm selectable on site	5 / 10 Nm selectable on site	15 Nm
Torque spring (F)	–	–	min. 10 Nm	min. 15 Nm
Torque blockade	In blockade and end positions torques are higher than above specified torques for motor and spring.			
Dimensioning of external load	Upon spring return the external load should be max. 80 % of torque spring (F).			
Supply voltage / frequency	24...240 VAC/DC ± 10 %, self adaptable, frequency 50...60 Hz ± 20 %			
Power consumption	max. starting currents see ❶Extra information (in acc. with voltage, $I_{start} >> I_{rated}$), approx. 5 W holding power, approx. 16 W for heater			
Protection class	Class I (grounded)			
Angle of rotation and indication	95° incl. ~ 5° pretension, mechanical value indication			
Working direction	Selectable by left/right mounting to the damper/valve shaft			
Motor running times	3 / 15 / 30 / 60 / 120 s/90° selectable on site			
3 sec. mode – motor	In acc. with the supply voltage and external torque 3 to 4 s/90° angle of rotation			
Motor	Brushless DC motor			
Control mode	On-off and 3-pos. in acc. with wiring, selectable on site			
Spring return (F)	–	–	spring return upon voltage interruption	
Spring return response time	–	–	up to 1 sec. after voltage interruption	
Spring return running time (F)	–	–	~ 3 or 10 s/90° selectable on site	
3 sec. mode – spring return	–	–	~ 3 to 4 s/90° angle of rotation acc. to external load	
Safety operations at 10 sec. (F)	–	–	min. 10,000 acc. to construction of damper and ambient	
at 3 sec. (F)	–	–	min. 1,000 acc. to construction of damper and ambient	
Auxiliary switches	...-S, ...-SF 2 integrated auxiliary switches, switching at 5° and 85° angle of rotation, potential free. Grid fuse-protection is recommended!			
	U_{max}/I_{max} AC = 250 V/5 A; U_{min} AC/DC = 5 V; After one-time operation with $U > 24$ V AC/DC or $I > 100$ mA: U_{min} AC/DC = 12 V			
	U_{max}/I_{max} DC = 48 V/1 A; I_{min} AC/DC = 5 mA; I_{min} AC/DC = 100 mA			
Axle of the actuator	Double square 12 × 12 mm, direct coupling, 100 % overload protected and self locking up to 15 Nm			
Electrical connection	Cable ~ 1 m, wire cross section 0.5 mm², equipotential bonding 4 mm².			
	Connections in hazardous areas require an Ex-e terminal box!			
Diameter of cable	~ Ø 7.1 mm	~ Ø 7.1 mm	~ Ø 7.4 mm	~ Ø 7.4 mm
	2 cables in the versions ...-S and ...-SF (~ Ø ... + 7.4 mm)			
Cable gland	M16 × 1.5 mm			
Manual override	Use delivered socket wrench, max. 4 Nm			
Heater	Integrated, controlled heater for ambient temperature down to –40 °C			
Housing material	Aluminium die-cast housing, coated. Optional with seawater resistant coating (...-CTS) or stainless steel housing, Ne 1.4581 / UNS-J92900 / similar AISI 316Nb (...-VAS)			
Dimensions (L × W × H)	210 × 95 × 80 mm, for diagrams see ❶Extra information			
Weight	~ 3,5 kg aluminium housing, stainless steel ~ 7 kg			
Ambients	Storage temperature –40...+70 °C, working temperature –40...+40 °C at T6 resp. –40...+50 °C at T5			
Humidity	0...90 % rH, non condensing			
Operating 3 sec. motor run time	In 3 s mode the motor will work only after 1 minute of voltage supply. While open/close operation (open voltage supply and shut it down) motor works only with speed of 15 s/90°			
≥ 15 sec. motor run time	at 15 / 30 / 60 / 120 s 100 % of ED is permitted (ED = duty cycle)			
Wiring diagrams	SB 1.0	SB 1.0	SB 2.0 / 2.1	SB 2.0 / 2.1
Scope of delivery	Actuator, 4 screws M4 × 100 mm, 4 nuts M4, Allen key for simple manual override			
Parameter at delivery	5 Nm, 30 s/90°	15 Nm, 30 s/90°	5 Nm, 30 s/90°	15 Nm, 30 s/90°

Approbations

ATEX Directive	2014/34/EU
EU-Type Examination	EPS 17 ATEX 1 132 X
IECEx Conformity	IECEx EPS 17.0065X
Marking Gases	II 2 (2) G Ex db [ib Gb] IIC T6, T5 Gb
Types ...-CTS	II 2 (2) G Ex db [ib Gb] IIB T6, T5 Gb
Marking Dusts	II 2 (2) D Ex tb [ib Db] IIIC T80°C, T95°C Db

CE Marking	CE 0158
EMC Directive	2014/30/EU
Low Voltage Directive	2014/35/EU
Enclosure Protection	IP66 in acc. with EN 60529

Special options

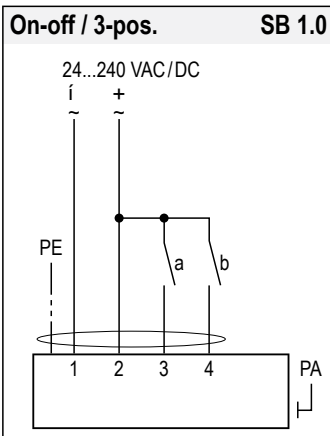
...-CTS

... -VAS

Electrical connection

All actuators are equipped with a universal supply unit working at a voltage range from 24...240 VAC/DC. The supply unit is self adjusting to the connected voltage!
The safety operation of the spring return function works if the supply voltage is cut.
For electrical connection inside hazardous areas an Ex-e terminal box, certificated in acc. with ATEX is required (e.g. ExBox).
An over-current protection fuse < 10 A has to be provided by installer.
Note: the initial current is appr. 2 A for 1 second.
Integrated auxiliary switches signal the rotation angle's position. U_{min} and I_{min} change once the switches were operated with higher voltage or current.

Wiring diagram ExMax- ... (without spring return)

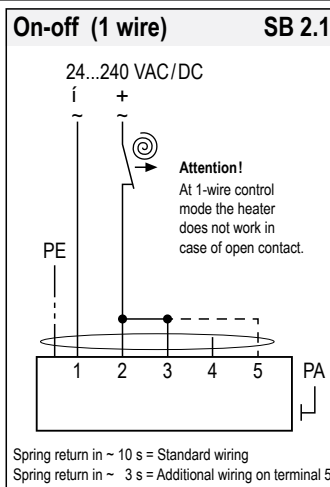
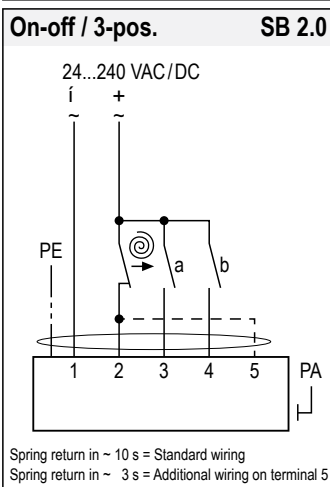


During commissioning apply
a self adjustment drive.

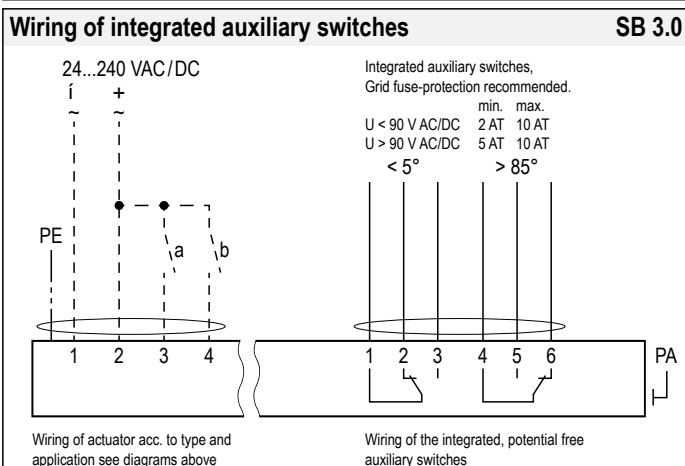
Regard duty cycle at motor running times!

Never use spring return actuators without external load.

Wiring diagram ExMax- ... -F (with spring return)

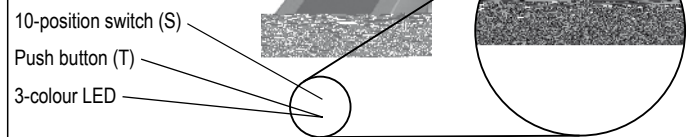


Wiring diagram ExMax- ... -S and ... -SF



Parameters, adjustments and failure indication

**Switch – Push button – Lamp
for adjustment
(behind the blanking plug)**



Parameter selection

Example:
ExMax-15.30

Requested parameter:
Torque 30 Nm
Motor running time 30 s/90°

Result:
Switch position **07**

Type		Torques	
ExMax-	5.10 ▶	5 Nm	10 Nm
ExMax-	15.30 ▶	15 Nm	30 Nm
ExMax-	5.10-F ▶	5 Nm	10 Nm
ExMax-	15-F ▶	15 Nm	
	▼		▼
Running times		Position of switch (S)	
3 s/90° ▶	00	05	
15 s/90° ▶	01	06	
30 s/90° ▶	02	<u>07</u>	
60 s/90° ▶	03	08	
120 s/90° ▶	04	09	

Functions, adjustments and parameters

A) Self adjustment of angle of rotation

Turn switch (S) to position 02 (low torque) or 07 (high torque). Press button (T) for a minimum of 3 seconds. The actuator drives to both end positions and detects the blocking positions. The LED flashes GREEN during adjustment.

The adjustment takes about 60 seconds (30 sec. "On", 30 sec. "Off").

B) Selecting motor running time and torque

Adjust parameters only if actuator is in idle state or without applied potential.

Turn switch (S) to the position required for the intended operation acc. to table above. The selected parameters will be carried out at the actuator's next operation.

C) Selecting spring return time

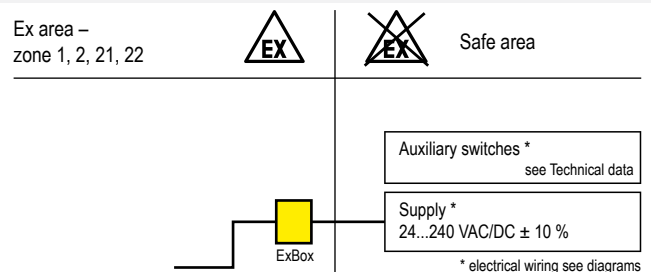
Spring return time is selected by wiring.

D) Additional information for control in 3-pos. operation

a closed, b open	= direction I	a and b closed	= motor doesn't work
b closed, a open	= direction II	a and b open	= motor doesn't work

The rotation direction (I and II) depends on left/right mounting of the actuator to the damper. To reverse the rotation direction (by motor) exchange the electrical wiring of terminal 3 and 4.

Installation



- Do not open the cover when circuits are live
- Connect potential earth
- Close all openings to ensure enclosure protection
- Clean only with damp cloth, avoid dust accumulation

