



ExMax – ¼ turn actuator

Electrical, explosion proof rotary actuators size M

On-off / 3-pos , 24...240 VAC/DC, 95° Angle of rotation incl. 5° pretention

50 - 150 Nm without and 30 Nm - 60 Nm with safety operation (spring return)

PTB-tested in acc. with ATEX RL 94/9/EC for zone 1, 2, 21, 22.

ExMax - 50.75
ExMax - 100
ExMax - 150
ExMax - 30 - F
ExMax - 50 - F
ExMax - 60 - F
ExMax - ... - S/SF
ExMax - ... - CTM

Subject to change!

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

Type	Torque	Supply	Motor running time	Spring return	Control mode	Feedback	Wiring diagram
ExMax- 50.75	50 Nm & 75 Nm	24..240 VAC/DC	40/60/90/120/150 sec. at 90°	without	On-off, 3-pos	-	SB 1.0
ExMax- 100	100 Nm	24..240 VAC/DC	40/60/90/120/150 sec. at 90°	without	On-off, 3-pos	-	SB 1.0
ExMax- 150	150 Nm	24..240 VAC/DC	40/60/90/120/150 sec. at 90°	without	On-off, 3-pos	-	SB 1.0
ExMax- 30 - F	30 Nm	24..240 VAC/DC	40/60/90/120/150 sec. at 90°	20 sec. at 90°	On-off, 3-pos	-	SB 1.1
ExMax- 50 - F	50 Nm	24..240 VAC/DC	40/60/90/120/120 sec. at 90°	20 sec. at 90°	On-off, 3-pos	-	SB 1.1
ExMax- 60 - F	60 Nm	24..240 VAC/DC	40/60/90/120/120 sec. at 90°	20 sec. at 90°	On-off, 3-pos	-	SB 1.1
ExMax- ... - S/SF	Type as above but with 2 integral, potential free aux. switches, switching at 5° and 85° Angle of rotation				max.24 V/1 A, 240 V/0,25 A		SB 3.5
ExMax- ... - CTM	Type as above but with aluminium housing and Amercoat paint, gearbox parts in stainless steel, cable gland and hollow rivet nickel-plated						

Application

Damper



Ball valve



Throttle valve



Description size M

The ExMax actuators are a revolution for safety, control and shut-off dampers, 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 IP 66 protection, small dimensions, only 9,5 kg weight, universal functions and technical data, an integrated heater 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 - according to the actuator type - selectable or adjustable on site. The integrated universal power supply is self adaptable to input voltages in the range of 24 to 240 VAC/DC.

The actuators are 100% overload protected.

ExMax-...-F actuators are equipped with spring return fail safe function. Standard shaft connection is a double squared direct coupling with 16 x 16 mm.

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

Highlights

- ▶ For all type of gas, mixtures, vapours and dust for use in zone 1, 2, 21 and 22
- ▶ Universal supply unit from 24 to 240 VAC/DC
- ▶ 5 different motor running times (40-60-90-120-150 sec./90°), adjustable on site
- ▶ 2 different spring return running times (20 sec./90°), selectable on site
- ▶ On-off and 3-pos control with or without spring return function
- ▶ 30 - 150 Nm actuators in the same size (M)
- ▶ 100 % overload protected
- ▶ Compact design and small dimension (L x W x H = 286 x 150 x 116 mm)
- ▶ Direct coupling to the damper shaft with double-squared connection 16 x 16 mm
- ▶ 95° Angle of rotation incl. 5° pre-tention
- ▶ Robust aluminium housing (optional Amercoat painting)
- ▶ IP66 protection
- ▶ Simple manual override include + preparation for comfortable manual override
- ▶ Gear made of stainless steel and sinter metal
- ▶ Only 9,5 kg weight
- ▶ Integral heater for ambient temperatures down to -40°C
- ▶ Integral safety temperature sensor
- ▶ Integral equipment for manual adjustment (push button, lamp, switch)
- ▶ Preparation for adaptable aux. switches type ExSwitch
- ▶ Range of accessories



ExMax-50...150

ExMax-30...60-F

Special makes

ExMax-...-S/SF

ExMax-...-CTM

SCHISCHEK
EXPLOSION PROOF

Technical data	ExMax-50.75	ExMax-100	ExMax-150	ExMax-30-F	ExMax-50-F	ExMax-60-F
Torque motor	50 / 75 Nm selectable	100 Nm	150 Nm	30 Nm	50 Nm	60 Nm
Torque spring return (F)	without F	without F	without F	min. 30 Nm	min. 50 Nm	min. 60 Nm
Dimension of external torque	above mentioned torques are min. torques in blocked position, external torque should be max. 80 % of max. actuator torque but min.10 Nm					
Supply voltage/Frequency	24...240 VAC/DC ± 10 %, self adaptable, Frequency 50...60 Hz ± 20 %					
Power supply rating	Inrush current 2 A max. 1 sec. nominal current (I start >> I rated)					
Power consumption	see table extra info EL depends on voltage and adjusted running time max. 30 W resp. 50 VA, in blocking position max. 10 W					
Power consumption heater	approx. 16 W, heater starts at temperature lower -20 °C					
Protection class	class I (grounded)					
Angle of rotation and indication	95°, incl. ~ 5° pre-tention, mechanical value indication					
Working direction	selectable by left/right mounting to the damper/valve shaft					
Motor running time	40 / 60 / 90 / 120 / 150 sec. at 90° selectable on site					
Motor	brushless DC Motor					
Spring return (F)	without F	without F	without F	spring return in the event of loss of power		
Spring return running time (F)	without F	without F	without F	spring return in 20 sec. at 90°		
Safety operations	min. 10.000 in acc. with construction of damper and ambient					
Response time spring return	up to 1 sec. after power failure					
Control mode	On-off and 3-pos in acc. with wiring, selectable on site					
Axle of the actuator	double squared 16 × 16 mm, direct coupling, 100 % overload protected					
Electrical connection	cable, ~1 m, diameter of wires 0,5 mm², for connection inside hazardous areas an Ex-e terminal box is required!					
Diameter of cable	~ Ø 7,1 mm (..Max-...S/SF = 1 × ~ Ø 7,1 mm / 1 × Ø 7,4 mm)					
Cable gland	M16 × 1,5 standard cable and wire entries are integral part of explosions proof encapsulation					
Manual override	Manual override only if supply voltage is cut, use delivered socket wrench, slow motion, enough torque/force is required Attention: with manual operation of actuators with spring return danger of injury exists, with release/let go the socket wrench.					
Integral heater	integral heater, controlled, for ambient temperature down to -40°C					
Housing material	Aluminium die cast housing, painted (optional in amercoat painted = CTM)					
Dimensions	L × W × H = 286 × 150 × 116 mm, for diagramm see extra information „ME-M“					
Weight	~ 9,5 kg aluminium housing					
Ambients	storage temperature -40...+70°C, working temperature -40...+40°C at T6 and -40...+50°C at T5					
Humidity	0..90 %rH non condensing					
Operation mode	100 % ED					
Self adjustment	if you select 40 sec. and 60 sec. mode for motor or rotation angle < 90° you need to start the self adjustment mode					
Maintenance	maintenance free, maintenance must be complied with regional standards, rules and regulations					
Cleaning	Dirt and dust deposition should be avoided, for cleaning use wet cloth					
Wiring diagrams (SB)	SB 1.0	SB 1.0	SB 1.0	SB 1.1	SB1.1	SB1.1
Delivery	1 actuator, 1 m cable, double squared shaft connection 16 × 16 mm, 4 screws M8 × 140, 4 nuts M8 socket wrench for simple manual override					
Parameter at delivery	50 Nm. 90 s/90°	100 Nm. 90 s/90°	150 Nm. 90 s/90°	30 Nm. 90 s/90°	50 Nm. 90 s/90°	60 Nm. 90 s/90°

Explosion proof	ExMax actuators – size M
PTB-tested	PTB 04 ATEX 1028 X
In acc. with ATEX	RL 94/9/EC (ATEX)
Approval for gas	II(2)G Ex d[ia] IIC T6/T5 gas, mist, vapour, zone 1 and 2
Approval for dust	II(2)D Ex tD A21 [iaD] IP66 T80°C dust, zone 21 and 22
Identification	CE No. 0158
EMC	2004/108/EC
Low voltage	2006/95/EC
IP-Protection	IP66, in acc. with EN 60529
Potential compensation	external PA-terminal, 4 mm ²

Accessories or special solutions – size M	
ExMax-...-S	2 internal, potential free limit switches at 5°/85°, 24 V/3 A, 250 V/0,25 A, SB 3.5
...-CTM	above listed types in Aluminium housing marine painted
ExBox-...	Ex-e terminal boxes for zone 1, 2, 21, 22
MKK-M	mounting bracket for terminal boxes type ExBox-... direct on actuator
ExSwitch	2 external aux. switches, adjustable, for zone 1, 2, 21, 22
HV-M	comfortable manual override for ExMax actuators size M
Adaptations	various adaptations for dampers/valves on request
ExMax-... S3	Special version ambient temperature up to +60°C (T4), 110-240VAC/DC





ExMax-50...150

ExMax-30...60-F

Special makes

ExMax-...-S/SF

ExMax-...-CTM

SCHISCHEK
EXPLOSION PROOF**Electrical connection**

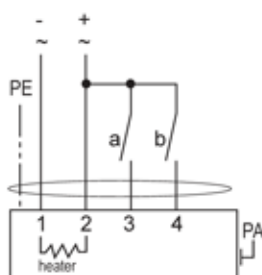
ExMax actuators are equipped with a universal supply unit working at a voltage range from 24 to 240 VAC/DC. The supply unit is self adjustable to the connected voltage!

The safety operation of the spring return function works if the supply voltage is cut. For electrical connection inside hazardous locations an explosion proof junction box is required. For permanently connected equipment is an external 5 A (time lag) circuit-breaker in the control cabinet required.

Wiring diagram ExMax-... (without spring)

SB 1.0

24 to 240 VAC/DC

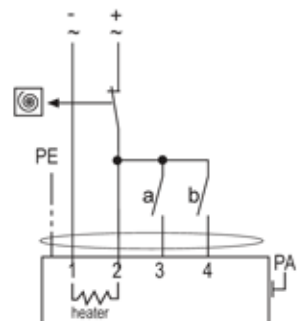
**Attention**

If 40 sec. or 60 sec. mode is selected, the self adjustment of angle of rotation must be started.

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

SB 1.1

24 to 240 VAC/DC

**Attention!**

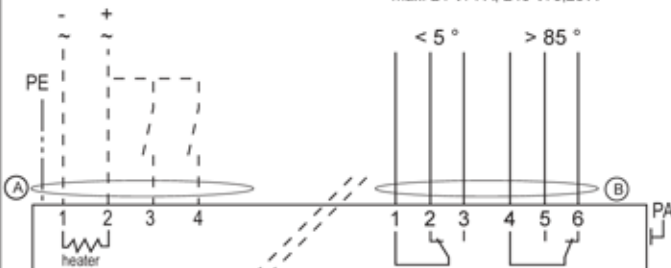
If 40 sec. or 60 sec. mode is selected for motor and/or spring return, the self adjustment of angle of rotation must be started.

Never use actuators in this mode without external torque/force.

Wiring diagram type ExMax-...-M with integral aux. switches**Wiring of integral aux. switches**

SB 3.5

24 to 240 VAC/DC



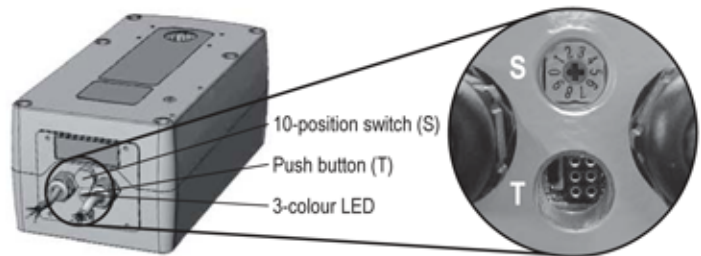
Integral aux. switches
potential free contacts
switching at 5° and 85°
Angle of rotation
max. 24 V/1 A, 240 V/0.25 A

Wiring of the actuator in acc. with
actuator type, see wiring diagrams 1.0/1.1

Additional wiring of the integral aux. switches

Parameter, Adjustment – Failure indication

Switch – Push button – Lamp for adjustment, behind the blanking plug

**Parameter selection**

Example: ExMax-50.75

Requested parameter:

Torque 75 Nm

Running time motor 90 sec/90°

Result: switch position (S) 07

Type	Torques	
ExMax- 50.75	50 Nm	75 Nm
ExMax- 100	100 Nm	
ExMax- 150	150 Nm	
ExMax- 30-F	30 Nm	
ExMax- 50-F	50 Nm	
ExMax- 60-F	60 Nm	
Running times		Position of switch S
40 sec./90°	00	05
60 sec./90°	01	06
90 sec./90°	02	07
120 sec./90°	03	08
150 sec./90°	04	09

Function, adjustment and parameter**A) Self adjustment of Angle of rotation:**

Switch (S) into position 02 (low torque) or 07 (high torque), then push button (T) for minimum 3 seconds. The actuator will drive into both end positions to be adjusted. LED indicates green.

Adjustment time needs approx. 180 sec. (90 sec. On, 90 sec. Off). After that, switch S into position 00-09 in acc. with your required torque and running time.

B) Selection of running time and torque:

Put switch (S) into the correct/selected position in acc. to above table.

The selected parameter will work at next operation of the actuator.

Adjustment can be done even without supply voltage. If supply voltage is available turn switch only if actuator is not running.

C) Additional information for 3-pos operation:

a closed, b open = direction I

b closed, a open = direction II

a and b closed = Motor doesn't work

a and b opened = Motor doesn't work

Direction (I and II) depends on left/right mounting of the actuator to the damper/valve.

You can change direction of the motor by changing electrical wiring terminal 3 and 4.

Error indication

See extra information „EL-M“



ExMax-50...150

ExMax-30...60-F

Special makes

ExMax-...-S/SF

ExMax-...-CTM

SCHISCHEK
EXPLOSION PROOF**Mounting instructions and important information for operation and installation****Important information for installation and operation****A. Installation, commissioning, maintenance**

The cable of the actuator must be installed in a fixed position and protected against mechanical and thermal damage. In acc. with operation ExMax actuators are maintenance free. Nevertheless maintenance must comply with regional standards, rules and regulations. The flameproof enclosure is protected against mechanical shock in acc. with EN 60079 by the housing of the actuator.

The actuators must not be opened by the customer. For outdoor installation a protective housing against rain, snow and sun should be applied to the actuator, as well as a constant supply at terminal 1 and 2 for the integral heater. For electrical connection inside hazardous areas an Ex-e terminal box is requested (e.g. type ExBox).

Attention: If the actuator is put out of operation all Ex-rules and regulation must be applied.

Example: you have to cut the supply voltage before opening an Ex-e terminal box

B. Shaft connection, selection of running time, heater

ExMax actuators are equipped with a direct coupling double squared shaft connection of 16 x 16 mm. The housing of the actuator is axially symmetrically built to select open/close direction of the spring return function by left/right mounting.

In acc. to the actuator type 5 different motor running times can be selected on site. The integral heater is for ambient temperatures down to -40°C.

C. 3-pos control mode

See extra information „EL-M“.

D. Spring return

Spring return function works if the supply voltage (terminal 1 or 2) is cut. In the event of an electrical interruption, the spring returns to its end position.

E. Operation at an ambient temperature below -20°C

See extra information „EL-M“.

F. Excess temperature

In acc. to the ATEX rules and regulations Ex actuators must be protected against excess temperature. An internal thermostat guarantees the temperature class in the event of failure. If this thermostat is working the actuator must be sent to the factory.

ExMax actuators are equipped with an additional temperature sensor to stop the actuator before reaching this max. temperature. In this case the failure must be eliminated immediately on site.

G. Loss of voltage

In switch position 0, 1 and 5, 6 (motor running time 40, 60 sec.) and after voltage interrupts moves the actuator (type 50.75 and -100, -150 /-S) in OFF position then the actuators works regarding control signal.

H. Synchronous mode

To link two or more actuators together is not permitted.

Extra information „EL-M“ (see additional data sheet)

extra technical information, versions of circuit diagrams and failure indication

Extra information „ME-M“ (see additional data sheet)

extra technical information, dimensions, installation instruction and illustration

Mounting on air dampers with double squared shaft connection

Details see extra information „ME-M“.

Mounting of quarter turn valves

Details see extra information „ME-M“.

ExSwitch – adaptable external Ex-d aux. switches

ExSwitch is an accessory to ExMax actuators, fixing directly onto the actuator. ExSwitch are aux. switches with 2 potential free contacts, adjustable on site. The electrical wiring needs an Ex-e terminal box.

ExBox – adaptable Ex-e terminal box

For electrical connection of an ExMax-.. inside the hazardous area an Ex-e terminal box is required.

ExBox-3P for ExMax-.. actuators.

ExBox-Y/S for ExMax-... integral aux. switches.

To adapt the ExBox direct to the actuator housing an additional accessory type **MKK-M** is required.