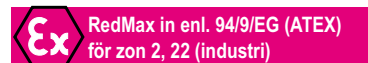


## RedMax - vridande industrispjällmotorer



### Produktkännetecken

RedMax-motorerna är explosionssäkra enligt 94/9/EG(ATEX) för montering inom zon 2 och 22 samt uppfyller IP65. Motorer med vridmoment från 5 till 30 Nm har alla samma byggmått; h\*b\*I = 80\*93\*209 mm = storlek S. Kapslingsmaterialet är aluminium som standard alt. rostfritt stål som tillval vid aggressiv miljö. Axelkopplingen är fyrkanthål 12 x 12 mm. Märkspänningen är självjusterande från 24 till 230 V AC/DC. Gångtiden är valbar. Återgångstiden för fjädermotorerna kan vid elinkopplingen väljas mellan 3 och 10 sek. En inbyggd förvärmare medger en omgivande drifttemperatur om -40°C. Levereras med 1 m förmonterad kabel samt med don för manuell inställning av spjälläge



Storlek S - (80x93x209 mm)

### Motorer utan fjäderåtergång, 5...30 Nm, 24...230 VAC/DC, 95° vridområde

RedMax	Vridmoment	Gångtid 90°	Fjäderretur	Styrsignal	Mätspänning	Tillbehör	Utf.
RedMax- 5.10	5 alt. 10 Nm	3, 15, 30, 60, 120 s	-	On-off, 3-punkt	-	-	S
RedMax-15.30	15 alt. 30 Nm	3, 15, 30, 60, 120 s	-	On-off, 3-punkt	-	-	S
RedMax- 5.10 - S	5 alt. 10 Nm	3, 15, 30, 60, 120 s	-	On-off, 3-punkt	-	2 integr. hjälpbrytare	S
RedMax-15.30 - S	15 alt. 30 Nm	3, 15, 30, 60, 120 s	-	On-off, 3-punkt	-	2 integr. hjälpbrytare	S
RedMax- 5.10 - Y	5 alt. 10 Nm	3, 15, 30, 60, 120 s	-	3-punkt, 0...10V-, 4..20 mA	0...10V-, 4..20 mA	-	S
RedMax-15.30 - Y	15 alt. 30 Nm	3, 15, 30, 60, 120 s	-	3-punkt, 0...10V-, 4..20 mA	0...10V-, 4..20 mA	-	S

### Motorer med fjäderåtergång, 5...30 Nm, 24...230 VAC/DC, 95° vridområde

RedMax	Vridmoment	Gångtid 90°	Fjäderretur	Styrsignal	Mätspänning	Tillbehör	Utf.
RedMax-5.10 - F	5 alt. 10 Nm	3, 15, 30, 60, 120 s	3 / 10 sek	On-off, 3-punkt	-	-	S
RedMax- 15 - F	15 Nm	3, 15, 30, 60, 120 s	3 / 10 sek	On-off, 3-punkt	-	-	S
RedMax-5.10 - SF	5 alt. 10 Nm	3, 15, 30, 60, 120 s	3 / 10 sek	On-off, 3-punkt	-	2 integr. hjälpbrytare	S
RedMax- 15 - SF	15 Nm	3, 15, 30, 60, 120 s	3 / 10 sek	On-off, 3-punkt	-	2 integr. hjälpbrytare	S
RedMax-5.10 - YF	5 alt. 10 Nm	3, 15, 30, 60, 120 s	3 / 10 sek	3-punkt, 0...10V-, 4..20 mA	0...10V-, 4..20 mA	-	S
RedMax- 15 - YF	15 Nm	3, 15, 30, 60, 120 s	3 / 10 sek	3-punkt, 0...10V-, 4..20 mA	0...10V-, 4..20 mA	-	S
RedMax-5.10 - BF	5 alt. 10 Nm	3, 15, 30, 60, 120 s	3 / 10 sek	On-off	-	EEx-i utgång+ 2x 1p2v	S
RedMax- 15 - BF	15 Nm	3, 15, 30, 60, 120 s	3 / 10 sek	On-off	-	EEx-i utgång+ 2x 1p2v	S

### Motorer utan fjäderåtergång, 5...30 Nm, 24...230 VAC/DC, roterande n x 360°

RedMax	Vridmoment	Gångtid / 360°	Fjäderretur	Styrsignal	Mätspänning	Utf.
RedMax 5.10 - R	5 alt. 10 Nm	12, 60, 120, 240, 480 s	-	On-off, 3-punkt	-	S
RedMax 15.30 - R	15 alt. 30 Nm	12, 60, 120, 240, 480 s	-	On-off, 3-punkt	-	S

### Tillbehör

Artikel	Beskrivning	
RedMax-.../VA	Kapsling av rostfritt stål AISI 316 (för storlek S)	Exempel: typ RedMax-5.10/VA
RedSwitch	2 externa hjälpbrytare passande RedMax motorer	Justerbara för zon 2 och 22
RedBox-3P	Kopplingsbox I13G/I13D EEx e IIT6, zon 2, 22	För RedMax-5.10, RedMax-15.30, RedMax-...-F, RedMax-...-R
RedBox-3SP	Kopplingsbox I13G/I13D EEx e IIT6, zon 2, 22	För RedMax-...-S, RedMax-...-SF
RedBox-Y	Kopplingsbox I13G/I13D EEx e IIT6, zon 2, 22	För RedMax-...-Y, RedMax-...-YF
RedBox-BF	Kopplingsbox I13G/I13D EEx e IIT6, zon 2, 22	För RedMax -...-BF
MKK-S	Monteringskonsol för montering av kopplingsbox RedBox...	För samtliga motorer storlek S
LIN-S	Linjärkonsol, för omvandling av vridande- till linjär rörelse	För samtliga motorer storlek S, valbar slaglängd 10, 20, 30, 42 mm
VAD-...	Adapter för anpassning av LIN-S till sätesventil	Flera ventiltyper och fabrikat enligt separat förteckning
D-F.-S	Adapter med fläns enligt DIN EN 5211	För samtliga motorer storlek S
KB-S	Klämbygel (universal) för runda och fyrkantiga spjällaxlar	För samtliga motorer storlek S, axelt Ø 10 to 20 mm, Ø 10 to 16 mm
HV-S	Tillbehör för manuell inställning av spjälläge	För samtliga motorer storlek S
DWB-S	Mekanisk vridvinkelbegränsning	För samtliga motorer storlek S
FireSafe	Temperaturvakt för säkerhetsspjäll (ex. brand) 72°C	Ansluts endast till EEx-i utgång från RedMax-...-BF motorer
AR-12-xx	Övergång från motors 12 mm fyrkanthål till fyrkantaxel	11 mm (AR-12-11), 10 mm (AR-12-10), 8 mm (AR-12-08)
3P3A	Modul för 3-Punkts / 3-ledarstyrning och panelmontage på skena	3-punkts styrsignal för öka/minska-motorer med 3-ledarstyrning

## RedMax rotary actuators

**Ex** RedMax in acc. with 94/9/EG (ATEX) for zone 2, 22 and for industry

### Basics

ExMax actuators are fully equipped in the basic version, with a lot of adjustable parameters to reduce types and increase parallel function. Only 1 size (S) is necessary to achieve torques from 5 to 30 Nm. ExMax actuators are explosion proof for use in all type of gas, mists, vapours and dust in zone 2 and 22. The standard version has a robust, antistatic aluminium housing, with an optional AISI 316 stainless steel housing for aggressive atmospheres e.g. for use in the food industry. The shaft connection is squared with 12 x 12 mm. All actuators have an internal multifunctional power supply, with a wide working range from 24 to 230 VAC/DC. The universal power supply is self adjustable.

For use down to -40°C the actuators is equipped with an internal heater.

Delivery with 1 m cable, tool for simple manual override and prepared for a comfortable manual override type HV-S.



**Size S** - (hxwxl 80 x 95 x 210 mm)

### Actuators without spring return, 5...30 Nm, 24...230 VAC/DC, 95° angle of rotation

RedMax	Torque	Motor running 90°	Spring return	Control mode	Feedback signal	add. equipment	Size
RedMax- 5.10	5 and 10 Nm	3/15/30/60/120 sec	-	On-off, 3-pos	-	-	S
RedMax-15.30	15 and 30 Nm	3/15/30/60/120 sec	-	On-off, 3-pos	-	-	S
RedMax- 5.10 - S	5 and 10 Nm	3/15/30/60/120 sec	-	On-off, 3-pos	-	2 integr. aux. switches	S
RedMax-15.30 - S	15 and 30 Nm	3/15/30/60/120 sec	-	On-off, 3-pos	-	2 integr. aux. switches	S
RedMax- 5.10 - Y	5 and 10 Nm	3/15/30/60/120 sec	-	3-pos, 0...10V-, 4..20 mA	0...10V-, 4..20 mA	-	S
RedMax-15.30 - Y	15 and 30 Nm	3/15/30/60/120 sec	-	3-pos, 0...10V-, 4..20 mA	0...10V-, 4..20 mA	-	S

### Actuators with spring return, 5...30 Nm, 24...230 VAC/DC, 95° angle of rotation

RedMax	Torque	Motor running 90°	Spring return	Control mode	Feedback signal	add. equipment	Size
RedMax-5.10 - F	5 and 10 Nm	3/15/30/60/120 sec	3 and 10 sec	On-off, 3-pos	-	-	S
RedMax- 15 - F	15 Nm	3/15/30/60/120 sec	3 and 10 sec	On-off, 3-pos	-	-	S
RedMax-5.10 - SF	5 and 10 Nm	3/15/30/60/120 sec	3 and 10 sec	On-off, 3-pos	-	2 integr. aux. switches	S
RedMax- 15 - SF	15 Nm	3/15/30/60/120 sec	3 and 10 sec	On-off, 3-pos	-	2 integr. aux. switches	S
RedMax-5.10 - YF	5 and 10 Nm	3/15/30/60/120 sec	3 and 10 sec	3-pos, 0...10V-, 4..20 mA	0...10V-, 4..20 mA	-	S
RedMax- 15 - YF	15 Nm	3/15/30/60/120 sec	3 and 10 sec	3-pos, 0...10V-, 4..20 mA	0...10V-, 4..20 mA	-	S
RedMax-5.10 - BF	5 and 10 Nm	3/15/30/60/120 sec	3 and 10 sec	On-off	-	EEx-i output+ 2xEPU	S
RedMax- 15 - BF	15 Nm	3/15/30/60/120 sec	3 and 10 sec	On-off	-	EEx-i output+ 2xEPU	S

### Actuators without spring return, 5...30 Nm, 24...230 VAC/DC, n x 360° angle of rotation

RedMax	Torque	Motor running 360°	Spring return	Control mode	Feedback signal	Size
RedMax 5.10 - R	5 and 10 Nm	60/120/240/480 sec	-	On-off, 3-pos	-	S
RedMax 15.30 - R	15 and 30 Nm	60/120/240/480 sec	-	On-off, 3-pos	-	S

### Accessories (additional price)

Type	Technical data
RedMax-.../VA	Size S, housing material stainless steel AISI 316 type .../VA (Example RedMax-5.10/VA)
RedSwitch	2 external, aux. switches adaptable to RedMax actuators 2 x EPU, adjustable, for zone 2 and 22
RedBox-3P	Terminal box II3G/II3D EEx e IIT6, for zone 2, 22 for RedMax-5.10, RedMax-15.30, RedMax-...-F, RedMax-...-R
RedBox-3SP	Terminal box II3G/II3D EEx e IIT6, for zone 2, 22 for RedMax-...-S, RedMax-...-SF
RedBox-Y	Terminal box II3G/II3D EEx e IIT6, for zone 2, 22 for RedMax-...-Y, RedMax-...-YF
RedBox-BF	Terminal box II3G/II3D EEx e IIT6, for zone 2, 22 for RedMax-...-BF
MKK-S	Mounting bracket for terminal boxes connectable to actuators size S
LIN-S	Linear gearbox, to change rotation of actuator into linear motion connectable to actuators size S, strokes 10/20/30/42 mm selectable
VAD-...	Adaptation LIN-S to valve body various types in acc. to valve type and size
D-F.-S	Adaptation with flange in acc. to DIN EN 5211 connectable to actuators size S
KB-S	Clutch for round and for squared damper shafts connectable to actuators size S, shaft Ø 10 to 20 mm, ∩ 10 to 16 mm
HV-S	Comfortable manual override connectable to actuators size S
DWB-S	Mechanical limitation of angle of rotation connectable to actuators size S
FireSafe	Safety temperature sensor for fire dampers, switching at 72°C connectable to EEx-i output of RedMax-...-BF actuators
AR-12-xx	Reduction of squared damper connection from 12 mm to 11 mm (AR-12-11), 10 mm (AR-12-10), 8 mm (AR-12-08)
3P3A	3-Pos-3-wire module for pannel rail-mounting 3-pos control of 3-pos actuators with 3 wire connection

# RedMax - Revolution

Electrical, explosion proof rotary actuators - size S

On-off / 3-pos , 24..230 VAC/DC, 95° angle of rotation, potential free contacts, EEx-i circuit  
5/10 Nm - 15/30 Nm without and 5/10 Nm - 15 Nm with safety operation (spring return)

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

RedMax-5.10-BF  
RedMax- 15-BF  
RedMax - ...-BF - VA

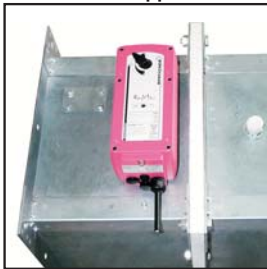
Subject to change

## Compact - Easy installation - Universal - Cost effective - Safe

Type	Torque	Supply	Motor running time	Spring return	Control mode	Additional features	Wiring diagram
RedMax- 5.10 - BF	5 Nm & 10 Nm	24..230VAC/DC	3/15/30/60/120 sec. at 90°	3 or 10 sec. at 90°	On-off, 3-pos	2 contacts (5/85°) + EEx-i circuit	SB 7.0/7.1
RedMax- 15 - BF	15 Nm	24..230VAC/DC	3/15/30/60/120 sec. at 90°	3 or 10 sec. at 90°	On-off, 3-pos	2 contacts (5/85°) + EEx-i circuit	SB 7.0/7.1
RedMax- ... - VA	Type as above but with stainless steel housing (AISI 316) for aggressive ambients (combination of RedMax-...S and -VA is possible)						

### Application

#### Brandschutzklappen



#### Sicherheitsklappen



#### Kugelhähne, Drosselklappen



#### Linearventile



### Description size S

The new RedMax actuators are a revolution for safety, fire and shut-off dampers, VAV systems, ball valves, throttle valves, linear motion valves and other motorized applications for HVAC systems, in chemical, pharmaceutical, industrial and Offshore-/Onshore plants, for use in EEx-areas zone 2 (gas) and zone 22 (dust).

Highest protection class (ATEX) and IP 65 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. 5 motor running times and 2 torques as well as 2 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 to 230 VAC / DC. The actuators are 100% overload protected and self locking. RedMax-...-BF actuators are equipped with spring return fail safe function, with integrated aux. switches for end position indication and an intrinsic safe circuit to connect an external passive potential free thermostat. Standard shaft connection is a double squared direct coupling with 12 x 12 mm.

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

### Highlights

- ▶ For all type of gas, mixtures, vapours and dust for use in zone 2 and 22
- ▶ Universal supply unit from 24 to 230 V - AC/DC
- ▶ EEx-i circuit for directly connection of a passive potential free safety thermostat
- ▶ 2 integral aux. switches , switching at 5° and 85° angle of rotation
- ▶ 5 different motor running times (3-15-30-60-120 sec./90°), adjustable on site
- ▶ 2 different spring return running times (3-10 sec./90°), selectable on site
- ▶ On-off and 3-pos control with spring return function
- ▶ 5 - 10 - 15 Nm actuators in the same size (S)
- ▶ 100 % overload protected
- ▶ 100 % self locking
- ▶ Compact design and small dimension (l x b x h = 210 x 95 x 80 mm)
- ▶ Direct coupling to the damper shaft with double-squared connection 12 x 12 mm
- ▶ 95° Angle of rotation incl. 5° pre-tention
- ▶ Robust aluminium housing (optional stainless steel) with IP 65 protection
- ▶ Simple manual override include + preparation for comfortable manual override
- ▶ Gear made of stainless steel and sinter metal
- ▶ Only 3,5 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 RedSwitch
- ▶ Range of accessories

**RedMax-5.10-BF****Special makes****RedMax-15-BF****RedMax-.-VA**

Technical data	RedMax-5.10-BF	RedMax-15-BF
Torque motor	5 / 10 Nm selectable on site	15 Nm
Torque spring return (F)	min. 10 Nm	min. 15 Nm
Dimension of external torque	above mentioned torques are min. torques in blocked position, eternal torque should be max. 80% of max. actuator torque but min. 3 Nm	
Supply voltage/Frequency	24...230 VAC/DC, + 15 % /-20% , self adaptable, Frequency 50...60 Hz +/- 20 %	
Dimension	max. starting currents see table (in acc. with voltage, $I_{start} \gg I_{rated}$ ), max. 20 W blocking position, approx. 5-12 W for heater	
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	3 / 15 / 30 / 60 / 120 sec. at 90° selectable on site	
3 sec. mode - motor	In acc. with the supply voltage and external torque 3 to 4 sec at 90° angle of rotation	
Motor	brushless DC Motor	
Spring return (F)	spring return in the event of loss of power	
Spring return running time (F)	spring return in 3 sec., or 10 sec. at 90°, selectable on site	
3 sec. mode - spring return	in acc. with external torque 3 to 4 sec. at 90° angle of rotation	
Safety operations at 10 sec (F)	min. 10.000 in acc. with construction of damper and ambient	
Safety operations at 3 sec (F)	min. 1.000 in acc. with construction of damper and ambient	
Control mode	On-off and 3-pos in acc. with wiring, selectable on site	
Intrinsic safe circuit	Additional EEx-i circuit to connect a passive potential free thermostat as a safety sensor, e.g. type FireSafe	
Integratet aux. switches	2 aux. switches, switching at 5° and 85° Angle of rotation	
Axle of the actuator	double squared 12 x 12 mm, direct coupling, 100 % overload protected and 100 % self locking up to the rated torque	
Electrical connection	cable, ~1 m, diameter of wires 0,5 mm <sup>2</sup> + PE (for connection inside hazardous areas an EEx-e terminal box is required!)	
Diameter of cable	~ Ø 9,6 mm + ~ Ø 6,2 mm	
Manual override	Use Manual override only if supply voltage is cut, use delivered socket wrench, slow motion, enough torque/force is required	
Integral heater	integral heater, controlled, for ambient temperature down to - 40°C	
Housing material & weight	Aluminium die cast housing, painted (optional in stainless steel AISI 316 - type RedMax-.../VA), ~ 3,5 Kg Aluminium (stainless steel ~ 7 Kg)	
Ambients	storage temp. - 40...+ 70°C, working temperature - 40...+ 40°C at T6 and - 40...+ 50°C at T5, humidity in acc. with EN 60335-1	
Operation mode	at 3 sec. 10 % ED, max. 1 on-off cycle per minute, at 15/30/60/120 sec. 100 % ED	
Self adjustment at 3 sec. mode	if you select 3 sec. mode for motor and/or spring return you need to start the self adjustment mode	
Maintenance	maintenance free, maintenance must be complied with regional standards, rules and regulations	
Wiring diagrams (SB)	<b>SB 7.0 / 7.1</b>	
Delivery	1 actuator, 1 m cable, double squared shaft connection 12x12 mm, 4 screws M 4 x 90, socket wrench for simple manual override	
Parameter at delivery	5 Nm, 30 sec./90°	15 Nm, 30 sec./90°

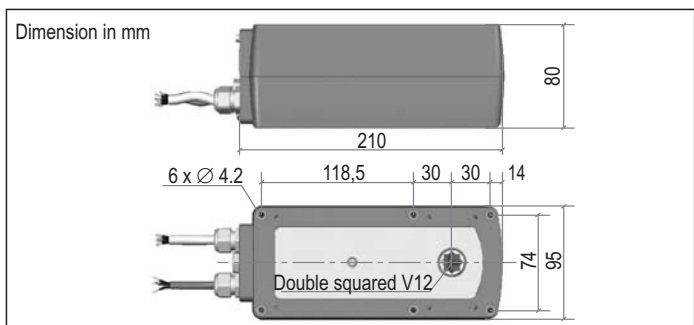
Explosion proof	RedMax actuators - size S
Certification	Manufacturer certification in acc. ATEX
ATEX	RL 94/9/EG (ATEX)
Approval for gas	II3G EEx nC IIC T6/T5 gas, mist, vapour, zone 2
Approval for dust	II3D IP66 T80°C dust, zone 22
Identification	CE
EMV	EMV-RL 89/336/EG
Low voltage	Low-voltage RL 72/23/EG
IP-Protection	IP 65, in acc. with EN 60529
Potential compensation	external PA-terminal, 2,5 mm <sup>2</sup>
EEx-i circuit data	see table below wiring diagrams

Accessories or special solutions - size S
<b>RedMax-.-VA</b> above listed types in stainless steel version, housing AISI 316.
<b>RedBox-BF</b> EEx-e terminal box for zone 2, 22.
<b>MKK-S</b> mounting bracket for EEx-e terminal boxes type RedBox-... direct on actuator
<b>RedSwitch</b> external aux. switches, 2 x EPU, adjustable, for zone 2, 22
<b>KB-S</b> clutch for damper shafts Ø 10...20 mm and $\square$ 10...16 mm.
<b>HV-S</b> comfortable manual override for RedMax actuators size S
<b>Adaptations</b> various adaptations for dampers/valves on request

**Current consumption for dimension of power supply**

Voltage	Current	Rated current in acc. with motor running time				
		3s	15s	30s	60s	120s
230 V	$I_{rated}$	0,5 A	0,3 A	0,15 A	0,10 A	0,10 A
120 V	$I_{rated}$	0,75 A	0,4 A	0,3 A	0,25 A	0,25 A
48 V	$I_{rated}$	2,0 A	0,5 A	0,3 A	0,2 A	0,2 A
24 V	$I_{rated}$	4,7 A	1,45 A	0,52 A	0,4 A	0,4 A

The dimension of power supply depends on selected motor running time and voltage range. Start current is 3 to 5 times higher than the rated current ( $I_{start} \gg I_{current}$ ) with an impulse of some "ms". The power consumption for blocking position is about 20 W. The power consumption for the heater is from 5 to 12 W. If actuator works, heater is switched off.

**Dimension - size S**

Malux Sweden AB, Box 221, 891 25 Örnsköldsvik.  
Växel 0660-29 29 00, fax 0660-850 85. Hemsida: [www.malux.se](http://www.malux.se)

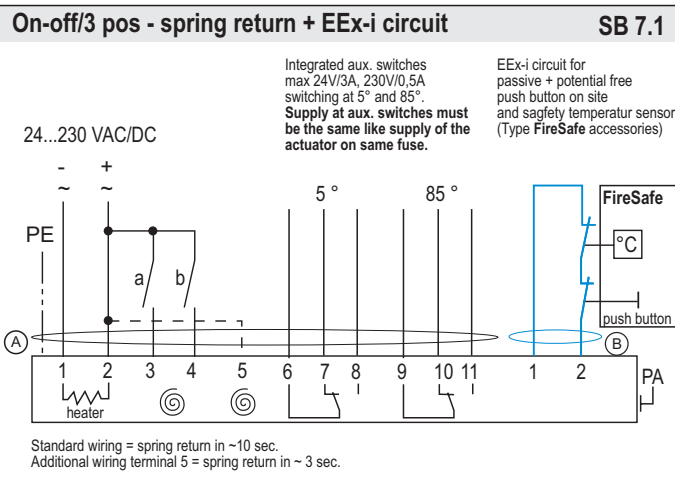
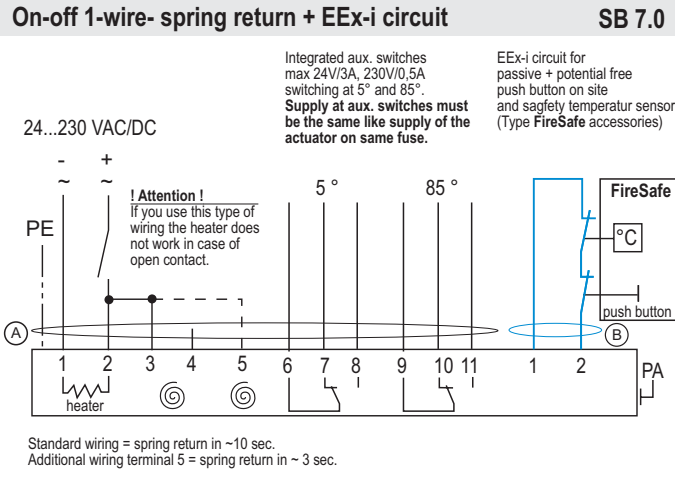




**Electrical connection**

RedMax actuators are equipped with a universal supply unit working at a voltage range from 24 to 230 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 areas an EEx-e terminal box, certificated in acc. with ATEX is required (e.g. RedBox).

**Wiring diagram RedMax-5.10-BF and RedMax-15-BF**



**EEx-i intrinsic safe data**

U<sub>0</sub> = 10,6 V  
I<sub>0</sub> = 11 mA  
P<sub>0</sub> = 30 mW  
C<sub>i</sub> = 0  
L<sub>i</sub> = 0

	IIC	IIB	IIA
C <sub>0</sub>	830 nF	3,7µF	4,5 µF
L <sub>0</sub>	2 mH	5 mH	10 mH

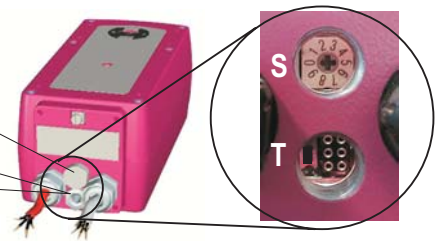


If 3 sec. mode is selected, the self adjustment of Angle of rotation must be started and operation mode of max. 10% ED must be guaranteed. Never use actuators in this mode without external torque/force.

**Parameter, Adjustment - Failure indication**

**Switch - Push button - Lamp for adjustment, behind the blanking plug**

- 10-position switch (S)
- Push button(T)
- 3-colour LED



**Parameter selection**

Example: RedMax-5.10-BF

Requested parameter:  
Torque 10 Nm  
Running time motor 60 sec/90°

Type	Torques	
RedMax -5.10-BF	5 Nm	10 Nm
RedMax- 15-BF	15 Nm	30 Nm

Running times	Position of switch S	
3 sec./90°	00	05
15 sec./90°	01	06
30 sec./90°	02	07
60 sec./90°	03	08
120 sec./90°	04	09

Result: switch position (S) 08

**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. 60 sec. (30 sec. On, 30 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) Running time spring return:**

The running time of 3 or 10 sec. spring return is selected by wiring (see wiring diagrams).

**D) 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.

**E) Function of a passive sensor in the EEx-i circuit:**

If the sensor opens the EEx-i circuit the actuator runs into its safety end-position with spring return

**Operation and failure indication by LED**

LED	Operation/Failure	Next steps
Off	No supply, actuator damaged	supply voltage, change actuator
GREEN	Supply available	Actuator active
GREEN blinking	Self adjustment active	Wait until self adjustment has finished
RED blinking	Temperature failure (high/low)	Reduce/increase ambient temp.
RED	Electronic device failure	Return actuator to the factory for test





## 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 RedMax 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 50014, Abs. 23.4.3.1 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 EEx-e terminal box is requested (e.g. type ExBox).

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

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

#### B. Shaft connection, selection of running time, heater

RedMax actuators are equipped with a direct coupling double squared shaft connection of 12 x 12 mm. For round shafts an adaptor is available (Accessory type KB-S). 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 and 2 different spring return running times can be selected on site. The integral heater is for ambient temperatures down to -40°C.

#### C. Working with 3 sec. motor running time

When working with the 3 sec. motor running time mode, you have to comply with the following parameters:

1. Max. operation mode 10 % ED, max. 1 on-off cycle per minute
2. In case of over-temperature, actuator stops until temperature decreased
3. Min. load not less than 20% of the rated torque, min. 3 Nm
4. After installation to the damper/valve a self adjustment to the Angle of rotation must be started to guarantee a soft endposition.

This function prevents the damper/valve from mechanical impacts. The actuator runs to each end positions within 30 sec/90°, recognizes the open/closed position and reduces the motor power automatically for soft start and soft stop.

#### D. 3-pos control mode

RedMax actuators are designed for on-off and 3-pos operation. To prevent parts like gear and mechanical devices from damage the internal RedMax electronic filters very short control pulses.

Max. 20 pulses < 1 > 0,5 sec. working in one direction are allowed, then min. 1 pulse > 1 sec. must work, otherwise the actuator stops. In this event the actuator needs to reset. For reset, the supply voltage must be cut for a minimum of 2 seconds. Please set the parameters of your control device to guarantee these limits.

#### E. 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.

#### F. Operation at an ambient temperature below - 20°C

All RedMax actuators are equipped with an internal heater for use in ambient temperatures down to - 40°C. The heater works automatically if terminal 1 and 2 are connected to supply voltage.

At ambient temperatures < - 20°C you have to comply with following parameters :

1. Electrical connection to supply voltage directly after mechanical installation
2. Actuator does not work before reaching an internal temperature of min. - 20°C.

#### G. Excess temperature

In acc. to the ATEX rules and regulations EEx 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. RedMax 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.

### Mounting on air dampers with double squared shaft connection



Shaft connection is a double squared 12 x 12 mm and can enter max. 20 mm into the actuator. The actuator must be fixed directly to the damper or on a special mounting bracket.

### Mounting of quarter turn valves



For ball, throttle or other valves, a variety of adaptations/linkages are available on request.

### Mounting on linear valves with linear motion adaptation



For linear valves a variety of adaptations/linkages from 10 to 42 mm stroke is available on request.

### EEx-i safety temperature sensor - FireSafe



The safety thermostat type FireSafe is passive and potential free for use in intrinsic safe circuits, directly connectable to the EEx-i circuit of the RedMax-...-BF actuators. The sensor switches at an ambient temperature of 72°C and starts the fail safe spring return function of the actuator. Sensor with manufacturer certificate in acc. with ATEX.

### RedSwitch - adaptable external EEx-d aux. switches



**RedSwitch** is an accessory to RedMax actuators size S, fixing directly onto the actuator. **RedSwitch** are aux. switches with 2 potential free contacts, adjustable on site. The electrical wiring needs an EEx-e terminal box.

### RedBox - adaptable EEx-e terminal box



For electrical connection of an RedMax inside the hazardous area an EEx-e terminal box is required. **RedBox-BF** for **RedMax-5.10-BF** and **RedMax-15-BF**. To adapt the RedBox direct to the actuator housing an additional accessory type MKK-S is required.

# RedMax - Revolution

Electrical, explosion proof rotary actuators - size S

On-off / 3-pos , 24..230 VAC/DC, 95° angle of rotation incl. 5° pretention

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

ATEX-tested in acc. with RL 94/9/EG for zone 2 and 22.

RedMax - 5.10
RedMax -15.30
RedMax - 5.10 - F
RedMax - 15 - F
RedMax - ... - S
RedMax - ... - VA

## Compact - Easy installation - Universal - Cost effective - Safe

Type	Torque	Supply	Motor running time	Spring return	Control mode	Feedback	Wiring diagram
RedMax -5.10	5 Nm & 10 Nm	24..230VAC/DC	3/15/30/60/120 sec. at 90°	without	On-off, 3-pos	-	SB 1.0
RedMax-15.30	15 Nm & 30 Nm	24..230VAC/DC	3/15/30/60/120 sec. at 90°	without	On-off, 3-pos	-	SB 1.0
RedMax- 5.10 - F	5 Nm & 10 Nm	24..230VAC/DC	3/15/30/60/120 sec. at 90°	3 or 10 sec. at 90°	On-off, 3-pos	-	SB 2.0
RedMax- 15 - F	15 Nm	24..230VAC/DC	3/15/30/60/120 sec. at 90°	3 or 10 sec. at 90°	On-off, 3-pos	-	SB 2.0
RedMax- ... - S	Type as above but with 2 integral, potential free aux. switches, switching at 5° and 85° angle of rotation, 2 xEPU, max.24V/3A, 230V/0,25A						SB 3.5
RedMax- ... - VA	Type as above but with stainless steel housing (V4A) for aggressive ambients (combination of RedMax-..S and -VA is possible)						

### Application

Damper



Ball valve



Throttle valve



Linear valve



### Description size S

The new RedMax actuators are a revolution for safety and shut-off dampers, VAV systems, ball valves, throttle valves, linear motion valves and other motorized applications for HVAC systems, in chemical, pharmaceutical, industrial and Offshore-/Onshore plants, for use in EEx-areas zone 2 (gas) and zone 22 (dust).

Highest protection class (ATEX) and IP 65 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. 5 motor running times and 2 torques as well as 2 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 to 230 VAC / DC. The actuators are 100% overload protected and self locking.

**RedMax-...-F** actuators are equipped with spring return failsafe function. Standard shaft connection is a double squared direct coupling with 12 x 12 mm.

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

### Highlights

- ▶ For all type of gas, mixtures, vapours and dust for use in zone 2 and 22
- ▶ Universal supply unit from 24 to 230 V - AC/DC
- ▶ 5 different motor running times (3-15-30-60-120 sec./90°), adjustable on site
- ▶ 2 different spring return running times (3-10 sec./90°), selectable on site
- ▶ On-off and 3-pos control with or without spring return function
- ▶ 5 - 10 - 15 - 30 Nm actuators in the same size (S)
- ▶ 100 % overload protected
- ▶ 100 % self locking
- ▶ Compact design and small dimension (l x b x h = 210 x 95 x 80 mm)
- ▶ Direct coupling to the damper shaft with double-squared connection 12 x 12 mm
- ▶ 95° angle of rotation incl. 5° pre-tention
- ▶ Robust aluminium housing (optional stainless steel) with IP 65 protection
- ▶ Simple manual override include + preparation for comfortable manual override
- ▶ Gear made of stainless steel and sinter metal
- ▶ Only 3,5 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 RedSwitch
- ▶ Range of accessories



RedMax-5.10 RedMax-15.30  
Special makes

RedMax-5.10-F RedMax-15-F  
RedMax-..-S RedMax-..-VA



Technical data	RedMax-5.10	RedMax-15.30	RedMax-5.10-F	RedMax-15-F
Torque motor	5 / 10 Nm selectable on site	15 / 30 Nm selectable on site	5 / 10 Nm selectable on site	15 Nm
Torque spring return (F)	without F	without F	min. 10 Nm	min. 15 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. 3 Nm			
Supply voltage/Frequency	24...230 VAC/DC, + 15 % /-20% , self adaptable, Frequency 50...60 Hz +/- 20 %			
Dimension	max. starting currents see table (in acc. with voltage, $I_{start} \gg I_{rated}$ ), max. 20 W blocking position, approx. 5-12 W for heater			
Protection class	class I (grounded)			
Angle of rotatio 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	3 / 15 / 30 / 60 / 120 sec. at 90° selectable on site			
3 sec. mode - motor	In acc. with the supply voltage rand external torque 3 to 4 sec at 90° angle of rotation			
Motor	brushless DC Motor			
Spring return (F)	without F	without F	spring return in the event of loss of power	
Spring return running time (F)	without F	without F	spring return in 3 sec., or 10 sec. at 90°, selectable on site	
3 sec. mode - spring return	without F	without F	in acc. with external torque 3 to 4 sec. at 90° angle of rotation	
Safety operations at 10 sec (F)	without F	without F	min. 10.000 in acc. with construction of damper and ambient	
Safety operations at 3 sec (F)	without F	without F	min. 1.000 in acc. with construction of damper and ambient	
Control mode	On-off and 3-pos in acc. with wiring, selectable on site			
Axle of the actuator	double squared 12 x 12 mm, direct coupling, 100 % overload protected and 100 % self locking up to the rated torque			
Electrical connection	cable, ~1 m, diameter of wires 0,5 mm <sup>2</sup> + PE (for connection inside hazardous areas an EEx-e terminal box is required!)			
Diameter of cable	~ Ø 7,1 mm	~ Ø 7,1 mm	~ Ø 7,4 mm	~ Ø 7,4 mm
Manual override	Manual override only if supply voltage is cut, use delivered socket wrench, slow motion, enogh torque/force is required			
Integral heater	integral heater, controlled, for ambient temperature down to - 40°C			
Housing material	Aluminium die cast housing, painted (optional in stainless steel version V4A - Type RedMax-.../VA)			
Weight	~ 3,5 Kg Aluminium housing (stainless steel ~ 7 Kg)			
Ambients	storage temp. - 40...+ 70°C, working temperature - 40...+ 40°C at T6 and - 40...+ 50°C at T5, humidity in acc. with EN 60335-1			
Operation mode	at 3 sec. 10 % ED, max. 1 on-off cycle per minute, at 15/30/60/120 sec. 100 % ED			
Self adjustment at 3 sec. mode	if you select 3 sec. mode for motor and/or spring return you need to start the self adjustment mode			
Maintenance	maintenance free, maintenace must be complied with regional standards, rules and regulations			
Wiring diagrams (SB)	SB 1.0	SB 1.0	SB 2.0	SB 2.0
Delivery	1 actuator, 1 m cable, double squared shaft connection 12x12 mm, 4 screws M 4 x 90, socket wrench for simple manual override			
Parameter at delivery	5 Nm, 30 sec./90°	15 Nm, 30 sec./90°	5 Nm, 30 sec./90°	15 Nm, 30 sec./90°

Explosion proof	RedMax actuators - size S
Certification	Manufacturer certification in acc. ATEX
ATEX	RL 94/9/EG (ATEX)
Approval for gas	II3G EEx nC IIC T6/T5 gas, mist, vapour, zone 2
Approval for dust	II3D IP66 T80°C dust, zone 22
Identification	CE
EMV	EMV-RL 89/336/EG
Low voltage	Low-voltage RL 72/23/EG
IP-Protection	IP 65, in acc. with EN 60529
Potential compensation	external PA-terminal, 2,5 mm <sup>2</sup>

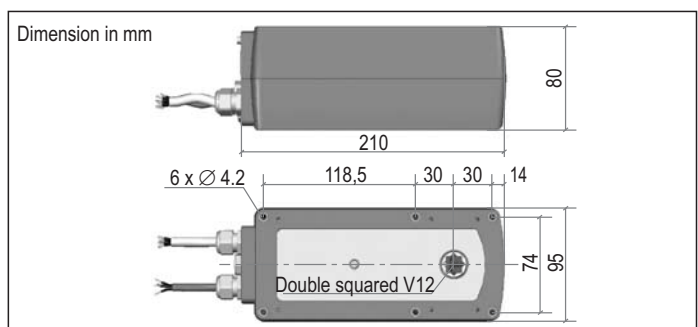
Accessories or special solutions - size S
<b>RedMax-...-S</b> 2 internal, potential free aux. switches at 5°/85°, 24V/3A, 230V/0,25A, SB 3.5
<b>RedMax-...-VA</b> above listed types in stainless steel version, housing AISI 316.
<b>RedBox-...</b> EEx-e terminal box for zone 2, 22.
<b>MKK-S</b> mounting bracket for EEx-e terminal boxes type ExBox-... direct on actuator
<b>RedSwitch</b> external aux. switches, 2 x EPU, adjustable, for zone 2, 22
<b>KB-S</b> clutch for damper shafts Ø 10...20 mm and Ø 10...16 mm.
<b>HV-S</b> comfortable manual override for RedMax actuators size S
<b>Adaptations</b> various adaptations for dampers/valves on request

### Current consumption for dimension of power supply

Voltage	Current	Rated current in acc. with motor running time				
		3s	15s	30s	60s	120s
230 V	I <sub>rated</sub>	0,5 A	0,3 A	0,15 A	0,10 A	0,10 A
120 V	I <sub>rated</sub>	0,75 A	0,4 A	0,3 A	0,25 A	0,25 A
48 V	I <sub>rated</sub>	2,0 A	0,5 A	0,3 A	0,2 A	0,2 A
24 V	I <sub>rated</sub>	4,7 A	1,45 A	0,52 A	0,4 A	0,4 A

The dimension of power supply depends on selected motor running time and voltage range. Start current is 3 to 5 times higher than the rated current ( $I_{start} \gg I_{current}$ ) with an impulse of some "ms". The power consumption for blocking position is about 20 W. The power consumption for the heater is from 5 to 12 W. If actuator works, heater is switched off.

### Dimension - sizeS



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RedMax-5.10

RedMax-15.30

RedMax-5.10-F

RedMax-15-F



Special makes

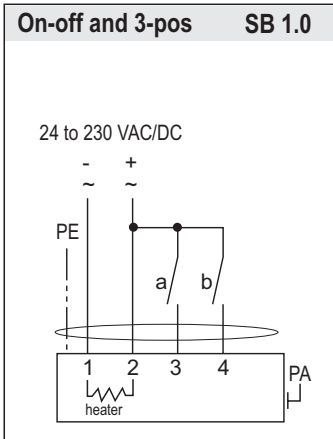
RedMax-...S

RedMax-...VA

### Electrical connection

RedMax actuators are equipped with a universal supply unit working at a voltage range from 24 to 230 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 areas an EEx-e terminal box, certificated in acc. with ATEX is required (e.g. RedBox).

### Wiring diagram RedMax-5.10 and RedMax-15.30 without spring return



**Attention!**

If 3 sec. mode is selected, the self adjustment of angle of rotation must be started and operation mode of max. 10% ED must be guaranteed. Never use actuators in this mode without external torque/force.

### Parametrierung und Betriebs-/Störmeldungen

Schalter - Taster - Lampe zur Parametrierung, hinter den Blindstopfen (kabelseitig)

- 10-Stellen Schalter (S)
- Taster (T)
- 3-Farb LED



### Parameter selection

Example: RedMax-15.30

Requested parameter:  
Torque 30 Nm  
Running time motor 30 sec/90°

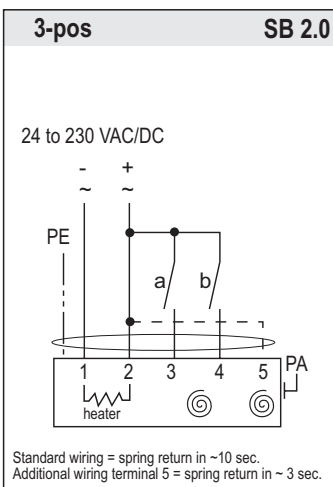
Type	Torques	
RedMax -5.10	5 Nm	10 Nm
<b>RedMax-15.30</b>	<b>15 Nm</b>	<b>30 Nm</b>
RedMax- 5.10-F	5 Nm	10 Nm
RedMax- 15-F	15 Nm	

Running times	Position of switch S	
3 sec./90°	00	05
15 sec./90°	01	06
<b>30 sec./90°</b>	<b>02</b>	<b>07</b>
60 sec./90°	03	08
120 sec./90°	04	09

Result: switch position (S) 07

### Wiring diagram RedMax-5.10-F and RedMax-15-F (with spring return)



**Attention!**

If 3 sec. mode is selected for motor and/or spring return, the self adjustment of angle of rotation must be started and operation mode of max. 10% ED must be guaranteed. Never use actuators in this mode without external torque/force.

### 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. 60 sec. (30 sec. On, 30 sec. Off). After that switch S into position 00-09 in acc. with the 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) Running time spring return:

The running time of 3 or 10 sec. spring return is selected by wiring (see wiring diagrams).

#### D) Additional information for 3-pos operation:

a closed, b open = direction I

b closed, a open = direction II

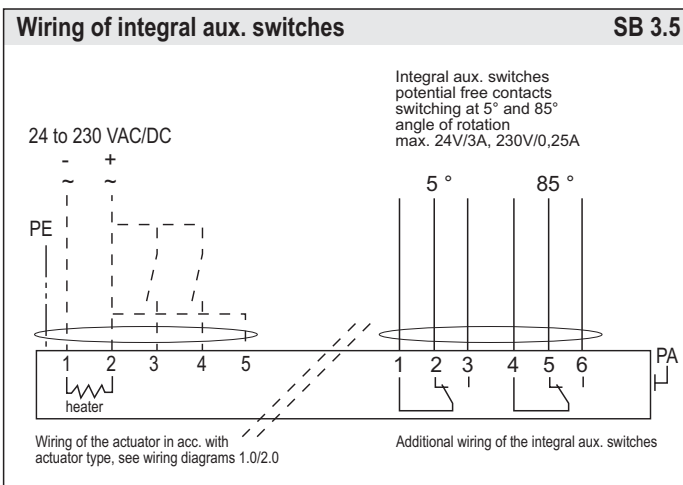
a and b closed = Motor doesn't work

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.

### Wiring diagram type ExMax-...S with integral aux. switches



### Operation and failure indication by LED

LED	Operation/Failure	Next steps
Off	No supply, actuator damaged	supply voltage, change actuator
GREEN	Supply available	Actuator active
GREEN blinking	Self adjustment active	Wait until self adjustment has finished
RED blinking	Temperature failure (high/low)	Reduce/increase ambient temp.
RED	Electronic device failure	Return actuator to the factory for test

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RedMax-5.10 RedMax-15.30  
Special makes

RedMax-5.10-F

RedMax-..-S

RedMax-15-F  
RedMax-..-VA

**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 RedMax 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 50014, Abs. 23.4.3.1 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 EEx-e terminal box is requested (e.g. type RedBox).

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

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

#### B. Shaft connection, selection of running time, heater

ExMax actuators are equipped with a direct coupling double squared shaft connection of 12 x 12 mm. For round shafts an adaptor is available (Accessory type KB-S). 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 and 2 different spring return running times can be selected on site. The integral heater is for ambient temperatures down to -40°C.

#### C. Working with 3 sec. motor running time

When working with the 3 sec. motor running time mode, you have to comply with the following parameters:

1. Max. operation mode 10 % ED, max. 1 on-off cycle per minute
2. In case of over-temperature, actuator stops until temperature decreased
3. Min. load not less than 20% of the rated torque, min. 3 Nm
4. After installation to the damper/valve a self adjustment to the angle of rotation must be started to guarantee a soft endposition.

This function prevents the damper/valve from mechanical impacts. The actuator runs to each end positions within 30 sec/90°, recognizes the open/closed position and reduces the motor power automatically for soft start and soft stop.

#### D. 3-pos control mode

RedMax actuators are designed for on-off and 3-pos operation. To prevent parts like gear and mechanical devices from damage the internal ExMax electronic filters very short control pulses.

Max. 20 pulses < 1 > 0,5 sec. working in one direction are allowed, then min. 1 pulse > 1 sec. must work, otherwise the actuator stops. In this event the actuator needs to reset. For reset, the supply voltage must be cut for a minimum of 2 seconds. Please set the parameters of your control device to guarantee these limits.

#### E. 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.

#### F. Operation at an ambient temperature below - 20°C

All ExMax actuators are equipped with an internal heater for use in ambient temperatures down to - 40°C. The heater works automatically if terminal 1 and 2 are connected to supply voltage.

At ambient temperatures < - 20°C you have to comply with following parameters :

1. Electrical connection to supply voltage directly after mechanical installation
2. Actuator does not work before reaching an internal temperature of min. - 20°C.

#### G. Excess temperature

In acc. to the ATEX rules and regulations EEx 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. RedMax 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.

### Mounting on air dampers with double squared shaft connection



Shaft connection is a double squared 12 x 12 mm and can enter max. 20 mm into the actuator. The actuator must be fixed directly to the damper or on a special mounting bracket.

### Mounting on air dampers with clutch



For round damper shafts a clutch, type KB-S is available to connect the actuator to a shaft with  $\varnothing$  10..20 mm or  $\varnothing$  10..16 mm. Max. torque is 30 Nm. The shaft can enter max. 20 mm into the actuator.

### Mounting of quarter turn valves



For ball, throttle or other valves, a variety of adaptations/linkages are available on request.

### Mounting on linear valves with linear motion adaptation



For linear valves a variety of adaptations/linkages from 10 to 42 mm stroke is available on request.

### RedSwitch - adaptable external aux. switches



RedSwitch is an accessory to RedMax actuators size S, fixing directly onto the actuator. RedSwitch are aux. switches with 2 potential free contacts, adjustable on site. The electrical wiring needs an EEx-e terminal box.

### RedBox - adaptable EEx-e terminal box



For electrical connection of an ExMax inside the hazardous area an EEx-e terminal box is required. **RedBox-3P** for RedMax-5.10,..-15.30, ..-5.10-F, ..-15-F **RedBox-3SP** for RedMax-...-S integral aux. switches To adapt the RedBox direct to the actuator housing an additional accessory **type MKK-S** is required.

D.RM-01.02-S-en-3P

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# RedMax - Revolution

Electrical, explosion proof rotary actuators - size S

3-pos, 0...10 VDC, 4...20 mA, 24...230 VAC/DC, 95° Angle of rotation incl. 5° pretention

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

PTB-tested in acc. with ATEX RL 94/9/EG for zone 2 and 22.

RedMax- 5.10-Y  
RedMax-15.30-Y  
RedMax- 5.10 - YF  
RedMax- 15 - YF  
RedMax- ... - VA

## Compact - Easy installation - Universal - Cost effective - Safe

Type	Torque	Supply	Motor running time	Spring return	Control mode	Feedback	Wiring diagram
RedMax- 5.10-Y	5 Nm & 10 Nm	24..230VAC/DC	3/15/30/60/120 sec. at 90°	without	3-pos, 0...10VDC, 4...20 mA	0...10VDC, 4...20 mA	SB 4.0
RedMax- 15.30-Y	15 Nm & 30 Nm	24..230VAC/DC	3/15/30/60/120 sec. at 90°	without	3-pos, 0...10VDC, 4...20 mA	0...10VDC, 4...20 mA	SB 4.0
RedMax- 5.10 - YF	5 Nm & 10 Nm	24..230VAC/DC	3/15/30/60/120 sec. at 90°	3 or 10 sec. at 90°	3-pos, 0...10VDC, 4...20 mA	0...10VDC, 4...20 mA	SB 5.0
RedMax- 15 - YF	15 Nm	24..230VAC/DC	3/15/30/60/120 sec. at 90°	3 or 10 sec. at 90°	3-pos, 0...10VDC, 4...20 mA	0...10VDC, 4...20 mA	SB 5.0
RedMax- ... - VA	Type as above but with stainless steel housing (A316) for aggressive ambients (combination of RedMax-...S and -VA is possible)						

### Application



### Description size S

The new RedMax actuators are a revolution for safety, control and shut-off dampers, VAV systems, ball valves, throttle valves, linear motion valves and other motorized applications for HVAC systems, in chemical, pharmaceutical, industrial and Offshore-/Onshore plants, for use in EEx-areas zone 2 (gas) and zone 22 (dust).

Highest protection class (ATEX) and IP 65 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. 5 motor running times and 2 torques as well as 2 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 to 230 VAC / DC. The actuators are 100% overload protected and self locking. RedMax-...-F actuators are equipped with spring return fail safe function. Standard shaft connection is a double squared direct coupling with 12 x 12 mm.

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

### Highlights

- ▶ For all type of gas, mixtures, vapours and dust for use in zone 2 and 22
- ▶ Universal supply unit from 24 to 230 V - AC/DC
- ▶ 5 different motor running times (3-15-30-60-120 sec./90°), adjustable on site
- ▶ 2 different spring return running times (3-10 sec./90°), selectable on site
- ▶ 3-pos, 0...10 VDC, 4...20 mA control mode, with or without spring return function
- ▶ Feedback signal 0...10 VDC and 4...20 mA
- ▶ Reverse function
- ▶ 5 - 10 - 15 - 30 Nm actuators in the same size (S)
- ▶ 100 % overload protected
- ▶ 100 % self locking
- ▶ Compact design and small dimension (l x b x h = 210 x 95 x 80 mm)
- ▶ Direct coupling to the damper shaft with double-squared connection 12 x 12 mm
- ▶ 95° Angle of rotation incl. 5° pre-tention
- ▶ Robust aluminium housing (optional stainless steel) with IP 65 protection
- ▶ Simple manual override include + preparation for comfortable manual override
- ▶ Gear made of stainless steel and sinter metal
- ▶ Only 3,5 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



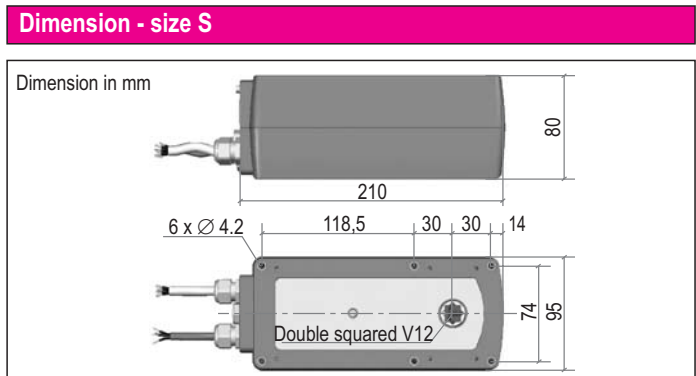
Technical data	RedMax-5.10-Y	RedMax-15.30-Y	RedMax-5.10-YF	RedMax-15-YF
Torque motor	5 / 10 Nm selectable on site	15 / 30 Nm selectable on site	5 / 10 Nm selectable on site	15 Nm
Torque spring return (F)	without F	without F	min. 10 Nm	min. 15 Nm
Dimension of external torque	above mentioned torques are min. torques in blocked position, external torque should be max. 80 % of max. actuator torque but min. 3 Nm			
Supply voltage/Frequency	24...230 VAC/DC, + 15 % /-20% , self adaptable, Frequency 50...60 Hz +/- 20 %			
Dimension	max. starting currents see table (in acc. with voltage, I <sub>start</sub> >> I <sub>rated</sub> ), max. 20 W blocking position, approx. 5-12 W for heater			
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	3 / 15 / 30 / 60 / 120 sec. at 90° selectable on site			
3 sec. mode - motor	In acc. with the supply voltage and external torque 3 to 4 sec at 90° angle of rotation			
Motor	brushless DC Motor			
Spring return (F)	without F	without F	spring return in the event of loss of power	
Spring return running time (F)	without F	without F	spring return in 3 sec., or 10 sec. at 90°, selectable on site	
3 sec. mode - spring return	without F	without F	in acc. with external torque 3 to 4 sec. at 90° angle of rotation	
Safety operations at 10 sec (F)	without F	without F	min. 10.000 in acc. with construction of damper and ambient	
Safety operations at 3 sec (F)	without F	without F	min. 1.000 in acc. with construction of damper and ambient	
Control mode Y	3-pos, 0..10 VDC, 4...20 mA in acc. with wiring, selectable on site, galvanic separation between supply and signals			
Feedback signal U	0..10 VDC, 4...20 mA in acc. with wiring, selectable on site			
Resistance of Y and U signals	<b>Input signal</b> Yu 0...10 VDC @ 10 kΩ, Yi 4...20 mA @ 100 Ω. <b>Feedback signal</b> Uu 0...10 VDC @ 1.000...∞ Ω, Ui 4...20 mA @ 0..800 Ω			
Reverse function	Bridge between wiring 3 and 4 (signal wise) gets a reverse function of Y and U			
Axle of the actuator	double squared 12 x 12 mm, direct coupling, 100 % overload protected and 100 % self locking up to the rated torque			
Electrical connection	cable, ~1 m, diameter of wires 0,5 mm <sup>2</sup> + PE (for connection inside hazardous areas an EEx-e terminal box is required!)			
Diameter of cable	~ Ø 7,1 mm	~ Ø 7,1 mm	~ Ø 7,4 mm	~ Ø 7,4 mm
Manual override	Manual override only if supply voltage is cut, use delivered socket wrench, slow motion, enough torque/force is required			
Integral heater	integral heater, controlled, for ambient temperature down to - 40°C			
Housing material and weight	Aluminium die cast housing ~ 3,5 Kg, painted (optional in stainless steel version ~ 7 Kg, Type RedMax-..VA)			
Ambients	storage temp. - 40...+ 70°C, working temperature - 40...+ 40°C at T6 and - 40...+ 50°C at T5, humidity in acc. with EN 60335-1			
Operation mode	at 3 sec. 10 % ED, max. 1 on-off cycle per minute, at 15/30/60/120 sec. 100 % ED			
Self adjustment at 3 sec. mode	if you select 3 sec. mode for motor and/or spring return you need to start the self adjustment mode			
Maintenance	maintenance free, maintenance must be complied with regional standards, rules and regulations			
Wiring diagrams (SB)	<b>SB 1.0</b>	<b>SB 1.0</b>	<b>SB 2.0</b>	<b>SB 2.0</b>
Delivery	1 actuator, 1 m cable, double squared shaft connection 12x12 mm, 4 screws M 4 x 90, socket wrench for simple manual override			
Parameter at delivery	5 Nm, 30 sec./90°	15 Nm, 30 sec./90°	5 Nm, 30 sec./90°	15 Nm, 30 sec./90°

Explosion proof	RedMax actuators - size S
Certification	Manufacturer certification in acc. ATEX
ATEX	RL 94/9/EG (ATEX)
Approval for gas	II3G EEx nC IIC T6/T5 gas, mist, vapour, zone 2
Approval for dust	II3D IP66 T80°C dust, zone 22
Identification	CE
EMV	EMV-RL 89/336/EG
Low voltage	Low-voltage RL 72/23/EG
IP-Protection	IP 65, in acc. with EN 60529
Potential compensation	external PA-terminal, 2,5 mm <sup>2</sup>

Accessories or special solutions - size S
<b>RedMax-..VA</b> above listed types in stainless steel version, housing AISI 316.
<b>RedBox-Y</b> EEx-e terminal box for zone 2, 22.
<b>MKK-S</b> mounting bracket for EEx-e terminal boxes type RedBox-... direct on actuator
<b>RedSwitch</b> external aux. switches, 2 x EPU, adjustable, for zone 2, 22
<b>KB-S</b> clutch for damper shafts Ø 10...20 mm and $\square$ 10...16 mm.
<b>HV-S</b> comfortable manual override for RedMax actuators size S
<b>Adaptations</b> various adaptations for dampers/valves on request

Current consumption for dimension of power supply		Rated current in acc. with motor running time				
Voltage	Current	3s	15s	30s	60s	120s
230 V	I <sub>rated</sub>	0,5 A	0,3 A	0,15 A	0,10 A	0,10 A
120 V	I <sub>rated</sub>	0,75 A	0,4 A	0,3 A	0,25 A	0,25 A
48 V	I <sub>rated</sub>	2,0 A	0,5 A	0,3 A	0,2 A	0,2 A
24 V	I <sub>rated</sub>	4,7 A	1,45 A	0,52 A	0,4 A	0,4 A

The dimension of power supply depends on selected motor running time and voltage range. Start current is 3 to 5 times higher than the rated current (I<sub>start</sub> >> I<sub>current</sub>) with an impulse of some "ms". The power consumption for blocking position is about 20 W. The power consumption for the heater is from 5 to 12 W. If actuator works, heater is switched off.



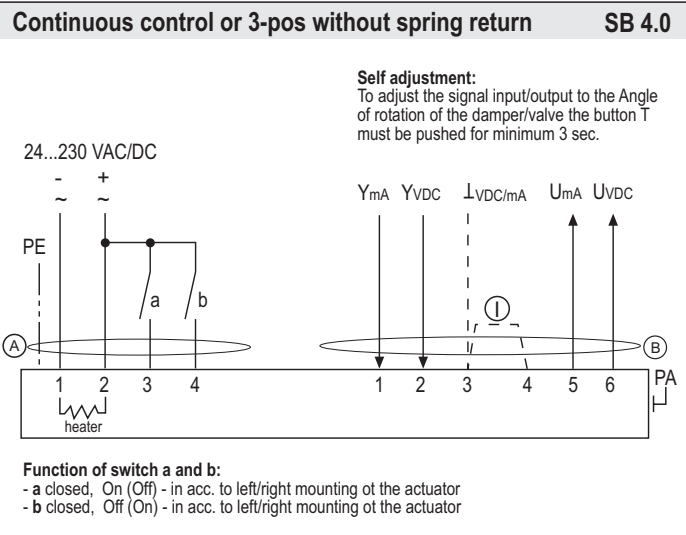




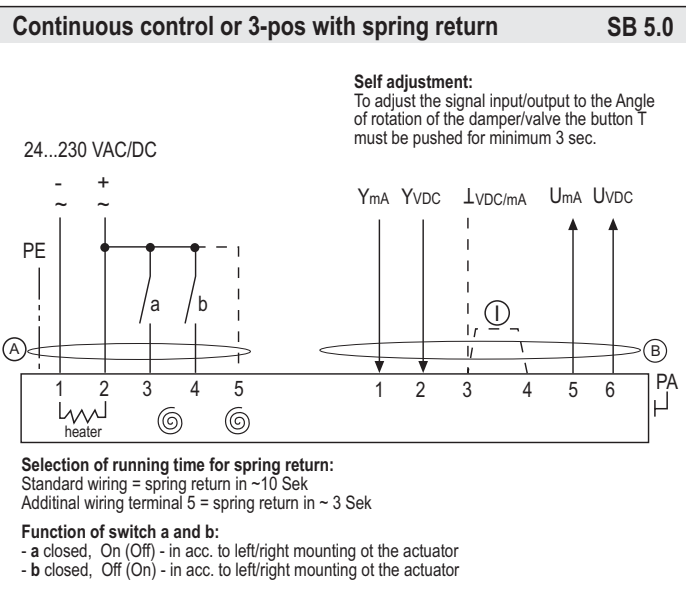
**Electrical connection**

RedMax actuators are equipped with a universal supply unit working at a voltage range from 24 to 230 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 areas an EEx-e terminal box, certificated in acc. with ATEX is required (e.g. ExBox).

**Wiring diagram RedMax-5.10-Y and RedMax-15.30-Y**



**Wiring diagram RedMax-5.10-YF and RedMax-15-YF**



If 3 sec. mode is selected for motor and/or spring return, the self adjustment of Angle of rotation must be started and operation mode of max. 10% ED must be guaranteed. Never use actuators in this mode without external torque/force.

**Parametrierung und Betriebs-/Störmeldungen**

Schalter - Taster - Lampe zur Parametrierung, hinter den Blindstopfen (kabelseitig)

- 10-Stellen Schalter (S)
- Taster (T)
- 3-Farb LED



**Parameter selection**

Example: RedMax-15.30-Y

Requested parameter:

Torque 30 Nm  
Running time motor 30 sec/90°

Result: switch position (S) 07

Type	Torques	
RedMax -5.10-Y	5 Nm	10 Nm
<b>RedMax-15.30 -Y</b>	<b>15 Nm</b>	<b>30 Nm</b>
RedMax- 5.10-YF	5 Nm	10 Nm
RedMax- 15-YF	15 Nm	

Running times	Position of switch S	
3 sec./90°	00	05
15 sec./90°	01	06
<b>30 sec./90°</b>	<b>02</b>	<b>07</b>
60 sec./90°	03	08
120 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. 60 sec. (30 sec. On, 30 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) Running time spring return:**

The running time of 3 or 10 sec. spring return is selected by wiring (see wiring diagrams).

**D) Change from modulating into 3-pos operation mode:**

Push button (T) 3 times. LED changes from green to yellow.

**E) Change from modulating into 3-pos operation mode:**

Push button (T) 3 times. LED changes from yellow to green.

**F) 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.

**G) Reverse function:**

Bridge between wiring 3 and 4 (signal wise) gets a reverse function of Y and U.

**Operation and failure indication by LED**

LED	Operation/Failure	Next steps
Off	No supply, actuator damaged	supply voltage, change actuator
GREEN	Supply available	Actuator active in modulating mode
YELLOW	Supply available	Actuator active in 3-pos mode
GREEN blinking	Self adjustment active	Wait until self adjustment has finished
RED blinking	Temperature failure (high/low)	Reduce/increase ambient temp.
RED	Electronic device failure	Return actuator to the factory for test



**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 RedMax 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 50014, Abs. 23.4.3.1 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 EEx-e terminal box is requested (e.g. type ExBox).

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

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

**B. Shaft connection, selection of running time, heater**

RedMax actuators are equipped with a direct coupling double squared shaft connection of 12 x 12 mm. For round shafts an adaptor is available (Accessory type KB-S). 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 and 2 different spring return running times can be selected on site. The integral heater is for ambient temperatures down to -40°C.

**C. Working with 3 sec. motor running time**

When working with the 3 sec. motor running time mode, you have to comply with the following parameters:

1. Max. operation mode 10 % ED, max. 1 on-off cycle per minute
2. In case of over-temperature, actuator stops until temperature decreased
3. Min. load not less than 20% of the rated torque, min. 3 Nm
4. After installation to the damper/valve a self adjustment to the Angle of rotation must be started to guarantee a soft endposition.

This function prevents the damper/valve from mechanical impacts. The actuator runs to each end positions within 30 sec/90°, recognizes the open/closed position and reduces the motor power automatically for soft start and soft stop.

**D. 3-pos control mode**

RedMax actuators are designed for on-off and 3-pos operation. To prevent parts like gear and mechanical devices from damage the internal RedMax electronic filters very short control pulses.

Max. 20 pulses < 1 > 0,5 sec. working in one direction are allowed, then min. 1 pulse > 1 sec. must work, otherwise the actuator stops. In this event the actuator needs to reset. For reset, the supply voltage must be cut for a minimum of 2 seconds. Please set the parameters of your control device to guarantee these limits.

**E. 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.

**F. Operation at an ambient temperature below - 20°C**

All RedMax actuators are equipped with an internal heater for use in ambient temperatures down to - 40°C. The heater works automatically if terminal 1 and 2 are connected to supply voltage.

At ambient temperatures < - 20°C you have to comply with following parameters :

1. Electrical connection to supply voltage directly after mechanical installation
2. Actuator does not work before reaching an internal temperature of min. - 20°C.

**G. Excess temperature**

In acc. to the ATEX rules and regulations EEx 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. RedMax 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.

**Mounting on air dampers with double squared shaft connection**

Shaft connection is a double squared 12 x 12 mm and can enter max. 20 mm into the actuator.

The actuator must be fixed directly to the damper or on a special mounting bracket.

**Mounting on air dampers with clutch**

For round damper shafts a clutch, type KB-S is available to connect the actuator to a shaft with  $\varnothing$  10..20 mm or  $\square$  10..16 mm. Max. torque is 30 Nm. The shaft can enter max. 20 mm into the actuator.

**Mounting of quarter turn valves**

For ball, throttle or other valves, a variety of adaptations/linkages are available on request.

**Mounting on linear valves with linear motion adaptation**

For linear valves a variety of adaptations/linkages from 10 to 42 mm stroke is available on request.

**RedSwitch - adaptable external EEx-d aux. switches**

RedSwitch is an accessory to RedMax actuators size S, fixing directly onto the actuator. RedSwitch are aux. switches with with 2 potential free contacts, adjustable on site. The electrical wiring needs an EEx-e terminal box.

**RedBox - adaptable EEx-e terminal box**

For electrical connection of an RedMax inside the hazardous area an EEx-e terminal box is required. **RedBox-3P** for RedMax-5.10,..-15.30,..-5.10-F,..-15-F **RedBox-3SP** for RedMax-...-S integral aux. switches To adapt the RedBox direct to the actuator housing an additional accessory **type MKK-S** is required.