



RedMax ¼ turn actuators – size M

RedMax - ... - Y - A
RedMax - ... - YF - A
RedMax - ... - CTM - A

Subject to change!

Electrical, explosion proof rotary actuators, 95° angle of rotation incl. 5° pretension
On-off, 3-pos., 0...10 VDC / 4...20 mA control mode, with feedback, 24...240 VAC/DC
450 –900 lbf.in without and 270–450 lbf.in with safety operation (spring return)
Tested in acc. with Canadian and United States hazardous location standards for
Class I Division 2, Groups ABCD and Zone 2

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

| Type | Torque | Supply | Motor running time | Spring return | Control mode | Feedback | Wiring diagram |
|----------------------|---|-----------------|--------------------------|---------------|-----------------------|-----------------------|----------------|
| RedMax-450.675 - Y-A | 450 / 675 lbf.in (50 / 75 Nm) | 24...240 VAC/DC | 40 / 60 / 90 / 120 s/90° | – | 0...10 VDC, 4...20 mA | 0...10 VDC, 4...20 mA | SB 4.0 |
| RedMax- 900 - Y -A | 900 lbf.in (100 Nm) | 24...240 VAC/DC | 40 / 60 / 90 / 120 s/90° | – | 0...10 VDC, 4...20 mA | 0...10 VDC, 4...20 mA | SB 4.0 |
| RedMax- 270 - YF-A | 270 lbf.in (30 Nm) | 24...240 VAC/DC | 40 / 60 / 90 / 120 s/90° | ~ 20 s/90° | 0...10 VDC, 4...20 mA | 0...10 VDC, 4...20 mA | SB 5.0 |
| RedMax- 450 - YF-A | 450 lbf.in (50 Nm) | 24...240 VAC/DC | 40 / 60 / 90 / 120 s/90° | ~ 20 s/90° | 0...10 VDC, 4...20 mA | 0...10 VDC, 4...20 mA | SB 5.0 |
| RedMax- ... - CTM -A | Types as above with aluminium housing and seawater resistant coating (cable glands brass nickel-plated) | | | | | | |

Product views and applications

RedMax-...-A



Safety damper



Ball valve



Throttle valve



Stick US



Description

The RedMax 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 hazardous areas Class I Division 2 (NEC 500) and Zone 2 (NEC 505).

Highest protection class (ATEX) and NEMA 4X protection, small dimensions, only 21 lb (9.5 kg) weight, universal functions, 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, accessory "Stick" is required. Motor running times and torques, according to the actuator type, are selectable 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.

...Max-...-F-A actuators are equipped with spring return fail safe function. Standard shaft connection is a double square direct coupling with 0.63" x 0.63" (16 x 16 mm).

Different accessories are available to adapt round/square shafts of different sizes, conduit boxes or adaptations for ball valves and throttle valves and other armatures.

Highlights

- ▶ For use in Class I, Division 2 and zone 2 areas
- ▶ Universal supply unit from 24...240 VAC/DC
- ▶ 4 different motor running times 40–60–90–120 s/90°, adjustable on site with "Stick"
- ▶ Control 0...10 V DC, 4...20 mA with feedback signal and with or without spring return
- ▶ Optional with spring return ~ 20 s/90°
- ▶ 270–900 lbf.in (30–50–60–75–100 Nm) actuators in the same housing size
- ▶ 100 % overload protected
- ▶ Compact design and small dimension: 11.34" x 5.87" x 4.57" (288 x 149 x 116 mm)
- ▶ Direct coupling to the damper shaft with double square 0.63" x 0.63" (16 x 16 mm)
- ▶ 95° angle of rotation inclusive 5° pretension
- ▶ Robust aluminium housing (optional with seawater resistant coating)
- ▶ NEMA 4X protection
- ▶ Simple manual override included + preparation for comfortable manual override
- ▶ Gears made of stainless steel and sinter metal
- ▶ Weight only ~ 21 lb (~ 9.5 kg)
- ▶ Integrated heater for ambient temperatures down to –40 °F (–40 °C)
- ▶ Integrated safety temperature sensor
- ▶ Integrated equipment for manual adjustment (push button, lamp)



| Technical data | ...- 450.675 -...-A | ...- 900 -...-A | ...- 270 -...-F-A | ...- 450 -...-F-A |
|----------------------------------|---|-------------------------------|--|------------------------------|
| Torque motor (min.) | 450/675 lbf.in (50/75 Nm) | 900 lbf.in (100 Nm) | 270 lbf.in (30 Nm) 4 | 50 lbf.in (50 Nm) |
| Torque spring (F) | – | – | min. 270 lbf.in | min. 450 lbf.in |
| 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), but min. 90 lbf.in (10 Nm) | | | |
| Supply voltage / frequency | 24...240 VAC/DC, ± 10 %, self adaptable, frequency 50...60 Hz ± 20 % | | | |
| Power consumption | max. starting currents see ⓘ Extra information (in acc. with voltage, $I_{start} \gg I_{rated}$), 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 time | 90 s/90° (with accessory "Stick" adjustable running times are 40 / 60 / 120 s/90°, selectable on site) | | | |
| Motor | Brushless DC motor | | | |
| Spring return (F) | – | – | spring return upon voltage interruption | |
| Spring return response time | – | – | up to 1 sec. after voltage interruption | |
| Spring return running time (F) | – | – | ~ 20 s/90° | |
| Safety operation (F) | – | – | min. 10,000 acc. to construction of damper and ambient | |
| Control mode | 0...10 VDC, 4...20 mA selectable on site. Galvanic separation between supply and Y-signal | | | |
| Feedback signal U | 0...10 VDC, 4...20 mA selectable on site | | | |
| Resistance of Y and U signals | Input signal: Y_i 0...10 VDC at 10 k Ω , Y_i 4...20 mA at 100 Ω . Feedback signal: U_i 0...10 VDC at 2,000... ∞ Ω , U_i 4...20 mA at 0...800 Ω | | | |
| Inverse function | Inverts signals Y and U, selectable with "Stick" | | | |
| Adjustment of Y and U | In case of external mechanical limitation of the angle of rotation, perform a self adjustment drive | | | |
| Axle of the actuator | Double square 0.63" x 0.63" (16 x 16 mm) direct coupling, 100 % overload protected | | | |
| Electrical connection | Cable ~ 39.4" (1 m), wire cross section 20 AWG (0.5 mm ²), equipotential bonding 4 mm ² . Connect an additional protection earth with min. 18 AWG. | | | |
| Diameter of cable | ~ \varnothing 0.3" (8 mm) | | | |
| Conduit connection | 1/2" NPT standard | | | |
| Manual override | Use delivered socket wrench, max. 36 lbf.in (4 Nm). | | | |
| Heater | Integrated, controlled heater for ambient temperature down to -40 °F (-40 °C), heating starts at -4 °F (-20 °C) | | | |
| Housing material | Aluminium die-cast housing, coated. Optional with seawater resistant coating (...-CTM) | | | |
| Dimensions (L x W x H) | ~ 11.34" x 5.87" x 4.57" (288 x 149 x 116 mm), for diagrams see ⓘ Extra information | | | |
| Weight | ~ 21 lb (~ 9,5 kg) | | | |
| Ambient temperature | Storage temperature -40...+158 °F (-40...+70 °C), working temperature -40...+104 °F (-40...+40 °C) at T6 and -40...+122 °F (-40...+50 °C) at T5 | | | |
| Humidity | 0...90 % rH, non condensing | | | |
| Operation mode | S3 intermittent mode, 50 % ED (ED = duty cycle). Note also page 4, chapter "Operation mode" | | | |
| Wiring diagrams | SB 4.0 / 6.0 | SB 4.0 / 6.0 | SB 5.0 / 7.0 | SB 5.0 / 7.0 |
| Scope of supply | Actuator with 1 m flying leads, 4 screws M8 x 140 mm, 4 nuts M8, Allen key for manual override | | | |
| Parameter at delivery | 450 lbf.in (50 Nm), 90 s/90° | 900 lbf.in (100 Nm), 90 s/90° | 270 lbf.in (30 Nm), 90 s/90° | 450 lbf.in (50 Nm), 90 s/90° |

Approbations

| | |
|-------------------------|---|
| CSA certificate | 2236405 |
| Approval Divisions | Class I, Division 2, Groups A, B, C, D; T5/T6, Enclosure 4X |
| Approval Zones | Class I, Zone 2, AEx db ec IIC T6/T5 Gc, Enclosure 4X Ex db ec IIC T6/T5 Gc, Enclosure 4X |
| Types ...-CTM | AEx db ec IIB T6/T5 Gc, Enclosure 4X Ex db ec IIB T6/T5 Gc, Enclosure 4X |
| UL certificate | QUYX E340805 |
| Approval electr. safety | UL 61010-1 |
| Enclosure protection | NEMA 4X |



Wiring to or from this device, which enters or leaves the system enclosure, must utilise wiring methods suitable for Class I, Division 2 Hazardous Locations, as appropriate for the installation.



This equipment is suitable for installation in Class I, Division 2, Group A, B, C, D hazardous locations or nonhazardous locations only.
CET EQUIPEMENT EST SEULEMENT APPROPRIÉ À L'INSTALLATION DANS LA CLASSE I, DIVISION 2, GROUPES A, B, C, D DES EMPLACEMENTS DANGEREUX OU DES EMPLACEMENTS NON DANGEREUX.



WARNING – EXPLOSION HAZARD:
Substitution of components may impair suitability for Class I, Division 2.
*AVERTISSEMENT – RISQUE D'EXPLOSION:
LA SUBSTITUTION DE COMPOSANTS PEUT RENDRE CE MATERIEL INACCEPTABLE POUR LES EMPLACEMENTS DE CLASSE I, DIVISION 2.*



WARNING – EXPLOSION HAZARD:
Do not connect or disconnect this equipment unless power has been removed or the area is known to be nonhazardous.
*AVERTISSEMENT – RISQUE D'EXPLOSION:
NE PAS BRANCHER OU DEBRANCHER TANT QUE LE CIRCUIT EST SOUS TENSION, À MOINS QU'IL NE S'AGISSE D'UN EMPLACEMENT NON DANGEREUX.*

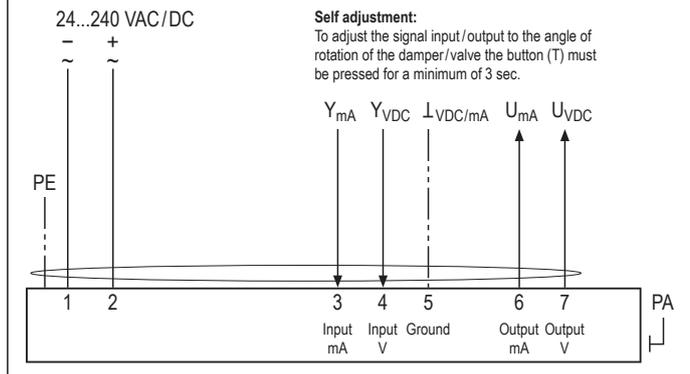


Electrical connection

RedMax 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!

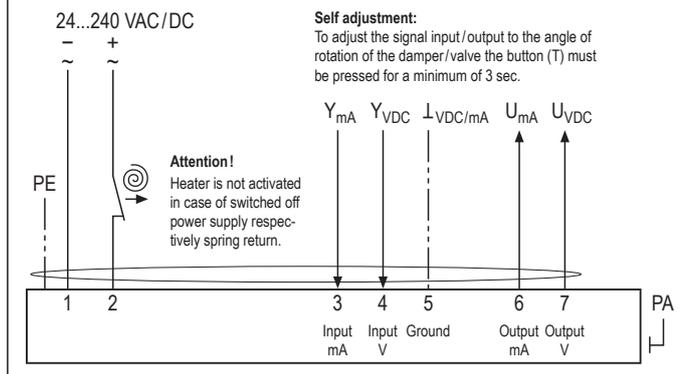
Modulating – without spring return

SB 9.0



Modulating – with spring return

SB 9.1



Parameters, adjustments and failure indication

Push button – Lamp – Connection for adjustment



Functions, adjustments and parameters

- A) Self adjustment of angle of rotation
B) Selecting motor running time, spring return time and torque with "Stick US"
C) Selecting Inverse with "Stick US"
D) Additional information for operation

Parameter selection with programming "Stick US"

- 1. Set stick's DIP switches acc. to table below
2. When actuator is powered, LED is GREEN
3. Screw stick into the actuator
4. Press actuator's "red" button (T) for 1 to 3 seconds, stick's setting are transferred
5. If transfer was successful the LED is blinking RED to GREEN 2 times



- Write protection
Blank
Blank
Inverse
Torque
Running time
Running time
Running time
Blank

Table with columns for Position of DIP switches and DIP switch 2/3 settings. Includes values like ON on, OFF off, 40 s/90°, 60 s/90°, 90 s/90°, 120 s/90°.



Caution

During commissioning apply a self adjustment drive. Regard duty cycle at motor running times! Never use spring return actuators without external load.



Important information for installation and operation

A. Installation, commissioning, maintenance

All national and international standards, rules and regulations must be complied with.

Canada: Install per Canadian Electrical Code (CEC).

USA: Install per National Electrical Code (NEC).

Certified apparatus must be installed in accordance with manufacturer instructions. If the equipment is used in a manner not specified by the manufacturer, the safety protection provided by the equipment may be impaired.

Attention: If the actuator is put out of operation all Ex rules and regulations must be applied. You have to cut the supply voltage before opening a junction box! For hazardous location installation regard the control drawing.

The actuator's cable must be installed in a fixed position and protected against mechanical and thermal damage. Connect potential earth. Seal conduit within 18 inches. All conduits must be assembled with a minimum of five full threads engagement. Avoid temperature transfer from armature to actuator! Close all openings with min. NEMA 4X. For outdoor installation a protective weather shield against sun, rain and snow (altitude up to 2000 m, pollution degree 2) should be applied to the actuator as well as a constant supply at terminal 1 and 2 for the integrated heater.

Actuators are maintenance free. An annual inspection is recommended. Clean only with damp cloth, avoid dust accumulation.

Actuators must not be opened by the customer.

B. Manual override

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

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

C. Shaft connection, selection of running time

Actuators are equipped with a direct coupling double square shaft connection of 0.63" x 0.63" (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. Acc. to the actuator type different motor running times and spring return running times can be selected on site.

D. Operation mode

The actuator works with intermittent operation mode S3 – 50 %. This restriction is valid for full load applications. Means: 5 min. working, 5 min. idle. Otherwise the internal thermostat switches off the motor.

E. Spring return

Spring return function works only if the supply voltage for terminal 1 or 2 is cut. In the event of an electrical interruption, the spring returns to its end position even if supply voltage is available again during return function. Thereafter operation will continue.

F. Operation at ambient temperatures below -4 °F (-20 °C)

All actuators are equipped with a regulated integrated heating device designed for employments down to -40 °F (-40 °C) ambient temperature. The heater will be supplied automatically by connecting the constant voltage supply on the clamps 1 and 2.

1. After mounting the actuator must be electrically connected immediately.
2. The heater switches on automatically when the actuator reaches internally -4 °F (-20 °C). It heats up the actuator to a proper working temperature, then the heater switches off automatically. The actuator will not run during heating process.
3. The adjustment options are only ensured after this heating up period.

G. Excess temperatures

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

H. Synchron mode

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

I. Mechanical protection

Actuators must be operated with a minimum external load.

After installing the actuator to the damper/armature a self adjustment drive has to be performed in order to protect the damper/armature against mechanical overload. During operation the actuator reduces briefly its speed (motor power) before reaching the end position for a "gentle" blockade/stop.

J. Intrinsically safe circuits

The actuator has a flameproof enclosure. The supply of the push button (adjustment drive) and the LED indicator is performed intrinsically safe!

Extra information (see additional data sheet)

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

Installation

Hazardous (classified) locations



Nonhazardous locations



Junction box

Signal *
Input 4...20 mA / 0...10 V DC
Output 4...20 mA / 0...10 V DC

Supply *
24...240 V AC/DC ± 10 %

* electrical wiring see diagrams

- Do not open covers when circuits are live
- The cable must be installed in a fixed position and protected against mechanical and thermal damage. Damaged cords must be replaced by manufacturer
- Use supply wires suitable for 9 °F (5 °C) above surroundings
- Connect protection earth with min. 18 AWG wire size
- Avoid thermal transfer from ducts, pipes, ... to actuator (ensure max. ambient temperature T_a!)
- After setting close all covers and entries tightly with min. NEMA 4X
- Clean only with damp cloth, avoid dust accumulation

Special solutions and accessories

| | |
|-----------|---|
| ...-CTM | Types in aluminium housing with seawater resistant coating, parts nickel-plated |
| Stick US | For setting of different actuator functions (motor running time, torque) |
| HV-MK | Comfortable manual override for...Max actuators size M |
| AR-16-xx | Reduction part for 0.63" square connection to 0.55" or 0.47" shafts |
| WS-... | Weather shield in stainless steel |
| Adaptions | For dampers and valves on request |