



**True Fail-Safe Technology and Precision  
Control for Reliable Shutdown**

**RTS Series Compact Fail-Safe Electric Actuators**  
Reliable, Accurate, Compact Electric Actuation Technology for Critical Fail-Safe and  
Demanding Process Requirements

**BETTIS™**



**EMERSON™**

## RTS Actuators from Emerson



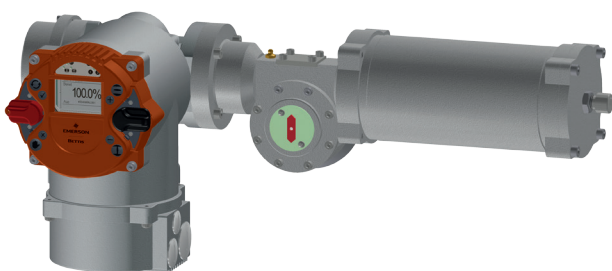
*RTS CM Compact Multi-Turn*



*RTS CL Compact Linear*



*RTS FL Fail-Safe Linear*



*RTS FQ Fail-Safe Quarter-Turn*

RTS Series of electric actuators builds upon over half a century of innovation, reliability and success in the field. The RTS Series offers four distinct, technologically advanced electric actuators that address a broad spectrum of market needs. From meeting the challenge of demanding process control applications to the safety requirements of critical plant processes. RTS is ideal for power, oil and gas, chemical, water, wastewater and mining industries.

### Compact & Smart

The RTS CM Compact Multi-Turn electric actuators developed in collaboration with end users delivers an efficient and flexible actuator in two different sizes. With an integrated smart control unit, the RTS CM actuator not only meets the need for your gate valve applications but also serves as the common design platform for the RTS Series of actuators. The RTS CM utilizes a high power density motor and new materials for compact design and lightweight.

### Mechanical Spring Return Fail-Safe for Reliable Emergency Shutdown

The RTS FQ Fail-Safe Quarter-Turn and RTS FL Fail-Safe Linear electric actuators use energy stored in mechanical springs to position the valve in a safe closed or open position. Targeted for both quarter turn and linear applications these products provide a reliable mechanism for emergency shutdown applications without the need for electric power. Built upon a compact and unique electro-mechanical design, these units offer a cost effective, low maintenance alternative to pneumatic and hydraulic based systems.

### Precise & Repeatable Process Control

With the RTS CL Compact Linear electric actuators, we provide an actuator that is suitable for your most demanding control applications. Available in multiple sizes, the RTS CL actuator combines a brushless DC motor using variable frequency controls and advanced software into a compact form factor to provide advanced linear modulating control capability.

### Advanced Insight & Ease of Use

In developing the RTS Series of electric actuators special attention was given to the usability and data capability. The integrated control unit common on all RTS actuators is characterized by ease of use. RTS actuators can be configured and controlled either using local controls or wirelessly using Bluetooth. In order to optimize operations and prevent downtime, actuator operational data including status information, alerts, event log, and data history is logged and made available to the end user.

## Features & Benefits

### RTS Series Features

- Compact, multi-turn, quarter-turn, linear and fail-safe electric actuator series
- Integrated actuator control unit with frequency converter for variable speed control
- High efficiency brushless DC motor technology
- Adjustable stroke time and torque range
- Precise and repeatable control
- Mode of operation from S2-S9
- Non-intrusive setup
- PID controller
- Programmable emergency speeds and ramps
- Position limits non-intrusively adjustable
- Anti-water hammer
- Voltage options from 24 VDC to 480 VAC
- Compact and lightweight
- Watertight and explosion proof enclosures
- Discrete, analog and network control
- 5 Programmable LEDs
- 5 discrete inputs and 8 output relays
- Analog position feedback 4 -20 mA (2-wire)
- Optional relay board for 250 VAC, 2A with 4 or 6 outputs
- Bluetooth interface for easy wireless configuration
- Real-time operational data logging for analysis and preventative maintenance service
- Multi-language display

### Fail-Safe Design

- Mechanical spring return design
- No hydraulics or battery needed
- Fail-safe triggering in case of loss of 24 VDC fail-safe signal or main power supply
- Adjustable fail-safe operating speed
- Eliminates periodic inspections with self-testing every time it is operated
- Partial valve stroke test (PST)
- No initializing stroke needed
- Regulating operation
- Optional override available

### Mechanical Design

- Compact and lightweight
- High efficiency with planetary gear train
- Hand wheel with reverse torque lock (no de-clutch for manual operation)
- Convenient rotatable display panel and read-out in 90° increments
- Less sealing surfaces and high corrosion protection
- Low noise and low wear (maximum noise level of 54 dB at a distance of 1 m)
- Standard NEMA 4 enclosure
- Aluminum housing (also available in bronze and steel)

### Communication Protocols

- Modbus RTU and HART
- In future, will be DCMLink software compatibility

### Weatherproof Protection

- IP 66, IP 67

### Ambient Temperature

- Standard: -40° C to +60° C

### Corrosion Protection and Paint

- Standard corrosion protection equivalent to C4 according to ISO 12944-2
- Optional 4-layer coating for increased corrosion protection equivalent to C5-M according to ISO 12944-2

### Enclosure Explosion Certification

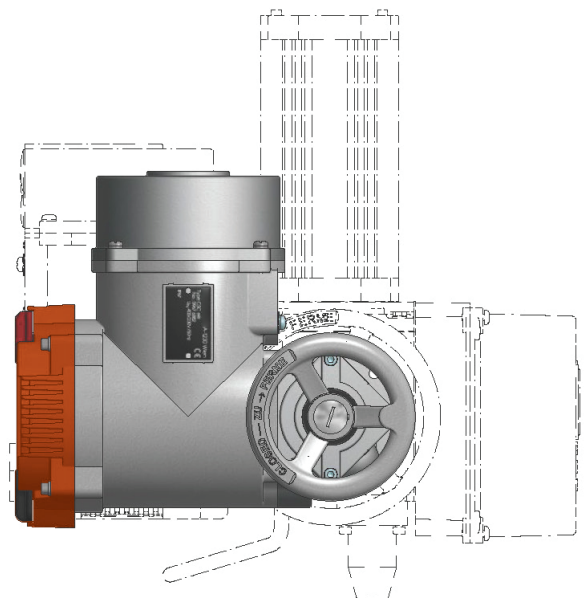
- ATEX , IECEx, UL, CSA

### Operating Temperature

- -40°C to +60°C

### Operating Modes

- On/off equivalent to S2 - 25% DC
- Positioning equivalent to S2 starts per hour
- Regulating equivalent to S4, 1,200 40, 40 % DC



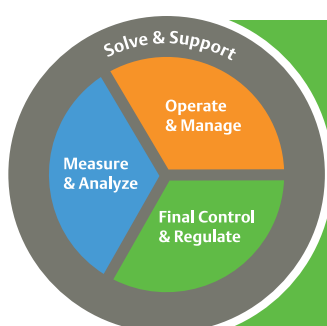


## RTS Series delivers reliable and fail-safe performance for critical emergency relief valves in power plants

A global leader in power turbine generation had a need to operate critical steam and water control valves with an actuator that could deliver precise positioning control with a reliable fails-safe mechanism that could operating the valve under two seconds. The RTS Series exceeded customer expectations by providing a solution with the fail-safe linear actuator that provided fast emergency shut off in a compact package while lowering plant maintenance by eliminating the need for piping systems associated with pneumatic solution.

Whether it is providing emergency shut down for well heads, actuating critical control valves in power plants, meeting the safety needs of biogas or district heating for cities around the globe, the Emerson RTS family of actuators provides a reliable, compact, cost-effective and smart solution to meet your process challenges.

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With an integrated control unit, the RTS Series compact controlled, fail-safe electric actuator opens up new possibilities for your process. Flexible and smart, these actuators are utilized in many industrial applications and can be easily upgraded at any time through our software enhancements. Even the basic design, compact size and lightweight, allows the RTS Series to be in many industrial applications.

### Final Control & Regulate

Valves, Actuators & Regulators & Relief Valves • Actuation Technologies

## Designed for Emergency Shutdown Requirements



### Reliable Fail-Safe

Mechanical spring return design requires no hydraulics or battery needed for peace of mind, low maintenance fail-safe system



### Selectable Fail-Safe Trigger

Fail-safe triggering in case of loss of 24 VDC fail-safe signal or main power supply



### Adjustable Fail-Safe Speed

Adjustable fail-safe operation for both linear and quarter-turn applications with fast configurable shutdown between 1-15 secs

## Challenging Process Control Applications



### Configurable Speed and Torque

Advanced technology uses frequency inverter technology to control brushless dc motor speed and torque



### High Accuracy Control

On/off, positioning and regulating control



### PID Controller

Standard PID feature for controlling an external process variable using 0/4-20 mA signal

## Network Communications Protocols

### Supports Hart and Modbus



Due to the increasing amount of information that can be provided by electric actuators, the importance of bus systems in actuator technology is growing.

RTS actuators are capable of supporting the HIGHWAY ADDRESSABLE REMOTE TRANSDUCER (HART) communication protocol over existing analog 4–20 mA signal. Using master/slave mode HART enables communication in both directions at a maximum speed of 1200 bits/s.



Modbus RTS is based on the RS485 interface and on the IEC 61158 and IEC 61784 standards. This open, flexible and simple bus system makes it easy to integrate into existing systems.

- Speeds up to 1.5 M Baud
- Up to 247 nodes / max. of 32 nodes per segment and max. of 8 segments
- 1-channel or 2-channel (redundant) design



### SMARTCON Control Unit

From the beginning, attention to detail was given to the safety and usability of the SMARTCON Control Unit. Emerson combines both safety and user-friendly flexibility into the RTS control module making it easy to read and configure.

## RTS Series Electric Actuators

Reliable valve control for critical safety needs in demanding process applications

### RTS CM Compact

#### Multi-Turn Electric Actuator

- On/off operation and modulating duty
- DC, single phase and three phase options
- Available in two sizes: CM-32 and CM-64
- Maximum torque up 64 Nm (47 ft lbs)
- Adjustable speed and positioning time
- Brushless DC motor technology
- 4 x 90° rotatable display
- Low number of sealing surfaces
- Aluminum housing
- Absolute position detection
- Non-intrusive setup



### RTS CL Compact

#### Linear Electric Actuator

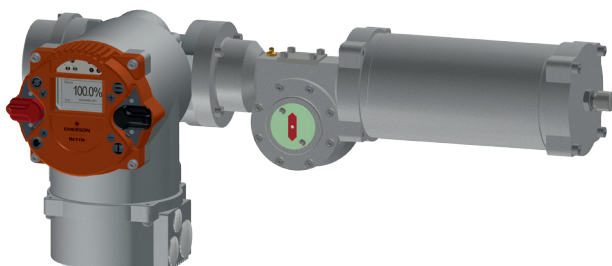
- On/off operation and modulating duty
- DC, single phase and three phase options
- Available in three sizes: CL-05, CL-15, CL-25
- Maximum force up to 25 KN (5,620 ft lbs)
- Adjustable speed and positioning time
- Brushless DC motor technology
- 4 x 90° rotatable display
- Low number of sealing surfaces
- Aluminum housing
- Absolute position detection
- Non-intrusive setup



### RTS FQ Fail-Safe

#### Quarter-Turn Electric Actuator

- On/off operation and modulating duty
- DC, single phase and three phase options
- Available in three sizes: FQ-03, FQ-06, FQ-20
- Maximum torque up 2,000 Nm (1,475 ft lbs)
- Maximum fail-safe torque 1,000 Nm ( 737 ft lbs)
- Adjustable speed and positioning time
- Brushless DC motor technology
- Aluminum housing
- Absolute position detection
- Non-intrusive setup



### RTS FL Fail-Safe

#### Linear Electric Actuator

- On/off operation and modulating duty
- DC, single phase and three phase options
- Available in three sizes: FL-05, FL-15, FL-25
- Maximum force up to 25 KN (5,620 ft lbs)
- Maximum spring remaining fail-safe force 12KN (2,700 ft lbs)
- Adjustable speed and positioning time
- Brushless DC motor technology
- Aluminum housing
- Absolute position detection
- Non-intrusive setup



## Operational Data Logging



The RTS Series includes an integrated operational data logging capability that records data in real-time, provides meter readings, displays operating status, history, and warning alerts.

By obtaining real time data, service issues and repairs may be identified early allowing for preventative and targeted measures to be performed before major and costly malfunctions occur. The RTS Series, non-intrusive setup, operates in multi-languages reliably and gathers valuable information about its operational status in real-time. With the integrated SMARTCON controls with Bluetooth capability, the RTS Series is easy to install, maintain and use.

### Status Display

ACTUSMART	
S1	Bin Outputs
12345678	10 100000

#### S1 Binary Outputs

Displays eight binary feedbacks (freely programmable) providing information about communications with the control unit. This provides commissioning support. Depending on the configuration, a set output 1 (active high) or 0 (active low) is shown.

ACTUSMART	
S2	Bin Inputs
1 2 3 4 5	0 0 0 0 0

#### S2 Binary Inputs

Displays five binary inputs (freely parameterizable) representing the incoming movement commands with 1 instead of 0.

ACTUSMART		
S3	Analogue values	
	In	out
1	0.00mA	20.00mA
2	0.00mA	0.00mA

#### S3 Analog Values

Displays analog 0/4–20-mA inputs and feedbacks from and to the control unit.

ACTUSMART	
S4	Absolute values
Pos:	638U (rel. 93.6%)
Drehmo:	0 (rel. 00%)

#### S4 Absolute Values

Displays absolute and relative values for positions and torques.

ACTUSMART	
S5	Firmware
PNr:	1124 65 38
CD Nov:	6 2015
Para Vers:	1123 0

#### S5 Firmware

Displays firmware version and date.

ACTUSMART	
S6	Serial number
aaFc:	24d557893897
Actuator:	1411300395
Control:	1411300395

#### S6 Serial Number

Displays electronic's, actuator and control unit serial numbers.

ACTUSMART	
S7	Counter values
PowerOn Cycles:	21
PowerOn Time:	14d 0h
Motor runtime:	0d 0h

#### S7 Counter Readings

Displays how often the actuators has been turned on and off.

Displays actuator running in current voltage and motor running time.

### History Status

ACTUSMART	
H 1	HISTORY
#8 Power On	2015-11-09 09:59:17

In the history status menu, events are continuously time-stamped, logged and stored. Up to 100 events can be tracked and displayed.

#### Warning Alerts

Displays warning alerts providing valuable information on the actuator operating status allowing for a complete failure to be detected early to mitigate the risk of shutdown.

#### Failures and Malfunctions

Should an actuator fail, the white backlight of the display will automatically change to red, which can be seen from a distance.

#### Signal LEDs

Multiple colored LED are used to indicate operating status. Two LEDs are for visualizing the movement and reaching the end position. Two LEDs are for standby status. One LED is for visualizing an active communication interface (Bluetooth or infrared).

#### Other Available Options

- Torque logging
- Partial valve stroke test
- Adjustable maintenance and service intervals

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