



True Fail-Safe Technology and Precise Process Control

Bettis™ RTS Electric Actuators

Reliable, trusted and safe electric actuators for critical fail-safe applications and demanding process control requirements



RTS Compact Actuators

Process Control & On/Off



RTS Compact Multi-Turn



RTS Compact Linear



RTS Compact Quarter-Turn

The RTS Electric Actuators are built upon half a century of innovation, reliability and success in the field. These technologically advanced electric actuators are designed to increase operational safety, improve plant productivity, minimize downtime and reduce cost with a portfolio that meets the needs of control and fail-safe applications.

The RTS compact actuators are an intelligent, non-intrusive design available for multi-turn, linear and quarter-turn outputs for both on/off and process control applications.

Adjustable Speeds and Repeatable Process Control

High precision and continuous regulation at the plant site can help contribute to plant efficiency. Adjustable speeds in both open and close directions and accuracy of 0.1% for positioning can help prevent damages due to water hammering effects. The device uses a high efficiency brushless DC motor driven by variable frequency controls to adjust open/close and overall speed of the actuator.

Robust Design

The design is housed in a corrosion resistant aluminum housing delivering long life and reliability. The lubricated planetary gear train produces low noise and reduced wear and tear on the device, thus enabling ease of maintenance in the field. In addition, to improve user experience, the clutch-less handwheel with mechanical torque barrier offers a robust manual override protection mechanism.

Advanced Local User Interface

The smart user interface was designed with safety, flexibility and reliability in mind. The integrated control unit is common across the RTS actuators and is characterized by ease of use. The actuators can be configured and controlled either using local controls or wirelessly using Bluetooth. To enhance user experience the actuator operational data – status information, alerts, event logs and data history are logged and made available to the end user on a display that can be conveniently rotated in 90° increments.

Design Versatility

The elegant and smart compact multi-turn design is modular and can be expanded to both linear and quarter-turn designs to address a broad spectrum of market needs. Linear applications can be achieved by attaching a linear drive at the output of the multi-turn unit and quarter-turn application can be achieved by attaching an auxiliary gear box at the output of the multi-turn unit.

Product Features

- Multi-turn, linear and quarter-turn options
- Light weight and small footprint
- Non-intrusive setup
- On/off and continuous modulating duty-S9
- Adjustable speeds
- Independently adjustable soft starts/stops
- Torque measurement for protection and diagnostics
- Fail in last position
- Reliable and highly accurate positioning control
- DC, single phase, three phase power supply options
- Clutchless handwheel design
- 5 discrete inputs and 8 output relays
- 4-20 mA (2 wire) analog position feedback
- Optional relay board for 250 VAC, 2A with 4 outputs
- Process control via optional on-board PID controller
- Local user interface with Bluetooth connectivity for configuration, monitoring and diagnostics
- Multi-lingual user interface

Power Supply

- 24 – 230 VDC, 115-230 VAC 50/60 Hz 1ph to 380-480 VAC 3 ph

Ambient Temperature

- Standard: -40°C to +60°C

Operating Modes

- On/Off – S2
- Modulating – S9 Continuous

Ingress Protection

- IP66 (NEMA 4x), IP67 (NEMA 6), IP68

Corrosion Protection

- Standard: C4 ISO 12944-2
- Optional: 4-layer with Epoxy. C5-I, C5-M ISO 12944-5

Compact Multi-Turn (CM) Torque

Model	Adjustable Max Torque ft lbs (Nm)	Min Torque ft lbs (Nm)	Modulating Torque ft lbs (Nm)
CM-32	23 (32)	5.9 (8)	12 (16)
CM-64	47 (64)	11.8 (16)	23.6 (32)

Compact Linear (CL) Thrust & Stroke

Model	Max Thrust lbs (KN)	Max Modulating Force lbs (KN)	Max Stroke Length Inch (mm)
CL-05	3327 (15)	1798 (8)	1.96 (50)
CL-15	3327 (15)	1798 (8)	3.93 (100)
CL-25	5620 (25)	3327 (15)	3.93 (100)

Compact Quarter-Turn (CM+QT) Torque

Model	Adjustable Max Torque ft lbs (Nm)	Min Switch Off Torque ft lbs (Nm)	Modulating Torque ft lbs (Nm)
CM-32/QT12	92 (125)	5.9 (33)	49 (66)
CM-32/QT25	187 (250)	47 (64)	94 (125)

Certifications

CM-32¹

1ph, 24VD – CSA NEC 500 / NEC505, ATEX, IECEx, LVD

3ph - ATEX

CM-64²

1ph, 24VD – CSA NEC505, ATEX

Communication Protocols



¹ - Applies to all CM-32 models – CL-05, CL-15, CM-32/QT12, CM-32/QT25

² - Applies to all CM-64 models – CL-25

RTS Fail-Safe Actuators

On/Off & Process Control



RTS Fail-Safe Quarter-Turn



RTS Fail-Safe Linear

The RTS fail-safe product line is designed to meet challenging critical shut down requirements. The fail-safe actuators offer a range of sizes for both part-turn and linear emergency shut-down applications. The intelligent, non-intrusive platform delivers high accuracy of 0.1% for accurate positioning and adjustable speeds of the fail-safe stroke. The fail-safe action can be triggered either via loss of 24VDC signal or main power supply.

Reliable Fail-Safe Actions

Repeatable and reliable fail-safe shutdowns, when initiated, ensure plant safety and reliability. The RTS fail-safe quarter-turn (FQ) and RTS fail-safe linear (FL) electric actuator use energy stored in mechanical springs to position the valve in fail-safe close or open direction. The fail-safe actuators provide a reliable and repeatable mechanism for fail-safe actions without dependency on battery backup or the repeated re-charge cycles of a super capacitor. The mechanical fail-safe spring action enables safe operating mechanism for emergency shutdowns.

Robust Operations

The mechanical spring housed in a corrosion resistant aluminum housing provides low maintenance and long life. This elegant design encapsulates a compact multi-turn module connected to the rack & pinion which in turn is connected to a spring pack. In addition, to improve user experience, the clutchless handwheel with mechanical torque barrier offers a strong manual override protection mechanism.

Adjustable Speeds and Repeatable Process Control

High precision and continuous modulation of valves can help contribute to plant efficiency. Adjustable operating speeds in both open and close directions can help optimize the process. The device uses a high efficiency brushless DC motor driven by variable frequency controls to adjust open/close and overall speed of the actuator.

Advanced Local User Interface

The smart local user interface was designed with safety, flexibility and reliability in mind. The integrated control unit is common across the RTS actuators and is characterized by ease of use. The actuators can be configured and controlled either using local controls or wirelessly using Bluetooth. To enhance user experience, the actuator operational data – status information, alerts, event logs and data history are logged and made available to the end user directly on the display that can be conveniently rotated in 90° increments.

Product Features

- Smart mechanical fail-safe quarter-turn and linear actuators
- Mechanical driven fail-safe operation for reliability and safety
- No battery or super-capacitor dependency for fail-safe action
- Direct coupling of the fail-safe with the valve shaft
- Non-intrusive setup
- On/off and continuous modulating duty-S9
- Adjustable speeds
- Fail-safe triggering selectable in case of drop-off 24 VDC fail-safe signal or main power supply
- Independently adjustable soft starts/stops
- Reliable and highly accurate positioning control
- DC, single phase, three phase power supply options
- Optional de-clutchable handwheel
- Weather-proof and explosion-proof construction
- SIL 3 capable
- 5 discrete inputs and 8 output relays
- 4-20 mA (2 wire) analog position feedback
- Optional relay board for 250 VAC, 2A with 4 outputs
- Process control via optional on-board PID controller
- Torque measurement for protection and diagnostics
- Local user interface with Bluetooth connectivity for configuration, monitoring and diagnostics
- Multi-lingual user interface

Power Supply

- 24 – 230 VDC, 115-230 VAC 50/60 Hz 1ph to 280-480 VAC 3 ph

Ambient Temperature

- Standard: -40°C to +60°C

Operating Modes

- On/Off – S2
- Modulating – S9 Continuous

Ingress Protection

- IP66 (NEMA 4x), IP67 (NEMA 6), IP68

Corrosion Protection

- Standard: C4 ISO 12944-2
- Optional: 4-layer with Epoxy. C5-I, C5-M ISO 12944-5

Fail-Safe Quarter Turn (FQ) Torque Range

Model	Max. Electric Torque ft lbs (Nm)	End of Spring Remaining Fail-Safe Torque ft lbs (Nm)	Modulating Torque ft lbs (Nm)
FQ-03	220 (300)	110 (150)	110 (150)
FQ-06	440 (600)	220 (300)	220 (300)
FQ-10	738 (1000)	369 (500)	369 (500)
FQ-20	1475 (2000)	730 (1000)	730 (1000)
FQ-30	2210 (3000)	1100 (1500)	1100 (1500)
FQ-50	3687 (5000)	1800 (2500)	1800 (2500)

Fail-Safe Linear (FL) Thrust & Stroke Range

Model	Max Electric Thrust lbs (KN)	Max Modulating Thrust lbs (KN)	Max Stroke Length Inch (mm)
FL-05	1124 (5)	674 (3)	1.18 (30)
FL-15	3372 (15)	1798 (8)	2.0 (50.8)
FL-25	5620 (25)	2697 (12)	4.0 (101.6)
FL-40	10116 (45)	3372 (15)	4.0 (101.6)

Certifications ^{3/4}

1ph, 24VDC – CSA NEC 500 / NEC505, ATEX, IECEx, LVD

3ph - ATEX

Communication Protocols



³ - FQ-10/20/30/50 - 1ph, 24VDC-CSA NEC 505, ATEX

⁴ - FL-40 – 1ph, 24VDC – CSA NEC 505, ATEX

Intelligent User Interface

Available via Local Display or Mobile APP

The RTS actuators include 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 preventive maintenance to be performed before major and costly malfunctions occur. The RTS Series local user interface offers a non-intrusive setup mechanism. The multi-language user interface helps gather valuable data about the operational status of the device in real time. With Bluetooth connectivity, the RTS actuators are easy to install, maintain and operate.



Local User Display



Binary Outputs

Displays 8 binary outputs feedback for communication with the control unit



Binary Inputs

Displays 5 binary inputs to manage incoming commands



Analog Values

Displays 4-20 mA feedbacks from and to the control unit



Absolute Values

Displays absolute and relative values for positions and torques



Firmware

Displays firmware version and date



Serial Number

Displays control unit serial numbers



Counter Readings

Displays frequency of power cycles, current voltage and motor operating time



Warning Alerts

Indicates early failure detection for preventive maintenance



Failures and Malfunctions

Device failure indicated with red display screen



Signal LEDs

Multi-color LEDs for ease of operation



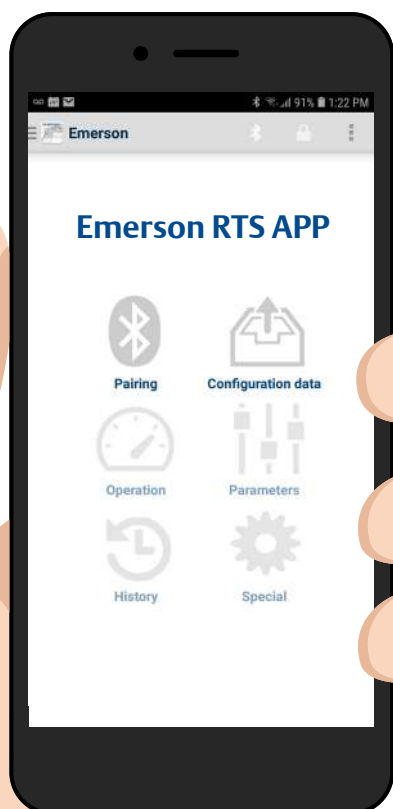
History Status

Displays up to 100 events that can be tracked and displayed



Other Available Options

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



RTS Applications

RTS Compact Actuators for Challenging Process Control Environments



Gas/Oil Water Separation - Upstream O&G

High frequency modulation rates for gas / oil water separation supporting production fields requiring high precision resolution. The RTS Compact Linear (CL) electric actuator was able to achieve 0.2% resolution at very fast stroke times of 1-2 sec.



Steam Distribution – Combined Cycle Power Plant

Used as an energy source in urban buildings, the district heating and cooling distribution for pressure and level control require high resolution modulation and speed control. The RTS Compact Multi-turn (CM) was able to achieve 0.1% resolution with S9 continuous modulation operation mode.



Titanium Parts - Casting Facility

Controlling environmental temperatures to ensure proper casting quality. Used to isolate chilled water from building HVAC system. The RTS Fail-Safe Linear (FL) actuators with mechanical fail-safe action can be triggered in case of loss of 24VDC signal or main power supply to ensure casting integrity and plant safety. High frequency modulation with 0.1% accuracy to control facility temperatures within $\pm 1^\circ$.

RTS Fail-Safe Actuators for Critical Shutdown Requirements



Ammonia Barge - Truck Loading Facility

The operation at the barge required high safety standards to ensure the shut off of the tank farm from the loading rack in case of fire or chemical release. The RTS Fail-Safe Quarter-turn (FQ) with true mechanical spring return and fail-safe action that could be controlled via an external power supply proved to be a right fit for this application.



Aeration Basins – Waste Water Treatment Plants

The aeration process at the wastewater treatment plants require continuous modulation control and variable speeds to manage the operation. The RTS Compact Quarter-turn (CM+QT) with its small footprint, adjustable speeds of 2-54 sec and continuous modulation duty S9, proved to be the perfect solution.



Well Kill - Upstream Oil & Gas

Majority of the well kill applications are at remote locations and because of the nature of the operation there is no room for error. Both the RTS Fail-Safe Linear (FL) and Fail-Safe Quarter-turn (FQ) 24VDC machines with mechanical spring return have both been implemented at various sites. With no dependency on battery backup or waiting on recharge times for a super-capacitor the RTS actuators were a perfect match for the application.



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