

Bettis RTS CM Series

Smart Compact Multi-Turn Actuator



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Main Features

- CM Series suitable for Torque-Only, Torque and Thrust applications
- Both lightweight and delivers torque in small envelope
- Non-intrusive local device configuration
- On/Off: S2-15 min. and 30 s/h, IEC 60034 (Class A and B, EN 15714)
- Modulating: S4-1200 s/h and S9-Continuous duty, IEC 60034 (Class C and D, EN 15714)
- Adjustable speed and torque
- Independently adjustable soft starts/stops
- Torque measurement for protection and diagnostics
- Fail in last position. For fail-safe reference, see FL and FQ data sheets
- Reliable and high positioning control 0.1% accuracy
- DC, single phase, three phase power supply options
- Clutchless handwheel design
- Local user Interface with wireless Bluetooth® capability for configuration, monitoring and diagnostics of key parameters
- DCMLink software interface available
- Process control via optional onboard PID-controller
- Multilingual user interface
- Brushless DC motor technology
- Configurable action on loss of control signal

Figure 1. Bettis RTS CM Series Cut-away

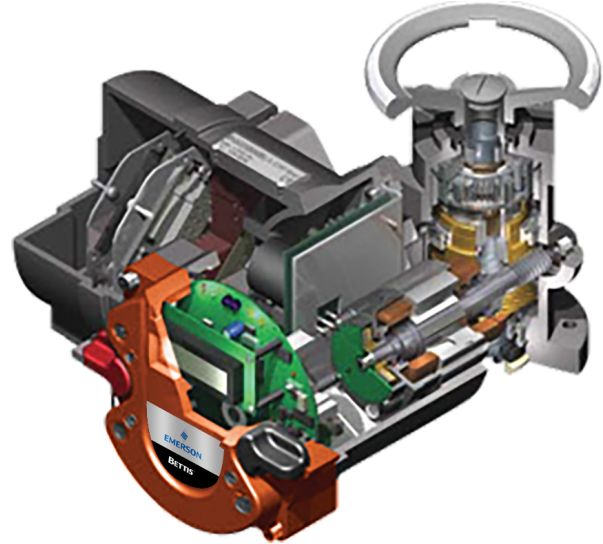


Figure 2. RTS Modular Design



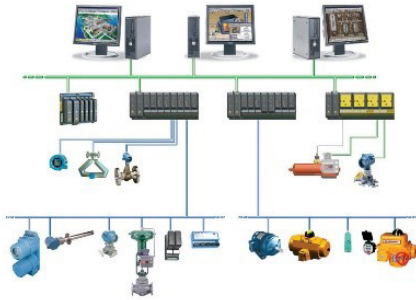
Features

Figure 3. Local Display, Status, and Configuration



Rotatable display panel and readout in 90° increments
2 Hall Effect contactless selector switches
(Black) right selector switch for local Open, Close directional commands
Padlockable (Red) left selector switch for Local, Off, Remote control options
Programmable status indicating LEDs for visual operation, readiness, warnings and error message enunciations
Day/night backlit text display in multiple configurable languages
Current position, over torque indication, machine health, operation data logging history

Figure 4. Control and Status Options



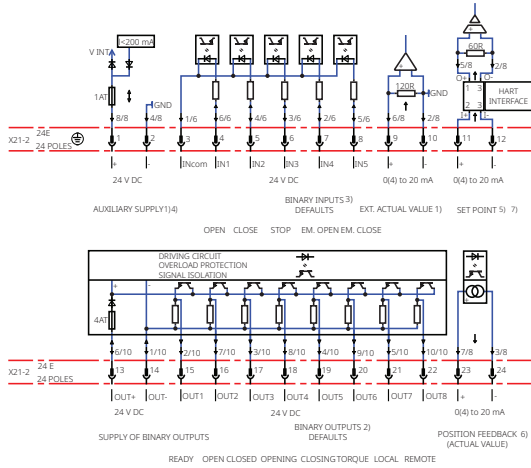
Discrete I/O 2, 3, or 4 wire control options
Multiple status feedback: Actuator ready, open, closed, ESD initialized, PST pass/fail, etc.
Analog 0 to 20 mA or 4 to 20 mA position set-point and position feedback
WirelessHART® capable with Thum: control and status update
Network Protocols: Modbus® TCP and RTU, HART®, Profinet and Profibus DP (optional)
Single loop PID process variable control (optional)

Figure 5. Diagnostics, Monitoring, Control, and Configure



Configuration software: DCMLink
Wireless communications via IRLT and Bluetooth
Communication device: MS laptop
DCMLink provides diagnostics, control, configuration uploads and monitoring of alarms
DCMLink comes as a single laptop application or a licensed AMS Device Manager Snap-On

Figure 6. Digital Inputs and Outputs



5 Binary Inputs 8 Configurable Binary Outputs
Digital Inputs and Outputs can be powered by actuator or customer supplied 24 V DC
Optional board available for 115 to 230 DC/AC voltage for discrete inputs and outputs
Common ground of the binary inputs is optically isolated from other internal electronics
All binary outputs are optically isolated when customer supplies control voltage
Different wiring conduits available for weatherproof and explosion proof ratings

Figure 7. Binary Input/Output Current Characteristics



Customer supplied control power: 20 to 30 V DC Max. current: 500 mA or 120 mA in power-safe
Max. allowed current for all binary outputs with power supplied by control system: 250 mA
Actuator sourced output voltage: typical 23 V Max. output current: 200 mA
Max. allowed current for all binary outputs with power supplied by actuator: 150 mA
Max. allowed current per binary output: 500 mA
Analog in and out uses the actuator's control unit common ground

Bettis RTS CM32 and CM64 Multi-Turn Units

Table 1. Bettis RTS CM32 and CM64 Multi-Turn Units

Attribute	CM32			CM64		
	24 V DC ±10%	1 PH 110 to 230 V ±10%	3 PH 380 to 480 V ±10%	24 V DC ±10%	1 PH 110 to 230 V ±10%	3 PH 380 to 480 V ±10%
Power Supply, V ⁽¹⁾⁽²⁾	24 V DC ±10%	1 PH 110 to 230 V ±10%	3 PH 380 to 480 V ±10%	24 V DC ±10%	1 PH 110 to 230 V ±10%	3 PH 380 to 480 V ±10%
Nominal Motor Current, A (Conditions) ⁽³⁾	4.6 (16 Nm/ 20 RPM/ 24 V DC)	1.47 (16 Nm/ 72 RPM/ 230 V)	0.46 (16 Nm/ 72 RPM/ 400 V)	NOT AVAILABLE	2.17 (20 Nm/ 60 RPM/ 230 V)	0.9 (32 Nm/ 60 RPM/ 400 V)
Idle Power Consumption	6 W	12 W		NOT AVAILABLE	12 W	
Torque Range, S2 (Class A/B), lbf-ft / Nm	6 to 24 / 8 to 32			NOT AVAILABLE	12 to 47 / 16 to 64	
Standard Speed, S2 (Class A/B), RPM	1.0 to 20	1.0 to 72		NOT AVAILABLE	1.0 to 64	
Max. Modulating Torque, S4 (Class C), lbf-ft / Nm	12 / 16			NOT AVAILABLE	24 / 32	
Allowed Modulating Speed, S4 (Class C), RPM	1.0 to 20	1.0 to 36		NOT AVAILABLE	1.0 to 30	
Max. Modulating Torque, S9 (Class D), lbf-ft / Nm	7 / 10			NOT AVAILABLE	15 / 20	
Allowed Modulating Speed, S9 (Class D), RPM	1.0 to 20	1.0 to 20		NOT AVAILABLE	1.0 to 20	
Max. Thrust with A Form Base, lbf / kN	4496 and 8992 / 20 and 40 F07/F10 (TB1)			NOT AVAILABLE	8992 / 40 F10 (TB2)	
Max. Number of Turns	100			NOT AVAILABLE	300	
Max. Shaft Diameter Acceptance, in. / mm	0.78 / 20			NOT AVAILABLE	1.26 / 32	
Mounting Base Standard Flange (ISO 5210)	F07 and F10			NOT AVAILABLE	F10	
Ambient Temperature Range, °F / °C	-40 to +140 / -40 to +60			NOT AVAILABLE	-40 to +140 / -40 to +60	
Explosion Proof Certifications	CSA-NEC 500 Class I, Div I, Group D	CSA-NEC 500 Class I, Div I, Group D	-	NOT AVAILABLE	-	-
	CSA-NEC-505 Class I, Zone I Ex db eb IIC	CSA-NEC-505 Class I, Zone I Ex db eb IIC	-	NOT AVAILABLE	CSA-NEC-505 Class I Zone 1 Ex db eb IIC	-
	IECEX Ex db eb IIC Ex tb IIIC	IECEX Ex db eb IIC Ex tb IIIC	IECEX Ex db eb IIC Ex tb IIIC	NOT AVAILABLE	IECEX Ex db eb mb IIC Ex tb IIIC	IECEX Ex db eb mb IIC Ex tb IIIC
	ATEX Ex db eb mb IIC	ATEX Ex db eb mb IIC	ATEX Ex db eb mb IIC	NOT AVAILABLE	ATEX Ex db eb mb IIC	ATEX Ex db eb mb IIC
Water Ingress Protection ⁽⁴⁾	IP66 (NEMA 4X), IP67 (NEMA 6), IP68			NOT AVAILABLE	IP66 (NEMA 4X), IP67 (NEMA 6), IP68	
Approximate Weight, lb / kg	25.4 / 11.5			NOT AVAILABLE	38.6 / 17.5	
Duty Cycle	S2 (Class A/B) Standard, S4/S9 (Class C/D) Optional			NOT AVAILABLE	S2 (Class A/B) Standard, S4/S9 (Class C/D) Optional	
Coating and Color	High quality two component polyurethane paint system - C2 ISO 12944-5/RAL 7012 Other options available on request			NOT AVAILABLE	High quality two component polyurethane paint system - C2 ISO 12944-5/RAL 7012 Other options available on request	
Max. Bore/Key	-			NOT AVAILABLE	-	

NOTES:

- 24 V DC power supply characteristics are applicable for BLDC version 10.1 and higher.
- 1 PH actuator configurations with optional 125 V DC power supply can be provided on request.
- Nominal motor current measured at specified conditions: base unit torque set up/speed/power supply. For detailed current draw and other performance data, please contact a local Emerson sales channel representative.
- CM32 and CM64 base units IP68 immersion: 5 m / 16 ft, 21 hours. All bolt-on gear boxes (linear drives, QT planetary gears, fail-safe units) are not IP68 rated and need to be rebuilt in case of a flood event.

Selection of QT Planetary Gearboxes for 90°, 180° and Multi-Turn Rotation Applications

Figure 8. Bettis RTS CM QT



Table 2. QT Series Gearboxes Technical Data

Type	QT12	QT25	QT50
Suitable Actuator	CM32	CM32/CM64	CM64
Configuration	90° (G1), 180° (GA), Multi-turn (GE)	90° (G2), 180° (GB), Multi-turn (GF)	90° (G3), 180° (GH), Multi-turn (GJ)
Max. Output Torque, lbf-ft / Nm	89 / 120	184 / 250	369 / 500
Max. Output Torque, S4 (Class C) lbf-ft / Nm	44 / 60	92 / 125	184 / 250
Max. Output Speed, RPM	10	20	20
Gearbox Ratio	4.88	9	9
Mechanical Advantage	4.16	7.92	7.92
Max. input torque, lbf-ft / Nm	21 / 28	23 / 31	47 / 63
Input Flange for Actuator	F10	F10	F10
Valve Flange	F05 and F07	F07 and F10	F10 and F12
Max. Valve Shaft-Ø, in. / mm	0.79 / 20	0.99 / 25	1.57 / 40
Max. Valve Square, in. / mm	0.67 / 17	0.87 / 22	1.26 / 32
Max. Valve Shaft Height, in. / mm	1.18 / 30	1.61 / 41	1.81 / 46
Approximate Weight, lb / kg	7.1 / 3.2	10.6 / 4.8	19.6 / 8.9
Rotation	Clockwise insert rotation by clockwise rotation of input shaft		
Ambient Temperature Range, °F / °C	-40 to +185 / -40 to +85		
Protection Enclosure	IP67 according to EN 60529 and IEC529		
End Stop (Quarter-Turn)	Mechanical end stops at 95° in Open and Close position		

Selection of Linear Drives

Figure 9. Bettis RTS CM Linear



Table 3. Linear Drives Technical Data

Type	L05 (L1)	L15 (L2)	L25 (L4)	LB05 (L6)	LB30 (L3)	LB64 (L5)
Suitable Actuator	CM32	CM32	CM64	CM32	CM32	CM64
Max. Thrust, lbf / kN	3372 / 15	3372 / 15	5620 / 25	3372 / 15	6744 / 30	13489 / 60
Min. Thrust, lbf / kN	899 / 4	899 / 4	1798 / 8	1798 / 8	1798 / 8	3597 / 16
Max. Modulating Thrust, S4 (Class C), lbf / kN	1686 / 7.5	1686 / 7.5	2810 / 12.5	1798 / 8	3372 / 15	6744 / 30
Max. Modulating Thrust, S9 (Class D), lbf / kN	Not Suitable			1012 / 4.5	1798 / 8	4046 / 18
Max. Stroke, in. / mm	1.97 / 50	3.94 / 100		1.97 / 50	3.94 / 100	4.74 / 120
Mechanical Advantage	2	2		1.06	1.06	1.06
Spindle Pitch, in. / mm	0.16 / 4	0.16 / 4		0.20 / 5	0.20 / 5	0.20 / 5
Valve Flange	F10	F10		F10	F10	F10
Spindle End-work for Valve Mounting	M16x1.5	M16x1.5		M20x1.5	M20x1.5	M20x1.5
Input Flange for Actuator	F10	F10		F10	F10	F10
Approximate Weight, lb / kg	15.4 / 7	19.8 / 9		27.1 / 12.3	33.1 / 15	42.3 / 19.2
Rotation	Spindle of Linear-Unit moves out of the housing with clockwise movement of the actuator and closes the valve					
Self-locking	Yes			Yes ⁽¹⁾		
Ambient Temperature Range, °F / °C	-40 to +176 / -40 to +80					
Protection Enclosure	L-units: IP66 according to EN 60529 and IEC529			LB-units: IP67 according to EN 60529 and IEC529		

NOTE:

- When attached with a CM actuator, the complete package is self-locking due to the actuator worm gear set mechanically locking and the handwheel assembly non-back-drive latch. The LB ball-screw type linear drive itself is not self-locking.

Different Versions of Cable Entries

Table 4. Conduit Entries

	Non Fail-Safe	Fail-Safe	Step-down Converter (400 V Module)	Bus System Enabled	Bus System TCP
Standard/WP	1xM40, 1xM32, 1xM25	1xM40, 1xM32, 1xM25	1xM40, 1xM32, 1xM25	2xM32, 1xM25 + additional 4xM20 (different connector housing)	1xM40, 1xM32, 1xM25 + 2xM12 connector directly on housing (different actuator housing)
XP	1xM40, 2xM20, 1xM16	1xM40, 2xM20	SDC Module with 1xM40, 2xM20 1xM40, 2xM20 from actuator housing not usable	1xM40, 2xM20 + additional ring with 4xM20	1xM40, 2xM20 + additional ring with 4xM20
Additional Ring Added VA001-654-22	4xM20	4xM20	4xM20	N/A	N/A

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