

rotork® Controls

Compact modulating control valve actuators

CMA range modulating actuators deliver a series of sizes suitable for linear, quarter-turn and rotary control valve and pump applications requiring precise position control and continuous modulation.

The Rotork CMA range provides for simple, safe and easy set-up via an internal electronic 6-segment LCD display and pushbutton configuration.

Features

- Powered by single-phase or 24 V direct current supplies
- Linear, quarter-turn and rotary drive action
- Permanently lubricated and maintenance-free drive train
- Optional configurable ESD input for end of travel or stayput emergency shutdown function
- Watertight and hazardous area enclosures
- 4-20 mA loop powered, feedback signal
- Fail to position on loss of signal capability
- All CMA units have the ability to adjust their speed 50-100 % of operation
- Seating torque/thrust capability (60 -150 % of rated) for required tight seating of the valve in the CLOSE position
- Wide standard ambient temperature range and low temperature option
- Manual override standard
- Electronic thrust/torque limiting
- Two standard adjustable position relay outputs
- Optional local controls including positional display
- Optional Reserve Power Pack (RPP) including local controls and positional display
- Pakscan™, HART®, Profibus®, Modbus®, DeviceNet® and Foundation Fieldbus® available. Optional hardwired RIRO (Remote In Remote Out)



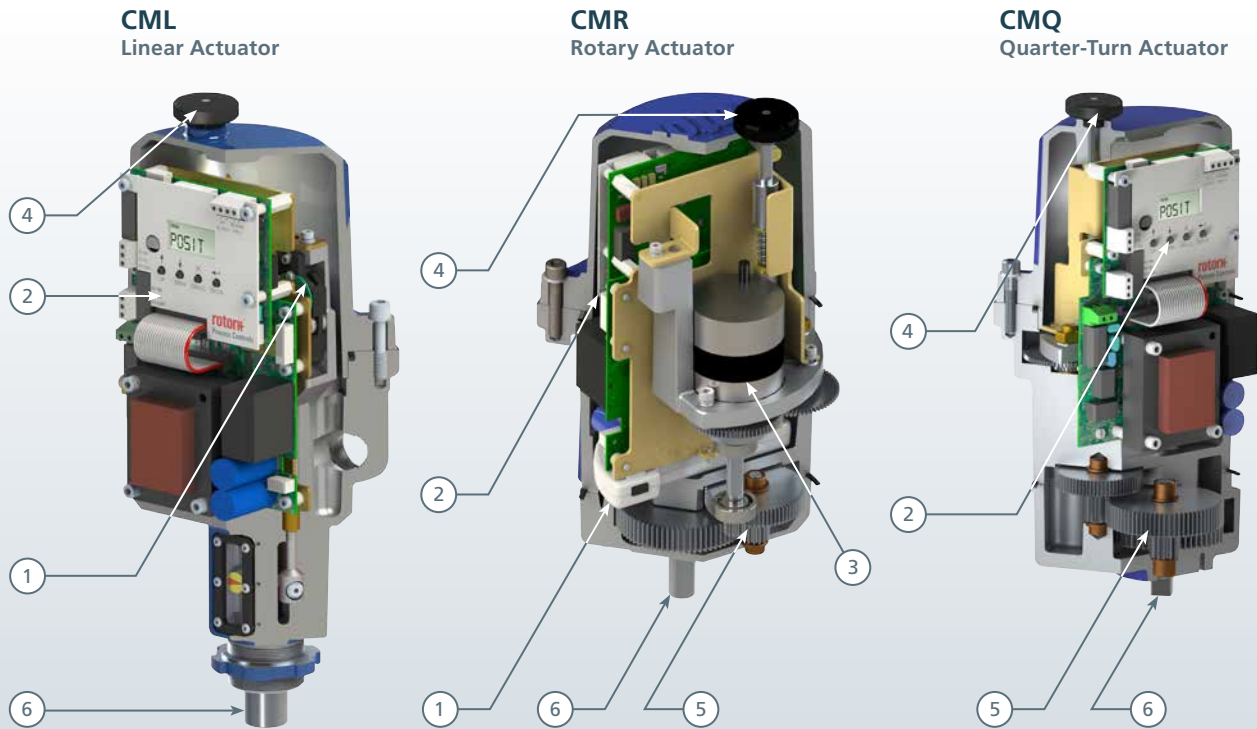
CMA Range Linear, Rotary and Quarter-Turn Control Valve Actuators



The CMA range is available in standard configuration with internal controls (left), with local controls and display (centre) and with local controls, display and Reserve Power Pack (right).

Redefining Flow Control

CMA Range Standard Unit



1 Encoder Technology

The CMA utilises absolute encoder technology where a unique digital code corresponds to the angular position (CMQ), stroke length (CML) or rotary (CMR) position of the actuator.

To achieve high resolution, the position sensor location eliminates any backlash effect in the gearing. The sensor is 12-bit for quarter-turn and linear actuators and 10-bit for rotary actuators, fitted at the output gear stages, removing any internal backlash effect that may exist in the drive train.

2 User Interface

Two programmable relays energize upon reaching a desired position or any other available condition among the programmable options.

Field selectable adjustments for:

- Deadband
- Zero and span
- Command signal type
- Standard or reverse acting
- Manual-auto operation
- Fail to position on loss of signal capability

3 DC Brushless Motor

The CMA uses a high efficiency, continuous rated, brushless DC motor allowing for maintenance-free operation with continuous modulation duty.

4 Hand Drive

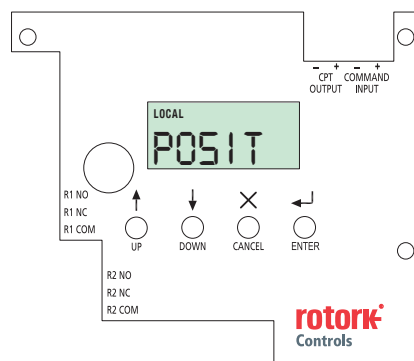
A hand drive mechanism is provided as standard for all CMA actuators to allow manual operation of the valve. Pressing down on the hand-knob shaft engages a gear in the upper section of the drive train and releasing the knob causes the spring to disengage the gear.

5 Geartrain

The simple yet durable high efficiency spur gear drive is lubricated for life with proven high reliability.

6 Output Drive

The CMQ base conforms to MSS SP-101 or ISO 5211. CML and CMR may be adapted to suit individual valves.



CMA Range

Linear, Rotary and Quarter-Turn
Control Valve Actuators

CMA Range with Options

CML
Linear Actuator



CMR
Rotary Actuator



CMQ
Quarter-Turn Actuator

CML
Linear Actuator



CMQ
Quarter-Turn Actuator



Optional Local Controls and Display

The CMA range of linear, quarter-turn and rotary actuators simplifies initial engineering and procurement requirements. The display provides local control to CMA range actuators through selector switches and an LED backlit display for clear valve position indication.

The CMA range local controls option consists of the following features:

- **Linear, quarter-turn and rotary control** with continuous indication of valve position in 0.1% increments
- **Large, easy-to-read screen** with icons for fast diagnostic feedback
- **Vivid display** showing actuator position, critical and non-critical fault symbols
- **Valve position** as a percentage of set valve travel (e.g. 100% = Open)
- **Control selection knobs** provide Local, Stop or Remote operation mode selection and Open or Close input commands for position adjustment in local control mode
- **Tamper resistance** capability for the mode selection knob allows each mode to be locked in place preventing unauthorized changes to actuator operation

Optional Local Controls and Display Plus Reserve Power Pack (RPP)

This option includes all the benefits of the local controls option with the addition of power and signal-loss action functionality:

- **Linear and quarter-turn control** with continuous indication of valve position and fail-to-position functionality
- **Reserve Power Pack (RPP)** provides the actuator with enough stored energy to perform a predetermined action on mains power failure
- **Position indication** during power loss action on the LCD display
- **Vivid display** showing actuator position, critical and non-critical fault symbols plus additional RPP status
- **Short, 2 minute charge time** for the reserve power pack, once mains power is reinstated, allows actuation control to continue quickly and efficiently – the LCD display will flash and operation is inhibited during charging
- **Super capacitors** do not suffer from the 'memory' effect caused by repeat partial charge/discharge cycles
- **Power loss action** is easily configured via the standard CMA Human-Machine Interface (HMI)

Note: Actuators not displayed in proportion to each other.

Performance summary

The values shown in the performance charts relate to the maximum available speeds or fastest operating times. These speeds can be slowed down to 50% of the maximum value in 1% increments.

The rated force (thrust or torque) for each size of actuator is detailed below. Operating time tolerance +/-10%.

The CML and CMQ can resist backdriving forces from the valve up to 125% of rated load without movement. All CMA actuators are factory calibrated. CMA resolution is 0.20%.

CML: Linear Actuator

Model	Min Modulating Thrust (lbf)	Min Modulating Thrust (N)	Max Modulating Thrust (lbf)	Max Modulating Thrust (N)	Max Seating Thrust (lbf)*	Max Seating Thrust (N)*	Max Speed (inches/sec)	Max Speed (mm/sec)	Stroke (inches)	Stroke (mm)
CML-100	60	266.9	100	444.8	150.00*	667.2*	0.25	6.35	1.5	38.1
CML-250	150	667.2	250	1112.1	375.00*	1668.1*	0.13	3.18	1.5	38.1
CML-750	450	2001.7	750	3336.2	1125.00*	5004.2*	0.13	3.18	2.0	50.8

CMQ: Quarter-Turn Actuator

Model	Min Modulating Torque (lbf.in)	Min Modulating Torque (Nm)	Max Modulating Torque (lbf.in)	Max Modulating Torque (Nm)	Max Seating Torque (lbf.in)*	Max Seating Torque (Nm)*	CMQ High Speed Fastest Time for 1/4 Turn (secs)	CMQ Self Locking Fastest Time for 1/4 Turn (secs)
CMQ-250	150	16.9	250	28.2	375*	42.4*	5	10
CMQ-500	300	33.9	500	56.5	750*	84.7*	7.5	15
CMQ-1000	600	67.8	1000	113.0	1100*	124.3*	11	22

Note: The CMQ low speed units are normally self-locking up to 125% of rated load. The CMQ high speed unit is not self-locking.

* **Seating Torque and Thrust** – Some applications require tight seating at the valve in the close position. The CMA has a selective seating capability. The seating torque/thrust values shown for CML and CMQ are the forces available to close a valve tightly at its end of travel. The seating torque/thrust option can be selected and configured during setup (at “close action” selection, choose “torque” or “thrust” as applicable).

CMR: Rotary Actuator

Model	Min Torque (lbf.in)	Min Torque (Nm)	Max Torque (lbf.in)	Max Torque (Nm)	Max Speed (RPM)	Total turns available
CMR-50	20	2.3	50	5.6	11	90° to 320 turns in 2° increments
CMR-100	40	4.5	100	11.3	10	90° to 320 turns in 2° increments
CMR-200	80	9.0	200	22.6	5	90° to 320 turns in 2° increments
CMR-89	35.6	4.0	89	10.1	24	90° to 320 turns in 2° increments
CMR-125	50	5.6	125	14.1	18	90° to 320 turns in 2° increments
CMR-250	100	11.3	250	28.2	10	90° to 320 turns in 2° increments
CMR-250/GB3	160	18.1	400	45.2	5.8	90° to 200 turns in 3.2° increments

For further information, see the CMA Range brochure PUB094-001

A full listing of our worldwide sales and service network is available on our website.

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