

CERTIFICATE OF CONFORMITY



- HAZARDOUS (CLASSIFIED) LOCATION ELECTRICAL EQUIPMENT PER US REQUIREMENTS**
- Certificate No:** FM17US0101
- Equipment:** CML, CMQ, CMR Series
(Type Reference and Name) Compact Modulating Actuators (CMA)
Electronic Valve Actuators
- Name of Listing Company:** Rotork Process Controls
- Address of Listing Company:** 5607 W Douglas Ave
Milwaukee, WI 53218
United States
- The examination and test results are recorded in confidential report number:
3048160 dated 28th March 2013
- FM Approvals LLC, certifies that the equipment described has been found to comply with the following Approval standards and other documents:
FM Class 3600:2018, FM Class 3615:2018, FM Class 3616:2011, FM Class 3810:2018,
ANSI/UL 50E:2015, ANSI/UL 61010-1:2012, ANSI/IEC 60529:R2011
- If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to specific conditions of use specified in the schedule to this certificate.
- This certificate relates to the design, examination and testing of the products specified herein. The FM Approvals surveillance audit program has further determined that the manufacturing processes and quality control procedures in place are satisfactory to manufacture the product as examined, tested and Approved.
- Equipment Ratings:**
CML, CMQ, CMR Series Compact Modulating Actuators (CMA) are rated as Explosionproof for Class I, Division 1, Groups C and D; Dust-ignitionproof for Class II, Division 1, Groups E, F and G; Hazardous (Classified) Locations, indoors and outdoors, Type 4 and IP67 or IP66/IP68 (IPX8 at 7meters, 72 hours). The actuators are rated for overall ambient temperature ranges of -20°C to +65°C or -40°C to +60°C depending on the configuration.

Certificate issued by:



J.E. Marquedant
VP, Manager, Electrical Systems

24 February 2019

Date

To verify the availability of the Approved product, please refer to www.approvalguide.com

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FM Approvals LLC. 1151 Boston-Providence Turnpike, Norwood, MA 02062 USA
T: +1 (1) 781 762 4300 F: +1 (1) 781 762 9375 E-mail: information@fmapprovals.com www.fmapprovals.com

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11. The marking of the equipment shall include:

CLASS I, DIV 1, GROUPS C & D

CLASS II, DIV 1, GROUPS E, F & G

T4, MIN. RATED AMBIENT TEMP -20°C or -40°C MAX. RATED AMBIENT TEMP +60°C or +65°C

Type 4 (for all CMA), IP67 (for Size 1, 2 and 3) or IP66/IP68 (7m, 72hr) (for Size 4 and 5)

DO NOT OPEN WHEN EXPLOSIVE ATMOSPHERE PRESENT.

CONDUIT SEAL REQUIRED TO BE SEALED AT HOUSING.

12. **Description of Equipment:**

The CMA (Compact Modulating Actuator) is self contained and used for continuous remote electrical operation of a control valve. The CMA consists of a main flameproof enclosure containing all of the electrical components and an attached smaller mechanical enclosure containing only gearing and mechanical power transfer devices. It is available in three different functions: Linear, Quarter-turn, and Rotary. The main enclosure is defined into "Sizes" per the table on the following page.

The top part of the equipment is the explosionproof "XP" enclosure (the main enclosure), which is cylindrical in shape and includes a base and cover. The main enclosure is constructed out of the same aluminum either Low Pressure Gravity Cast (LPGC) or High Pressure Die Cast (HPDC). For Size 1, 2 and 3 equipment identified in the table on the following page, the cover has three different sizes: standard, intermediate and extended. For Size 4 and 5 equipment identified in the table on the following page, the covers are all the same size. The main enclosure includes a hand-knob which creates a cylindrical flamepath joint with the housing. The user may use the hand-knob to switch from manual to remote operation and control of the actuator. The cover forms a cylindrical flamepath joint with the base to which it is attached by M8 fasteners. The joints are provided with suitable seals for environmental protection.

The main enclosure houses all of the electronic components which make up the monitoring and control circuitry. This circuitry consists of power and logic PCBs both mounted on an aluminum bracket. The bracket is fastened to a cast aluminum mount which also acts as a mount for the DC motor. The whole assembly is fastened to the base. The operator uses an LCD display to program the actuator to control the motor and the logic PCB uses a feedback mechanism to sense the position of the output shaft. There are four 3/4 NPT or M25 threaded entries to the enclosure for field wiring purposes.

Operation Temperature Ranges:

The ambient operating temperature range of the equipment is -20°C to +65°C or -40°C to +60°C, depending on the model.

Electrical Data:

Electrical ratings are either 12 VDC and 50 Watts maximum; or 24 VDC or 110...240VAC, 1Ø, 50/60Hz, and 540 Watts maximum, depending on the configuration.

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CML-a. Compact Modulating Actuators (CMA).

CMQ-b. Compact Modulating Actuators (CMA).

CMR-c. Compact Modulating Actuators (CMA).

a = Size 100, 250, 750, 1500 or 3000.

b = Size 250, 500 or 1000.

c = Size 50, 89, 100, 125, 200 or 250.

Options are identified by wiring diagram number on the nameplate according to the Size of the actuator model and include: M00-00, M00-D0, M00-F0, M00-H0, M00-K0, M00-M0, M00-N0, M00-P0, M01-00, M01-D0, M01-F0, M01-H0, M01-K0, M01-M0, M01-N0, M01-P0, M02-0S, M02-DS, M02-FD, M02-FS, M02-HD, M02-HS, M02-KD, M02-KS, M02-MD, M02-MS, M02-ND, M02-NS, M02-PD, M02-PS, M10-00, M10-D0, M10-F0, M10-H0, M10-K0, M10-M0, M10-N0, M10-P0, M11-00, M11-D0, M11-F0, M11-H0, M11-K0, M11-M0, M11-N0, M11-P0, M12-0S, M12-DS, M12-FD, M12-FS, M12-HD, M12-HS, M12-KD, M12-KS, M12-MD, M12-MS, M12-ND, M12-NS, M12-PD, M12-PS, M32-00, M32-0S, M32-D0, M32-DS, M32-F0, M32-FD, M32-FS, M32-H0, M32-HD, M32-HS, M32-K0, M32-KD, M32-KS, M32-M0, M32-MD, M32-MS, M32-N0, M32-ND, M32-NS, M32-P0, M32-PD, M32-PS, M42-00, M42-0S, M42-D0, M42-DS, M42-F0, M42-FD, M42-FS, M42-H0, M42-HD, M42-HS, M42-K0, M42-KD, M42-KS, M42-M0, M42-MD, M42-MS, M42-N0, M42-ND, M42-NS, M42-P0, M42-PD, M42-PS, M52-00, M52-0S, M52-D0, M52-DS, M52-F0, M52-FD, M52-FS, M52-H0, M52-HD, M52-HS, M52-K0, M52-KD, M52-KS, M52-M0, M52-MD, M52-MS, M52-N0, M52-ND, M52-NS, M52-P0, M52-PD, or M52-PS.

The CMA range includes the following variants:

Model	Size*	Minimum Thrust or Torque	Maximum Thrust or Torque	Speed	Stroke	Shut-off Thrust or Torque
CMR-50	1	2.3 Nm	5.6 Nm	11 RPM	N/A	N/A
CML-100	1	177.9 N	444.8 N	6.35 mm/s	38.1 mm	889.6 N
CMR-100	2	4.5 Nm	11.3 Nm	10 RPM	N/A	N/A
CMR-200	2	9 Nm	22.6 Nm	5 RPM	N/A	N/A
CMQ-250	1	11.3 Nm	28.2 Nm	5 s/qtr-turn	N/A	42.3 Nm
CML-250	2	444.8 N	1112 N	3.175 mm/s	38.1 mm	2200 N
CMQ-500	2	22.6 Nm	56.5 Nm	7.5 s/qtr-turn	N/A	84.8 Nm
CMR-89	3	4.04 Nm	10.1 Nm	24 RPM	N/A	N/A
CMR-125	3	5.6 Nm	14.1 Nm	18 RPM	N/A	N/A
CMR-250	3	11.3 Nm	28.2 Nm	10 RPM	N/A	N/A
CML-750	3	1334.5 N	3336.2 N	3.18 mm/s	50.8 mm	6670 N
CMQ-1000	3	45.2 Nm	113.0 Nm	11 s/qtr-turn	N/A	169.5 Nm
CML-1500	4	2668.8 N	6672 N	4.57 mm/s	114.3 mm	10 kN
CML-3000	5	5337.6 N	13.34 kN	4.57 mm/s	114.3 mm	20 kN

*Note "Size" refers to performance aspects of the equipment; Sizes 1 and 2 are physically the same.

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13. Specific Conditions of Use:

None

14. Test and Assessment Procedure and Conditions:

This Certificate has been issued in accordance with FM Approvals US Certification Requirements.

15. Schedule Drawings

A copy of the technical documentation has been kept by FM Approvals.

16. Certificate History

Details of the supplements to this certificate are described below:

Date	Description
28 th March 2013	Original Issue.
19 th April 2017	<u>Supplement 4:</u> Report Reference: 3060693 dated 19 th April 2017 Description of the Change: This supplement includes updates to new certificate format, minor documentation revisions, as well as testing and evaluation to qualify minor construction changes to the equipment enclosures.
23 rd May 2018	<u>Supplement 5:</u> Report Reference: 3062907 dated 23 rd May 2018 Description of the Change: Evaluation conducted for continued compliance of Size 1, 2 and 3 CMA Series and addition of Size 4 and 5 Linear CMA Series (CML-1500 and CML-3000 models), as well as associated updates to controlled documentation and equipment instruction manuals. Updates to standard editions.
24 th February 2019	<u>Supplement 6:</u> Report Reference: PR451412 dated 24 th February 2019 Description of the Change: Testing and evaluation conducted to qualify changes to enclosure for Size 1, 2 and 3 actuators, additional Approval for Canada for Size 4 and 5 actuators, as well as associated documentation revisions.

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