

CERTIFICATE OF CONFORMITY



- HAZARDOUS LOCATION ELECTRICAL EQUIPMENT PER CANADIAN REQUIREMENTS**
- Certificate No:** FM18CA0156X
- Equipment:** CML, CMQ, CMR Series
(Type Reference and Name) Compact Modulating Actuators (CMA)
Electronic Valve Actuators
- Name of Listing Company:** Rotork Controls Inc
- Address of Listing Company:** 5607 W Douglas Ave
Milwaukee, WI 53218
United States
- The examination and test results are recorded in confidential report number:

PR451412 dated 24th February 2019
- FM Approvals LLC, certifies that the equipment described has been found to comply with the following Approval standards and other documents:

CSA-C22.2 No. 0.4:2017, CSA-C22.2 No. 0.5:2016, CSA-C22.2 No. 25:2017, CSA-C22.2 No. 30:2020,
CSA-C22.2 No. 94.2:2015, CSA-C22.2 No. 139:2013*, CAN/CSA C22.2 No. 60079-0:2019,
CAN/CSA C22.2 No. 60079-1:2016, CAN/CSA C22.2 No. 60079-31:2015,
CAN/CSA-C22.2 No. 60529:R2015, CAN/CSA-C22.2 No. 61010-1:2012

** CSA-C22.2 No. 139 applies to CML (Linear) Series, Sizes 1500 and 3000 only. Refer to Specific Conditions of Use.*
- 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:**
Explosionproof for Class I, Division 1, Groups C and D; Dust-ignitionproof for Class II, Division 1, Groups E, F and G, Class III; Flameproof Ex db IIB T4 Gb, and Dust-Protected by Enclosure Ex tb IIIC T85C Db Hazardous Locations, for overall ambient temperature ranges of -20°C to +65°C or -40°C to +60°C depending on the configuration; indoor and outdoor Type 4 and IP66/IP67 or IP66/IP68 (IPX8 at 7 m, 72 hr).

Certificate issued by:



J.E. Marquedant
VP, Manager - Electrical Systems

18 February 2022

Date

To verify the availability of the Approved product, please refer to www.approvalguide.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; CLASS III

Ex db IIB T4 Gb; Ex tb IIIC T85C Db

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

Note: IP66/IP68 for model CML (Linear) Sizes 1500 and 3000 only; IP67 for all other models.

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 ¾ 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.

Temperature Ratings:

The equipment is rated and marked for ambient temperature ranges of Ta = -20°C to +65°C (Standard Version) or Ta = -20°C to +60°C (UPS/HMI and HMI Versions) with the Standard Seals; or Ta = -40°C to +60°C (All Versions) with the Low Temperature Seals.

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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:

1. The critical dimensions of the flamepaths are:

CML-100, CML-250 (Size 1 & 2 - Linear)		
Flamepath	Maximum Gap (mm)	Minimum Length L (mm)
Lid/Base	0.15	12.8
Base/Screw Shaft	0.145 ¹	13.5
Base/Feedback Shaft Bushing	-0.02 ²	13.7
Feedback Shaft Bushing/Shaft	0.06	13.7
Handknob Shaft/Lid (short cover)	0.10	25.9
Handknob Shaft/Lid (intermediate and extended covers)	0.10	15.7

CMR-50, CMR-100, CMR-200 (Size 1 & 2 - Rotary)		
Flamepath	Maximum Gap (mm)	Minimum Length L (mm)
Lid/Base	0.15	12.8
Base/Pinion Shaft	0.235 ¹	29.8
Base/Output Shaft	0.145 ¹	12.8
Handknob Shaft/Lid (short cover)	0.10	25.9
Handknob Shaft/Lid (intermediate and extended covers)	0.10	15.7

CMQ-250, CMQ-500 (Size 1 & 2 - Quarter-turn)		
Flamepath	Maximum Gap (mm)	Minimum Length L (mm)
Lid/Base	0.15	12.8
Base/Pinion Shaft	0.235 ²	29.8
Base/Feedback Shaft Bushing	-0.02 ¹	13.7
Feedback Shaft Bushing/Shaft	0.06	13.7
Handknob Shaft/Lid (short cover)	0.10	25.9
Handknob Shaft/Lid (intermediate and extended covers)	0.10	15.7

CML-750 (Size 3 - Linear)		
Flamepath	Maximum Gap (mm)	Minimum Length L (mm)
Lid/Base	0.15	12.8
Base/Screw Shaft	0.235 ¹	37.3
Base/Feedback Shaft Bushing	-0.02 ²	13.7
Feedback Shaft Bushing/Shaft	0.06	13.7
Handknob Shaft/Lid (short cover)	0.10	25.9
Handknob Shaft/Lid (intermediate and extended covers)	0.10	15.7

CMR-89, CMR-125, CMR-250 (Size 3 - Rotary)		
Flamepath	Maximum Gap (mm)	Minimum Length L (mm)
Lid/Base	0.15	12.8
Base/Pinion Shaft	0.235 ¹	37.3
Base/Output Shaft	0.145 ¹	13.0
Handknob Shaft/Lid (short cover)	0.10	25.9
Handknob Shaft/Lid (intermediate and extended covers)	0.10	15.7

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CMQ-1000 (Size 3 - Quarter-turn)		
Flamepath	Maximum Gap (mm)	Minimum Length L (mm)
Lid/Base	0.15	12.8
Base/Pinion Shaft	0.235 ¹	37.3
Base/Feedback Shaft Bushing	-0.02 ²	13.7
Feedback Shaft Bushing/Shaft	0.06	13.7
Handknob Shaft/Lid (short cover)	0.10	25.9
Handknob Shaft/Lid (intermediate and extended covers)	0.10	15.7
CML-1500 and CML-3000 (Size 4 & 5 - Linear)		
Flamepath	Maximum Gap (mm)	Minimum Length (mm)
Lid / Base	0.20	26.4
Screw Shaft Bushing / Shaft	0.10	68.5
Base / Screw Shaft Bushing	0.361	36.96
Handwheel Shaft / Base	0.20	27.9

Note 1: This dimension includes allowance for the 0.05mm requirements defined in CAN/CSA-C22.2 No. 60079-1.

Note 2: Negative sign denotes an interference fit.

- The equipment utilizes a non-metallic outer coating and has a potential static hazard. Clean only with a damp cloth.
- The screws securing the outer window frame maintain the integrity of the flameproof enclosure and must not be removed.
- For all CMA actuators other than CML (Linear) Size 1500 and 3000 models, reliability in respect to fatigue or long-term operation against CSA C22.2 No. 139 standard is not included in the Approval.

14. Test and Assessment Procedure and Conditions:

This Certificate has been issued in accordance with FM Approvals Canadian Certification Scheme.

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
24 th February 2019	Original Issue.

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Date	Description
18 th February 2022	<u>Supplement 1:</u> Report Reference: - PR461421 dated 18 th February 2022. Description of the Change: Evaluation conducted to qualify remaining CMA Series for Canada. All models added other than existing CML (Linear) Sizes 1500 & 3000, for same hazardous location ratings. Gap analysis to current standard editions with no testing required. Specific Conditions of Use updated to address CSA-C22.2 No. 139 for additional models. Revisions to labels and instructions made accordingly. Company name updated to "Rotork Controls Inc" – refer to RR227966 for details.

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