



IECEX Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification System for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: **IECEX CML 20.0049X** Page 1 of 3 [Certificate history:](#)

Status: **Current** Issue No: 0

Date of Issue: 2020-06-01

Applicant: **Rotork Controls Ltd.**
Brassmill Lane
Bath
BA1 3JQ
United Kingdom

Equipment: **Range of Control Valve Actuators (CVA)**

Optional accessory:

Type of Protection: **Flameproof "db", Increased Safety "eb", Intrinsic Safety "[ia]", Dust Ignition "tb", Non-Electrical "h"**

Marking:	Without optional intrinsically safe interface:	With optional intrinsically safe interface:
	Ex db h IIC T4 Gb Ex h tb IIIC T120°C Db Ta = -40°C to +60°C OR (when Ex e terminal facility is required) Ex db eb h IIC T4 Gb Ex h tb IIIC T120°C Db Ta = -40°C to +60°C	Ex db h [ia IIC Ga] IIC T4 Gb Ex h [ia IIIC Da] tb IIIC T120°C Db Ta = -40°C to +60°C OR (when Ex e terminal facility is required) Ex db eb h [ia IIC Ga] IIC T4 Gb Ex h [ia IIIC Da] tb IIIC T120°C Db Ta = -40°C to +60°C

Approved for issue on behalf of the IECEx
Certification Body:

R C Marshall

Position:

Certification Officer

Signature:
(for printed version)

Date:

2020-06-02

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Certificate issued by:

Eurofins E&E CML Limited
Unit 1, Newport Business Park
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Ellesmere Port, CH65 4LZ
United Kingdom





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Manufacturer: **Rotork Controls Ltd.**
Brassmill Lane
Bath
BA1 3JQ
United Kingdom

Additional manufacturing locations: **Rotork Controls, Inc.**
675 Mile Crossing Blvd
Rochester
NY 14624
United States of America

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended

STANDARDS :

The equipment and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards

IEC 60079-0:2017 Explosive atmospheres - Part 0: Equipment - General requirements
Edition:7.0

IEC 60079-1:2014-06 Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
Edition:7.0

IEC 60079-11:2011 Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
Edition:6.0

IEC 60079-31:2013 Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure "t"
Edition:2

ISO 80079-36:2016 Explosive atmospheres - Part 36: Non-electrical equipment for explosive atmospheres - Basic methods and requirements
Edition:1.0

This Certificate **does not** indicate compliance with safety and performance requirements other than those expressly included in the Standards listed above.

TEST & ASSESSMENT REPORTS:

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in:

Test Report:

[GB/CML/ExTR20.0061/00](#)

Quality Assessment Reports:

[GB/CML/QAR19.0012/00](#)

[GB/CML/QAR20.0010/00](#)



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EQUIPMENT:

Equipment and systems covered by this Certificate are as follows:

The Range of Control Valve Actuators (CVA) comprise two enclosures, the electrical enclosure and the terminal enclosure. The enclosures are cast in aluminium alloy LM25TF (or equivalent). The electrical enclosure is separated from the terminal enclosure by the terminal bung.

Refer to Annex for full description and conditions of manufacture.

SPECIFIC CONDITIONS OF USE: YES as shown below:

Refer to Annex for specific conditions of use.

Annex:

[IECEx CML 20.0049X Iss. 0 Certificate Annex.pdf](#)

Annexe to: IECEx CML 20.0049X Issue 0
Applicant: Rotork Controls Limited
Apparatus: CVA Range of Control Valve Actuators



Description

The Range of Control Valve Actuators (CVA) comprise two enclosures, the electrical enclosure and the terminal enclosure. The enclosures are cast in aluminium alloy LM25TF (or equivalent). The electrical enclosure is separated from the terminal enclosure by the terminal bung.

The terminal bung is manufactured in CRASTIN® ST830FRUV NC010, manufactured by Dupont De Nemours & Co. Inc. Electrical terminations pass through the terminal bung. The arrangement is sealed with ROBNOR® PX700K/BK, manufactured by Robnorganic Systems Ltd. The terminal bung is secured in position by means of a circlip. A nitrile O-ring is provided between the terminal bung and the terminal enclosure lid and the enclosure. The joint between the terminal bung and the metallic casing forms a cylindrical flamepath.

The terminal enclosure provides all electrical field-wiring terminations at the terminal bung. Cable entry facilities are provided in the form of four threaded, 3/4" NPT (or M25 x 1.5p) entry points. The terminal enclosure is closed by means of a lid, the joint between the lid and the enclosure forming a tapered spigot joint. The terminal enclosure lid is secured by four, retained, M10, stainless steel, grade A4-80 socket cap-head screws. A nitrile O-ring is provided between the terminal enclosure lid and the enclosure.

The electrical enclosure is formed from an enclosure base and lid. The interface between the lid and the enclosure base forms a cylindrical flamepath with a spigot. The lid is secured by six, M10, stainless steel, grade A4-80 socket cap-head screws. The electrical enclosure lid includes a viewing window, manufactured from MAKROLON® 6717, manufactured by Bayer Material Science Ltd. The window screws into the enclosure lid from the inside, the joint between the window and enclosure lid forming a threaded flamepath. The window is prevented from becoming loose by an internal locking arrangement. The actuator output can either be rotary 1/4 turn, or linear depending upon the internal equipment specified. The output shaft in each case exits the electrical enclosure via a brass bushing, secured into the enclosure by means of an interference fit. Cylindrical flamepaths are formed between the output shaft bushing and the electrical enclosure as well as between the output shaft and the output shaft bushing. The optional manual operation of the actuator is provided by way of a shaft that can be rotated externally. Access to the shaft is via a removable threaded cover. The manual override shaft is supported in a brass bushing that is secured into the electrical enclosure wall by means of an interference fit. Cylindrical flamepaths are formed between the manual override shaft bushing and the electrical enclosure as well as between the manual override shaft and the manual override shaft bushing. Alternatively, the flamepath between the manual shaft and the enclosure etc. is omitted, in which case the threaded joint between the enclosure and the removable threaded cover forms a flamepath. Nitrile seals are provided as necessary.

Thermal protective devices are installed within the equipment located on the outside of the motor casing. These devices are rated up to 132°C.

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Intrinsically safe entity parameters:

Terminals 1, 2, and 3	Terminals 6, 7, and 8
Ui: 30 V	Ui: 30 V
Ii: 250 mA	Ii: 250 mA
Pi: 700 mW	Pi: 700 mW
Ci: 0.12 μ F	Ci: 0.12 μ F
Li: 0	Li: 0
Uo: 0	Uo: 0
Io: 0	Io: 0
Po: 0	Po: 0

Note: terminals 3 and 6 are intended for the connection of cable screens only.

Model Codes

Size 2	Size 3	Size 4
CVL500	CVL1000	CVL5000
CVQ1200	CVL1500	
	CVQ2400	

Design Options

The omission of the bushing associated with the manual override shaft.

- i. Alternative materials of construction for the terminal lid and gear case electrical enclosure top covers.
 - Alternative gearcase electrical enclosure top cover material (CVL500, CVQ1200, CVL1000, CVL1500 and CVQ2400 models only), cast aluminium alloy to BS EN 1706, Grade: AC42100 T6 or equivalent (low pressure die cast).
 - Alternative terminal enclosure cover material cast aluminium alloy to, ASTM B85, Grade: A360 or equivalent (high pressure die cast), to all models.
- ii. 12.9 grade top cover screws added as an alternative to A4-80 top cover screws.
- iii. Alternative CVL500 Gearcase casting P/N 16640. The material remains as aluminium alloy, LM25TF, however, it is gravity fed rather than low pressure fed.

Conditions of Manufacture

The following conditions are required of the manufacturing process for compliance with the certification.

- i. Where the product incorporates certified parts or safety critical components the manufacturer shall ensure that any changes to those parts or components do not affect the compliance of the certified product that is the subject of this certificate.
- ii. Each Control Valve Actuator shall be subjected to a routine overpressure test in accordance with IEC 60079-1 clause 16 at the following values.

Tamb below -20°C

Equipment	Test Pressure (bar)
Gearcase Electrical Enclosure (CVQ1200) - 1/4 Turn	24.51
Gearcase Electrical Enclosure (CVQ2400)	23.90
Top Cover (CVQ1200) - 1/4 Turn (sand cast)	24.51
Top Cover (CVQ1200) (1/4 Turn) - Aluminium alloy to BS EN 1706, Grade: AC42100 T6 (low pressure die-cast)	24.51
Top Cover (CVQ2400) (sand cast)	23.90
Top Cover (CVQ2400) - Aluminium Alloy to BS EN 1706, Grade: AC42100 T6 (low pressure die cast)	23.90
Gearcase Electrical Enclosure (CVL500) (Linear)	24.87
Gearcase Electrical Enclosure (CVL1000, CVL1500)	21.60
Top Cover (CVL500) (Linear) (sand cast)	24.87
Top Cover (CVL500) (Linear) - Aluminium Alloy to BS EN 1706, Grade: AC42100 T6 (low pressure die-cast)	24.87

- iii. When the terminal enclosure utilises increased safety explosion protection, the following electrical strength tests shall be applied to the termination facilities for at least 60 s in accordance with IEC 60079-7 clause 6.1 at the following values.

Test Voltage Applied Between	Test Voltage
Terminals with voltages of 90 V peak or greater and the case and lower voltage terminals	$1,000 + 2U V_{rms}^{+5\%}$ or $1,500 V_{rms}^{+5\%}$ whichever is greater, where U is the working voltage
Terminals with voltages not exceeding 90 V peak and the case	$500 V_{rms}^{+5\%}$

Alternatively, a test shall be carried out at 1.2 times the test voltage but maintained for at least 100 ms.

- iv. When the termination facility utilises intrinsic safety explosion protection, the apparatus shall be subjected to a routine test voltage of 500 Vrms between the case and terminals 1, 2, 7 & 8 as required by IEC 60079-11 clauses 6.3.12 and 10.3.

Specific Conditions of Use

The following conditions relate to safe installation and/or use of the equipment.

- i. In accordance with IEC 60079-1 clause 5.1, the critical dimensions of the flamepaths are as follows.

CVL5000

Flamepath	Max. Gap (mm)	Min. L (mm)
Gearcase Electrical Enclosure/Top Cover	0.20	40.0
Gearcase Electrical Enclosure/Terminal Bung	0.15	25.0
Gearcase Electrical Enclosure/Terminal Cover	0.15	26.0
Gearcase Electrical Enclosure/Manual Override Shaft	0.15	26.0
Output Shaft/Output Shaft Bush (Linear)	0.15	26.0
Output Shaft Bush/Gearcase Electrical Enclosure (Linear)	-0.018	25.5

All other models

Flamepath	Max. Gap (mm)	Min. L (mm)
Gearcase Electrical Enclosure/Top Cover	0.15	25.0
Gearcase Electrical Enclosure/Terminal Bung	0.15	25.0
Gearcase Electrical Enclosure/Terminal Cover	0.15	26.0
Gearcase Electrical Enclosure/Manual Override Bush (<i>if fitted</i>)	-0.005	28.0
Manual Override Shaft/Gearcase Electrical Enclosure (<i>or bush if fitted</i>)	0.15	25.0
Output Shaft/Output Shaft Bush (Linear)	0.15	25.0
Output Shaft Bush/Gearcase Electrical Enclosure CVL500	-0.005	25.0
Output Shaft Bush/Gearcase Electrical Enclosure CVL1000, CVL1500	0.15	30.0
Output Shaft/Output Shaft Bush - 1/4 Turn	0.15	25.0
Output Shaft Bush/Gearcase Electrical Enclosure - 1/4 Turn	-0.005	25.0

- ii. **WARNING** – There is a potential electrical charging hazard associated with the operating knob, manual hand wheel assembly and outer case depending on the model and coating applied; see the user instructions.
- iii. When the optional intrinsically safe interface is fitted, terminal 3 and 6 are intended for the connection of cable screens only. These connection points are not isolated from the assembly enclosure and do not comply with the dielectric strength requirements of IEC 60079-11:2007 clause 6.3.12. This should be taken into account regarding the applicable code of practice, e.g. IEC 60079-14.