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 SIR 04.0024X**

Certificate history:
Issue 3 (2018-08-06)
Issue 2 (2012-02-22)
Issue 1 (2005-05-09)

Status: **Current**

Issue No: 4

Date of Issue: 2022-11-14

Applicant: **Rotork Controls Inc.**
675 Mile Crossing Blvd
Rochester
New York 14624
United States of America

Equipment: **EH1.1 Actuator Control Module**

Optional accessory:

Type of Protection: **Flameproof**

Marking: Ex db eb* IIB T4 Gb
Ta = -20°C** to +60°C
* if the increased safety terminal facility is specified
** may be down to -50°C

Approved for issue on behalf of the IECEx Certification Body: **Michelle Halliwell**

Position: **Director Operations, UK & Industrial Europe**

Signature:
(for printed version)

Date:
(for printed version)

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting www.iecex.com or use of this QR Code.

Certificate issued by:

CSA Group Testing UK Ltd
Unit 6, Hawarden Industrial Park
Hawarden, Deeside CH5 3US
United Kingdom

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Certificate No.: **IECEx SIR 04.0024X**

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Manufacturer: **Rotork Controls Inc.**
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Manufacturing locations: **Rotork Controls Inc.**
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Rochester
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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 60079-7:2017 Explosive atmospheres - Part 7: Equipment protection by increased safety "e"
Edition:5.1

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 Reports:

GB/SIR/ExTR12.0036/00 GB/SIR/ExTR18.0134/00 GB/SIR/ExTR22.0187/00

Quality Assessment Report:

US/UL/QAR21.0007/02

IECEx ATR: **File reference:**

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EQUIPMENT:
Equipment and systems covered by this Certificate are as follows:

The EH1.1 Actuator Control Module is used for the remote positioning of hydraulically actuated process control valves. It is rated up to 690 Vac with a maximum control circuit voltage off 120 Vac or 60 V dc. It consists of a main cylindrical cast aluminium enclosure with a threaded top entry cover, a terminal housing and a hydraulic control block assembly.
The top entry cover is fitted with a window to allow external observation of an internal LCD device. The window is manufactured from glass and is potted into a threaded housing, which in turn is screwed into the top entry cover.
The main enclosure houses PCBs, electrical control circuits and switches. There are two rotary control knob switch shafts and an indicator switch shaft, which pass through the wall of the main enclosure to form cylindrical flameproof joints. Additionally, there is a threaded cable entry in the wall of the main enclosure.

Refer to the Annexe for Additional information.

SPECIFIC CONDITIONS OF USE: YES as shown below:
Refer to the Annexe

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DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)
This issue, Issue 4, recognises the following changes; refer to the certificate annex to view a comprehensive history:

1. Modification to the drawing 83772
2. Modification to the drawing 83766
3. Following appropriate assessment to demonstrate compliance with the latest technical knowledge, IEC 60079-0:2011 Ed. 6 was replaced by IEC 60079-0:2017 Ed.7, IEC 60079-7:2006 Ed. 4 was replaced by IEC 60079-7:2017 Ed.5.1, The documents were updated accordingly to recognize the new standards.

Annex:

IECEx SIR 04.0024X Issue 4 Annexe.pdf

Equipment Continued:

The terminal enclosure provides all electrical field wiring terminations. It connects to the main enclosure by means of a spigoted flamepath joint and is secured by four M8 capscrews. The terminal housing is machined to take four threaded cable entries and is separated from the main enclosure by a terminal bung. The terminal bung comprises of a moulded plastic main body, through which passes a number of terminals that are sealed in place with a potting compound. The terminal enclosure is closed by means of a lid, which connects to the terminal enclosure by means of a spigoted flamepath joint and is secured by four M8 capscrews.

The hydraulic process pressure is sealed from the main enclosure by the hydraulic manifold block, which connects to the main enclosure by means of a flanged flamepath joint and is secured by ten M8 capscrews. The hydraulic valve block utilises up to three solenoid valves which contain welded armatures, and a pressure sensor. The pressure sensor consists of a welded metal diaphragm, the stresses in which, at the maximum working pressure, are low enough as not fail in service due to fatigue.

Specific Conditions of Use

EH 1.1 Actuator control Module MAXIMUM FLAMEPATH GAPS (GAS GROUP IIB)

i. In accordance with clause 5.1 of IEC 60079-1, the critical dimensions of the flamepaths relevant to the EH 1.1 are:

Flamepath	Maximum Gap (mm)	Minimum L (mm)
Manifold Block/Main Enclosure	0.10	12.50
Control Knob Shaft /Main Enclosure	0.20	25.00
Terminal Bung/Terminal Enclosure	0.20	26.00
Indicator Shaft Bushing/Main Enclosure	0.00	25.25
Indicator Shaft/Indicator Shaft Bushing	0.20	31.75
Terminal housing/Main Enclosure	0.15	26.20
Terminal Cover/Terminal Housing	0.15	14.70

ii. Any installation must ensure that any external sources of heating or cooling, when combined with the local ambient temperature does not cause the maximum or minimum operating temperature of the equipment to be exceeded. The hydraulic system connected to the Electro-Hydraulic Power Units could provide an external heat source.

Conditions of Manufacture

1. When the termination facility is to be designed as “Ex eb”, the following essential strength tests shall be applied to the termination facilities for at least 60 s and no more than 63 s as required by clause 6.1 of IEC 60079-7:2017 (Ed. 5.1).

Test Voltage Applied Between	Test Voltage
Terminals with voltages of 90 V peak or greater and the case and lower voltage terminals.	1000 + 2U V_{RMS} $^{+5}_{0}$ % or 1500 V $_{RMS}{}^{+5}_{0}$% whichever is greater (U being the supply voltage)
Terminals with voltages not exceeding 90 V peak and the case	500 V_{RMS} $^{+5}_{0}$%

2. When an ambient temperature below -20°C and down to -40°C is specified, each device shall be subjected to a routine overpressure test in accordance with the table below. In all cases, the pressure

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shall be maintained for at least 10 s as required by clause 16 of IEC 60079-1:2014 (Ed. 7). There shall be no permanent deformation or damage to the enclosure.

Equipment	Hydrostatic Overpressure Test Pressure Applied	
	Bar	Lbf/in^2
Terminal Compartment	15.38	223.0
Main compartment	13.65	198.0

3. When an ambient temperature below -20ºC and down to -50ºC is specified, each device shall be subjected to a routine overpressure test in accordance with the table below. In all cases, the pressure shall be maintained for at least 10 s as required by clause 16 of IEC 60079-1:2014 (Ed. 7). There shall be no permanent deformation or damage to the enclosure.

Equipment	Test Pressure	
	Bar	Lbf/in^2
EH 1.1 Actuator Control Module Main Enclosure	14.51	210.31
Eh 1.1 Actuator Control Module Terminal Compartment	16.33	236.85
Terminal Bung	16.33	236.85

Full certificate change history

Issue 1 – this Issue introduced the following changes:

1. Extension of the ambient temperature range associated with the EH 1.1 Actuator Control Module, from -40°C to -50°C
2. The option to fit a suitable blanking plug in place of the pressure switch
3. The apparatus to be manufactured at an additional location (as listed).

Issue 2 – this Issue introduced the following changes:

1. Following appropriate re-assessment to demonstrate compliance with the requirements of the IEC 60079 series of standards, the documents previously listed IEC 60079-0:2000 Ed 3.1, IEC 60079-1:1998 Ed 3.2 and IEC 60079-7:2001 Ed 3, were replaced by those currently listed, the markings were updated accordingly and a condition of certification was added to recognise the new standards.
2. The UK manufacturing site for this product has been removed from the certificate.
3. The introduction of an alternative pressure sensor.
4. The introduction of an alternative solenoid coils to replace obsolete items.
5. The introduction of an alternative main PCB.
6. The introduction of an alternative indicator shaft retention method.
7. The introduction of a four way SPDT limit switches assembly.
8. The option to omit the two way SPDT limit switches was approved.
9. The recognition of minor drawing modifications for the purpose of clarification; these amendments are administrative or involve changes to the design that do not affect the aspects of the product that are relevant to explosion safety

Issue 3 – this Issue introduced the following change:

1. Following appropriate assessment to demonstrate compliance with the latest technical knowledge, IEC 60079-1:2007 Ed 6 was replaced by IEC 60079-1:2014 Ed 7 the markings were updated accordingly and the Specific Conditions of Use and Conditions of Manufacture was amended to recognise the new standard.

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Issue 4 – this Issue introduced the following changes:

1. Modification to the drawing 83772.
2. Modification to the drawing 83766.
3. Following appropriate assessment to demonstrate compliance with the latest technical knowledge, IEC 60079-0:2011 Ed. 6 was replaced by IEC 60079-0:2017 Ed.7, IEC 60079-7:2006 Ed. 4 was replaced by IEC 60079-7:2017 Ed.5.1, The documents were updated accordingly to recognize the new standards.

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