



IECEX Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification Scheme for Explosive Atmospheres

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

Certificate No.: IECEx SIR 15.0046X issue No.:2

Status: **Current**

Date of Issue: **2016-10-24** Page 1 of 4

Certificate history:
Issue No. 2 (2016-10-24)
Issue No. 1 (2016-7-28)
Issue No. 0 (2015-8-13)

Applicant: **Rotork Fluid Systems**
(A Division of Rotork UK Ltd.)
9 Brown Lane West
Holbeck
Leeds LS12 6BH
United Kingdom

Equipment: **SI-3.3 Electric Fail-Safe Actuators**
Optional accessory:


Type of Protection: **Flameproof and Increased Safety**

Marking: Ex db ¹ IIB T4 Gb IP66/68 ² or
Ex db ¹ IIC T4 Gb IP66/68 ²
¹ "e" added on versions with increased safety terminal enclosure
² Only IP64 is endorsed by Sira on this certificate
Tamb = -3°C to +4°C
³ down to -50°C, ⁴ up to 70°C

Approved for issue on behalf of the IECEx Certification Body: N Jones

Position: Certification Manager

Signature:
(for printed version)


2016-10-24

Date:

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 the [Official IECEx Website](http://www.iecex.com).

Certificate issued by:

SIRA Certification Service
CSA Group
Unit 6, Hawarden Industrial Park
Hawarden, Deeside, CH5 3US
United Kingdom

sira
CERTIFICATION





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Manufacturer: **Rotork Fluid Systems**
A Division of Rotork UK Ltd.)
9 Brown Lane West
Holbeck
Leeds LS12 6BH
United Kingdom

Additional Manufacturing location(s):

Rotork Controls Inc
675 Mile Crossing Boulevard
Rochester
New York 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 electrical apparatus 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 : 2011 Explosive atmospheres - Part 0: General requirements
Edition: 6.0
IEC 60079-1 : 2014-06 Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
Edition: 7.0
IEC 60079-7 : 2006-07 Explosive atmospheres - Part 7: Equipment protection by increased safety "e"
Edition: 4

*This Certificate **does not** indicate compliance with electrical 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/SIR/ExTR15.0219/00

GB/SIR/ExTR16.0194/00

GB/SIR/ExTR16.0274/00

Quality Assessment Report:

GB/SIR/QAR06.0023/05

GB/SIR/QAR07.0033/06



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Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

The SI-3.3 Electro-Hydraulic Power Unit is a self-contained electrically operated source of hydraulic power, which can be instantaneously switched to increase or decrease the pressure to a suitable spring return/double acting, linear or quarter-turn actuator. The Power Unit consists of a number of distinct enclosures, which are separated by the centre housing casting.

The electrical enclosure has a display window and can contain the following equipment: control PCB, power PCB, transformer, pressure transducer and radio module. This enclosure has been designed to meet the requirements of flameproof type of protection.

Thermal protection devices are installed within the motor windings.

Refer to ANNEXE for additional description and Conditions of Manufacture.

CONDITIONS OF CERTIFICATION: YES as shown below:

Refer to Annexe.



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DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):

Issue 1 – this Issue introduced the following changes:

1. The introduction of alternative motor types for the 24 Vdc, single phase and three phase versions.
2. Modifications to the 'k' and 'm' dimensions associated with the motor shaft flamepaths.
3. Drawing amendments to address the above modifications, and certain other minor modifications.

Issue 2 – this Issue introduced the following changes:

1. Introduction of the alternate DC motor cover, part number 10164.
2. Typographical correction of the manufacturing process of the DC motor cover, part number 10527.

Annexe to: IECEx SIR 15.0046X Issue 2

Applicant: Rotork Fluid Systems (A Division of Rotork UK Ltd.)



Apparatus: SI-3.3 Electric Fail-Safe Actuators

A metallic oil reservoir fitted with a metallic plug or a suitably certified plug is connected to the motor enclosure.

The terminal enclosure connects to the electrical enclosure via the centre housing, their volumes being separated by a flameproof terminal bung. The flameproof terminal bung comprises a moulded plastic main body through which passes a number of terminals which are sealed in place with a potting compound. The terminal bung is secured in position by means of a circlip. In this form, the terminal enclosure meets the requirements of increased safety type of protection and only provides electrical field wiring terminations, all of which are at the terminal bung. However, the flameproof terminal bung may be replaced with a non-flameproof version or it may be removed altogether, in which case, the electrical and terminal compartments are considered as one flameproof enclosure.

Cable entry facilities are provided in the form of four or five threaded entries. The terminal enclosure is closed by means of a lid, which connects to the centre housing by means of a tapered spigot joint and is secured by four, M8 capscrews. All external fasteners are stainless steel, grade A4-80 socket cap head screws.

Conditions of Certification

The user/installer shall comply with the following:

- i. This equipment shall be installed such that the risk of impact to the window is low.
- ii. This equipment includes some external non-metallic parts, including the outer protective coating. The user shall therefore ensure that the equipment is not installed in a location where it may be subjected to external conditions (such as high-pressure steam) which might cause a build-up of electrostatic charges on non-conducting surfaces. Additionally, cleaning of the equipment should be done only with a damp cloth.
- iii. The equipment utilises A4-80 fasteners, if these are changed they shall only be replaced by A4-80 fasteners.
- iv. Special conditions relating to flamepath dimensions as required by Clause 5.1 of IEC 60079-1 are shown below:

Flamepath	Flamepath Dimension (mm)	
	Gap	Length
Indication Cover/Centre housing	0.150	26.80
Electronics Cover/Centre housing	0.150	26.20
Manifold/ Centre housing	0.150	26.80
Blanking / Motor Port	0.150	26.80
Blanking / Motor Port	0.150	26.80
Terminal Bung (IIC)/ Centre housing	0.115	25.05
Terminal Cover/ Centre housing	0.150	25.20
Indication Cover Shaft	0.150	26.40
Indication Cover Shaft Bush	0.017	26.40
Manifold Shaft	0.150	28.40
Manifold Shaft Bush	0.017	28.40
Manifold Shaft Plug	0.150	32.75
Motor Port	0.150	26.80
Blanking Cover/Cable Entry	0.150	26.80
Motor Line Bush	0.150	33.25
DC Motor Cover/Motor Housing	0.150	25.20
AC Motor Cover/Motor Housing	0.150	25.20
DC Motor Shaft	0.167 [Note 1]	27.28
AC Motor Shaft	0.167 [Note 1]	27.28

[Note 1] This is based upon a minimum gap specification 'k' of 0.05 mm in accordance with clause 8.1.2 of IEC 60079-1

Date: 24 October 2016

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Sira Certification Service

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Form 9530 Issue 1

Annexe to: IECEx SIR 15.0046X Issue 2
Applicant: Rotork Fluid Systems (A Division of Rotork UK Ltd.)
Apparatus: SI-3.3 Electric Fail-Safe Actuators



Conditions of Manufacture

The Manufacturer shall comply with the following:

- i. When the terminal enclosure is intended to conform with the requirements of increased safety type of protection, the following electrical strength tests shall be applied to the termination facilities for at least 60 s and no more than 63 s as required by IEC 60079-7 clause 6.1:

Test Voltage Applied Between	AC Test Voltage	DC Test Voltage
Three phase terminations/case	2500 V _{RMS}	3171 Vdc
Three phase terminals and low voltage terminations	2500 V _{RMS}	3171 Vdc
Low voltage terminations and case	1500 V _{RMS}	3171 Vdc

- ii. The equipment requires a combination of routine overpressure tests and batch overpressure tests in accordance with the tables below for the design option and ambient temperature range stated. In all cases the pressure shall be maintained for at least 10 s as required by IEC 60079-1 clause 16. There shall be no permanent deformation or damage to the enclosure:

Equipment	Gas Group	Test Pressure	
		bar	lbf/in ²
Control Module – Ex Terminal Bung NOT Fitted/Non-Ex Terminal Bung Fitted			
Normal Ambient – Routine Tests (IEC/EN 60079-1 clause 16.1)			
Solenoid Valve	IIB	12.54	181.88
Solenoid Valve	IIC	15.63	226.69
Pressure Transducer	IIB	12.54	181.88
Pressure Transducer	IIC	15.63	226.69
-20°C to -50°C – Routine Tests (IEC/EN 60079-1 clause 16.1)			
Centre housing Aluminium Alloy to BS1706. Grade: (LM25TF) (or equivalent)	IIC	29.25	424.24
Electrical Cover Aluminium Alloy to ASTM B85, Grade: 1360 (or equivalent)	IIC	29.25	424.24
Indication cover Aluminium BS EN 1706 AC-42100-K-T6 (L99TF) (or equivalent)	IIC	29.25	424.24
Solenoid Valve	IIB	17.15	248.74
Solenoid Valve	IIC	29.25	424.24
Pressure Transducer	IIB	17.15	248.74
Pressure Transducer	IIC	29.25	424.24
-20°C to -50°C – Batch Tests (IEC/EN 60079-1 clause 16.6)			
Centre housing Aluminium Alloy to BS1706. Grade: ILM25TFI (or equivalent)	IIB	17.15	248.74
Terminal Cover Aluminium Alloy to ASTM B85, Grade: A360 (or equivalent)	IIC	29.25	424.24
Manifold Aluminium BS EN 573-1 6082 T6 (3.2315) (or equivalent)	IIC	29.25	424.24
Control Module – Ex Terminal Bung Fitted			
Normal Ambient – Routine Tests (IEC/EN 60079-1 clause 16.1)			
Centre housing Aluminium Alloy to BS1706. Grade: (LM25TF) (or equivalent)	IIC	23.87	346.21
Terminal Bung Crastin ST830FRUV/Robnor PX700/BK	IIC	23.87	346.21
Solenoid Valve	IIB	15.63	226.69
Solenoid Valve	IIC	23.87	346.21
Pressure Transducer	IIB	15.63	226.69
Pressure Transducer	IIC	23.87	346.21
Normal Ambient – Batch Tests (IEC/EN 60079-1 clause 16.6)			
Electrical Cover Aluminium Alloy to ASTM B85, Grade: 1360 (or equivalent)	IIC	23.87	346.21

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Annexe to: IECEx SIR 15.0046X Issue 2
Applicant: Rotork Fluid Systems (A Division of Rotork UK Ltd.)
Apparatus: SI-3.3 Electric Fail-Safe Actuators



Equipment	Gas Group	Test Pressure	
		bar	lbf/in ²
Indication cover Aluminium BS EN 1706 AC-42100-K-T6 (L99TF) (or equivalent)	IIC	23.87	346.21
Terminal Bung Crastin ST830FRUV/Robnor PX700/BK	IIB	15.63	226.69
Manifold Aluminium BS EN 573-1 6082 T6 (3.2315) (or equivalent)	IIC	23.87	346.21
-20°C to -50°C – Routine Tests (IEC/EN 60079-1 clause 16.1)			
Centre housing Aluminium Alloy to BS1706. Grade: (LM25TF) (or equivalent)	IIC	25.10	364.05
Electrical Cover Aluminium Alloy to ASTM B85, Grade: 1360 (or equivalent)	IIC	25.10	364.05
Indication cover Aluminium BS EN 1706 AC-42100-K-T6 (L99TF) (or equivalent)	IIC	25.10	364.05
Terminal Bung Crastin ST830FRUV/Robnor PX700/BK	IIC	25.10	364.05
Solenoid Valve	IIB	14.97	217.12
Solenoid Valve	IIC	25.10	364.05
Pressure Transducer	IIB	14.97	217.12
Pressure Transducer	IIC	25.10	364.05
-20°C to -50°C – Batch Tests (IEC/EN 60079-1 clause 16.6)			
Manifold Aluminium BS EN 573-1 6082 T6 (3.2315) (or equivalent)	IIC	25.10	364.05
Power Module			
-20°C to -50°C – Batch Tests (IEC/EN 60079-1 clause 16.6)			
AC Motor Cover	IIB	17.82	258.46
DC motor cover Aluminium alloy to ASTM B85. Grade: A360 (or equivalent)	IIB	17.82	258.46
Motor/Pump Housing	IIB	17.82	258.46
AC Motor Cover	IIC	22.92	332.43
DC motor cover Aluminium alloy to ASTM B85. Grade: A360 (or equivalent)	IIC	22.92	332.43
Motor/Pump Housing	IIC	22.92	332.43
Line Bush Robnor PX700/BK	IIC	22.92	332.43

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