



# 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](http://www.iecex.com)

Certificate No.: IECEx SIR 15.0046X

Issue No: 4

Certificate history:

Issue No. 4 (2019-08-22)

Issue No. 3 (2019-06-14)

Issue No. 2 (2016-10-24)

Issue No. 1 (2016-07-28)

Issue No. 0 (2015-08-13)

Status: **Current**

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Date of Issue: **2019-08-22**

Applicant: **Rotork (UK) Ltd**  
9 Brown Lane West  
Holbeck  
Leeds LS12 6BH  
**United Kingdom**

Equipment: **The SI3 and SI4, Sklmatic Range of Electro-Hydraulic Control Modules**

Optional accessory:

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

Marking:

Ex db 1 IIB T4 Gb IP66/68 <sup>2</sup> or Ex db 1 IIC T4 Gb IP66/68 <sup>2</sup>

<sup>1</sup> "e" added on versions with increased safety terminal enclosure

<sup>2</sup> Only IP64 is endorsed by Sira on this certificate

Tamb = -3°C to +4°C

Refer to the Annexe for additional information

Approved for issue on behalf of the IECEx  
Certification Body:

N Jones

Position:

Certification Manager

Signature:  
(for printed version)

Date:

2019-08-22

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





# IECEX Certificate of Conformity

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Manufacturer: **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 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:

<b>IEC 60079-0 : 2017</b> Edition:7.0	Explosive atmospheres - Part 0: Equipment - General requirements
<b>IEC 60079-1 : 2014-06</b> Edition:7.0	Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
<b>IEC 60079-7 : 2017</b> Edition:5.1	Explosive atmospheres - Part 7: Equipment protection by increased safety "e"

*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:

<a href="#">GB/SIR/ExTR15.0219/00</a>	<a href="#">GB/SIR/ExTR16.0194/00</a>	<a href="#">GB/SIR/ExTR16.0274/00</a>
<a href="#">GB/SIR/ExTR19.0156/00</a>	<a href="#">GB/SIR/ExTR19.0214/00</a>	

#### Quality Assessment Report:

<a href="#">GB/SIR/QAR06.0023/08</a>	<a href="#">GB/SIR/QAR07.0033/07</a>
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## Schedule

### EQUIPMENT:

*Equipment and systems covered by this certificate are as follows:*

The SI3 and SI4, Skilmatic Range of Electro-Hydraulic Control Modules for use with either an optional Power Module or a suitably approved third party motor and hydraulic pump <sup>[Note 1]</sup>, which can be instantaneously switched to increase or decrease the hydraulic pressure to a suitable spring return or double acting, linear or quarter-turn actuator.

The Control Module consists of an electrical and terminal enclosure, with a hydraulic manifold.

The electrical enclosure has been designed to meet the requirements of the flameproof type of protection, and is formed by the main centre housing, hydraulic manifold, electrical cover with a display window, indication cover and blanking covers or the optional Power Module, all of which form flameproof spigot joints with the centre housing. The electrical enclosure may contain the following equipment: user-interface PCB (incl. Bluetooth radio module), control PCB, power PCB, adaptor PCB, transformer, solenoid valve coils/bodies, pressure transducer bodies, up to four mechanical or proximity limit switches and operating cams and up to four option PCB's for ESD functions, device drivers or network communication.

Refer to the Annexe for additional information

**SPECIFIC CONDITIONS OF USE: YES as shown below:**

Refer to 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. Addition of an alternative terminal cover P/N 100561 manufactured in aluminium alloy BS 1490 LM25TF.
2. Introduce additional exemptions from routine overpressure testing.
3. Clarification of requirements relating to fastener strength, leading to the introduction of related Specific Conditions of Use, and Conditions of Manufacture.
4. Correction to tabulated Routine Test requirements as required.

## Annex:

[IECEX SIR 15.0046X Annexe Iss 4.pdf](#)

**Annexe to:** IECEx SIR 15.0046X Issue 4  
**Applicant:** Rotork (UK) Ltd.  
**Apparatus:** The SI3 and SI4, Skilmatic Range of Electro-Hydraulic Control Modules



## FULL MARKING

Ex db ① IIB T4 Gb IP66/68② or

Ex db ① IIC T4 Gb IP66/68②

① "eb" added on versions with increased safety terminal enclosure

② Only IP64 is endorsed by Sira on this certificate

(-③°C to +④°C)

③down to -50°C, ④up to 70°C (Configuration 1 – IIB & IIC)

③down to -50°C, ④up to 70°C (Configuration 2 – IIB)

③down to -20°C, ④up to 70°C (Configuration 2 – IIC)

### Description Continued:

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 pass 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, in which case the electrical and terminal compartments are considered as one flameproof enclosure closed by means of a cover, which connects to the centre housing by means of a tapered spigot flameproof joint.

Cable entry facilities are provided in the form of five threaded entries.

All external fasteners are stainless steel, grade A4-80 socket cap head screws.

There are two basic hydraulic manifold configurations providing different functionality depending on the number and type (normally open or normally closed), of solenoid valves and pressure transducers fitted.

#### Configuration 1

- Two solenoid valves and one pressure transducer.
- Three solenoid valves and one pressure transducer.

#### Configuration 2

- Three solenoid valves and two pressure transducers.
- Four solenoid valves and two pressure transducers.

Additional hydraulic manifold circuit configurations are permitted, provided the required functionality can be achieved using the basic manifold, solenoid and pressure transducer configurations 1 and 2 above.

The hydraulic circuits are separated from the electrical enclosure by threaded flameproof joints between the solenoid valve and pressure transducer bodies and the hydraulic manifold, which connects to the main centre housing by a flameproof tapered spigot joint to form part of the flameproof electrical enclosure.

The optional Power Module consists of a motor enclosure and hydraulic fluid reservoir which also contains the hydraulic pump, the motor enclosure and reservoir are connected by the motor/pump housing. The motor enclosure contains a motor fitted with thermal protection devices and connects to the motor/pump housing by means of a flameproof cylindrical spigot joint. The motor shaft forms a cylindrical flameproof joint through the motor pump housing and connects to the hydraulic pump in the reservoir via an oldham coupling. The hydraulic pump is not considered a source of ignition and the reservoir is not considered as part of the flameproof enclosure.

**Date:** 22 August 2019

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**Form 9530 Issue 1**

## Sira Certification Service

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**Annexe to:** IECEx SIR 15.0046X Issue 4

**Applicant:** Rotork (UK) Ltd.

**Apparatus:** The SI3 and SI4, Skilmatic Range of Electro-Hydraulic Control Modules



When the optional Power Module is mounted locally the electrical and motor enclosures are separated by a potted line bush that forms a cylindrical flameproof joint with the motor pump housing. When the Power Module is remotely mounted or a third party motor and pump is used <sup>[Note 1]</sup> the connection is via additional cable entries in the blanking covers fitted with suitably approved cable entry devices. The following basic configurations are included.

The table below shows the possible build arrangements for each model:

Model No.	Manifold Configuration	Power Module (Local)	Power Module (Remote)	Third Party Motor / Pump
SI3	1	Yes	No	No
SI3	1	No	Yes	No
SI3	1	No	No	Yes
SI4	1	Yes	No	No
SI4	1	No	Yes	No
SI4	1	No	No	Yes
SI4	2	Yes	No	No
SI4	2	No	Yes	No
SI4	2	No	No	Yes

**Note 1:** The utilisation of or a third party motor and hydraulic pump is outside the scope of this approval.

### Specific Conditions of Use

The user/installer shall comply with the following:

1. This equipment shall be installed such that the risk of impact to the window is low.
2. 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.
3. The equipment utilises A4-80 fasteners, if these are changed they shall only be replaced by A4-80 fasteners.
4. With reference to clause 5.1 of IEC 60079-1:2014 - The flamepaths associated with this equipment are not to be repaired.
5. When covers are removed and replaced, all cover securing fasteners must be tightened to 20 to 22 Nm.

**Annexe to:** IECEx SIR 15.0046X Issue 4

**Applicant:** Rotork (UK) Ltd.

**Apparatus:** The SI3 and SI4, Skilmatic Range of Electro-Hydraulic Control Modules



## Conditions of Manufacture

The Manufacturer shall comply with the following:

- i. All cover securing fasteners to be tightened to between 20 and 22 Nm.
- ii. 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 <sub>RMS</sub>	3171 Vdc
Three phase terminals and low voltage terminations	2500 V <sub>RMS</sub>	3171 Vdc
Low voltage terminations and case	1500 V <sub>RMS</sub>	3171 Vdc

- iii. 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/EN 60079-1 clause 16. There shall be no permanent deformation or damage to the enclosure:

Control Module Manifold Configuration 1, Flameproof Terminal Enclosure (Non-Ex Terminal Bung fitted)	Test Pressure	
	bar	lbf/in <sup>2</sup>
<b>Group IIB, Ambient Temperature -20°C to +70°C Routine Tests</b>		
Solenoid Valves	12.54	181.88
Pressure Transducers		
<b>Group IIB, Ambient Temperature -50°C to +70°C Routine Tests</b>		
Solenoid Valves	17.15	248.74
Pressure Transducer		
<b>Group IIC, Ambient Temperature -20°C to +70°C Routine Tests</b>		
Solenoid Valves	15.63	226.69
Pressure Transducers		
<b>Group IIC, Ambient Temperature -50°C to +70°C Routine Tests</b>		
Centre Housing	29.25	424.24
Indication Cover		
Indication Cover for Beacon		
Electronics Cover		
Vandal Proof Electronics Cover		
Motor Loom Transfer Bush		
Solenoid Valves		
Pressure Transducers		

**Date:** 22 August 2019

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**Form 9530 Issue 1**

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Annexe to: IECEx SIR 15.0046X Issue 4

Applicant: Rotork (UK) Ltd.

Apparatus: The SI3 and SI4, Skilmatic Range of Electro-Hydraulic Control Modules



Control Module Manifold Configuration 1, Increased Safety Terminal Enclosure (Ex Terminal Bung fitted)	Test Pressure	
	bar	lbf/in <sup>2</sup>
<b>Group IIB, Ambient Temperature -20°C to +70°C Routine Tests</b>		
Solenoid Valves	15.63	226.69
Pressure Transducers		
<b>Group IIB, Ambient Temperature -20°C to +70°C Batch Tests</b>		
Terminal Bung	15.63	226.69
<b>Group IIB, Ambient Temperature -50°C to +70°C Routine Tests</b>		
Solenoid Valves	14.97	217.12
Pressure Transducers		
<b>Group IIC, Ambient Temperature -20°C to +70°C Routine Tests</b>		
Centre Housing	23.87	346.21
Solenoid Valves		
Pressure Transducers		
<b>Group IIC, Ambient Temperature -20°C to +70°C Batch Tests</b>		
Indication Cover	23.87	346.21
Indication Cover for Beacon		
Electronics Cover		
Vandal Proof Electronics Cover		
Motor Loom Transfer Bush		
<b>Group IIC, Ambient Temperature -50°C to +70°C Routine Tests</b>		
Centre Housing	25.10	364.05
Indication Cover		
Indication Cover for Beacon		
Electronics Cover		
Vandal Proof Electronics Cover		
Motor Loom Transfer Bush		
Solenoid Valves		
Pressure Transducers		
Terminal Bung		

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Form 9530 Issue 1

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Annexe to: IECEx SIR 15.0046X Issue 4

Applicant: Rotork (UK) Ltd.

Apparatus: The SI3 and SI4, Skilmatic Range of Electro-Hydraulic Control Modules



Control Module Manifold Configuration 2, Flameproof Terminal Enclosure (Non-Ex Terminal Bung fitted)	Test Pressure	
	bar	lbf/in <sup>2</sup>
<b>Group IIB, Ambient Temperature -20°C to +70°C Routine Tests</b>		
Solenoid Valves	18.78	272.38
Pressure Transducers		
<b>Group IIB, Ambient Temperature -20°C to +70°C Batch Tests</b>		
Centre Housing	18.78	272.38
Indication Cover		
Indication Cover for Beacon		
Electronics Cover		
Vandal Proof Electronics Cover		
Motor Loom Transfer Bush		
<b>Group IIB, Ambient Temperature -50°C to +70°C Routine Tests</b>		
Centre Housing	28.01	406.25
Indication Cover		
Indication Cover for Beacon		
Electronics Cover		
Vandal Proof Electronics Cover		
Solenoid Valves		
Pressure Transducers		
<b>Group IIC, Ambient Temperature -20°C to +70°C Routine Tests</b>		
Centre Housing	30.14	437.14
Indication Cover		
Indication Cover for Beacon		
Electronics Cover		
Vandal Proof Electronics Cover		
Manifold		
Motor Loom Transfer Bush		
Solenoid Valves		
Pressure Transducers		
<b>Group IIC, Ambient Temperature -20°C to +70°C Batch Tests</b>		
Blanking Cover	30.14	437.14
Blanking Cover with Cable Entry		

**Annexe to:** IECEx SIR 15.0046X Issue 4

**Applicant:** Rotork (UK) Ltd.

**Apparatus:** The SI3 and SI4, Skilmatic Range of Electro-Hydraulic Control Modules



Control Module Manifold Configuration 2, Increased Safety Terminal Enclosure (Ex Terminal Bung fitted)	Test Pressure	
	bar	lbf/in <sup>2</sup>
<b>Group IIB, Ambient Temperature -20°C to +70°C Routine Tests</b>		
Solenoid Valves	20.04	290.66
Pressure Transducers		
<b>Group IIB, Ambient Temperature -20°C to +70°C Batch Tests</b>		
Centre Housing	20.04	290.66
Indication Cover		
Indication Cover for Beacon		
Electronics Cover		
Vandal Proof Electronics Cover		
Motor Loom Transfer Bush		
Terminal Bung		
<b>Group IIB, Ambient Temperature -50°C to +70°C Routine Tests</b>		
Centre Housing	26.30	381.45
Indication Cover		
Indication Cover for Beacon		
Electronics Cover		
Vandal Proof Electronics Cover		
Motor Loom Transfer Bush		
Solenoid Valves		
Pressure Transducers		
Terminal Bung		
<b>Group IIC, Ambient Temperature -20°C to +70°C Routine Tests</b>		
Centre Housing	30.50	442.37
Indication Cover		
Indication Cover for Beacon		
Electronics Cover		
Vandal Proof Electronics Cover		
Motor Loom Transfer Bush		
Solenoid Valves		
Pressure Transducers		
Terminal Bung		
<b>Group IIC, Ambient Temperature -20°C to +70°C Batch Tests</b>		
Blanking Cover	30.50	442.37
Blanking Cover with Cable Entry		
<b>Power Module</b>		
<b>Test Pressure</b>		
	bar	lbf/in <sup>2</sup>
<b>Group IIB, Ambient Temperature -20°C to +70°C Batch Tests</b>		
AC Motor Cover	17.82	258.46
DC motor cover Aluminium alloy to ASTM B85. Grade: A360 (or equivalent)	17.82	258.46
Motor/Pump Housing	17.82	258.46
<b>Group IIC, Ambient Temperature -20°C to +70°C Batch Tests</b>		
AC Motor Cover	22.92	332.43
DC motor cover Aluminium alloy to ASTM B85. Grade: A360 (or equivalent)	22.92	332.43
Motor/Pump Housing	22.92	332.43
Line Bush Robnor PX700/BK	22.92	332.43

**Annexe to:** IECEx SIR 15.0046X Issue 4  
**Applicant:** Rotork (UK) Ltd.  
**Apparatus:** The SI3 and SI4, Skilmatic Range of Electro-Hydraulic Control Modules

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## **FULL Certificate Change History**

**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.

**Issue 3** – this Issue introduced the following changes:

1. Introduction of the Type SI4 Skilmatic Range of Electro-Hydraulic Control Modules.
2. Amend the type designation of the SI 3.3 to Type SI 3 Skilmatic Range of Electro-Hydraulic Control Modules, and the Condition of Manufacture were amended to recognise the new designations.
3. The introduction of amended flamepath dimension for gas group IIB applications.
4. Company name change. From Rotork Fluid Systems (A division of Rotork UK Ltd) to 'Rotork (UK) Ltd
5. Amendments to various approval drawings.
6. Following appropriate assessment to demonstrate compliance with the latest technical knowledge, IEC 60079-0:2011 Ed 6, IEC 60079-1:2014 Ed 7 and IEC 60079-7:2006 Ed 4 were replaced by IEC 60079-0:2017 Ed 7, IEC 60079-1:2014 Ed.7 + Corr.1:2018 and IEC 60079-7:2017 Ed 5.1.

**Issue 4** – this Issue introduced the following changes:

1. Addition of an alternative terminal cover P/N 100561 manufactured in aluminium alloy BS 1490 LM25TF.
2. Introduce additional exemptions from routine overpressure testing.
3. Clarification of requirements relating to fastener strength, leading to the introduction of related Specific Conditions of Use, and Conditions of Manufacture.
4. Correction to tabulated Routine Test requirements as required.