



IECEX Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification System for Explosive Atmospheres

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Certificate No.: **IECEX SIR 15.0046X** Page 1 of 4 Certificate history:
Status: **Current** Issue No: 5 Issue 4 (2019-08-22)
Date of Issue: 2021-08-19 Issue 3 (2019-06-14)
Applicant: **Rotork UK Limited** Issue 2 (2016-10-24)
9 Brown Lane West Issue 1 (2016-07-28)
Leeds Issue 0 (2015-08-13)
LS12 6BH
United Kingdom
Equipment: **The SI3 and SI4, Skilmatic Range of Electro-Hydraulic Control Modules**
Optional accessory:
Type of Protection: **Flameproof and Increased Safety**
Marking: **Refer to the Annexe**

Approved for issue on behalf of the IECEx
Certification Body:

N Jones

Position:

Certification Manager

Signature:
(for printed version)

Date:

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Certificate issued by:

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





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Date of issue: 2021-08-19

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Manufacturer: **Rotork UK Limited**
9 Brown Lane West
Leeds
LS12 6BH
United Kingdom

Additional
manufacturing
locations:

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/CSAE/ExTR21.0052/00](#)
[GB/SIR/ExTR16.0274/00](#)

[GB/SIR/ExTR15.0219/00](#)
[GB/SIR/ExTR19.0156/00](#)

[GB/SIR/ExTR16.0194/00](#)
[GB/SIR/ExTR19.0214/00](#)

Quality Assessment Report:

[GB/SIR/QAR07.0033/08](#)



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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 ^[Note 1], 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 5, recognises the following change; refer to the certificate annex to view a comprehensive history:

1. To introduce the following alternative part numbers for manifold configuration 1:
2024948-C1 is an alternative to HPU-1343-C1
2024948-C2 is an alternative to HPU-1343-C2
2. Removal of the QAR marks for the Rochester site on certificates and drawing 2036223.
3. Change to the flash testing note on the drawing 2031357.

Annex:

[IECEX SIR 15.0046X Annexe Iss 5.pdf](#)

Annexe to: IECEx SIR 15.0046X Issue 5

Applicant: Rotork UK Ltd.

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



FULL MARKING

Ex db • IIB T4 Gb IP66/68, or

Ex db • IIC T4 Gb IP66/68,

• "eb" added on versions with increased safety terminal enclosure
, Only IP64 is endorsed by Sira on this certificate

(-f°C to + °C)

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

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

f down to -20°C, ° up 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

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pump is not considered a source of ignition and the reservoir is not considered as part of the flameproof enclosure.

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 ^[Note 1] 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.

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



Conditions of Manufacture

- 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 |
|--|-----------------------|-----------------|
| Test Between Mains terminal and enclosure | 2200 V _{RMS} | 3100 Vdc |
| Test Between Mains terminals and secondary terminals | 2200 V _{RMS} | 3100 Vdc |
| Test Between Secondary Terminals and enclosure | 1500 V _{RMS} | 2100 Vdc |

For 24 VDC equipment, the above test may be conducted with the DC power board located in the flame-proof electrical enclosure disconnected from the terminal bung

- 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 ² |
| Group IIB, Ambient Temperature -20°C to +70°C Routine Tests | | |
| Solenoid Valves | 12.54 | 181.88 |
| Pressure Transducers | | |
| Group IIB, Ambient Temperature -50°C to +70°C Routine Tests | | |
| Solenoid Valves | 17.15 | 248.74 |
| Pressure Transducer | | |
| Group IIC, Ambient Temperature -20°C to +70°C Routine Tests | | |
| Solenoid Valves | 15.63 | 226.69 |
| Pressure Transducers | | |
| Group IIC, Ambient Temperature -50°C to +70°C Routine Tests | | |
| 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 | | |
| Group IIC, Ambient Temperature -50°C to +70°C Batch Tests | | |
| Terminal Cover (100551) when used | 29.25 | 424.24 |

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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 ² |
| Group IIB, Ambient Temperature -20°C to +70°C Routine Tests | | |
| Solenoid Valves | 15.63 | 226.69 |
| Pressure Transducers | | |
| Group IIB, Ambient Temperature -20°C to +70°C Batch Tests | | |
| Terminal Bung | 15.63 | 226.69 |
| Group IIB, Ambient Temperature -50°C to +70°C Routine Tests | | |
| Solenoid Valves | 14.97 | 217.12 |
| Pressure Transducers | | |
| Group IIC, Ambient Temperature -20°C to +70°C Routine Tests | | |
| Centre Housing | 23.87 | 346.21 |
| Solenoid Valves | | |
| Pressure Transducers | | |
| Group IIC, Ambient Temperature -20°C to +70°C Batch Tests | | |
| Indication Cover | 23.87 | 346.21 |
| Indication Cover for Beacon | | |
| Electronics Cover | | |
| Vandal Proof Electronics Cover | | |
| Motor Loom Transfer Bush | | |
| Group IIC, Ambient Temperature -50°C to +70°C Routine Tests | | |
| 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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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 ² |
| Group IIB, Ambient Temperature -20°C to +70°C Routine Tests | | |
| Solenoid Valves | 18.78 | 272.38 |
| Pressure Transducers | | |
| Group IIB, Ambient Temperature -20°C to +70°C Batch Tests | | |
| Centre Housing | 18.78 | 272.38 |
| Indication Cover | | |
| Indication Cover for Beacon | | |
| Electronics Cover | | |
| Vandal Proof Electronics Cover | | |
| Motor Loom Transfer Bush | | |
| Group IIB, Ambient Temperature -50°C to +70°C Routine Tests | | |
| Centre Housing | 28.01 | 406.25 |
| Indication Cover | | |
| Indication Cover for Beacon | | |
| Electronics Cover | | |
| Vandal Proof Electronics Cover | | |
| Solenoid Valves | | |
| Pressure Transducers | | |
| Group IIC, Ambient Temperature -20°C to +70°C Routine Tests | | |
| Centre Housing | 30.14 | 437.14 |
| Indication Cover | | |
| Indication Cover for Beacon | | |
| Electronics Cover | | |
| Vandal Proof Electronics Cover | | |
| Motor Loom Transfer Bush | | |
| Solenoid Valves | | |
| Pressure Transducers | | |
| Group IIB, Ambient Temperature -50°C to +70°C Batch Tests | | |
| Terminal Cover (100551) when used | 28.01 | 406.25 |
| Group IIC, Ambient Temperature -20°C to +70°C Batch Tests | | |
| Blanking Cover | 30.14 | 437.14 |
| Blanking Cover with Cable Entry | | |
| Terminal Cover (100551) when used | | |

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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 ² |
| Group IIB, Ambient Temperature -20°C to +70°C Routine Tests | | |
| Solenoid Valves | 20.04 | 290.66 |
| Pressure Transducers | | |
| Group IIB, Ambient Temperature -20°C to +70°C Batch Tests | | |
| Centre Housing | 20.04 | 290.66 |
| Indication Cover | | |
| Indication Cover for Beacon | | |
| Electronics Cover | | |
| Vandal Proof Electronics Cover | | |
| Motor Loom Transfer Bush | | |
| Terminal Bung | | |
| Group IIB, Ambient Temperature -50°C to +70°C Routine Tests | | |
| 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 | | |
| Group IIC, Ambient Temperature -20°C to +70°C Routine Tests | | |
| 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 | | |
| Group IIC, Ambient Temperature -20°C to +70°C Batch Tests | | |
| Blanking Cover | 30.50 | 442.37 |
| Blanking Cover with Cable Entry | | |
| Power Module | | |
| | Test Pressure | |
| | bar | lbf/in ² |
| Group IIB, Ambient Temperature -20°C to +70°C Batch Tests | | |
| AC Motor Cover | 17.82 | 258.46 |
| DC motor cover (10164 when used) | | |
| Motor/Pump Housing | | |
| Group IIC, Ambient Temperature -20°C to +70°C Batch Tests | | |
| AC Motor Cover | 22.92 | 332.43 |
| motor cover (10164 when used) | | |
| Motor/Pump Housing | | |

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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.

Issue 5 – this Issue introduced the following change:

1. To introduce the following alternative part numbers for manifold configuration 1:
 - 2024948-C1 is an alternative to HPU-1343-C1
 - 2024948-C2 is an alternative to HPU-1343-C2
2. Removal of the QAR marks for the Rochester site on certificates and drawing 2036223.
3. Change to the flash testing note on the drawing 2031357.