

UK Type Examination Certificate CML 21UKEX1121X Issue 2

United Kingdom Conformity Assessment

- 1 Product or Protective System Intended for use in Potentially Explosive Atmospheres UKSI 2016:1107 (as amended) – Schedule 3A, Part 1
- 2 Equipment **IQT3 Range of Electric Valve Actuators**
- 3 Manufacturer **Rotork Controls Limited** **Rotork Actuation (Shanghai) Co., Ltd.** **Rotork Controls, Inc.** **Rotork Controls (India) Pvt Ltd**
- 4 Address **Brassmill Lane, Bath, BA1 3JQ, United Kingdom** **Building G, No.260 Liancao Rd, Minhang District, Shanghai, 201108, China** **675 Mile Crossing Blvd, Rochester, NY 14624, USA** **28B, Ambattur Industrial Estate (North) TN Chennai-600 098, India**
- 5 The equipment is specified in the description of this certificate and the documents to which it refers.
- 6 Eurofins E&E CML Limited, Newport Business Park, New Port Road, Ellesmere Port, CH65 4LZ, United Kingdom, Approved Body Number 2503, in accordance with Regulation 43 of the Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 2016, UKSI 2016:1107 (as amended), certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Schedule 1 of the Regulations.
The examination and test results are recorded in the confidential reports listed in Section 12.
- 7 If an 'X' suffix appears after the certificate number, it indicates that the equipment is subject to specific conditions of use (affecting correct installation or safe use). These are specified in Section 14.
- 8 This UK Type Examination certificate relates only to the design and construction of the specified equipment. Further requirements of the Regulations apply to the manufacturing process and supply of the product. These are not covered by this certificate.
- 9 Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the confidential report, has been demonstrated through compliance with the following documents:

EN IEC 60079-0:2018

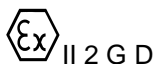
EN 60079-1:2014

EN IEC 60079-7:2015+A1:2018

EN 60079-31:2014

EN ISO 80079-36:2016

- 10 The equipment shall be marked with the following:



Ex db[Ⓢ] h IIC T4[Ⓢ] Gb IP66/IP68[Ⓢ]

Ex h tb IIIC T120°C[Ⓢ] Db

Ta = (-[Ⓢ]°C to +[Ⓢ]°C) [Ⓢ]down to -50°C, [Ⓢ]up to +70°C

[Ⓢ]'eb' added on versions with increased safety terminal enclosure.

[Ⓢ]Can be T6 when a duty cycle is specified (See Specific Conditions of Use)

T6 cannot be applied when an Intumescent Coating is specified.

[Ⓢ]Only IP64 is endorsed by CML

[Ⓢ]Can be T80°C when a duty cycle is specified (See Specific Conditions of Use)

T80°C cannot be applied when an Intumescent Coating is specified.





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11 Description

The IQT3 Electric Valve Actuator comprises an oil-filled spur/worm gearbox with handwheel and de-clutch mechanism, to which is attached an electrical enclosure and a terminal enclosure. Both these enclosures form an integral part of the gearcase and are designed to satisfy the requirements for flameproof equipment. In addition, the terminal enclosure is designed to satisfy the requirements for increased safety, providing an alternative method of protection for the field wiring facilities. The IQT3 Electric Valve Actuator comprises a range of electric actuators based upon two gearcase sizes, the flameproof enclosures are constructionally identical on both gearcase sizes.

The IQT3 Electric Valve Actuator is driven by a 24 Vdc, or in the case of the IQT3000 36 Vdc, permanent magnet motor which is controlled by an internal control circuit. The latter can be configured to accept various external power supplies ranging from three phase, single phase to 24 Vdc.

The permanent magnet dc motor is installed in the electrical enclosure by means of a motor cover, which has a spigoted flamepath joint and is secured by three M8 socket cap-head screws. The rotary output from the motor, transfers to the gearbox by means of a shaft supported in a rolling element bearing and a cylindrical brass flamepath bushing.

The dc motor is fitted with two 150°C thermal protective devices. There is a facility to override these devices should the user find it necessary. See Specific Conditions of Use.

An electrical cover connects to the gearcase by means of a spigoted flamepath joint and is secured by four M8 socket cap-head screws. In one end of the electrical cover a window is provided to allow the external observation of an internal LCD display. As well as the motor, the electrical enclosure contains monitoring and control circuitry and a battery. The monitoring and control circuitry controls the output speed and torque of the motor. It also senses and controls the position of the output shaft of the actuator by means of an encoder shaft. This shaft transfers to the gearbox by means of a cylindrical brass flamepath bushing.

The terminal enclosure connects to the electrical enclosure via the gearcase. The terminal enclosure incorporates a terminal bung, which comprises of a moulded main body, through which passes a number of terminals that are moulded in place. Optionally, in all deep cover versions, and compulsory in all increased safety versions; the terminal bung provides separation between the gearcase/electrical enclosure and the terminal enclosure. The joint between the two parts forming a flamepath. The terminal enclosure provides all electrical field-wiring terminations at the terminal bung. Cable entry facilities are provided in the form of two or four threaded entries. The terminal enclosure is closed by means of a terminal cover which connects to the gearcase by means of a tapered spigot flamepath joint and is secured by four M8 socket cap-head screws.

Model Codes

The following gearcase options are covered by the scope of this certificate:

IQT50, IQT100, IQT125, IQT250, IQT500 and IQT1500

Quarter turn and multi-turn output option (designated IQT or IQTF respectively);

Three phase, single phase and dc actuator power supply;



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Modulating output duty cycle option (designated IQTM or IQTFM).

IQT1000, IQT2000 and IQT3000

Quarter turn and multi-turn output option (designated IQT or IQTF respectively);

Three phase, single phase and dc actuator power supply;

Modulating output duty cycle option (designated IQTM or IQTFM).

Design Options

Extra Alarm Relays

Fieldbus System Control Options

Network interface cards: Pakscan; Modbus; Profibus; Foundation Fieldbus; Devicenet.

Remote Control

Analogue Control – Folomatic; Analogue position feedback – CPT; Analogue torque feedback – CTT.

Deep Terminal Cover Option – All actuator sizes

The deep terminal cover allows the installation of a PCB for Network disconnect applications or a wireless network PCB and associated external aerial enclosure. The deep cover is provided with threaded entry points.

Intumescent Coating Option

The Intumescent coating is a fire-retardant coating which swells as a result of heat exposure increasing in volume and decreasing in density the effect of which is to insulate the actuator from fire allowing it to continue to operate.

Plug & Socket Cover/Plug & Socket Connection/Non-Flameproof Terminal Bung option - Ex db versions Gas Group IIB and Ex tb versions only, all sizes, Tamb -20°C to +70°C.

The flameproof terminal bung is removed and replaced with a non-flameproof Plug & Socket arrangement. To accommodate the plug and socket arrangement, a Plug & Socket Cover has been introduced, manufactured in aluminium alloy to BS1490, Grade: LM25M. The latter includes up to four M25 threaded cable entry points. Additionally, it can optionally accommodate the Network Disconnect PCB.

Optionally in place of the Plug & Socket Connection facility, a non-flameproof Terminal Bung can be installed along with the Plug & Socket Cover, with or without the Network Disconnect PCB.



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Shutdown Battery Module Option

The Range of Electric Valve Actuators sizes IQT50, 100, 125, 250, 500, 1000, 1500 and 2000, (IQT, IQTF, IQTM and IQTFM Types as applicable), ambient temperature range -40°C to +70°C may have a long electrical cover to accommodate a lithium-ion battery pack, associated control protective circuitry, and a heater.

Notes:

- Sira 15ATEX1011X is superseded by this certificate.
- The product covered by Issue 0 of this certificate remains identical to that previously covered by Sira 15ATEX1011X.
- Where Sira 15ATEX1011X is specified in other product certification, or other technical specifications, this certificate reference for the product shall be used in its place; updating of the other product certificate or technical specification is not required.

Variation 1

- To recognise a change to the name of the manufacturer of a material of construction.
- To permit the up-issuing of certification drawings in order to align drawing versions across corresponding ATEX, UKEX and IECEx certificates.
- To recognize an editorial change to drawings AD1399 and AD1414 regarding Ex e ring tags.

Variation 2

- Include the option for the heat pad to be disconnected.
- Amendment to table in specific conditions of use to include IQT1500.

12 Certificate history and evaluation reports

Issue	Date	Associated report	Notes
0	17 May 2021	R13837f/00	The issue of prime certificate.
1	21 Nov 2021	R14711A/00	Introduction of variation 1
2	21 Feb 2022	R15013A/00	Introduction of variation 2

Note: Drawings that describe the equipment are listed in the Annex.

13 Conditions of Manufacture

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

- 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.
- Each IQT3 Range of Electric Actuators shall be subjected to a routine overpressure test in accordance with EN 60079-1 clause 16 at the following values.



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Routine overpressure tests Tamb -20°C

Equipment	Test Pressure (bar)
Non-Flameproof Terminal Bung fitted (Normal Terminal Cover)	
Gearcase/Electrical/Terminal Compartment - Aluminium Alloy to BS1490, Grade: LM25M Grade A4-80 fasteners	23.43
Motor Cover - Aluminium Alloy to ASTM B85, Grade: A360 LM20	23.43
Extra-Short Electrical Cover - Aluminium Alloy to BS1490. Grade: LM25M	23.43
Non-Flameproof Terminal Bung fitted (Deep Terminal Cover)	
Gearcase/Electrical/Terminal Compartment - Aluminium Alloy to BS1490, Grade: LM25M Grade A4-80 fasteners	29.32
Gearcase/Electrical/Terminal Compartment - Aluminium Alloy to BS1490, Grade: LM25M Grade 12.9 fasteners	29.32
Motor Cover - Aluminium Alloy to ASTM B85, Grade: A360 LM20	29.32
Extra-Short Electrical Cover - Aluminium Alloy to BS1490, Grade: LM25M	29.32
Deep Terminal Cover - Aluminium Alloy to BS1490, Grade: LM25TF (heat treated)	29.32
Aerial Housing - Dalau Ltd, Grade: Dalcon 001	29.32
Gearcase/Electrical Compartment with flameproof Terminal Bung fitted	
Gearcase/Electrical Compartment – Terminal bung circlip groove Aluminium Alloy to BS1490. Grade: LM25M	20.69
Gearcase/Electrical Compartment - Aluminium Alloy to BS1490, Grade: LM25M Grade A4-80 fasteners	20.69
Extra-Short Electrical Cover - Aluminium Alloy to BS1490, Grade: LM25M	20.69
Terminal Bung - Crastin ST830FRUV/Robnor PX700/BK	20.69

Routine overpressure tests Tamb below -20°C

Equipment	Test Pressure (bar)
Non-Flameproof Terminal Bung fitted (Normal Terminal Cover)	
Gearcase/Electrical/Terminal Compartment - Aluminium Alloy to BS1490, Grade: LM25M Grade A4-80 fasteners	36.35
Gearcase/Electrical/Terminal Compartment - Aluminium Alloy to BS1490, Grade: LM25M Grade 12.9 fasteners	36.35
Terminal Cover - Aluminium Alloy to ASTM B85, Grade: A360	36.35
Motor Cover - Aluminium Alloy to ASTM B85, Grade: A360 LM20	36.35
Extra-Short Electrical Cover - Aluminium Alloy to BS1490, Grade: LM25M	36.35
Terminal Housing with flameproof Terminal Bung fitted (Normal Terminal Cover)	
Gearcase Terminal Compartment - Aluminium Alloy to BS1490. Grade: LM25M Grade A4-80 fasteners	18.09
Terminal Bung - Crastin ST830FRUV/Robnor PX700/BK	18.09
Terminal Housing with flameproof Terminal Bung fitted (Deep Terminal Cover & Network Disconnect PCB)	



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Equipment	Test Pressure (bar)
Gearcase Terminal Compartment - Aluminium Alloy to BS1490, Grade: LM25M Grade A4-80 fasteners	20.86
Terminal Bung - Crastin ST830FRUV/Robnor PX700/BK	20.86
Deep Terminal Cover - Aluminium Alloy to BS1490, Grade: LM25TF (heat treated)	20.86
Gearcase/Electrical Compartment with flameproof Terminal Bung fitted	
Gearcase/Electrical Compartment - Terminal Bung circlip groove - Aluminium Alloy to BS1490, Grade: LM25M	29.93
Gearcase/Electrical Compartment - Aluminium Alloy to BS1490, Grade: LM25M Grade A4-80 fasteners	29.93
Gearcase/Electrical Compartment - Aluminium Alloy to BS1490, Grade: LM25M Grade 12.9 fasteners	29.93
Motor Cover - Aluminium Alloy to BS1490, Grade: LM25M	29.93
Extra-Short Electrical Cover - Aluminium Alloy to BS1490, Grade: LM25M	29.93
Terminal Bung - Crastin ST830FRUV/Robnor PX700/BK	29.93

Routine overpressure tests when fitted with the shutdown battery module. Non-flameproof terminal bung fitted Tamb -20°C

Equipment	Test Pressure (bar)
Gearcase/Electrical/Terminal Compartment - Aluminium Alloy to BS1490, Grade: LM25M Grade A4-80 fasteners	23.56
Gearcase/Electrical/Terminal Compartment - Aluminium Alloy to BS1490, Grade: LM25M Grade 12.9 fasteners	23.56
Motor cover - Aluminium Alloy to ASTM B85, Grade: A360 LM20	23.56
Long Electrical Cover - Aluminium Alloy to ASTM B85, Grade: A360 (or equivalent)	23.56
Long Electrical Cover - Aluminium Alloy to BS1490, Grade: LM25TF (heat treated) (or equivalent)	23.56

Routine overpressure tests when fitted with the shutdown battery module. Non-flameproof terminal bung fitted Tamb -40°C

Equipment	Test Pressure (bar)
Gearcase/Electrical/Terminal Compartment - Aluminium Alloy to BS1490, Grade: LM25M Grade A4-80 fasteners	36.78
Gearcase/Electrical/Terminal Compartment - Aluminium Alloy to BS1490, Grade: LM25M Grade 12.9 fasteners	36.78
Motor Cover - Aluminium Alloy to ASTM B85, Grade: A360 LM20	36.78
Long Electrical Cover - Aluminium Alloy to ASTM B85, Grade: A360 (or equivalent)	36.78
Long Electrical Cover - Aluminium Alloy to BS1490, Grade: LM25TF (heat treated) (or equivalent)	36.78
Terminal Cover - Aluminium Alloy to ASTM B85, Grade: A360	36.78



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**Routine overpressure tests when fitted with the shutdown battery module.
Flameproof terminal bung fitted. Routine overpressure tests Tamb -20°C**

Equipment	Test Pressure (bar)
Gearcase/Electrical/ Compartment Terminal bung circlip groove - Aluminium Alloy to BS1490, Grade: LM25M	28.97
Gearcase/Electrical/ Compartment - Aluminium Alloy to BS1490. Grade: LM25M Grade A4-80 fasteners	28.97
Gearcase/Electrical/ Compartment - Aluminium Alloy to BS1490, Grade: LM25M Grade 12.9 fasteners	28.97
Motor Cover - Aluminium Alloy to ASTM B85, Grade: A360 LM20	28.97
Long Electrical Cover - Aluminium Alloy to ASTM B85, Grade: A360 (or equivalent)	28.97
Long Electrical Cover - Aluminium Alloy to BS1490, Grade: LM25TF (heat treated) (or equivalent)	28.97
Terminal Bung - Crastin ST830FRUV/Robnor PX700/BK	28.97

- 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 EN 60079-7 by clause 6.1 at the following values:

Test Voltage Applied Between	Test Voltage
Three phase Terminations/Case	2,500 Vrms
Three phase Terminals/Low Voltage Terminations	2,500 Vrms
Low Voltage Terminations/Case	1,500 Vrms

Alternatively, a test shall be carried out at 1.2 times the test voltage. But maintained for at least 100 ms in accordance with EN 60079-7 clause 7.1.

- iv. The Deep Terminal Cover option shall not be marked for applications below -20°C unless a flameproof Terminal Bung is fitted.
- v. When the Intumescent Coating is applied the equipment shall not be marked T6/T80°C
- vi. The Shutdown Battery Module combined with the flameproof Terminal Bung shall not be marked for use in IIC applications below -20°C.

14 Specific Conditions of Use

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

- i. This certificate does not cover the IQT3 Range of Electric Valve Actuators if the motor has been overridden. See manufacturer's instructions.
- ii. The IQT3 Range of Electric Valve Actuators shall be installed such that the risk of impact to the window is low.



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- iii. In accordance with EN 60079-1 clause 5.1, the critical dimensions of the flamepaths are as follows:

Flamepath	Max, Gap (mm)	Min. L (mm)
Terminal Cover/Terminal Housing	0.15	26.95
Gearcase/Plug and Socket Cover	0.15	27.00
Terminal Bung/Gearcase	0.20	26.0
Electrical Cover/Gearcase	0.15	26.0
Motor Cover/Gearcase	0.15	26.0
Motor Shaft/Motor Shaft Bushing	0.24	25.0
Motor Shaft Bushing/Gearcase	0.00	25.0
Encoder Shaft/Resolver Shaft Bushing	0.08	28.0
Encoder Shaft Bushing/Gearcase	0.07	25.0

- iv. When the IQT3 Range of Electric Valve Actuators are marked with a T6 temperature classification/T80°C maximum surface temperature, the following duty cycle is applicable:

IQT50, IQT100, IQT125, IQT250, IQT500, IQT1000, IQT1500 and IQT2000

15 minutes rated based upon a nominal 75% of rated torque.

IQT3000

15 minutes rated based upon a nominal 50% of rated torque

- v. When the actuator has a Shutdown Battery Module installed, the actuator shall only operate a certain number of strokes when the battery is in use or during mains power loss. Below is the number of strokes the battery pack can sustain and the time to recharge in reference to utilized strokes. The Shutdown Battery Pack shall only be used to either open or close the end-application valve once, even during manual adjustment.

Size	IQT - Number of strokes	Discharging duration (mins)	IQT - Time to recharge per stroke (mins)
IQTF 50	80	4	2
IQTF 100	72	4	2
IQT 125*	30	4	5
IQT 250*	14	4	11
IQT 500*	8	4	19
IQT 1000*	4	4	38
IQT 1500	3	4	51
IQT 2000*	2	4	75
* These models may have the prefix IQT, IQTF, IQTM or IQTFM			



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When the shutdown Battery Pack is installed, the actuator powered from mains shall operate as follows:

IQT/IQTF series up to 2000 models:- 15 minutes rated based at 60°C ambient temperature and 6 minutes rated based at 70°C on a nominal torque of 75% of rated torque.

IQTM/IQTFM series up to 2000 models:- 50% duty cycle rated based at 60°C ambient temperature and 20% duty cycle rated based at 70°C on a nominal torque of 50% of rated torque.

- vi. Where the end user connects locally to the actuator via a mobile app, the end user must use a suitably certified explosion proof handheld device.
- vii. The actuator should only be cleaned with a damp cloth.

Certificate Annex

Certificate Number CML 21UKEX1121X
Equipment IQT3 Range of Electric Valve Actuators
Manufacturer Rotork Controls Limited
Rotork Actuation (Shanghai) Co., Ltd
Rotork Controls, Inc.
Rotork Controls (India) Pvt Ltd



The following documents describe the equipment defined in this certificate:

Issue 0

For drawings describing the equipment, refer to CML 19ATEX1193X. In addition to the drawings listed on CML 19ATEX1193X, the following drawings include the additional marking required for this UK Type Examination certification:

Drawing No	Sheets	Rev	Approved date	Title
AD1414	1 to 2	7	17 May 2021	CertDwg IQT3 ATEX-IECEX Terminal Bung & Main Labels

Issue 1

Drawing No	Sheets	Rev	Approved date	Title
PLAD1346	1 to 6	11	21 Nov 2021	Parts List for IQ19, 20 & 25 Actuators ATEX & IECEX Certification Group IIB & IIC
PLAD1350	1 to 8	10	21 Nov 2021	Parts List for IQ10, 12 & 18 Actuators ATEX & IECEX Certification Group IIB & IIC
PLAD1351	1 to 8	08	21 Nov 2021	Parts List for IQ35 Actuators ATEX & IECEX Certification Group IIB & IIC
AD1414	1 to 2	8-0	21 Nov 2021	CertDwg IQT3 ATEX-IECEX TERMINAL BUNG & MAINL LABELS

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Drawing No	Sheets	Rev	Approved date	Title
AD1480	1 to 2	2-0	21 Feb 2022	CertDwg IQT3 Batt shutdown elec safety diag (<600V)