



EU Type Examination Certificate CML 19ATEX1190X Issue 0

- 1 Equipment intended for use in Potentially Explosive Atmospheres Directive 2014/34/EU
- 2 Equipment **IQ Range of Electric Valve Actuators**
- 3 Manufacturer **Rotork Controls Limited** **Rotork Actuation (Shanghai) Co., Ltd.** **Rotork Controls, Inc.**
- 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

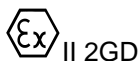
- 5 The equipment is specified in the description of this certificate and the documents to which it refers.
- 6 CML B.V., Chamber of Commerce No 6738671, Hoogoorddreef 15, Amsterdam, 1101 BA, The Netherlands, Notified Body Number 2776, in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, 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 Annex II to the Directive.

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 conditions of safe use (affecting correct installation or safe use). These are specified in Section 14.
- 8 This EU Type Examination certificate relates only to the design and construction of the specified equipment or component. Further requirements of Directive 2014/34/EU Article 13 apply to the manufacture of the equipment or component and are separately certified.
- 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 60079-0:2018 EN 60079-1:2014 EN 60079-7:2015/AMD1:2017
EN 60079-31:2014 EN 80079-36:2016

- 10 The equipment shall be marked with the following:



II 2GD

Ex db^① h IIB T4 Gb IP66/IP68

Ex h tb IIIC T120°C Db

(Ta = -^②°C to +^③°C) ^② down to -50°C, ^③ up to +70°C

^① 'eb' included if the terminal enclosure utilises increased safety.

The IQD** and IQH** models are not available as a low temperature version (below -20°C).



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11 Description

The IQ Range of Electric Valve Actuators comprise of an oil-filled worm gearcase with a rotating shaft and drive bush, an external handwheel and de-clutch mechanism. Attached to the gearcase is a motor enclosure, an electrical control enclosure and a terminal enclosure. All electrical enclosures 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 IQ Range of Electric Actuators comprise of a range of electric actuators based upon various gearcase sizes.

The motor enclosure is formed by a cover which connects to the gearcase by means of a spigoted flamepath joint and is secured by four M8 socket cap-head screws. The rotary output from the motor transfers to the gearcase by means of a shaft supported by rolling element bearings and a cylindrical brass bushing forming its flamepath. Electrical services to the motor are supplied from the electrical enclosure via a potted, motor loom transfer bush.

Thermal protection devices are installed within the motor windings. There is a facility to override these devices should the user find it necessary.

NOTE: The overriding of the temperature classification thermal protection devices is not covered by the scope of this certificate.

The electrical enclosure is formed by a cover which connects to the gearcase by means of a spigoted flamepath joint and is secured by four M8 socket cap-head screws. The electrical enclosure contains monitoring and control circuitry, which senses and controls the position of the output shaft; it also contains a back-up battery facility, contained within an internal battery pocket, accessed externally via the battery pocket plug. The permitted battery types are: Ultralife PP3 type U9VL/U9VL-J-P; SAFT to Rotork part no. 95-462; Tadiran/Sonnenschein to Rotork part no. 95-614, in each case the battery is protected by an in-line fuse (permitted fuse types are Quick Blow Bussman S500, 100 mA, Quick Blow Littlefuse 217, 100 mA).

At one end of the electrical enclosure a window is provided to allow the observation of an internal LCD device. The window is manufactured from toughened glass and potted into the electrical cover. An encoder shaft exits the electrical enclosure via a cylindrical brass bushing, flamepaths being between the bushing and the gearcase and between the shaft and the bushing. The encoder shaft has a shoulder that is held against the shroud by a circlip.

The terminal enclosure connects to the electrical enclosure via the gearcase, their volumes being separated by a flameproof terminal bung. The flameproof terminal bung comprises of 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. The terminal enclosure provides all electrical field wiring terminations at the terminal bung. The above flameproof terminal bung may be replaced with a non-flameproof terminal bung, in which case the electrical and terminal compartments are considered as one flameproof enclosure. This configuration cannot be applied to the variants that incorporate increased safety terminal facilities. Cable entry facilities are provided in the form of three or four threaded entries. The terminal enclosure is closed by means of a lid, which connects to the gearcase by means of a tapered spigot joint and is secured by four M8 socket cap-head screws. The terminal compartment is common to all sizes.

All external fasteners are stainless steel either, grade A4-80 or grade 12.9 socket cap head screws.



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Model Codes

IQ Gearcase/Motor Configurations 3 phase, up to 690 V rms

Size 1

Gearcase size 1

One motor enclosure, four pole motors, two stator lengths Designated IQ10, 12 & 18.

Size 2

Gearcase size 2

One motor enclosure, with either two or four pole motors, six stator lengths Designated IQ19, 20 & 25.

Size 3

Gearcase size 3

One motor enclosure, with either two or four pole motors, one stator length Designated IQ35.

Size 5

Gearcase size 5

Motor Options

Three Motor enclosures:

One motor enclosure with two or four pole motor, one stator length Designated IQ40

One motor enclosure with either two or four pole motors, five stator lengths Designated IQ70, IQ90, or IQ95.

One motor enclosure with a two pole motor, one stator length Designated IQ91

Design Options

Single phase motor option – Actuator sizes 1, 2 and 3

Actuator	Motor type
IQS12	4 pole 110 Vrms to 240 Vrms ± 10%
IQS20	4 pole 110 Vrms to 240 Vrms ± 10%
IQS35	2/4 pole 110 Vrms to 240 Vrms ± 10%

Different motor options (as can be seen above) as well as the necessary alternative control equipment within the electrical enclosure.

Modulating motor control option for three phase motors – Actuator sizes 1, 2 & 3

The reversing contactor has been replaced with a solid-state starter module, utilising thyristor drives and their associated control electronics, designated:

IQM10, IQM12, IQM20, IQM25, IQM35



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Deep Terminal Cover Option - All Actuator sizes

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

Short electrical cover option - Actuator sizes 1, 2 & 3

Used when the internal equipment specified for the IQ Electric Valve Actuator allows a reduced size of electrical enclosure.

DC Motor options for Actuator sizes 1 & 2

Ambient temperature range -20°C to +70°C (Leeson motor)

Actuator	Motor type
IQD10, IQD12 & IQD18	Short Motor (Leeson motor)
IQD20	Short Motor (Leeson motor)
IQD25	Long Motor (Leeson motor)

Different motor options (as can be seen above) as well as the necessary alternative control equipment within the electrical enclosure.

Intumescent® coating option to the exterior of the actuators for fire proofing purposes

The application of an outer, Intumescent® fire retardant coating can be applied to all sizes.

Lightning suppression module option - All Actuator sizes

Applies to terminal enclosures that are marked 'Ex db' only; it allows the inclusion of a lightning suppression module secured to the inner face of the existing terminal lid.

IQH variant option – Ambient temperature range -20°C to +70°C

The following high-speed actuator types have been introduced:
IQH20, IQH25, IQH35, IQH40

Plug and Socket Cover/ Plug and Socket connection/ Non-Flameproof Terminal Bung option - Ex db versions gas group IIB only, all sizes, ambient temperature range -20°C to +70°C

The flameproof terminal bung is removed and replaced with a non-flameproof plug and socket arrangement, to accommodate the plug and socket arrangement a Plug and Socket Cover has been introduced, manufactured in aluminium alloy to BS 1490 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 and socket connection facility, a non-flameproof terminal bung can be installed along with the Plug and Socket Cover, with or without the Network Disconnect PCB.



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Design Options

- i. Alternative absolute encoder shaft, manufactured in steel (Sizes 1, 2 and 3).
- ii. Alternative electrical cover manufactured in aluminium alloy to BS1490. Grade: LM25TF (heat treated).
- iii. Alternative design for the handwheel cover seal for all sizes.
- iv. Alternative Size 2 motor cover (Brook Motor).
- v. Alternative electrical cover manufactured in aluminium alloy to ASTM B85, Grade: A360 modified to accept an anti-vandal fixture.
- vi. Alternative Plug and Socket Cover/Plug and Socket connection/Non-Flameproof Terminal Bung option:
 - Ex db versions only; all sizes; ambient temperature range -20°C to +70°C;
 - Ex tb versions only; all sizes; ambient temperature range -50°C to +70°C.

Notes:

- Sira 12ATEX1123X is superseded by this certificate.
- The product covered by Issue 0 of this certificate remains identical to that previously covered by Sira 12ATEX1123X.
- Where Sira 12ATEX1123X 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.

12 Certificate history and evaluation reports

Issue	Date	Associated report	Notes
0	26 Jul 2019	R12481A/00	Issue of Prime Certificate

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



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13 Conditions of Manufacture

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

- i. 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.
- ii. Each enclosure shall be subjected to a routine overpressure test in accordance with EN 60079-1 clause 16 at the following values.

Equipment	
Motor Enclosure	Test Pressure (bar)
Size 5	
Gearcase/Motor Compartment IQ70/90/95 - Aluminium Alloy to BS 1490, Grade: LM25M (or equivalent)	13.88
IQ70/90*/95 Motor Cover - Aluminium Alloy to BS 1490, Grade: LM25M (or equivalent)	13.88
<i>cont.</i>	

Routine overpressure tests IQ Tamb below -20°C

Equipment	
All sizes with Deep Terminal Cover fitted	Test Pressure (bar)
Certified Terminal Bung - Crastin ST830FRUV/Robnor PX700/BK	16.56
Gearcase - Flameproof Terminal Bung fitted	
Size 1	
Gearcase/Electrical Compartment - Aluminium Alloy to BS1490, Grade: LM25M (or equivalent)	16.92
Terminal Bung - Crastin ST830FRUV/Robnor PX700/BK	16.92
Size 2	
Gearcase/Electrical Compartment - Aluminium Alloy to BS149, Grade: LM25M (or equivalent)	22.85
Terminal Bung - Crastin ST830FRUV/Robnor PX700/BK	22.85
Long Electrical Cover - Aluminium Alloy to ASTM B85, Grade: A360 (or equivalent)	22.85
Motor Loom Bush - Robnor PX700/BK	22.85
Short Electrical Cover aluminium alloy to ASTM B85, Grade: A360 (or equivalent)	22.85
Size 3	
Gearcase/Electrical Compartment - Aluminium Alloy to BS1490, Grade: LM25M (or equivalent)	17.27
Terminal Bung - Crastin ST830FRUV/Robnor PX700/BK	17.27
Size 5	
Terminal Bung - Crastin ST830FRUV/Robnor PX700/BK (tested from either terminal or flameproof side)	17.27



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Gearcase – Flameproof Terminal Bung not fitted	
Size 2	
Gearcase/Electrical-Terminal Comp Aluminium Alloy to BS1490, Grade: LM25M (or equivalent)	23.30
Long Electrical Cover - Aluminium Alloy to ASTM B85, Grade: A360 (or equivalent)	23.30
Long Electrical Cover - Aluminium Alloy to BS1490, Grade: LM25TF (Heat Treated) (or equivalent)	23.30
Motor Loom Bush - Robnor PX700/BK	23.30
Short Electrical Cover - Aluminium Alloy to ASTM B85, Grade: A360 (or equivalent)	23.30
Size 3	
Gearcase/Electrical-Terminal Comp - Aluminium Alloy to BS149, Grade: LM25M (or equivalent)	19.31
Motor loom bush - Robnor PX700/BK	19.31
Short Electrical Cover - Aluminium Alloy to ASTM B85, Grade: A360 (or equivalent)	19.31
Size 5	
Gearcase/Electrical-Terminal Compartment - Aluminium Alloy to BS1490, Grade: LM25M (or equivalent)	33.90
Terminal Cover - Aluminium Alloy to ASTM B85, Grade: A360 (or equivalent)	33.90
Long Electrical Cover - Aluminium Alloy to ASTM B85, Grade: A360 (or equivalent)	33.90
Long Electrical Cover - Aluminium Alloy to BS1490, Grade: LM25TF (Heat Treated) (or equivalent)	33.90
Motor Loom Bush - Robnor PX700/BK (Size 5)	33.90
Motor Enclosure	
Size 5	
Gearcase/Motor Compartment IQ40 - Aluminium Alloy to BS1490, Grade: LM25M (or equivalent)	18.27
Gearcase/Motor Compartment IQ70/90/95 - Aluminium Alloy to BS1490, Grade: LM25M (or equivalent)	18.27
Motor Loom Bush (IQ70/90/95 motor side, when terminal bung fitted) - Robnor PX700/BK (Size 5)	18.27
Gearcase/Motor Compartment IQ91 - Aluminium Alloy to BS1490, Grade: LM25M (or equivalent)	18.27
IQ40 Motor Cover - Aluminium Alloy to BS1490, Grade: LM25M (or equivalent)	18.27
IQ70/90/95 Motor Cover - Aluminium Alloy to BS1490, Grade: LM25M (or equivalent)	18.27



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When fitted with the Plug & Socket connection facility and associated Plug and Socket Cover. Routine overpressure tests Tamb -20°C

Equipment	
Without Network PCB fitted	Test Pressure (bar)
SIZE 2 Gearcase/Electrical-Terminal Compartment (with A4-80 grade fasteners) - Aluminium Alloy to BS1490, Grade: LM25M (or equivalent)	17.91
SIZE 3 Gearcase/Electrical-Terminal Compartment (with A4-80 grade fasteners) Aluminium Alloy to BS1490, Grade: LM25M (or equivalent)	17.91
With Network PCB fitted	
Motor Loom Bush (Sizes 1-3) - Robnor PX700/BK	20.54
Motor Loom Bush (Size 5) - Robnor PX700/BK	20.54
Short Electrical Cover - Aluminium Alloy to ASTM B85, Grade: A360 (or equivalent)	20.54
SIZE 1 Gearcase/Electrical-Terminal Compartment (with A4-80 grade fasteners) - Aluminium Alloy to BS1490, Grade: LM25M (or equivalent)	20.54
SIZE 2 Gearcase/Electrical-Terminal Compartment (with A4-80 grade fasteners) - Aluminium Alloy to BS1490, Grade: LM25M (or equivalent)	20.54
SIZE 2 Gearcase/Electrical-Terminal Compartment (with grade 12.9 fasteners) - Aluminium Alloy to BS1490, Grade: LM25M (or equivalent)	20.54
SIZE 3 Gearcase/Electrical-Terminal Compartment (with A4-80 grade fasteners) - Aluminium Alloy to BS1490, Grade: LM25M (or equivalent)	20.54
SIZE 5 Gearcase/Electrical-Terminal Compartment (with A4-80 grade fasteners) - Aluminium Alloy to BS1490, Grade: LM25M (or equivalent)	20.54

Routine overpressure tests when fitted with Plug & Socket Cover; Non-flameproof Terminal Bung. Tamb -20°C

Equipment	
With Network PCB fitted	Test Pressure (bar)
SIZE 2 Gearcase/Electrical-Terminal Compartment (with A4-80 grade fasteners) - Aluminium Alloy to BS1490, Grade: LM25M (or equivalent)	17.17
SIZE 3 Gearcase/Electrical-Terminal Compartment (with A4-80 grade fasteners) Aluminium Alloy to BS1490, Grade: LM25M (or equivalent)	17.17

- 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 in accordance with EN 60079-7 clause 6.1 at the following values.

Test Voltage Applied Between	Test Voltage
Three phase terminals/case	2,500 Vrms
Three phase terminals/low voltage terminations	2,500 Vrms
Low voltage terminals/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.



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14 Specific Conditions of Use (Special Conditions)

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

- i. The IQ Range of Electric Valve Actuators shall be installed such that the risk of impact to the window is low.
- ii. In accordance with EN 60079-1 clause 5.1, the critical dimensions of the flamepaths are as follows.

Flamepath	IQ Sizes 1, 2 & 3		IQ Size 5	
	Max. Gap (mm)	Min. L (mm)	Max. Gap (mm)	Min. L (mm)
Gearcase / Motor Cover	0.15	25.0	0.15	25.00
Gearcase / Wormshaft shroud	0.05	35.0	0.00	49.75
Wormshaft shroud / Wormshaft	0.24	26.0	0.25	49.75
Gearcase / Terminal Bung	0.20	27.0	0.20	27.00
Gearcase / Terminal Cover	0.15	27.0	0.15	27.00
Gearcase/Plug and Socket Cover	0.15	27.00	0.15	27.00
Gearcase / Electrical Cover	0.15	26.0	0.15	26.00
Encoder Shaft Bush / Encoder Shaft	0.08	27.0	0.08	27.00
Gearcase / Encoder Shaft Bush	0.07	25.0	0.07	25.00
Gearcase / Motor Loom Bush	0.15	29.0	0.15	33.25
Gearcase / Deep Terminal Cover	0.15	27.0	0.15	27.0
Gearcase / Short Electrical Cover	0.15	26.0	-	-

- iii. **WARNING** – There is a potential electrical charging hazard associated with the non-metallic external parts and outer case depending on the model and coating applied; see user instructions.

Certificate Annex

Certificate Number CML 19ATEX1190X
Equipment IQ Range of Electric Valve Actuators
Manufacturer Rotork Controls Limited
Rotork Actuation (Shanghai) Co., Ltd.
Rotork Controls, Inc.



The following documents describe the equipment or component defined in this certificate:

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Drawing No	Sheets	Rev	Approved date	Title
95-462	1 to 2	8	26 Jul 2019	Low temperature battery
95-614	1 to 2	2	26 Jul 2019	High temperature battery
44406	1 of 1	1	26 Jul 2019	Label fuse types – CENELEC Battery loom
AD1346	1 to 8	7	26 Jul 2019	IQ19,20 & 25 Actuator ATEX & IECEx Approval Group IIB & IIC
AD1347	1 to 7	4	26 Jul 2019	IQ40,70,90,95 & 91 Actuator ATEX & IECEx Approval GP IIB & IIC
AD1350	1 to 7	6	26 Jul 2019	IQ10, 12 & 18 Actuator ATEX & IECEx Approval GRP IIB & IIC
AD1351	1 to 7	5	26 Jul 2019	IQ35 Actuator ATEX & IECEx Approval Group IIB & IIC
AD1399	1 to 2	3	26 Jul 2019	Terminal Bung & Main labels – IQ ATEX & IECEx IIB & IIC
AD1411	1 to 3	2	26 Jul 2019	Deep Cover Housing, ATEX & IECEx Group IIB & IIC
AD1412	1 to 2	1	26 Jul 2019	IQ10-95 Intumescent Coated Actuators (ATEX, IECEx, FM & CSA)
AD1423	1 to 2	1	26 Jul 2019	Lightning Suppression Module, ATEX& IECEx Approvals
PLAD1346	1 to 8	09	26 Jul 2019	Parts List for IQ19, 20 & 25 Actuators ATEX & IECEx Certification Group IIB & IIC
PLAD1347	1 to 8	06	26 Jul 2019	Parts List for IQ40, 70, 90, 95, & 91 Actuators ATEX & IECEx Certification Group IIB & IIC
PLAD1350	1 to 8	08	26 Jul 2019	Parts List for IQ10, 12 & 18 Actuators ATEX & IECEx Certification Group IIB & IIC
PLAD1351	1 to 8	06	26 Jul 2019	Parts List for IQ35 Actuators ATEX & IECEx Certification Group IIB & IIC
RS448	1 to 2	1	26 Jul 2019	Window Bonding Procedure
RS308	1 to 2	9	26 Jul 2019	Potting Procedure for Cenelec and ATEX Term, Blocks / MTR. Looms / RHS Loom