

# rotork

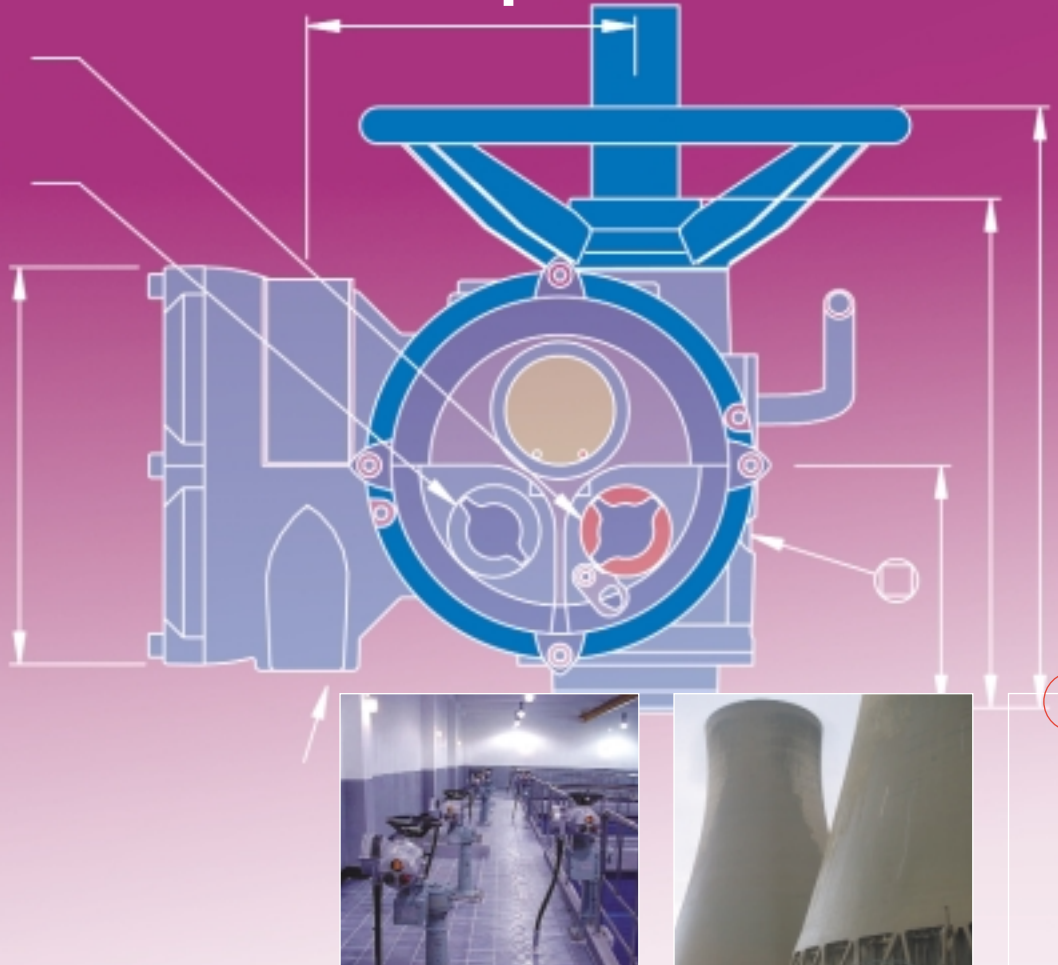
Established leaders in Actuation Technology



## IQM & IQML Range

**watertight and explosionproof**  
3-phase electric actuator for modulating  
duty on valves and dampers

# defining your exact requirements



## whatever you need wherever you are

In the 45 years since it was founded Rotork has become the name for excellence in the field of valve, sluice gate and damper actuation products for every industry - worldwide.

Rotork has the experience, know-how and product range to deliver virtually any actuation solution - from compact, manually operated gearboxes, to large, highly specified actuators for use in extreme temperature and hazardous environments.

## the knowledge to help

Rotork has been at the forefront of actuation technology since the company was formed in 1957 and enjoys an unrivalled reputation for its commitment to the development of leading-edge techniques and processes. Rotork products are designed and manufactured to the highest possible standards of engineering - a principle which drives all areas of our business. So whether you require electric, fluid power, specialist gear or valve adaption products or services Rotork has the experience to help you.

## Established leaders in Actuation Technology

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### reliability in service

Experience has proved that uncompromising attention to sealing against the affects of the environment makes the greatest contribution to MOV reliability. The IQM and IQML take this a stage further by introducing the concept of the 'non-intrusive' actuator.

This is achieved by making it unnecessary to remove electrical covers during motorized valve commissioning and by providing 'non-intrusive' local controls that do not penetrate the electrical enclosure.

### rotork IQM and IQML range actuators

Rotork has taken the motor and gearing technology developed in the 'A' and 'M' ranges during the last 40 years and combined it with the latest electronic techniques used in the 'IQ' range to produce the 'IQM' range of modulating actuators.



### **Reliability in Feedback**

Reliability is further enhanced by using 'Hall effect' measurement of valve stroke and electronic sensing of torque. When analogue position feedback is required, a contactless position transmitter is provided as the standard option.

### **Fast Commissioning**

The infra-red 'point and shoot' setting tool provides setting of torque levels, position limits and all other control and indication functions at the 'press of a button' and without the need to remove the electrical covers.

### **Convenience and Safety**

Because the infra-red procedures are non-intrusive and the setting tool is certified watertight and intrinsically safe, all on-site settings may be made in hazardous or wet conditions.

### **Simple Trouble Shooting**

The illuminated local position indicator display also makes 'Help' screens available to display valve, actuator and control system status.

### **Insight**

This visually interactive software is a browser based application that enables Laptop PC's with an IrDA™ link to be directly "connected" to an IQ actuator to allow setup, adjustment and analysis of configuration or data logger files.

### **Specification**

The type IQM actuator specification is generally the same as that of the type IQ, as described in Publication E110E and E120E, but with a solid state reversing starter in place of the electro-mechanical contactors, suitably rated 4-pole winding low inertia motor and with the 'hammerblow' backlash omitted from the output gear train.

All other standard and optional IQ actuator features are available with IQM modulating actuators subject to the following:

Supply Voltage - maximum 480 volts, 50/60Hz. (Apply for higher voltages up to 575 volts).

Minimum voltage for the size IQM30 is 380 volts, 50/60Hz.

### **Performance**

The actuators are suitable for up to 1200 starts per hour with a duty in accordance with IEC 34-1 to S4 50%.

Torques and thrusts for multi-turn and linear applications are shown on pages 6 and 7. A sizing selection program is also available on computer disk.

The performance given on page 6 for IQM and IQML actuators is for units with the dynamic braking feature inhibited. Where dynamic braking is used, the modulating torques are available at an ambient temperature of up to 40°C and reduce to 50% of that listed at higher temperatures with a maximum of 55°C (131°F). Dynamic braking does not affect the available seating torques.

### **Solid State Starter**

The actuator design incorporates a solid state starter to achieve an increased design life. 5 pairs of 1600 volt thyristors switch all three phases of the incoming power supply. Thyristors are considered to be more suitable than triacs for reversing applications and have a higher resistance to transients in the power supply. The design also includes snubbing and transient protection circuits.

### **Dynamic Braking**

The facility for dynamic braking is included as standard with the ability to select this function by fitting an electrical link at the actuator terminal block.

### **Automatic Self Test and Diagnosis**

ASTD is performed each time that the actuator is powered up and automatically tests its memory devices and the integrity of power supplies.

### **Power Fuse**

It is essential that the power supply for each actuator is protected by suitable rated high speed fuses mounted at the power distribution panel. Recommended types and values for these are shown in Publication E420E.

### **Positional Accuracy**

With analogue inputs via the Folomatic controller, overall accuracy (actuator mechanical output position/demanded value): 0.5% of maximum signal with dynamic braking and minimum of 10 turns for full valve stroke, assuming a deadband setting of <0.2%.

Repeatability with pulse control is 0.1 output turns.

### **Pulse Control**

When using pulse control the minimum pulse length should be 18 milliseconds, with a maximum of 1200 pulses per hour. The minimum time required between pulses is 500 milliseconds.

## The IQM Range

### **Ambient Temperatures and Enclosures Options**

Actuators are available with the following main enclosure types for which the ambient working temperature ranges are as shown unless dynamic braking is enabled, when the maximum operating temperature will be 55°C unless a lower value is already indicated.

#### **WT:**

Standard watertight, IEC 60529 (1989-11), IP68 7 metres/ 72 hours, NEMA 4, 4X and 6.  
Temperature -30°C to +70°C (-22°F to +158°F).

#### **CENELEC EExd IIB:**

CENELEC Norm EN50014, EN50018 and EN50018 for EExd IIBT4.

Temperature -20°C to +70°C (-4°F to +158°F).

\* Option -30°C to +70°C (-22°F to +158°F).

\* Option -40°C to +70°C (-40°F to +158°F).

#### **CENELEC EExd IIC:**

CENELEC Norm EN50014, EN50018 and EN50018 for EExd IICT4.

Temperature -20°C to +70°C (-4°F to +158°F).

#### **CENELEC EExde IIB:**

CENELEC Norm EN50014 and EN50019 for EExde IIBT4.

Temperature -20°C to +70°C (-4°F to +158°F).

\* Option -30°C to +70°C (-22°F to +158°F).

\* Option -40°C to +70°C (-40°F to +158°F).

#### **CENELEC EExde IIC:**

CENELEC Norm EN50014 and EN50019 for EExde IICT4.

Temperature -20°C to +70°C (-4°F to +158°F).

#### **FM:**

Factory Mutual - Explosionproof Class 1, Div 1, Groups C, D, E, F, G hazardous areas to NEC Article 500.

Temperature -30°C to +60°C (-22°F to +140°F).

\* Option -40°C to +60°C (-40°F to +140°F).

\* Alternative for Group B hazardous area. Temperatures as for Group C & D.

#### **CSA WT:**

Built in accordance with Canadian Standard Association - Watertight wiring and components complying with CSA enclosure 4 and 4X.

Temperature -30°C to +70°C (-22°F to +158°F).

\* Option -40°C to +70°C (-40°F to 158°F).

#### **CSA EP:**

Built in accordance with Canadian Standard Association - Explosionproof Class 1, Division 1, Groups C & D hazardous areas.

Temperature -30°C to +40°C (-22°F to +104°F).

\* Option -40°C to +40°C (-40°F to +104°F).

### **Dimensions**

The dimensions are identical to the equivalent size IQ actuators.

Dimensions and mounting details of the linear output drive assemblies are shown in Publication E420E.

For applications requiring separately mounted starters, please see details of IQML type Syncroset actuators below.

## The IQML Range

### **Modulating Actuators for use with Separate Starters**

Type IQML multi-turn modulating actuators are available for use with separately mounted reversing starters. These are based on the Syncroset specification A Range design of actuators as generally described in Publication E210E.

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### **The Optional Mechanical Equipment**

The following additional mechanical assemblies can be supplied to assist in the operation of linear or part turn valves:

#### **Linear Output Drive Assemblies**

These consist of a lead screw arrangement attached to the base of the actuator in order to provide a linear output. An optional mounting yoke is available if required. Please apply to Rotork for details.

#### **Part Turn Gearboxes**

Actuators can be supplied fitted to a complementary range of second stage worm and wheel gearboxes.

These type MOW gearboxes have been specially rated for modulating duty with torques of up to 76965Nm (56800 lbf.ft). They are available, as standard, with blank output drive centres for machining to suit direct coupling to valve or damper shafts.

#### **Lever Arm Output**

Actuators can be supplied fitted with lever arm output gearboxes to suit remote linkage operation of valves or dampers. Please apply to Rotork for details.

## IQM and IQML Range Performance

### PERFORMANCE DATA FOR TYPE 'IQM' MODULATING MULTI-TURN ACTUATORS

Actuator size	IQM10				IQM12				IQM20				IQM25				IQM35				
Thrust rating	10000 lbf 44kN				10000 lbf 44kN				22480 lbf 100kN				22480 lbf 100kN				33750 lbf 150kN				
Base sizes to ISO 5210	F10				F10				F14				F14				F16				
Max. rising stem dia. ins/mm	1.25 / 32				1.25 / 32				2 / 51				2 / 51				2 1/8 / 54				
Actuator rpm	Modulating torque		Max. seat. torque		Modulating torque		Max. seat. torque		Modulating torque		Max. seat. torque		Modulating torque		Max. seat. torque		Modulating torque		Max. seat. torque		
	50Hz	60Hz	lbs ft	Nm	lbs ft	Nm	lbs ft	Nm	lbs ft	Nm	lbs ft	Nm	lbs ft	Nm	lbs ft	Nm	lbs ft	Nm	lbs ft	Nm	
18	21	12.5	17.0	25	34	25.0	34.0	45	61	60.0	81.0	90	122	112.5	152.0	150	204	200.0	271.0	400	544
24	29	12.5	17.0	25	34	25.0	34.0	40	54	60.0	81.0	80	109	112.5	152.0	150	204	200.0	271.0	400	544
36	43	11.5	15.6	23	30	22.0	30.0	40	54	50.0	68.0	60	81	95.0	129.0	120	163	187.0	253.0	300	408
48	57	10.0	13.6	20	27	20.0	27.0	35	48	40.0	54.0	50	68	75.0	102.0	100	136	150.0	203.0	230	313
72	86	-	-	-	-	-	-	-	-	35.0	47.0	40	54	75.0	102.0	100	136	150.0	203.0	160	218

### PERFORMANCE DATA FOR TYPE 'IQML' MODULATING LINEAR ACTUATORS

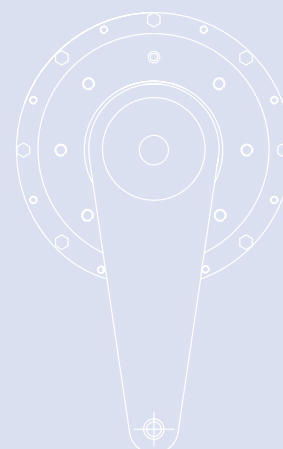
Actuator size	IQML10						IQML12						
Base sizes to ISO 5210	F10						F10						
Leadscrew dia./lead mm	25 / 3						25 / 3						
Max. rising stem dia. ins/mm	4 1/2 / 115						4 1/2 / 115						
Actuator rpm	Linear speed mm/sec		Modulating thrust		Rated seating thrust		Linear speed mm/sec		Modulating thrust		Rated seating thrust		
	50Hz	60Hz	lbf	kN	lbf	kN	50Hz	60Hz	lbf	kN	lbf	kN	
18	21	0.9	1.1	1785	7.94	3570	15.88	0.9	1.1	3571	15.9	6428	28.59
24	29	1.2	1.4	1785	7.94	3570	15.88	1.2	1.4	3571	15.9	5714	25.42
36	43	1.8	2.2	1643	7.3	3285	14.61	1.8	2.2	3214	14.3	5714	25.42
48	57	2.4	2.9	1429	6.35	2858	12.71	2.4	2.9	2860	12.7	5005	22.26

Actuator size	IQML20						IQML20						
Base sizes to ISO 5210	F14						F14						
Leadscrew dia./lead mm	33 / 7						38 / 15						
Max. rising stem dia. ins/mm	4 1/2 / 115						4 1/2 / 115						
Actuator rpm	Linear speed mm/sec		Modulating thrust		Rated seating thrust		Linear speed mm/sec		Modulating thrust		Rated seating thrust		
	50Hz	60Hz	lbf	kN	lbf	kN	50Hz	60Hz	lbf	kN	lbf	kN	
18	21	2.1	2.5	5455	24.26	8183	36.4	4.5	5.4	3750	16.7	5625	25.1
24	29	2.8	3.4	5455	24.26	8183	36.4	6.0	7.2	3750	16.7	5625	25.1
36	43	4.2	5.0	4545	20.22	5454	24.26	9.0	10.8	3125	13.9	3750	16.7
48	57	5.6	6.8	3636	16.17	4545	20.2	12.0	14.4	2500	11.1	3125	13.9
72	86	8.4	10.1	3182	14.15	3636	16.1	18.0	21.6	2000	8.9	2500	11.1

Actuator size	IQML25						IQML25						
Base sizes to ISO 5210	F14						F14						
Leadscrew dia./lead mm	33 / 7						38 / 15						
Max. rising stem dia. ins/mm	4½ / 115						4½ / 115						
Actuator rpm	Linear speed mm/sec		Modulating thrust		Rated seating thrust		Linear speed mm/sec		Modulating thrust		Rated seating thrust		
	50Hz	60Hz	lbf	kN	lbf	kN	50Hz	60Hz	lbf	kN	lbf	kN	
18	21	2.1	2.5	10227	45.49	13636	60.7	4.5	5.4	7031	31.3	9375	41.7
24	29	2.8	3.4	10227	45.49	13636	60.7	6.0	7.3	7031	31.3	9375	41.7
36	43	4.2	5.0	8636	38.41	10908	48.5	9.0	10.8	5937	26.4	7500	33.3
48	57	5.6	6.8	6818	30.33	9090	40.4	12.0	14.4	4687	20.85	6249	27.8
72	86	8.4	10.1	6818	30.33	9090	40.4	18.0	21.6	4687	20.85	6249	27.8

**Performance data for type IQM modulating actuators/  
MOW part-turn gearbox combinations**

Please apply to Rotork. A selection programme is available on CD Rom.



# IQM & IQML Range

**watertight and explosionproof**

3-phase electric actuator for modulating  
duty on valves and dampers

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**rotork**

*UK head office*  
Rotork Controls Limited  
telephone Bath 01225 733200  
telefax 01225 333467  
email [mail@rotork.co.uk](mailto:mail@rotork.co.uk)

*USA head office*  
Rotork Controls Inc  
telephone Rochester (585) 328 1550  
telefax (585) 328 5848  
email [info@rotork.com](mailto:info@rotork.com)



Rotork Controls Ltd, Bath, UK



Rotork Controls Inc, Rochester, USA

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**[www.rotork.com](http://www.rotork.com)**

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