



Keeping the World Flowing
for Future Generations

IQ3H Pro range

High speed, self-locking multi-turn
electric valve actuators



Based on the multi-turn IQ3 Pro actuator the IQ3H Pro provides a range of high output speeds while being generally irreversible and therefore provides a self-locking ability by the actuator for the valve. Developed for diverter valves in meter prover applications, they provide fast operation with positive seating without backdriving.

It should be noted that a self-locking ability cannot be guaranteed for worm and wheel drives under all conditions including high loads and vibration, either under static and dynamic conditions. When handwheel operation is selected the gear train is disconnected and therefore any locking ability will be lost.



A 1:3 step up epicyclic gearbox enables high speed operation

HART
COMMUNICATION PROTOCOL

PROFI
BUS

PROFI
NET

PakscanTM

RIRO

EtherNet/IP



Modbus[®]

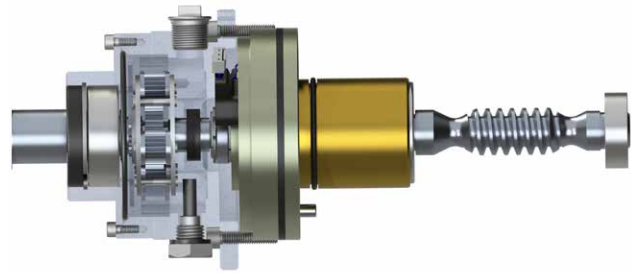
DeviceNet
COMFORMANCE TESTED

Modbus
TCP/IP

- Graphical interface, remote indication and data logger accessible without power
- Explosionproof to international standards
- Oil bath lubrication provides extended life and the ability to mount in any orientation
- Increased protection by using independent torque and position sensing
- Double-sealed to IP66/68 7 m for 72 hours
- Safe, motor-independent, handwheel operation
- Detailed trend analysis and diagnostic data available for asset management
- Control and commissioning via Rotork App, Bluetooth[®] Setting Tool Pro handset (BTST) or local control knobs
- Easy installation and maintenance using detachable thrust bases
- Continuous position sensing at all times, even without power
- Compatible with a wide variety of fieldbus, hardwired and analogue site systems

The IQ3H Pro epicyclic gearbox

Fast operation is achieved by using a 1:3 step up epicyclic gearbox between the 2-pole motor and worm gearbox. This is a mature design and was first implemented in the IQ design of the 1990s.



IQ3H Pro performance data

		Actuator output speeds					
RPM	50 Hz	108		144		216	
	60 Hz	130		173		259	
Final gear ratio		80:1		60:1		40:1	
		Torque*					
Model		Nm	lbf.ft	Nm	lbf.ft	Nm	lbf.ft
IQH20		75	55	75	55	68	50
IQH25		108	80	98	72	83	61
IQH35		202	149	182	134	153	113
IQH40		397	293	347	256	240	177

* Torque rating is maximum torque setting in both directions.
Stall torque will be 1.4 to 2 times this value depending on speed and voltage.

Simple, secure commissioning and configuration

Ensuring correct configuration and keeping it secure is the bedrock of reliable operation.

All IQ3 Pro actuators can be set up non-intrusively using the Rotork app on a smartphone, Rotork Bluetooth® Setting Tool Pro (BTST) handset or via manual setup using the actuator control knobs.

Torque levels, position limits, control and indication functions can all be accessed using any of these setting options. Bluetooth wireless connectivity with a smartphone or BTST allows easy use without direct line-of-sight, however security has to match.

For the Rotork app, a secure connection is established between the app and the actuator utilising 'PIN pairing' to gain access. For the BTST, a secure connection is achieved by the initial 'pairing' of tool and actuator being carried out by a single infra-red transaction after which a Bluetooth wireless connection automatically takes over. Connection times out after two minutes of inactivity. Manual setup using the actuator control knobs allows access to on-screen menus and settings. Password entry is required to enable manual setup and it is automatically disabled after five minutes of inactivity. All configuration changes are password protected and the actuator is immune to connection by non-Rotork devices or applications.

IQ3 Pro actuators benefit from a configurable, information-rich display, with a highly intuitive menu system for commissioning, updates and diagnostics.

IQ3 Pro actuators can be interrogated and set up, even when mains power is not available; the actuator can be configured and interrogated by using power from its display back-up battery.

- Rapid and secure commissioning and configuration even without power via advanced, multilingual HMI display
- Non-intrusive setting in any environmental conditions - no cover removal required, using the Rotork app on a smartphone¹, Rotork Bluetooth® Setting Tool Pro (BTST) handset or via manual setup using the actuator control knobs
- Rotork app configuration wizard enables easy and convenient commissioning of valves
- Easy installation and valve maintenance using detachable thrust bases
- Duplicate operation, configuration and commissioning up to 100m from actuator with Remote Hand Station Pro (RHS Pro)

1 - Smartphones must be certified intrinsically safe for use in hazardous areas.

IQ3 Pro technological advances

Position

Reliable valve position sensing is critical. Using the latest technology and after years of testing, the patented Rotork IQ absolute encoder is contactless, has only four active parts, can measure up to 8,000 output turns and has redundancy and self-checking. Unlike existing absolute encoder designs, these technological breakthroughs increase position sensing reliability while providing zero-power position measurement.

Closed-loop control for setpoint positioning

Multi-turn non-modulating IQ3 Pro actuators use a setpoint positioning method known as "bang-bang". This feature is explained in detail in PUB002-040.

Integrated Ethernet

Rotork's Ethernet option supports Modbus TCP, EtherNet/IP and PROFINET industrial communication protocols in IQ3 Pro range actuators, providing a high-bandwidth connection that enables advanced asset management. The option card is situated in the double-sealed body of the actuator, and only the wiring connection is located in the terminal compartment. This makes it possible to have explosionproof actuators with Ethernet connectivity. The IQ3 Pro internal data log can be accessed remotely via the webserver, allowing for remote data collection and uploading to Rotork's intelligent Asset Management (iAM) cloud-based system.

Display

The advanced display allows large segment character position displays down to -50 °C while the matrix display provides detailed setting, status and diagnostic multilingual screens. The large display is backlit to provide excellent contrast even in the brightest ambient light conditions and is protected by a toughened glass window. An optional protective clip-in cover is available for use in high UV levels or abrasive environments.

Torque

IQ3 Pro actuators use a torque sensor developed and used successfully by Rotork for over 20 years. Torque generated when moving the valve produces a proportional thrust reaction on the motor worm-shaft. This thrust creates pressure in the piezo torque transducer which converts it to a voltage signal directly proportional to the output torque being produced by the actuator. See PUB002-197 for details.

Control

Control elements such as main control and network interface cards, are connected using an internal bus system based on CAN, reducing wiring and connections for increased reliability.

Backwards compatibility

We provide backwards compatibility across a wide range of our legacy products. We can provide appropriate upgrade services, with no intrusive changes to plant controls or electrical options. This ensures access to innovative technology, seamlessly future-proofing your actuators while considering the importance of managing the life cycle of your critical flow control assets.

Asset management

With an advanced display, position, torque, status and configuration data is clear and immediately accessible. In addition, the valve, actuator and process data is available in real-time on screen or in the control room. Valve stroke torque/thrust graphs, duty trend logs, vibration levels and valve & actuator manufacturing data can be extracted and stored as the basis for planned maintenance and operational activities, process performance characteristics and comparison.

Entire operations can be performed in minutes and data logs can be downloaded to the Rotork app or Rotork Bluetooth® Setting Tool *Pro*, then transferred to a PC and analysed using Rotork Insight 2 software or uploaded to Rotork's intelligent Asset Management (iAM) system.

- Real-time valve and actuator performance information are viewable on-screen
- Safe and secure data download via non-intrusive and intrinsically safe setting tool
- Field upgradeable and configurable control and indication options
- Compatible with *Pakscan* digital control and monitoring system plus all leading fieldbus networks
- Detailed trend analysis, diagnostics and data logger available, on-screen or downloadable via Bluetooth

Optimised for preventative maintenance

All IQ3 Pro actuators incorporate a sophisticated data logger, which can provide comprehensive data capture and analysis for planned maintenance and troubleshooting issues with valves and processes. They capture:

- Valve torque profiles
- Operational starts profiles
- Operational, vibration and temperature trend logs
- Event log

Asset management data regarding the actuator and the valve is stored within the actuator and available for download. Specific asset management information includes:

- Running time
- Average torque
- Starts
- Life statistics

IQ3 Pro range actuators include configurable service/maintenance alarms. The alarm parameters are:

- Open torque levels
- Close torque levels
- Starts/hr
- Total starts
- Total turns
- Service intervals

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IQ3H Pro specification

The IQ3H Pro matches the same specification as IQ3 Pro (refer to PUB002-197) unless stated differently in this publication.

General

Enclosure and temperature

IP66/68 7 m for 72 hours
Type 4, 4X & 6
-20 to +70 °C (-4 to +158 °F)

ATEX & IECEx

Ex db h IIB T4 Gb IP66/IP68
Ex db h IIC T4 Gb IP66/IP68
Ex h tb IIIC T120°C Db
-20 to +70 °C (-4 to +158 °F)

FM & cCSAus

XP Class I, Div 1, Group B, C, D
DIP Class II, Div 1, Group E, F, G
-20 to +70 °C (-4 to +158 °F)

Power supply

3-phase supplies only

Mounting interface

ISO 5210, MSS SP-102

Lubrication

Oil bath with sealed lubricated
epicyclic gearing

Handwheel

Top direct drive handwheel
Side geared handwheel

Conduit entries

3 x M25 x 1.5p, 1 x M40 x 1.5p
Via adaptors: 3 x 1" NPT, 1 x 1½" NPT
Via adaptors: 3 x PG16, 1 x PG29

Orientation

Any

Finish

Polyester powder-coat (P1)
Polyester powder-coat + offshore
triple coat – ferrous parts (P2)
Offshore triple coat – all parts (PX)

Indication

Remote indication

4 x volt free relay contacts

Remote indication options

8 x extra volt free relay contacts
4-20 mA position / torque output
Pakscan™, Profibus®, Modbus®,
Foundation Fieldbus®, DeviceNet®, HART®

Operation

Type

Isolating

Duty cycle

Class A & B (ISO 22153)
S2-15 min (IEC60034)

Control

Wiring diagram

Basic – 100B0000

Local control

Non-intrusive design
LOCAL / STOP / REMOTE selector
OPEN / CLOSE selector
Restricted access with padlock

Remote control

Hardwired digital inputs
OPEN, CLOSE, STOP, ESD, OPEN
INTERLOCK, CLOSE INTERLOCK

Remote control options

4-20 mA position control - Folomatic

Network control options

Pakscan™, PROFIBUS®, Modbus®,
Foundation Fieldbus®, DeviceNet®, HART®
EtherNet/IP, PROFINET®, Modbus/TCP

System

Configuration

Non-intrusive infrared / Bluetooth®

Local display

LCD and dot matrix dual-layer display
Multilingual setting support
Wide viewing angle
Backlit for full visibility in daylight
Toughened glass protection

Limit switching

2.5 to 8,000 turns, resolution 7.5°
Contactless absolute encoder
Built-in redundancy

Torque switching

Independently configurable switches
Piezo electric torque sensor device
Switch bypass function available

Data logger

Standard detailed data logger
Torque profiles, trend graphs, event log,
fault log, service log

Support tools

Analysis software

Insight 2 PC software
Configuration and data log review

Contact us now

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