

rotork®

Controls

Introducing the new generation of intelligent valve control.

For over 50 years Rotork has used innovation in designing reliable, flexible and robust valve actuators and control systems. Continuing our ethos of evolving design, the 3rd generation IQ multi-turn actuator is now available. Reliability standards have been set even higher, it is simpler to commission and use and is unrivalled in its ability to provide valve and process control operational data.

Key benefits of the 3rd generation IQ

- Valve position monitoring during power loss through simple and robust Rotork absolute encoder
- Large information-rich backlit display
- Advanced dual stacked display presents valve and process data for asset management and data analysis
- In the event of power failure actuator display and remote contacts are maintained
- Toughened glass screen plus optional environmental shield
- Outstanding environmental protection
- Non-intrusive setting – no cover removal required using secure *Bluetooth*® connection
- Enhanced reliability through solid state controls; reduced internal wiring; simplified torque sensor
- Detachable thrust bases across the entire range
- Advanced realtime status reporting
- Configurable datalogger functionality, including service alarms
- Plug & socket option available



Redefining Flow Control



IQ Range

3rd Generation Intelligent Electric Actuator



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Outstanding reliability

Valve operation must be reliable. Rotork IQ actuators are designed to meet the toughest applications and engineered for a lifetime of uninterrupted service. Built on the Rotork drive train, proven for over 40 years, 3rd generation IQ actuators feature numerous enhancements including:

- Advanced absolute position measurement
- Simplified control components
- Increased thrust base integrity; separable across all sizes
- High immunity from spurious signals
- Configurable motor drive "enable" input which stops the actuator operating unless a signal is applied
- Casing material selection and coatings have been designed for improved corrosion protection

Reliability of equipment depends on the protection provided by its enclosure. IQ retains the Rotork developed double-sealed, non-breathing, non-intrusive enclosure proven to maximise operational reliability. Regardless of whether the actuator is in a hazardous location or not, the fully sealed enclosure provides the highest reliability.

Asset management

With an advanced dual stacked display, position, torque, status and configuration data is clear and immediate. In addition the valve, actuator and process data is available 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 by the user and stored as the basis for planned maintenance and operational activities, process performance characteristics and comparison.

Commissioning and configuring 3rd generation IQ actuators is faster and simpler than ever. In addition to a new and intuitive user interface, entire operations can now be carried out in moments and datalogger data downloaded using the supplied Rotork *Bluetooth*® Setting Tool 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, this technological breakthrough increases position sensing reliability while providing zero-power position measurement.

Display

The dual stacked display allows large segment character position displays down to -50 °C while the matrix display provides detailed setting, status and diagnostic multilingual screens. Overall the display is 30% bigger, is backlit to

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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 where high UV levels or abrasive environments are present.

Torque

Now enhanced to provide increased integrity and performance, torque sensing is simple, accurate with high resolution and extremely reliable over the life of the actuator. Unlike other systems employed, the IQ system of torque measurement has the advantage of being independent of voltage and temperature variations.

Control

Control elements such as main control and network interface cards, like those used with fieldbus systems, are connected using an internal bus system based on CAN, reducing wiring and connections and increasing reliability.

Indication power

With the absolute encoder, a battery is not required for position sensing and tracking. As all configuration and datalogger data is stored in non-volatile EEPROM memory, all settings are safe when no power is available. However, to maintain the display and ensure remote indication is kept updated, allow data logging and power off commissioning, an indication battery is included as standard. Reduced power consumption means the battery has an exceptionally long life and low-cost replacements are available from suppliers globally.

Optimised for preventative maintenance

All IQ actuators incorporate a sophisticated datalogger, 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

In addition, 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

As part of the ongoing commitment to improving asset management and providing reliable data for optimised preventative maintenance, the 3rd generation IQ now includes configurable service / maintenance alarms.

The alarm parameters can be set in the assets section of the setup menus and include:

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

With 3rd generation IQ actuators this data can be viewed in realtime using the large dual stacked display. In addition, the data can be downloaded wirelessly with the Rotork *Bluetooth*® Setting Tool Pro or to a PC and analysed using the Rotork *Insight2* software.

Safe manual operation

In case of an emergency, power outage or failure of the control network, IQ actuators can be operated by hand. A manual clutch and handwheel allow an operator to disengage the motor and operate the valve independently, without risk of damage or injury.

Where the location requires it, the clutch can be padlocked into position to prevent accidental or unauthorised manual operation.

Manual movements of the valve are recorded and logged by the actuator. Position sensing in Rotork IQ actuators is highly reliable (power on or off) thanks to the unique robust and simple design of the absolute encoder.

Network system connectivity

With the addition of an appropriate option card, the IQ actuator can be incorporated into a number of different fieldbus control systems. The IQ actuator can be utilised within the Rotork Pakscan control system, either wired or wirelessly, and the major open Fieldbus protocols including Profibus®, Foundation Fieldbus®, Modbus and HART®.



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1 Hand operation

Direct drive and geared handwheel sized for effective manual operation of the valve. Handwheel drive is independent of the motor drive and is selected with a lockable hand/auto lever for safe operation even when the motor is running.

Motor operation always has preference unless the hand/auto lever is purposely locked into 'hand drive'. Lost motion 'hammerblow' action is provided with both direct and geared handwheels.

2 Environmental sealing

The Rotork double-sealed terminal compartment results in the actuator enclosure being completely sealed, protecting the actuator from the environment for life. Using the supplied Rotork *Bluetooth®* Setting Tool Pro, no covers need to be removed for commissioning, adjusting, analysis or accessing the actuator data log.

3 Display

The advanced dual stacked display is significantly larger, clearer and has a wide viewing angle making it easily legible from a distance. In normal mode the LCD display indicates valve position and can operate from -50 °C up to 70 °C.

The matrix layer provides high resolution screens for setting menus, status, alarm and graphical data log screens such as valve torque profiles. Position indication lights (red, yellow and green) are duplicated each side of the display. All display elements are protected by a 13 mm toughened glass window with an optional shield for protection against abrasive media such as sand and UV light.

4 Local controls

Local open/close and lockable Local/Stop/Remote selectors are coupled magnetically to the designated switches and therefore do not penetrate the control cover. This further enhances the non-intrusive protection of the IQ.

5 Position control

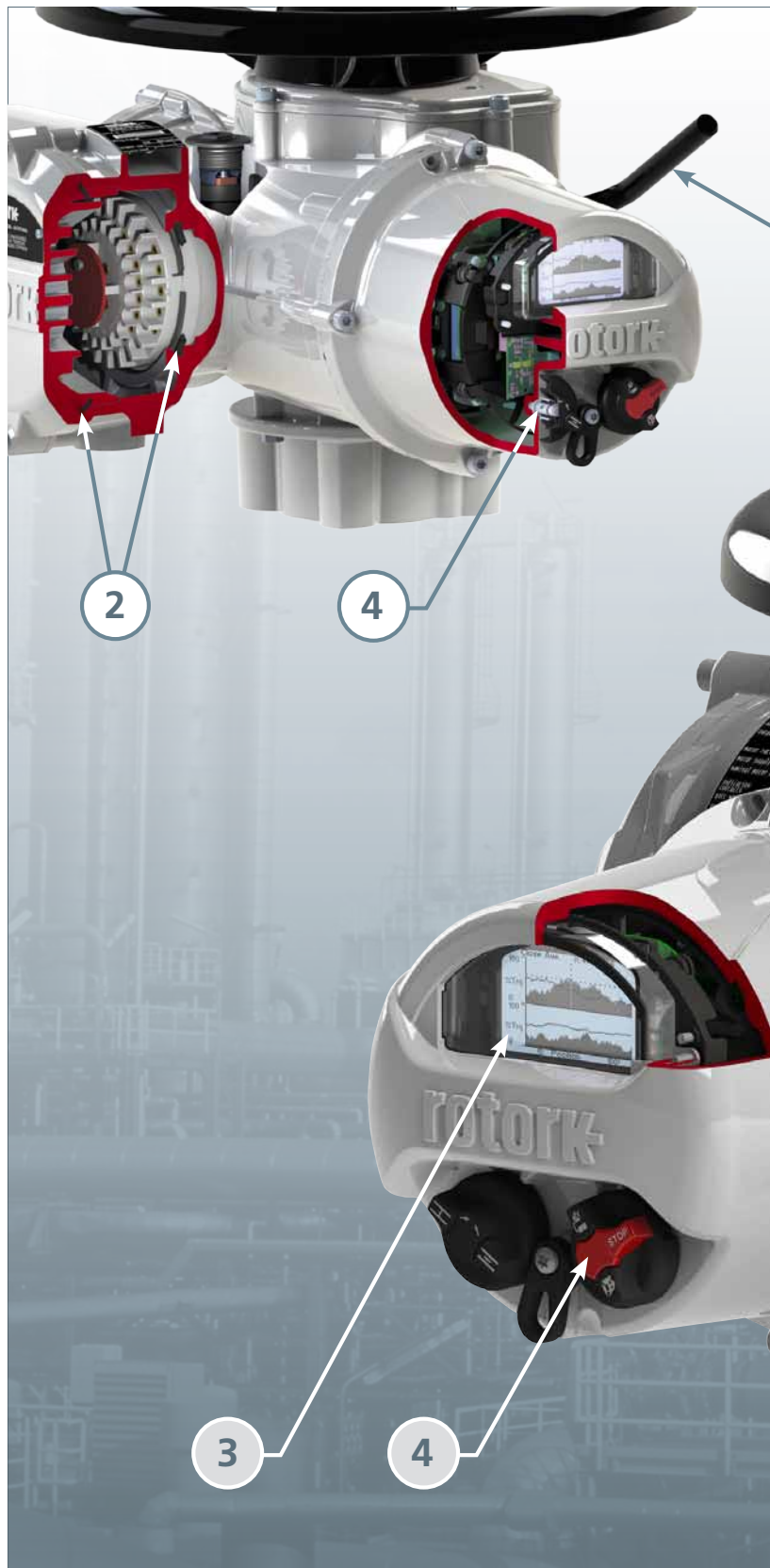
The unique Rotork patented absolute position sensor is highly accurate and can measure up to 8,000 output turns as standard. With only four active parts it is very simple and robust, providing the most reliable position sensing regardless of the availability of electrical power. It also includes built-in redundancy and self-checking.

6 Proven drive train

The drive train and motor uses the proven basic design principals employed for over 40 years. Simple, reliable and robust, the components are oil bath lubricated (for life).

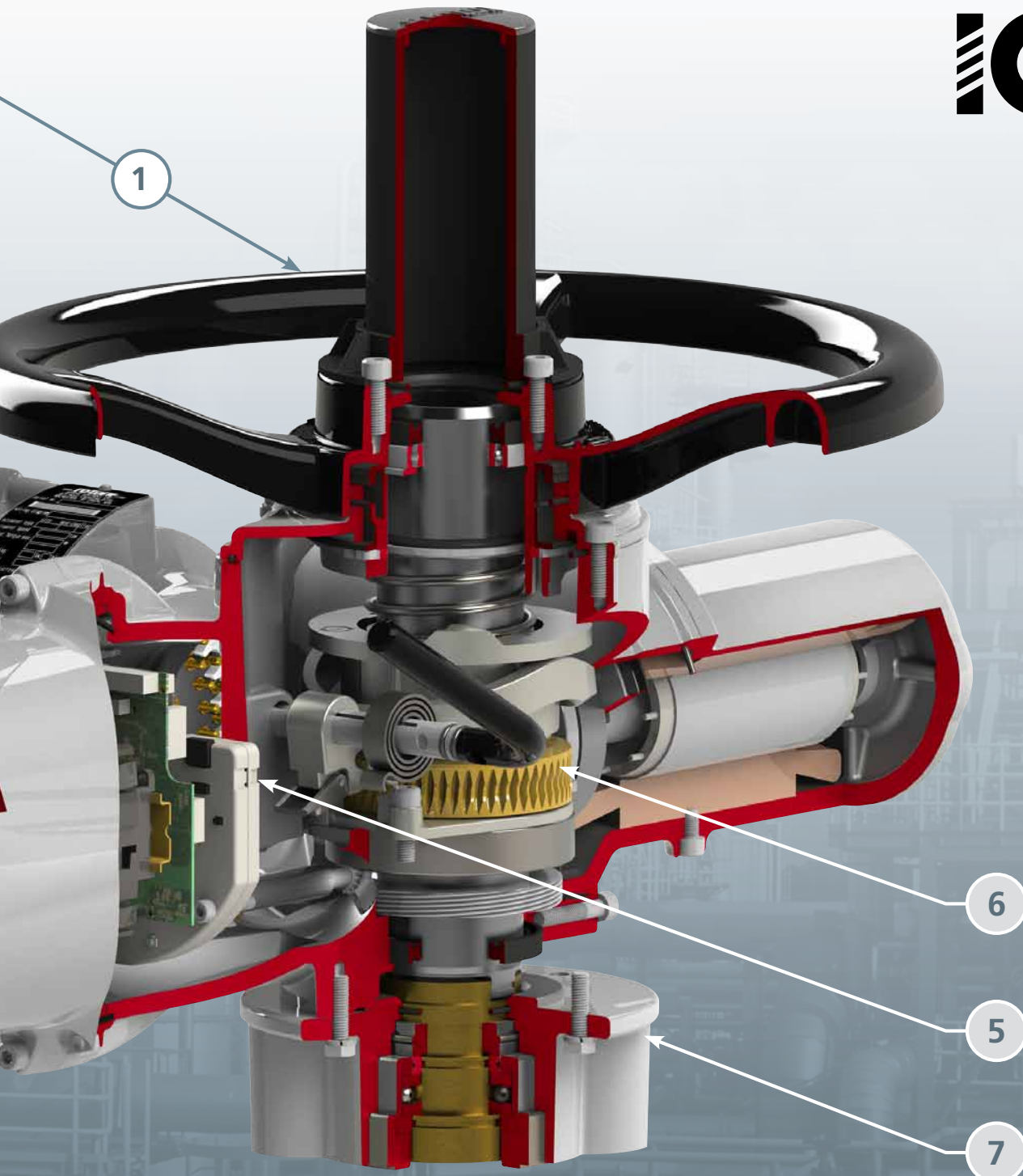
7 Separable bases

For all sizes the thrust and non-thrust base types are separate to the gearcase allowing easy installation. Should the actuator be removed, the base can be left on the valve to maintain its position. All bases conform to attachment standards ISO5210 or MSS SP 102.



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Intelligent Electric Actuator



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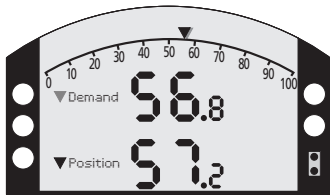
Local diagnostics and setup

The large dual stacked, hi-resolution display, with positional characters that are 25 mm high, is unrivalled in visibility for all lighting and orientation conditions. Consisting of a static, high-contrast positional display and a fully configurable dot-matrix LCD behind, the IQ offers the easiest, user-friendly configuration and data analysis ever seen in the actuation world.

Configurable Home-screens

With a mixture of the static and dot-matrix displays, there are now four configurable home-screens available to the user. The four screens reflect the parameters most commonly required to analyse operation at-a-glance:

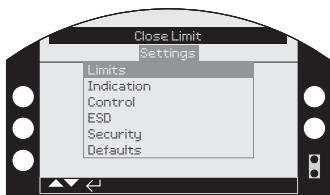
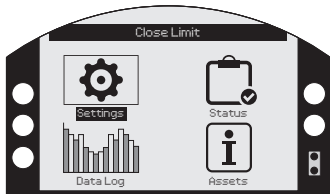
- Positional information with input demand (digital and analogue)



Using the Rotork *Bluetooth*® Setting Tool Pro, each of these screens can be easily accessed with a press of a button. Alternatively you can select one of the four screens to be continually displayed in the setup menu.

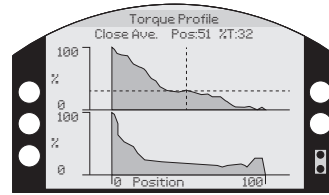
User friendly setup menus

A single press of a button on the Rotork *Bluetooth*® Setting Tool Pro takes you into the user-friendly setup menu. This menu has been designed and structured to reduce reliance on having a written manual to hand. With large, clear characters available in many languages, setup and configuration has never been so easy.



Graphical datalogger

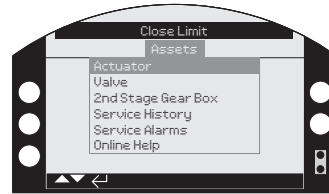
Greater amounts of data and analytical screens are now available in the datalogger and viewable locally. The datalogger screens are displayed on a 168 x 132 pixel dot-matrix display and can display anything from a torque vs position graph to statistical operational data.



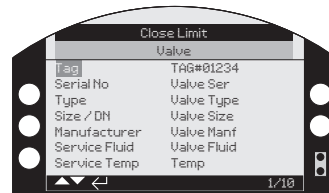
Asset management

Not only can you store information relating to the actuator, but also the valve and gearbox. This includes data about build (class, size, ratio and tag numbers) along with service information (commission date, service date etc).

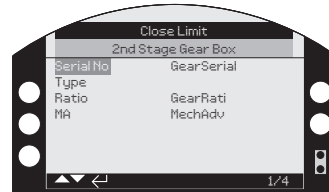
- Actuator data



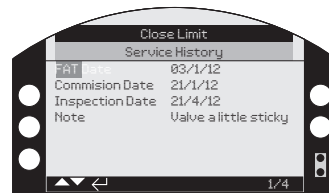
- Valve data



- Gearbox data



- Service history



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Features across the 3rd generation IQ range include:

- Three-phase, direct current and single-phase variants
- Watertight and hazardous area enclosures
- Double-sealing
- Handwheels for emergency and ease-of-use operation
- Oil bath lubrication
- Advanced, multilingual display for status and setup
- Detailed datalogging
- Setting and data capture using the supplied Rotork *Bluetooth*[®] Setting Tool Pro
- InSight2 PC software for valve performance analysis
- Highly intuitive user interface
- Comprehensive control and flexibility



IQ

IQ multi-turn 3-phase electric actuators designed for isolation or regulation duties (S2 & S3/Class A & B) of up to 60 starts per hour.

Direct torque output range from 34 Nm (25 lbf.ft) to 3,000 Nm (2,200 lbf.ft).

With the addition of second stage gearboxes, multi-turn output torque up to 43,000 Nm (31,715 lbf.ft) and quarter-turn up to 1,000,000 Nm (737,561 lbf.ft) are available.

IQM

The modulating version of the IQ 3-phase electric actuator has a solid state reversing starter in place of the electro-mechanical contactors. They feature fast-response remote control circuits for rapid control. To optimise positional control, the solid state starter also adds an electronic motor 'brake' feature.

The 'hammer-blow' drive - for shifting infrequently used valves - is not included in this model. IQM is suitable for up to 1,200 starts per hour (S4/Class C).

With the addition of second stage gearboxes, IQM multi-turn output seating torque up to 3,600 Nm (2,655 lbf.ft) and quarter-turn up to 58,000 Nm (42,778 lbf.ft) are available.

IQML

Benefiting from all the features of the IQM 3-phase electric actuator, the IQML has a linear output drive providing modulating thrust output of up to 150 kN (33,721 lbf).

IQS

IQS actuators are single phase versions of IQ actuators. Torque range from 65 Nm (48 lbf.ft) to 450 Nm (332 lbf.ft).

With the addition of second stage gearboxes, single-phase multi-turn output torque up to 3,000 Nm (2,212 lbf.ft) and quarter-turn up to 208,500 Nm (153,781 lbf.ft) are available.

IQD

IQD actuators are direct current powered versions of IQ actuators. Torque range 34 Nm (25 lbf.ft) to 305 Nm (225 lbf.ft). Voltage ranges available are 24 VDC, 48 VDC and 110 VDC (limited size/voltage availability – refer to PUB002-038 for details).

With the addition of second stage gearboxes, DC multi-turn output torque up to 1,500 Nm (1,106 lbf.ft) and quarter-turn up to 132,000 Nm (97,358 lbf.ft) are available.

Special Designs

If you require an IQ actuator for duties that are not covered by our standard range, we are happy to discuss custom solutions.

	Electrical Supply	Actuator Type	Duty Cycle	Torque Range*
IQ	3-phase	Multi-turn isolating/regulating duty	60 starts/hour	14 - 3,000 Nm direct drive. When combined with a gearbox up to 43,000 Nm multi-turn or 1,000,000 Nm quarter-turn.
IQM/ML	3-phase	Multi-turn modulating duty	up to 1,200 starts/hour S4 - 50% duty	12 - 550 Nm with linear output thrust range 5 - 100 kN
IQS	Single-phase	Multi-turn isolating/regulating duty	60 starts/hour	25 - 450 Nm

* Actuator direct output. Higher torque ranges are available using gearbox combinations.

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