Installation, Operating and Maintenance Instructions

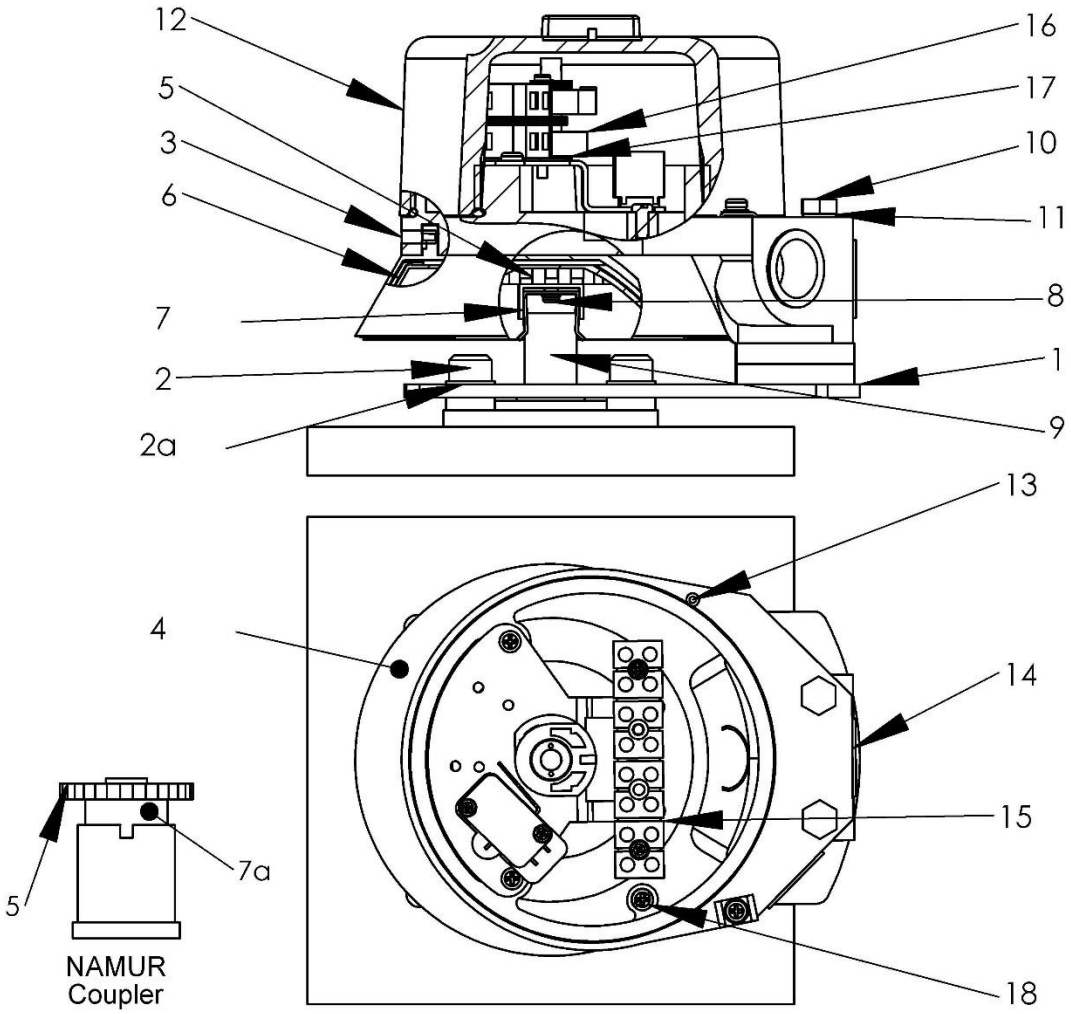
Model	IQ
Hazardous Classification	Exd (Flameproof)
Regional Certification	ATEX / IECEx / UKCA

Instructions

Type IQ Valve Position Monitors are designed to provide high accuracy feedback of valve position to plant control systems. These instructions outline the requirements for ensuring a long and trouble free service life from the monitors.

Installation – Mounting

(refer to diagram below)



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Attach mounting plate (1) to the actuator using fasteners (2) and lockwashers (2a) provided with mounting kit (if supplied by Imtex). Ensure there is clearance between the indicator on the Monitor and the plate it is mounted to (either through use of a spacer or adequate clearance) to prevent the potential for icing preventing the free movement of the indicator.

Loosen indicator cover set screw (3) and rotate indicator cover (4) to desired viewing angle. Retighten set screw (3).

Rotate coupling spacer (5) and indicator drum (6) to desired position (OPEN or CLOSED appearing through indicator window).

Fit torque coupler (7) or NAMUR drive block (7a) using screw (8) supplied in kit.

Fit monitor assembly to actuator ensuring that the torque coupler/NAMUR drive block (7/7a) engages the pinion of the actuator (9). Secure the assembly using the bolts (10) and lockwashers (11) provided with the mounting kit. Fine tune the indicator cover (4) by loosening set screw (3). Retighten set screw when completed.

Operate the actuator to ensure proper alignment between monitor and actuator. Eccentricity of the shaft must not exceed 0.25mm. If it should be necessary, re-align monitor by loosening mount bolts (10). Retighten bolts when satisfied with alignment.

Installation - Wiring & Switch Setting

Once the monitor is fitted to the actuator, remove cover (12). NOTE: On flameproof enclosures, the cover lock screw (13) must be loosened prior to cover removal.

Bring field wiring into the enclosure via the conduit entries (14) fitted with a suitable cable gland. Use blanking plugs to block off any un-used cable entries. NOTE: Suitable IP6x rated cable glands, blanking plugs and thread adaptors must be used to maintain monitor IP rating. On flameproof enclosures, only certified Exd cable gland, blanking plugs and thread adaptors can be used. Blanking plugs must not be used with a gland adaptor.

Connect field wiring to the terminals (15) within the enclosure according to the wiring diagram and terminal labelling. Connect earth conductor (which forms part of the supply cable and MUST be at least equal to the size of the phase conductors) to the internal earth point (18). Connect the external earth/equipotential bonding conductor to the monitor using the external earth clamp assembly (19). Conductor should be $4mm^2$ (min)

For monitors fitted with standard cam/spline activated switches/sensors, drive the actuator to the first required indication position and set the bottom switch by lifting and rotating the bottom cam (16). Secure the cam by allowing it to fully re-engage with the spline (17).Repeat the process for each switch in-turn by lifting/pushing down the appropriate cam, rotating and re-engaging as desired position is reached.

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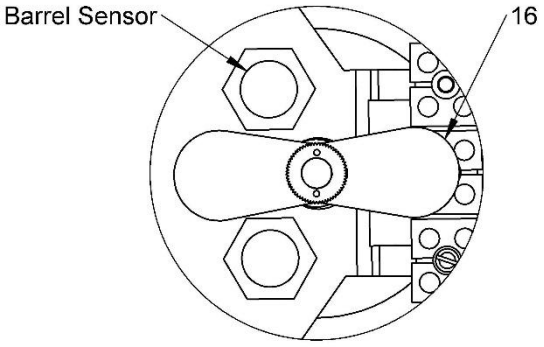
For monitors with barrel or slotted sensors, or with a transmitter, consult below.

Barrel/Slot Sensor Setting

Drive the actuator to the first required indication position and set the first switch by pushing round the lower metal shim on the shaft (16) to cover the sensor.

Repeat the process for each sensor in-turn by driving the actuator to the indication position and adjusting the appropriate shim to cover the corresponding sensor.



Transmitter Setting

NOTE: The Type IQ Transmitter is factory set to provide position information over a 90 Degree span. Specific information on the method for setting the zero and span for the transmitter option supplied is detailed on the attached Set Up Sheet.

Drive the actuator to the position intended to indicate the 'low' signal. Set the zero point for the transmitter either locally (when available) or using suitable configuration software. Drive the actuator to the position intended to indicate the 'high' signal. Set the span point either locally (where applicable) or using suitable configuration software.

To set the switches/sensors, if supplied, refer to page one of these instructions.

Once completed, verify that indication is required by fully stroking the actuator. Then refit cover (12).

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SPECIAL CONDITIONS FOR CERTIFIED ENCLOSURES

Installation should be carried out by suitably trained personnel to an applicable Code of Practice (eg IEC/EN60079-14).

Only suitably certified and temperature rated cable glands and blanking plugs are permitted for use with certified enclosures.

- ⚠ WARNING - The cable entry temperature rise is the amount stated on the product above ambient - ensure use of suitably temperature rated cable & gland.
- ⚠ WARNING - Electrostatic Hazard: Clean Only with a Damp Cloth.
- ⚠ WARNING - Do not install on an external source of heating or cooling e.g. by hot/cold air blowing temperature units
- ⚠ WARNING - Locate monitor to prevent propagating brush discharges
- ⚠ WARNING - Monitor should not be opened when energised or an explosive atmosphere may be present.

The cover screw (13) must be loosened before opening and re-tightened before the monitor re-enters service.

SPECIAL CONDITIONS OF USE

ATEX/UKCA - The maximum constructional gap (i/C) is less than that required by Table 2 of EN 60079-1:2014 clause 5.2.2 as detailed below:

IECEx - The maximum constructional gap (i/C) is less than that required by Table 2 of IEC 60079-1:2014 clause 5.2.2 as detailed below:

Flamepath	Max Gap (mm)	Comment
Push Rod and Main Body	0.1	Cylindrical Spigot Joint

Additional Instructions for Safe Use

The certification for this monitor relies upon the following materials used in its construction:

- Stainless Steel
- EDPM 70 or Viton V700-75 Seals (depending on operating temperatures)

If the equipment is likely to come into contact with aggressive substances, then it is the responsibility of the user to take suitable precautions that prevent it from being adversely affected, thus ensuring that the type of protection provided by the equipment is not compromised. Aggressive substances might be: acidic liquids or gases that attack Stainless Steel, or direct and prolonged contact with some Hydrocarbons that could affect the seals. Regular checks/inspections should be carried out if aggressive substances are present.

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Maintenance

The Type IQ requires no servicing during normal working life, if installed correctly. However, it is advisable to check mounting screws/bolts, o-rings and terminal wiring for signs of loosening or corrosion as part of the routine plant maintenance to ensure continued operation. Ensure safety warnings are observed during maintenance.

Inspection & maintenance to ATEX/UKCA/IECEx flameproof enclosures to be carried out by suitably trained personnel with applicable code of practice (eg IEC/EN60079-17). Repairs to Type IQ flameproof enclosures are not permitted. Please consult factory.

Certification

Exdb IIC T6 Gb and Ex tb IIIC T85°C Db - IP6X
Tamb = -40°C to +40°C
or
Exdb IIC T6 Gb and Ex tb IIIC T85°C Db - IP6X
Tamb = -40°C to +60°C
or
Exdb IIC T4 Gb and Ex tb IIIC T135°C Db - IP6X
Tamb = -15°C to +80°C

Referenced Standards

The following standards have been referred to in these instructions and are applicable to the use of this product when used in an environment where an explosive atmosphere may be present:

IEC 60079-0:2017 7th Ed
IEC60079-1:2014 7th Ed
IEC 60079-31:2013 2nd Ed
EN60079-0:2012
EN60079-1:2014
EN60079-31:2014
EN IEC 60079-0:2018

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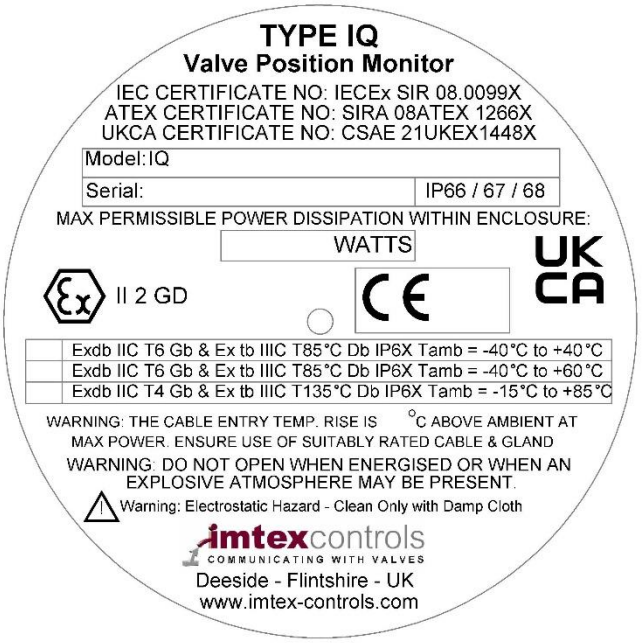
Product Markings

The label on the monitor should be one of the two shown below:



NOTE: The year of manufacture of the monitor can be obtained from the last 2 digits of the serial number.

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Cable Entries

The number and type of cable entry on the Monitor can be determined by reference to the 6th digit of the Format 1 part number or the 5th digit of the 2nd block in Format 2 part number.

For example, in the following part numbers –

Format 1 – **IQ25S5SR-IOO**

the 6th digit is a '5' which corresponds to the monitor having 2 off M20 x 1.5 cable entry. Refer to table below for details.

DIGIT	ENTRIES SUPPLIED
5	(2) M20 X 1.5
6	(3) M20 X 1.5
8	(1) ¾"NPT (central) / (1) ½"NPT (offset)
9	(1) ¾"NPT (central) / (2) ½"NPT (offset)
B	(2) ½"NPT
C	(3) ½"NPT

Format 2 - **IQ225000OO-SSOO2SR2-0-WDOO**

the 5th digit / 2nd block is a '2' which corresponds to the monitor having 2 off M20 x 1.5 cable entry. Refer to table below for details.

DIGIT	ENTRIES SUPPLIED	DIGIT	ENTRIES SUPPLIED
1	(1) M20 x 1.5	A	(1) ½" NPT
2	(2) M20 x 1.5	B	(2) ½" NPT
3	(3) M20 x 1.5	C	(3) ½" NPT
5	(1) M25 x 1.5	E	(1) ¾" NPT
6	(1) M25 x 1.5 / (1) M20 x 1.5	F	(1) ¾" NPT / (1) ½" NPT
7	(1) M25 x 1.5 / (1) M20 x 1.5	G	(1) ¾" NPT / (2) ½" NPT

NPT Threads conform to ANSI/ASME B1.20.1 and shall be made up wrench tight.

Metric Thread tolerance to ISO 965-1 and ISO 965-3

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Electrical Characteristics

Format 1 – **IQXXxxxx-xxx**
Format 2 – **IQxXXxXXxx-xxxxxxxx-x-xxxx**

Mechanical Switch w/ Silver Contacts	
Function No	16 & 55 (format 1) / 16 (format 2)
Electrical Ratings	10.0A @ 125/250VAC 0.5A @ 125VDC
Temperature Range	-40 to +85°C
Operating Life	400, 000 Cycles
Not Recommended for circuits operating under 20mA @ 24VDC	

Mechanical Switch w/ Gold Contacts	
Function No	17 & 56 (format 1) / 17 (format 2)
Electrical Ratings	1.0A @ 125VAC 0.5A @ 30VDC
Temperature Range	-40 to +85°C
Operating Life	100, 000 Cycles
Recommended for use in 24VDC computer input circuits	

Reed Switch (A140077)	
Function No	25 & 58 (format 1) / 25 (format 2)
Electrical Ratings	0.5A (switching) / 1.0A (Steady State) @ 120V Max 10W/VA Max
Temperature Range	-50 to +85°C
Operating Life	5,000, 000 Cycles
Where reed switches are installed at the end of long cable runs, it is the responsibility of the installer to ensure suitable precautions are taken to ensure cable capacitance does not induce premature switch failure. Consult Imtex for further information	

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Reed Switch w/ Choke (A140077-SU)	
Function No	25 & 58 (format 1) / 40 (format 2)
Electrical Ratings	0.15A @ 125VAC / 30VDC 680µH 10 Ohms
Temperature Range	-50 to +85°C
Operating Life	5,000, 000 Cycles
Where a reed switch with choke is used, the installer must carry out an ignition capability assessment of the full circuit (in accordance with EN60079-11:2012,Annex A).	

Tungsten Reed Switch (A140088)	
Function No	25 & 58 (format 1) / 30 (format 2)
Electrical Ratings	Max Current: 3.0A Max Power 100W/VA Max Min Power: 2 Watts
Temperature Range	-40 to +85°C
Operating Life	5,000, 000 Cycles
Not Recommended for circuits operating under 90mA @ 24VDC	

V3 NAMUR Proximity Sensor	
Function No	42 & 52 (format 1) / 42 (format 2)
Electrical Ratings	Target Present – Current < 1mA Target Absent – Current > 3mA 5 to 25VDC (Nominal 8VDC)
Temperature Range	-25 to +100°C
Operating Life	Unlimited Cycles
Use with intrinsically safe repeater barrier. Namur sensors fully conform to EN60947-5-6 (VDE0660 Part 212) standard.	

Cylindical/Slot NAMUR Proximity Sensor	
Function No	43 & 53 (format 1) / 43 & 47 (format 2)
Electrical Ratings	Target Present – Current < 1mA Target Absent – Current > 3mA 5 to 25VDC (Nominal 8VDC)
Temperature Range	-50 to +100°C (sensor dependent)
Operating Life	Unlimited Cycles
Use with intrinsically safe repeater barrier. Namur sensors fully conform to EN60947-5-6 (VDE0660 Part 212) standard.	

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Non-Contact Transmitter	
Function No	70 (format 1) / 70 & 71 (format 2)
Electrical Ratings	12 to 28 VDC R < (U-9) / 0.02 Linearity < 1% FS Repeatability < 0.36°
Temperature Range	-40 to +85°C
Operating Life	Unlimited Cycles

Programmable Transmitter	
Function No	70 (format 1) / 72 (format 2)
Electrical Ratings	8 to 30 VDC Internal Consumption: 25mW to 0.8W Voltage Drop: 8VDC Warm Up Time: 5 min Min Response Time: 0.33s (model dependent) Linearity < 1% FS Repeatability < 0.36°
Temperature Range	-40 to +85°C
Operating Life	1, 000, 000 Cycles

Analogue Transmitter – PCB Style	
Function No	70 (format 1) / 74 (format 2)
Electrical Ratings	12 to 40 VDC R < 700 ohms @ 24VDC Linearity ± 0.85°
Temperature Range	-40 to +85°C
Operating Life	1, 000, 000 Cycles

Potentiometer	
Function No	70 (format 1) / 73 (format 2)
Electrical Ratings	Resistance: 10k ohms Output Smoothness: 0.1% (Max) Electrical Travel: 340° ± 3° Power Rating: 1.0W @ 70°C Tolerance: ± 20% Linearity: ± 2.0%
Temperature Range	-40 to +85°C
Operating Life	1, 000, 000 Cycles

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Terminal Wiring

Wiring connection details are provided in the unit, with detail of the assigned connection displayed on the terminal block.

Further Details

For further information on this product contact:

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Deeside, Flintshire, CH5 2UA
United Kingdom
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