

Installation, Operating and Maintenance Instructions

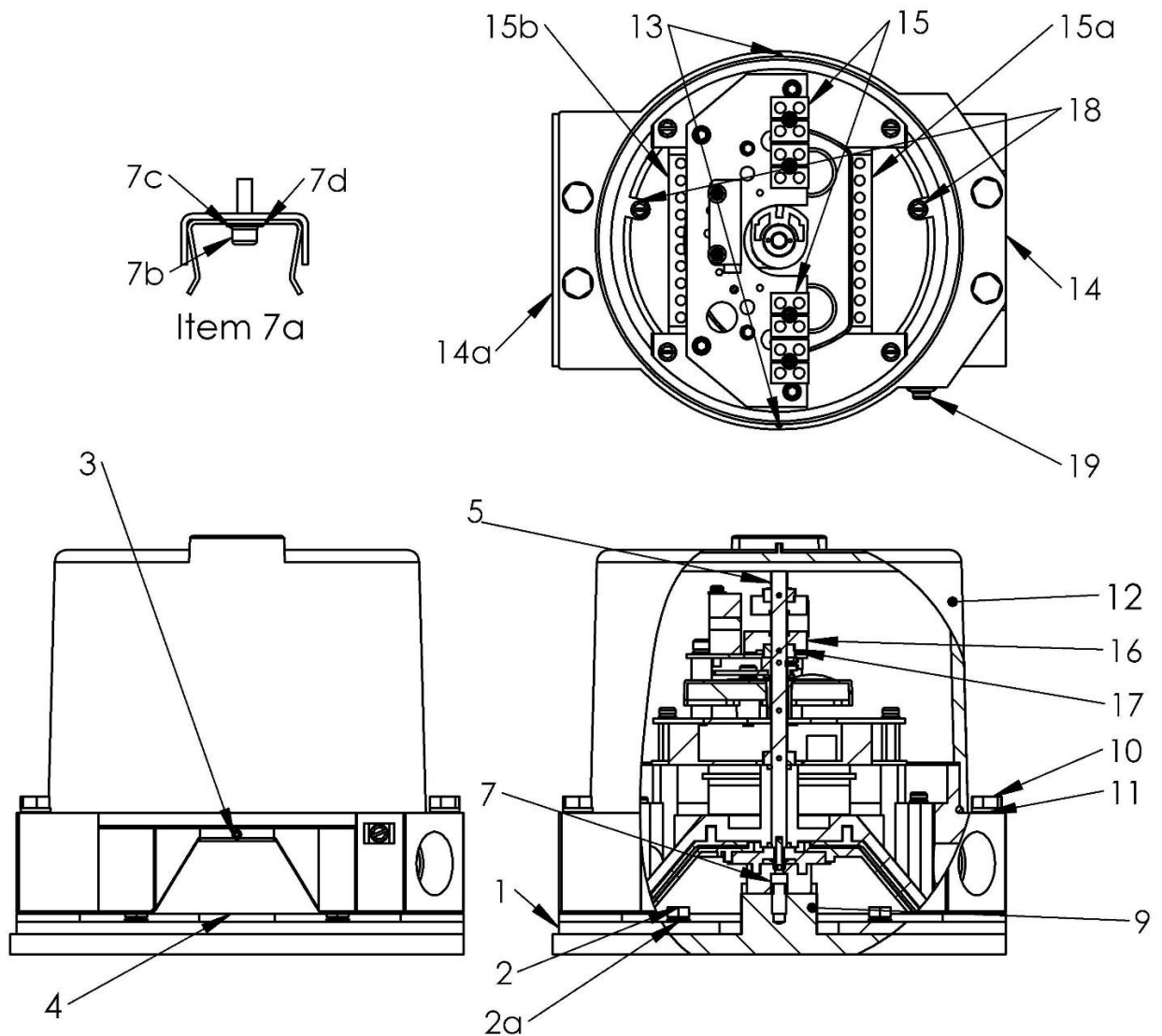
Model	Type V
Hazardous Classification	Exd (Flameproof)
Regional Certification	ATEX / IECEx / UKCA

Instructions

Type V Valve Controllers are designed to provide high accuracy feedback control of valve position with the option for comprehensive diagnostics, including Partial Stroke Testing (PST). This document, outlines the essential safety and setup information for installing and connecting the device. Additional connections to and operation of the Valve Diagnostic/PST system within the device are covered by supplementary documents.

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).

Fit the Type V assembly to actuator ensuring that the NAMUR coupler (7) engages the shaft of the actuator (9). If a torque coupler (7a) is used instead of the NAMUR Coupler on Non-NAMUR actuators, ensure this is securely fitted to the underside of the controller using the screw, flatwasher and lockwasher supplied (7b/7c/7d) before fitting over the flats on the actuator shaft (9). Secure the assembly using the screws (10) and lockwashers (11) provided with the mounting kit. Eccentricity of the shaft must not exceed 0.25mm.

If it should be necessary, re-align controller by loosening mount screws (10). Retighten screws when satisfied with alignment.

Fine tune the indicator cover (4) by loosening set screw (3). Retighten set screw when completed.

Installation - Wiring & Switch Setting

Once the controller is fitted to the actuator, remove cover (12) by loosening 2 x cover lock screws (13).

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. If wiring in the actuator solenoid(s) or additional components, bring these into the enclosure using conduit entries 14a to facilitate wiring. NOTE: Suitable IP6x rated cable glands, blanking plugs and thread adaptors must be used to maintain controller 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 wiring to the terminals (15, 15a, 15b) 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 points (18). Connect the external earth/equipotential bonding conductor to the controller using the external earth clamp assembly(19). Conductor should be 4mm² (min)

The next stage of the installation requires the actuator to be stroked. This can be done in a number of ways depending on the configuration of the controller installed. Supplementary Documents cover how the actuator might be stroked using the controller. Otherwise, the actuator can be stroked using the solenoid(s) on the actuator as operated from the control room, (may require a separate 24VDC power supply to be connected depending on unit supplied).

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The internal transmitter is factory set to provide feedback for 90 degree rotation, clockwise to close. If required, the transmitter can be re-programmed. See Supplementary Documents for information on this.

For controllers 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.

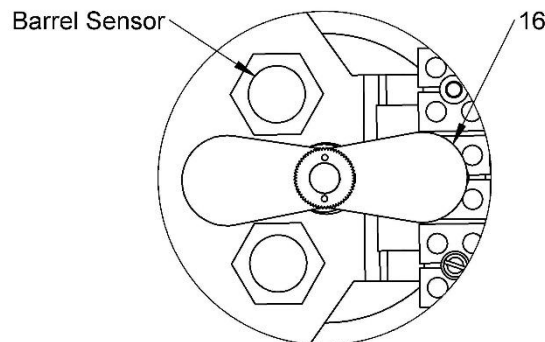
For controllers with barrel or slotted sensors, or with a transmitter, consult the section below.

Once completed, verify that indication is as required by fully stroking the actuator. Then refit cover (12) and secure using the 2 x cover lock screws (13).

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.



Independent Transmitter Setting

NOTE: The Type V Controller is factory set to provide position information over a 90 Degree span from its internal transmitter output. It can be re-ranged during calibration, as detailed in Supplementary Information. Where an Independent Transmitter is fitted setting is done following the additional instructions provided. The independent transmitter will be located above the internally wired transmitter or PCB.

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/EN60079-17).

Only suitably IP and Exd certified and temperature rated cable glands, thread adaptors and blanking plugs are permitted for use with certified flameproof enclosures.

The equipment shall not be subjected to a build up of dust and is to be cleaned regularly to prevent dust build up forming on the enclosure.

Where intrinsically safe components are fitted and are to be used within an Intrinsically Safe Circuit, they MUST be supplied by a certified barrier that is suitable to work with Input Parameters of the respective components.

WARNING - For units operating at +85°C, cable, cable glands or conductors in conduit shall be rated +100°C (minimum).

WARNING - Controller includes external plastic parts and presents an 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 - Controller should not be opened when energised or an explosive atmosphere may be present. Controller should not be opened for at least 15 after being de-energised. The cover screws (13) must be loosened before opening and re-tightened before the controller re-enters service.

The maximum constructional gap (i/C) is less than that required by

Table 1 of IEC 60079-1 clause 5.2.2 as detailed below:

Flamepath	Max Gap (mm)	Comment
Through Shaft	0.07	Cylindrical Spigot Joint

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Additional Instructions for Safe Use

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

- Stainless Steel
- Aluminium LM20
- EDPM 70

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 V 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 certified flameproof enclosures to be carried out by suitably trained personnel with applicable code of practice (eg IEC/EN60079-17). Repairs to Type V certified flameproof enclosures are not permitted. Please consult factory.

Certification

Ex db [ia] IIC T6 Gb
 Ex tb IIIC T85°C Db - IP6X
 Tamb = -**°C to +60°C

Or

Ex db [ia] IIC T4 Gb
 Ex tb IIIC T135°C Db - IP6X
 Tamb = -**°C to +85°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 60079-11:2011 6th Ed
 IEC 60079-31:2013 2nd Ed

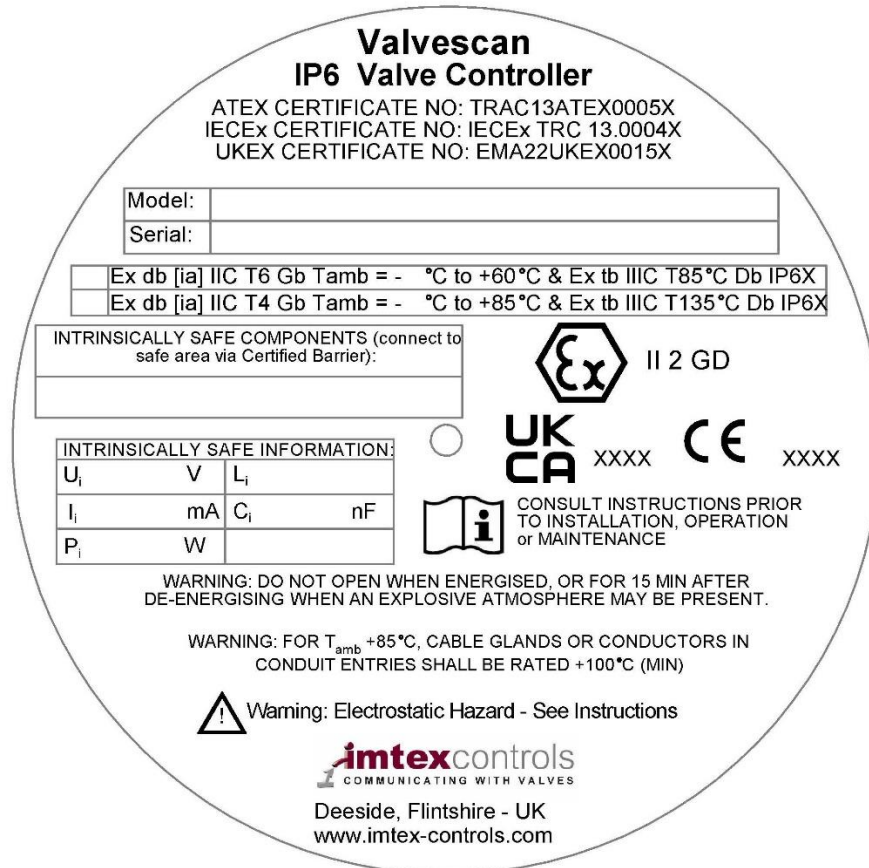
EN60079-0:2012
 EN60079-1:2014
 EN60079-11:2012
 EN IEC 60079-0:2018

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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 Controller can be determined by reference to the 9th 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 - VADD216SYSR0P-IOO

the 9th digit is a 'Y' which corresponds to the controller having 3 off M25 x 1.5 cable entry and 3 off M20 x 1.5 cable entry. Refer to table below for details.

CABLE ENTRY GUIDE			
DIGIT	ENTRIES SUPPLIED	DIGIT	ENTRIES SUPPLIED
Z	(6) M20 x 1.5	U	(3) 3/4"NPT / (3) 1/2" NPT
Y	(3) M25 x 1.5 / (3) M20 x 1.5	T	(2) 3/4"NPT / (4) 1/2" NPT
X	(2) M25 x 1.5 / (4) M20 x 1.5	S	(1) 3/4"NPT / (5) 1/2" NPT
W	(1) M25 x 1.5 / (5) M20 x 1.5		
V	(6) 1/2" NPT		

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Format 2 - VADD21600000-SSOOZSR2-2-WCOO

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

CABLE ENTRY GUIDE			
DIGIT	ENTRIES SUPPLIED	DIGIT	ENTRIES SUPPLIED
Z	(6) M20 x 1.5	P	(2) M25 x 1.5 / (3) M20 x 1.5
Y	(3) M25 x 1.5 / (3) M20 x 1.5	N	(1) M25 x 1.5 / (4) M20 x 1.5
X	(2) M25 x 1.5 / (4) M20 x 1.5	M	(5) 1/2" NPT
W	(1) M25 x 1.5 / (5) M20 x 1.5	L	(3) 3/4"NPT / (2) 1/2" NPT
V	(6) 1/2" NPT	K	(2) 3/4"NPT / (3) 1/2" NPT
U	(3) 3/4"NPT / (3) 1/2" NPT	H	(1) 3/4"NPT / (3) 1/2" NPT
T	(2) 3/4"NPT / (4) 1/2" NPT	D	(4) 1/2" NPT
S	(1) 3/4"NPT / (5) 1/2" NPT	8	(1) M25 x 1.5 / (3) M20 x 1.5
R	(5) M20 x 1.5	4	(4) M20 x 1.5
Q	(3) M25 x 1.5 / (2) M20 x 1.5		

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 – VxxxxXXxxxxxx-xxx

Format 2 – VxxxxXXxXXxx-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.	

Cylindrical/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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