Installation, Operating and Maintenance Instructions

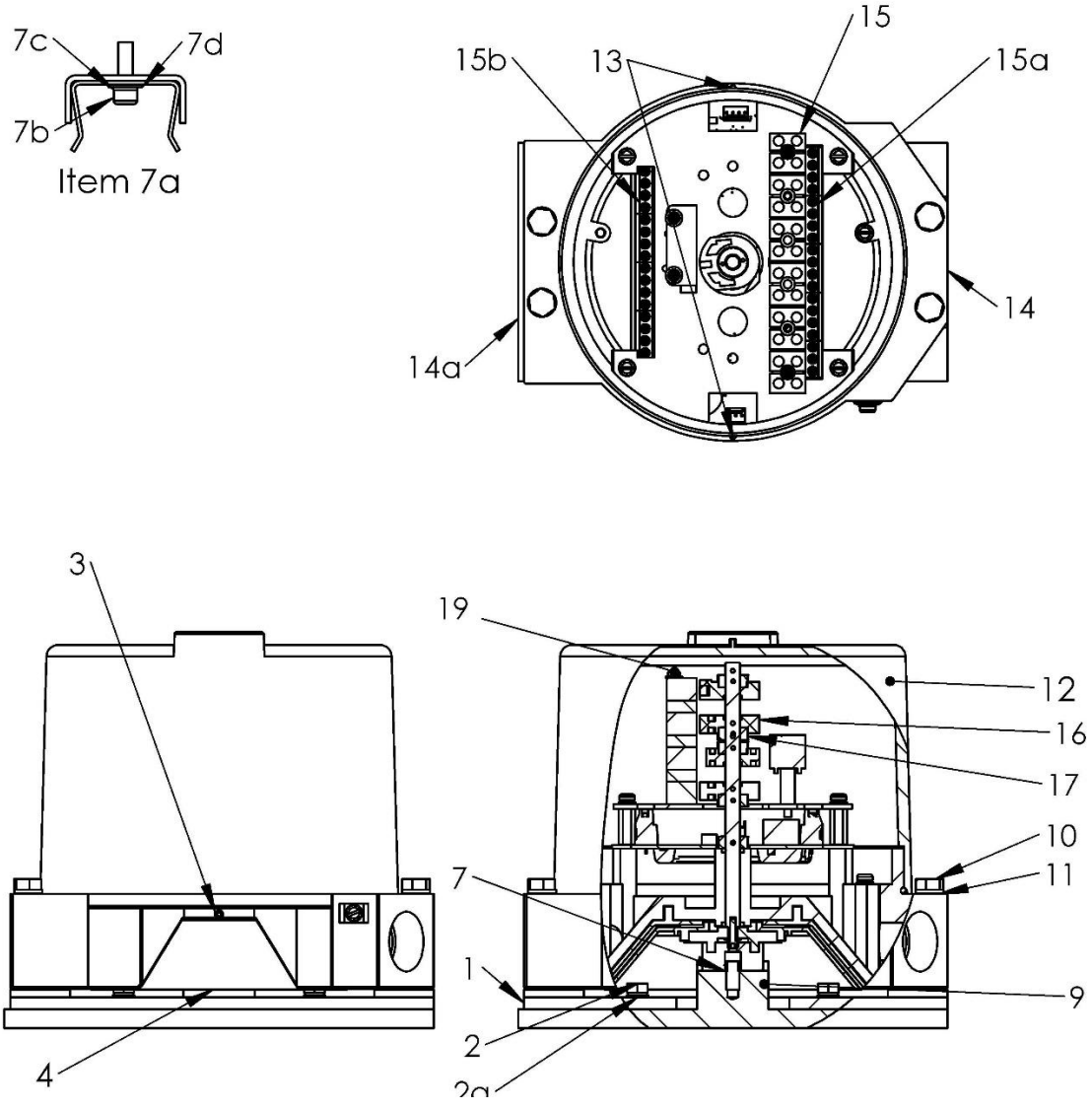
Model	Type V
Hazardous Classification	Exi (Intrinsically Safe)
Regional Certification	ATEX / IECEx / UKCA

Instructions

Type V Valve Controllers are designed to provide both high accuracy feedback of valve position and comprehensive valve diagnostics and testing. This document, outlines the essential safety information for installing the device within an Intrinsically Safe System, connecting into the device and the the method for setting of the independent feedback systems. The document references additional documentation that is required for detailed information for the set up and calibration of the device, depending on the configuration of the device supplied.

Installation – Mounting

(refer to diagram below)



Model	Type V
Hazardous Classification	Exi (Intrinsically Safe)
Regional Certification	ATEX / IECEx / UKCA

Attach mounting plate (1) to the actuator using fasteners (2) and lockwashers (2a) provided with mounting kit (if supplied by Imtex). NOTE: There should be sufficient clearance between the moving indicator portion of the unit and the top of the actuator to prevent any icing effect hampering the indicator movement.

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

Fit 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 adjustment 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 & Setting - Internally Wired Transmitter and Independent Switches

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

Bring field wiring into the enclosure via the conduit entries (14) fitted with a suitably rated 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 certified IP6x rated cable glands, blanking plugs and thread adaptors must be used to maintain controller IP rating.

Type VA Variant

More detailed information on the connection, calibration and operation of the Type V Controller variants 'VA' and 'VI' (with diagnostic controllers) can be found on the supporting Installation and Programming Guide (IPG) documents VAID-IPG001 (Type VA variant).

Connect wiring to the terminals (15a, 15b) within the enclosure according to the wiring diagram and terminal labelling.

The internally wired transmitter is factory set to provide feedback for 90 degree rotation - clockwise to close. If required, the internally wired transmitter can be re-programmed as described in the relevant IPG document.

Model	Type V
Hazardous Classification	Exi (Intrinsically Safe)
Regional Certification	ATEX / IECEx / UKCA

All Variants with Function Components

Function components can be supplied in the enclosure for independent feedback of valve position. Wiring diagrams specific to the variant of the Controller supplied are provided with the unit and available on request from the Imtex Sales Office.

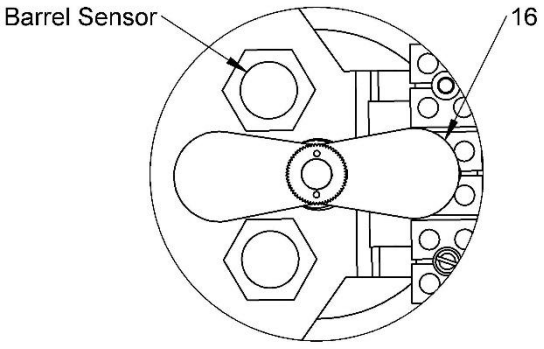
Connect wiring to the terminals (15) within the enclosure according to the wiring diagram and terminal labelling.

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

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 Transmitter is factory set to provide position information over a 90 Degree span but can be re-configured (refer to VAID-IPG001). If an additional independent transmitter is this is configured by following the seperate programming sheet supplied.

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.

Model	Type V
Hazardous Classification	Exi (Intrinsically Safe)
Regional Certification	ATEX / IECEx / UKCA

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) if provided.

Installation, Operating and Maintenance Instructions

Model	Type V
Hazardous Classification	Exi (Intrinsically Safe)
Regional Certification	ATEX / IECEx / UKCA

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.

The equipment shall be cleaned regularly to prevent build up of dust on the equipment surfaces

Unit contains intrinsically safe components and are to be used within an Intrinsically Safe Circuit, they MUST be supplied by an ATEX/IECEx/UKCA approved barrier that is suitable to work with Input Parameters of the respective components (see unit markings)

- ⚠ WARNING - Electrostatic Hazard: Clean regularly, Only with a Damp or Antistatic 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 – For T +85 °C, cable glands or conductors in conduit entries shall be rated +100°C (min)

Additional Instructions for Safe Use

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

- Stainless Steel
- EDPM 70
- NBR70

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.

Installation, Operating and Maintenance Instructions

Model	Type V
Hazardous Classification	Exi (Intrinsically Safe)
Regional Certification	ATEX / IECEx / UKCA

Maintenance

The Type V Controller 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.

Certification

Variant VO	Variant VA
Ex ia IIC T6..T4 Ga Ex ia IIIC T85°C..135°C Db II 1 G / II 2 D	Ex ib IIC T6..T4 Gb Ex ib IIIC T85°C..135°C Db II 2 GD

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
IEC60079-11:2011 6th Ed
EN IEC 60079-0:2018
EN60079-11:2012

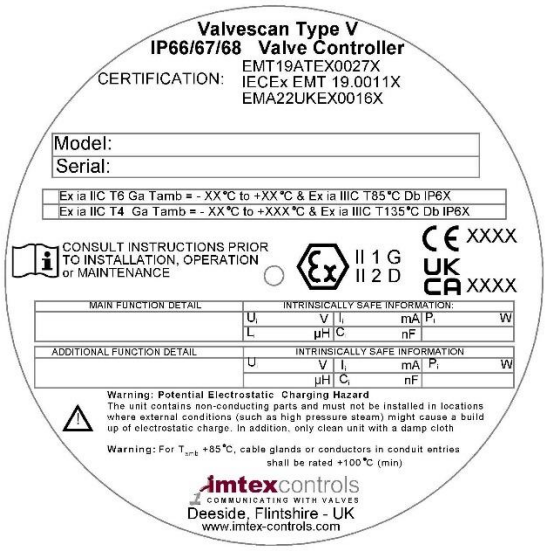
Installation, Operating and Maintenance Instructions

Model	Type V
Hazardous Classification	Exi (Intrinsically Safe)
Regional Certification	ATEX / IECEx / UKCA

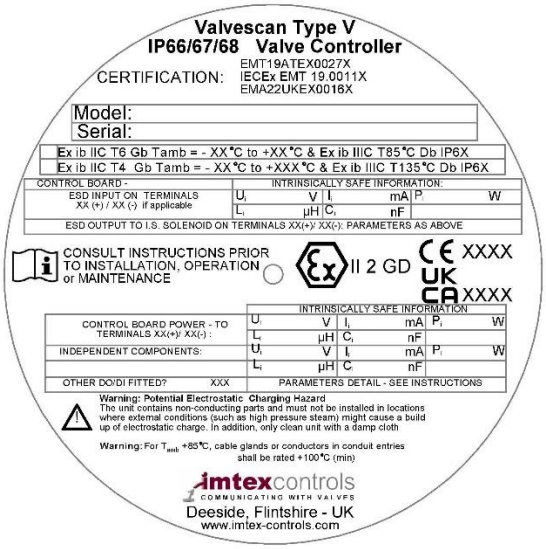
Product Markings

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

VO



VA



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

Installation, Operating and Maintenance Instructions

Model	Type V
Hazardous Classification	Exi (Intrinsically Safe)
Regional Certification	ATEX / IECEx / UKCA

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 - VAII217SYSR0P-1OO

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	Q	(3) M25 x 1.5 / (2) M20 x 1.5 / (1) 1/2"NPT
Y	(3) M25 x 1.5 / (3) M20 x 1.5	P	(2) M25 x 1.5 / (3) M20 x 1.5 / (1) 1/2"NPT
X	(2) M25 x 1.5 / (4) M20 x 1.5	N	(1) M25 x 1.5 / (4) M20 x 1.5 / (1) 1/2"NPT
W	(1) M25 x 1.5 / (5) M20 x 1.5	M	(1) M20 x 1.5 / (5) 1/2"NPT
V	(6) 1/2" NPT	L	(1) M20 x 1.5 / (2) 1/2"NPT / (3) 3/4"NPT
U	(3) 3/4"NPT / (3) 1/2" NPT	K	(1) M20 x 1.5 / (3) 1/2"NPT / (2) 3/4"NPT
T	(2) 3/4"NPT / (4) 1/2" NPT	J	(1) M20 x 1.5 / (4) 1/2"NPT / (1) 3/4"NPT
S	(1) 3/4"NPT / (5) 1/2" NPT		
R	(5) M20 x 1.5 / (1) 1/2"NPT		

Model	Type V
Hazardous Classification	Exi (Intrinsically Safe)
Regional Certification	ATEX / IECEx / UKCA

Format 2 - VAID217000OO-SSOOZSR2-2-WZOO

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

Model	Type V
Hazardous Classification	Exi (Intrinsically Safe)
Regional Certification	ATEX / IECEx / UKCA

Electrical Characteristics

Format 1 – **VxxxxxXXxxxxxx-xxx**
Format 2 – **VxxxxXXxXXxx-xxxxxxxx-x-xxxx**

Mechanical Switch w/ Silver Contacts	
Function No	16 (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 (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 (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	

Installation, Operating and Maintenance Instructions

Model	Type V
Hazardous Classification	Exi (Intrinsically Safe)
Regional Certification	ATEX / IECEx / UKCA

Reed Switch w/ Choke (A140077-SU)	
Function No	25 (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 (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 (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 (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.	

Installation, Operating and Maintenance Instructions

Model	Type V
Hazardous Classification	Exi (Intrinsically Safe)
Regional Certification	ATEX / IECEx / UKCA

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) / 74 (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

Installation, Operating and Maintenance Instructions

Model	Type V
Hazardous Classification	Exi (Intrinsically Safe)
Regional Certification	ATEX / IECEx / UKCA

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:

Imtex Controls Ltd
Unit 4, Tenth Avenue
Deeside Industrial Estate
Deeside, Flintshire, CH5 2UA
United Kingdom
www.imtex-controls.com
sales@imtex-controls.com