

AVID

AVID ZR & ZR Plus Position Monitors Installation & Operating Instructions

Installation and operating instructions for AVID ZR & ZR Plus, Corrosion resistant ATEX approved position monitors for General Purpose, Hazardous Area and Intrinsically Safe Applications



Figure 1



Figure 2



Figure 3

www.pentair.com/valves

Note

All AVID® Products are factory equipped with Pentair direct mounting. For standard Namur mounting see Appendix "A". Please ensure that the Pentair/Keystone actuator is provided with the standard 16 dia x 11 af drive.

- 1. Operate the actuator to full closed position.
- 2. Fasten the ZR Position Monitor to the actuator using (4) M5 x 12 mm long socket head cap screws and (4) M5 washers while engaging its output shaft into the actuator's input (fig.1).
- Loosen the (4) captive screws which fasten the ZR Position Monitor cover. Twist cover approximately 45° and lift up (fig.2). (Wiring diagram inside ZR Position Monitor cover).
- 4. To set switches, lift bottom cam and turn until closed switch is activated and then release. Spring will push cam back onto the splined shaft. Operate the actuator to the opposite extreme, push down on the top cam and turn until the open switch is activated (fig. 3).
- 5. Operate actuator from one extreme to the other several times to check switch operation.
- 6. Replace housing cover. Confirm that you have noted the final position of the valve, (full open or full closed).
- 7. Make sure the HiVue visual display coincide with the position of the valve (fig.4).
- 8. The inner HiVue indicator should show either "Open" or "Closed. If the position indicated is the opposite of the actuator position. Remove the outer indicator by removing the four (4) slot head screws and rotate the inner indicator 90° to correct the visual display.
- 9. Secure the outer HiVue indicator to the housing cover with (4) slot head screws.
- 10. Ensure the correct gland is installed to provide the appropriate rating.

Important: Do not exceed 1.13 Nm of torque for each screw



Figure 4

Exploded parts list



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Item #	Qty	Description
1	1	Housing Assembly
2	1	Shaft Assembly
3	1	Cover Assembly
4	1	Direct Mount Assembly
5	1	RFX Coil Assembly (note 1)
6	1	RFX Solenoid Valve Assembly (note 1)

Note 1

Items 5 & 6 are supplied with ZR Plus Control Position Monitors, only.

Technical data

V3 Mechanical	Switches
Electrical Version	SPDT form C
Electrical Rating	15 amps/125/250 VAC 6 amps/24 VDC 0.5 amps/125 VDC 0.25 amps/250 VDC

Proximity Type (Inductive), Intrinsically Safe			
Sensing Range	2 mm		
Electrical Version	D.C. voltage 2 wire in accordance DIN19234 (NAMUR)		
Hysteresis	Approx. 5%		
Nominal Voltage	8 VDC		
Input Voltage Range	5-25 VDC		
Output Load	(Target Present) ≤ 1mA		
Current	(Target Absent) ≥ 3mA (15 mA Max.)		

Optional Proximity Type (Inductive)

The ZR position monitor is also available with 2 & 3-wire DC PNP/NPN (NO/NC) inductive proximity sensors (5-36 VDC) and 2-wire AC/DC inductive proximity sensors (20-140 AC/ 10-140 DC).

T Sensor for EEx m e	Classification
Electrical Version	SPDT Form C Normally Open
Contacts	Rhodium
Electrical Rating	2A / 120VAC 1.5A / 24VDC 1.0A / 230VAC
Contact Resistance	0.08 Ohms
Seal	Encapsulation

Materials of Construction

Housing	Engineered Resin
Cover	Clear Engineered Resin
Shaft	Stainless Steel
Fasteners	Stainless Steel
HiVue	Copolyester
ModMount	Engineered Resin

Area Classification & Approvals

Weatherproof	I <u>P</u> 67
ATEX	(£x) 2 G / 3 D EEx ia C T 6
	$\langle \overline{\mathbf{E}_{\mathbf{x}}} \rangle \parallel 2 \text{ G} / 3 \text{ D} \text{ T80°C EEx me II T 6}$

Enclosure	
Conduit Entries	2 x M20 2 x 1/2" NPT 2 x PG 13.5
Temperature Range	
ZR with V3 Mech	-40°C to +80°C
ZR Plus with V3 Mech	-40°C to +80°C
ZR with NJ2-V3-N	-25°C to +80°C
Temperature Rating	-40°C to +150°C

Appendix "A"

Instructions for ZR & ZR Plus Mounting Using Standard Namur Output:

- 1. Remove Pentair direct mounting bracket assembly from the ZR or ZR Plus position monitor. Note: The ZR & ZR Plus position monitor comes with a standard Namur output shaft.
- 2. Replace bracket assembly with a standard Namur mounting bracket. Note: Standard Namur mounting bracket is not included.

Dimensions (mm) - ZR Position Monitor - Pentair Direct Mounting





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Top View

Standard Pentair/Keystone output shaft



Dimensions (mm) - ZR Plus Position Monitor - Pentair Direct Mounting



Standard Pentair/Keystone output shaft



Note

All ZR Plus units are factory installed with a solenoid valve. No internal installation is required.

General Description

The solenoid valve incorporates elastomer static seals through which a shaped spool moves which are designed for 5 way operation. 5 way valves are normally used to control the action of double acting cylinders.

The seal spacer assembly forms individual annular chambers opposite each valve port and the grooved spool either closes or allows flow between adjacent chambers. The position of the spool determines which ports are open or closed.

The spool is moved by way of a manually or mechanically operated mechanism normally against a return spring. Operation may be by application or removal of a pilot air supply acting on a pilot piston. This form of control is utilized for electrical actuation where integral solenoid valves control the pilot air supply.

Specifications

45-120 PSIG
-20° C to +65° C (I/S only)
-20° C to +82° C
Non Lubricated Filtered Air to 20 Microns

Field Wiring

Complete the electrical wiring in accordance with local and National Electrical Codes. The ground wire should be secure under the green screw. Check all screws for tightness. If the installation is in a hazardous area, all electrical leads must be sealed with an approved compound, in accordance with local and National Electrical Codes unless the switches are hermetically sealed. (NEC 5051-5)

Always check the nameplate to make sure the approval ratings coincide with the application.

CAUTION

To prevent ignition of hazardous atmospheres, replace cover before actuating the electrical circuits. Keep cover tightly closed when in operation.

(Air Line) Designation

1/4" NPT or 1/4" BSP air po	orts for inlet, outlet, and exhaust
Description of Operation	
Solenoid De-energized	air flows from Inlet Port 1 to Port 2 and exhausts from Port 4 to Port 5.
Solenoid Energized	air flows from Inlet Port 1 to Port 4 and exhausts from Port 2 to Port 3.

(Air Line) Installation Considerations

Air Mains and lines should be large enough to avoid excessive pressure loss under conditions of maximum flow. Air lines should be installed with as few restrictions as possible if the cost of compressed air is to be kept to a minimum. Sharp turns in piping should be avoided for more efficient air flow and economical air power. It is advisable to pitch the mains in the direction of air flow so that both gravity and air flow will carry the water to traps or water legs located at frequent intervals.

To help in preventing condensed moisture from reaching the point of usage, down pipes should never be taken directly from the bottom of air pipes or mains. Connection should be made at the top of the main and a long radius return bend used.

Air Flow

Pipe sizes are normally determined on semi empirical lines, basis for selection being an acceptable pressure drop e.g. not more than 10% of the applied pressure. In sizing pipes, consideration should be given to likely future demands, as a system will be inefficient if the demand outgrows the supply. It is always better to over size mains as this will reduce air velocity and make water separation more effective.

Air Service Equipment

The importance of proper filtration (20 Micron) and lubrication of the air supply to pneumatic equipment can never be over-emphasized as a means of decreasing friction and preventing corrosion and wear due to moisture and abrasive solids being present in the air supply. At higher pressures than recommended, pneumatic equipment can wear excessively with no significant increase in output and compressed air is consequently wasted.

There is much to be gained, therefore, from providing pneumatic equipment with serviced air by including suitable air line filters, pressure regulators and lubricants in the installation.



Tubes and Fittings

The use of copper, stainless steel, nylon or polyethylene tube is recommended for piping up air circuits and equipment. As a general rule, pipe threaded fittings should not be assembled to a specific torque because the torque required for a reliable joint varies with thread quality, port and fitting materials, sealant used, and other factors. The suggested method of assembling pipe threaded connections is to assemble them finger tight and then wrench tighten further to a specified number of turns from finger tight. The assembly procedure given below is for reference only, the fitting should not be over tightened for this will lead to distortion and most likely, complete valve failure.

- 1. Inspect port and connectors to ensure that the threads on both are free of dirt, burrs and excessive nicks.
- 2. Apply sealant/lubricant or Teflon tape to the male pipe threads. With any sealant tape, the first one or two threads should be left uncovered to avoid system contamination.
- 3. Screw the connector into the port to the finger tight position.
- 4. Wrench tighten the connector approximately 1 2 turns (to seal) from finger tight. Again this is only reference the fitting should NOT be over tightened.

Maintenance

Routine maintenance is usually confined to the periodic replenishment of Dow Corning III lubricant or equivalent to spool and spring.

Coil Replacement

- 1. Verify that the electrical power to the coil is off.
- 2. Carefully remove the clear exhaust tube from the fitting by sliding each collar to the middle of the tube and then sliding the tube off of the barbed ends.
- 3. Remove the coil leads from the terminal block, noting terminal connections.
- Note the wire route of the coil leads and cut the wire tie that holds the coil leads to the terminal post.
- 5. Loosen and remove the coil retaining nut.
- 6. Turn the coil 90° so the leads are positioned from the top of the coil to the side and slide the coil off of the core tube.
- 7. With the coil leads positioned to the right of the coil (as in Step 6), slide the replacement coil over the core tube until it bottoms. The lettering on the coil should be right side up with respect to the valve body.
- 8. Install the new coil retaining nut until it is "hand tight".
- 9. Route the coil lead wires as before insuring sufficient clearance for moving parts, and using the replacement wire tie, affix the coil leads to the terminal post.
- 10. Following the wiring diagram on the inside of the cover assembly, insert and fasten coil lead wires into the terminal block. Ensure that bare wires are clamped.
- 11. Re-install the clear exhaust tube over the barbed fittings making sure the collars are secure behind the barbed recess.

Valve Replacement

- 1. Verify that the electrical power to the coil and air supply to the valve as both off.
- 2. Remove all piping from the valve assembly.
- 3. Remove the coil as described above in the "Coil Replacement" procedure steps 1-6. Note: If the coil is not to be replaced, skip steps 3 & 4.
- 4. Remove the barbed fitting from the bottom of enclosure if damaged.
- 5. Remove the valve retaining nut and lock washer from the valve assembly.
- 6. Remove the valve assembly from the conduit entry.
- 7. Verify that the o-ring is in position on the replacement valve assembly.
- 8. Pass the core tube through the conduit entry and position the valve as desired (increments of 90°). Verify that the locating pins are completely inserted into the locating holes on the enclosure.
- 9. Replace the lock-washer and valve retainer nut and tighten until lock-washer is flat.
- 10. Replace the coil as described above in the "Coil Replacement" procedure, steps 7-11.
- 11. Reinstall the piping to the valve assembly.



Namur shaft details