



VPIF

## INTRODUCTION

The Valve Position Indicator, model VPIF, is a digital monitoring module for use with all Sealed Motor Valve (SMV) models except HMSV. The VPIF displays the valve position during normal (automatic) operation, and can also be used to locally open or close the valve. This is particularly helpful when servicing or recalibrating the valve is required.

The large LED readout displays the valve position (in percent). The VPIF contains an internal independent current source, which is switch selectable for 4 mA (close) and 20 mA (open).

The VPIF can be mounted on or near the valve for ease of use and visibility. This provides better accessibility for technicians when valves are mounted high in the air or in obstructed areas. The VPIF can be mounted up to 10 feet (3 meters) in any direction from the valve. VPIEC extension cables are available where more length is required.

## KEY FEATURES

- Provides local indication of the SMV valve position
- Facilitates SMV recalibration
- Versatile installation options
- Large LED readout
- Watertight corrosion resistant enclosure (NEMA4X)
- Uses same supply voltage as SMV

## Specifications, Applications, Service Instructions & Parts

### VPIF VALVE POSITION INDICATOR

for use with  
Sealed Motor Valve Model Series  
HMXV, HMMR, HMMV

## ADVANTAGES

The VPIF displays valve position locally while passing the feedback signal if it is to be monitored remotely. For recalibration of SMV, the VPIF will output either 4 mA (close) or 20 mA (open). An externally mounted, waterproof three position switch is used for positioning of the SMV.

The VPIF valve position feedback can alert operators to unstable control schemes. This feature is very important to the proper operation of the refrigeration system and the life of the Sealed Motor Valve. The VPIF is compact and reliable at very low temperatures. Waterproof quick disconnect connectors allow for easy removal of the SMV power head for service.

## APPLICATIONS

The VPIF may be installed on the following Sealed Motor Valve series models:

- HMXV
- HMMV
- HMMR

## MATERIAL SPECIFICATIONS

### Electrical

Readout: LED, 0.0 – 100.0%

Signal Output to SMV:

Automatic: Pass through

Open: 20 mA

Close: 4 mA

Power Supply: 24V AC

VPIF Power Consumption: 3.6 VA

Housing: Watertight, NEMA4X (IP65)

Ambient Temperature: -20°F to +125°F  
(-30°C to +50°C)

Cables: 7 wires - marked every foot one thru six with the seventh yellow/green (earth ground), 18 AWG wire cable with waterproof, quick disconnect connectors

## INSTALLATION

The VPIF is shipped in a box with the Sealed Motor Valve and comes factory calibrated and tested; ready to use. Mountable on the valve or to any flat surface. The clear cover must be removed to access the four plate bolts. These same four holes are used to mount the VPIF on a flat surface. Replace the clear cover when complete.

## WIRING

The VPIF is provided with waterproof quick disconnect cables. If the VPIF is mounted on the valve, the 8 foot cable and the 2 foot cable with pigtails can be connected together for a total of 10 feet to the customer supplied junction box.

If the VPIF is mounted separately from the valve, the 8 foot cable is connected to the SMV power head. The VPIF can be mounted up to 10 feet away from the valve. For greater distances, additional 8 foot VPIEC Extension Cables can be connected. Refer to Figure D.

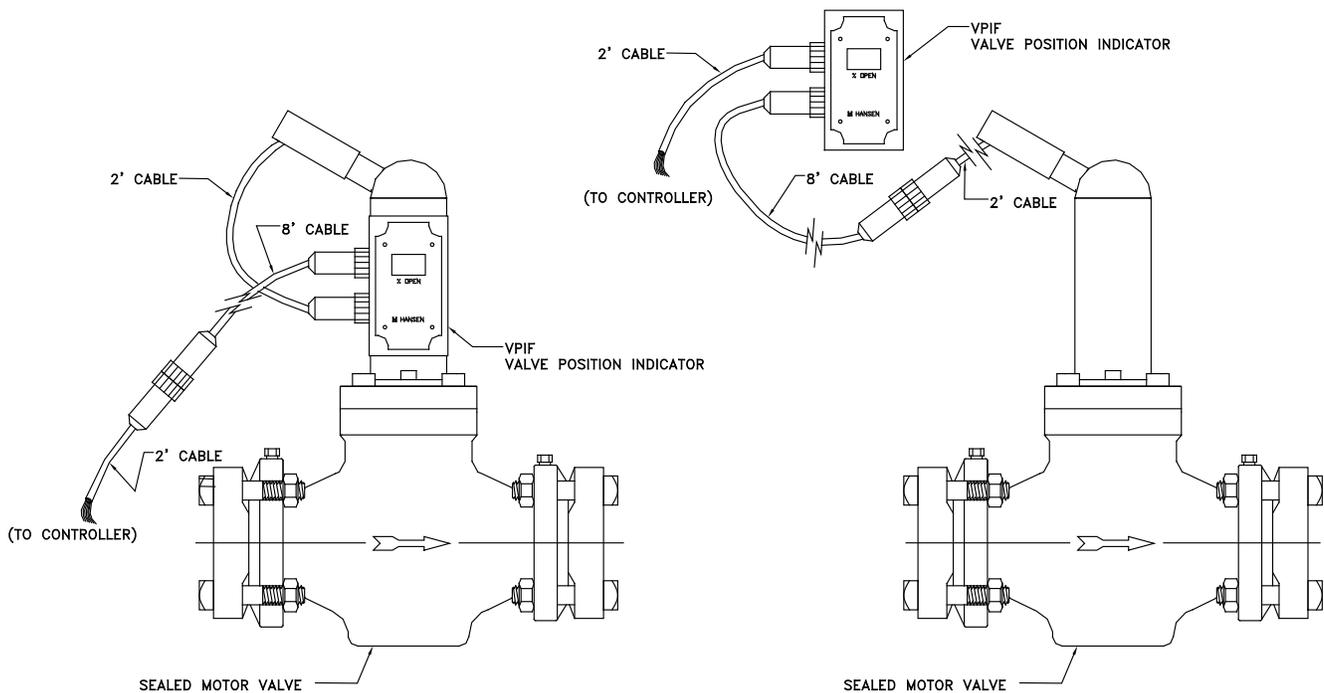
Proper wiring is very important to the operation of the Sealed Motor Valve. Correct wire size for 24V AC power to the power head must be selected for the distance and number of valves. See 24V AC Power Wiring Table 1.

TABLE 1: 24V AC POWER WIRING

24V AC POWER WIRING (WIRES NO. 1 AND 2) (90 VA PER VALVE REQUIRED)	AWG WIRE GAUGE (mm <sup>2</sup> ) NUMBER OF VALVES POWERED			
	1	2	3	4
CABLE LENGTH ft (m)				
50 (15)	18 (1,0)	16 (1,5)	14 (2,5)	12 (4,0)
100 (30)	16 (1,5)	12 (4,0)	10 (6,0)	10 (6,0)
150 (46)	12 (2,5)	10 (6,0)	8 (10,0)	8 (10,0)
200 (61)	12 (4,0)	10 (6,0)	8 (10,0)	
300 (91)	10 (6,0)	8 (10,0)		

## TYPICAL INSTALLATION

Figure A

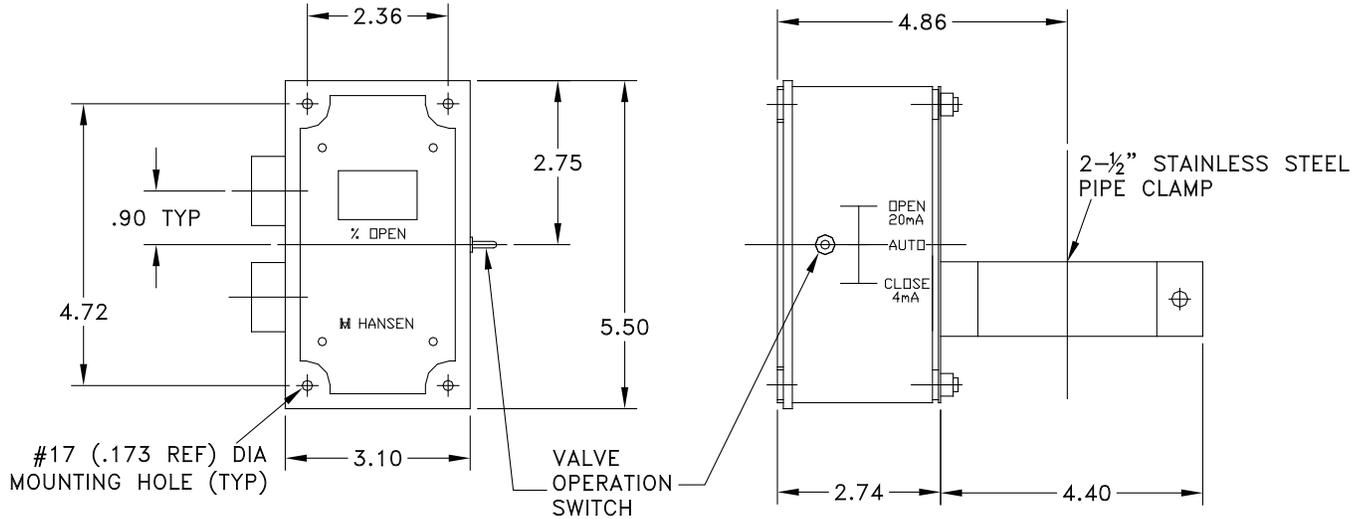


VPIF MOUNTED ON VALVE

VPIF MOUNTED REMOTELY

## VPIF INSTALLATION DIMENSIONS, INCH (MM)

Figure B



### VPIF MOUNTED REMOTELY

### VPIF MOUNTED ON VALVE

## RECALIBRATION INSTRUCTIONS

Hansen Sealed Motor Valves are factory calibrated, and hold their calibration during shipment, power outages, etc. However, valve disassembly or manual opening with the MOVT (Manual Operation Valve Tool) does require subsequent recalibration. Therefore, after removing or replacing the 4-20 mA power head of a Sealed Motor Valve, recalibrate the valve. Recalibration synchronizes the control input with the valve position; that means, for example, a 12 mA input (50%) would result in the valve moving to the half-open position.

Recalibration requires the ability to control the 4-20 mA control input to the motor between 4 mA and 20 mA, and requires the ability to allow the valve to stroke fully open and closed. For valves shipped after July 4, 2006, or retrofitted valves with VPIF, the 4 mA and 20 mA signal to calibrate the valve is part of the function of the VPIF. If the valve is not equipped with a VPIF, then the 4 mA and 20 mA to calibrate must come from the computer or separate signal generator. Only qualified refrigeration service personnel should perform this procedure, and proper precautions taken to prevent a hazardous or undesirable occurrence resulting from operating the valve from open and closed.

1. Secure the refrigeration system to allow the valve to open and close fully without causing undesirable system problems to occur.
2. Mount and secure the motor on the sealed motor valve. Connect electrical wiring in accordance to the valve and controller manufacturers specifications.
3. Install "Calibration Key" over 'X' on side of motor and secure with strap.

4. Increase the control input to 20 mA or slightly greater. Move VPIF switch to up (OPEN) position. Maintain at least 20 mA for at least two minutes. This will give the valve time to move to the wide open position and calibrate its position.

Note: Some computer control systems have lag times before the control input is sent to the valve.

5. Decrease the control input to 4 mA or less. Move VPIF switch to down (CLOSE) position. Maintain 4 mA or less for at least two minutes. This will give the valve time to move to the completely closed position and calibrate its zero point.
6. Again increase the control input to at least 20 mA. Move VPIF switch to up (OPEN) position. Maintain at least 20 mA for at least two minutes. This will give the valve time to move to the wide open position and set its span.
7. The valve should now be calibrated and in the wide open position.
8. Remove "Calibration Key" and store. The valve will operate satisfactorily if the "Calibration Key" remains over the "X", but the valve will recalibrate each time the control input is at 4 mA or 20 mA for more than the two minutes.
9. Return valve operation switch to (AUTO).

## FEEDBACK MODES

There are two feedback modes for the VPIF, “Local Display Only” or “Local Display and Remote Feedback”. To change the setting, the VPIF must be opened and manually set to the proper system requirements. Improper settings can result in damage to the system controller and/or VPIF.

The VPIF is shipped from the factory with the jumper in the “Local Display Only” mode.

- 1) **Local Display Only** - This standard mode is used when the controller is not equipped with a valve position display. The VPIF always displays valve position in the AUTO, OPEN or CLOSE switch positions. (Jumper on pins 1 and 2).
- 2) **Local Display and Remote Feedback** – With switch in AUTO, valve position is read at both the VPIF and controller (with valve position display). With switch in OPEN or CLOSE position, valve position is displayed on both the VPIF **and** the customer or Hansen controllers with valve position display. (Place jumper on one post for future use).

## CHANGING THE FEEDBACK MODE

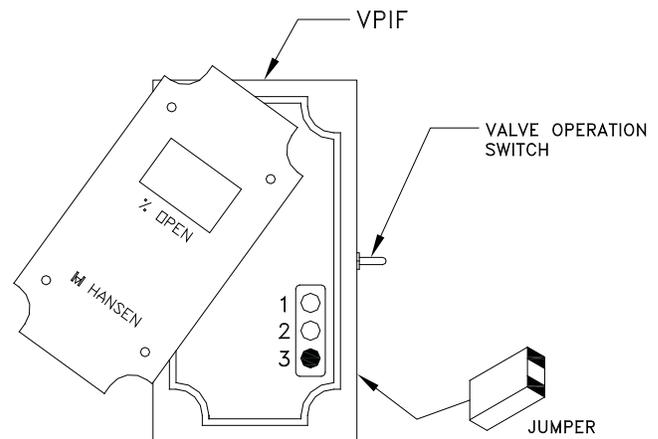
Tools required: 2mm hex key, Phillips head screwdriver and needle nose pliers.

To change the feedback mode, move the two position jumper to the appropriate setting. Take care not to touch the electronic components as static electricity may damage the electronic circuits.

1. Remove power and control signal lines from the VPIF by removing the external quick disconnect connector labeled “TO CONTROLLER”.
2. Remove the clear cover from the VPIF.
3. Remove the black acrylic plastic faceplate by removing the four buttonhead hex keyed screws. Use a 2mm hex key.
4. Rotate the bottom of the plastic plate to the left. Only lift the plate enough to clear the side of the housing. *Refer to Figure C.*
5. Use needle nose pliers to make the required changes.
6. Assemble unit in reverse order.

### VPIF FACEPLATE

Figure C



#### **Local Display Only Mode:**

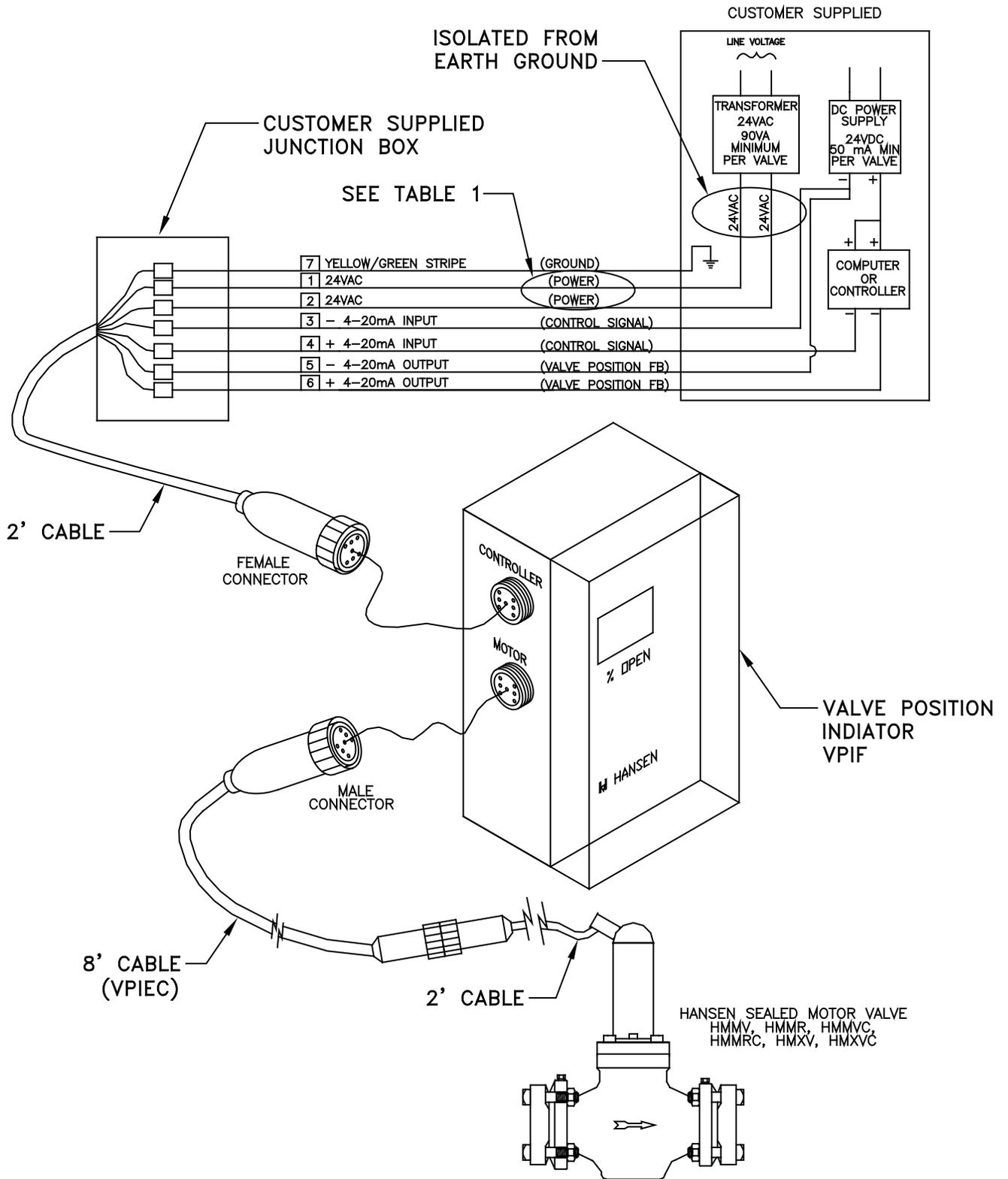
Jumper on pins 1 and 2 (Factory Setting).

#### **Local Display and Remote Feedback Mode:**

No jumper connection. Place jumper on one post for future use.

# MODEL: VPIF WIRING

Figure D



## RETRO-FIT KITS FOR EXISTING SEALED MOTOR VALVE INSTALLATIONS

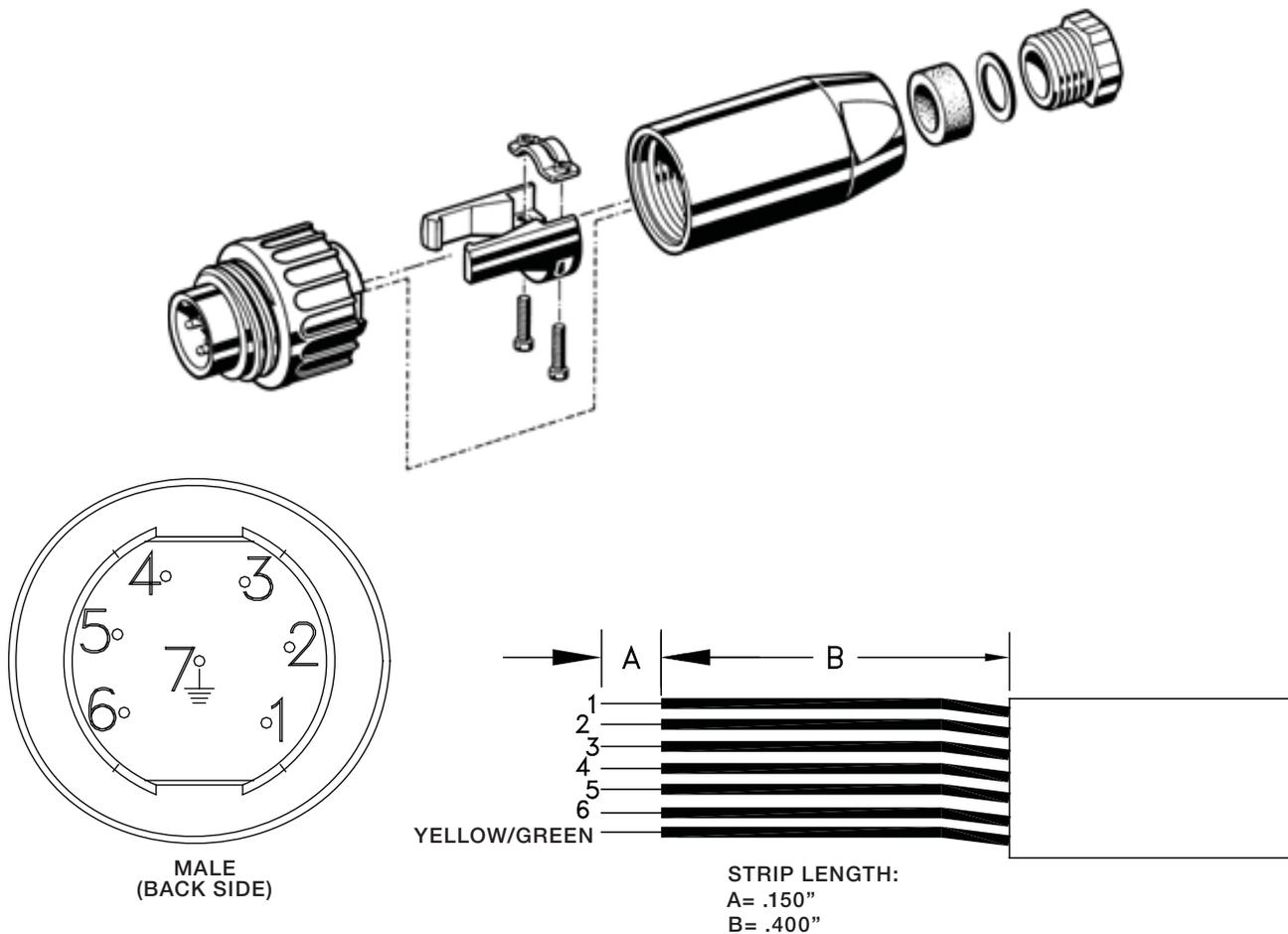
Retro-fit Kits are available to add the VPIF to existing Sealed Motor Valve installations. Kit number 75-1210 includes the VPIF, cables and junction box with wire nuts. The VPIF is simply spliced into the existing wiring. All wires are numbered each foot to aid in correct wire connections.

To add a quick disconnect connector on SMV power head, use Kit number 75-1211, which includes a field solder male cable connector. See *Figure E* for the correct terminal.

### VPIF FIELD SOLDERED CABLE CONNECTORS

(For 75-1211 VPIF Retro-fit Kit)

Figure E



- 1) EACH WIRE HAS A NUMBER IDENTIFIER (1 THRU 6). GROUND (YELLOW/GREEN) TO #7 PIN.
- 2) MATCH UP EACH WIRE TO ITS CORRESPONDING CONNECTOR POSITION AND SOLDER.

## TROUBLESHOOTING GUIDE FOR VPIF

<b><i>Problem/Complaint</i></b>	<b><i>Check/Solution</i></b>
Valve stuck	<ul style="list-style-type: none"> <li>• Wire size/gauge too small</li> <li>• Supply power not adequate</li> <li>• Cable connectors wired incorrectly</li> <li>• Check signal polarity - #3 and #4, #5 and #6 wires</li> <li>• Excessive dirt in valve; Use MOVIT tool to check for rough movement</li> </ul>
No valve position feedback or display -25%	<ul style="list-style-type: none"> <li>• Check 24V DC power supply</li> <li>• Check signal polarity - #3 and #4, #5 and #6 wires</li> <li>• Cable connectors wired incorrectly</li> <li>• VPIF in the Local and Remote Feedback Mode</li> </ul>
No visual data on LED display	<ul style="list-style-type: none"> <li>• Check 24V AC supply power is good (+/-5%)</li> <li>• Cable connectors wired incorrectly</li> </ul>
Valve % open span is very limited	<ul style="list-style-type: none"> <li>• Recalibrate SMV</li> </ul>
VPIF indicates % open greater than 100.0%	<ul style="list-style-type: none"> <li>• Recalibrate SMV</li> <li>• +/- 3% is within tolerance</li> </ul>
VPIF indicates % open less than 0.0%	<ul style="list-style-type: none"> <li>• Recalibrate SMV</li> <li>• +/- 3% is within tolerance</li> </ul>
VPIF LED display value is greater than or less than what is indicated by the system controller or PLC	<ul style="list-style-type: none"> <li>• If reading between the two devices are within +/- 3%, this is normal</li> </ul>
System computer or PLC displays open for SMV valve position feedback	<ul style="list-style-type: none"> <li>• VPIF configured in wrong feedback mode</li> <li>• Cable connectors wired incorrectly</li> <li>• Check signal polarity - #3 and #4, #5 and #6 wires</li> </ul>
VPIF % open tenths position is not stable	<ul style="list-style-type: none"> <li>• +/- 3% is within tolerance</li> </ul>
VPIF % open is not stable	<ul style="list-style-type: none"> <li>• Check wiring is sufficient size for the distance from 24V AC power supply and number of valves connected to the 24V AC power supply</li> <li>• Check 24V AC power source</li> <li>• System controller or PLC operation is erratic</li> <li>• RFI/EMI interference</li> </ul>

## CAUTION

The VPIF is designed for use with Hansen Sealed Motor Valves (model series HMXV, HMMR and HMMV) only. Read these instructions and related safety precautions before selecting, using, or servicing these devices.

## WARRANTY

Hansen electrical and electronic parts are guaranteed against defective materials and workmanship for 90 days F.O.B. our plant. All other components are guaranteed for one year F.O.B. our plant. No consequential damages or field labor is included.

## WARNING

As with all electronics and mechanical components, there is a limited life expectancy. An expected life of seven to ten years is typical. This should be understood as only a suggested replacement time period. Actual ambient conditions, contaminants, quality of electric current, voltage, etc., may necessitate a different replacement schedule. Regardless, the VPIF should be inspected at least annually to ensure safe and continuous service. See also Safety Precautions in the current List Price Bulletin and the Safety Precautions Sheet supplied with the product.

## ORDERING INFORMATION

CATALOG NO.	DESCRIPTION
75-1208	Power Head Upgrade Kit (includes Power Head, VPIF, VPIF bracket and gasket cables)
75-1213	Power-Close Power Head Upgrade Kit (includes Power-Close Power Head, VPIF, VPIF bracket gasket and cables)
75-1210	VPIF Retro-fit Kit (includes VPIF, two cables and junction box)
75-1211	VPIF Retro-fit Kit (includes VPIF, cable and solder quick disconnect cable connector)
VPIF	Valve Position Indicator (VPIF) Monitor for SMV series models HMXV, HMMR and HMMV with 4-20mA (less cables & bracket)
VPIEC	8' Extension Cable

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