IMVS2 - SMART INTEGRATED VALVE MONITORING DEVICE

IMVS2 is a smart diagnostic device for low and high pressure application with BUS communication protocol capability.

GENERAL APPLICATION

IMVS2 is a SMART device for predictive maintenance and safety able to perform partial and full stroke test without any impact to the process and provide SIL reliability.

APPROVALS

- ATEX certified: Ex 2GD Ex d [ia] IIC (IIB with Beacon) T5 Gb
  - Ex II 2GD Ex d [ia] IIC (IIB with Beacon) T4 Gb
- CSA
- CSAus and CSAc Class and Division both available
  [please refer to IOM par 2.5.1 for detail]
- IECEx Ex d [ia] IIC (IIB with Beacon) T4 Gb
- INMETRO
- EAC
- CCoE

TECHNICAL DATA

Ambient temperature -40°C to 75°C (-40°F to 167°F)
Power supply
- 24-48 V DC Two isolated circuits for ESD applications [controlling up to 2 external solenoid valves]
- Max device power consumption: 3W
Environmental protection
- IP66/68 (EN 60529)
  - NEMA 4, 4X & 6 (NEMA 250)
Certification
- ATEX Directive 2014/34/UE
- PED Directive 2014/68/EU
- EMC Directive 2004/108/EC
Functional safety
- Suitable for use in any SIL level applications according to IEC 61508
- Data transmission with Hard-wired point-to-point connection:
  - Open and close limits
  - Common failure alarm
  - PST status
  - In progress, passed and failed contacts
- Hart® 7 with DD Files and FDT & DTM certified and MODBUS® communication protocols
- OLED display with 0-180° orientation

FEATURES

- Safety valve maintenance
- Full advanced diagnostic capability
- Full and Partial stroke test
- SOV test
- Auto-calibration
- User friendly local/remote configuration
- Wireless configuration and data transmission via Bluetooth® interface
- BIFFI Assistant software configuration tool
- Log-in password with 4 different permission levels
- Digital input for remote control (PST and FST)
- Digital input rating: 19.2 - 57.6 V DC [current consumption 2-11 mA]
- Output contacts for position indication and diagnostics:
  - 2 output contacts for position indication [NO/NC configurable]
  - 1 output contact for alarm indication [NO/NC configurable]
  - 3 output contacts for PST status [In Progress, Passed, Failed]
- output contacts rating: up to 57.6 V DC and 0.5 A
- Data transmission with Hard-wired point-to-point connection:
  - Open and close limits
  - Common failure alarm
  - PST status
  - In progress, passed and failed contacts
- Hart® 7 with DD Files and FDT & DTM certified and MODBUS® communication protocols
- OLED display with 0-180° orientation

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VCTDS-07228-EN 19/06
WIRING DIAGRAMS

1. Configuration A - Wiring Diagram

Mandatory Connections:
- MAIN SUPPLY (terminals 3-4)
- SIS A SUPPLY (terminals 5-6)
- SOVA (terminals 9-11)

**CONFIGURATION A**
Single or double acting actuator
Single solenoid valve supplied/controlled by SIS

Diagram shows IMVS supplied by 24÷48 VDC in steady condition (no PST in progress)
2. Configuration B - Wiring Diagram

Mandatory Connections:
- MAIN SUPPLY [terminals 5-6]
- SOVA [terminals 9-11]

Recommended Connections:
- SOLENOID A CONTROL [terminals 19-20]

**CONFIGURATION B**

Single or double acting actuator
Single solenoid valve supplied by main supply and controlled by separate signal

Diagram shows IMVS supplied by 24÷48 VDC in steady condition
(no PST in progress)
3. Configuration C - Wiring Diagram

Mandatory Connections:
- MAIN SUPPLY (terminals 3-4)
- SIS A SUPPLY (terminals 5-6)
- SIS B SUPPLY (terminals 12-13)
- SOVA (terminals 9-11)
- SOVB (terminals 16-18)

**CONFIGURATION C**
Single or double acting actuator
Single solenoid valves supplied/controlled by two independent SIS signals

Diagram shows IMVS supplied by 24÷48 VDC in steady condition
(no PST in progress)
**IMVS2 - SMART INTEGRATED VALVE MONITORING DEVICE**

4. Configuration D - Wiring Diagram

**Mandatory Connections:**
- MAIN SUPPLY (terminals 5-6)
- SOVA (terminals 9-11)
- SOVB (terminals 16-18)

**Recommended Connections:**
- SOLENOID A CONTROL (terminals 19-20)
- SOLENOID B CONTROL (terminals 21-22)

**CONFIGURATION D**

Single or double acting actuator

Redundant solenoid valves supplied by main supply and controlled by separate signals

Diagram shows IMVS supplied by 24÷48 VDC in steady condition
(no PST in progress)
5. Configuration E - Wiring Diagram

Mandatory Connections:
- MAIN SUPPLY (terminals 3-4)
- SIS A SUPPLY (terminals 5-6)
- SOVA (terminals 9-11)
- SOVB (terminals 16-18)

Recommended Connections:
- SOLENOID A CONTROL (terminals 19-20)
- SOLENOID B CONTROL (terminals 21-22)

**CONFIGURATION E**

Single or double acting actuator
Dual solenoid valves supplied by SIS and controlled by separate signals

Diagram shows IMVS supplied by 24÷48 VDC in steady condition
(no PST in progress)
6. Configuration F - Wiring Diagram

Mandatory Connections:
- MAIN SUPPLY (terminals 5-6)
- SOVA (terminals 9-11)
- SOVB (terminals 16-18)

Recommended Connections:
- SOLENOID A CONTROL (terminals 19-20)
- SOLENOID B CONTROL (terminals 21-22)

**CONFIGURATION F**

Double acting actuator
Dual solenoid valves supplied by main supply and controlled by separate signals

Diagram shows IMVS supplied by 24÷48 VDC in steady condition (no PST in progress)
7. Configuration G - Wiring Diagram

Mandatory Connections:
- MAIN SUPPLY (terminals 5-6)
- SOVA (terminals 9-11)

**CONFIGURATION G**

Single or double acting actuator
Single solenoid valve supplied and controlled by main supply

**PNEUMATIC ACTUATOR**

**HYDRAULIC ACTUATOR**

Diagram shows IMVS supplied by 24÷48 VDC in steady condition
(no PST in progress)
8. Configuration H - Wiring Diagram

Mandatory Connections:
- MAIN SUPPLY (terminals 3-4)
- SIS A SUPPLY [terminals 5-6]
- SOVA [terminals 9-11]
- SOVB [terminals 16-18]

**CONFIGURATION H**
Single or double acting actuator
Redundant solenoid valves supplied/controlled by SIS

Diagram shows IMVS supplied by 24÷48 VDC in steady condition
(no PST in progress)
9. Hart Card - Wiring Diagram

The HART Card is optional.

4-20 mA + Hart card position or pressure feedback signal (optional)

10. Modbus Card - Wiring Diagram

The MODBUS Card is optional.
# IMVS SELECTION GUIDE

## Example: 234IMV C A 0 0 0 0 0 B

### Base Model

- **234IMV**: IMVS2 SS316 ESD/PST capability

### Pressure sensor configuration

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Single acting actuator up to 10 barg (145 psig) *</td>
</tr>
<tr>
<td>B</td>
<td>Double acting actuator up to 10 barg (145 psig) *</td>
</tr>
<tr>
<td>C</td>
<td>Single acting actuator up to 100 barg (1450 psig)</td>
</tr>
<tr>
<td>D</td>
<td>Double acting actuator up to 100 barg (1450 psig)</td>
</tr>
<tr>
<td>E</td>
<td>Single acting actuator up to 200 barg (2900 psig)</td>
</tr>
<tr>
<td>F</td>
<td>Double acting actuator up to 200 barg (2900 psig)</td>
</tr>
<tr>
<td>G</td>
<td>Single acting actuator up to 400 barg (5800 psig) **</td>
</tr>
<tr>
<td>H</td>
<td>Double acting actuator up to 400 barg (5800 psig) **</td>
</tr>
</tbody>
</table>

### Wiring Diagram configuration

- **A**: Single solenoid valve supplied/controlled by SIS Signal
- **B**: Single solenoid valve supplied by main supply and controlled by separate signal
- **C**: Redundant series/parallel solenoid valves supplied/controlled by two independent SIS signals
- **D**: Redundant series/parallel solenoid valves supplied by main supply controlled by separate signals
- **E**: Dual solenoid valves supplied by SIS and controlled by separate signals
- **F**: Dual solenoid valves supplied by main supply and controlled by separate signals
- **G**: Single solenoid valve supplied and controlled by main supply
- **H**: Redundant series/parallel solenoid valves supplied controlled by single SIS signal

### Bus Interface card

- **0**: Without bus interface
- **1**: HART+ 4-20mA Output Interface
- **2**: Modbus Interface
- **3**: HART + 4-20 mAh Output Interface - IMVS2000 replacement ***

### Material

- **0**: Full enclosure in SS 316 L
- **1**: Full enclosure in SS 316 L + Anticorrosive paint

### Beacon indicator

- **0**: Standard indicator
- **1**: Black/ yellow Beacon indicator
- **2**: Red/ green Beacon indicator

### Additional pressure sensor

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Not Installed</td>
</tr>
<tr>
<td>1</td>
<td>Sensor S3 10 barg (1450 psig) *</td>
</tr>
<tr>
<td>2</td>
<td>Sensor S3 100 barg (1450 psig)</td>
</tr>
<tr>
<td>3</td>
<td>Sensor S3 200 barg (2900 psig)</td>
</tr>
<tr>
<td>4</td>
<td>Sensor S3 400 barg (5800 psig) **</td>
</tr>
</tbody>
</table>

### Certification

- **0**: ATEX/IECEx
- **1**: CCOE - IP66/68 and nema 4, 4x and 6 (based on ATEX/IECEx)
- **2**: EAC - IP66/68 and nema 4, 4x and 6 (based on ATEX/IECEx)
- **3**: INMETRO - IP66/68 and NEMA 4, 4X and 6
- **4**: CSAc (please refer to IOM par 2.5.1 for detail)
- **5**: CSAus (please refer to IOM par 2.5.1 for detail)

### Shaft

- **B**: Shaft Standard Biffi
- **N**: Shaft Namur Type

### NOTE

Mounting kit when required, must be ordered separately by specifying the type of actuator (rotary or linear) and dimension of the interface.

- * Consult factory for availability
- ** Consult factory for availability (over 345 barg)
- *** Option to be used only to replace an IMVS2000 device