

Biffi IMVS2

Smart Integrated Valve Monitoring Device

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



This page is intentionally left blank

Table of Contents

Section 1: General Application

General Application 5

Section 2: Technical Data

Technical Data 5

Section 3: Features

Features 5

Section 4: Approvals

Approvals 5

Section 5: Wiring Diagrams

Configuration A 6
Configuration B 7
Configuration C 8
Configuration D 9
Configuration E 10
Configuration F 11
Configuration G 12
Configuration H 13
HART Card 14
Modbus Card 14

Section 6: IMVS Selection Guide

IMVS Selection Guide 15

This page is intentionally left blank

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.

Technical Data

Ambient Temperature:	-40 to 75 °C / -40 to 167 °F
Power Supply:	24 to 48 V DC Two isolated circuits for ESD applications (controlling up to 2 external solenoid valves)
Maximum Device Power Consumption:	3 W
Environmental Protection:	IP66/68 (EN 60529) NEMA 4, 4X and 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

Approvals

- II 2GD
Ex db [ia] IIC (IIB with Beacon) T4 Gb
Ex tb IIIC T135 °C Db
- IECEX
Ex d [ia] IIC (IIB with Beacon) T4 Gb
Ex tb IIIC T135 °C Db
- INMETRO
- EAC
- CCoE
- CCC
- CUTR
- UKCA

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
- Login password with 4 different permission levels
- Digital input for remote control (PST and FST)
- Digital input rating: 19.2 to 57.6 V DC (current consumption 2 to 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, Failed) contacts
- HART® 7 with DD Files and FDT and DTM certified and Modbus® communication protocols
- OLED display with 0 to 180° orientation

Wiring Diagrams

Configuration A

Figure 1.

CONFIGURATION - A - SINGLE OR DOUBLE-ACTING ACTUATOR SINGLE SOLENOID VALVE SUPPLIED/CONTROLLED BY SIS

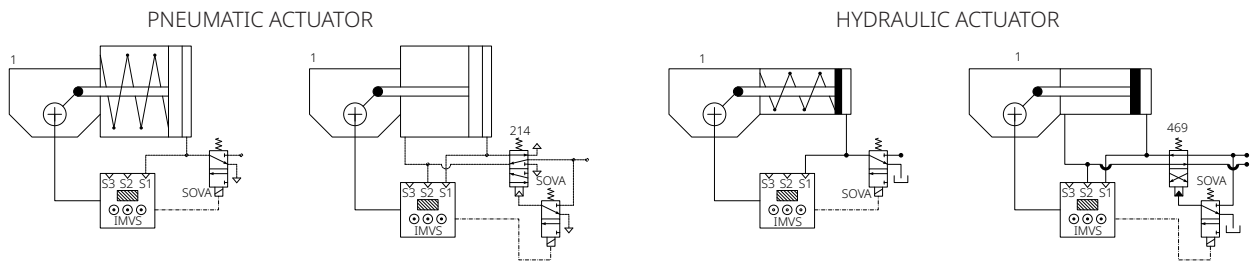
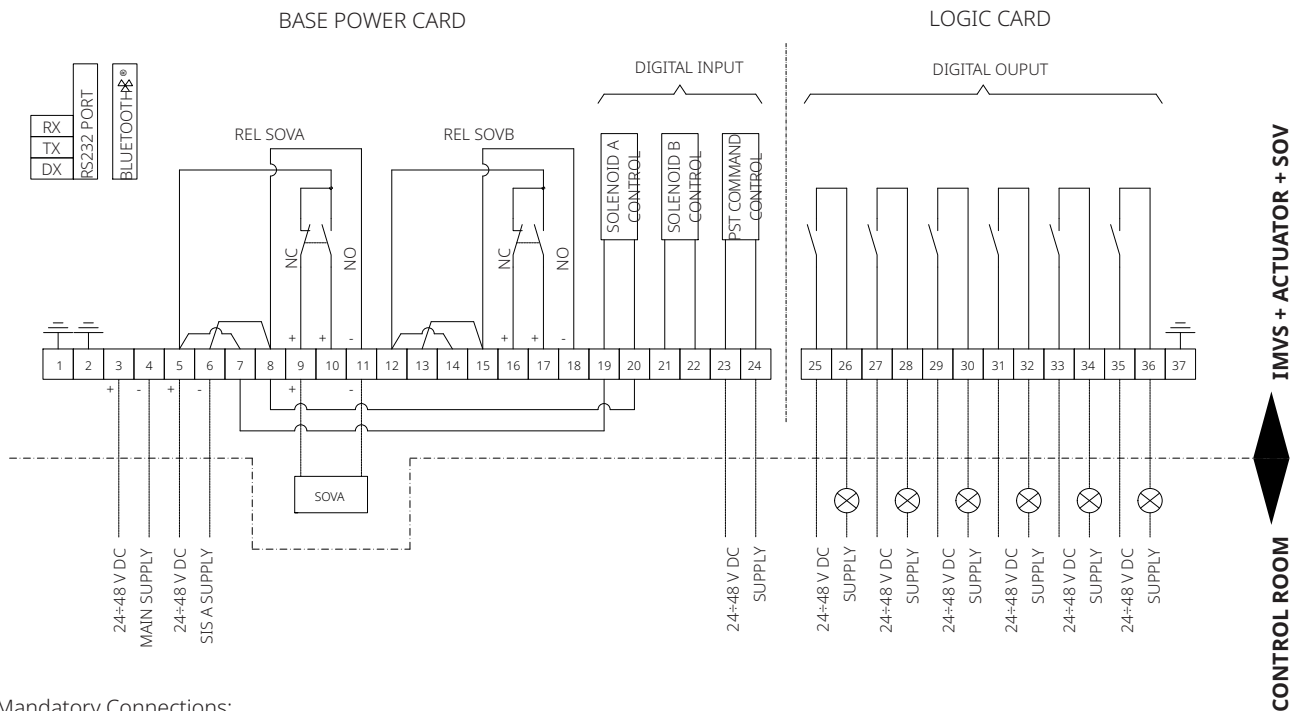


DIAGRAM SHOWS IMVS SUPPLIED BY 24÷48 V DC IN STEADY CONDITION (NO PST IN PROGRESS)



Mandatory Connections:

- MAIN SUPPLY (terminals 3 to 4)
- SIS A SUPPLY (terminals 5 to 6)
- SOVA (terminals 9 to 11)

Configuration B

Figure 2.

**CONFIGURATION - B -
SINGLE OR DOUBLE-ACTING ACTUATOR
SINGLE SOLENOID VALVE SUPPLIED BY MAIN SUPPLY AND CONTROLLED BY SEPARATE SIGNAL**

PNEUMATIC ACTUATOR

HYDRAULIC ACTUATOR

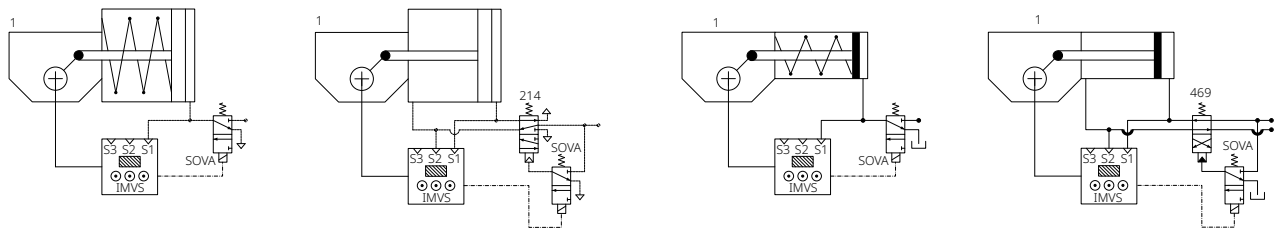
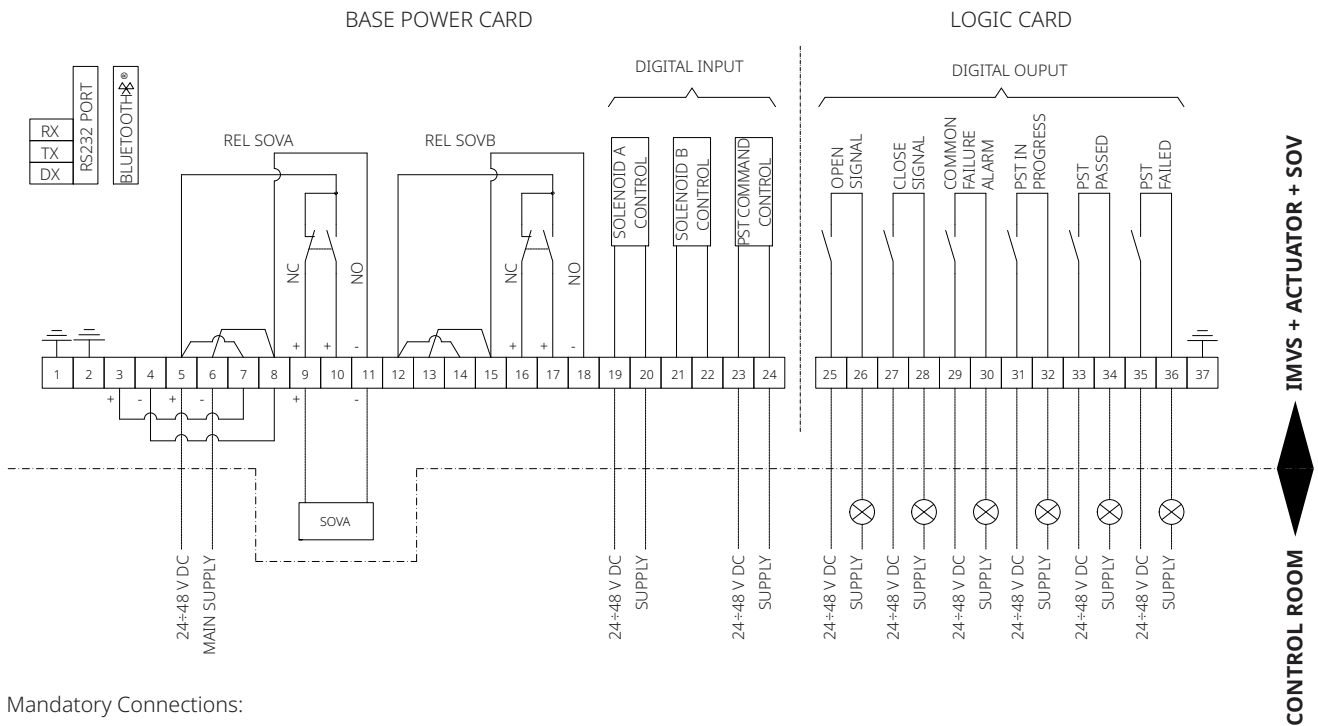


DIAGRAM SHOWS IMVS SUPPLIED BY 24÷48 V DC IN STEADY CONDITION (NO PST IN PROGRESS)



Mandatory Connections:

- MAIN SUPPLY (terminals 5 to 6)
- SOVA (terminals 9 to 11)

Recommended Connections:

- SOLENOID A CONTROL (terminals 19 to 20)

Configuration C

Figure 3.

**CONFIGURATION - C -
SINGLE OR DOUBLE-ACTING ACTUATOR
SINGLE SOLENOID VALVES SUPPLIED/CONTROLLED BY TWO INDEPENDENT SIS SIGNALS**

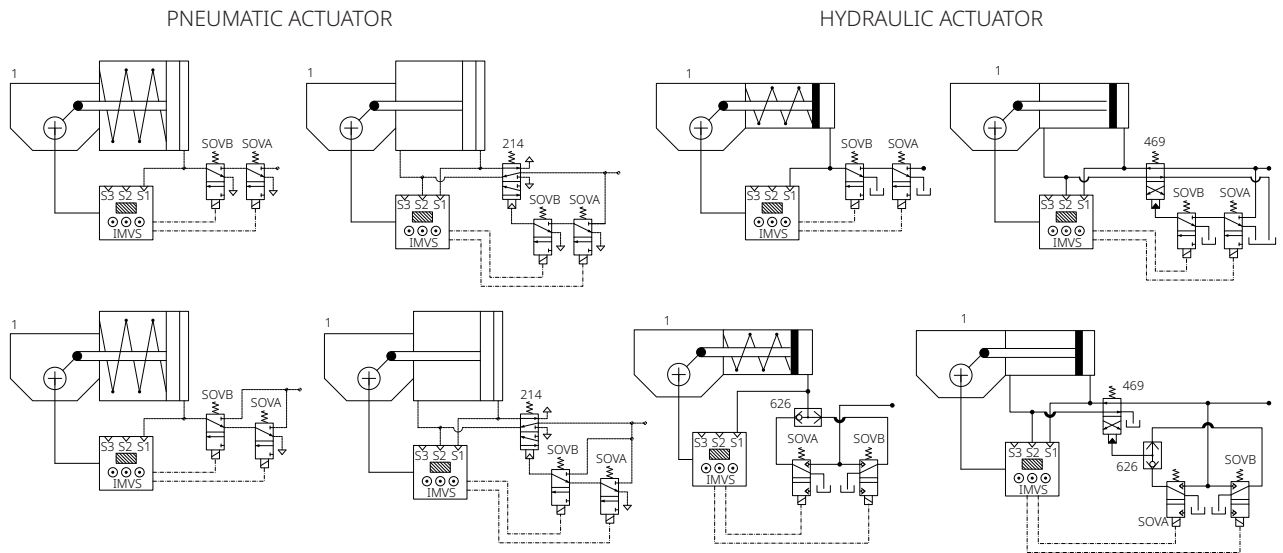
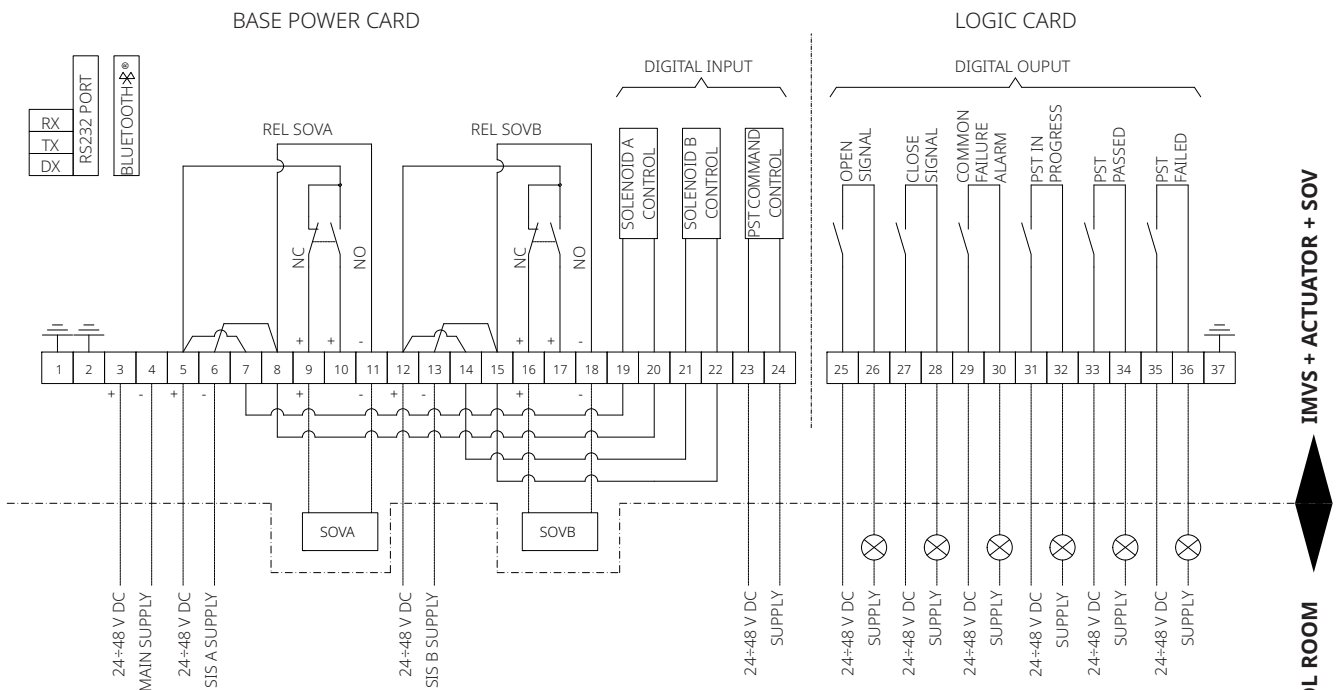


DIAGRAM SHOWS IMVS SUPPLIED BY 24÷48 V DC IN STEADY CONDITION (NO PST IN PROGRESS)



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

Configuration D

Figure 4.

**CONFIGURATION - D -
SINGLE OR DOUBLE-ACTING ACTUATOR
REDUNDANT SOLENOID VALVES SUPPLIED BY MAIN SUPPLY AND CONTROLLED BY SEPARATE SIGNALS**

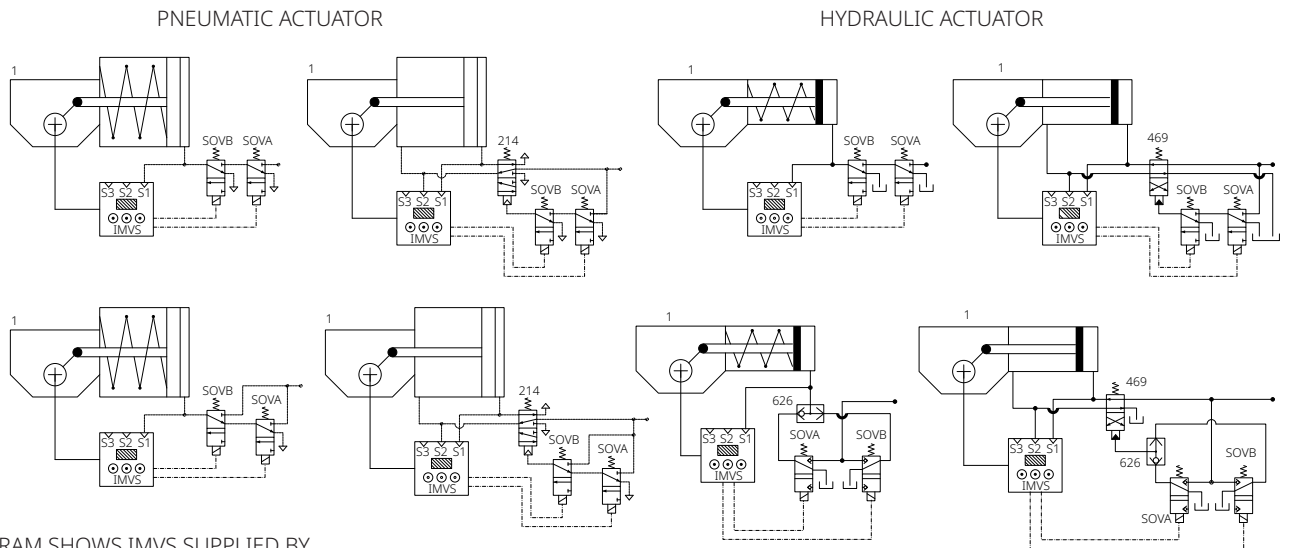
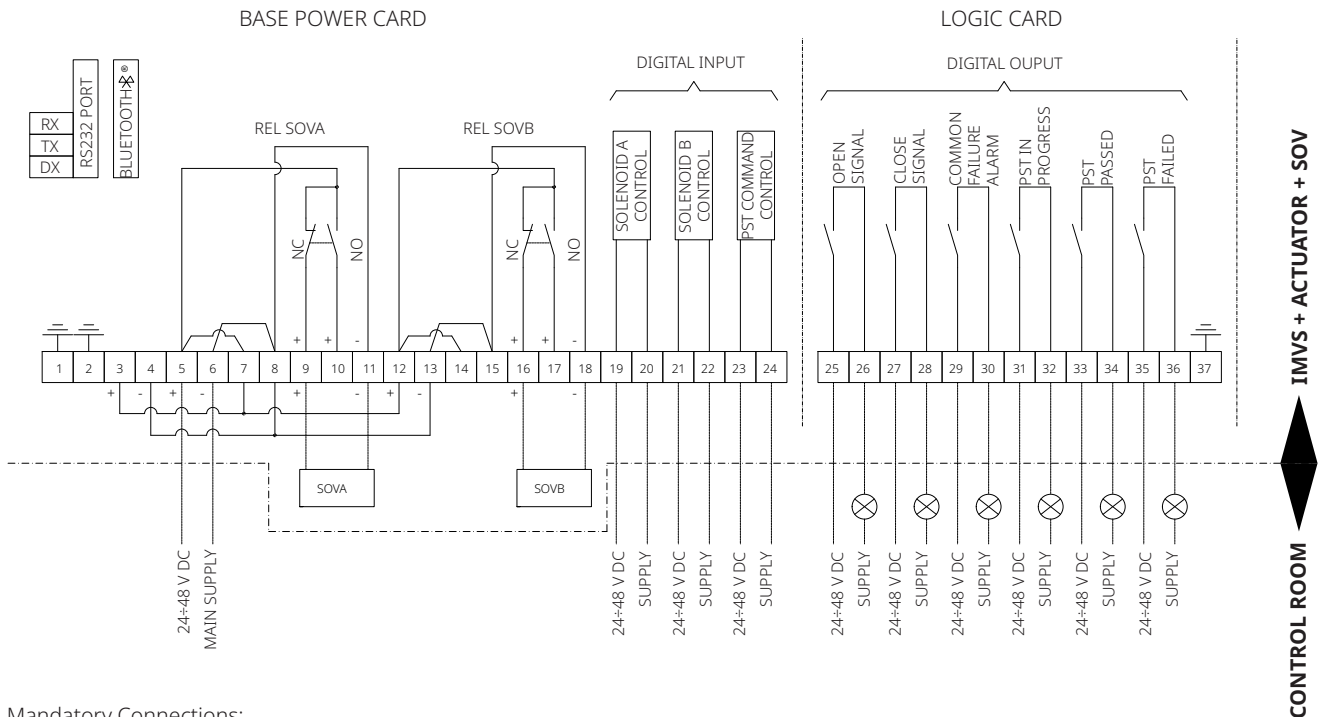


DIAGRAM SHOWS IMVS SUPPLIED BY 24÷48 V DC IN STEADY CONDITION (NO PST IN PROGRESS)



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

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

Configuration E

Figure 5.

**CONFIGURATION - E -
SINGLE OR DOUBLE-ACTING ACTUATOR
DUAL SOLENOID VALVES SUPPLIED BY SIS AND CONTROLLED BY SEPARATE SIGNALS**

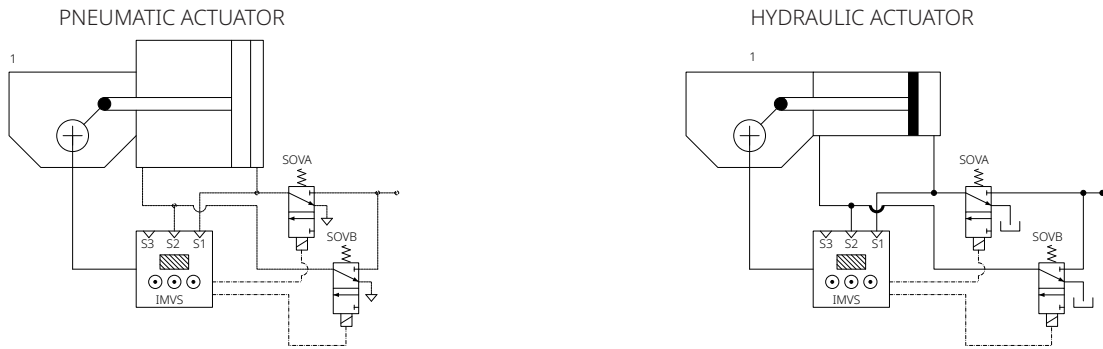
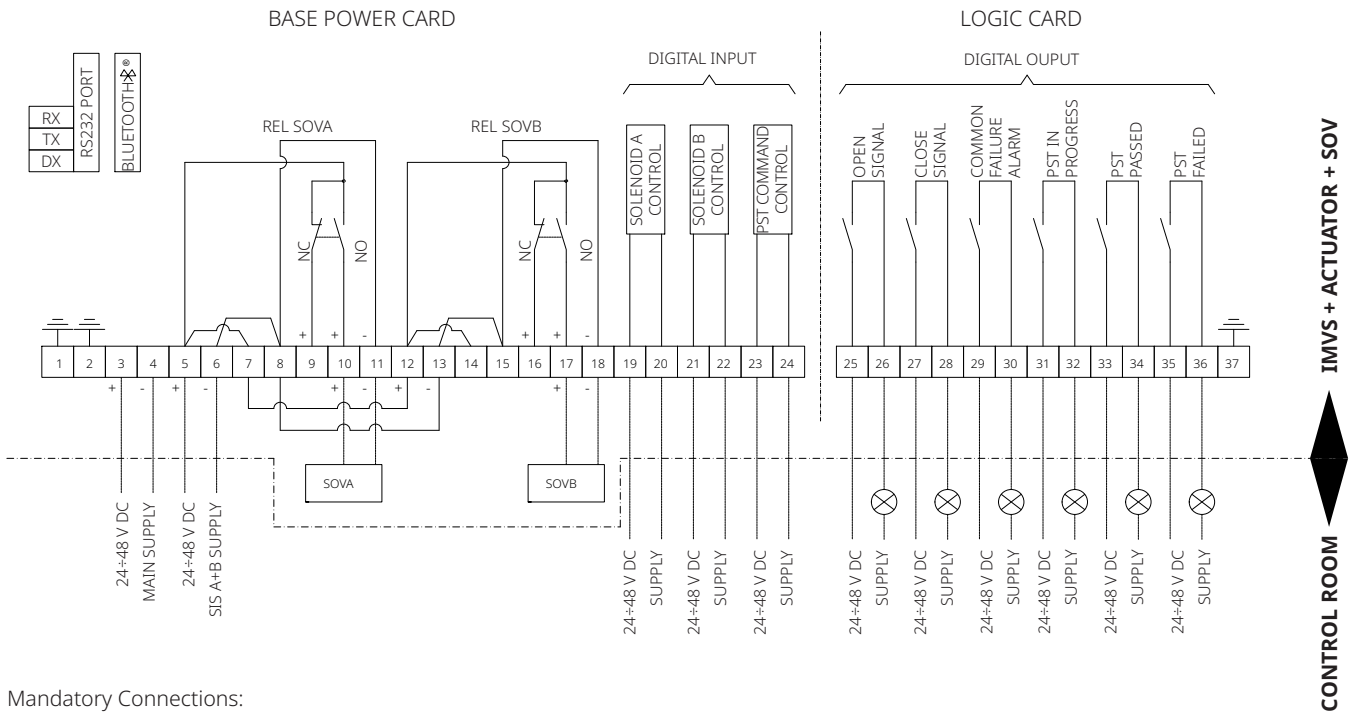


DIAGRAM SHOWS IMVS SUPPLIED BY 24÷48 V DC IN STEADY CONDITION (NO PST IN PROGRESS)



Mandatory Connections:

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

Recommended Connections:

- SOLENOID A CONTROL (terminals 19 to 20)
- SOLENOID B CONTROL (terminals 21 to 22)

Configuration F

Figure 6.

**CONFIGURATION - F -
DOUBLE-ACTING ACTUATOR
DUAL SOLENOID VALVES SUPPLIED BY MAIN SUPPLY AND/CONTROLLED BY SEPARATE SIGNALS**

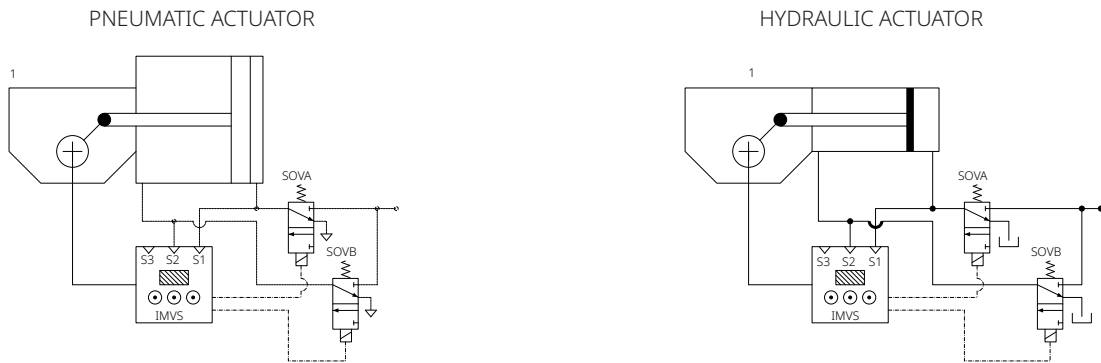
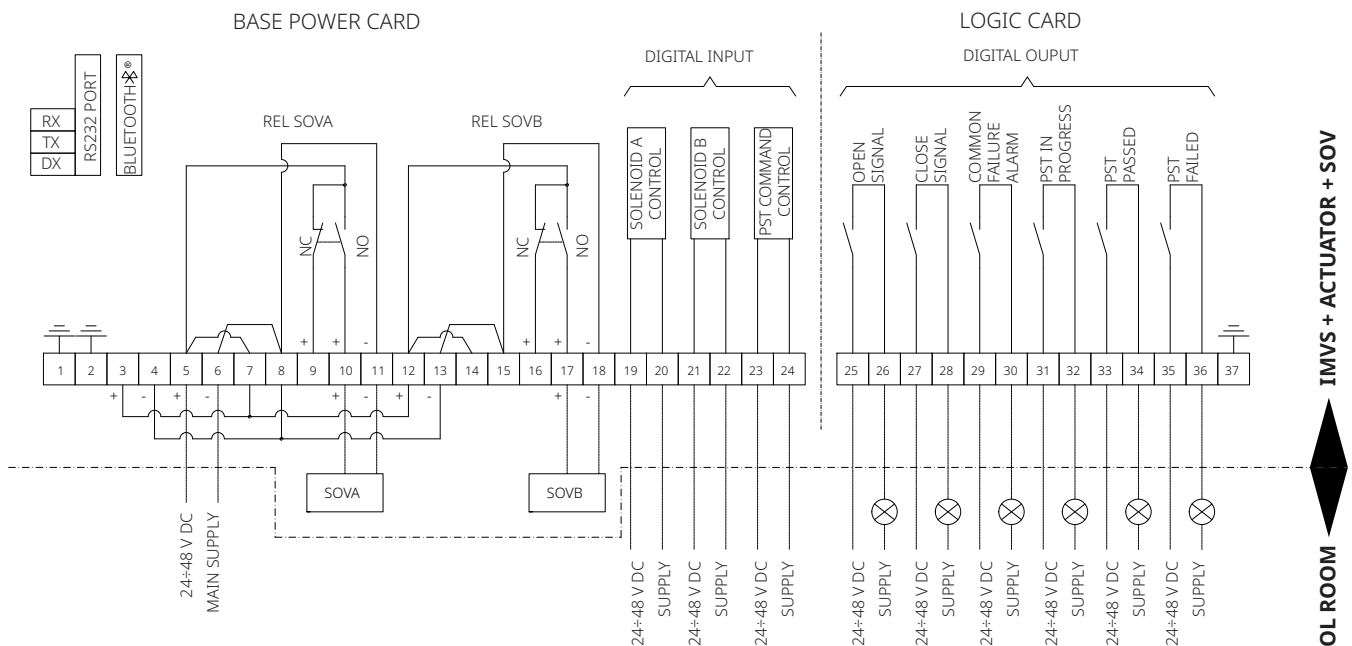


DIAGRAM SHOWS IMVS SUPPLIED BY 24÷48 V DC IN STEADY CONDITION (NO PST IN PROGRESS)



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

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

CONTROL ROOM **IMVS + ACTUATOR + SOV**

Configuration G

Figure 7.

**CONFIGURATION - G -
SINGLE OR DOUBLE-ACTING ACTUATOR
SINGLE SOLENOID VALVE SUPPLIED AND CONTROLLED BY MAIN SUPPLY**

PNEUMATIC ACTUATOR

HYDRAULIC ACTUATOR

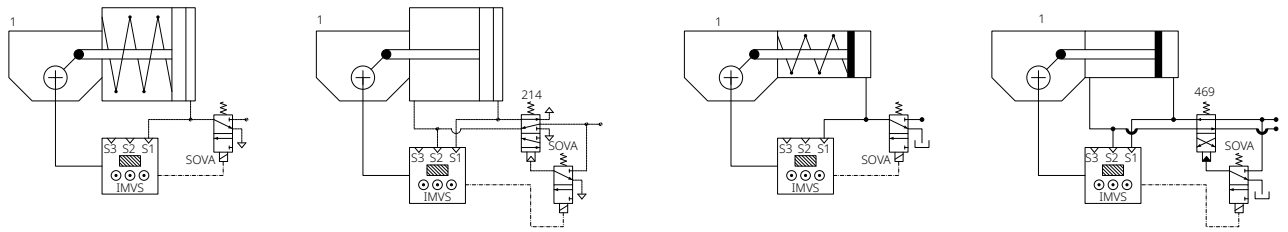
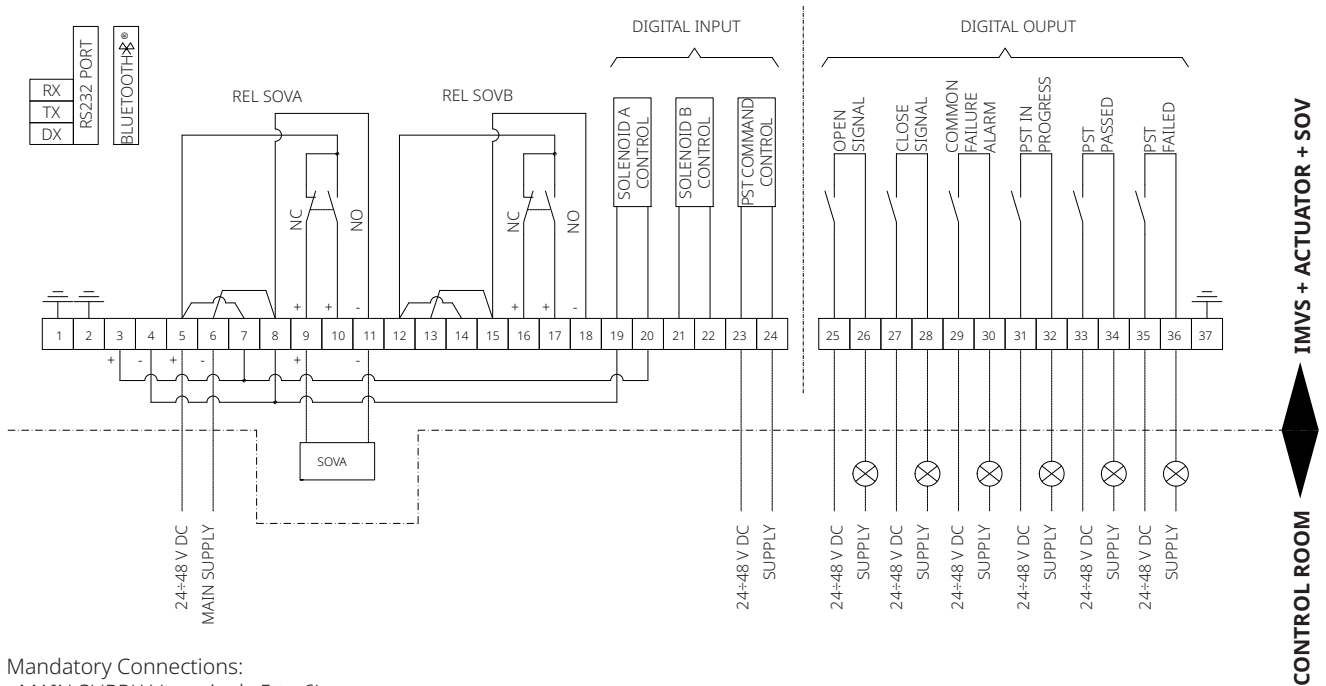


DIAGRAM SHOWS IMVS SUPPLIED BY 24÷48 V DC IN STEADY CONDITION (NO PST IN PROGRESS)

BASE POWER CARD

LOGIC CARD



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

Configuration H

Figure 8.

CONFIGURATION - H - SINGLE OR DOUBLE-ACTING ACTUATOR REDUNDANT SOLENOID VALVES SUPPLIED/CONTROLLED BY SIS

PNEUMATIC ACTUATOR

HYDRAULIC ACTUATOR

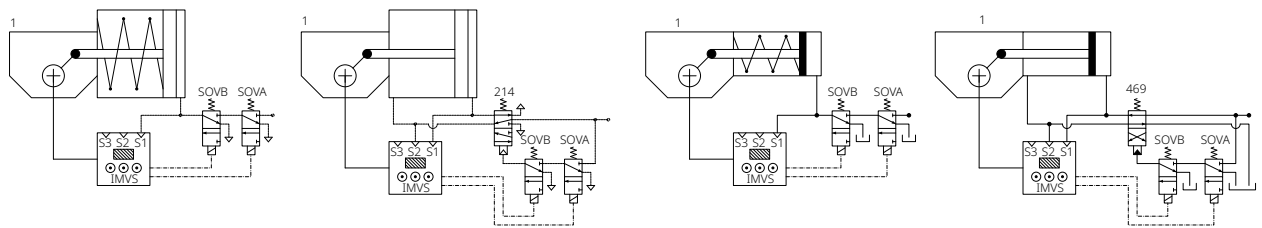
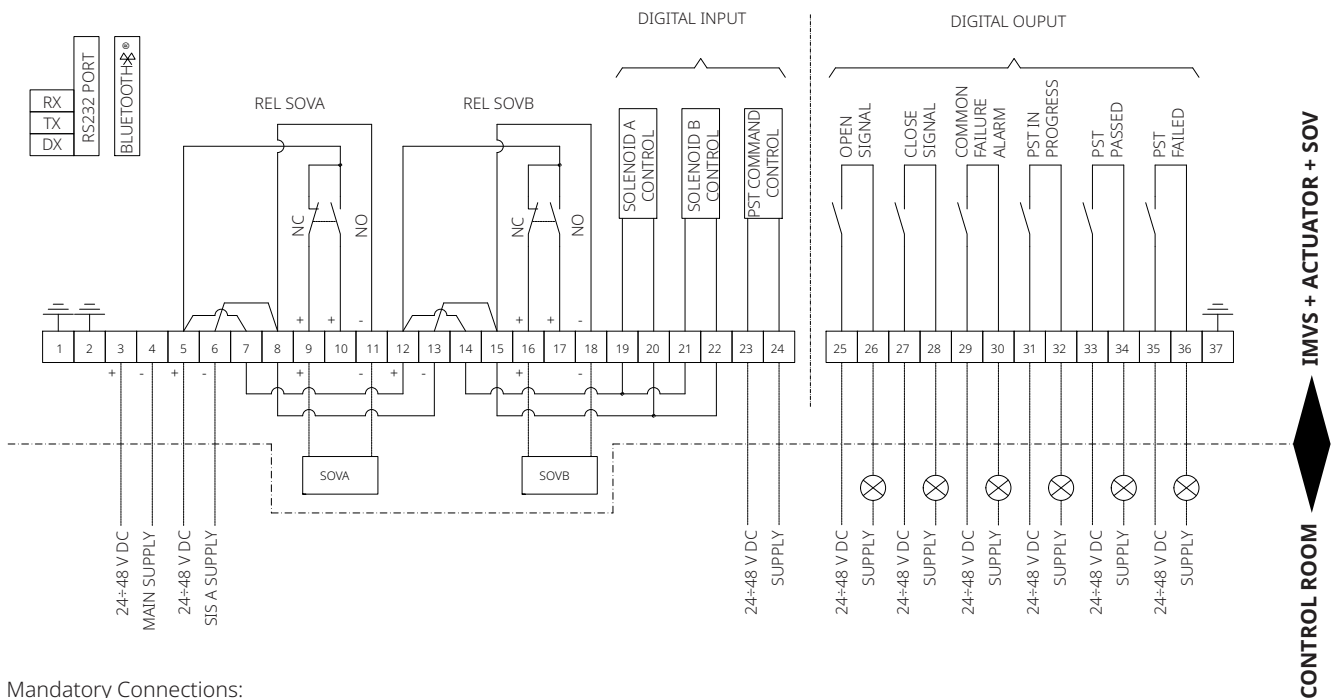


DIAGRAM SHOWS IMVS SUPPLIED BY
24÷48 V DC IN STEADY CONDITION
(NO PST IN PROGRESS)

BASE POWER CARD

LOGIC CARD

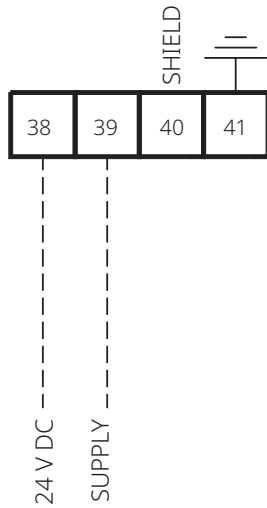


- Mandatory Connections:
- MAIN SUPPLY (terminals 3 to 4)
 - SIS A SUPPLY (terminals 5 to 6)
 - SOVA (terminals 9 to 11)
 - SOVB (terminals 16 to 18)

HART Card

Figure 9.

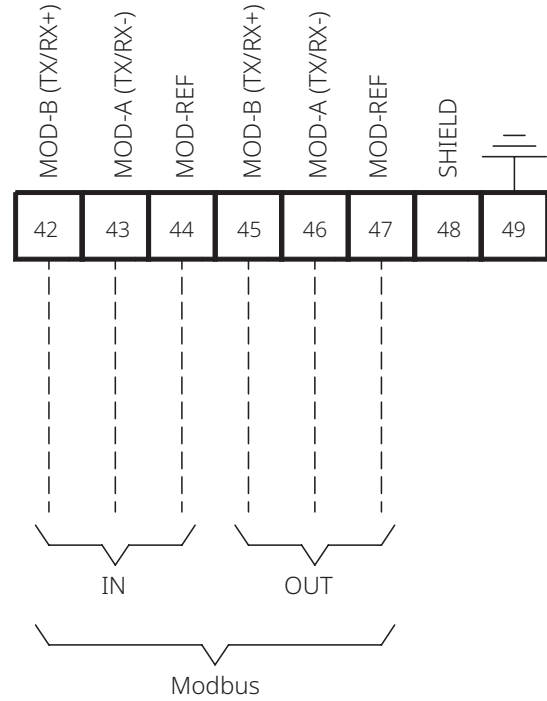
4 to 20 mA + HART CARD
POSITION OR PRESSURE
FEEDBACK SIGNAL
(OPTIONAL)



NOTE:
The HART Card is optional.

Modbus Card

Figure 10.



NOTE:
The Modbus Card is optional.

IMVS Selection Guide

Example:	234IMV	C	A	0	0	0	0	0	0	B
Base Model										
234IMV IMVS2 SS316 ESD/PST capability										
Pressure sensor configuration										
A Single-acting actuator up to 10 barg / 145 psig *										
B Double-acting actuator up to 10 barg / 145 psig *										
C Single-acting actuator up to 100 barg / 1450 psig										
D Double-acting actuator up to 100 barg / 1450 psig										
E Single-acting actuator up to 200 barg / 2900 psig										
F Double-acting actuator up to 200 barg / 2900 psig										
G Single-acting actuator up to 400 barg / 5800 psig **										
H Double-acting actuator up to 400 barg / 5800 psig **										
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 to 20 mA Output Interface										
2 Modbus Interface										
3 HART + 4 to 20 mA 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										
0 Not Installed										
1 Sensor S3 10 barg / 1450 psig *						3		Sensor S3 200 barg / 2900 psig		
2 Sensor S3 100 barg / 1450 psig						4		Sensor S3 400 barg / 5800 psig **		
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										
6 CCC according to the certification in the Biffi website										
Shaft										
B Shaft Standard Biffi										
N Shaft Namur Type										

NOTES:

Mounting kit when required, must be ordered separately by specifying the type of actuator (rotary of 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

Biffi Italia s.r.l.
Strada Biffi 165
29017 Fiorenzuola d'Arda (PC)
Italy
T +39 0523 944 411

For complete list of sales and manufacturing sites, please visit
www.biffi.it or contact us at biffi_italia@biffi.it

VCTDS-07228-EN © 2023 Biffi. All rights reserved.

The contents of this publication are presented for informational purposes only, and while every effort has been made to ensure their accuracy, they are not to be construed as warranties or guarantees, express or implied, regarding the products or services described herein or their use or applicability. All sales are governed by our terms and conditions, which are available upon request. We reserve the right to modify or improve the designs or specifications of such products at any time without notice.

