

SV2 Series Safety Shut-off Valves

V2F

INSTALLATION INSTRUCTIONS



INTRODUCTION

This document provides installation instructions and wiring information for the Honeywell SV2 Series valves. Other applicable publications are:

- 32-00017, Pressure Module Installation Instructions
- 32-00023, PC Tool Installation Instructions
- 32-00029, SV2 Series User Manual
- 32-00030, HMI Tool Installation Instructions
- 32-00031, HMI/PC Tool User Manual

FEATURES

- Side flexible, modular electronics
- HMI or PC Tools for programming, monitoring and troubleshooting
- Communication BUS (model dependent)

When Installing This Product...

1. Read these instructions and the appropriate product literature carefully. Failure to follow them could damage the product or cause a hazardous condition.
2. Installer must be a trained, experienced combustion service technician.
3. Check the ratings given in the instructions and on the product to make sure the product is suitable for your application. Do not exceed the valve ratings.

4. Disconnect the power supply before beginning installation to prevent electrical shock and equipment damage.
5. All wiring must comply with the National Electric Code (NEC) and any applicable local electrical codes, ordinances and regulations.
6. After installation is complete, carry out a thorough checkout of product operation as laid out in this document.

SPECIFICATIONS

Valve Inlet / Outlet Port Sizes:

¾, 1, 1-1/2, 2 inches
DN20, DN25, DN40, DN50

Flange Sizes:

Valve size: ¾ and 1 inch (DN20 and DN25):
½, ¾, 1 and 1 ¼ in NPT or BSPP
DN15, 20, 25, 32

Valve size: 1 ½ and 2 in (DN40 and DN50):
1, 1 ¼, 1 ½, 2 in NPT or BSPP
DN25, 32, 40, 50

Pressure Port Sizes:

1/8 in (3mm) NPT or BSP

NOW Port Sizes:

¾ and 1 in (DN20/DN25) valves: 3/4 in NPT
1-1/2 and 2 in (DN40/DN50) valves: 1 in NPT

Capacity Ratings:

See Table 1

INDEX

INTRODUCTION	1	INSTALLATION	10
FEATURES	1	WIRING	18
SPECIFICATIONS	1	VALVE CHECKOUT AND OPERATION	33
VALVE CAPACITY RATINGS	3	FINAL WIRING CHECK AND STATIC CHECKOUT	35
VALVE ACCESSORIES AND REPLACEMENT PARTS	4	PROGRAMMING AND SETUP	36
DIMENSIONAL INFORMATION	5	FINISH	37
REMOVE FROM BOX	10		



32-00018-04

Valve Electrical Ratings:

3/4 and 1 in valves (DN20 and 25)
100-120VAC, 50/60 Hz, 0.8 amps pick, 0.3 amps holding
200-240VAC, 50/60Hz, 0.4 amps pick, 0.15 amps holding
All voltages are -15%/+10%VAC
All values at 20°C (68°F)

External Load Relay Ratings:

ILK / Interlock: 100-240VAC, 50/60Hz, 8 amps
VPS / Valve Proving contact: 100-240VAC, 50/60Hz, 0.1 amps
POC / Proof of Closure contact: 100-240VAC, 50/60Hz, 0.1 amps

Class Ratings:

100-240VAC models are Class A rated
Safety combination valve for control of gaseous fluids in gas
consuming appliances in accordance with international
standards

Applicable Gas Types:

Natural gas or liquid propane (LP) only
EU designations: 2nd and 3rd families

Environmental Ratings:

Electrical enclosure: NEMA 1 / IP20 or NEMA 4 / IP66

Pressure Ratings

Fuel/air versions (V2P/V2V): 7.25 psi / 0.5 kg/mm² / 500mbar
On/off versions (V2F/V2A): 10psi / 0.7 kg/mm² / 689mbar

Storage/Shipping Conditions:

-40°F to 150°F (-40°C to 66°C)
95% RH at 104°F (40°C) and 30 in. Hg (1013.25 mbar)

Operating Temperature Range:

Fuel/air versions (V2P/V2V): +5°F to 150°F / -15°C to 65°C
On/off versions (V2F/V2A): -40°F to 150°F / -40°C to 65°C

Operating Humidity Range:

95% RH at 104°F (40°C) for 14 days
Non-condensing for NEMA 1 / IP20 valve versions

Fluid Temperature Rating:

Fuel/air versions (V2P/V2V): +5°F to 150°F / -15°C to 65°C
On/off versions (V2F/V2A): -40°F to 150°F / -40°C to 65°C

Valve Opening Time:

1 second maximum at 68°F (20°C)

Valve Closing Time:

1 second maximum at 68°F (20°C)

Mounting Position:

Vertical to 90 degrees from vertical, refer to Fig. 3.

Material:

Valve body: Die-cast aluminum
Electrical enclosure: Valox™ 553

Torsion and Bending Stress:

Pipe connections meet group 2 according to EN161 requirements

Electrical Equipment:

AC rectified coils with separated rectifier and power saving circuitry
inside the cover

Coil Insulation Solenoid Valves:

Insulation material is specified according to class H

Duty Cycle:

Coils are suitable for permanent energizing via SV2 Series valve
electronics with power saving

Weight:

3/4 and 1 in valves (DN20 and DN25)
On/Off: ~19.0 lb (8.6 kg)
Fuel/Air: ~18.7 lb (8.5 kg)

Dimensions:

See Fig. 2.

Approvals:

cULus (Underwriters Laboratories): Electrically operated valves. Vol
11 valve body, Vol 12 control boards.
UL429, UL353 and UL1998.
NEMA 1 / IP20 valves: Recognized
NEMA 4 / IP66 valves: Listed
FM7400, FM3510 Approved - PENDING
CSD-1 Acceptable
CSA Approved for US and Canada - PENDING
Commercial / Industrial Certified
FCC Part 15, Class A Digital Device
Complies with standard ANSI Z21.21-CSA6.5
CE Approved per:
EN1643 2014 Safety and control devices for gas burners and
gas burning appliances - Valve proving systems for automatic
shut-off valves
EN13611 2007+A2 2011 Safety and control devices for gas burners
and gas burning appliances - General requirements
EN14459 Annex J Control functions in electronic systems for
gas burners and gas burning appliances - Methods for
classification and assessment
EN1854 2010 Pressure sensing devices for gas burners and gas
burning appliances
EN161 2011 Automatic shut-off valves for gas burners and gas
appliances
Certificate # 87873/02

Throughout this manual, reference is made to the available Intelligent Features in the SV2 Series valves. The 9th digit in the valve part number signifies the embedded Intelligence Feature level as follows:

- 5 = BASIC. Basic functionality; no Modbus or Pressure Module compatibility.
- 6 = STANDARD. Includes Modbus, Pressure Module compatible, external VPS using Pressure Module.
- 7 = ENHANCED. Includes Modbus, Pressure Module compatible, external VPS using Pressure Module, metering (EU future release).
- 8 = FULL. Includes Modbus, Pressure Module compatible, internal VPS using Pressure Module, metering (EU future release).
- 9 = ELITE. Includes Modbus, Pressure Module compatible, internal VPS using Pressure Module, metering, leak detection sequence (North America future release).

VALVE CAPACITY RATINGS

The SV2 Series valve ratings shown below are for both 4 in. w.c. and 1 in w.c..

Valve Capacity Designation / Internal Port Size			@ 4 in. w.c. pressure drop ¹ (10 mbar)				@ 1 in. w.c. pressure drop ¹ (2.5 mbar)			
			kW	MMB-TU/hr	SCFH (ft ³ /hr)	M ³ /hr	kW	MMB-TU/hr	SCFH (ft ³ /hr)	M ³ /hr
A	0.75 in.	DN20	150	0.5	500	14	73	0.25	250	7
B	1.0 in	DN25	300	1.0	1,000	28	150	0.5	500	14

1. Stated capacities for natural gas (specific gravity 0.64) at 1013.3mbar / 406.9 in w.c. / 29.2 in Hg / 14.7 psi pressure and 15°C / 59°F temperature
2. For LP (liquid propane, specific gravity 1.53) capacity, multiply the cfh or m³/hr by 0.647
3. Stated capacities for valve with matching flange size

Table 1. Valve Capacity Rating.

VALVE CAPACITY CURVES

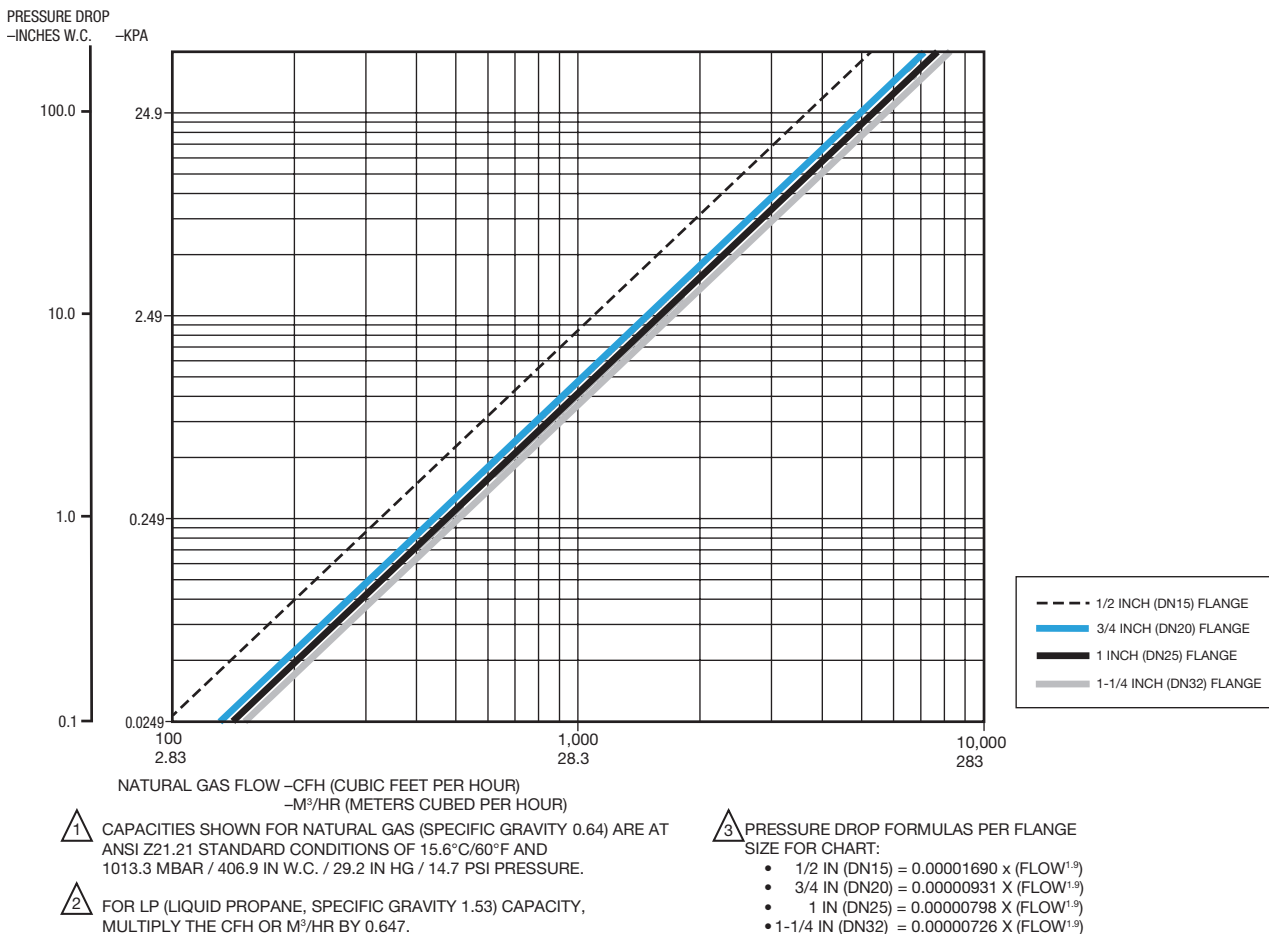


Fig. 1. 1 inch (DN25) Valve capacity curves.

VALVE ACCESSORIES AND REPLACEMENT PARTS

The SV2 Series valve has required and optional accessories for installation, pressure switch operation, set-up and fuel/air applications. Flanges are required for each valve and must be ordered separately.

SV2 also has field replaceable electronics, modules, solenoids and filters.

Category	Part Number	Description	Applicable Model(s)
Flanges	FLANGEABNPT050	0.50 in / DN15 NPT flange, A/B capacity models	All
	FLANGEABNPT075	0.75 in / DN20 NPT flange, A/B capacity models	
	FLANGEABNPT100	1.00 in / DN25 NPT flange, A/B capacity models	
	FLANGEABNPT125	1.25 in / DN32 NPT flange, A/B capacity models	
	FLANGEABBSP050	0.50 in / DN15 BSP flange, A/B capacity models	
	FLANGEABBSP075	0.75 in / DN20 BSP flange, A/B capacity models	
	FLANGEABBSP100	1.00 in / DN25 BSP flange, A/B capacity models	
	FLANGEABBSP125	1.25 in / DN32 BSP flange, A/B capacity models	
Programming Tools	HMITOOL-000	HMI touchscreen interface, 24VAC. NOTE: HMITOOL or PCTOOL required to setup intelligent features.	All models with Intelligent Features of 6, 7, 8 or 9
	AT72D1683/U	120VAC to 24VAC transformer, 40VA, universal mount (foot, plate, clamp)	
	AT72D1691/U	208/240VAC to 24VAC transformer, 40VA, universal mount (foot, plate, clamp)	
	PCTOOL-000	PC interface software NOTE: HMITOOL or PCTOOL required to setup intelligent features.	
Pressure Modules	PRESSMOD11-000	For NEMA 1/IP20 enclosure, pressure range 0.8-40 mBar / 0.32-16 in wc / 0.012- 0.58 psi	All models with Intelligent Features of 6, 7, 8 or 9
	PRESSMOD12-000	For NEMA 1/IP20 enclosure, pressure range 2.6-160 mBar / 1.1-64 in wc / 0.038 - 2.3psi	
	PRESSMOD13-000	For NEMA 1/ IP20 enclosure, pressure range 8.4-600 mBar / 3.4-241 in wc/ 0.12-8.7 psi	
	PRESSMOD14-000	For NEMA 1/ IP20 enclosure, range range 16.8-1000 mBar / 6.7-401 in wc/ 0.25-14.5 psi	
	PRESSMOD41-000	For NEMA 4 / IP66 enclosure, pressure range 1.3-40 mBar / 0.51-16 in wc / 0.018 -0.58 psi	
	PRESSMOD42-000	For NEMA 4 / IP66 enclosure, pressure range 4-160 mBar / 1.6-64 in wc / 0.057-2.32 psi	
	PRESSMOD43-000	For NEMA 4 / IP66 enclosure, pressure range 10.5-600 mBar / 4.2-241 in wc/ 0.15-8.7 psi	
	PRESSMOD44-000	For NEMA 4 / IP66 enclosure, pressure range 21-1000 mBar / 8.5-401 in wc/ 0.3-14.5 psi	
Replacement Parts	CONNECTORKIT-000	Valve replacement electrical connector kit	All
	REL4N230V5Q	Replacement electronics, NEMA 4/IP66, 100-240VAC, 50/60Hz, IQ 5 models NEMA 4/IP66	IQ 5 models NEMA 4/IP66
	REL4N230V6Q	Replacement electronics, NEMA 4/IP66, 100-240VAC, 50/60Hz, IQ 6 models NEMA 4/IP66	IQ 6 models NEMA 4/IP66
	REL1N230V6Q	Replacement electronics, NEMA 1/IP20, 100-240VAC, 50/60Hz, IQ 6 models NEMA 1/IP20	IQ 6 models NEMA 1/IP20
	COILAB120V-000	Coil/Solenoid, 0.75/1.00 in, 100-120VAC, A/B capacity models	All
	COILAB240V-000	Coil/Solenoid, 0.75/1.00 in, 200-240VAC, A/B capacity models	
	50063482-001	HMITOOL replacement bag assembly; 8-pin connector, battery, hardware, 3 clamp filters	HMITOOL

Table 2. Valve Accessories and Replacement Parts.

DIMENSIONAL INFORMATION

ON/OFF VALVE WITH NEMA 4/IP66 ENCLOSURE

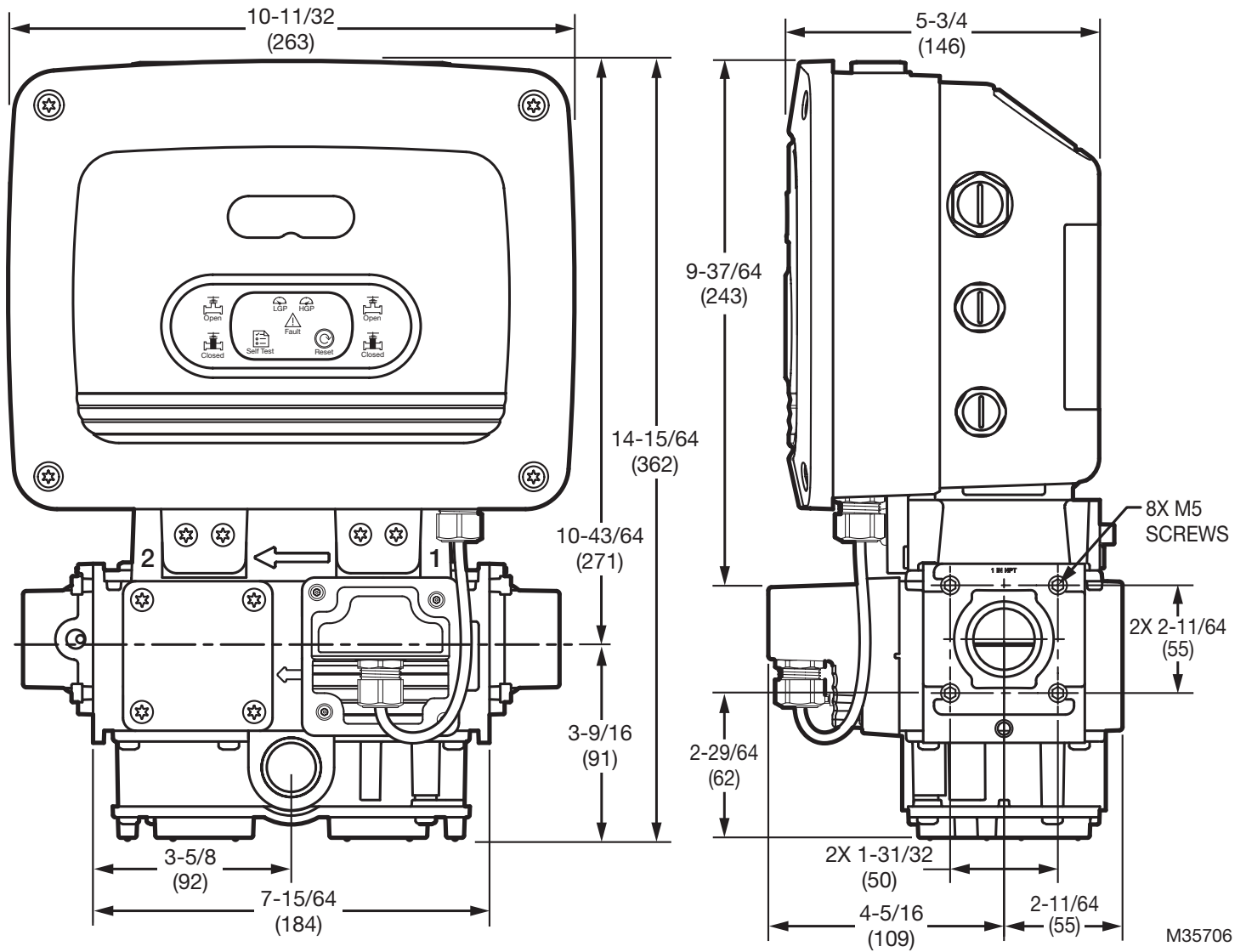


Fig 2. Continued onto next page.



Fig. 2. 3/4 and 1 in. (DN20 and DN25) valve dimensional information.

VALVE INSTALLATION QUICK START GUIDE

The SV2 Series valve installation steps are illustrated below with elaboration of each step in the following pages after the Quick Start Guide.

Please review this Quick Start Guide before installation to ensure a smooth install!



What's in the box

A. Valve



B. Accessory Box:

- Connectors (not EU)
- Cord grips (NEMA 4 / IP66 versions only)
- Mounting Hardware (for C6907 Pressure Switch)
- Installation Instructions



C. Accessories Ordered Separately:

- Flanges
- Pressure Module
- HMI or PC Tool
- HMI transformer

1 Remove from box



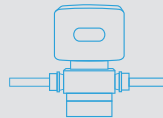
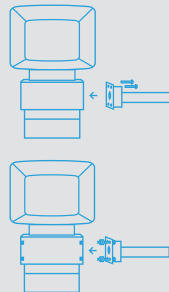
2 Installation and Mounting

A. Orientation planning

B. Mounting flanges

C. Mount valve to flanges and piping

- $\frac{3}{4}$, 1 inch (DN20/25) valve bodies have drilled and tapped holes
- 1½ inch (DN40) and larger valve bodies with embedded slots for flange retaining nuts

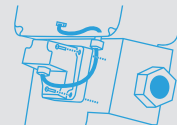


D. Vent valve connection

E. Pressure Module or C6097 planning

- Investigate correct mounting location and pressure access port

F. Mount Pressure Module or C6097



3 Wiring

A. Wiring and conduit recommendations.

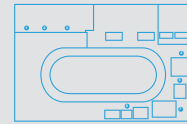
- Use only flexible conduit on NEMA 4 / IP66 enclosures.
- Wiring must comply with all applicable electrical codes, ordinances and regulations.
- All line voltage wiring must be NEC Class 1.
- Use lead wire, which can withstand 90°C (194°F) ambient temperatures.
- Power supply voltage and frequency must agree with those marked on the device.
- Load connected to the device must not exceed the ratings given in this document.
- Separate line and low voltage wiring to avoid signal interference. If using conduit, run line voltage and low voltage wiring in separate conduit.

B. Remove valve front electrical enclosure cover



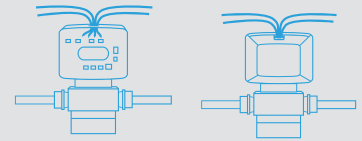
C. Estimate wiring:

- Observe unique line voltage, limits & interlock wiring required for the SV2 Series valves.
- More wires may be required than typical valves.



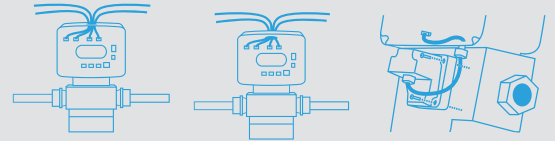
D. String wires:

- String wires through conduit, NEMA 4 / IP66 enclosure entry points, cord grips and nuts before wiring to connectors.
- String wires through NEMA 1 / IP20 enclosure rear opening or bottom slot before wiring to connectors.



E. Connect wires:

- Observe terminal labeling and proper electrical connector placement.
- Connect wires to the wire connectors.
- Plug electrical connectors into their proper sockets.
- Pressure Module must be field connected in electrical enclosure.



F. In connecting more than 1 valve to HMI / PC Tool or a building automation network, be sure to setup bias + termination resistors.

G. Install plugs and nuts in unused NEMA 4 / IP66 electronic enclosure wire entry locations.

- Low voltage, M16 x 1.5
- Line voltage, 1/2 in. NPT

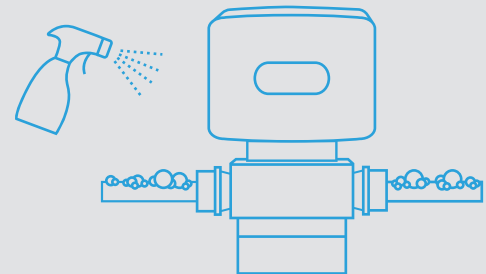
4 Checkout and Operation - Leak Check

You will need:

- Rich soap and water solution.
- Jar or glass filled with water.
- 1/4 in (6mm) flexible tubing.
- 1/4 in (6mm) aluminum or copper pilot tubing with 1 end cut at 45 angle.
- Manual test petcock

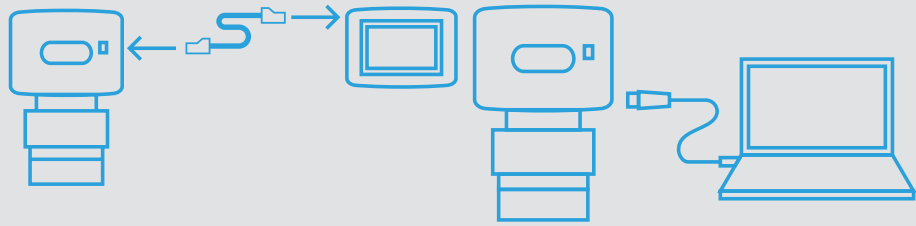
A. Valve connection and accessory leak test.

B. Valve seat leak test.



5 Programming & Setup

Any intelligent features requiring setup must be completed before the valve will be operational. The HMI or PC Tools are used for this purpose.



This includes:

- Valve modbus address + communication speed
- Low gas pressure
- High gas pressure
- External or Internal VPS (Internal future release)
- Fuel/air firing curve (future release)
- Leak detection sequence (future release)
- Fuel metering functionality (future release)

A. Connect Modbus wiring per HMI Tool or PC Tool Installation Instructions.

B. Power SV2 Series valve and HMI or PC Tool.

C. Complete setup as required and run on-board test procedures as required.

6 Wiring Checkout

A. Test:

- Cycle the valve several times to verify proper function.
- Each limit and interlock.
- Following burner management system checkout guidelines.
- Any other recommended or required tests.

7 Finish

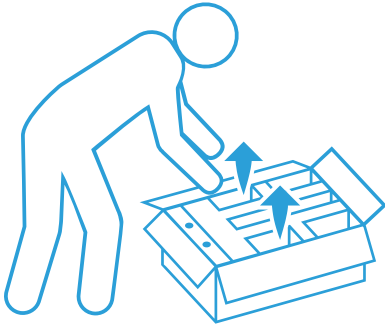
A. Replace the electrical enclosure cover.

B. Replace solenoid cover (if removed).





C. Your valve is ready to use.



1 REMOVE FROM THE BOX



There will be a second box packaged with the valve which contains accessory items and documentation. The box will contain:

- A bag of electrical connectors. Note that connectors are typically not provided with EU models. 
- Cord grips (NEMA 4 / IP66 versions only)
- Mounting hardware for C6097 pressure switches and/or SV2 Series valve pressure modules (M4x25)  
- Installation Instructions 

Remove any other separately ordered accessory items from their packaging. This may include the following:

- Flanges
- Pressure Module
- HMI or PC Tool
- HMI transformer

2 INSTALLATION AND MOUNTING

When Installing This Product...

1. Read these instructions and the appropriate product literature carefully. Failure to follow them could damage the product or cause a hazardous condition.
2. Installer must be a trained, experienced combustion service technician.
3. Check the ratings given in the instructions and on the product to make sure the product is suitable for your application. Do not exceed the valve ratings.
4. Disconnect the power supply before beginning installation to prevent electrical shock and equipment damage.
5. All wiring must comply with the National Electric Code (NEC) and any applicable local electrical codes, ordinances and regulations.
6. After installation is complete, carry out a thorough checkout of product operation as laid out in this document.

WARNING

Explosion Hazard and Electrical Shock Hazard.
Can cause explosion, serious injury or death.

- Turn off gas supply before starting installation.
- Disconnect power supplies before beginning installation.
- More than one disconnect can be involved

IMPORTANT

- The valve must be installed so that the arrow on the valve points in the direction of the gas flow (gas pressure helps to close the valve).
- Make sure the O-ring seals (provided) are properly positioned and seated at the inlet and outlet flange connections.
- Do not remove the dust seal over the valve inlet and outlet until ready to connect piping.

WARNING

Explosion Hazard and Electrical Shock Hazard.
Can cause explosion, serious injury or death.

- Do not take valve apart.
- Do not use tools to operate valve.
- Do not use valve if it has been flooded.
- Call serviceman if valve does not work properly.

IMPORTANT

- Disassembly of the valve in the field may cause permanent damage to the valve and void the factory warranty.
- Fasteners containing lacquer paint indicate non-field accessible areas.
- Accessory modules may be removed or replaced as necessary in the field.

CAUTION

If valve has been dropped, do not use it.

- Dropping the valve may cause permanent damage to the valve.
- Replace entire valve and associated modules before use.

A. Orientation Planning

The gas valve can be mounted plus or minus 90 degrees from the vertical. Refer to Fig. 3. Pay attention to the gas flow direction arrows on the valve body when planning the mounting orientation (refer to Figs. 8 and 9). The electronics and LEDs should be accessible when the valve is installed in the valve train for programming purposes and visual indication purposes.

NOTE: If the valve electronics needs to be moved to the opposite side of the valve for better access, refer to the Changing Electronics Orientation procedure in the SV2 Series User Manual, document 32-00029

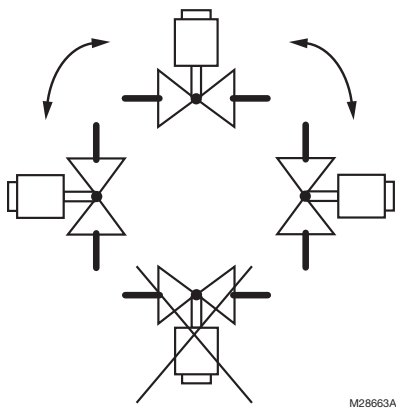


Fig. 3. Valve mounting position.

NOTICE

DO NOT attempt to change valve electronics side orientation without consulting the valve user manual.

- Reference document 32-00029 for detailed instructions on this procedure.

B. Flange Mounting to Main Gas Connection

1. Remove the flanges from the box or from the valve if attached. Refer to Fig. 5.
2. Use a sound taper fitting with thread according to ISO7-1 or new, properly reamed pipe free from swarf.
3. Apply a moderate amount of good quality thread compound to the pipe for fitting only, leaving the two end threads bare. Ensure the thread compound is resistant to the action of liquid propane (LP) gas. Refer to Fig. 4.

NOTE: Ensure the gap left between the flanges when installed on the pipes does not exceed the valve body width otherwise the valve piping may be over stressed.

4. Screw the flanges onto the pipes. Refer to Fig. 5.
5. Ensure the pressure taps on the flanges are oriented for access as needed. Refer to Fig. 5.
6. Ensure that inlet and outlet flanges are in line and separated from each other enough to allow the valve to be mounted between them without damaging the O-ring.

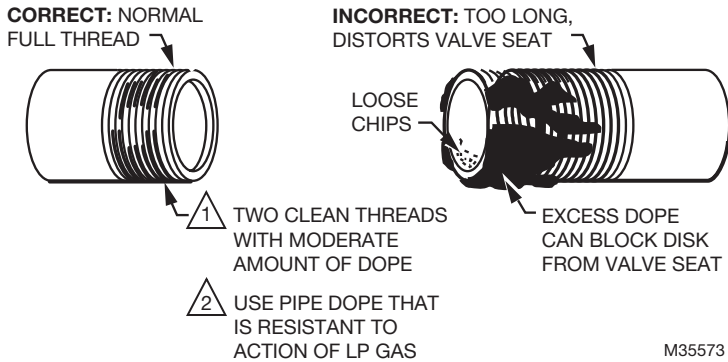
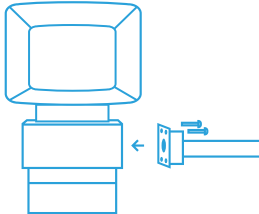
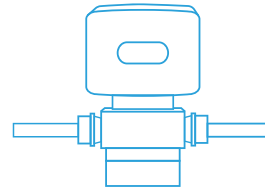


Fig. 4. Preparing pipelines.

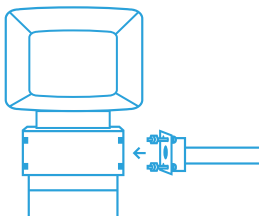
C. Mounting Valve to Flange(s) and Piping

NOTE: Flange installation instructions are packed with the flanges.

1. Remove the paper covering over the valve inlet and outlet ports.
2. Take care that dirt does not enter the gas valve during handling.
3. Make sure O-ring surfaces on valve body and flange are clean.
4. Ensure the O-rings provided with the valve are properly positioned in the valve body O-ring groove. Refer to Fig. 5.
5. Mount gas valve between flanges using the screws provided for each flange.
 - a. $\frac{3}{4}$ and 1 in (DN20 and DN25) valve bodies have drilled and tapped holes.
 - i. Slide valve into pipe train, supporting as necessary so that valve does not rotate.
 - ii. Insert provided screws into the flanges and tighten.
 - iii. Recommended tightening torque is 4-5 Nm (35-44 in-lbf).



- b. 1 $\frac{1}{2}$ (DN40) and larger valve bodies have embedded slots for flange retaining nuts. Flanges are shipped with screws and retaining nuts.
 - i. In the embedded valve body slots, place flange retaining nuts **on one side only of valve**, from inlet to outlet. Refer to Fig. 5 and Fig. 9.
 - ii. On each flange, partially install screws and retaining nuts onto one side, **opposite relative to the nut placement in step i.**
 - iii. Slide valve into pipe train, supporting as necessary so that valve does not rotate.
 - iv. Tighten flange screws. Recommended tightening torque is 13.5-14.5 Nm (120-128 in-lbf).
 - v. Install and tighten remaining screws; first on top remaining slots then second on bottom remaining slots. Tighten to the recommended torque above.

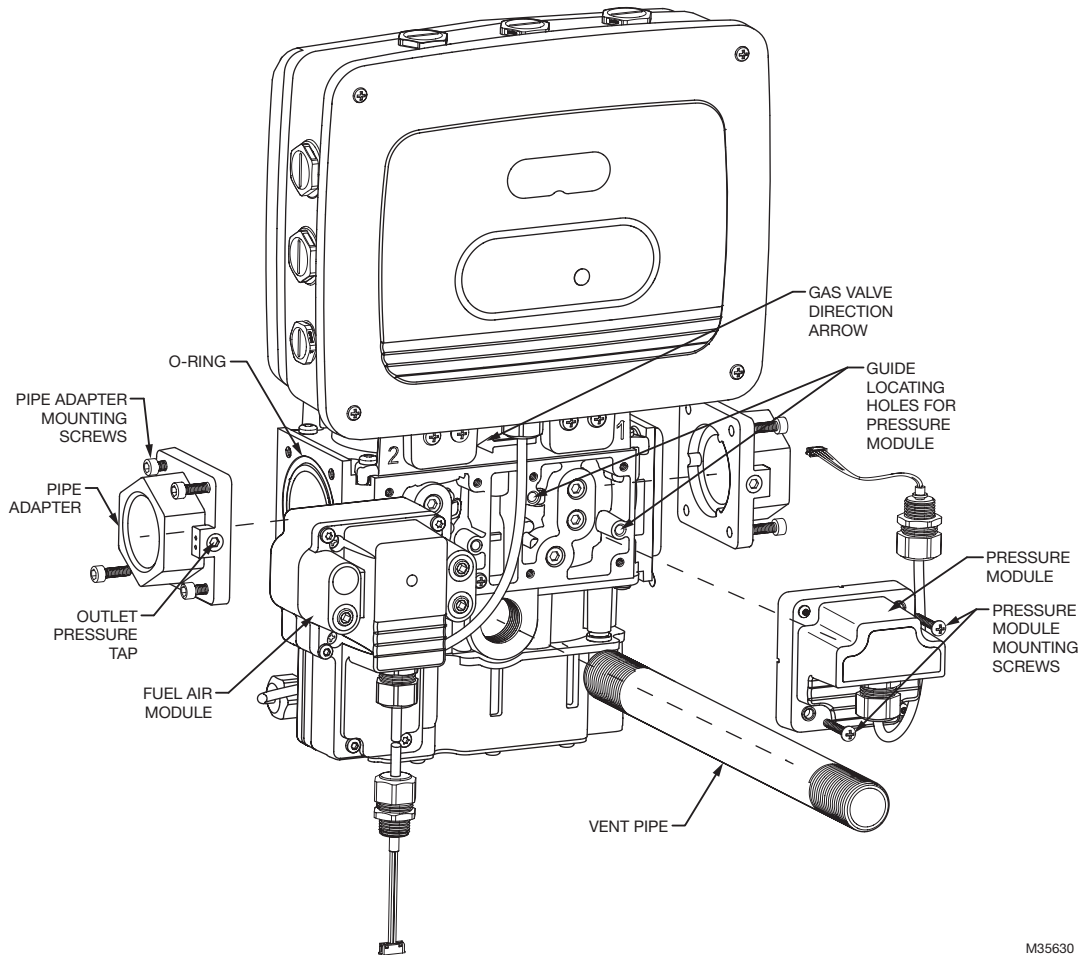


D. Vent Valve Connection

1. Take care that dirt does not enter the gas valve during handling.
2. Remove the vent plug from the side of the valve body. Refer to Fig. 5.

NOTE: If you need to replace the NOVV plug on the valve, the tightening torque should be between 72 to 88 Nm (53 to 65 ft-lbf).

3. Use a sound taper fitting thread according to ISO 7-1 or new, properly reamed pipe free from swart.
4. Apply a moderate amount of good quality thread compound to the pipe for fitting only leaving the two end threads. Ensure the thread compound is resistant to the action of liquid propane (LP) gas. Refer to Fig. 4.
5. Screw the fitting into the valve body.
6. Install vent valve per manufacturer's instructions

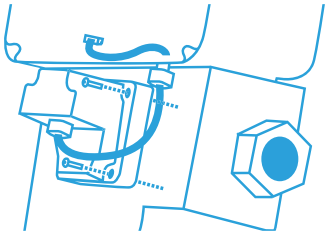


M35630

Fig. 5. Valve exploded view.

E.–F. Pressure Module or C6097 Planning and Mounting

SV2 Series Pressure Module Placement and Connection



Refer to document 32-00017, which is packed with the Pressure Modules, for installation instructions regarding the placement, connection and wiring of the SV2 Series smart Pressure Modules. Applicable part numbers include:

- PRESSMOD11-000
- PRESSMOD12-000
- PRESSMOD13-000
- PRESSMOD14-000
- PRESSMOD41-000
- PRESSMOD42-000
- PRESSMOD43-000
- PRESSMOD44-000

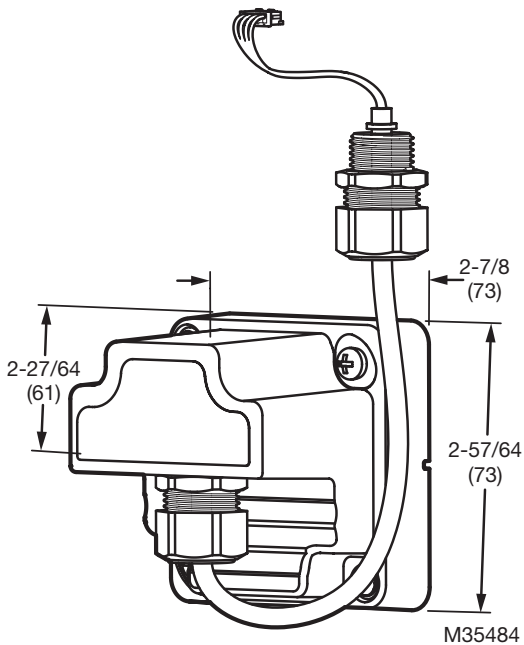


Fig. 6. SV2 Series Pressure Module.

Use of the SV2 Series smart Pressure Module is only applicable to valve versions with embedded intelligence. The 9th digit in the valve part number signifies the embedded Intelligence Feature level as follows:

- 6 = STANDARD. Includes Modbus, Pressure Module compatible, external VPS using Pressure Module.
- 7 = ENHANCED. Includes Modbus, Pressure Module compatible, external VPS using Pressure Module, metering (EU future release).
- 8 = FULL. Includes Modbus, Pressure Module compatible, internal VPS using Pressure Module, metering (EU future release).
- 9 = ELITE. Includes Modbus, Pressure Module compatible, internal VPS using Pressure Module, metering, leak detection sequence (North America future release).

NOTE: Accessing the Inlet (I) port of mounting locations A and C on V1 is not allowed for the Pressure Module. Refer to Fig. 9.

C6097 Pressure Switch Placement and Connection



Fig. 7. C6097

WARNING

Explosion Hazard.

Can cause explosion, serious injury or death.

- The M4x25 screws (bag assembly 32305434-001) shipped with the SV2 valve **MUST** be used to secure the flange mount C6097 to the valve body
- **DO NOT** use the 8-32 screws provided with the flange mount C6097 pressure switch
- Failure to follow this advice can result in gas leakage and explosion

C6097 flange mount pressure switches may be mounted directly on the SV2 Series valves and used for high gas pressure and VPS (valve proving system) switch operation. The NPT or Rp versions may be mounted to various valve pressure taps and can be used for high gas pressure, low gas pressure and VPS. The C6097 pressure switches may be used on all SV2 series valve models.

NOTES:

- Flange mount C6097s cannot be used for low gas pressure on the SV2 series valves.
- NPT or Rp mount C6097s may be used for low gas pressure mounted external to the valve, using the pressure tap on the inlet flange or using the Inlet (I) port on pressure access locations A and C on V1.

The flange mount C6097 pressure switches can be mounted in any of the four (4) positions on the valve body. The seals of the C6097 will only cover the center pressure access port of each location.

V1 seat mounting locations A and C access the Middle (M) and Inlet (I) pressure ports. V2 seat mounting locations B and D access the Outlet (O) and M (Middle) pressure ports. Refer to Fig. 9.

NOTES:

- The Inlet (I) port on V1 seat mounting locations A and C is only allowed for NPT/Rp mount pressure switches.
- The Middle (M) port on V2 seat mounting locations B and D is only allowed for NPT/Rp mount pressure switches.

The available pressure port locations for V1 and V2 seats for both sides of the valve are shown in Fig. 9. Pressure switch types, placement and associated functionality information can be found in Table 3.

Valve Model	Description	C6097 Functions	C6097 Mounting Style	Pressure Access Location	Pressure Port to Open
V2F	On/off	VPS	Flange	A/C on V1	Middle (M)
		High gas pressure		B/D on V2	Outlet (O)
		VPS	NPT or Rp (¼ in)	B/D on V2	Middle (M)
		High gas pressure		Pressure tap on outlet flange	
		Low gas pressure		A/C on V1	Inlet (I)
				Pressure tap on inlet flange	

Table 3. C6097 Pressure Switch Placement.

Preparation

1. Take care that dirt does not enter the gas valve during handling.
2. Select the correct pressure access location (A/B/C/D) to mount the C6097 and correct pressure port to open from the selection table. Refer to Table 3 and Fig. 9.

NOTE: You may want to mount the C6097 on the same side as the valve electrical enclosure for easy access when the valve is mounted in the valve train.

3. Remove the appropriate pressure access location cover (A/B/C/D) as identified in Fig. 8.

NOTE: If you need to replace a pressure access location cover, the tightening torque should be between 1.36 to 1.82 Nm (12 to 16 in-lbf).

C6097 Installation on SV2 Series Valve

WARNING

**Explosion Hazard and Electrical Shock Hazard.
Can cause explosion, serious injury or death.**

- Turn off gas supply before starting installation.
 - Disconnect power supplies before beginning installation.
 - More than one disconnect can be involved
1. Ensure that line voltage has been removed from the valve.
 2. Remove the appropriate pressure port plug (O, M or I) from the side of the valve body as identified in Table 3, Fig. 8, and Fig. 9.
 3. Flange mount models:
 - a. Remove the label holding the O-ring in place and make sure O-ring is properly seated.
 - b. Assemble the C6097 to the valve body by mating its two screw holes and seal with the valve body. Refer to Fig. 8.
 - c. Attach the C6097 to the valve body using the two screws provided with the valve (M4x25). Verify the pressure module is flush against the casting to ensure the O-ring is compressed.
 - i. The tightening torque should be between 1.8 and 2.2 Nm (16 to 20 in-lbf).
 4. NPT/Rp mount models:
 - a. Remove the dust seal, if present, from the positive pressure inlet.
 - b. C6097 has 1/4 in tapping while the SV2 pressure ports are 1/8 in (3mm), so a pipe reducer will be required.
 - c. Apply a moderate amount of good quality compound to the pipe for fitting only leaving the end threads bare. Ensure the thread compound is resistant to the action of liquid propane (LP) gas. Refer to Fig. 4.
 - d. Use a sound taper fitting thread according to ISO-7 (BS21, DIN2999) or new, properly reamed pipe, free from swarf.
 - e. Screw the C6097 onto the pipe, using the wrench boss incorporated in the housing.
 - f. Screw the pipe into the SV2 valve pressure port.
 5. Refer to the C6097 pressure switch product data / instruction sheet for further installation, wiring and adjustment information, documents 65-0237 or EN1R-9172 9907R1-NE (continent dependent). Complete the electrical connections as instructed in the applicable document.

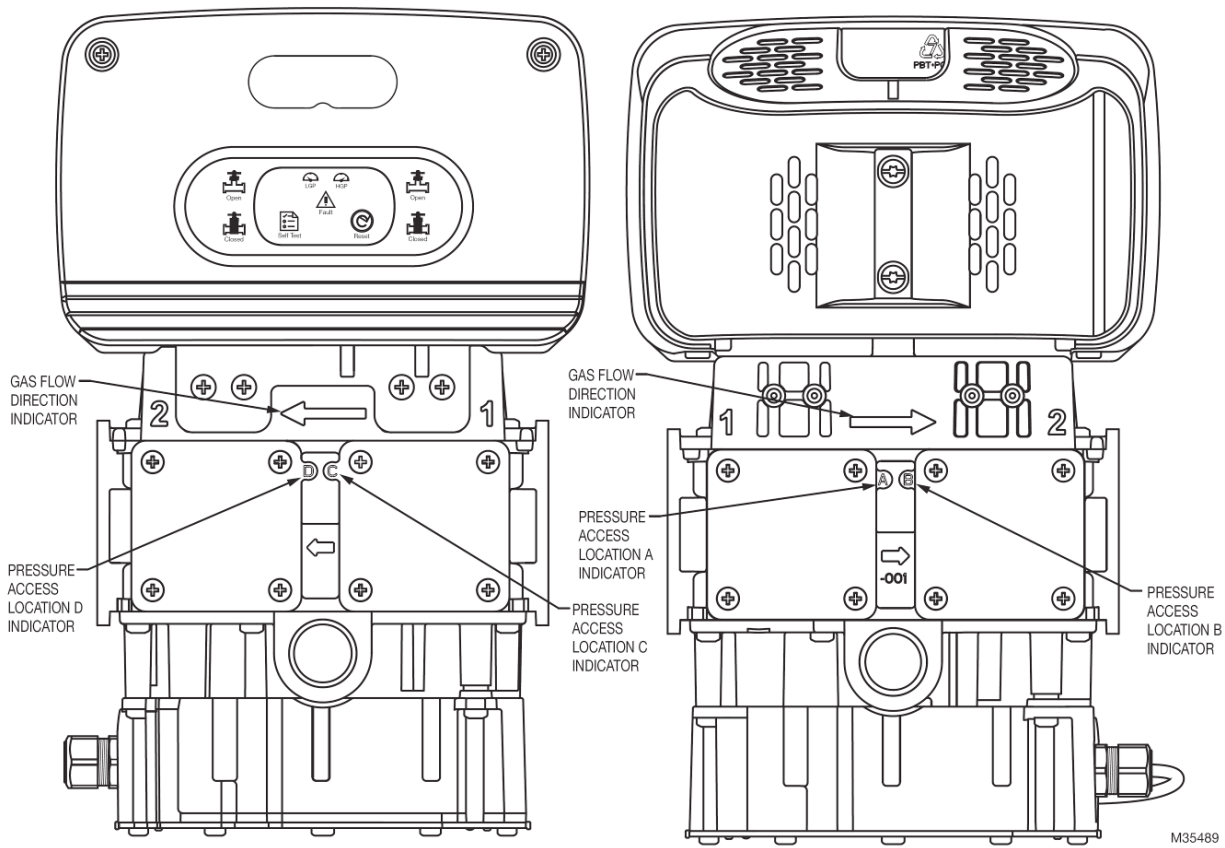


Fig. 8. Valve body and pressure port covers.

NOTE: If you need to replace a pressure access location cover, the tightening torque should be between 1.36 to 1.82 Nm (12 to 16 in-lbf).

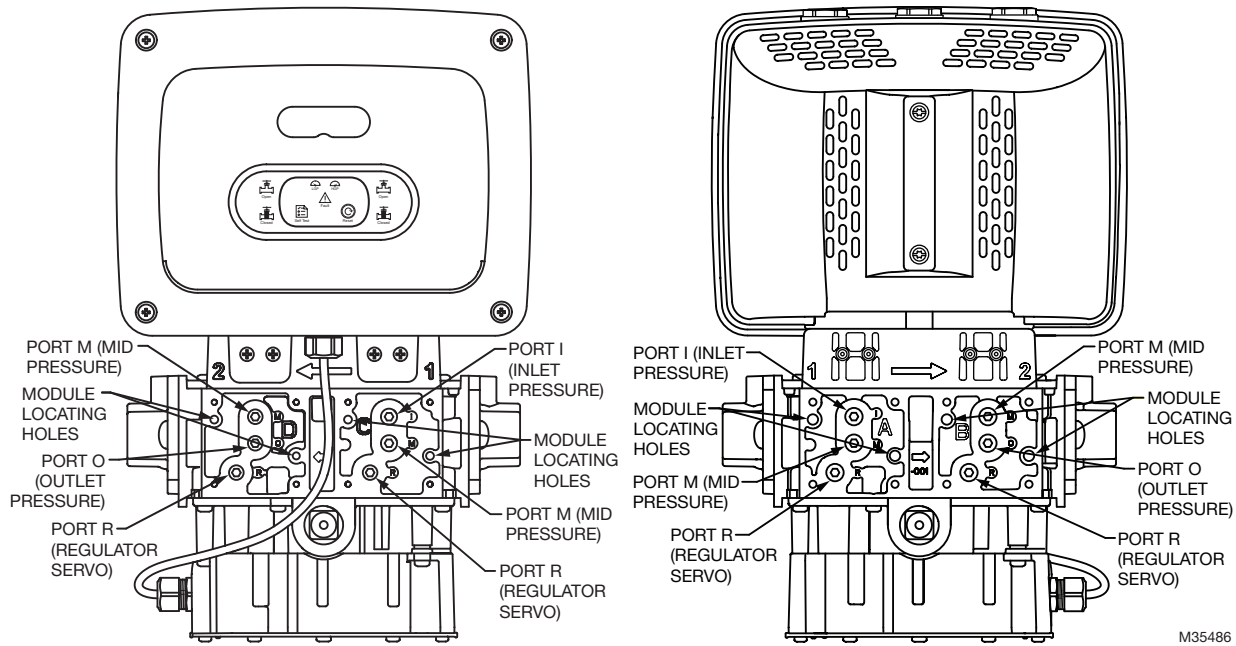


Fig. 9. Valve body and pressure ports.

3 WIRING

From the factory, several items will be fully wired internally via connectors inside the electrical enclosure. The factory wiring terminals can be found in Table 5. Customers may purchase the Honeywell SV2 Series valve with or without required electrical connectors (continent dependent).

If purchased with electrical connectors, they may be found in a bag assembly, housed in the accessory box that contains the literature and spare screws for mounting the pressure module or C6097 pressure switch.

If the valve is not purchased with the required electrical connectors, they may be purchased separately under part number CONNECTORKIT-000 or purchased externally. The appropriate connector information is shown in Table 4.

Vendor	Description	Vendor Part Number	SV2 Purpose	Required Quantity
Lumberg	RAST 5, 2 Pole	3611 02 K02M08	Mains supply	1
Lumberg	RAST 5, 3 Pole	3611 03 K04M08	RS-485 Modbus	1
Lumberg	RAST 5, 4 Pole	3611 04 K120M08	Analog Fire Rate + Analog O2 Sensor	2
Lumberg	RAST 5, 6 Pole	3611 06 K01M08	Control Wiring	1

Table 4. SV2 Valve Electrical Connectors Identification.

A. Wiring and Conduit Recommendations



WARNING

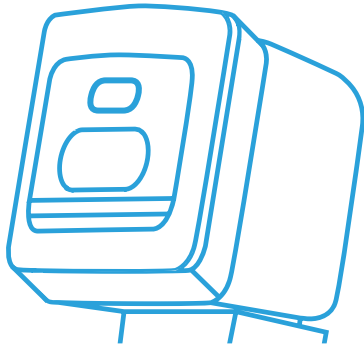
Explosion Hazard and Electrical Shock Hazard.
Can cause explosion, serious injury or death.

- Disconnect the power supply making wiring connections to prevent electrical shock and equipment damage.
- More than one power supply disconnect can be involved.

IMPORTANT

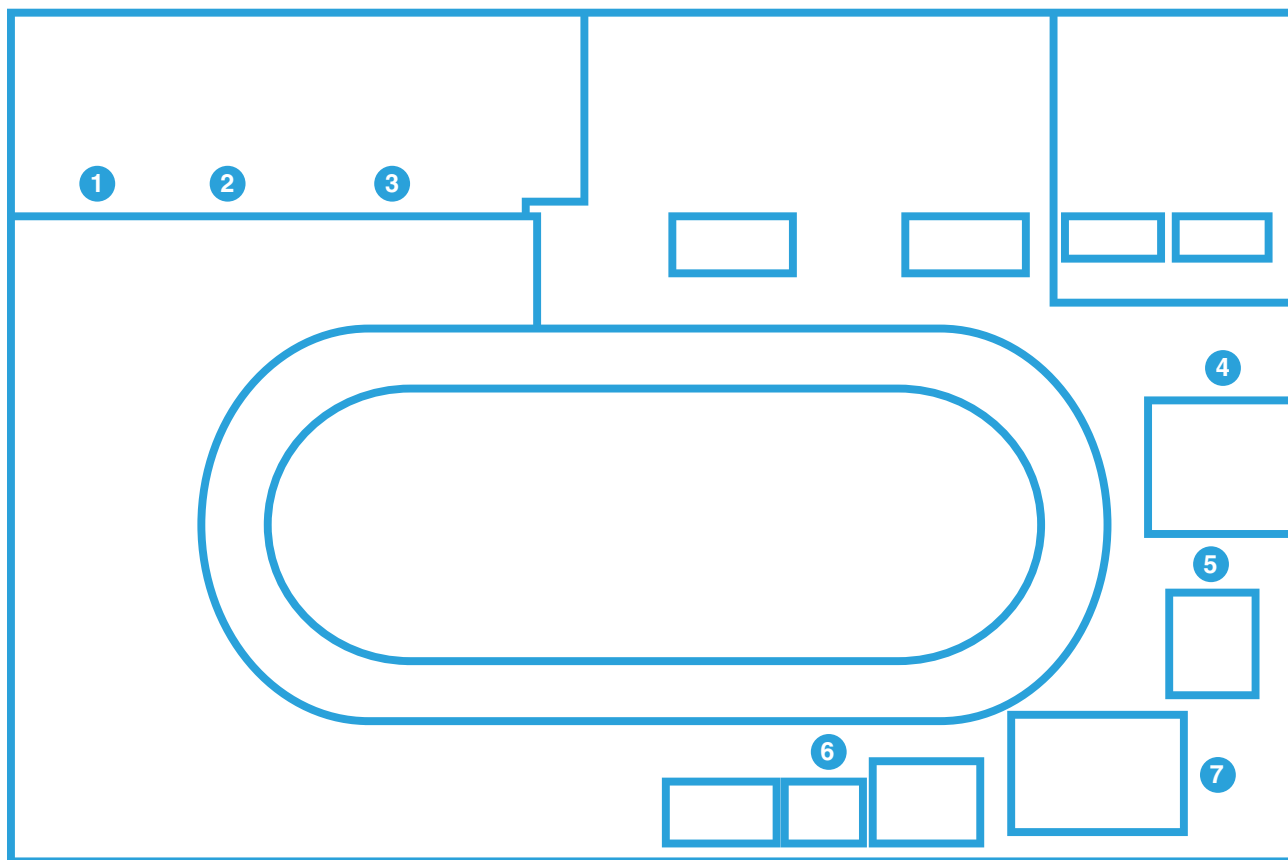
- Use only flexible conduit with the SV2 Series valve NEMA 4 / IP66 enclosures.
- Wiring must comply with all applicable electrical codes, ordinances and regulations.
- Wiring must comply with NEC Class 1 (line voltage) wiring.
- Use lead wire which can withstand 90°C (194°F) ambient temperatures.
- Voltage and frequency of the power supply connected to this control must agree with those marked on the device.
- Loads connected to the VPS (valve proving system) Switch and/or POC (proof of closure) Switch, if used, must not exceed the ratings given in Table 6.
- Separate line and low voltage to avoid signal interference. If using conduit, run line voltage and low voltage wiring in separate conduit.

B. Remove Electrical Enclosure Cover



To access the customer wiring terminals, remove the valve front electrical enclosure retaining screws with the appropriate tool. Set the cover aside.

C. Estimate Wiring



Note that the SV2 Series valves have unique line voltage, limit, interlock and VPS (valve proving system) wire routing. SV2 Series valves require line voltage power input at all times to the internal electronics. This is true of all SV2 Series valve models. Interlock wiring is run through all valve models for solenoid power saving feature. Interlock dry contact input/output also used for flame safeguard control ILK string with the Pressure Module for low gas pressure and high gas pressure functions. VPS switch contact output present on applicable models when the Pressure Module is used for VPS that is externally triggered by a separate device. Refer to Figs. 13 to 20 for proper valve wiring.

NOTE: Even when external C6097 pressure switches are used, the ILK wiring must be run through the valve.

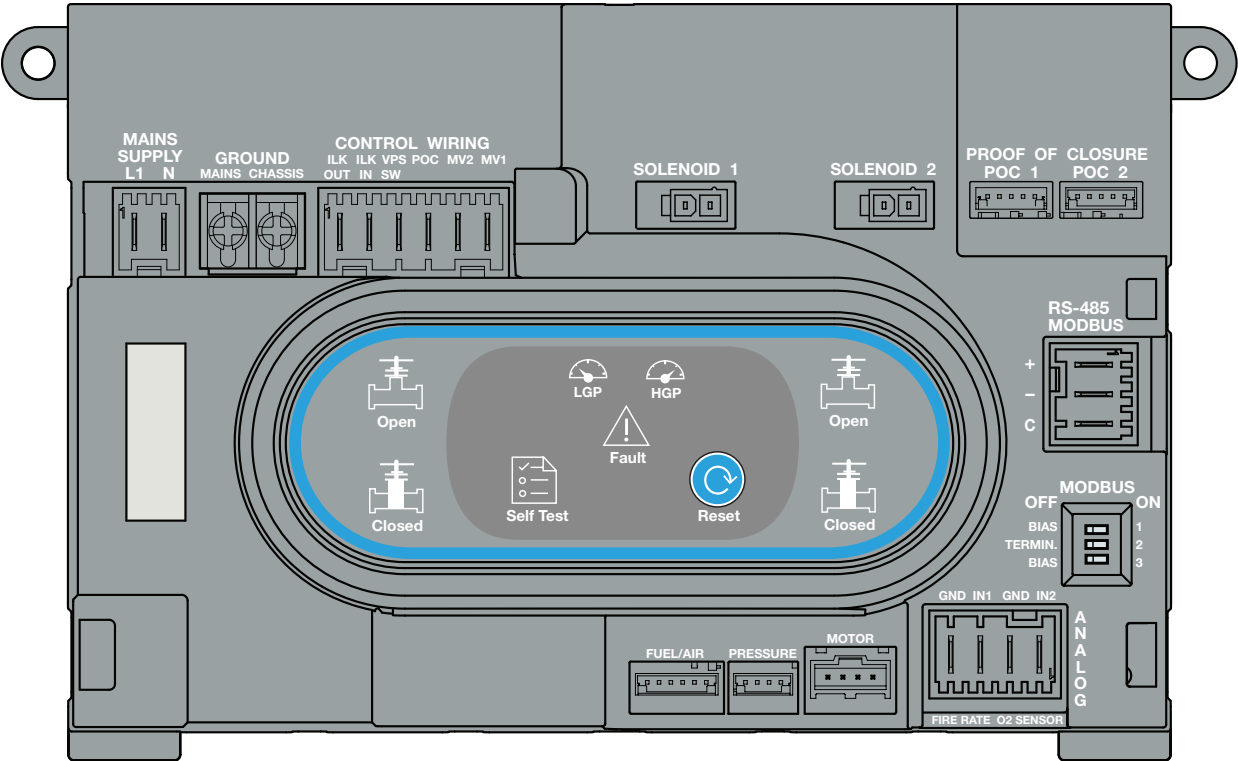
Certain models of the SV2 Series valves also have Modbus interface wiring as well as termination and bias resistor selections. The Modbus interface is used for programming intelligent features and connection to a building automation system.

Fig. 10 shows all of the wiring terminals inside the valve electronics enclosure. The factory wiring terminals can be found in Table 5 while the field wiring terminals and designations can be found in Table 6. A summary of the possible field wiring connectors is shown below, relative to the callouts in the illustration above.

1. Mains Supply L1 and N
2. Ground Mains and Chassis
3. ILK Out/In, VPS Switch output, POC output, Main Valve 1/2
4. RS-485 Modbus (not present on Basic Intelligence models)
5. Modbus termination and bias resistors (not present on Basic Intelligence models)
6. Pressure connection for Pressure Module
7. Analog GND/IN for Fire Rate and O2 Sensor (used for future enhancements)

Other – C6097/C437 pressure switches

NOTE: Use of certain terminals & items such as VPS Switch output, POC output, Modbus, 6 and 7 is model dependent. Refer to Table 6 for details.



MCR35488A

Fig. 10. NEMA 4 / IP66 STANDARD (6) or ENHANCED (7) electronics interface.

NOTES:

- **Electrical connections are the same for NEMA 1 / IP20 electrical assembly with the omission of POC 1 and POC 2.**
- **BASIC (5) electronics do not have any Modbus, Fuel/Air, Pressure, Motor or Analog connections**

Description	Purpose	Applicable Model(s)
SOLENOID 1	Connection from Solenoid 1 to main electronics. Enables powering of solenoid.	All
SOLENOID 2	Connection from Solenoid 2 to main electronics. Enables powering of solenoid.	
PROOF OF CLOSURE		
POC 1	Connection from Solenoid 1 POC to main electronics. Tied to the valve interface Open and Closed LEDs. Refer to Fig. 10.	All (optional)
POC 2	Connection from Solenoid 2 POC to main electronics. Tied to the valve interface Open and Closed LEDs. Refer to Fig. 10.	
FUEL/AIR	Module that measures gas, air and gas/air mix inputs from fuel/air system to control the fuel/air proportional and premix valves. Works with stepper MOTOR.	V2P V2V
MOTOR	Stepper motor performs valve modulation in response to changing conditions from the fuel/air module and burner system	V2P V2V

Table 5. Factory Wiring Information.

Description	Terminal	Purpose	Rating ⁶	Applicable Model(s) ⁵
MAINS SUPPLY ¹	L1	Valve incoming voltage supply L1 connection	100-240VAC, 15W	All
	N	Valve incoming voltage supply neutral connection		
GROUND (PROTECTIVE EARTH PE)	MAINS	Valve external ground connection	-	All
	CHASSIS	Valve chassis ground, connected to valve body grounding terminal		
CONTROL WIRING ²	ILK OUT	Interlock wiring run through all valve models for solenoid power saving feature. Dry contact output / input also used for flame safeguard control ILK string with Pressure Module for low gas pressure and high gas pressure functions.	100-240VAC, 8A	All
	ILK IN			
	VPS SW	Line voltage output for Valve Proving System switch, using the Pressure Module, for external VPS conducted by a separate device	100-240VAC, 0.1A	All models with Intelligent Features of 6 or 7
	POC	Line voltage output for Proof of Closure switch	100-240VAC, 0.1A	All valves with POC
	MV2 ³	Main valve 2 and 1 incoming voltage from burner control. May be jumpered if external VPS is NOT performed or if valve is an internal VPS model (models with Intelligent Features of 8 or 9)	100-120VAC, 0.4A 200-240VAC, 0.2A Each terminal pull-in	All
	MV1 ³			
RS-485 MODBUS ²	+	Modbus Data + connection	For HMI or PC Tools or building automation system connection	All models with Intelligent Features of 6, 7, 8 or 9
	-	Modbus Data - connection		
	C	Modbus common connection		
MODBUS BIAS RESISTORS	BIAS	Bias resistor for differential resistance	Refer to section F entitled Valve Modbus Bias Setup	All models with Intelligent Features of 6, 7, 8 or 9
	TERM.	Termination resistor		
	BIAS	Bias resistor for differential resistance		
PRESSURE	-	Field connection for Pressure Module, which can be used for Low gas pressure, High gas pressure, VPS (external and internal), Leak detection or pressure monitoring	-	All models with Intelligent Features of 6, 7, 8 or 9
FIRE RATE ²	GND	Ground connection for firing rate analog input	-	For future enhancements
	IN1	Firing rate 4-20mA / 2-10VDC analog input for metering function		
O2 SENSOR ²	GND	Ground connection for oxygen sensor analog input	-	
	IN2	O2 sensor 4-20mA / 2-10VDC analog input for fuel/air adaptive		

- Run line voltage wires in separate conduit.
- Run low voltage wires in separate conduit. For the best Modbus communication performance, use shielded wire with two twisted pairs (Belden 9842 or equivalent). Connect + and - to one twisted pair, and C to both wires of the other twisted pair. Connect the shield to Earth Ground at the end of the connected external device (i.e. HMI or building automation system). Do not connect C to the shield. Route any noise producing wires in conduit separate from the HMI and as far away from the HMI as possible. For further Modbus wiring information, refer to HMI installation instructions, document 32-00030.
- MV2 and MV1 may be jumpered if there is no need to individually power them. MV2 and MV1 should NOT be jumpered if an external VPS control is used, which requires MV2 and MV1 to be powered individually. On valve models with internal VPS functionality, MV2 and MV1 may be jumpered as the VPS sequence is directed by the valve itself, rather than an external control.
- Installation, operation and maintenance shall conform with National Fire Protection Association standards, national and local codes and authorities having jurisdiction.
- Use of the Pressure Module is only applicable to valve versions with embedded intelligence;
 - 6 = STANDARD. Includes Modbus, Pressure Module, external VPS using Pressure Module.
 - 7 = ENHANCED. Includes Modbus, Pressure Module, external VPS using Pressure Module, metering (EU future release).
 - 8 = FULL. Includes Modbus, Pressure Module, internal VPS using Pressure Module, metering (EU future release).
 - 9 = ELITE. Includes Modbus, Pressure Module, internal VPS using Pressure Module, metering, leak detection sequence (North America future release).
- Rating may be valve supply voltage dependent.

Table 6. Field Wiring and Terminal Designation⁴.

D. String Wires

You will need to remove the electrical connectors from the accessory box as well any line / low voltage nuts and plugs and low voltage cord grips. Inclusion of these items is contingent and model dependent.

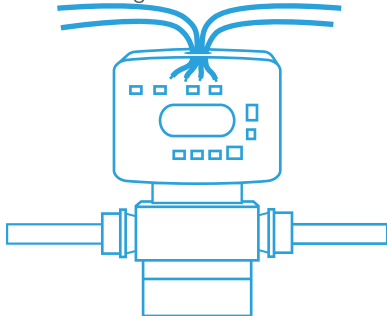
1. For NEMA 4 / IP66 enclosures:

NOTES:

- Use only flexible conduit with the SV2 Series valve NEMA 4 / IP66 enclosures.
- There are 6 low voltage entry points using M16 x 1.5 cord grips and retaining nuts.
- There are 6 entry points with 0.875 in (2.223 cm) holes for use with ½ in (1.27 cm) conduit or the provided 1/2 in NPT cord grip (for use with the RS-485 Modbus cable).
 - a. Select the line and low voltage wire entry locations you wish to use.
 - b. If using cord grips for low voltage wires:
 - i. Place the small retaining nuts in the low voltage entry points you wish to use.
 - ii. String wires through the cord grips, low voltage entry points and nuts **before** wiring to connectors.
 - iii. Tighten M16 x 1.5 cord grips to 3.7 to 4.2 Nm (33 to 38 in-lbf).

NOTE: If using a cord grip for the RS-485 Modbus wiring, the provided 1/2 in NPT cord grip must be used due to the recommended cable size. One of the larger 0.875 in (2.223 cm) electronic enclosure holes must be used along with one of the ½ in lock nuts which secure factory assembled plugs. The torque to assemble the ½ in NPT lock nut to the cord grip is 4.5 to 5.1 Nm (40 to 45 in-lbf). The torque to tighten the cord grip sealing nut around the cord is 5.6 to 6.2 Nm (50 to 55 in-lbf).

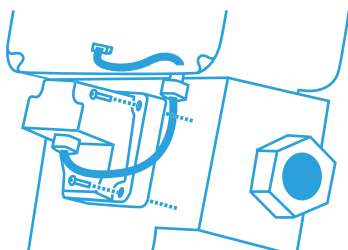
- c. If using conduit for low or line voltage wires:
 - i. String wires through the external conduit and through the valve enclosure entry points and conduit retaining fittings **before** wiring to connectors.



- ii. Torque conduit hardware to manufacturers recommended requirements.
- d. For the Pressure Module: Use the cable entry point just above the Pressure Module location or in the center of the electrical enclosure due to cable length. There are 3 low voltage entry points on the bottom of the electrical enclosure.

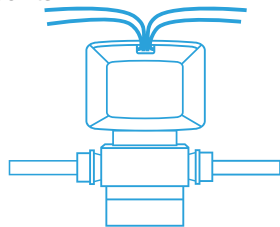
NOTE: A NEMA 4 / IP66 Pressure Module (PRESSMOD4x-0000) must be used with a NEMA 4 / IP66 valve electrical enclosure to retain the enclosure rating.

- i. Place the retaining nut in the selected entry location.
- ii. Thread the Pressure Module connector end through the hole and nut.
- iii. Thread extra cable length inside electrical enclosure as desired.
- iv. Insert the Pressure Module threaded cord grip into the hole and tighten, using the retaining nut.
- v. Tighten cord grip to 3.7 to 4.2 Nm (33 to 38 in-lbf).



2. For NEMA 1 / IP20 enclosures:

- String wires through enclosure rear opening or bottom slot **before** wiring to connectors. Separate the line and low voltage entry points.



- For wire strain relief, dress wires with a tie wrap to one of the wire clips located on the rear or bottom of the electrical enclosure.
- For the Pressure Module:

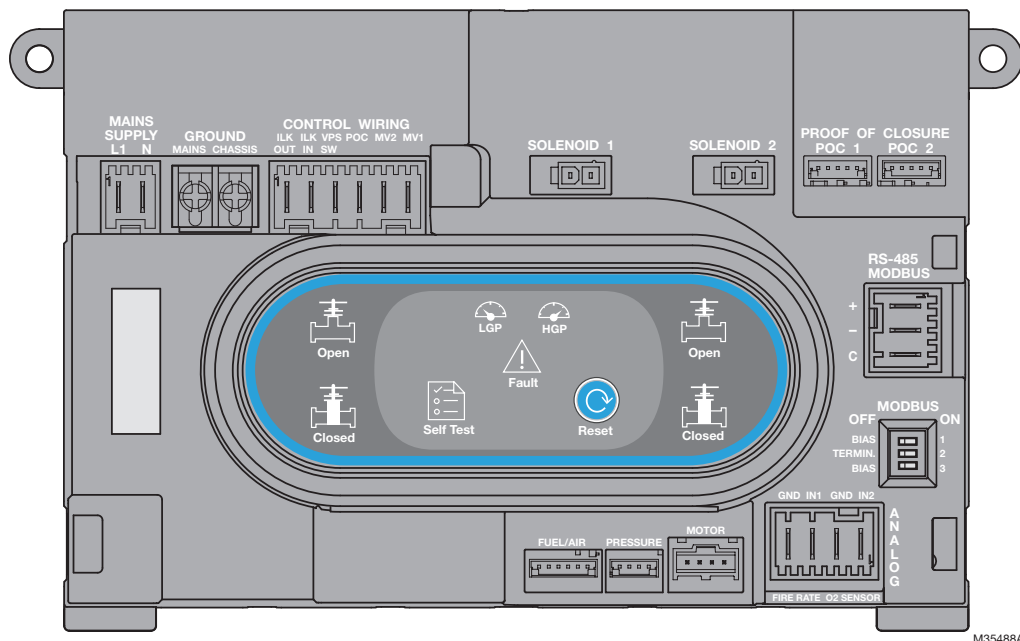
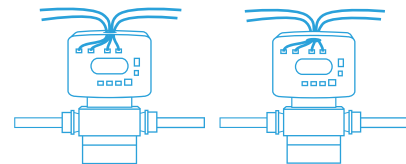
NOTE: A NEMA 1 / IP20 Pressure Module (PRESSMOD1x-0000) must be used with a NEMA 1 / IP20 valve electrical enclosure.

- Thread the connector end through the slot in the bottom center of the electrical enclosure.
- Thread extra cable length inside electrical enclosure as desired and dress the cable to one of the provided wire clips on the bottom of the electrical enclosure.

E. Connect Wires



- Be sure to observe the terminal labeling as shown below and proper electrical connector placement.
- Connect wires to the proper terminal on the proper connector.
 - Refer to Table 6.
 - Refer to the Burner Control Interface Wiring, Figs. 13 to 20.
- Plug electrical connectors into their proper sockets
- Plug Pressure Module (if used) connector into the socket labeled 'PRESSURE'.



M35488A

Fig. 11. NEMA 4 / IP66 STANDARD (6) or ENHANCED (7) electronics interface.

NOTES:

- **Electrical connections are the same for NEMA 1 / IP20 electrical assembly with the omission of POC 1 and POC 2**
- **BASIC (5) electronics do not have any Modbus, Fuel/Air, Pressure, Motor or Analog connections.**

F. Valve Modbus Bias Setup

The SV2 Series valve can communicate via Modbus RTU communication with any compatible device. Only RTU communications with **1 start bit, 8 data bits, 1 stop bit and no parity** is supported.

When more than one SV2 Series valve is connected to the HMI or PC Tools or directly connected to a building automation system, the Modbus termination and bias resistors should be adjusted appropriately. The resistors can be found inside the electrical enclosure on the right-hand side and are present in all intelligent valves models; valves where the 9th digit in the part number string are 6, 7, 8 or 9. Refer to Fig. 12.

The TERMIN. (termination) resistor in the ON position helps to improve signal integrity for the best performance in regards to EMC (electromagnetic compatibility). The termination resistor may be especially helpful to improve communication when the SV2 Series connected valve is at the end of the communication BUS.

The BIAS resistors in the ON position provide differential resistance for some older communication systems where communication can be lost with zero voltage present on the BUS. Resistors 1 and 3 should always be in the OFF or ON positions together. Refer to Table 7.

NOTE: If communication is problematic with all daisy-chained valves connected to the master control, adjusting the two BIAS resistors may solve the issue.

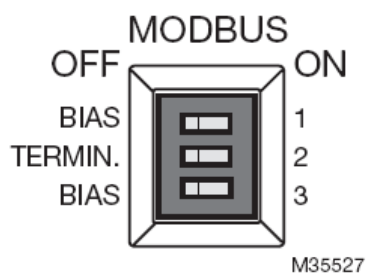


Fig. 12. SV2 Series valve Modbus bias and termination resistors.

SV2 Series Valve		Differential Biasing					
Not at BUS end	At BUS end	Not required	Required		OFF	ON	
X		X		BIAS	X		1
				TERMIN.	X		2
				BIAS	X		3
X			X	BIAS		X	1
				TERMIN.	X		2
				BIAS		X	3
	X	X		BIAS	X		1
				TERMIN.		X	2
				BIAS	X		3
	X		X	BIAS		X	1
				TERMIN.		X	2
				BIAS		X	3

Table 7. Modbus bias resistor setup.

G. Install Plugs

For any remaining unused wire entry locations in the NEMA 4 / IP66 electronic enclosure, install plugs and associated nuts to ensure enclosure rating. There are two different sizes of plugs for line and low voltage. The proper size and tightening torques are shown below.

- Low voltage, M16 x 1.5: 3.7 to 4.2 Nm (33 to 38 in-lbf).
- Line voltage, ½ in. NPT: 4.5 to 5.1 Nm (40 to 45 in-lbf).

Burner Control Interface Wiring

No External VPS (Valve Proving System) used; electronics configuration BASIC (5), STANDARD (6) or ENHANCED (7)

Wiring between the SV2 Series valve and Honeywell 7800 SERIES, SOLA, 7800 SERIES and ControlLinks and SLATE is shown in this section.

NOTE: For the best Modbus communication performance, use shielded wire with two twisted pairs (Belden 9842 or equivalent). Connect + and - to one twisted pair, and C to both wires of the other twisted pair. Connect the shield to earth ground at the end of the connected external device (i.e. HMI, PC or building automation system). Do not connect C to the shield. Run any noise producing wires in conduit separate from the HMI Tool and as far away from the HMI as possible. For further Modbus wiring information, refer to the HMI installation instructions, document 32-00030.

7800 SERIES North & South American Models

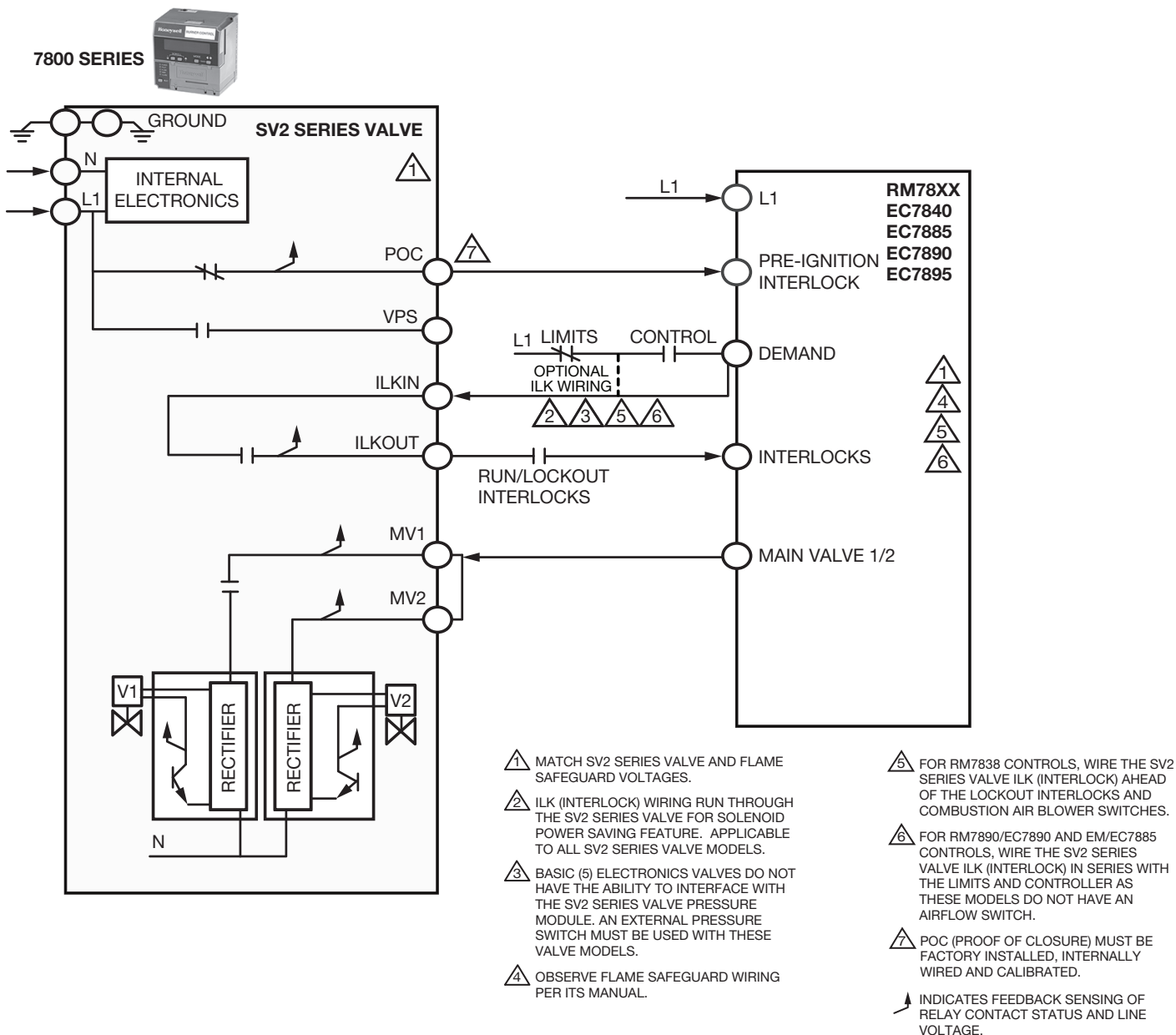
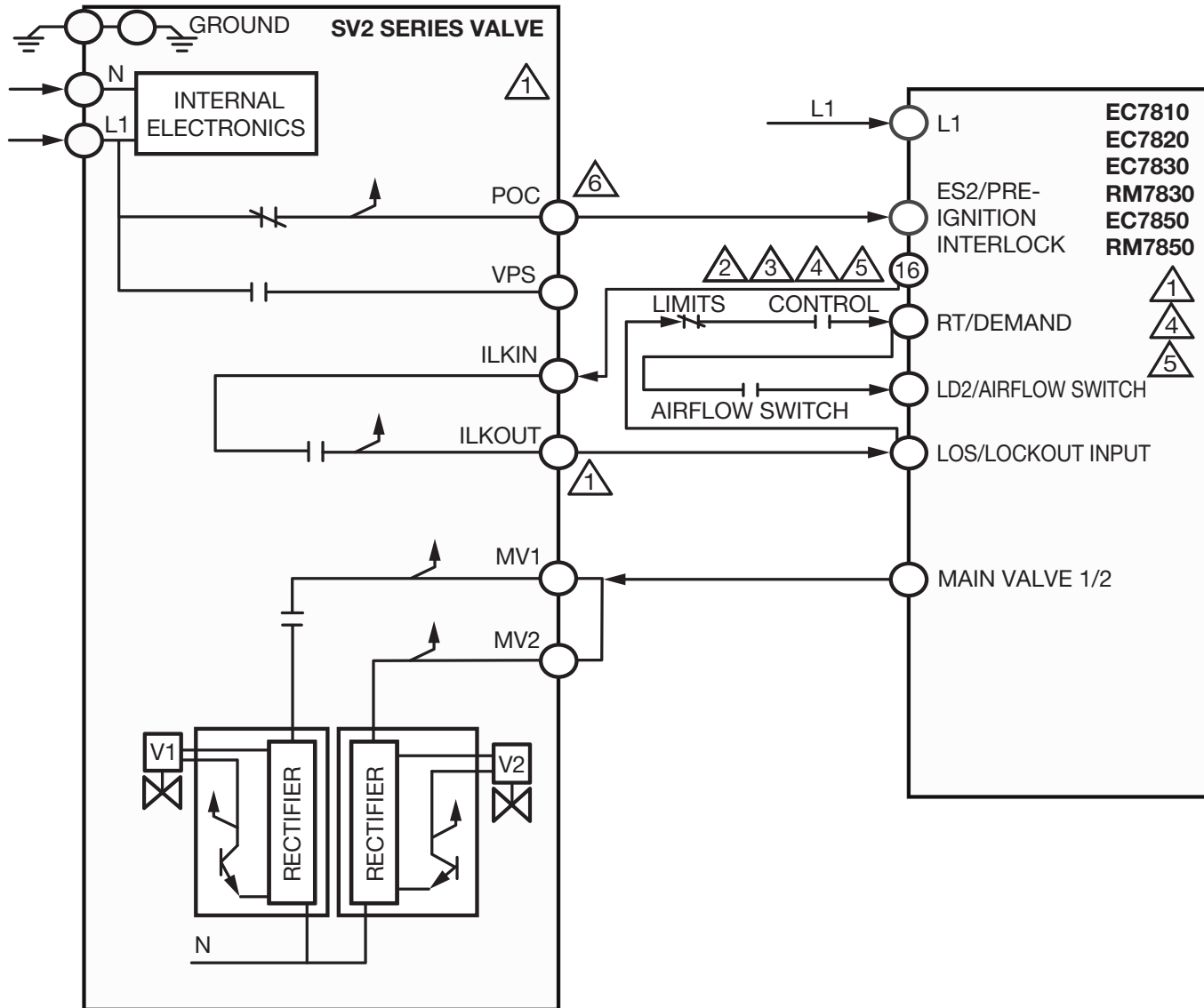


Fig. 13. 7800 SERIES with BASIC STANDARD or ENHANCED Electronics, No External VPS.

M35592

7800 Series European Models

7800 SERIES



⚠️ MATCH SV2 SERIES VALVE AND FLAME SAFEGUARD VOLTAGES.

⚠️ ILK (INTERLOCK) WIRING RUN THROUGH THE SV2 SERIES VALVE FOR SOLENOID POWER SAVING FEATURE. APPLICABLE TO ALL SV2 SERIES VALVE MODELS.

⚠️ BASIC (5) ELECTRONICS VALVES DO NOT HAVE THE ABILITY TO INTERFACE WITH THE SV2 SERIES VALVE PRESSURE MODULE. AN EXTERNAL PRESSURE SWITCH MUST BE USED WITH THESE VALVE MODELS.

⚠️ OBSERVE FLAME SAFEGUARD WIRING PER ITS MANUAL.

⚠️ FOR THE EC7810, WIRE THE SV2 SERIES VALVE ILK (INTERLOCK) IN SERIES WITH THE LIMITS AND CONTROLLER AS THIS MODEL DOES NOT HAVE AN AIRFLOW SWITCH.

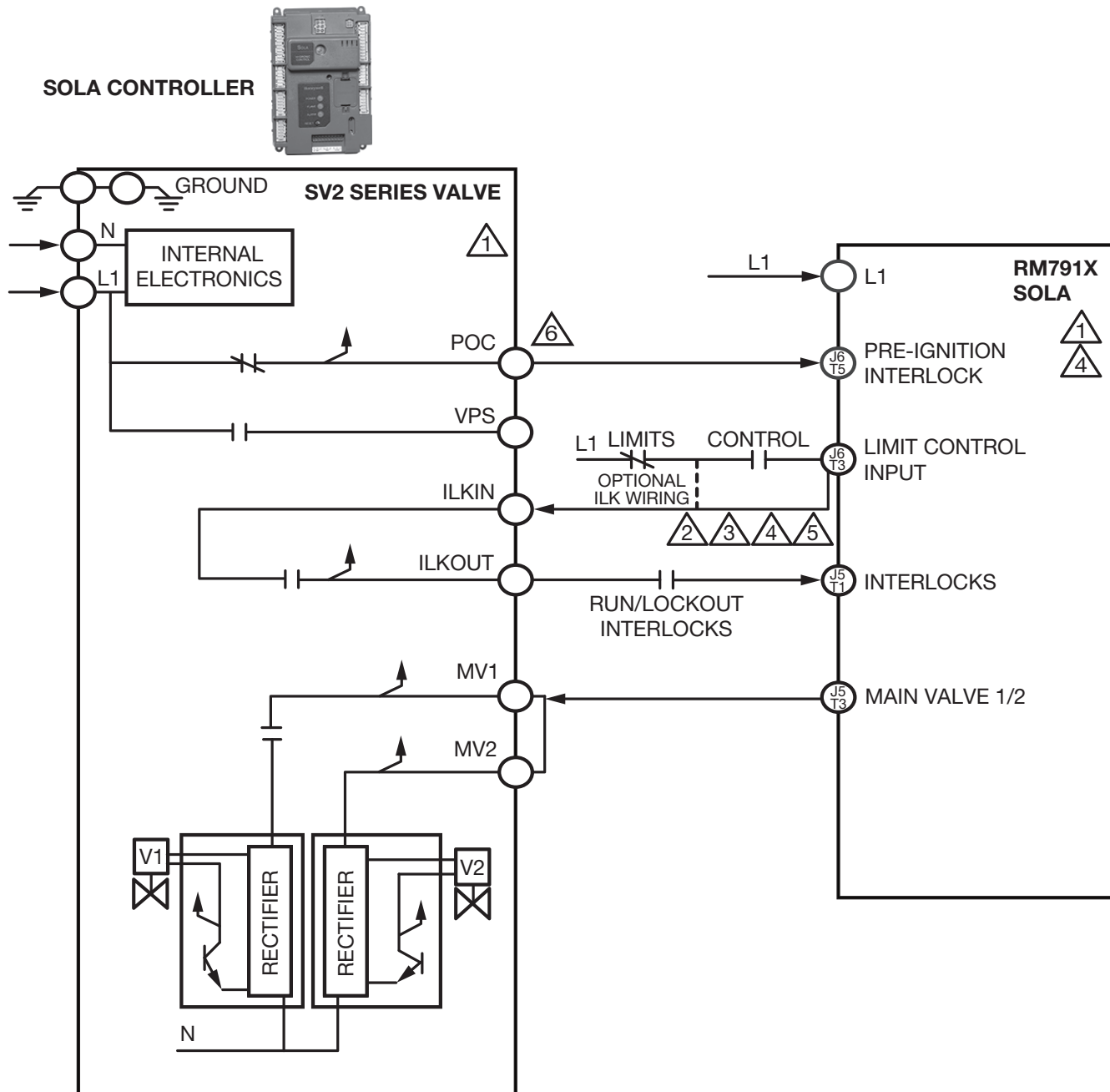
⚠️ POC (PROOF OF CLOSURE) MUST BE FACTORY INSTALLED, INTERNALLY WIRED AND CALIBRATED.

⤴️ INDICATES FEEDBACK SENSING OF RELAY CONTACT STATUS AND LINE VOLTAGE.

M35593A

Fig. 14. 7800 SERIES with BASIC STANDARD or ENHANCED Electronics, No External VPS.

SOLA Controller

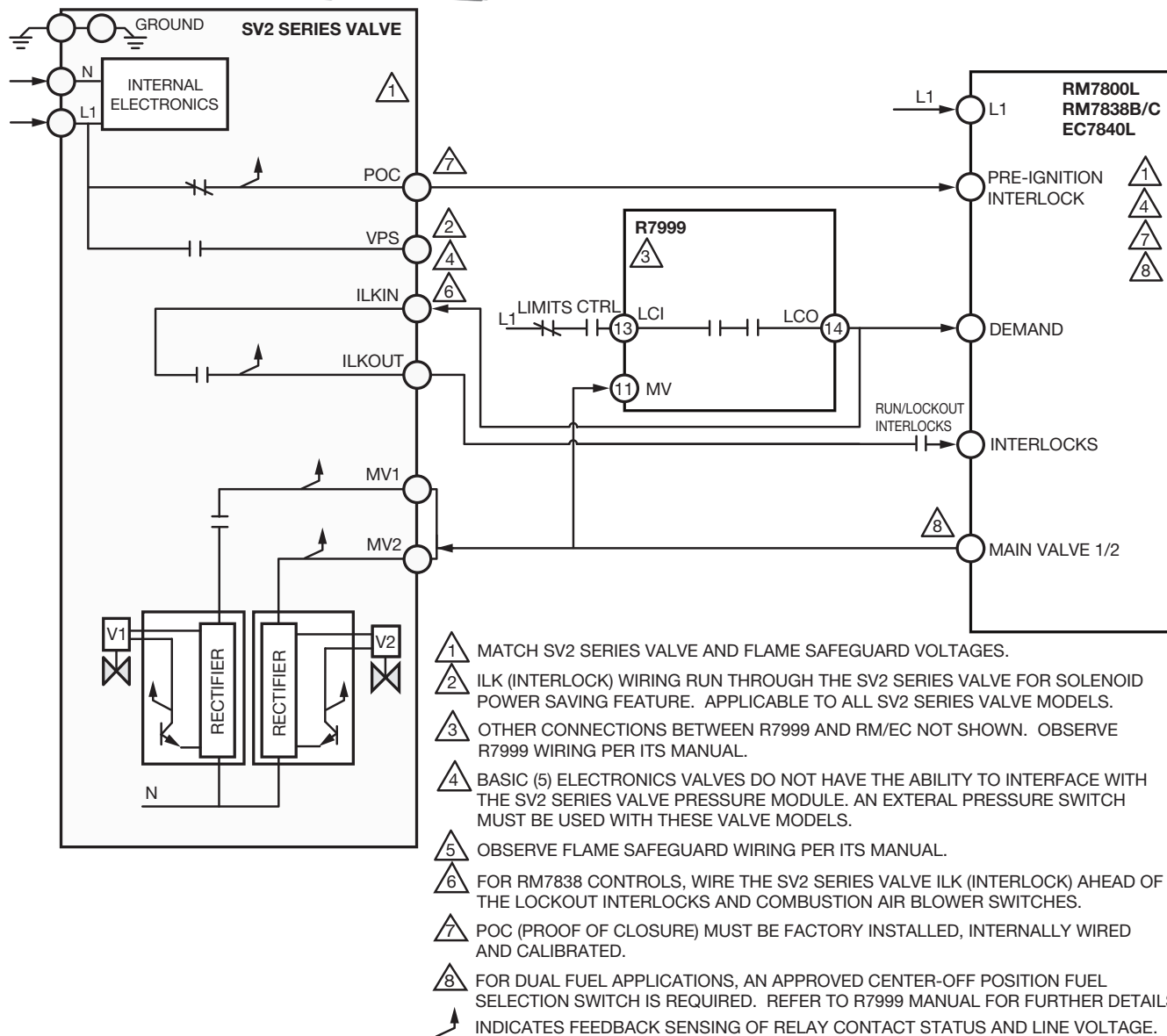


M35594

Fig. 15. SOLA with BASIC STANDARD or ENHANCED Electronics, No External VPS.

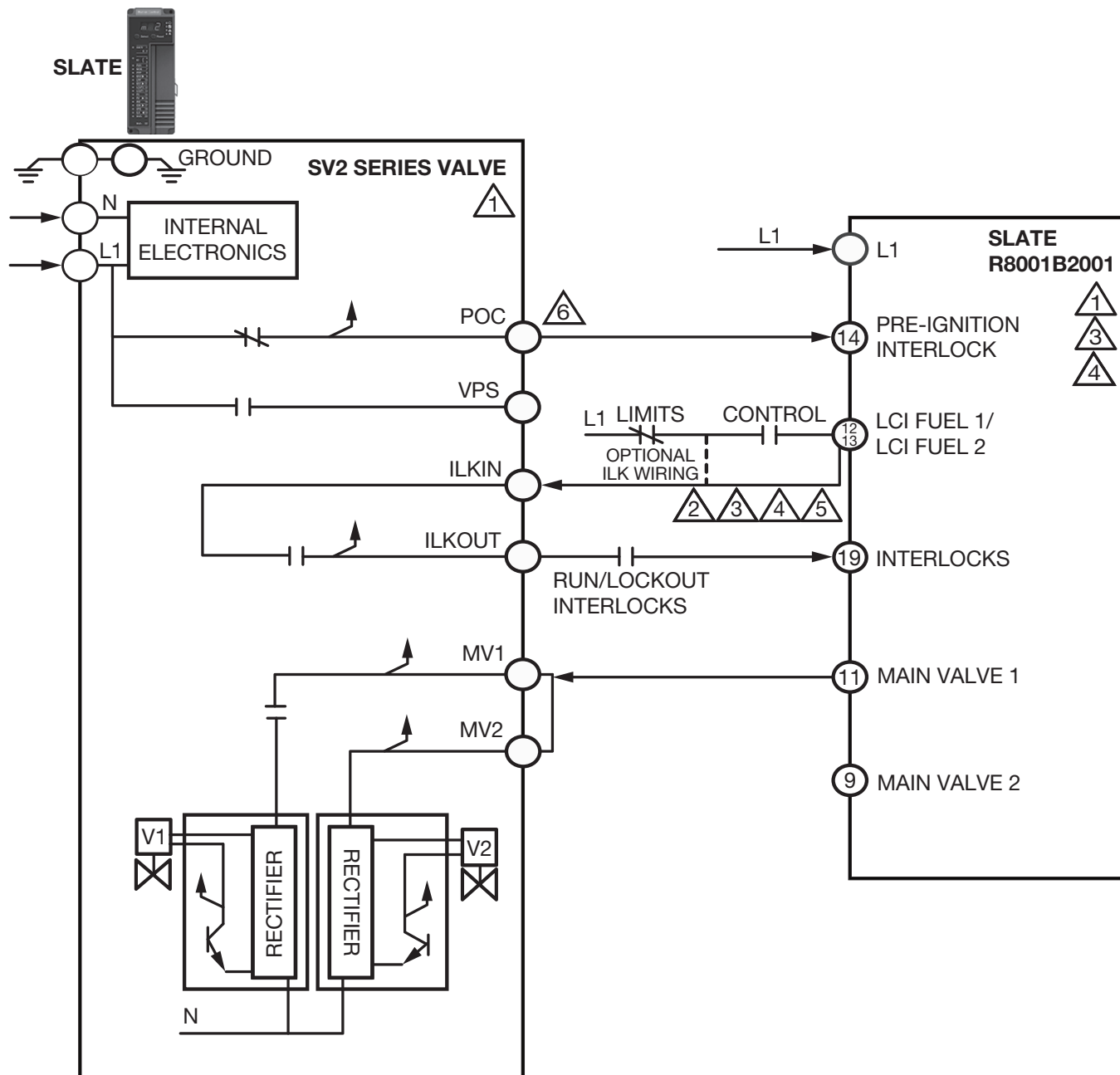
7800 SERIES and ControlLinks

7800 SERIES AND ControlLinks



M35595A

Fig. 16. 7800 SERIES and ControlLinks with BASIC STANDARD or ENHANCED Electronics, No External VPS.

SLATE™

⚠️ MATCH SV2 SERIES VALVE AND FLAME SAFEGUARD VOLTAGES.

⚠️ ILK (INTERLOCK) WIRING RUN THROUGH THE SV2 SERIES VALVE FOR SOLENOID POWER SAVING FEATURE. APPLICABLE TO ALL SV2 SERIES VALVE MODELS.

⚠️ BASIC (5) ELECTRONICS VALVES DO NOT HAVE THE ABILITY TO INTERFACE WITH THE SV2 SERIES VALVE PRESSURE MODULE. AN EXTERNAL PRESSURE SWITCH MUST BE USED WITH THESE VALVE MODELS.

⚠️ OBSERVE FLAME SAFEGUARD WIRING PER ITS MANUAL.

⚠️ IF SLATE INTERNAL OPERATING CONTROL IS USED, EXTERNAL CONTROL WIRING NOT APPLICABLE.

⚠️ POC (PROOF OF CLOSURE) MUST BE FACTORY INSTALLED, INTERNALLY WIRED AND CALIBRATED.

➦ INDICATES FEEDBACK SENSING OF RELAY CONTACT STATUS AND LINE VOLTAGE.

M35596

Fig. 17. SLATE with BASIC STANDARD or ENHANCED Electronics, No External VPS.

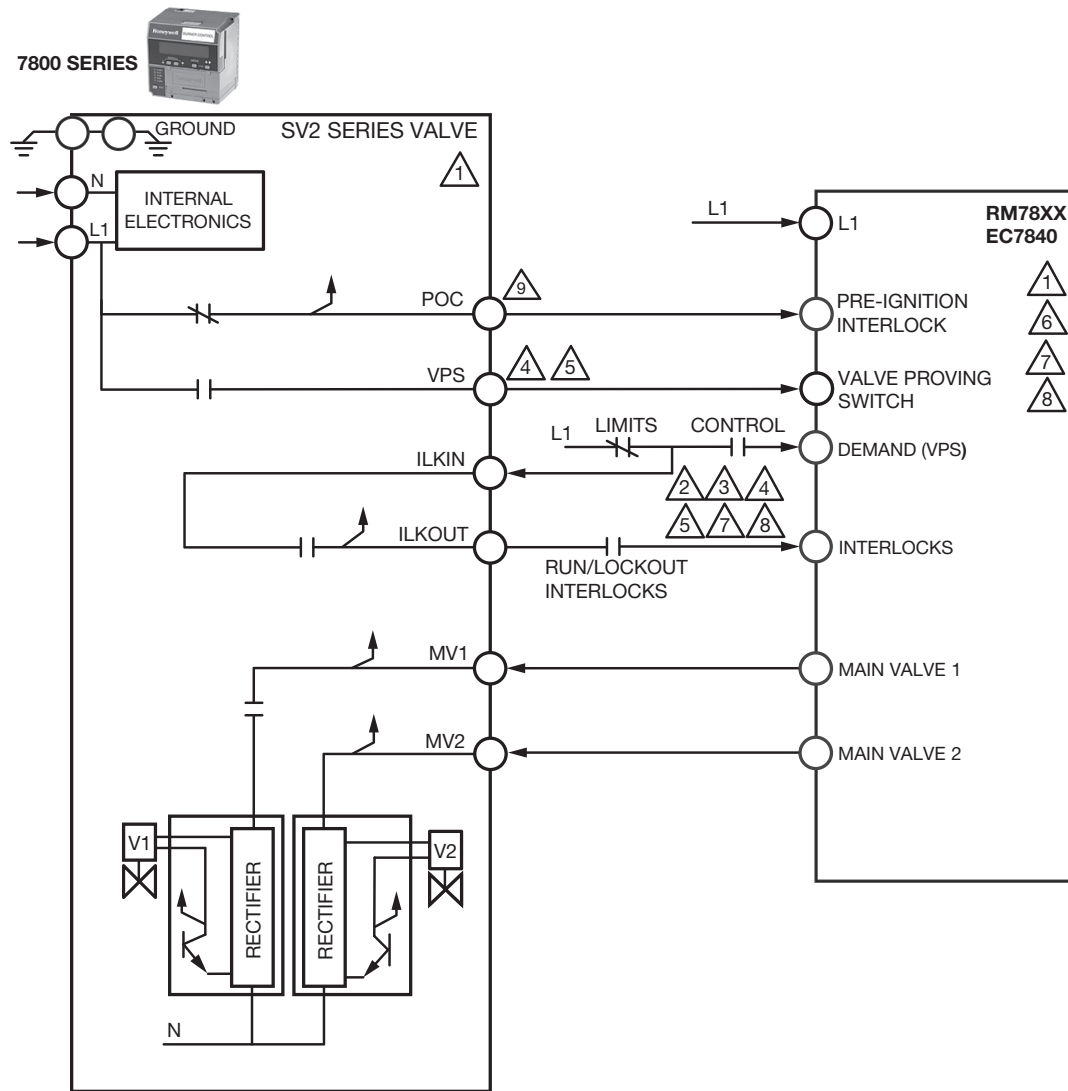
External VPS (Valve Proving System) Used; Electronics configuration BASIC (5) with external pressure switch or STANDARD (6) or ENHANCED (7) with Pressure Module

The SV2 Series valve Pressure Module is used with this scenario with the VPS switch output coming from the SV2 electronics.

Wiring between the SV2 Series valve and Honeywell 7800 SERIES, 7800 SERIES and ControlLinks and SLATE is shown in this section.

7800 SERIES

North & South American Models



1 MATCH SV2 SERIES VALVE AND FLAME SAFEGUARD VOLTAGES.

2 ILK (INTERLOCK) WIRING RUN THROUGH THE SV2 SERIES VALVE FOR SOLENOID POWER SAVING FEATURE. APPLICABLE TO ALL SC2 SERIES VALVE MODELS.

3 ILK (INTERLOCK) WIRING AS SHOWN KEEPS VALVE SOLENOIDS ENERGIZED IF VPS IS PERFORMED AFTER, BOTH OR SPLIT RELATIVE TO THE CALL FOR HEAT DEMAND.

4 VPS CONTACT OUTPUT FROM SV2 SERIES VALVE ONLY APPLICABLE WHEN THE SV2 SERIES PRESSURE MODULE IS USED FOR LOW GAS PRESSURE AND HIGH GAS PRESSURE LIMITS. THIS FEATURE MUST BE ENABLED AND PROGRAMMED VIA THE HMI OR PC TOOLS WHEN COMMISSIONING THE VALVE. THE SV2 SERIES VALVE LOW GAS PRESSURE AND HIGH GAS PRESSURE LIMITS ARE INCLUDED IN THE INTERNAL ILK (INTERLOCK) VALVE STRING.

5 BASIC (5) ELECTRONICS VALVES DO NOT HAVE THE ABILITY TO INTERFACE WITH THE SV2 SERIES VALVE PRESSURE MODULE OR VPS FUNCTIONALITY. AN EXTERNAL PRESSURE SWITCH MUST BE USED WITH THESE VALVE MODELS.

6 OBSERVE FLAME SAFEGUARD WIRING PER ITS MANUAL.

7 FOR RM7838 CONTROLS, WIRE THE SV2 SERIES VALVE ILK (INTERLOCK) AHEAD OF THE LOCKOUT INTERLOCKS AND COMBUSTION AIR BLOWER SWITCHES.

8 FOR RM7890/EC7890 CONTROLS, WIRE THE SV2 SERIES VALVE ILK (INTERLOCK) IN SERIES WITH THE LIMITS AND CONTROLLER AS THESE MODELS DO NOT HAVE AN AIRFLOW SWITCH.

9 POC (PROOF OF CLOSURE) MUST BE FACTORY INSTALLED, INTERNALLY WIRED AND CALIBRATED.

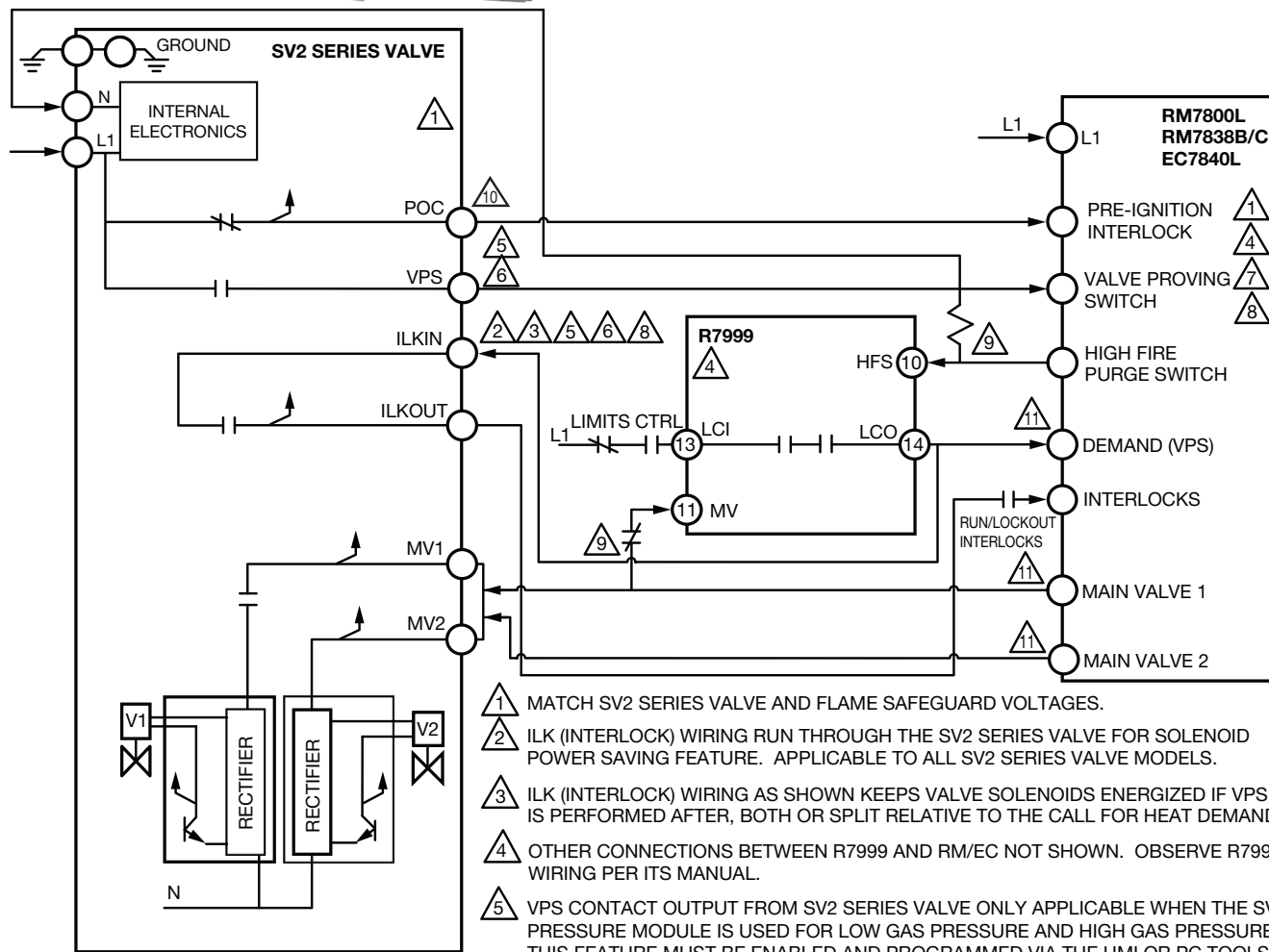
↑ INDICATES FEEDBACK SENSING OF RELAY CONTACT STATUS AND LINE VOLTAGE

M35591A

Fig. 18. 7800 SERIES with STANDARD or ENHANCED Electronics, External VPS Used.

7800 SERIES and ControlLinks

7800 SERIES AND ControlLinks

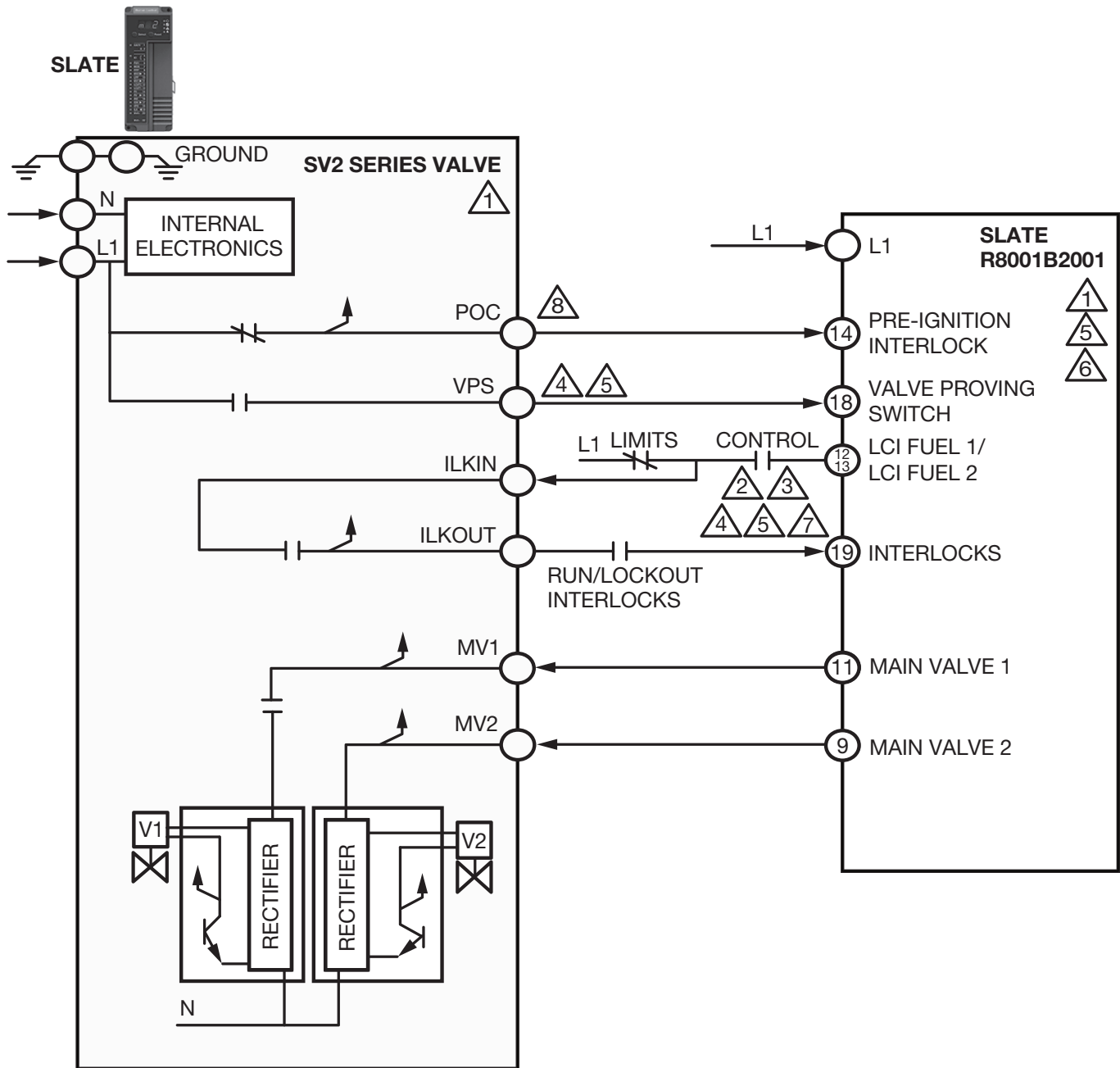


- 1 MATCH SV2 SERIES VALVE AND FLAME SAFEGUARD VOLTAGES.
 - 2 ILK (INTERLOCK) WIRING RUN THROUGH THE SV2 SERIES VALVE FOR SOLENOID POWER SAVING FEATURE. APPLICABLE TO ALL SV2 SERIES VALVE MODELS.
 - 3 ILK (INTERLOCK) WIRING AS SHOWN KEEPS VALVE SOLENOIDS ENERGIZED IF VPS IS PERFORMED AFTER, BOTH OR SPLIT RELATIVE TO THE CALL FOR HEAT DEMAND.
 - 4 OTHER CONNECTIONS BETWEEN R7999 AND RM/EC NOT SHOWN. OBSERVE R7999 WIRING PER ITS MANUAL.
 - 5 VPS CONTACT OUTPUT FROM SV2 SERIES VALVE ONLY APPLICABLE WHEN THE SV2 SERIES PRESSURE MODULE IS USED FOR LOW GAS PRESSURE AND HIGH GAS PRESSURE LIMITS. THIS FEATURE MUST BE ENABLED AND PROGRAMMED VIA THE HMI OR PC TOOLS WHEN COMMISSIONING THE VALVE. THE SV2 SERIES VALVE LOW GAS PRESSURE AND HIGH GAS PRESSURE LIMITS ARE INCLUDED IN THE INTERNAL ILK (INTERLOCK) VALVE STRING.
 - 6 BASIC (5) ELECTRONICS VALVES DO NOT HAVE THE ABILITY TO INTERFACE WITH THE SV2 SERIES VALVE PRESSURE MODULE OR VPS FUNCTIONALITY. AN EXTERNAL PRESSURE SWITCH MUST BE USED WITH THESE VALVE MODELS.
 - 7 OBSERVE FLAME SAFEGUARD WIRING PER ITS MANUAL.
 - 8 FOR RM7838 CONTROLS, WIRE THE SV2 SERIES VALVE ILK (INTERLOCK) AHEAD OF THE LOCKOUT INTERLOCKS AND COMBUSTION AIR BLOWER SWITCHES.
 - 9 LINE VOLTAGE RELAY SPDT, WITH NC CONTACT WIRE INTO THE LINE FROM RM/EC SUBBASE MAIN VALVE TERMINAL 9 AND R7999 SUBBASE TERMINAL 11. RELAY NEEDED FOR VPS APPLICATION IF BEFORE, SPLIT OR BOTH SELECTED. NOT REQUIRED WHEN AFTER IS SELECTED.
 - 10 POC (PROOF OF CLOSURE) MUST BE FACTORY INSTALLED, INTERNALLY WIRED AND CALIBRATED.
 - 11 FOR DUAL FUEL APPLICATIONS, AN APPROVED CENTER-OFF POSITION FUEL SELECTION SWITCH IS REQUIRED. ADDITIONALLY, THE BURNER CONTROL DEMAND TERMINAL INPUT MUST BE SWITCHED FROM VPS/GAS TERMINAL 17 TO OIL TERMINAL 6. REFER TO R79999 MANUAL FOR FURTHER DETAILS.
- INDICATES FEEDBACK SENSING OF RELAY CONTACT STATUS AND LINE VOLTAGE.

M35597A

Fig. 19. 7800 SERIES and ControlLinks with STANDARD or ENHANCED Electronics, External VPS Used.

SLATE™



⚠ MATCH SV2 SERIES VALVE AND FLAME SAFEGUARD VOLTAGES.

⚠ ILK (INTERLOCK) WIRING RUN THROUGH THE SV2 SERIES VALVE FOR SOLENOID POWER SAVING FEATURE. APPLICABLE TO ALL SV2 SERIES VALVE MODELS.

⚠ ILK (INTERLOCK) WIRING AS SHOWN KEEPS VALVE SOLENOIDS ENERGIZED IF VPS IS PERFORMED AFTER, BOTH OR SPLIT RELATIVE TO THE CALL FOR HEAT DEMAND WHEN AN EXTERNAL OPERATING IS USED.

⚠ VPS CONTACT OUTPUT FROM SV2 SERIES VALVE ONLY APPLICABLE WHEN THE SV2 SERIES PRESSURE MODULE IS USED FOR LOW GAS PRESSURE AND HIGH GAS PRESSURE LIMITS. THIS FEATURE MUST BE ENABLED AND PROGRAMMED VIA THE HMI OR PC TOOLS WHEN COMMISSIONING THE VALVE. THE SV2 SERIES VALVE LOW GAS PRESSURE AND HIGH GAS PRESSURE LIMITS ARE INCLUDED IN THE INTERNAL ILK (INTERLOCK) VALVE STRING.

⚠ BASIC (5) ELECTRONICS VALVES DO NOT HAVE THE ABILITY TO INTERFACE WITH THE SV2 SERIES VALVE PRESSURE MODULE OR VPS FUNCTIONALITY. AN EXTERNAL PRESSURE SWITCH MUST BE USED WITH THESE VALVE MODELS.

⚠ OBSERVE FLAME SAFEGUARD WIRING PER ITS MANUAL.

⚠ IF SLATE INTERNAL OPERATING CONTROL IS USED, EXTERNAL CONTROL WIRING NOT APPLICABLE.

⚠ POC (PROOF OF CLOSURE) MUST BE FACTORY INSTALLED, INTERNALLY WIRED AND CALIBRATED.

⚡ INDICATES FEEDBACK SENSING OF RELAY CONTACT STATUS AND LINE VOLTAGE.

M35598A

Fig. 20. SLATE with STANDARD or ENHANCED Electronics, External VPS Used.

4 VALVE CHECKOUT AND OPERATION

WARNING

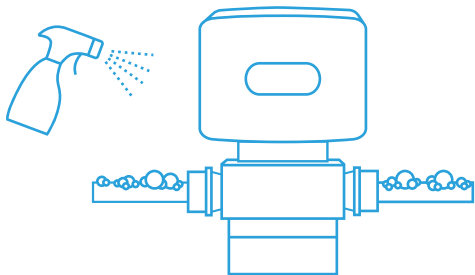
Explosion Hazard and Electrical Shock Hazard.
Can cause explosion, serious injury or death.

- Do not allow fuel to accumulate in the combustion chamber for longer than a few seconds without igniting. An explosive mixture can result.
- Do not put the system into service until you have satisfactorily completed the following Valve Seat Leak Test, all applicable tests described in the Checkout section of the flame safeguard control manual, and any other tests required by the burner manufacturer.
- All tests must be performed by a trained, experienced combustion service technician.
- Close all manual fuel shut-off valves as soon as trouble occurs. After the installation is complete, perform the Valve Seat Leak Test before putting the valve into service.

A. Valve Connection and Accessory Leak Test

Leak check should be performed only by trained, experienced combustion service technician during the initial startup of the burner system, or whenever the valve is replaced. It is recommended that this test also be included in the scheduled inspection and maintenance procedures.

1. Gather required items:
 - a. Rich soap and water solution
2. Close the downstream manual gas valve(s), if present (refer to NOTE below).
3. Open the upstream manual gas valve(s).
4. Energize the valve train to apply gas pressure.
5. Test with rich soap and water solution to make sure there is no leak at any pipe, flange, adapter, accessory module or valve mating surface.
6. De-energize the control system to make sure no power goes to the valves.



NOTE: If downstream manual gas valve(s) not present, only open/power SV2 Series valve V1 and check for leaks. Recheck for leaks on complete system when operational.

B. Valve Seat Leak Test (Refer to Fig. 21)

This is a test for checking the closure tightness of the gas shut-off valve. It should be performed only by trained, experienced combustion service technicians during the initial startup of the burner system or whenever the valve is replaced. It is recommended that this test should also be included in the scheduled inspection and maintenance procedures. Refer to Fig. 21.

WARNING

Electrical Shock Hazard and Explosion Hazard.
Can cause explosion, serious injury or death.

Remove the power from the system before beginning the valve leak test to prevent electrical shock. More than one disconnect may be involved. Power the system only when requested in the test procedure.

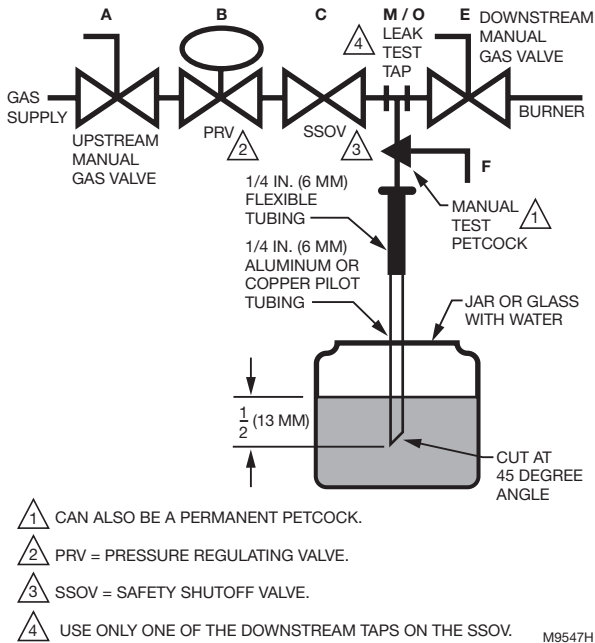


Fig. 21. Valve seat leak test.

1. Gather required items:
 - a. Glass or jar filled with water
 - b. 1/4 in (6mm) flexible tubing,
 - c. 1/4 in (6mm) aluminum or copper pilot tubing with one end cut at 45° angle,
 - d. Manual test petcock.

NOTE: The use of a gas ‘sniffer’ if not recommended as an alternative to this procedure as it can only sense gas leaks through the outer wall. The procedure outlined below is designed to locate and quantify a gas leak.

2. De-energize the control system to make sure no power goes to the valves.
3. To test the first SSOV, close the upstream manual gas valve (A).
4. Make sure the manual test petcock (F) is closed in the leak test tap assembly.
5. Remove the 1/8 in (3mm) NPT or BSP plug from pressure tap point (M) on the valve. Refer to Fig. 9 and Fig. 21
6. Install the leak test tap into pressure tap point (M) on the valve body.
7. Open the upstream manual gas valve (A) to pressurize the first SSOV.
8. Immerse the 1/4 in (6mm) tube vertically 1/2 in. (13mm) in a jar of water.
9. Slowly open the manual test petcock (F).
10. When the rate of bubbles coming through the water stabilizes, count the number of bubble appearing during a ten second period. Each bubble appearing represents a flow rate of 0.001 cfh (28 cch). Refer to Table 8.
11. Close the upstream manual gas valve (A).
12. Close the manual test petcock (F).
13. Remove the leak test tap from the valve body.
14. Using a small amount of pipe sealant on the 1/8 in (3mm) NPT or BSP plug, re-install the plug in pressure tap point (M). Maximum tightening torque is 60 in-lbf (7 Nm).
15. To test the second SSOV, remove the 1/8 in. (3mm) NPT or BSP plug from the valve outlet flange (O).
16. Install the leak test tap into the valve outlet flange pressure tap (O).
17. Close the downstream manual gas valve (E).
18. Open the upstream manual gas valve (A).
19. Energize the first SSOV.
20. Immerse the 1/4 in. (6mm) tube vertically 1/2 in. (13mm) into a jar of water.

21. Slowly open the manual test petcock **(F)**.
22. When the rate of bubbles coming through the water stabilizes, count the number of bubbles appearing during a ten second period. Each bubble appearing represents a flow rate of 0.001 cfh (28 cch). Refer to Table 8.
23. De-energize the first SSOV.
24. Remove the leak test tap from the outlet flange.
25. Using a small amount of pipe sealant on the 1/8 in. (3mm) NPT or BSP plug, re-install the plug in the valve outlet flange. Maximum tightening torque is 30 in-lbf (3 Nm).

Pipe Size DN (in. NPT or BSP)	Maximum Seat Leakage ¹ cch	Maximum Number of Bub- bles in 10 seconds
DN20/25 (3/4 or 1)	235 cch	6

1. Based on standard conditions and test pressures provided by ANSI Z21.21-2012/CSA6.5-2012 paragraph 5.4.2.

Table 8. Maximum Bubbles Per Pipe Size.

After the Test

1. Make sure the downstream manual gas valve **(E)** is closed.
2. Open the upstream manual gas valve **(A)** and energize the valve through the safety system.
3. Test with rich soap and water solution to make sure there are no leaks at the middle and valve outlet flange test taps **(M)** / **(O)** or any pipe adapter / valve mating surfaces.
4. De-energize the valve.
5. Cycle the valve several times with the manual fuel shut-off cock closed. Verify that the valve, accessory modules and control system function properly.
6. Open the downstream manual gas valve **(E)**.
7. Restore the system to normal operation.

5 PROGRAMMING AND SETUP

The SV2 Series valve's intelligent features are programmed via the use of the HMI or PC Tool (HMITOOL-000 or PCTOOL-000). The programmable features, which are model dependent, include:

- Valve Modbus address + communication speed
- Low gas pressure switch reset type and setting
- High gas pressure switch reset type and setting
- VPS (valve proving system)
- Fuel/air firing curve (future release)
- Leak detection sequence (future release)
- Fuel metering functionality (future release)

IMPORTANT

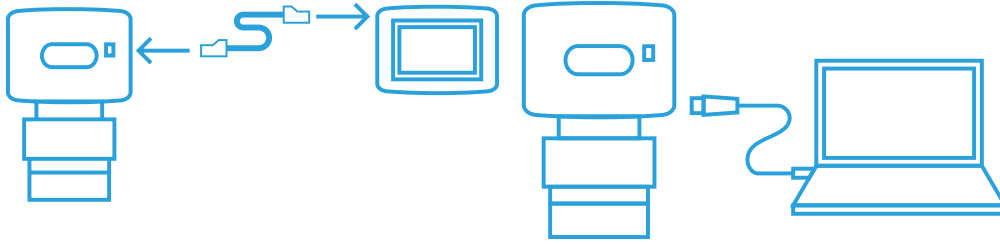
- *You DO NOT have to enable and utilize the intelligent valve features.*
- *Any intelligent features used do require completion of setup and verification during the initial valve setup using the HMI or PC tools before the valve will be operational.*
- *When using the Pressure Module, you MUST use both the low gas pressure and high gas pressure settings.*

Refer to the following documents for valve setup instructions using the HMI or PC Tools.

- 32-00023, PC Tool Installation Instructions
- 32-00030, HMI Tool Installation Instructions
- 32-00031, HMI / PC Tool User Manual

A. Connect Wiring

Connect the Modbus wiring per the HMI Tool or PC Tool installation instructions (whichever is used).



B. Power Valve and Programming Tool

Power the valve and the HMI Tool or PC Tool. The welcoming screen as in Fig. 22 should be shown.



Fig. 22. Touchscreen HMI (HMITOOL-000).

C. Complete Setup

Follow the embedded wizards in the HMI or PC Tool to complete the setup of all applicable intelligent items as required. You may reference the HMI / PC Tool User Manual, document 32-00031.

6 FINAL WIRING CHECK AND STATIC CHECKOUT

A. Test



CAUTION

- Cycle the valve several times with the manual fuel shut-off valve closed. Verify that the valve, accessory modules and control system function properly.
- Test each limit and interlock to ensure system operates correctly as defined in the applicable flame safeguard control manual instructions.
- Follow burner management system checkout guidelines. For 7800 SERIES, refer to the “Checkout and Test” document (Form #65-0229).
- Perform any other recommended manufacturer or other required tests.

Troubleshooting

WARNING

Electrical Shock Hazard.

Can cause severe injury, death or property damage.

Use extreme caution when troubleshooting; line voltage is present.

IMPORTANT

Do not replace the valve until all other sources of trouble have been eliminated.

Service Information

WARNING

Explosion Hazard and Electrical Shock Hazard.

Can cause severe injury, death or property damage.

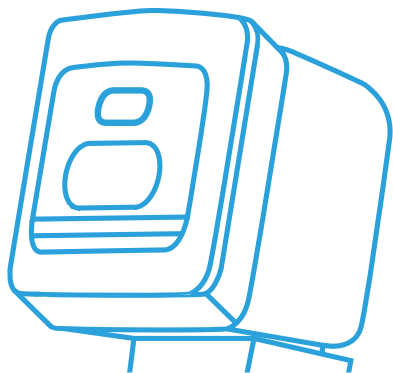
- Turn off gas supply and disconnect all electrical power to the valve before servicing
- Only trained, experienced combustion service technicians should attempt to service or repair flame safeguard controls, burner assemblies or valve trains.
- Refer to SV2 Series User Manual, 32-00029, for advice on component field replacements.

Scheduled Inspection and Maintenance

Setup and follow a schedule for periodic inspection and maintenance, including the burner, all other controls and the valves. It is recommended that the valve leak test in the Valve Checkout and Operation section of this manual be included in the periodic inspection and maintenance schedule. Refer to the instructions for the primary safety control(s) for more inspection and maintenance information.

7 FINISH

A. Replace Enclosure Cover



1. Replace the valve electrical enclosure cover.
2. Tightening torque for each fastener should be between 1.26 and 1.54 Nm (11 to 13.63 in-lbf).

B. Replace Solenoid Cover

1. Replace the solenoid cover if it has been removed during installation
2. Tightening torque should be between 2.2 to 2.35 Nm (19.5 to 20.8 in-lbf).

C. Your Valve is Ready to Use

Your SV2 Series safety shut-off valve installation and setup is now complete!

VALVE INTERFACE

The valve interface contains 8 back lit LEDs, which are used to indicate the following conditions; valve seat open / closed or powered / not powered status, the presence of a general fault condition, low gas pressure or high gas pressure fault condition or if a self-test is in process.

The valve seat Open / Closed LEDs indicate the status of the valve seat over which they are situated ¹.

The valve interface also has a push Reset button, which is used to reset the valve in the event it is in lockout status, to verify safety parameters after setup and to reverse the Open / Closed LEDs when the valve electronics orientation is changed in the field (refer to Note 1 below).

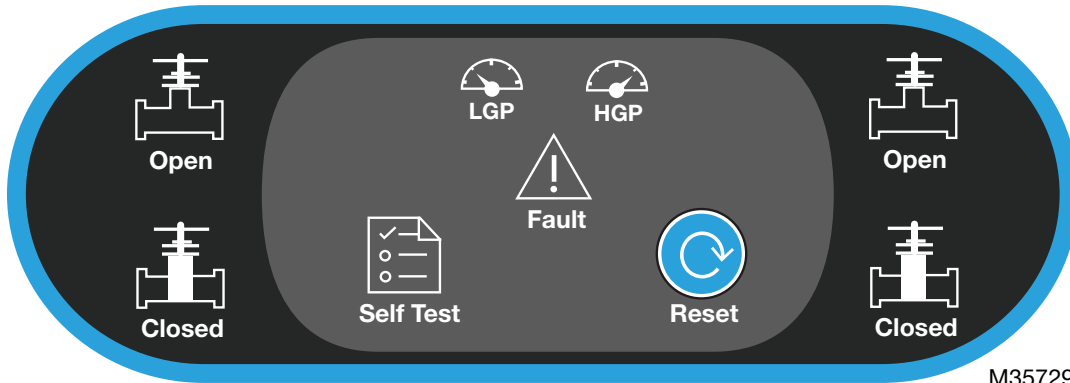


Fig. 23. Valve interface.







LED	Purpose	Applicable Models
 Open	If a POC (proof of closure switch) is present on the valve, this LED indicates that the valve seat is open. This gives visual position indication per FM (Factory Mutual) 7400 and ANSI Z21.21 / CSA 6.5. LED gives status indication of the valve seat over which the LED is situated. ¹ If a POC (proof of closure switch) is NOT present, this LED indicates the solenoid is powered.	All valve models
 Closed	If a POC (proof of closure switch) is present on the valve, this LED indicates that the valve seat is closed. This gives visual position indication per FM (Factory Mutual) 7400 and ANSI Z21.21 / CSA 6.5. LED gives status indication of the valve seat over which the LED is situated. ¹ If a POC (proof of closure switch) is NOT present, this LED indicates the solenoid not powered.	
 Self Test	The Self Test LED indicates a valve test is being performed. Self Tests include circuit check during initial power-up, internal VPS, leak detection test, manual low gas or high gas pressure tests. NOTE: On BASIC intelligence valves, this only indicates a circuit check.	
 Fault	Indicates a fault condition exists.	
 LGP	Indicates a Low Gas Pressure fault condition exists when a SV2 Series Pressure Module is used on the valve. NOTE: The Fault LED will also be lit while this fault is active.	All models with Intelligent Features of 6, 7, 8 or 9
 HGP	Indicates a High Gas Pressure fault condition exists when a SV2 Series Pressure Module is used on the valve. NOTE: The Fault LED will also be lit while this fault is active.	

Table 9. Valve Interface LED Descriptions.

1. Valve electronics orientation is ordered as left-hand or right-hand mounted from the factory (defined as being viewed from the valve gas outlet / burner end). If the electronics orientation is changed in the field (as illustrated in the SV2 Series User Manual 32-00029), the LED orientation procedure must be completed to ensure the LED annunciation continues to indicate status of the valve seat over which it is situated. This procedure is part of the instructions in the SV2 Series User Manual for changing electronics orientation.



Disposal and Recycling

Waste electrical products should not be disposed of with general waste.

Please recycle where these facilities exist. Check with your local authority for recycling advice.

Automation and Control Solutions

Americas:

Honeywell International Inc.
1985 Douglas Drive North
Golden Valley, MN 55422
customer.honeywell.com

Asia:

Honeywell (Tianjin) Limited
No. 158, NanHai Road
Tianjin, 300457, P.R.C.
<http://customer-ap.honeywell.com>

Europe, Middle East, Africa:

Honeywell Technologies Sàrl
La Piece 16
1180 Rolle
Switzerland
<http://ecc.emea.honeywell.com>

Australia:

Honeywell Ltd Australia
2 Richardson Place
North Ryde NSW 2113
<http://eccpacific.honeywell.com.au>

For more information on this product and the entire SV2 Series product line, please refer to the SV2 Series User Guide located on our website at <http://www.combustion.honeywell.com/SV2Series>



Honeywell

© U.S. Registered Trademark.

© 2016 Honeywell International Inc.

32-00018—04 M.S. Rev. 02-16

Printed in Hungary