Swagelok® Point-of-Use (SPU)

User Manual

Swagelok

Content

SPU User Manual

Swagelok® Point-of-Use (SPU)

Introduction

The Swagelok® point-of-use system (SPU) provides the critical last stage of pressure control in a gas distribution system before the gas is used. Point-of-use systems supply gas to lab benches, vent hoods, and single or small collections of equipment.

Gas is fed to point-of-use systems from either a site supply header or from individual gas bottles after the pressure is reduced with a Swagelok gas panel (SGP) or Swagelok changeover panel (SCO).

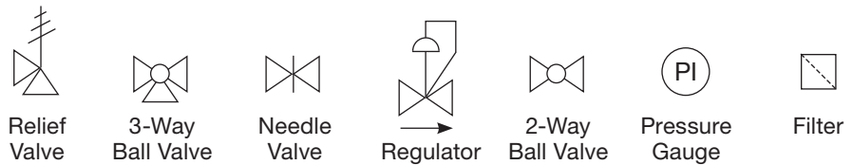
Swagelok SPU systems are available with several bracket options to enable wall, benchtop, or under-desk mounting. Designs can be ordered with top-to-bottom or bottom-to-top flow path configurations to accommodate installations that can vary widely between sites, buildings, or even within the same system.

Swagelok SPU systems give operators and technicians a convenient and accurate method of adjusting pressure to meet their test bench or equipment needs.

Configurations

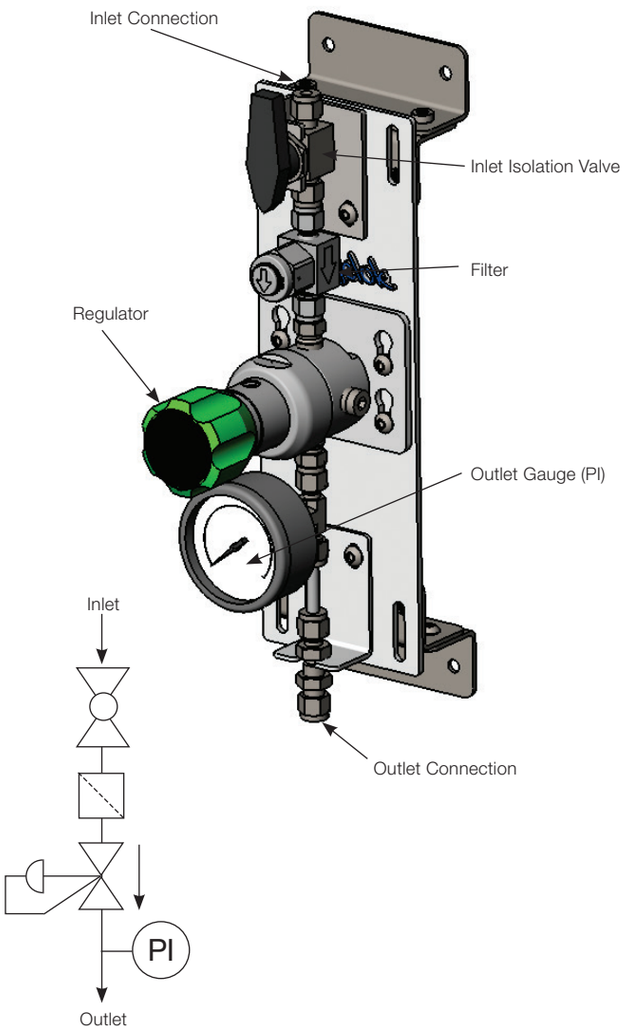
Overview

The SPU is available in top-to-bottom or bottom-to-top flow configurations with inlet gauge and low-pressure vent valve options. See the SPU section of the *Gas Distribution Systems, Application Guide*, MS-02-486, for additional information.

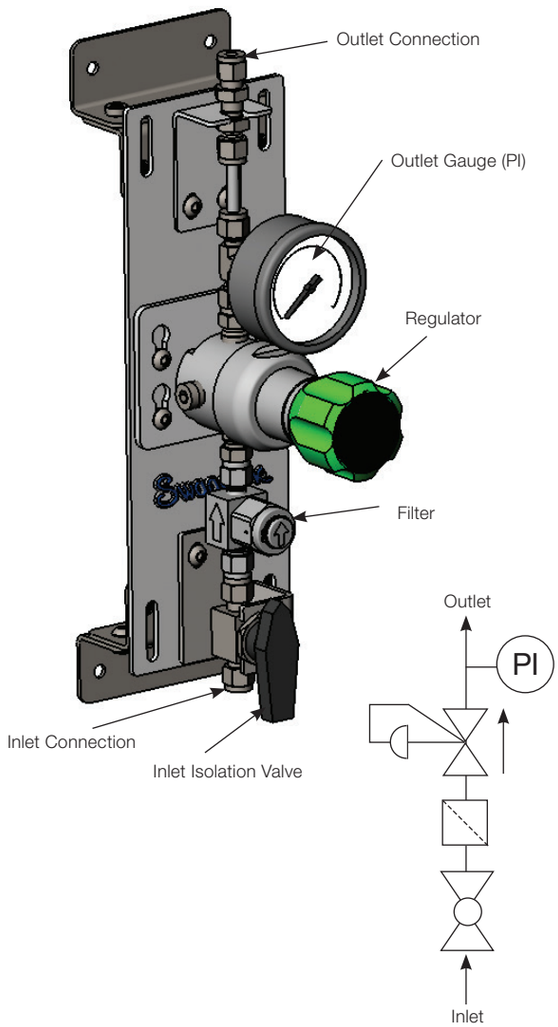


Configuration Symbols

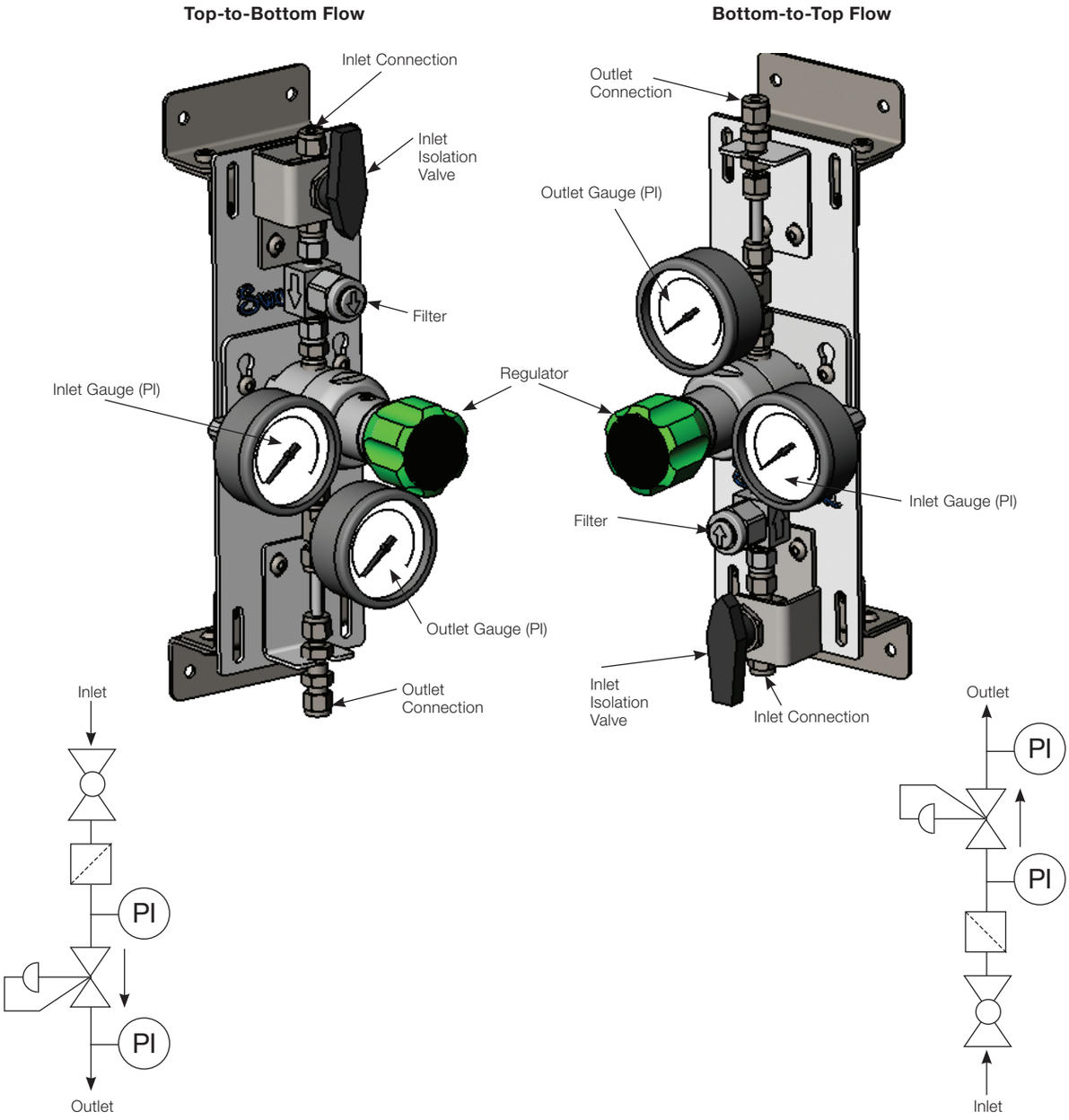
Top-to-Bottom Flow



Bottom-to-Top Flow

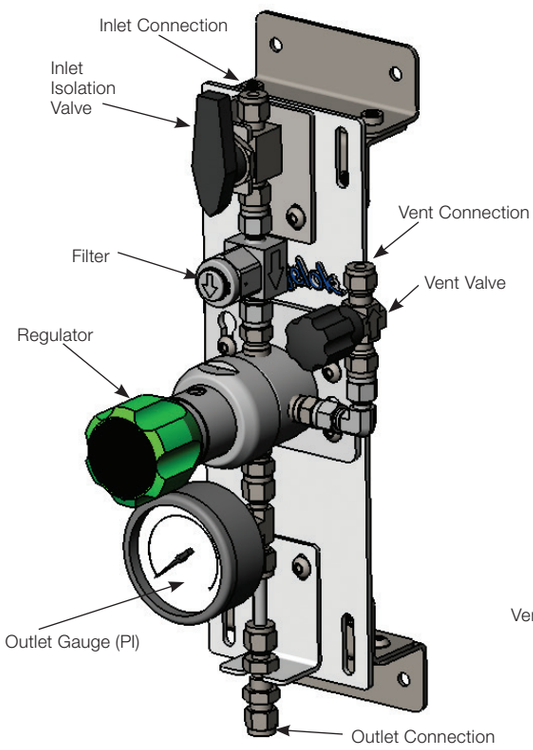


Configuration 1: 2-Way Inlet Isolation, Filter, and Outlet Gauge

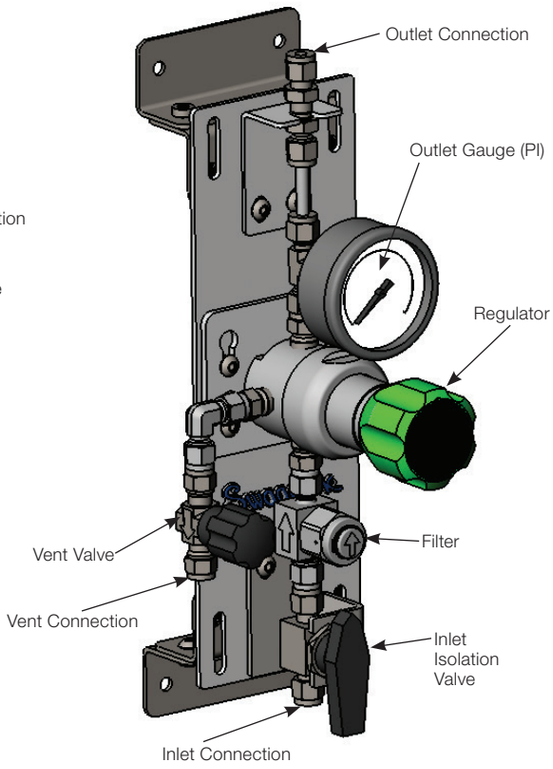


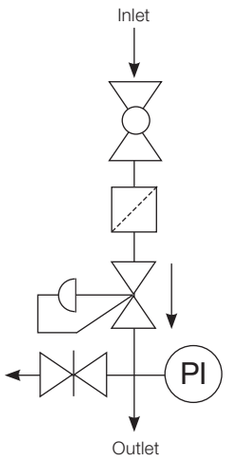
Configuration 2: 2-Way Inlet Isolation, Filter, Inlet and Outlet Gauge

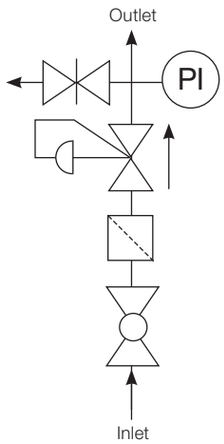
Top-to-Bottom Flow



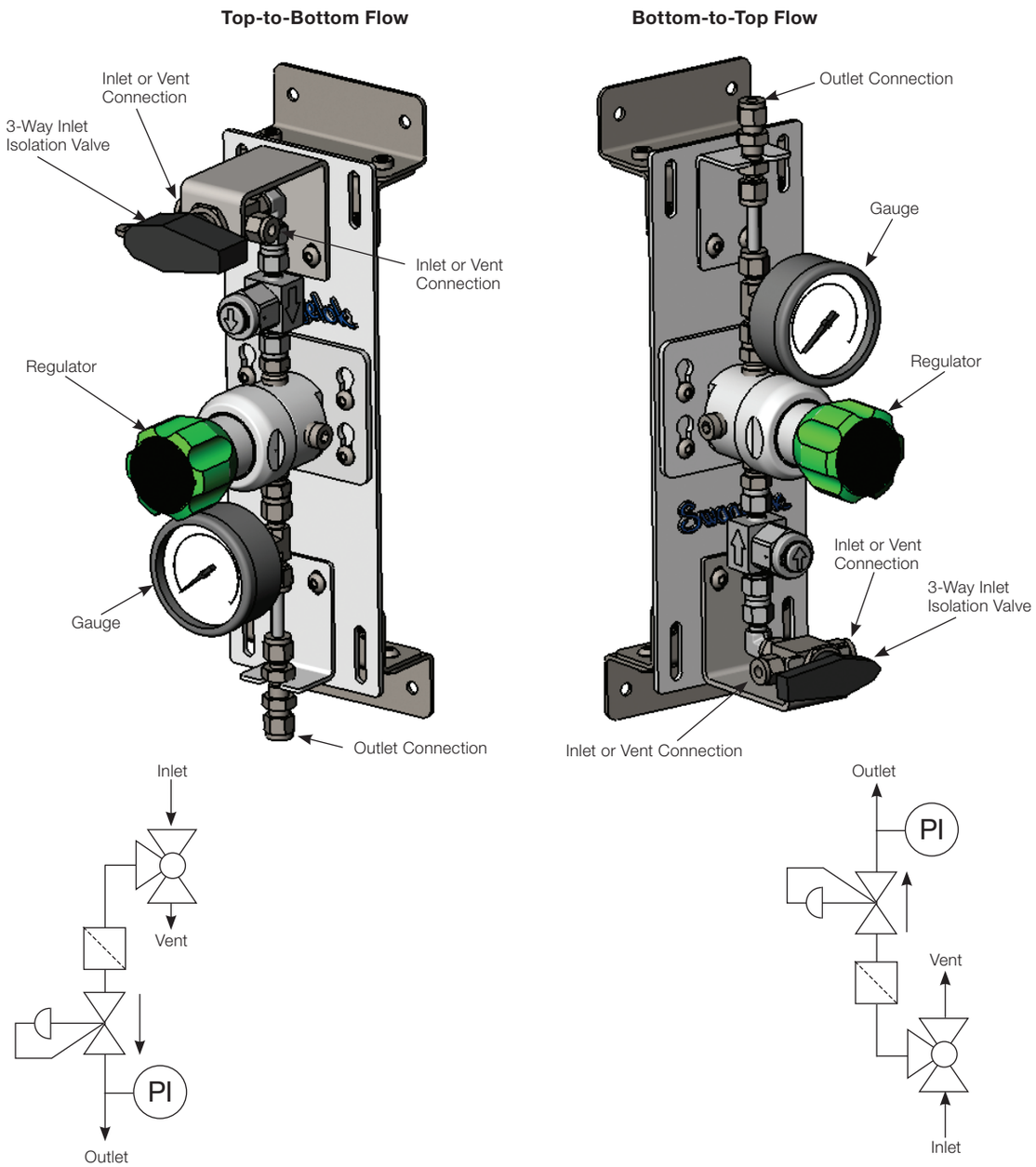
Bottom-to-Top Flow







Configuration 3: 2-Way Inlet Isolation, Filter, Vent, and Outlet Gauge



Configuration 4: 3-Way Inlet Isolation/Vent, Filter, and Outlet Gauge

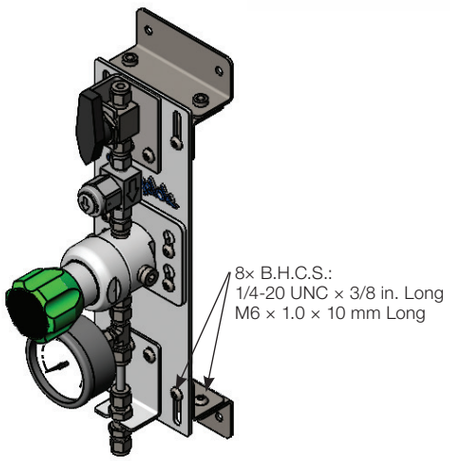
Mounting

The SPU mounting options include (selected at time of ordering):

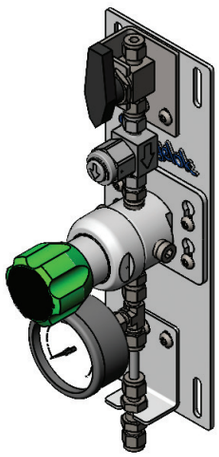
- Flat plate for vertical mounting to Unistrut® or similar arrangement
- Wall-mount wings for mounting directly to a wall or vertical surface
- Bottom-mount for mounting to a horizontal desk or bench
- Top-mount for mounting to an overhead shelf or horizontal surface

Mounting slots and holes are designed for 1/4 in. or 6 mm fasteners.

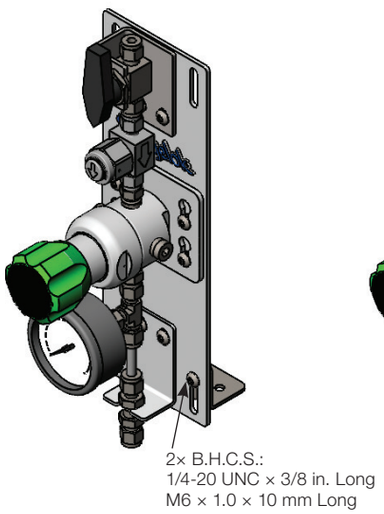
Approximate weight of SPU assembly is 7.6 lb (3.4 kg).
NOTE: weight will vary based on options ordered.



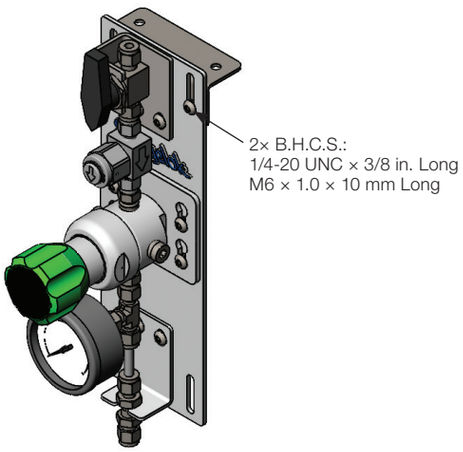
Wall-Mount Wings



Flat Plate



Bottom-Mount



Top-Mount

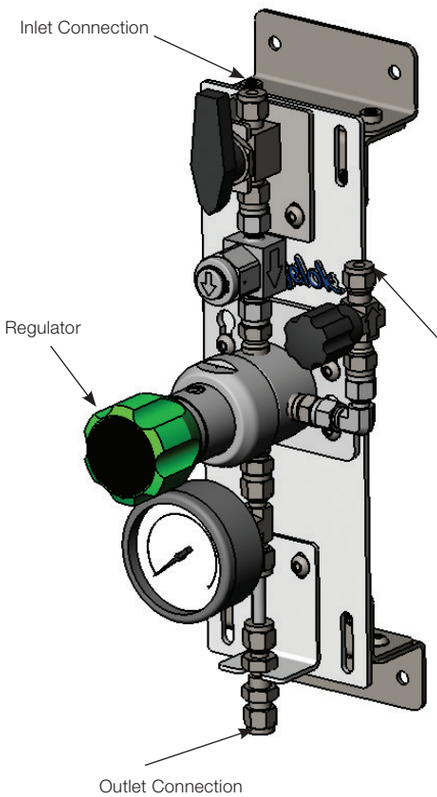
Installation

SPU systems have 1/4 in. fractional or 6 mm metric Swagelok tube fittings for all internal system connections. The vent valve outlet connection will be a 1/4 in. Swagelok tube fitting for fractional systems or a 6 mm Swagelok tube fitting for metric systems.

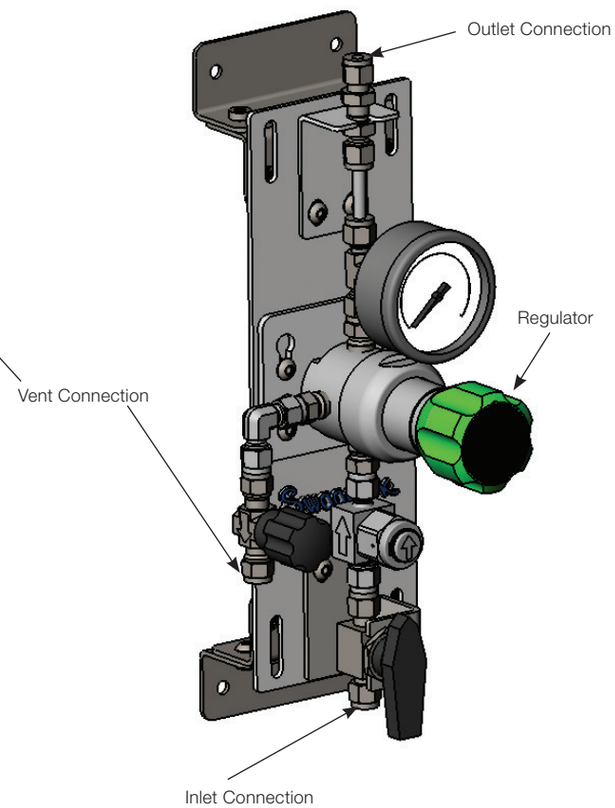
For systems using a 3-way ball valve for inlet isolation, the user has the option of using the second valve end as an inlet for an additional gas source or as a vent port providing double isolation and the ability to vent any pressure trapped between the regulator and inlet.

Install Swagelok tube fittings according to the Swagelok *Tube Fitting Instructions for 1 in. (25 mm) and Smaller Fittings,* MS-12-01.

Top-to-Bottom Flow



Bottom-to-Top Flow



System Startup

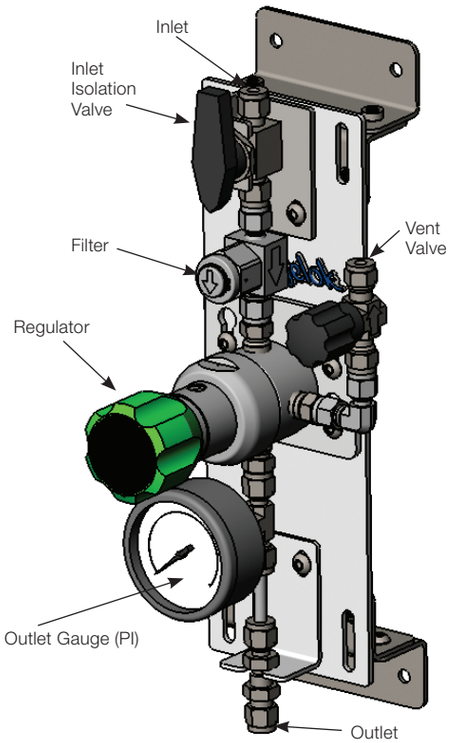
⚠ **CAUTION** **Swagelok ball valves are designed to be used in a fully open or fully closed position.**

⚠ **CAUTION** **Valves that have not been cycled for a period of time may have a higher initial actuation torque.**

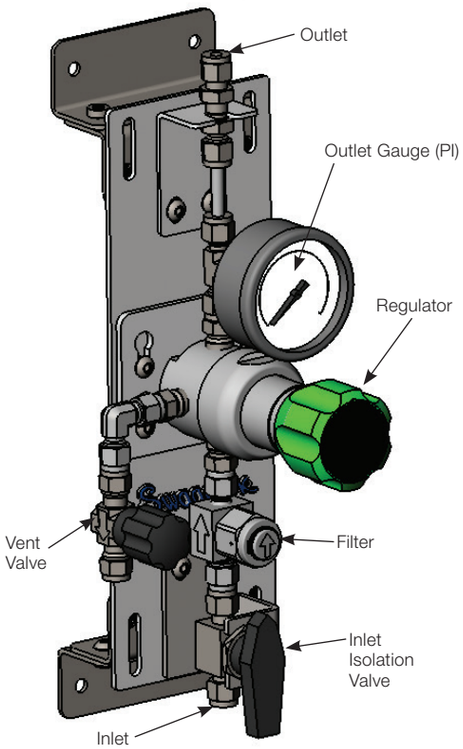
⚠ **CAUTION** **A packing adjustment may be required periodically for ball valves to increase service life and to prevent leakage.**

1. Verify the **inlet isolation valve** is CLOSED (if applicable).
2. Verify the **vent valve** is CLOSED (if applicable).
3. Verify the regulator outlet pressure is set to zero.
4. Supply distribution pressure to the **inlet**.
5. Open the **inlet isolation valve**.
6. Verify the inlet gauge (if applicable) is reading correct pressure.
7. Set the regulator to desired outlet pressure.
8. Verify the **outlet gauge** is reading the correct pressure.
9. Adjust the pressure setting of the regulator if necessary while system is flowing.

Top-to-Bottom Flow



Bottom-to-Top Flow



Operation

⚠ **CAUTION** **Swagelok pressure regulators are not “Safety Accessories” as defined in the Pressure Equipment Directive 2014/68/EU.**

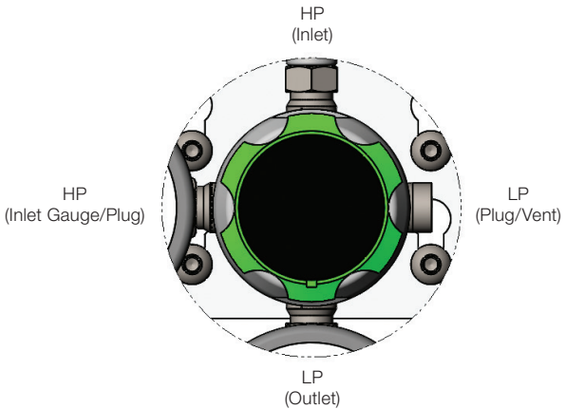
⚠ **CAUTION** **Do not use the regulator as a shutoff device.**

- Use the regulator handle to increase or decrease the SPU system outlet pressure to the desired setting
- Open/Close the inlet isolation valve to start/stop SPU system flow
- Open the multiturn needle vent valve (if applicable) when downstream venting is desired

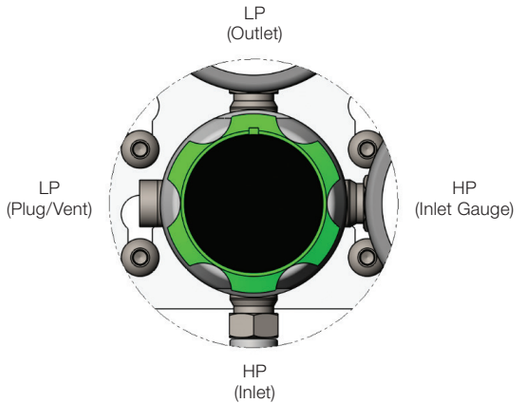
Maintenance

Regulator Port Configurations

The illustration below is a reference for the user on the regulator port locations for both bottom-to-top flow and top-to-bottom flow configurations. Use this illustration as reference when assembling the regulator to its mounting bracket should the regulator ever be removed for service.



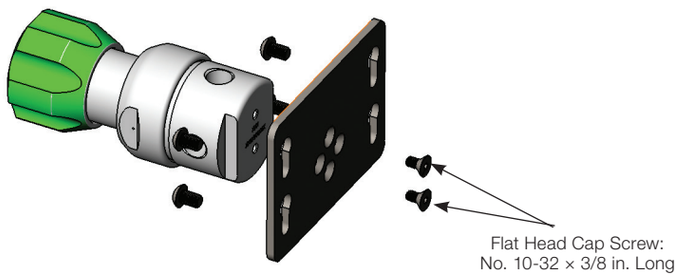
KPR E-Pattern Port Orientation (Top-to-Bottom Flow)



KPR E-Pattern Port Orientation (Bottom-to-Top Flow)

KPR Series Regulator Removal/Mounting

The regulator is assembled to the mounting bracket via two No. 10-32 flat head cap screws. The screw heads are recessed on the rear of the bracket so it can assemble to the main panel flush and without interference. To remove the regulator, loosen the 1/4 in. or 6 mm button head cap screws to remove the mounting bracket and access the regulator mounting screws.



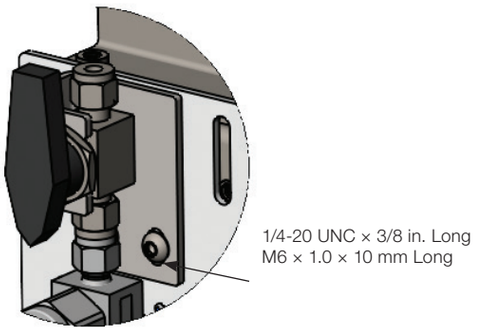
KPR Regulator and Bracket Mounting

Inlet Isolation Valve Removal/Mounting

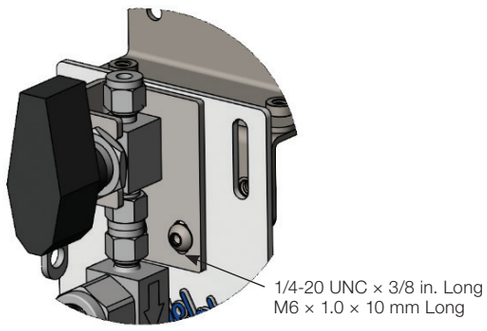
⚠ **WARNING Before removing valve from service, to avoid personal injury, you must:**

- **Depressurize the system**
- **Cycle the valve**
- **Purge system to remove any residual system media left in valve**

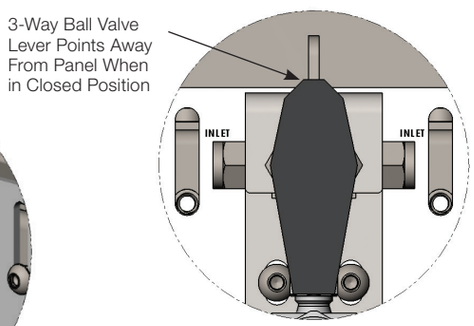
The illustrations below identify all available inlet isolation valve selections paired with their respective mounting brackets. To remove a valve from the panel, first unscrew the 1/4 in. or 6 mm button head cap screws to remove the bracket from the main panel. Then loosen the 1/4 in. or 6 mm Swagelok tube fitting end connections and remove the valve and bracket as a subassembly.



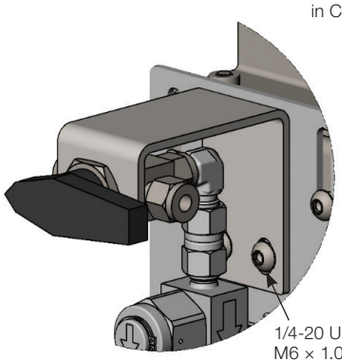
1/4-Turn Ball Valve



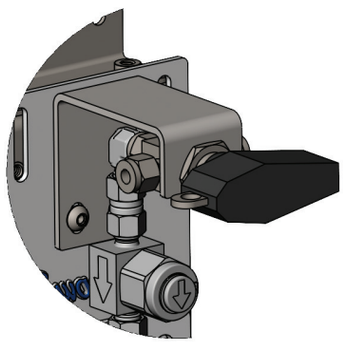
1/4-Turn Ball Valve (lockable)



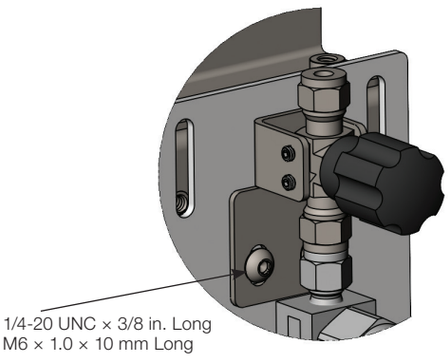
3-Way Ball Valve in Closed Position



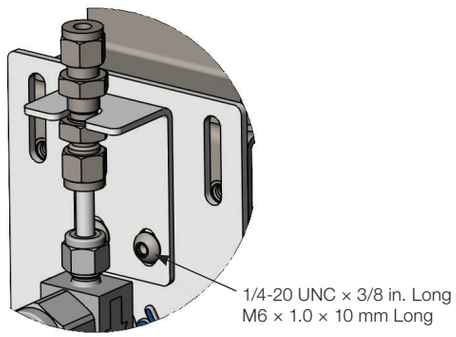
3-Way Ball Valve



3-Way Ball Valve (lockable)



Multiturn Needle Valve



No Inlet Isolation Valve

Maintenance by System Component

System Component	Replacement Ordering Information
Swagelok tube fitting	*Gaugeable Tube Fittings and Adapter Fittings,* MS-01-140
KPR regulator	*Pressure Regulators, K Series,* MS-02-230
D series needle valve	*Nonrotating-Stem Needle Valves, D Series,* MS-01-42
Ball valve (40G or 40 series)	*One-Piece Instrumentation Ball Valves, 40G Series and 40 Series,* MS-02-331
Pressure indicator (PGI series, C model)	*Pressure Gauges, Industrial and Process, PGI Series,* MS-02-170
TF series filter	*Filters,* MS-01-92

Reference Instruction Documents

Swagelok Tube Fitting Instructions for 1 in (25 mm) and Smaller Fittings, MS-12-01
Packing Adjustment for 40G Series Ball Valves, MS-INS-40G
D Series Maintenance Instructions, MS-INS-DK-1
KPR Series Maintenance Instructions, MS-CRD-KPRMAINT
TF Series Tee-Type Filter, Service Instructions, MS-CRD-0007

Troubleshooting

Symptom	Cause	Remedy
HP inlet pressure gauge (if applicable) shows no (or low) pressure.	There is an obstruction upstream of the SPU.	Check that flow is unobstructed.
	There is no process pressure.	Check that the supply line is pressurized.
	The inlet isolation valve is closed.	Open the inlet isolation valve.
	Filter (if applicable) is clogged.	Inspect filter, replace element if necessary.
LP outlet gauge shows no (or low) pressure.	Regulator is set to zero outlet pressure.	Adjust regulator outlet pressure.
	Vent valve is open or leaking.	Verify vent valve is closed and not leaking.
	Regulator damaged.	Inspect, repair, and/or replace regulator.
LP outlet gauge shows high pressure.	Regulator creep.	Inspect, repair, and/or replace regulator.
	Pressure gauge is damaged.	Inspect, repair, and/or replace gauge.
	Additional pressure source downstream in system.	Identify and correct system malfunctions.
	Trapped downstream pressure is higher than new regulator set point.	Vent/Consume downstream pressure.
Vent valve is leaking externally.	LP outlet gauge shows high pressure.	Make packing adjustment or replace valve.

For any symptoms not identified in the above table, please contact your local Swagelok sales and service center.

Safe Product Selection
When selecting a product, the total system design must be considered to ensure safe, trouble-free performance. Function, material compatibility, adequate ratings, proper installation, operation, and maintenance are the responsibilities of the system designer and user.

⚠ WARNING
Do not mix/interchange Swagelok products or components not governed by industrial design standards, including Swagelok tube fitting end connections, with those of other manufacturers.

Warranty Information

Swagelok products are backed by The Swagelok Limited Lifetime Warranty. For a copy, visit swagelok.com or contact your authorized Swagelok sales and service center.

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