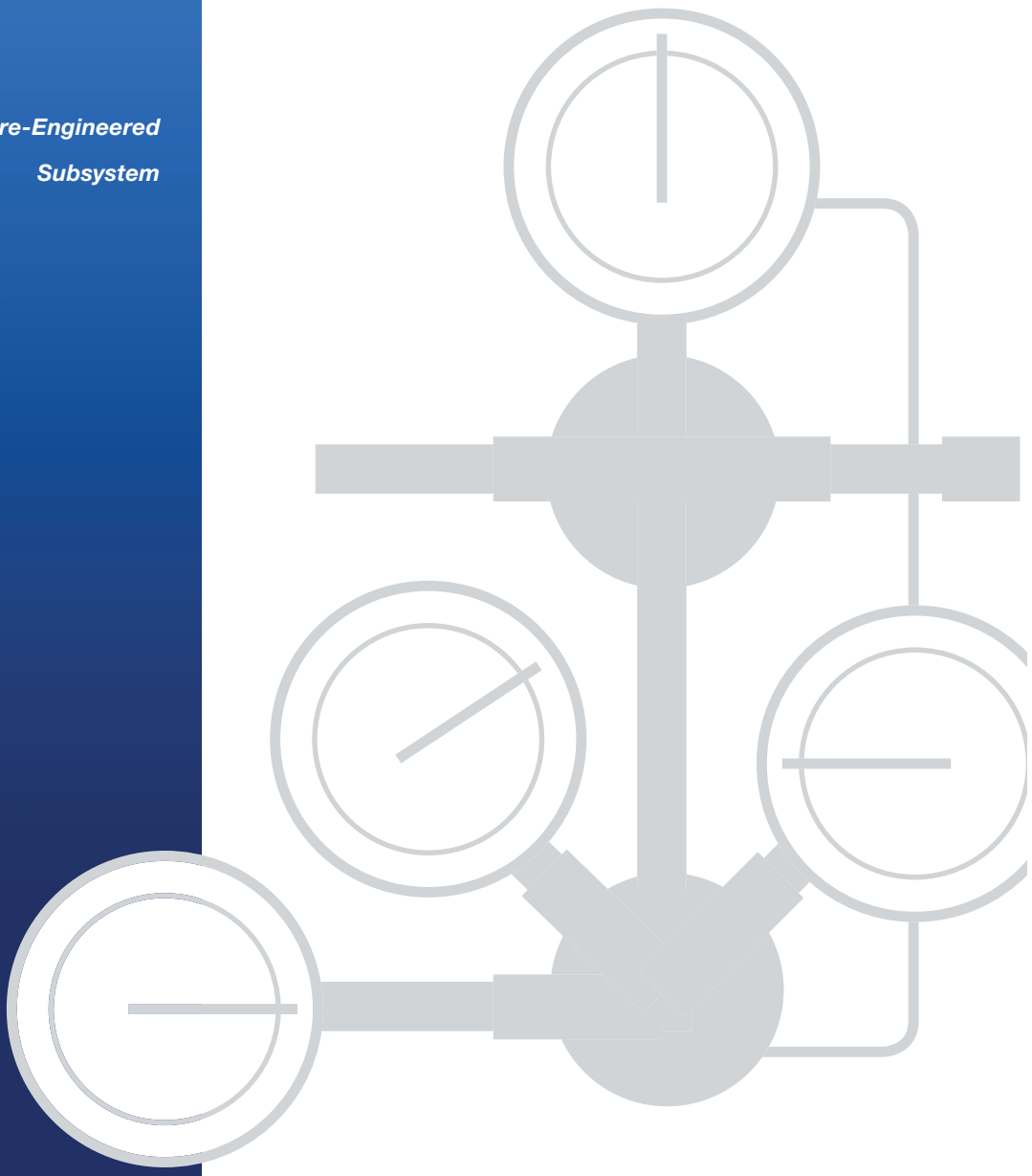
Field Station Module

User's Manual

A Swagelok® Pre-Engineered Subsystem



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Swagelok®

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Field Station Module (FSM)

System Manual

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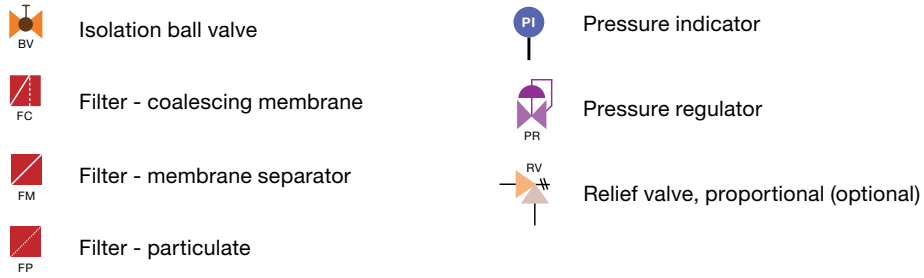
Introduction

The Swagelok® Field Station Module (FSM) is a part of an analytical sampling system. The FSM prepares and conditions a process gas sample for the downstream analyzer. The FSM reduces the pressure of the sample, which decreases the transport time to the analyzer, can help prevent the sample from condensing, and improves system safety.

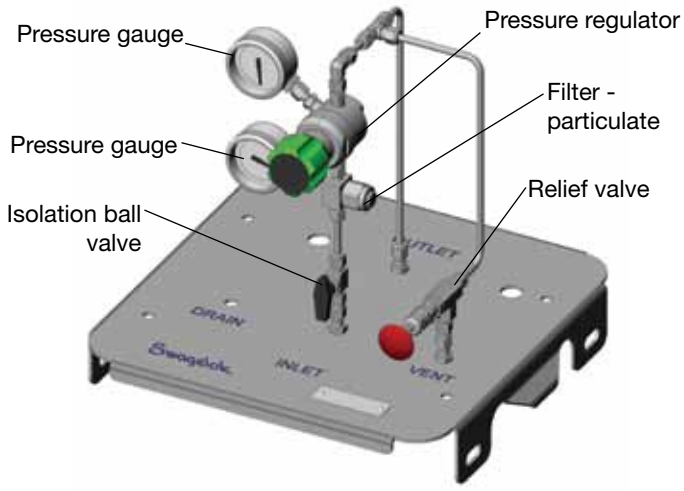
Configurations

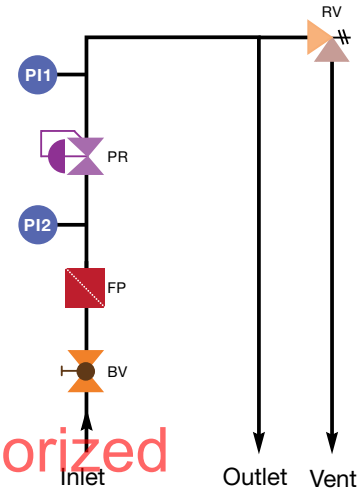
The FSM is available in five main configurations. See the *Field Station Module Application Guide*, MS-02-359, for additional information.

Configuration Symbols



Configuration 1: Clean, Dry, High-Pressure





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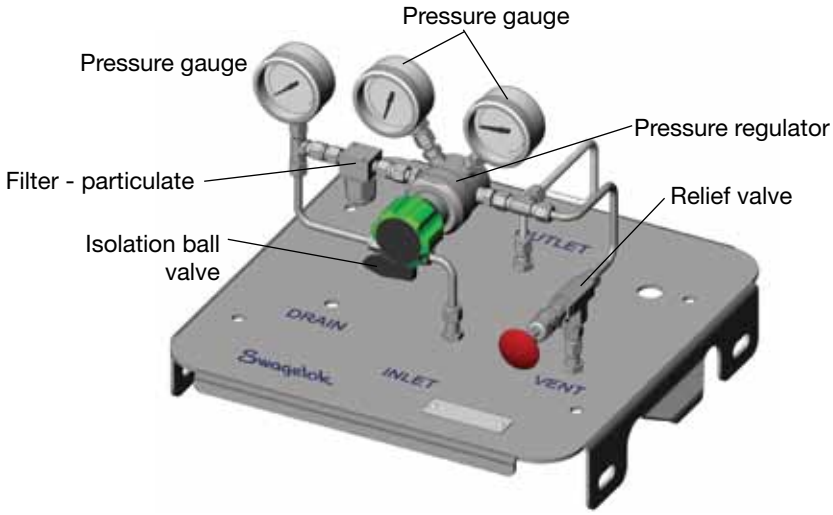
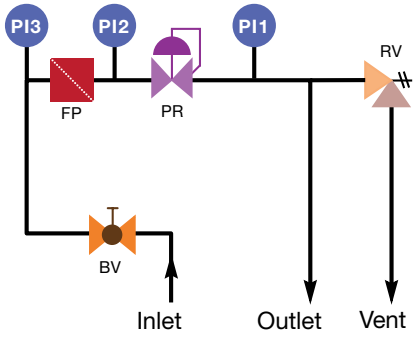
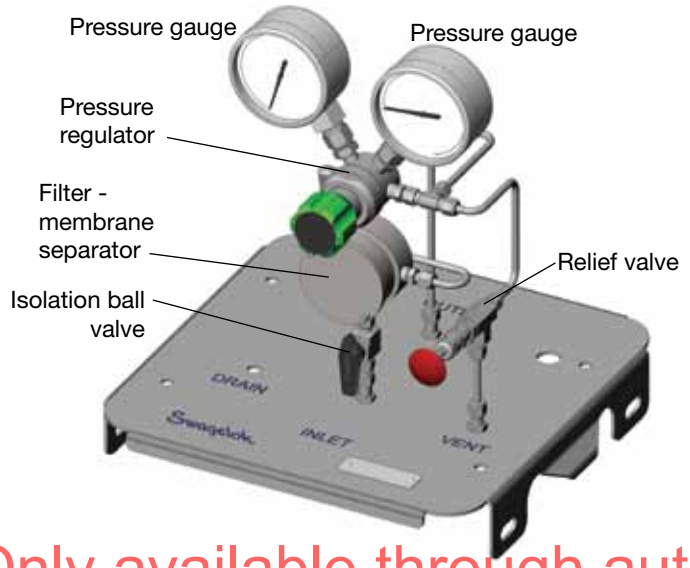
Configurations

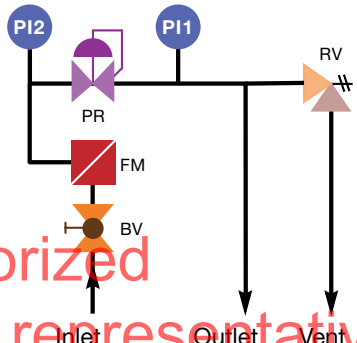
Configuration 2: Clean, Dry, Medium Pressure





Configuration 3: Low Moisture and Particulate Load





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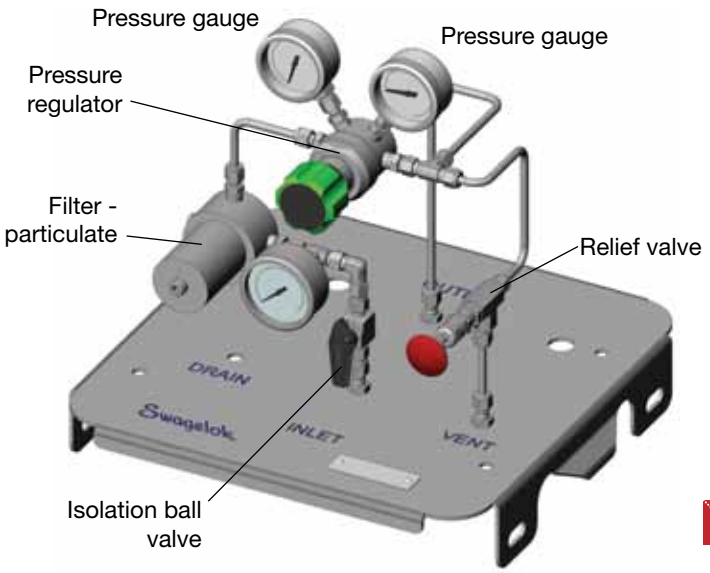
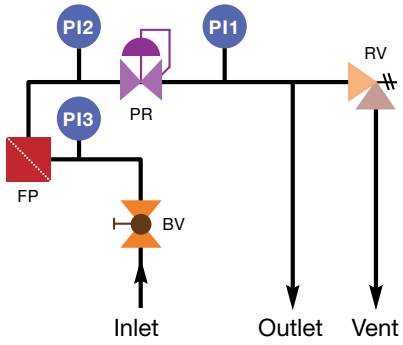
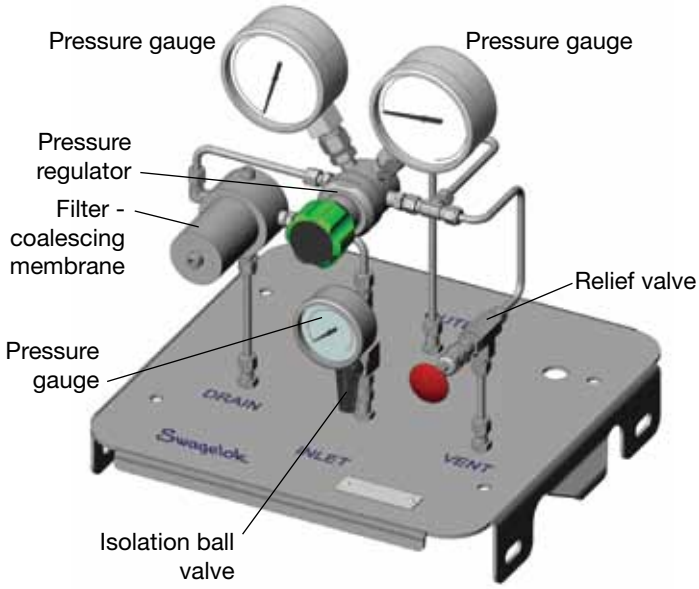
Configurations

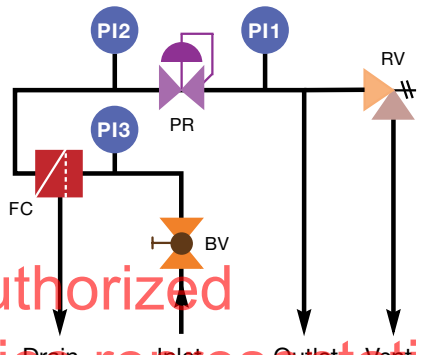
Configuration 4: High Particulate Load





Configuration 5: Moist Process Sample





Mounting

The FSM base plate has six mounting points, with a seventh added when an optional inlet flange connection is included. It is recommended to mount your FSM using a minimum of any three of these points.

The base plate is designed to accommodate 1 5/8 in. struts and nuts (not supplied) for mounting.

Note: The horizontal position refers to when the base plate is perpendicular to the ground. The vertical position is when the base plate is parallel to the ground.

Note: Configurations 3 and 5 must be mounted in the vertical position for proper drain function.

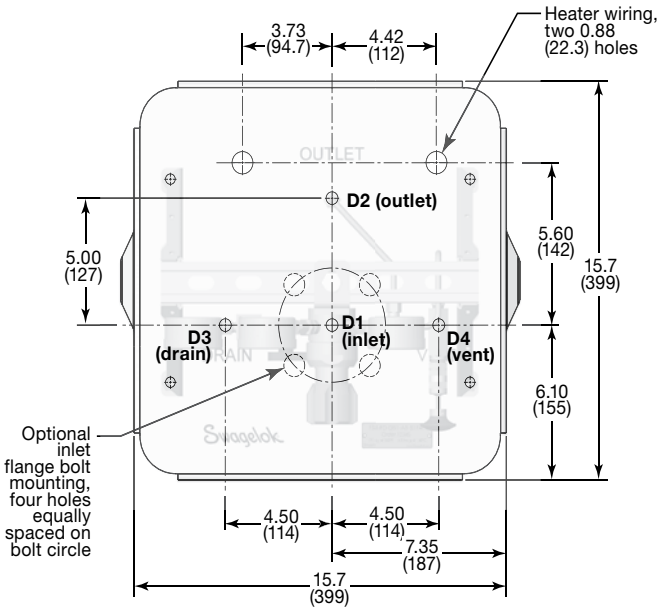
Mounting Brackets

A variety of brackets—including back mounting, side mounting, and cantilevered models—are available to mount the Swagelok FSM to piping, struts, or wall.

For more information, contact your authorized Swagelok representative.

Dimensions, in inches (millimeters), are for reference only and are subject to change.

Top



End Connections			Base Plate Dimensions in. (mm)	
Type	Size	ASME Pressure Class	D1, D2 Dia	D3, D4 Dia
Swagelok tube fitting	1/4 in.	—	0.50 (12.7)	0.50 (12.7)
	6 mm	—		
Female NPT	1/4 in.	—		
	1/2 in.	—		
Entry seal①	2 in.	—	2.00 (50.8)	
Tube stub②	1/4 in.	—	0.50 (12.7)	
Flange③	3/4 in.	150	1.50 (38.1)	
		600		
		1500		
	1 1/2 in.	150		
		600		
		1500		

① Entry seal includes inlet and outlet fittings with heat-shrinkable seal to accommodate 0.75 to 1.6 in. (19.0 to 40.6 mm) insulated tubing.

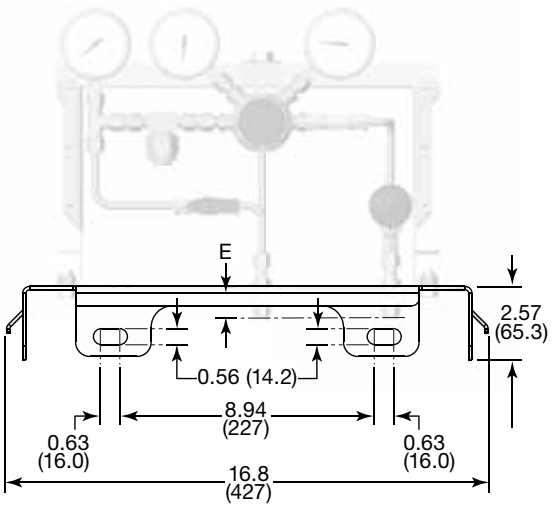
② All connections on FSM subsystems with ABS plastic or fiberglass enclosures are 1/4 in. tube stubs.

③ Flange available for inlet connection *only*.

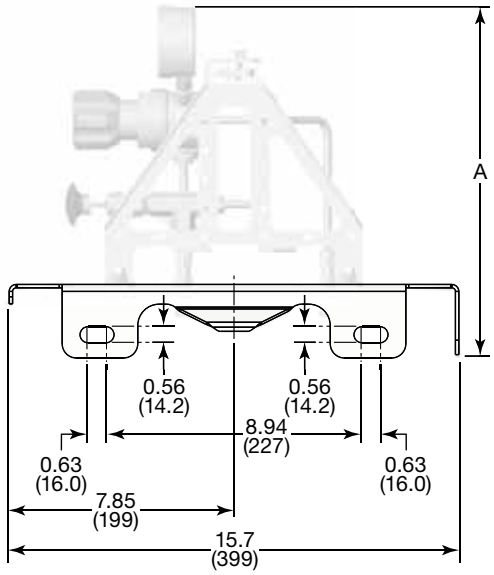
Mounting

Dimensions, in inches (millimeters), are for reference only and are subject to change.

Front



Side



End Connections		E, in. (mm)
Type	**Size**	
Swagelok tube fitting	1/4 in.	0.95 (24.1)
	6 mm	
Female NPT	1/4 in.	0.72 (18.3)
	1/2 in.	0.97 (24.6)
Entry seal①	2 in.	5.10 (130)
Tube stub②	1/4 in.	2.00 (50.8)
Flange③	3/4 in.	0.51 (13.0)
		0.88 (22.4)
		1.26 (32.0)
	1 1/2 in.	0.70 (17.8)
		1.14 (29.0)
		1.51 (38.4)

① Entry seal includes inlet and outlet fittings with heat-shrinkable seal to accommodate 0.75 to 1.6 in. (19.0 to 40.6 mm) insulated tubing.

② All connections on FSM subsystems with ABS plastic or fiberglass enclosures are 1/4 in. tube stubs.

③ Flange available for inlet connection *only*.

FSM Configuration	A, in. (mm)	
	63 mm (2 1/2 in.) Gauge	**100 mm (4 in.) Gauge**
1 Clean, dry, high-pressure	14.8 (376)	16.4 (417)
2 Clean, dry, medium-pressure	12.6 (320)	14.6 (371)
3 Low moisture and particulate load **4** High particulate load **5** Moist process sample	15.9 (404)	17.8 (452)

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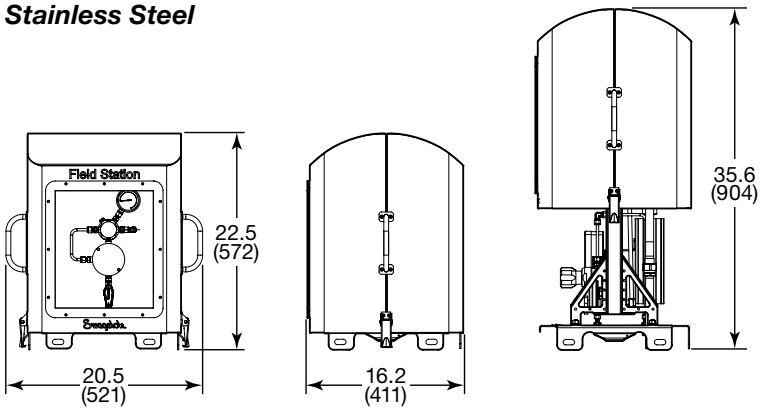
Mounting

Enclosure Dimensions

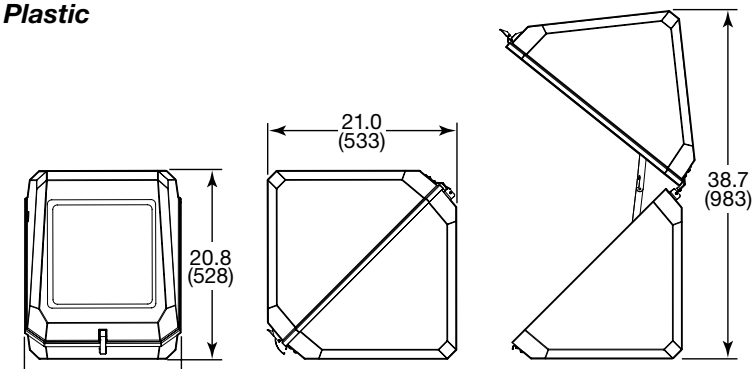
Dimensions, in inches (millimeters), are for reference only and are subject to change.

304 Stainless Steel



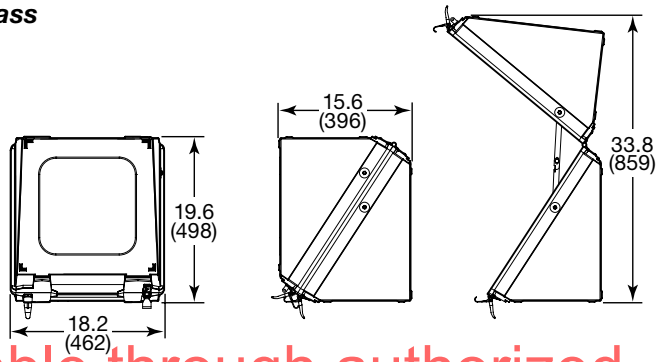
Front **Side, Closed** **Side, Open**

ABS Plastic



Front **Side, Closed** **Side, Open**

Fiberglass



Front **Side, Closed** **Side, Open**

Mounting

Enclosure Dimensions

Sun Shades

Stainless Steel Sun Shade

ABS Plastic Sun Shade Shown with Mounting Bracket (Available Separately)

Fiberglass Sun Shade Shown with Mounting Bracket (Available Separately)

Dimensions, in inches (millimeters), are for reference only and are subject to change.

Material	Dimensions, in. (mm)	Mounting
304 SS	Mounted: 22.4 H, 20 W, 20 D (569 H, 508 W, 508 D)	Mounts to the FSM brace in place of an enclosure
ABS plastic	Unmounted: 19.5 H, 17 W, 19.5 D (495 H, 432 W, 495 D)	Mounts to a 2 in. structural pipe (not supplied); two pipe clamps and mounting hardware provided
Fiberglass	Unmounted: 7.0 H, 22.4 W, 22.4 D (178 H, 569 W, 569 D)	

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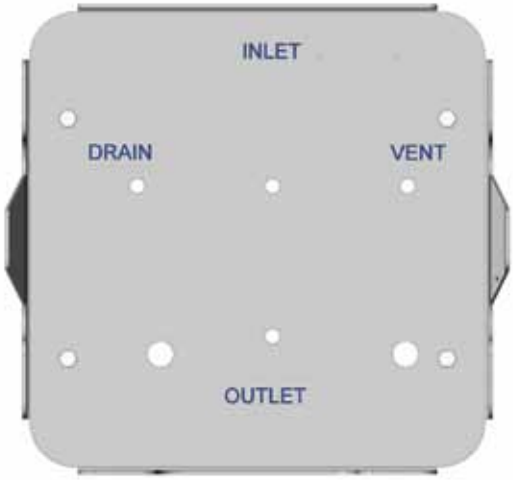
Installation

Assemble all Swagelok tube fittings according to *Swagelok Tube Fitting Instructions for 1 in. (25 mm) and Smaller Fittings*, page 24.

1. Rotate the isolation ball valve (BV) to the closed postion by turning the handle clockwise until the handle stops.
2. Connect the inlet to the sample supply line from the process tap.

   For FSMs with a flange inlet connection, disassemble the inlet flange connection bolts and connect to the mating flange. The bolts should pass through the bottom surface of the enclosure. Longer bolts are required. Bolts and gaskets are not supplied.
3. Connect the outlet to the system transport line going to the analyzer.
4. If your FSM has an optional proportional relief valve, connect the vent to an exhaust line with adequate flow to bleed down the system pressure from the proportional relief valve.
5. Configuration 5: Connect the drain to a liquid collection system.

   Note: The drain line is at full process pressure. The liquid collection system must be capable of limiting gas flow while collecting liquid.



Base Plate, Bottom View

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Installation

Wiring for Heaters

1. Make the wire and conduit connections. The installation must meet local codes.
2. The electrical source and wires must meet the following heater requirements (minimum wire gauge size, maximum current at voltage draws, etc.).

   ■ 120/230 VAC 100/200W 50/60 Hz for the enclosure heater

Electrical Connections

⚠ **Warning**

Disconnect power to junction box before opening electrical box lid. Failure to do so may result in electric shock.

⚠ **Warning**

The supply must not exceed 110 % of the rated voltage.

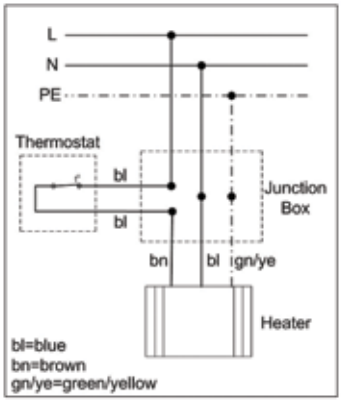
⚠ **Caution**

Use appropriate cable and glands to withstand the temperature range of the heated enclosure.

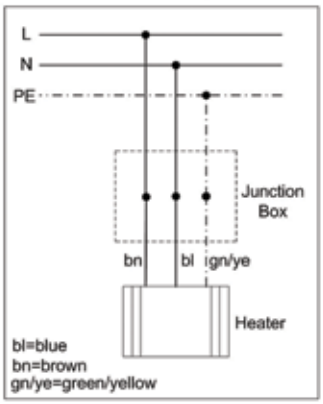
Note: Feed all wires through the cable gland through the base plate.

1. Remove the junction box cover.
2. Connect the AC wires to the appropriate terminals.
3. Connect to the internal ground using the loose green lead with a suitable connector. 6 in. (150 mm) of lead is supplied and can be shortened.
4. Replace the junction box cover.

Thermostat Controlled Enclosure Heater Wiring



Regulator Heater Wiring



Enclosure Heater Temperature

The enclosure temperature is controlled by a pre-set thermostat. To change the temperature set point, the thermostat must be replaced by one with the desired set point.

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Operation

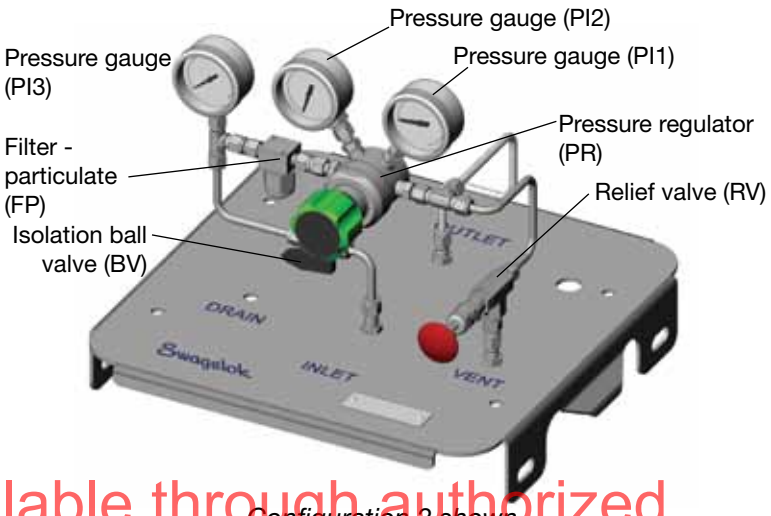
⚠ Caution

The FSM components and the enclosure could be hot when the FSM has a heated enclosure. Use caution when handling.

1. Close the inlet isolation ball valve (BV) by rotating the handle clockwise until the handle stops.
2. Close the pressure regulator (PR) by turning the handle counter-clockwise until the handle stops.
3. Supply pressure to the inlet supply line.
4. Start flow into the FSM by turning the inlet isolation ball valve (BV) handle counter clockwise until the handle stops.

   Note: If your FSM is fitted with a gauge upstream of the regulator (PI2 or PI3) then the gauge will indicate the pressure within the FSM.
5. Gradually open the pressure regulator (PR) by turning the handle clockwise to set and control the desired downstream pressure. The outlet pressure gauge (PI1) will indicate the downstream pressure.

   Note: For the most consistent pressure control the regulator should always be set by turning the regulator handle clockwise and increasing pressure to the desired set point.
6. If your FSM includes a proportional relief valve with a manual override handle, pull the handle to relieve the pressure downstream of the pressure regulator and of the FSM.
7. If your FSM is fitted with a proportional relief valve, it is preset to:
   - 45 psig (3.1 bar) for system pressures up to and including 300 psig (20.6 bar). To change the relief pressure set point refer to *RL3 Series Externally Adjustable Relief Valve Maintenance Instructions*, page 33.
   - 50 psig (3.4 bar) for system pressures above 300 psig (20.6 bar). To change the relief pressure set point refer to *R3A Series Externally Adjustable Relief Valves Maintenance Instructions*, page 26.



Configuration 2 shown

Maintenance

Relief Valve Cycling

Caution

For valves not actuated for a period of time, initial relief pressure may be higher than the set pressure.

Occasionally cycle the relief valve to ensure a more consistent relief pressure setting. Relief valves with a manual override handle can be cycled by pulling the handle and then releasing it. For relief valves without the manual override handle, open the regulator by turning the handle clockwise until the pressure stops increasing as observed on the outlet pressure gauge (PI1).

Depressurizing the FSM

Warning

Before servicing any installed system component you must
- **depressurize the system**
- **purge the system (when possible).**

Follow these steps to depressurize your FSM:

1. Close the inlet isolation ball valve (BV) by turning the handle clockwise until the handle stops.
2. Relieve or vent the pressure downstream of the pressure regulator (PR).
   - If your FSM is fitted with a proportional relief valve (RV) with a manual override handle, pull the handle to relieve downstream pressure. Hold the handle out until the outlet pressure gauge (PI1) reads zero.
   - If your FSM is not fitted with this type of relief valve, use other safe means outside of the FSM (ex. a drain or vent valve) to relieve the downstream pressure until the outlet pressure gauge (PI1) reads zero.
3. Relieve the pressure upstream of the pressure regulator (PR) by gradually opening the pressure regulator to the full open position by turning the handle clockwise until the handle stops.
4. Relieve or vent the pressure downstream of the pressure regulator (PR) again.
   - If your FSM is fitted with a proportional relief valve (RV) with a manual override handle, pull the handle to relieve downstream pressure. Hold the handle out until the all of the pressure gauges (PI1, PI2, and PI3) read zero.
   - If your FSM is not fitted with this type of relief valve, use other safe means outside of the FSM (ex. a drain or vent valve) to relieve the downstream pressure until the all of the pressure gauges (PI1, PI2, and PI3) read zero.
5. Close the pressure regulator (PR) by turning the handle counter clockwise until the handle stops.

Caution

The system should be completely depressurized at this time, but if there is an obstructed filter then care must be taken to ensure there is no trapped pressure between the inlet isolation ball valve and the filter.

Maintenance

System Component	Reference for Replacement Ordering Information
Isolation Ball Valve (42G or 43G series)	*One-Piece Instrumentation Ball Valves—40G Series and 40 Series,* MS-02-331
Pressure regulator (KPR series)	*Pressure Regulators,* MS-02-230
Filter - coalescing (configuration 5), membrane separator (configuration 3), and large-capacity particulate (configuration 4)	*Field Station Module Application Guide,* MS-02-359
Filter - small-capacity particulate (configurations 1 and 2)	*Filters*, MS-01-92
Pressure Indicator (B Model)	*Pressure Gauges, Industrial and Process—PGI Series,* MS-02-170
Proportional Relief Valve (RL3 or R3A Series)	*Proportional Relief Valves,* MS-01-141
Thermometer	*Temperature Measurement Devices—Bimetal Thermometer and Thermowells*, MS-02-353

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Enclosures

An enclosure has three positions: Closed, Open, and Removed. In the closed position the enclosure provides weatherproof protection of the FSM and prevents inadvertent changes to the operating parameters. Heated and insulated enclosures provide the added benefit of freeze protection or temperature control.

304 Stainless Steel

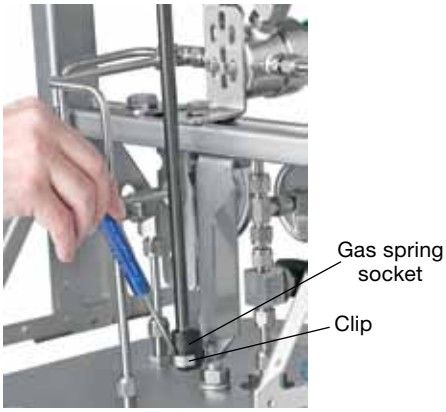
To open the enclosure:

1. Lift up on the two latch handles to unlatch the enclosure from the base plate. Swing the handles open 180° and rotate each latch hook one-half turn counterclockwise. This will prevent the latch hook from engaging the base plate. See figure below.

2. Use the two handles on the sides of the enclosure to raise the enclosure to the open position. The two spring plungers will snap into place and lock the enclosure in the open position.

To remove the enclosure from the open position:

1. Remove the gas spring socket from the gas spring mounting ball by using a screwdriver to pry open the clip. Use the handles to support the weight of the enclosure while unclipping the gas spring socket.



2. Use the handles to raise the enclosure and disengage it from the guide rails.

To install the enclosure:

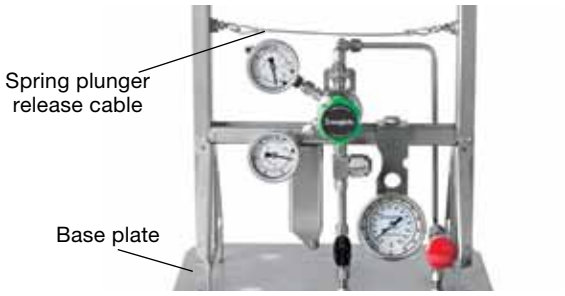
1. Center the enclosure above the FSM and position it so the lower gas spring socket mount is behind the horizontal support struts and near the center of the field station.
2. Lower the enclosure. Align the inner enclosure guides to the field station vertical rails. Once the guides are engaged with the rails, lower the enclosure until it is supported by the two spring plungers.

Enclosures

3. Lift up on the enclosure to raise it slightly and snap the lower gas spring socket onto the ball. Once the lower gas spring socket has fully engaged the ball the enclosure will support itself.

To close and lock the enclosure:

1. Rotate both latch hooks one-half turn clockwise so they will engage the catches on the base plate when the enclosure is in the closed position.
2. Use one hand to pull the spring plunger release cable to retract the spring plungers while at the same time using the other hand to push down on the top of the enclosure. Once the enclosure has lowered slightly let go of the spring plunger release cable and use the handles to lower the enclosure to the closed position. You may need to help guide the enclosure over the base plate.



3. Lift up on the two latch handles to lower the latch hooks until they engage their catches. Push down on the two latch handles to their full downward position at which point they will stay in place. If the latches are too tight to fully close or too loose when in the closed position, adjust the latches as noted.

To adjust the enclosure latch tension:

1. Lift up on the latch handle and swing it 180° and at the same time rotate the hook latch one turn counterclockwise to loosen the tension, clockwise to tighten the tension.
2. Push down on the latch handle to the full downward position at which point it will stay in place. If the latches are still too tight or too loose make another one-turn tightening adjustment.

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Enclosures

ABS Plastic

To open the enclosure:

1. Lift up on the latch at the base of the enclosure to unlatch the enclosure.
2. Lift up the front of the enclosure. Engage the support rod to hold the enclosure in the open position.

To close and lock the enclosure:

1. Disengage the support rod.
2. Lower the enclosure to the closed position and secure the latch.

Fiberglass

To open the enclosure:

1. Lift up on the latches at the base of the enclosure to unlatch the enclosure.
2. Lift up the front of the enclosure. Engage the support rod to hold the enclosure in the open position.

To close and lock the enclosure:

1. Disengage the support rod.
2. Lower the enclosure to the closed position and secure the latches.

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Troubleshooting

Symptom	Cause	Remedy
FSM Troubleshooting		
Reduced or decreasing flow is observed downstream of the FSM.	No or limited pressure upstream of the regulator.	Check the pressure upstream of the FSM. If possible, increase the pressure upstream.
	Isolation valve is closed or not fully open.	Check that the isolation ball valve (BV) is fully open by turning the handle counter-clockwise until the handle is in line with the transport line.
	Filter element has an obstruction and is restricting flow.	Remove the filter element(s) according to the appropriate filter replacement instructions and check if the filter element is obstructed. If it is obstructed then replace the filter element(s).
	Regulator is closed.	Check to make sure the pressure regulator is open by turning the regulator handle counter-clockwise until the handle stops at the full closed position. Then turn the handle clockwise to open the regulator.
	Regulator has an obstruction.	Check the regulator inlet filter for an obstruction. Replace the filter if necessary.
	There is no downstream restriction to result in the regulator functioning properly.	Add a downstream restriction to the system.
	Relief valve is relieving pressure and flowing to the vent.	Check the set pressure on the relief valve and increase if necessary.
	FSM transport lines are obstructed.	Inspect and clean out transport lines upstream of the FSM filter.
	Configuration 3 and 5 - The inlet line is flooded with liquid and is restricting the gravity drain function on the membrane separator.	Inspect and clean out the inlet line.
	Configuration 5 - The drain is unrestricted to gas flow.	Add a flow restriction to the drain line.
Excess flow is observed downstream of the FSM.	Regulator not properly set.	Verify that the pressure in the transport line is acceptable.
		Reset the regulator to the desired pressure as indicated on PI1.

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Troubleshooting

Symptom	Cause	Remedy
FSM Troubleshooting		
Regulator is unable to increase or decrease the downstream pressure.	Lack of inlet pressure.	Check the pressure at the inlet of the regulator. If possible, adjust the pressure as necessary.
	Inlet pressure gauge (PI2 or PI3) is not functioning properly.	Replace the inlet pressure gauge.
	Outlet pressure gauge (PI1) is not functioning properly.	Replace the outlet pressure gauge.
	The pressure range of the installed FSM is being exceeded.	Replace the regulator with a regulator using the correct pressure range. Alternatively, select a FSM with a system-appropriate pressure range.
	There is no downstream restriction to result in the regulator functioning properly.	Add a downstream restriction to the system.
	Pressure regulator not functioning properly.	Replace the regulator seal components or replace the pressure regulator.
	There is a leak to atmosphere downstream.	Locate leak and correct it.
As observed on pressure gauge PI1, pressure is increasing downstream of the FSM regulator.	Inlet supply pressure has decreased significantly.	Check to make sure there is inlet pressure to the FSM. When the inlet pressure decreases significantly the regulated outlet pressure will increase slightly and this is normal. If this change is not acceptable then check that the correct regulator and pressures have been chosen for your application.
	Pressure regulator not functioning properly.	Repair or replace the pressure regulator.
	Filter element has an obstruction and is restricting flow.	Replace the filter element(s) according to the appropriate filter replacement instructions.
	FSM lines upstream of the regulator are obstructed.	Inspect and clean out lines upstream of the FSM regulator.
	Downstream flow is stopped due to a valve closed downstream.	Open the downstream valve.
	Configuration 3 and 5 - The inlet line is flooded with liquid and is restricting the gravity drain function on the membrane separator.	Inspect and clean out the inlet line.
	Configuration 5 - The drain is unrestricted to gas flow.	Add a flow restriction to the drain line.

Only available through authorized Swagelok sales and service representatives.

Troubleshooting

Symptom	Cause	Remedy
FSM Troubleshooting		
As observed on pressure gauge PI1, pressure is decreasing downstream of the FSM.	Inlet supply pressure has increased significantly.	Check the inlet pressure to the FSM. When the inlet pressure has increased significantly the regulated outlet pressure will decrease slightly and this is normal. If this change is not acceptable then check that the correct regulator and pressures have been chosen for your application.
	Relief valve is relieving pressure and flow to the vent.	Check the set pressure on the relief valve and increase if necessary; or adjust the regulator to reduce the outlet pressure of the FSM.
	Regulator has an obstruction.	Check the regulator inlet filter for an obstruction. Clean or replace as necessary.
	Configuration 5 - The drain is unrestricted to gas flow.	Add a flow restriction to the drain line.
As observed on pressure gauge PI2, pressure is decreasing.	Process pressure is decreasing.	Check the pressure on the pressure outlet gauge (PI1), if it has changed significantly adjust the regulator outlet pressure.
	Filter element has an obstruction and is restricting flow.	Replace the filter element(s) according to the appropriate filter replacement instructions.
	FSM lines upstream of the regulator are obstructed.	Inspect and clean out lines upstream of the FSM regulator.
As observed on pressure gauge PI3, pressure is decreasing.	Process pressure is decreasing.	Check the pressure on the pressure outlet gauge (PI1), if it has changed significantly adjust the regulator outlet pressure.
	FSM lines upstream of the regulator are obstructed.	Inspect and clean out lines upstream of the FSM regulator.
The differential pressure between pressure gauges PI2 and PI3 is increasing.	Filter element has an obstruction and is restricting flow.	Replace the filter element(s) according to the appropriate filter replacement instructions

Only available through authorized Swagelok sales and service representatives.

Troubleshooting

Symptom	Cause	Remedy
Enclosure Heater Troubleshooting		
No heat is being generated.	The heater is wired incorrectly.	Check the power supply connections within the junction box.
	There is no power to the heater.	Check the voltage at the power supply connections.
	The thermostat is not functioning properly.	Check the continuity across the thermostat when the thermostat is at a temperature more than 9°F (5°C) below the set points. The thermostat contacts should be closed, if they are not, replace the thermostat.
	The heater is not functioning properly.	Verify that power is running to the heater. If the heater does not warm up, replace the heater.
There is insufficient heat (the temperature is too low).	Excessive heat loss.	Use an insulated enclosure without a window to minimize heat losses. For applications with an enclosure temperature rise greater than 125°F (50°C) above ambient, consult your authorized Swagelok sales and service representative for heater recommendations.
	The thermostat set point is lower than needed.	Replace the thermostat with one having the next higher set-point.
There is excessive heat (the temperature is too high).	The thermostat is not functioning properly.	Check the continuity across the thermostat when the thermostat is at a temperature more than 9°F (5°C) above the set points. The thermostat contacts should be open, if they are not, replace the thermostat.
	The thermostat set point is higher than needed.	Replace the thermostat with one having the next lower set-point.
There are excessive fluctuations in temperature.	There have been significant changes in the environmental conditions over a short period of time.	Reduce the changes in environmental conditions or consult your authorized Swagelok sales and service representative for heater recommendations.

Only available through authorized Swagelok sales and service representatives.

Troubleshooting

Symptom	Cause	Remedy
Regulator Heater Troubleshooting		
No heat is being generated.	The heater is wired incorrectly.	Check the power supply connections within the junction box.
	There is no power to the heater.	Check the voltage at the power supply connections.
	The heater is not functioning properly.	Verify that power is running to the heater. If the heater does not warm up, replace the heater.
There is insufficient heat (the temperature is too low).	Excessive heat loss.	Use an insulated enclosure without a window to minimize heat losses. For applications with an enclosure temperature rise greater than 125°F (50°C) above ambient, consult your authorized Swagelok sales and service representative for heater recommendations.
There is excessive heat (the temperature is too high).	Self-limiting heater - there is not sufficient heat dissipation.	Remove insulation from the enclosure.

Only available through authorized Swagelok sales and service representatives.

Swagelok Tube Fitting Instructions for 1 in. (25 mm) and smaller fittings

Fig. 1

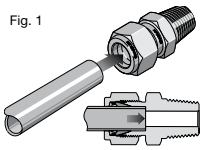


Fig. 2

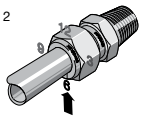


Fig. 3

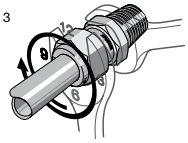


Fig. 4

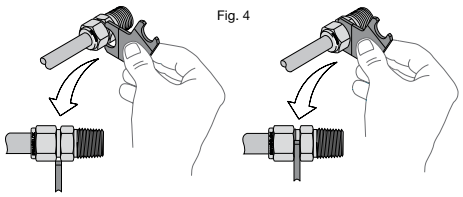


Fig. 5

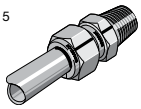


Fig. 6

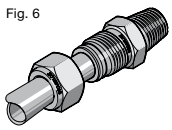


Fig. 7

Installation
These instructions apply to both traditional fittings and to fittings with the advanced back-ferrule geometry.

1. Fully insert the tube into the fitting and against the shoulder; rotate the nut finger-tight. *Fig. 1*.
   High-Pressure Applications and High Safety-Factor Systems: Further tighten the nut until the tube will not turn by hand or move axially in the fitting.
2. Mark the nut at the 6 o'clock position. *Fig. 2*.
3. While holding the fitting body steady, tighten the nut one and one-quarter turns to the 9 o'clock position. *Fig. 3*.
   Note: For **1/16, 1/8,** and **3/16 in.; 2, 3,** and **4 mm** tube fittings, tighten the nut three-quarters turn to the 3 o'clock position.

Gaugeability
On initial installation, the Swagelok gap inspection gauge assures the installer or inspector that a fitting has been sufficiently tightened.

Position the Swagelok gap inspection gauge next to the gap between the nut and body. *Fig. 4*.

- If the gauge will not enter the gap, the fitting is sufficiently tightened.
- If the gauge will enter the gap, additional tightening is required.

Reassembly Instructions — You may disassemble and reassemble Swagelok tube fittings many times.

⚠ **Warning**
Always depressurize the system before disassembling a Swagelok tube fitting.

1. Prior to disassembly, mark the tube at the back of the nut; mark a line along the nut and fitting body flats. *Fig. 5*.

Use these marks to ensure you return the nut to the previously pulled-up position.

2. Insert the tube with preswaged ferrules into the fitting body until the front ferrule seats against the fitting body. *Fig. 6*.
3. While holding the fitting body steady, rotate the nut with a wrench to the previously pulled-up position as indicated by the marks on the tube and the flats; at this point you will feel a significant increase in resistance. *Fig. 7*.
4. Tighten the nut slightly.

⚠ **Caution**
Do not use the gap inspection gauge with reassembled fittings.

⚠ **Caution**
Do not mix or interchange parts with those of other manufacturers.

For additional information, see the *Gaugeable Tube Fittings and Adapter Fittings* catalog, MS-01-140.

40G Series Valve Packing Adjustment

IMPORTANT

This valve is factory tested with nitrogen at 1000 psig (69 bar), or the rated pressure if lower than 1000 psig (69 bar).

Periodic maintenance: Packing adjustments may be required during the service life of the valve to prevent leakage.

Adjusting the Packing

1. Adjust the packing by turning the packing bolt clockwise in 1/16-turn increments until leak-tight performance is achieved.
2. Test valve for proper function and operation.

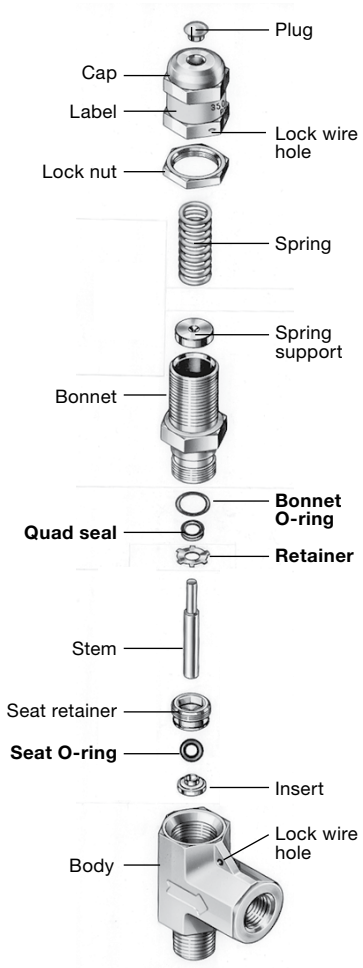
⚠ **Before removing any installed valve from the system, you must**

- depressurize the system
- cycle the valve
- purge the valve

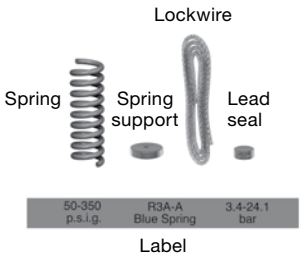
Only available through authorized Swagelok sales and service representatives.

R3A Series Externally Adjustable Relief Valves Maintenance Instructions

R3A Series Exploded View



Spring Kit



Tools Required

Tool	Size	Part
		
Open-end wrench	3/4 in. Thin head (3/16 in. max)	Lock nut
	3/4 in.	Cap
		
Crow's foot	3/4 in. Thin head (3/16 in. max)	Lock nut
		
Hex bit socket	5/64 in.	Handle set screw
		
Torque wrench, capable of:	10 in.·lb (1.1 N·m)	Set screw
	100 in.·lb (11.3 N·m)	Lock nut
		
Pic	n/a	O-rings

Spring Kit Identification

Spring Designator and Color		Set Pressure Range psig (bar)	Initial Cap Position (number of turns)
Spring Kit Basic Ordering Number: 177-R3A-K1-			
A	Blue	50 to 350 (3.4 to 24.1)	9
B	Yellow	350 to 750 (24.1 to 51.7)	8.5
C	Purple	750 to 1500 (51.7 to 103)	9
D	Orange	1500 to 2250 (103 to 155)	6
E	Brown	2250 to 3000 (155 to 206)	6
F	White	3000 to 4000 (206 to 275)	6
G	Red	4000 to 5000 (275 to 344)	6
H	Green	5000 to 6000 (344 to 413)	6

R3A Series Externally Adjustable Relief Valves Maintenance Instructions

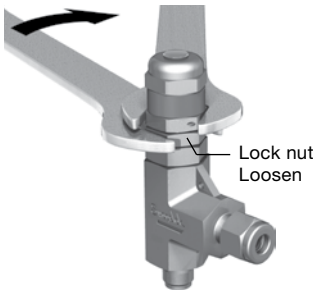
WARNING
Before servicing any installed valve, you must
- **depressurize system**
- **cycle valve**
- **purge the valve**

WARNING
Residual material may be left in the valve and system.

CAUTION
Do not scratch any sealing surfaces while following these instructions. Valve performance could be affected.

Spring Installation

1.



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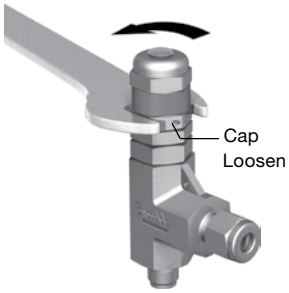

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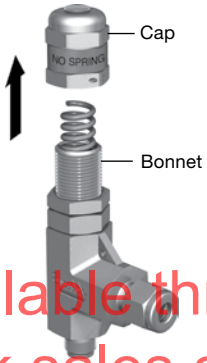
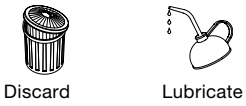


Definition of Symbols



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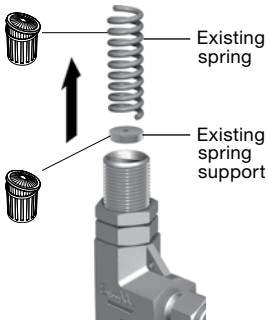
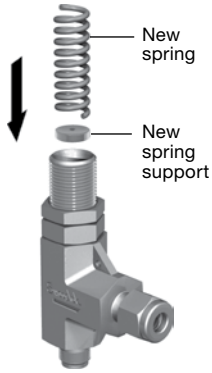


5. Make sure all components are clean.

6.



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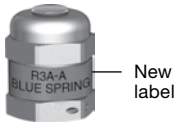
8.



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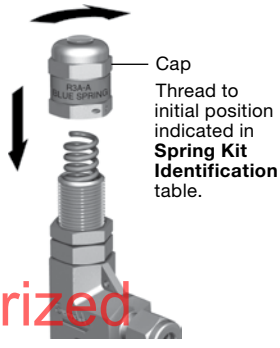
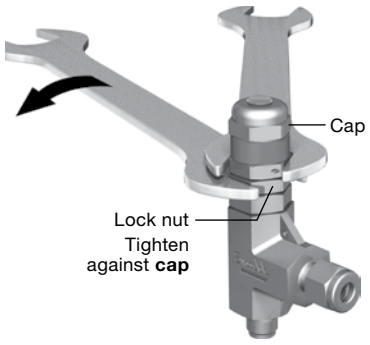


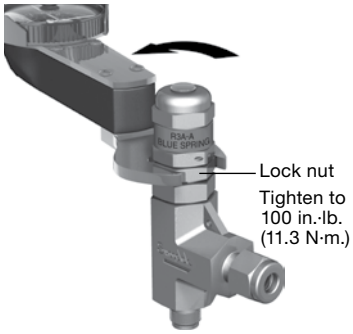
R3A Series Externally Adjustable Relief Valves Maintenance Instructions

10.



11. Test for set pressure.
12. To adjust set pressure, relieve system pressure and loosen **lock nut**.
    - To increase set pressure, tighten **cap** as needed.
    - To decrease set pressure, loosen **cap** as needed.
13. Repeat steps 10 through 12 as necessary to obtain desired set pressure.

14.



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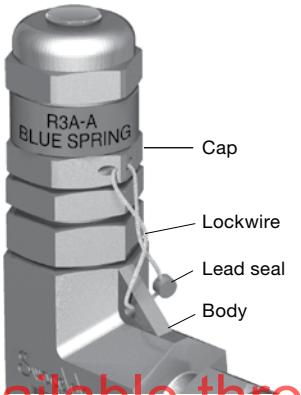
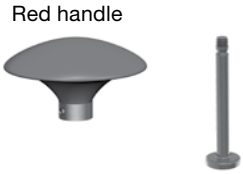


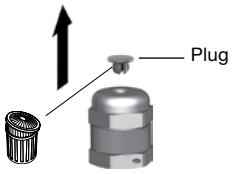
Manual Override Conversion

Manual Override Kit



1. Follow steps 1 through 4 in the Spring Installation section. Springs A, B, or C can be reused in step 3.

2.



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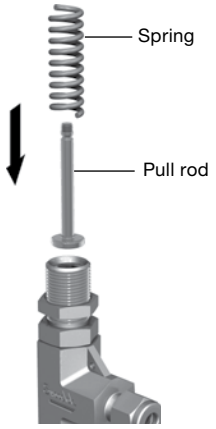

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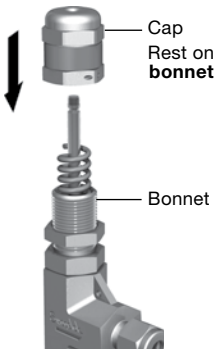
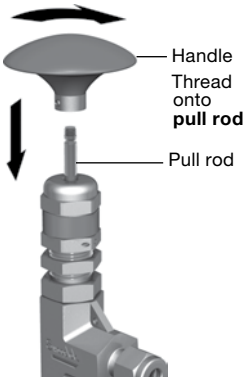


R3A Series Externally Adjustable Relief Valves Maintenance Instructions

5.



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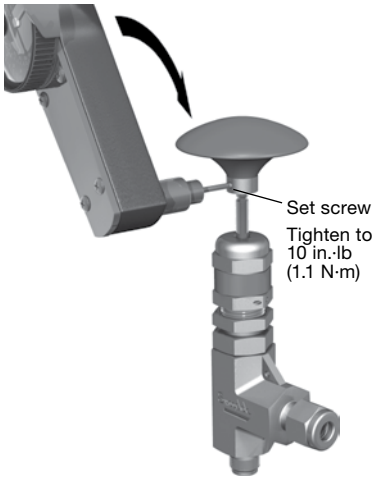

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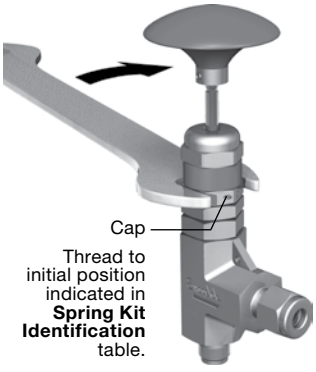

8. To adjust set pressure, see steps 10 through 13 in the **Spring Installation** section.

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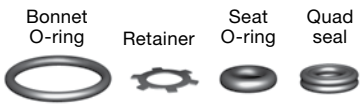
R3A Series Externally Adjustable Relief Valves Maintenance Instructions

Seat Replacement

Tools Required

Tool	Size	Part
		
Open-end wrench	3/4 in. Thin head (3/16 in. max)	Lock nut
	3/4 in.	Cap, Bonnet nut
	7/8 in.	Body wrench pad
		
Crow's foot	3/4 in.	Bonnet nut
		
Hex wrench	5/16 in.	Seat retainer
		
Hex bit socket	5/16 in.	Seat retainer
		
Torque wrench, capable of:	250 in.·lb (28.2 N·m)	Seat retainer
	600 in.·lb (67.8 N·m)	Bonnet nut
Pic	n/a	O-rings

Seal Kit



⚠ WARNING
Before removing any installed valve, you must
- **depressurize system**
- **cycle valve**
- **purge valve**

⚠ WARNING
Residual material may be left in the valve and system.

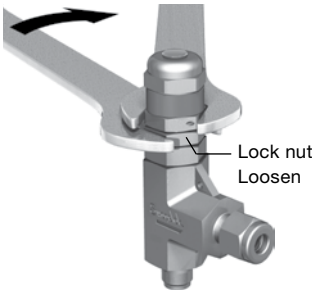
⚠ CAUTION
Do not scratch any sealing surfaces while following these instructions. Valve performance could be affected.

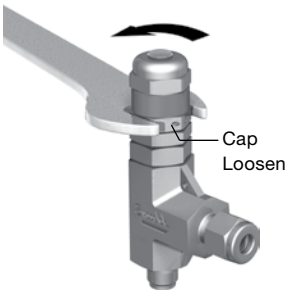
Definition of Symbols

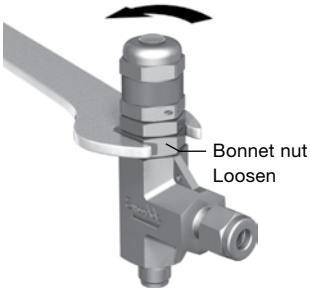

Discard

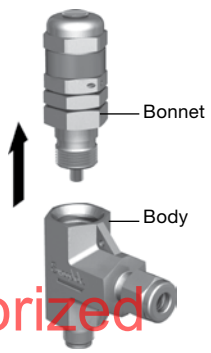

Lubricate

With system compatible lubricant

1. Remove valve from system.
2. 

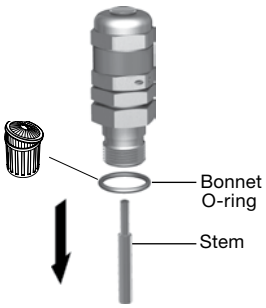
3. 

4. 

5. 

R3A Series Externally Adjustable Relief Valves Maintenance Instructions

6.



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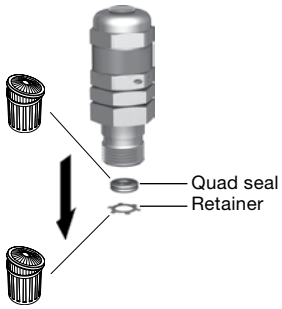

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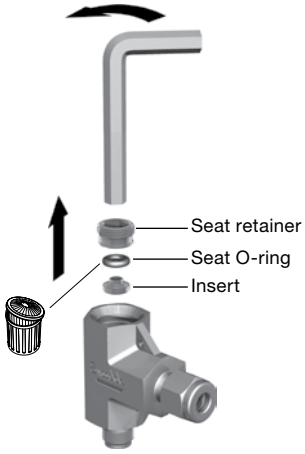
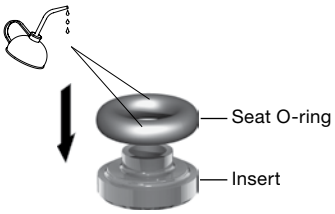
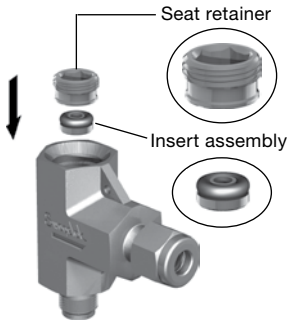


9. Make sure all components are clean.

10.



11.



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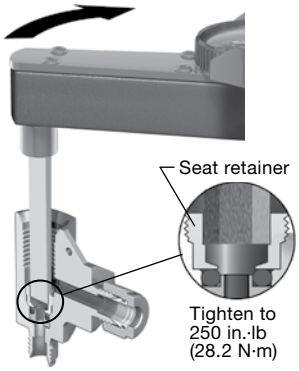

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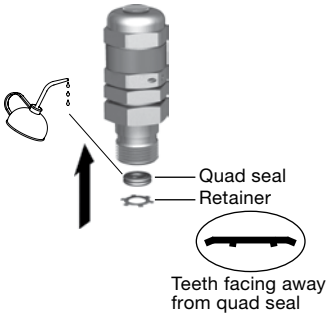

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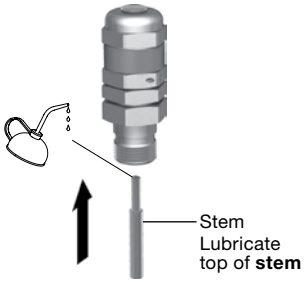

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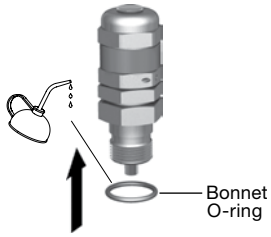
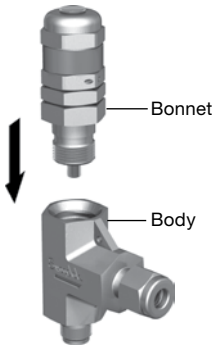
R3A Series Externally Adjustable Relief Valves Maintenance Instructions

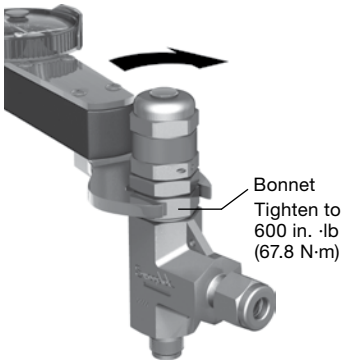
15.



16.

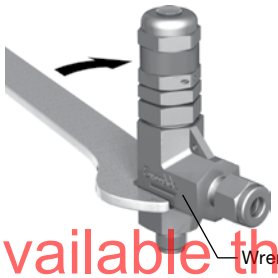


17.

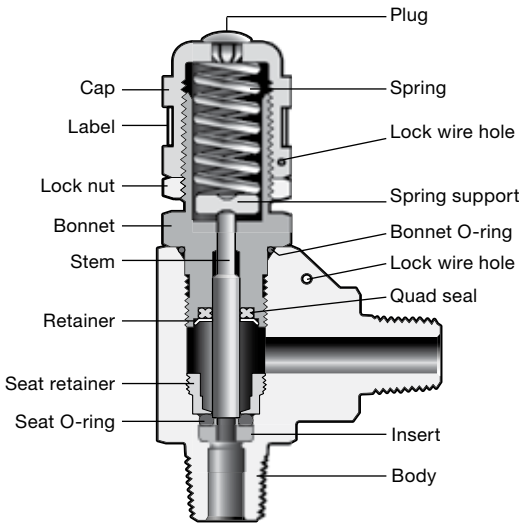


18. To adjust set pressure, see steps 10 through 13 in the **Spring Installation** section.

19. Install valve in system. Grip valve on wrench pad during installation.



R3A Series Cutaway



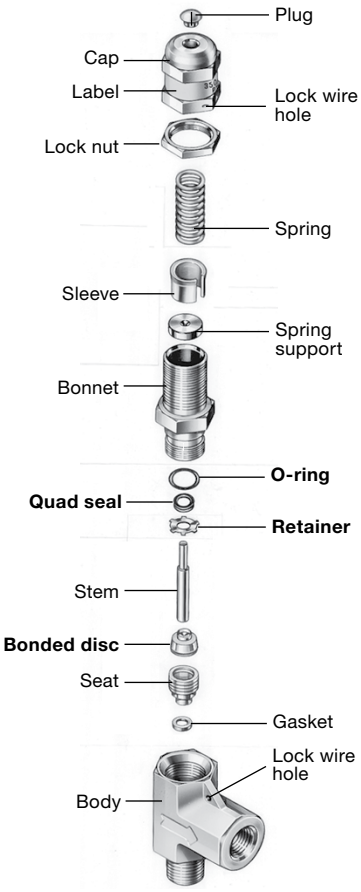
⚠ **Swagelok proportional relief valves should never be used as code safety relief valves.**

⚠ **Some system applications require relief valves to meet specific safety codes. The system designer and user must determine when such codes apply and whether these relief valves conform to them.**

⚠ **Swagelok proportional relief valves are not "Safety Accessories" as defined in the Pressure Equipment Directive 97/23/EC:**

RL3 Series Externally Adjustable Relief Valves Maintenance Instructions

RL3 Series Exploded View



Seal kit contents are in **bold**.
The spring kit contains only a spring.

Tools Required

Tool	Size	Component
		
Open-end wrench	3/4 in. Thin head (3/16 in. max)	Lock nut
	3/4 in.	Cap
	7/8 in.	Body wrench pad
		
Crow's foot	3/4 in. Thin head (3/16 in. max)	Lock nut
	3/4 in.	Bonnet
		
Torque wrench, capable of:	600 in.·lb (67.8 N·m)	Bonnet
	100 in.·lb (11.3 N·m)	Lock nut
Pic	n/a	O-rings

Definition of Symbols

Discard

Lubricate with system compatible lubricant

⚠ WARNING
Before removing any installed valve, you must
- **depressurize the system**
- **cycle the valve**
- **purge the valve**

⚠ WARNING
Residual material may be left in the valve and system.

⚠ CAUTION
Do not scratch any sealing surfaces while following these instructions. Valve performance could be affected.

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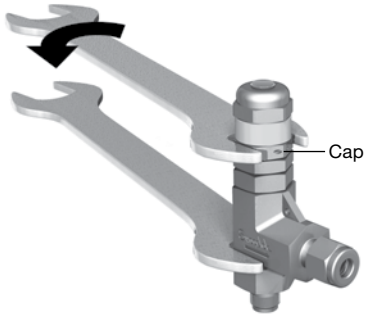
RL3 Series Maintenance Instructions

Maintenance

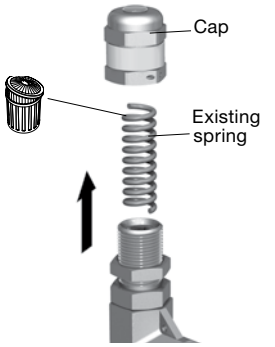
1. Remove the valve from the system.

Spring Replacement Instructions

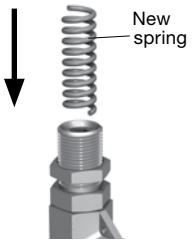
2. If replacing the contents of the seal kit only, proceed to step 8.
3. Loosen the **cap**.



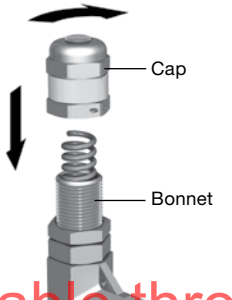
4. Remove the **cap** and the **spring**.



5. Insert the **new spring**.



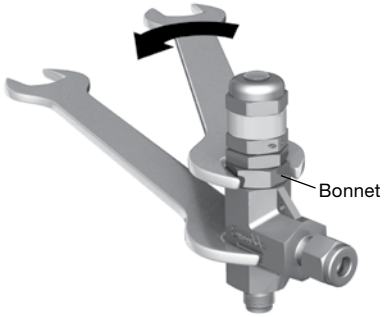
6. Thread the **cap** onto the **bonnet** 9 turns.



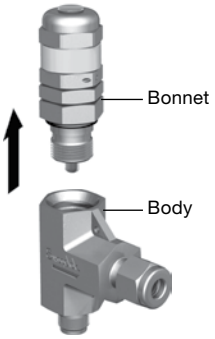
7. If replacing the spring only, proceed to ***Adjusting the Set Pressure***.

Seal Kit Replacement Instructions

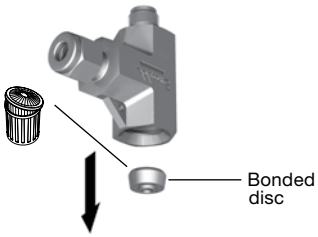
8. Loosen the **bonnet**.



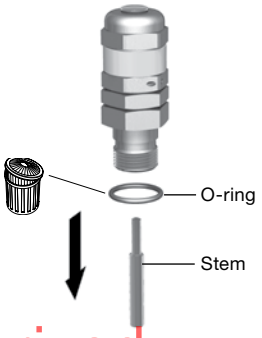
9. Remove the **bonnet** from the **body**.



10. Remove the **bonded disc** from the **body**.

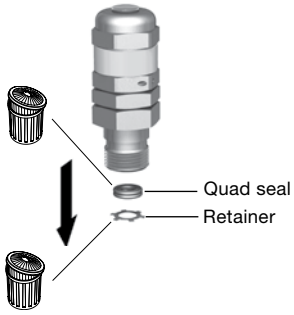


11. Remove the **stem** and **O-ring**.

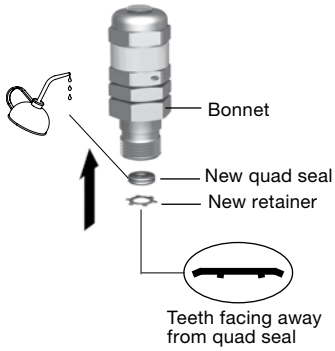


RL3 Series Maintenance Instructions

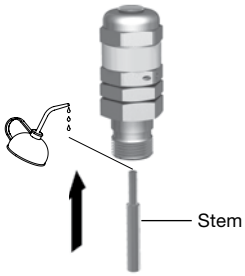
12. Remove the **quad seal** and **retainer**.



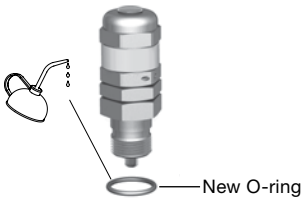
13. Clean all components.
14. Press new **quad seal** and **retainer** into the **bonnet**.



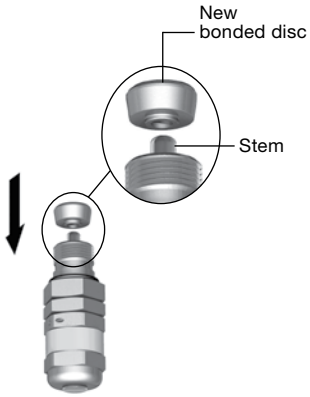
15. Lubricate the tip of the **stem** and insert the stem into the bonnet.



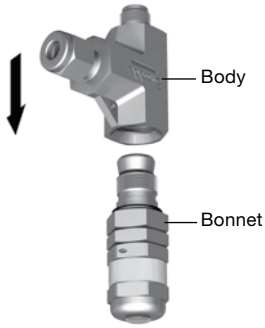
16. Place the new **O-ring** on the bonnet.



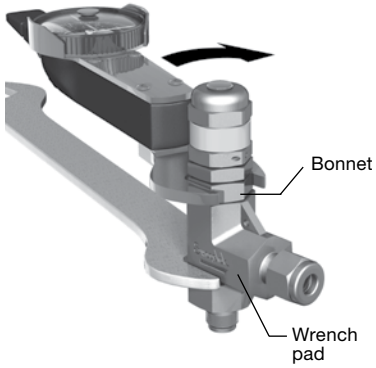
17. Place the **new bonded disc** on the **stem**.



18. Thread the **body** onto the **bonnet**.



19. Grip the valve on the wrench pad and tighten the **bonnet** to 600 in.·lb (67.8 N·m).



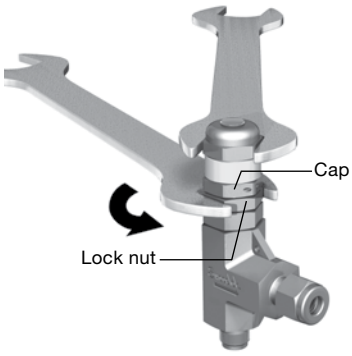
Only available through authorized Swagelok sales and service representatives.

RL3 Series Maintenance Instructions

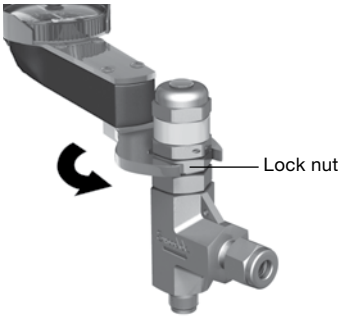
Adjusting the Set Pressure

*Note: Adjust the set pressure **before** installing the valve in the system.*

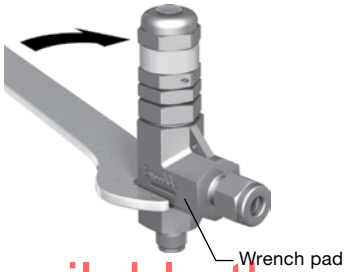
1. Tighten the **lock nut** against the **cap**.



2. Test for set pressure.
3. To adjust set pressure, relieve system pressure and loosen **lock nut**.
   - To *increase* set pressure, turn **cap** *clockwise*.
   - To *decrease* set pressure, turn **cap** *counterclockwise*.
4. Repeat steps 1 through 3 to obtain desired set pressure.
5. Tighten the **lock nut** to 100 in.·lb (11.3 N·m).



6. Install valve in system. Grip valve on **wrench pad** during installation.



RL3 Series Maintenance Instructions
Manual Override Handle Conversion Instructions

Kit contents

Handle Pull rod

Definition of Symbols

Discard

Tools Required

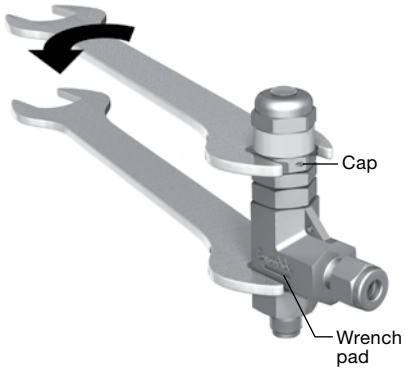
Tool	Size	Component
		
Open-end wrench	3/4 in. Thin head (3/16 in. max)	Lock nut
	3/4 in.	Cap
		
Hex bit socket	5/64 in.	Set screw
		
Torque wrench, capable of:	10 in.·lb (1.1 N·m)	Set screw
		
Pic	n/a	Sleeve

⚠ WARNING
Before servicing any installed valve, you must
- **depressurize system**
- **cycle valve**
- **purge the valve**

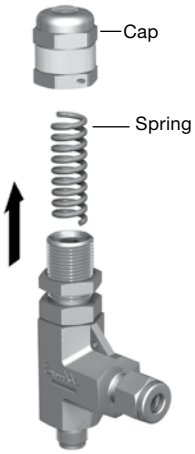
⚠ WARNING
Residual material may be left in the valve and system.

⚠ CAUTION
Do not scratch any sealing surfaces while following these instructions. Valve performance could be affected.

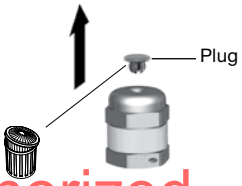
1. Grip the valve on the **wrench pad** and loosen the **cap**.



2. Remove the **cap** and **spring**.

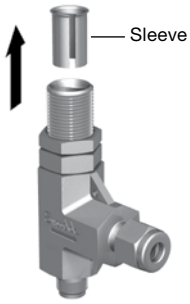


3. Remove the **plug** from the cap.

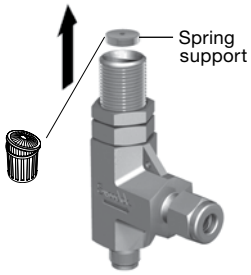


RL3 Series Maintenance Instructions

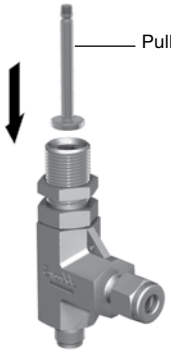
4. Use a pic the remove the **sleeve**.



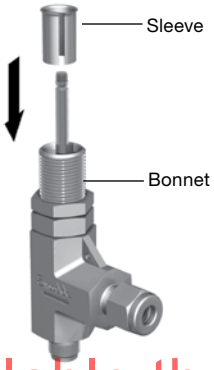
5. Remove the **spring support**.



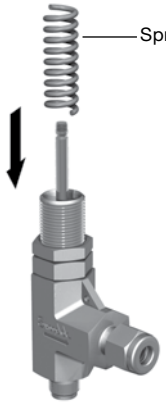
6. Insert the **pull rod**.



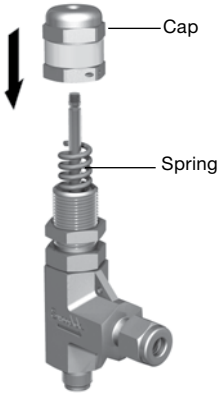
7. Compress the **sleeve** to reinstall it into the **bonnet**.



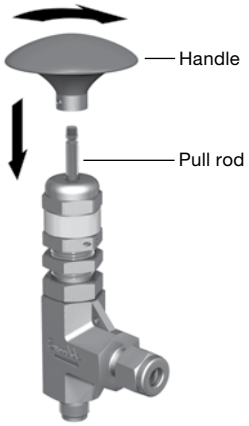
8. Reinstall the **spring**.



9. Rest the **cap** on the **spring**.



10. Thread the **handle** onto the **pull rod**.



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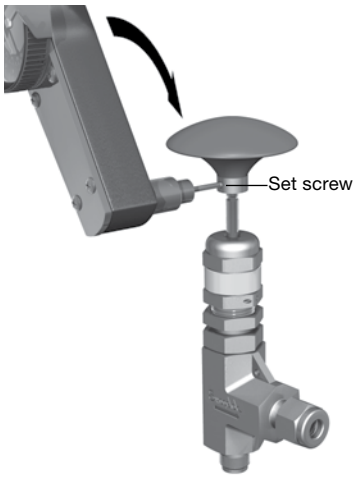
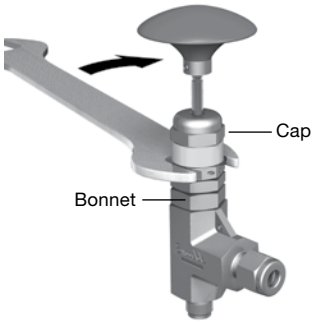
RL3 Series Maintenance Instructions

11. Tighten the **set screw** to 10 in.·lb (1.1 N·m).



12. Thread the **cap** onto the **bonnet** 9 full turns.



13. To adjust set pressure, see ***Adjusting the Set Pressure***.

⚠ **Swagelok proportional relief valves should never be used as code safety relief valves.**

⚠ **Some system applications require relief valves to meet specific safety codes. The system designer and user must determine when such codes apply and whether these relief valves conform to them.**

⚠ **Swagelok proportional relief valves are not "Safety Accessories" as defined in the Pressure Equipment Directive 97/23/EC:**

TF Series Tee-Type Filter Service Instructions

Kit Contents

Gasket Kit

Gasket

Element Kit

Filter element

Label

⚠ WARNING

Before servicing any installed filter you must

- **depressurize system**
- **purge the filter to remove any residual system media.**

⚠ WARNING

Residual system media may be left in the valve.

Tools Required

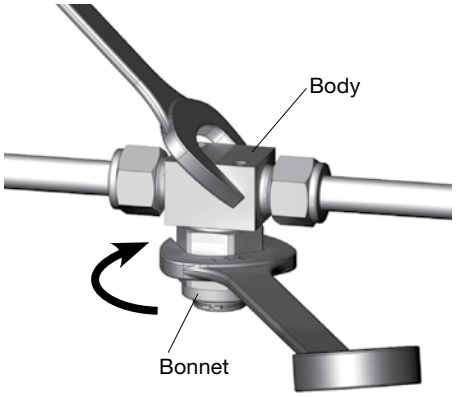
Tool	Size	Component
Open-ended wrenches 	2TF, 4TF: 1 in. 6TF, 8TF: 1 1/8 in.	Bonnet, Body
Crow's foot 	2TF, 4TF: 1 in. 6TF, 8TF: 1 1/8 in.	Bonnet
Torque wrench 	Capable of 650 in.·lb (73.4 N·m)	Bonnet

Definition of Symbols

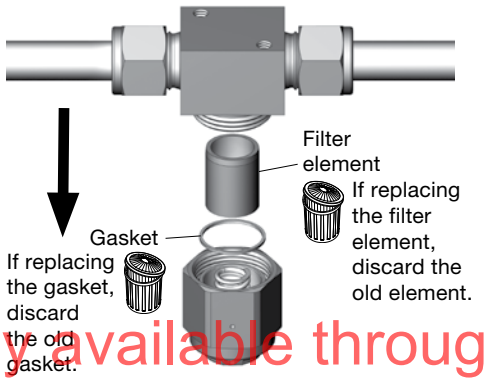
Discard

Disassembly

1. Isolate the filter from the system.
2. Stabilize the **body** with a wrench. Loosen the **bonnet**.

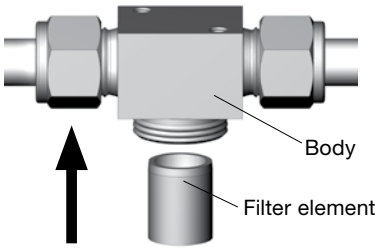


3. Remove the components.

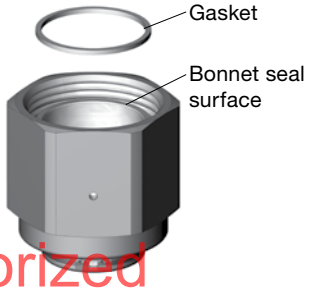


Reassembly

4. Clean all of the components.
5. Press the open end of the **filter element** into the **body**.



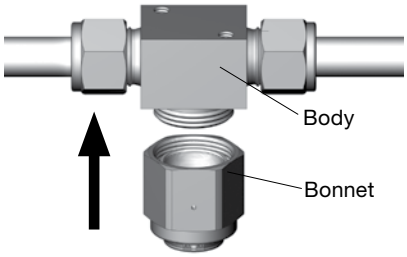
6. Center the **gasket** on the **bonnet seal surface**.



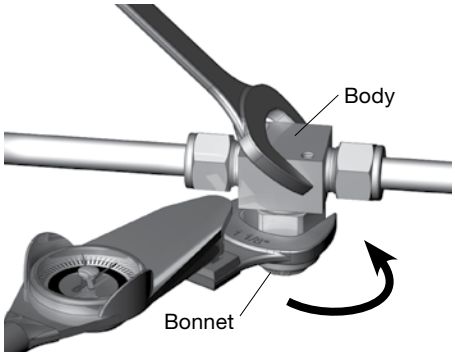
TF Series Tee-Type Filter Service Instructions

7. Thread the **bonnet** onto the **body** until the body threads are no longer visible**.**

   Note: If the bonnet does not fully thread onto the body, the gasket is not centered on the bonnet seal surface.



8. Stabilize the **body** with a wrench. Tighten the **bonnet** according to table below.



Series	Torque, in.·lb (N·m)	
	Stainless Steel	Brass
2TF, 4TF, 3TF-MM, 6TF-MM	550 (62.2)	450 (50.8)
6TF, 8TF, 8TF-MM, 10TF-MM, 12TF-MM, 14TF-MM	650 (73.4)	475 (53.7)
All using PCTFE gasket	1/4 turn past finger-tight	

9. Place the new label on the filter body.
10. Test the product for proper operation.

F Series Inline Filter Service Instructions

Kit Contents

Gasket Kit

Gasket

Element Kit

Filter element

Label

⚠ WARNING

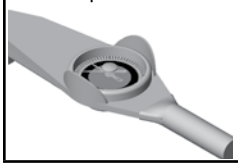
Before removing a filter from the system for service, you must

- **depressurize system**
- **purge the filter to remove any residual system media.**

⚠ WARNING

Residual system media may be left in the filter.

Tools Required

Tool	Size	Component
Open-ended wrenches 	2F: 9/16 in. 4F: 3/4 in. 6F, 8F: 1 in.	Body hex
Crow's foot 	2F: 9/16 in. 4F: 3/4 in. 6F, 8F: 1 in.	Body hex
Torque wrench 	Capable of 500 in.·lb (56.5 N·m)	Body hex

Definition of Symbols

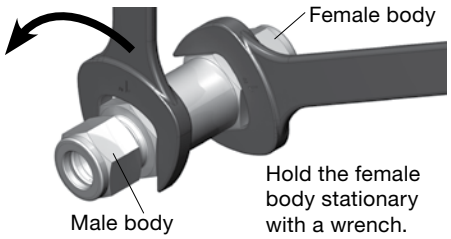
Discard

Only available through authorized Swagelok sales and service representatives.

F Series Inline Filter Service Instructions

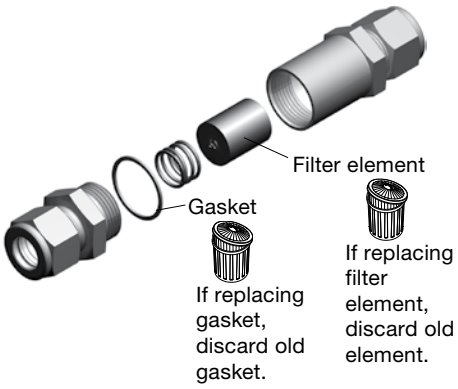
Disassembly

1. Remove the filter from the system.
2. Loosen the **male body** from the **female body**.



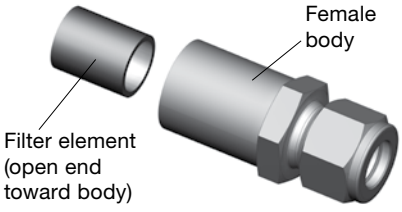
3. Remove the components.

   Note: Use a blunt tool to loosen the filter element if necessary.

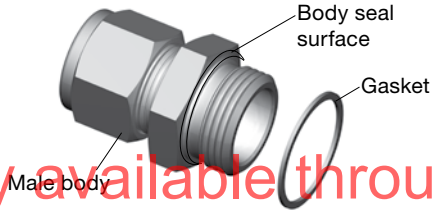


Reassembly

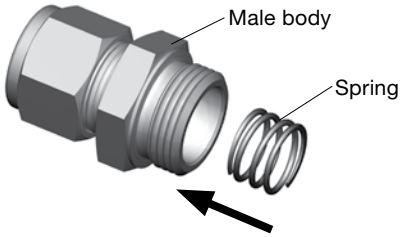
4. Clean all components.
5. Press the open end of the **filter element** into the **female body**.



6. Place the **gasket** on the **body seal surface** of the **male body**.

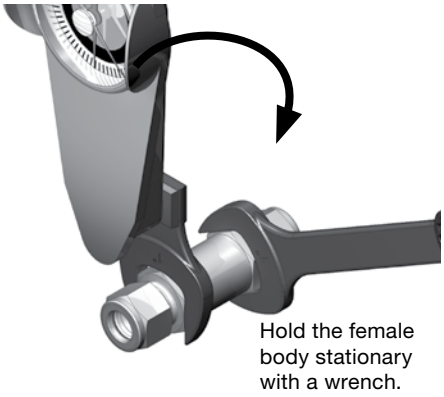


7. Insert the **spring** into the **male body**.



8. Thread the bodies together.

   Note: There will be no space between the gasket and the male body hex when the bodies are fully threaded.
9. Tighten the male body according to table below.



Series	Torque, in.·lb (N·m)	
	Stainless Steel, Alloy 400, Alloy C-276, Alloy 600	Brass
1F, 2F, 3F-MM	135 (15.2)	125 (14.1)
4F, 6F-MM	350 (39.6)	325 (36.7)
6F, 8F, 10F-MM, 12F-MM	500 (56.5)	450 (50.8)

10. Place the new label on the female body.
11. Test the product for proper operation prior to reinstallation in system.

Pressure-Reducing Regulators
KPR Series Maintenance Instructions

Kit Contents

- Filter (1)
- Filter ring (1)
- Retaining ring (1)
- Poppet damper (1)
- Poppet spring (1)
- Poppet (1)
- Seat (1)
- Seat retainer (1)
- Diaphragm (2 for 0 to 250 psig and 0 to 500 psig regulator, 1 for all others)
- Lubricant tube with MSDS (1)

Tool Requirements

- Needle-nose pliers
- 15 ft·lb (20 N·m) torque wrench
- 117 ft·lb (160 N·m) torque wrench
- 5/8 in. socket wrench
- 2 in. wrench

CAUTION
Before servicing any installed regulator, you must depressurize the system and purge the regulator.

Body Disassembly

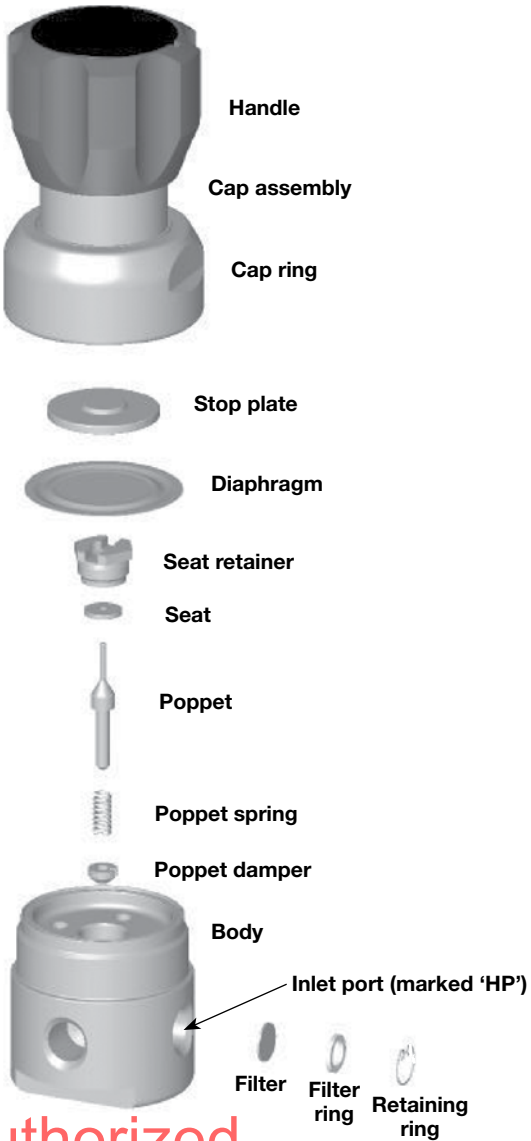
1. Turn handle counterclockwise until it stops in order to release the spring load.
2. Loosen **cap ring** with a 2 in. wrench, using the flats to grip the cap ring. Remove **cap assembly** and **handle** as one piece. In 0 to 500 psig regulator assemblies, the range spring and spring button will fall from the cap when it is lifted. Set aside the range spring and spring button for later use during reassembly.
3. Remove **stop plate** and **diaphragm** from body. It may be necessary to tap the regulator at an angle, by hand, to remove the diaphragm. Set aside stop plate for later use. Discard the diaphragm.
4. Remove **seat retainer** and **seat** (as one piece) using a 5/8 in. socket wrench and discard both components.
5. Pull **poppet, poppet spring,** and **poppet damper** from **body** and discard. If poppet damper remains in the body, invert the body and use the poppet to loosen and remove the poppet damper. Be careful not to scratch the inside of the body.

Filter Disassembly

1. Use needle-nose pliers or similar tool to remove the old **retaining ring** from the **inlet port (marked 'HP')** and discard. Be careful not to scratch the sides of the inlet port with the pliers.
2. Remove the old **filter ring** and **filter** and discard.

   Note: If necessary, tap the regulator by hand to allow the filter ring to fall out.

   Note: If necessary, prod the filter with the needle-nose pliers to tip it until the filter falls out. Be careful not to scratch the sides of the inlet port with the pliers.

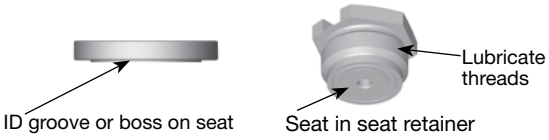


Pressure-Reducing Regulators
KPR Series Maintenance Instructions

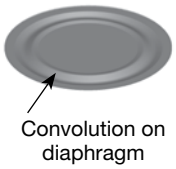
Body Reassembly

Note: Ensure the regulator body and all parts are clean and free of damage.

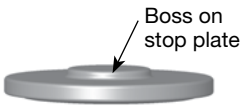
1. Place the new **seat** into the new **seat retainer** with the ID groove or boss pointing away from the seat retainer. Apply a very light coat of provided lubricant to the seat retainer threads.



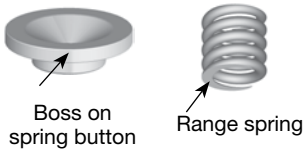
2. Slip the new **poppet spring** and new **poppet damper** onto the thicker end of the new **poppet**. Fit the flat face of the poppet damper against the poppet spring.
3. Invert the seat retainer/seat assembly and place the thinner end of the poppet in the center of the plastic seat.
4. Keeping the poppet/seat retainer assembly inverted, invert the **body** and thread the new **seat retainer** into the body. Tighten to 15 ft·lb (20 N·m) torque with a 5/8 in. socket on the torque wrench.
5. Install the new **diaphragm** into the **body** with the large convolution facing down into the body. For 0 to 250 psig and 0 to 500 psig regulators, which use two diaphragms, both diaphragms have the same orientation.



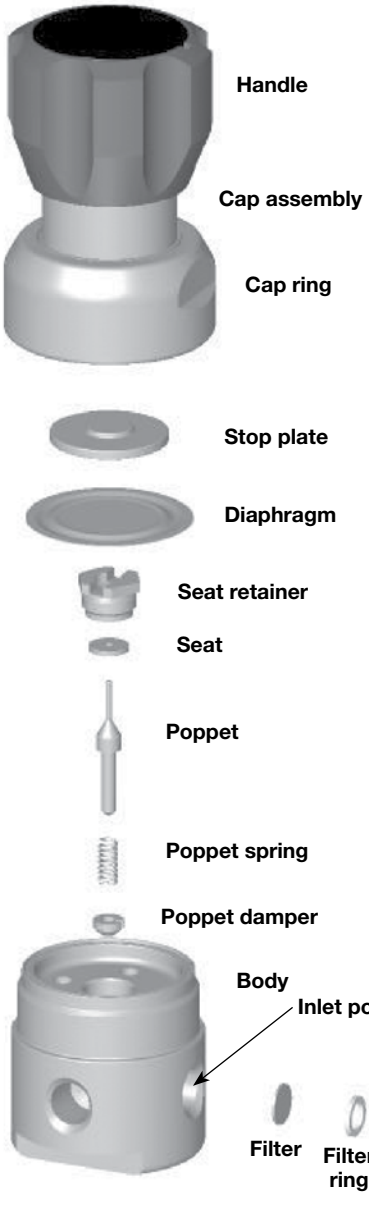
6. Install the **stop plate** onto the new **diaphragm** with the boss on the stop plate facing up, away from the diaphragm.



7. For 0 to 500 psig regulators, place the spring button into the cap assembly with the boss facing away from the handle, coned side up. Place the range spring into the cap.



8. Place the **cap assembly** on the **body**.
9. Thread the **cap ring** onto the **body**. Tighten cap ring to 117 ft.·lb (160 N·m) torque with a 2 in. wrench adapter on the torque wrench using the flats to grip the cap ring.
10. Test the regulator for proper operation.



Filter Reassembly

1. Place the new **filter** in the **inlet port (marked 'HP')** with the rough face toward the inside of the regulator and the smooth face out.

2. Place new **filter ring** and **retaining ring** into the **inlet port**. Ensure that the retaining ring is fully seated into the groove inside the inlet port. If necessary, use a blunt tool to fully seat the retaining ring.

Avenger® Model 38M Membrane Replacement Instructions

INSTALLATION INSTRUCTIONS
MEMBRANE KIT

O-RING MEMBRANE

#33M/38M-5 X 5

O-ring is not included unless elastomer is **Teflon Encapsulated Viton**

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www.geniefilters.com sales@geniefilters.com

Revision 12.06

Warning:

For models containing Liquid Block™: Slowly open the supply pressure so that the minimum differential pressure required to shut-off the Liquid Block™ is not met or exceeded..

Depressurize the Avenger Model 33M or 38M. It is *not* necessary to disconnect any fittings.

3

Unscrew the bowl from the 33M/38M Head.

4

If the cartridge does not need to be changed, the Filter Core Membrane Holder does not need to be removed. Remove the old membrane being careful not to damage the o-ring. The o-ring will be retained for future use. 5

Retrieve a new membrane from the clear plastic container. Grasp the membrane at the outer edge, taking great care not to damage it. Center the new membrane over the membrane support. 6

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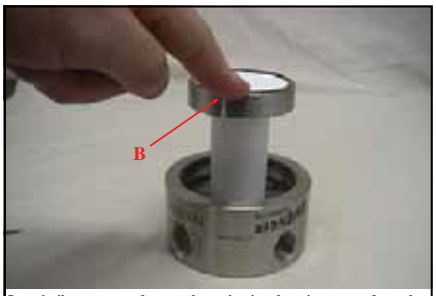
Avenger® Model 38M Membrane Replacement Instructions

Place the o-ring over the membrane aligning the o-ring over its groove. Gently press the o-ring to approximately 1/2 the groove depth in one location. 7



In a similar manner, depress the o-ring in a location across from the location selected in the previous step. 8

Repeat the two previous steps at different locations until the entire o-ring is depressed. The membrane should now be tightly stretched. 9

Re-install the Filter Core Membrane Holder if it was removed. Stop turning the Membrane Holder when it is finger tight against the filter cartridge. 10

Re-install the bowl onto the Avenger 33M/38M Head. Return the Avenger to service

11

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Genie® Supreme™ Model 123HP Maintenance Instructions

U.S. Patent 5,476,586; Patents Pending

Genie® Supreme™ Model 123 Maintenance Instructions

Manufacturing Contact Information

A+ Corporation, LLC *Call for expert product application assistance:*

41041 Black Bayou Rd. **Phone: (225)-644-5255** **Website: www.geniefilters.com**

Gonzales, LA 70737 **Fax: (225)-644-3975** **E-mail: sales@geniefilters.com**

Safety Warnings

⚠ Failure to abide by any of the safety warnings below may result in equipment failure and serious injury or death.

- For models containing Liquid Block™ : Slowly open the supply pressure so that the minimum differential pressure required to shut-off the Liquid Block™ is not met or exceeded..
- Valve off the sample flow to depressurize the Genie® Supreme™ prior to starting maintenance.
- Do not exceed any equipment pressure ratings.

Tools Required

No special tools are required for membrane and o-ring replacement.

An ISO 9001:2000 certified company

SCC-Supreme123-InsMaintenance_0609

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Genie® Supreme™ Model 123HP Maintenance Instructions

Genie Supreme™ Model 123

Membrane & O-ring Replacement

Step 1. Depressurize the system

- Valve off the sample flow and depressurize the **Genie® Supreme Membrane Separator™** prior to replacing the membrane and o-ring.

Step 2. Remove the o-ring

- Unscrew the cover by hand.
- Lift the o-ring using a fingernail or a small screwdriver. Avoid scoring or scratching the metal sealing surfaces.
- Remove the o-ring (Figure 1).

Step 3. Replace the membrane

- Remove the used membrane from the separator, and discard the membrane (Figure 2).
- Remove the fresh membrane from its shipping bag.
- Place the fresh membrane over the membrane support. If the new membrane is the type "High-Flow Backed", then place the *smooth side* of the membrane up. The membrane backing, which is the *rough side*, should be against the support.

Step 4. Replace the o-ring

- Place the o-ring over the membrane.
- Center the o-ring over the o-ring groove.
- Lightly press one side of the o-ring into its groove (*location A*) (Figure 3).
- Repeat the previous step at a location directly opposite from the first side to be pressed down (*location C*).
- Press down on the o-ring in about two more locations (*locations C and D*)

Step 5. Complete replacement

- Turn cover over so that the membrane side is down, and press the cover on a clean, flat surface (Figure 4).
- Screw the cover back onto the body until it reaches the mechanical stop. - DO NOT USE A WRENCH.

GENIE sampling solutions

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Genie® Supreme™ Model 123HP Maintenance Instructions

GENIE Supreme™ Model 123

Model Numbering & Additional Part Numbers

Your model number is determined by your specific needs. Choose options below.

Sealing material ▲	0 = Viton®	1 = Kalrez®	*(other materials available upon request)*
Membrane type	5 = Type 5	6 = BTU	7 = Hi-Flow Backed
Mounting bracket accessory	Part # = 123-509-SS *(sold separately)*		
O-ring replacement	Part # = 123-500 *(sold separately)*		

How to build the model number:

123 — 0 — SS

▲ Sealing material
Membrane type

How to build the replacement membrane kit number:
(Five membranes per kit. O-rings sold separately)

123 — 5 X

Membrane type

▲ We cannot recommend specific sealing materials due to the complex nature of sample stream compositions. Temperature and pressure also may be factors.
⚠ Unless specified otherwise, the product will ship with our standard sealing materials and materials of construction stated in the technical specifications section of the corresponding Product Sheet. ▲ Please refer to www.dupontelastomers.com for sealing material recommendations and advice. It is the user's responsibility to specify the sealing materials and other materials of construction for their application.

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GENIE sampling solutions

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Avenger® Model 38 and 38M Element Replacement Instructions

Avenger Model 33/33M & Model 38/38M Element Installation Instructions

Avenger Model 38/38M with Horizontal Mounting Bracket

Avenger Model 33/33M with Horizontal Mounting Bracket

Figure 1 - Peel Back View of Avenger 33M

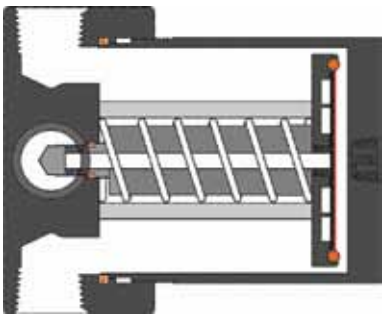
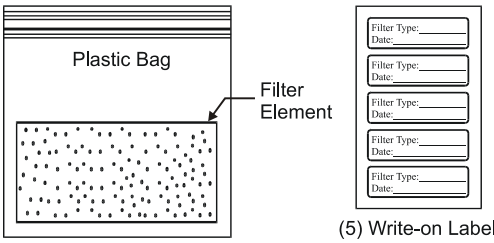


Figure 2 - Filter Element & Write-on Labels



Installation Instructions

1.) Remove all sources of gas and liquid from the Avenger Series 30 Filter Housing.

2.) Drain and dispose of all liquids from the Avenger Series 30 Filter housing.

3.) Remove the bowl from the head.

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Avenger® Model 38 and 38M Element Replacement Instructions

4.) Unscrew the Element Support from the head and remove the old filter element if necessary (see Figure 3).

5.) Remove a new element from the clear plastic bag.

6.) Slide the new filter element onto the element support. It should slide loosely onto the element support (see Figure 4).

Figure 3 - Exploded View of Series 30 Avenger

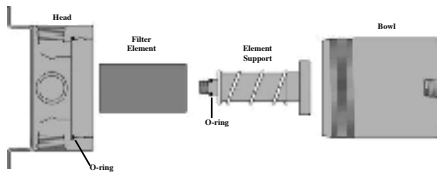
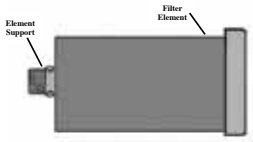


Figure 4 - Filter Element & Support



7.) Replace the element support with the filter element into the head and turn until finger-tight.

CAUTION: DO NOT OVERTIGHTEN the element support! The filter element may be damaged if the element support is overtightened. It is not necessary for the element support to be more than finger-tight.

8.) Replace the bowl into the head and turn until hand-tight. The O-ring seal will engage when the bowl comes to a mechanical stop.

CAUTION: It is not necessary to use any tools to tighten the bowl.

9.) If the replacement filter element type differs from the previous filter type, remove the protective backing from the write-on label included with the new element, and apply it to the bowl. Use a ball-point pen to write the filter element type and date installed on the label. The filter type is labeled on the clear plastic bag if the Avenger Series 30 Filter Housing came equipped with a filter element.

10.) Place the Avenger Series 30 Filter back in service.

Replacement Filter Element Ordering Information

30-5		
Series Number	**Element Type** O7CFS = 0.1 micron coalescer fluorocarbon SS10 = 10 micron stainless steel	**Element Quantity** 5 = Box of 5 replacement elements 10 = Box of 10 replacement elements

Warranty Information
Swagelok products are backed by The Swagelok Limited Lifetime Warranty. For a copy, visit swagelok.com or contact your authorized Swagelok representative.

April 2011, R0
MS-13-218

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