CHESTERTON FLOW GUARDIAN™ S50 AND SP50 SINGLE FLOWMETER INSTALLATION INSTRUCTIONS

GENERAL

The function of the FLOW GUARDIAN Single S50 (Item # 199801 compression fitting, 199804 barb fitting) and SP50 Flowmeter (Item # 199802 compression fitting, 199805 barb fitting) is to accurately control the flow rate of the seal or packing flush fluid. The S50 will control the flow rate of the flush fluid and the SP50 will control the flow rate and pressure of the flush fluid.

SPECIFICATIONS

Flow Rate

Flow rate range to be
2 – 50 GPH (0,1 - 3 Liters/min)

Pressure Regulating Valve Option (SP50)

An integral pressure-regulating valve is provided to set the flush fluid pressure for the mechanical seal or packing. The pressure regulating control knob is located below the pressure gauge and in back of the flow control knob.

(Please view Figure 4 page 5 for pressure regulating control knob location)

Pressure Gauge

The pressure gauge furnished on the FLOW GUARDIAN S50 and SP50 Flowmeters is constructed of 316 SS, oil filled, with 0 – 145 PSIG and 0 – 10 bar g compound markings.

Material of Construction	
Flowmeter Tubes:	POLYSULFONE (PSU)
Body of Unit:	POLYOXYMETHYLENE (POM)
O-rings:	FLUOROCARBON (FKM)
Pressure Gauge:	Oil filled with 316SS Stainless Steel Case and Wetted Parts, 1/4" – NPT Bronze fitting
Pressure Regulating Valve:	AISI 316
Flow Rate Regulating Valve:	AISI 316
Clean-out Plugs:	AISI 320
3/8" Tube Fittings (for compression connections) or optional Barb Fittings:	AISI 316
Mounting Bracket:	AISI 316

Temperature / Pressure Limits

Maximum Temperature:
212 °F (100 °C)

Maximum Pressure:
160 PSIG (11 bar g)

Optional Low Flow Sensor

Two adjustable low flow alarm sensors are available as options. One sensor (Item # 199809) operates on 20-250 AC/DC volts with a switching frequency of 25 Hz AC / 100 Hz DC and the second (Item # 199810) sensor option operates on 10 – 55 DC volts with a switching frequency of 100 Hz.

Qualification Test

All Chesterton FLOW GUARDIAN single flowmeters are tested for leak tightness.

INSTALLATION PROCEDURE

Typical installation illustrations of the CHESTERTON FLOW GUARDIAN™ S50/SP50 Single Flowmeters are represented on pages 4 and 5 of these instructions. The S50 and SP50 are utilized for single mechanical seal or packing gland applications.

The FLOW GUARDIAN has a mounting plate for simplified installation. The mounting bracket bolt slots accommodate bolt sizes from 1/2" (12 mm) to 7/8" (22 mm). The FLOW GUARDIAN **must** be mounted vertically to operate accurately.

(See Figure 2 page 4, and Figure 5 page 5 for mounting plate dimensions.)

Hose Connections for FLOW GUARDIAN S50

NOTE:
Hoses and clamps not included.

For compression fitting models use a 3/8" female compression coupling to make connection to all supply and return lines.

For barb connector models the hose connections are made by using hoses with a 3/8" (10mm) inside diameter. The hose must be textile reinforced. It must withstand at least 240 PSIG (16 bar g) pressure. Attach the hoses using hose clamps over the hose barb fittings. Leave the hose long enough to prevent kinks and to avoid sharp turns. Long radius connections are preferred.

Hose connection instructions are located on the bottom of the mounting plate:

1. **IN**
   Clean flush supply feed inlet
2. **TO SEAL**
   Clean flush feed to seal

(See Figure 2 and 3 page 4 for installation drawing)

Hose Connections for FLOW GUARDIAN SP50

Hose connection instructions are located on the bottom of the mounting plate:

NOTE:
Hose qualification is the same as S50.

NOTE:
For single seal operation a hose jumper is needed to properly install FLOW GUARDIAN SP50 Single Flowmeter.

(See Figure 5 page 5)

1. **IN**
   Clean flush supply feed inlet
2. **TO SEAL**
   Attach end #1 of hose jumper
3. **FROM SEAL**
   Attach end #2 of hose jumper
4. **OUT**
   Clean flush outlet to mechanical seal flush port or packing lubrication port.

Optional Flow Sensor Installation and Adjustment

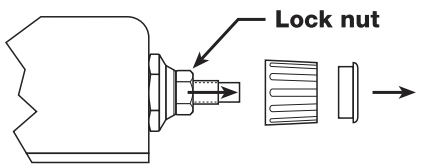
NOTE:
Sensor range capability (0,5 – 1,25 Liters/min) due to FLOW GUARDIAN body design.

Install the alarm sensor in the slot behind the indicating tube that is located in the back of the FLOW GUARDIAN.

(See Figure 1 on page 4 and Figure 4 on page 5)

1. The sensor has two lock nuts. Move one of the nuts to the flat end of the sensor.
2. Move the other nut to approximately 1/2" (10 mm) distance from the first nut.
3. Insert the sensor into the sensor slot located at the back of the FLOW GUARDIAN by pivoting it into place at the top opening of the sensor slot (widened). When the sensor is in place, it moves freely up and down in the sensor slot.
4. Locate the sensor in the desired position and tighten the sensor clockwise against the bottom of the sensor slot. To secure the sensor into position tighten the second locking nut by hand until the sensor is secure.

NOTE:
If you want to prevent the tampering of the FLOW GUARDIAN and/or make the FLOW GUARDIAN adjustable using a hand tool, remove the black knob. Unscrew the knob lock screw and remove the hand knob. When the knob is removed, screw the delivered M8 lock nut onto the valve.



LOW FLOW SENSOR ADJUSTMENT

This is done by adjusting the position of the sensor. When the float in the meter tube falls slightly below the midpoint of the sensor, the sensor is activated.

To make adjustment to the alarm setting:

1. Adjust the water flow to the alarm value. (Use red arrow sliding indicator as a guide)
2. Move the sensor up until the alarm goes off.
3. Retighten the sensor into position.

HIGH FLOW SENSOR ADJUSTMENT

This is done by adjusting the position of the sensor. When the float in the meter tube falls slightly below the midpoint of the sensor, the sensor is activated. Repeat the steps above (Low Flow Alarm Adjustment) for improved accuracy of sensor.

The FLOW GUARDIAN can have both low flow and high flow sensors. Two sensors are needed to maintain high and low flow conditions.

Flow Adjustment

(FLOW GUARDIAN S50 without pressurizing valve)

(See Figure 1 page 4)

To adjust the flow in a FLOW GUARDIAN S50 without the pressurizing valve as follows:

1. Thread the quick cleaning plunger rod into the top of the FLOW GUARDIAN. (Not installed at the factory)
2. Fully open the flow control valve and observe the flow.
3. Use red arrow sliding indicator as a guide for setting flow rate.
4. Push the quick clean plunger down while making flow adjustments until desired flow rate is visible.
5. Adjust the flow control knob until float begins to move slightly at the desired level.
6. To ensure proper flow indication pull quick clean plunger up to the top of the meter tube.

INSTALLATION PROCEDURE (CONTINUED)

Flow Adjustment

(FLOW GUARDIAN SP50 with pressurizing valve)

(See Figure 4 page 5)

When you use a FLOW GUARDIAN SP50 with a pressurizing valve, you must adjust both the flow rate and pressure as follows:

1. Thread the quick cleaning plunger rod into the top of the FLOW GUARDIAN.
2. Fully open both valves.
3. Push the quick clean plunger down until flow rate is desired.
4. Adjust the flow control valve until float begins to move slightly at desired level.
5. Adjust the pressure control valve that is located behind the flow control valve until the required pressure is set.

NOTE:
The adjusting of the pressurizing valve changes the flow rate. Therefore, repeat the steps until both the desired flow rate and the pressure value are reached.

SERVICE AND MAINTENANCE

Quick Cleaning

Over time the meter tube may discolor due to algae, silt, fiber, and other contamination. This may make it difficult to read the flow rate. The FLOW GUARDIAN has a built in quick cleaner plunger. Quick cleaner plunger operates as follows:

1. When you are cleaning, hold the FLOW GUARDIAN firmly.
2. Locate the cleaning plunger rod at the top of the FLOW GUARDIAN.
3. Push the cleaning rod plunger slowly downwards to avoid pressure variations to the seal.

   Note: If the FLOW GUARDIAN has a flow alarm, the cleaning process may cause a false alarm.
4. Let pressure push the plunger slowly upwards. If required use your hand to raise the plunger back to the top.

Metering Components and Valve

If quick cleaning with plunger does not resolve problems in flow measuring instruments, problems may be caused by foreign objects or contaminant build up in the metering components. If this occurs the metering components must be disassembled and inspected.

Metering component disassembly:

1. Close the water feed to the FLOW GUARDIAN unit.
2. Close the FLOW GUARDIAN flow control valve completely.
3. If the quick cleaner plunger is still in place, remove it.
4. Open and remove the plunger plug using a 14 mm metric wrench.
5. Screw on the quick cleaning rod. Push it halfway into the metering tube.
6. Pull out the quick cleaner and simultaneously push the metering tube out of the meter body using your thumb.
7. Gently lift out the float using a non-metallic device such as a toothpick.
8. Clean the feed inlet using a cloth wrapped around a toothpick or a small fiber brush.
9. Separate parts should be soaked in soap or mild solvent based solution. Brush them clean using a cloth.
10. Reassemble the metering components in the reverse order.

Usually, foreign material in the valve causes a valve problem. When you open the valve and then set the flow back to normal, the foreign material is removed. However, if this does not resolve the problem, you must disassemble the valve to determine the cause of the problem.

Valve Disassembly:

1. Close the water feed to the FLOW GUARDIAN unit.
2. The seal must be un-pressurized, shut down the pump.
3. Unscrew the flow control valve assembly using a 22 mm metric wrench.
4. Clean the meter inlet and valve area using a cloth wrapped around a toothpick or fiber brush.
5. If the valve needle O-ring leaks, remove the adjustment knob and screw the needle clockwise through the valve body. Replacement O-ring can be found in the FLOW GUARDIAN flowmeter repair kit. (Item # 199812)
6. Reassemble the valve in the reverse order.

O-RING SEALS

Remove the broken or worn out O-rings carefully to avoid damage to the sealing surfaces. Best results are obtained by using only fingers or toothpicks. Never use metallic tools. Replacement O-rings can be found in the FLOW GUARDIAN repair kit.

When you install new O-rings, remember the following:

1. Do not damage the O-ring when you move it over the threads. A short smooth pipe can be placed over the threads to protect O-ring.
2. Do not leave the O-ring on a spiral or twisted.
3. Before installation, lightly lubricate the new O-rings using silicone lubricant.
4. Use only FKM (Fluorocarbon) O-rings.

General Operation and Maintenance

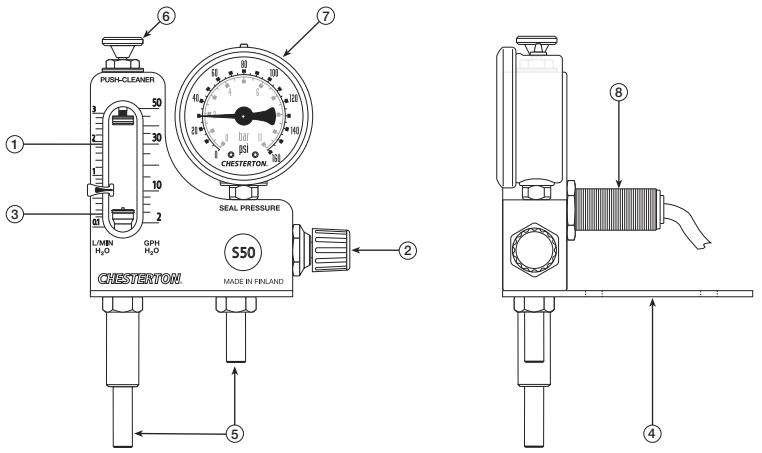
The FLOW GUARDIAN does not require regular maintenance. The FLOW GUARDIAN will remain operational for extended periods. Occasional metering tube cleaning is required using the quick cleaner plunger.

Only factory authorized spare parts should be used in the FLOW GUARDIAN. Do not replace existing parts with third party components (for example, connectors). Factory O-rings should be used for they are critical components to the FLOW GUARDIAN measurement and operation.

Do not leave water in the metering tube during shutdown in cold conditions. Freezing of the water left in the metering tube will break or weaken the tube. Freezing is avoided by purging the meter or fluid and by isolating it from the process.

Do not over-tighten the FLOW GUARDIAN components. Proper sealing on the instrument does not require large tightening torque. If a leak develops, replace the O-ring seal (when necessary) rather than tightening the connections more. The recommended tightening torque is 7-10 Nm (5.16-7.37 ft lbs) for all threaded connections.

FIGURE 1 - PARTS LIST - S50



KEY

1 – Single Flow Meter Tube
2 – Flow Control Valve
3 – Float
4 – Mounting Bracket
5 – 3/8" Compression Fittings (shown) or Hose Barb Fittings
6 – Quick Clean Plunger
7 – Pressure Gauge
8 – Optional Low Flow Sensor

FIGURE 2 - DIMENSIONAL REFERENCE - S50

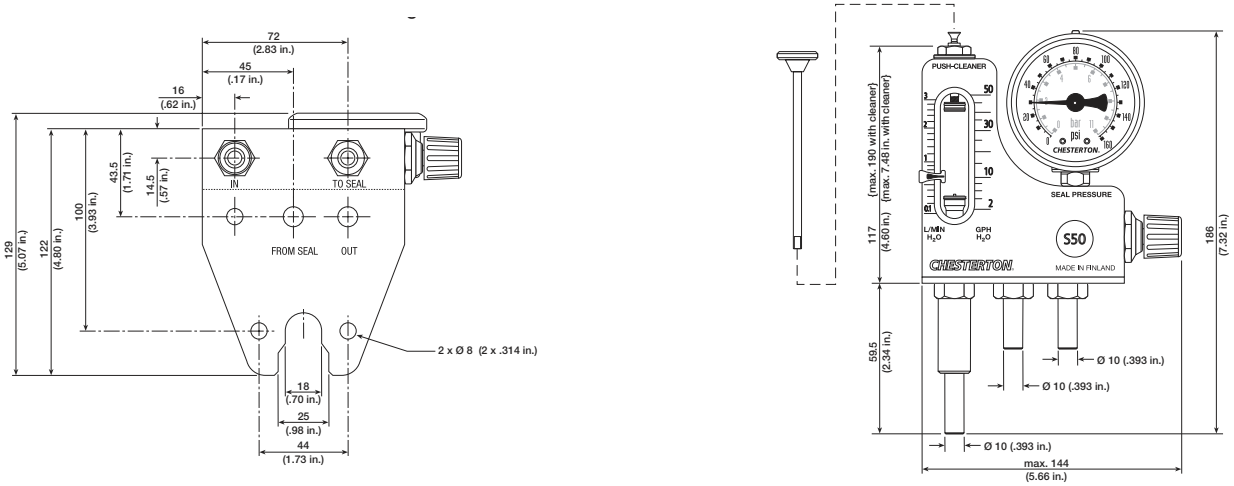
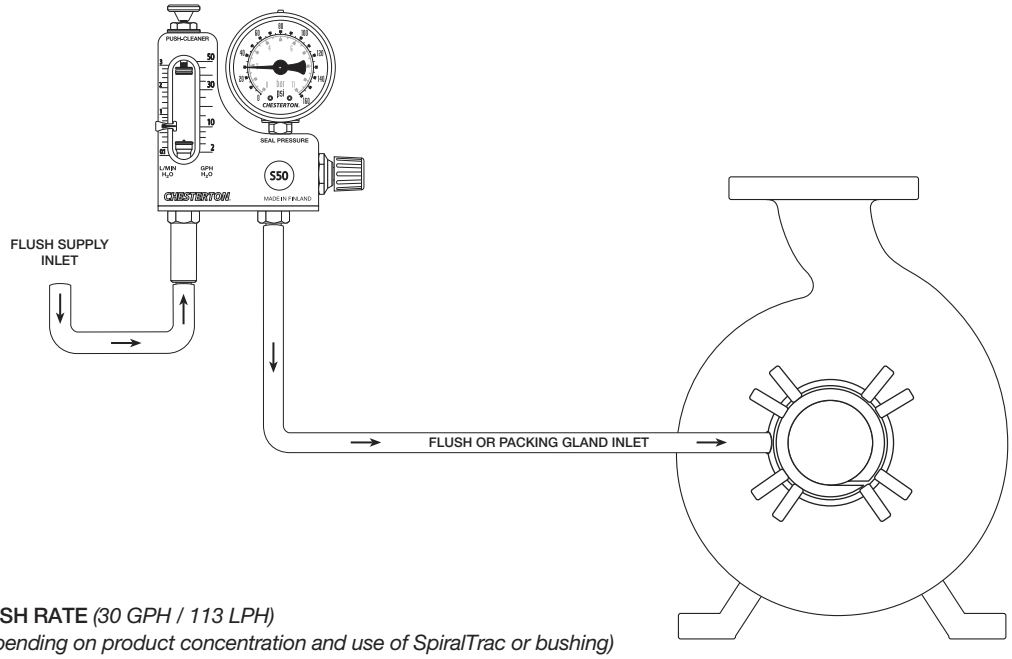


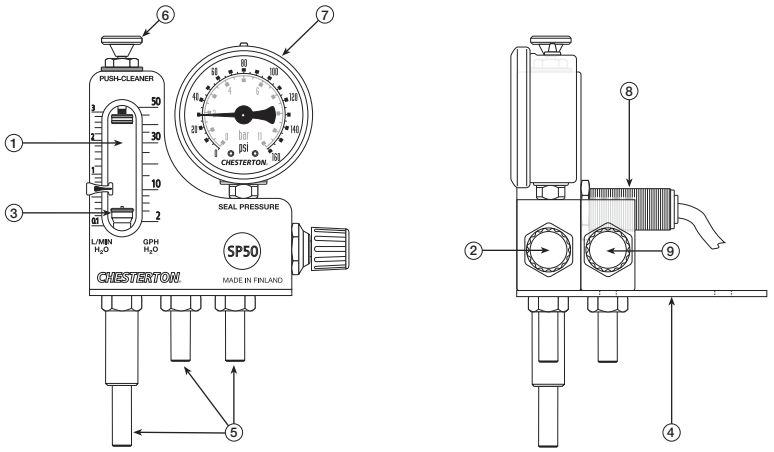
FIGURE 3 - TYPICAL INSTALLATION - S50 in a Single Mechanical Seal Application for control of fluid flush



INSTALLATION NOTES:

1. RECOMMENDED FLUSH RATE *(30 GPH / 113 LPH)*
   (Flush rate can vary depending on product concentration and use of SpiralTrac or bushing)
2. FLUSH PRESSURE TO BE HIGHER THAN STUFFING BOX PRESSURE *(15 psi / 1 bar)*

FIGURE 4 - PARTS LIST - SP50



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8 – Optional Low Flow Sensor
9 – Pressure Control Valve

FIGURE 5 - DIMENSIONAL REFERENCE - SP50

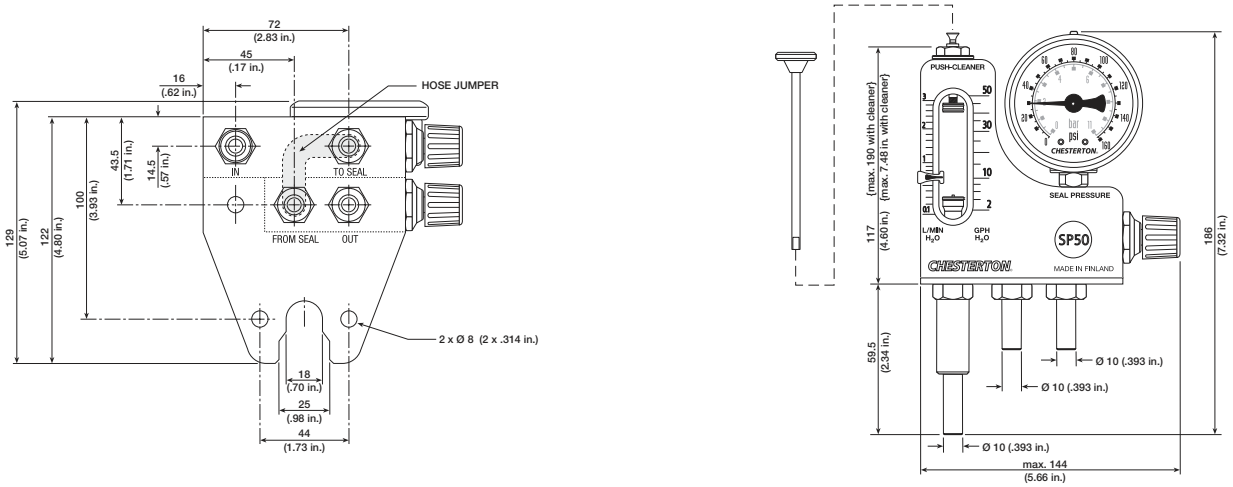
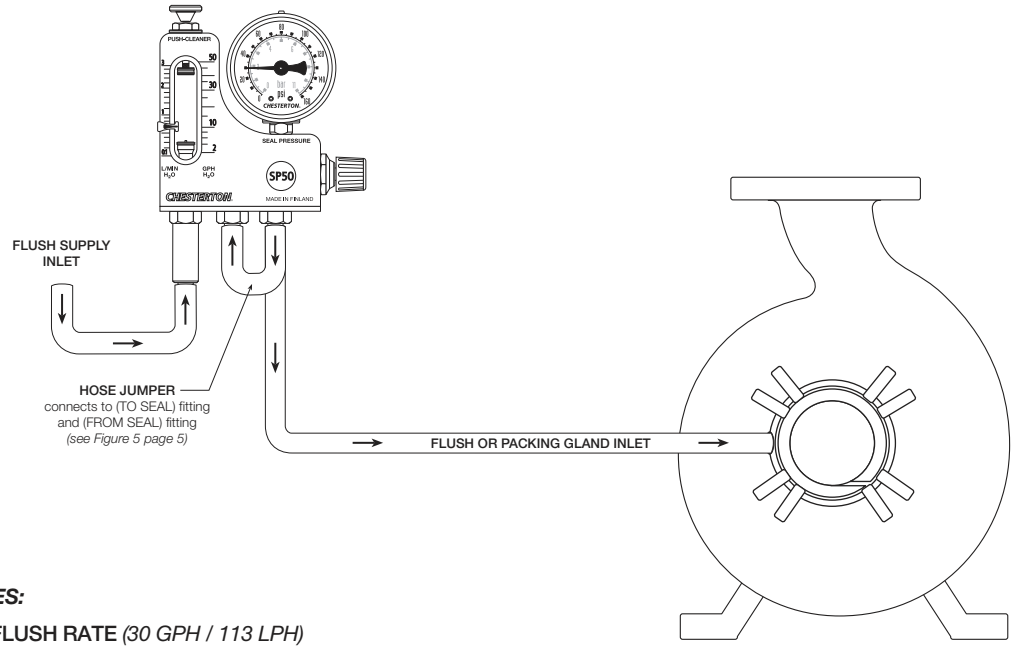


FIGURE 6 - TYPICAL INSTALLATION - SP50 in a Single Mechanical Seal Application for control of fluid flush



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