

# CHESTERTON FLOW GUARDIAN™ DP50 DUAL FLOWMETER INSTALLATION INSTRUCTIONS

## GENERAL

The function of the FLOW GUARDIAN Dual DP50 (Item # 199803 compression fitting, 199806 barb fitting) is to accurately control the flow rate and pressure of the seal barrier fluid. The unit consists of two

variable area flowmeters, one for the measurement of the barrier fluid liquid supply into the mechanical seal, and another one measuring the return (discharge) flow from the same seal.

The unit is furnished with a pressure gauge to indicate barrier fluid return discharge pressure.

## SPECIFICATIONS

### Flow Rate

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

### Pressure Regulating Valve (DP50)

A pressure-regulating valve is provided to set the barrier fluid pressure for the mechanical seal or packing. The pressure regulating control knob is located on the right hand side of the Flowmeter.

(Please view Figure 1 page 4 for pressure regulating control knob location)

### Pressure Gauge

The pressure gauge furnished on the FLOW GUARDIAN DP50 Flowmeters is constructed of 316 SS, oil filled, with 0 – 145 PSIG and 0 – 10 bar g compound markings.

### Material of Construction

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

## INSTALLATION PROCEDURE

Typical installation illustrations of the CHESTERTON FLOW GUARDIAN™ DP50 Dual Flowmeter are represented on page 4 of these instructions. The DP50 is utilized for double 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 on page 4 for mounting plate dimensions.)

### Hose Connections for FLOW GUARDIAN DP50

#### 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.

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

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

1. **IN**  
Barrier fluid feed inlet
2. **TO SEAL**  
Barrier fluid feed to seal
3. **FROM SEAL**  
Barrier fluid from seal to pressurizing valve
4. **OUT**  
Barrier fluid outlet to effluent channel or re-circulation.

### Optional Flow Sensor Installation and Adjustment

#### NOTE:

Sensor range (0,5 –1,25 Liters/min)

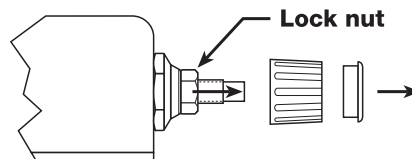
Install the sensor in the slot behind the indicating tube that is located in the back of the FLOW GUARDIAN. Two slots are available for low flow sensors, one for flow of barrier fluid liquid supply and another for barrier fluid return.

(See Figure 1 on page 4)

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 sensor Adjustment) for improved accuracy of alarm.

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 DP50 with pressurizing valve)

When you use a FLOW GUARDIAN DP50 unit, you must adjust both the flow rate and pressure as follows:

1. Thread the quick cleaning plunger rods 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 # 199811)
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

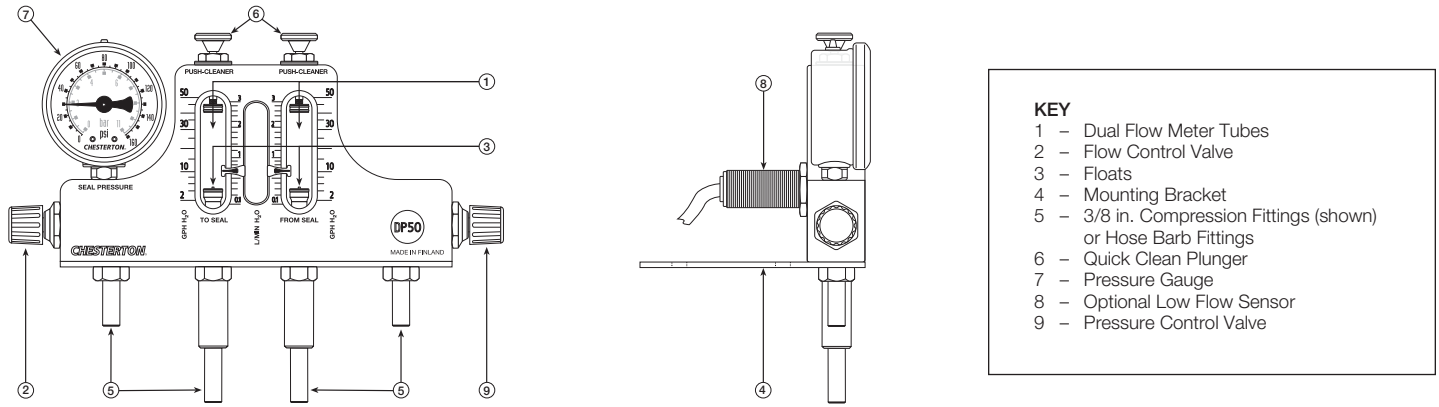
**The FLOW GUARDIAN does not require regular maintenance.** The FLOW GUARDIAN will remain operational for extended periods. Occasional metering tube cleaning is required using the quick cleaner plunger.

**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.

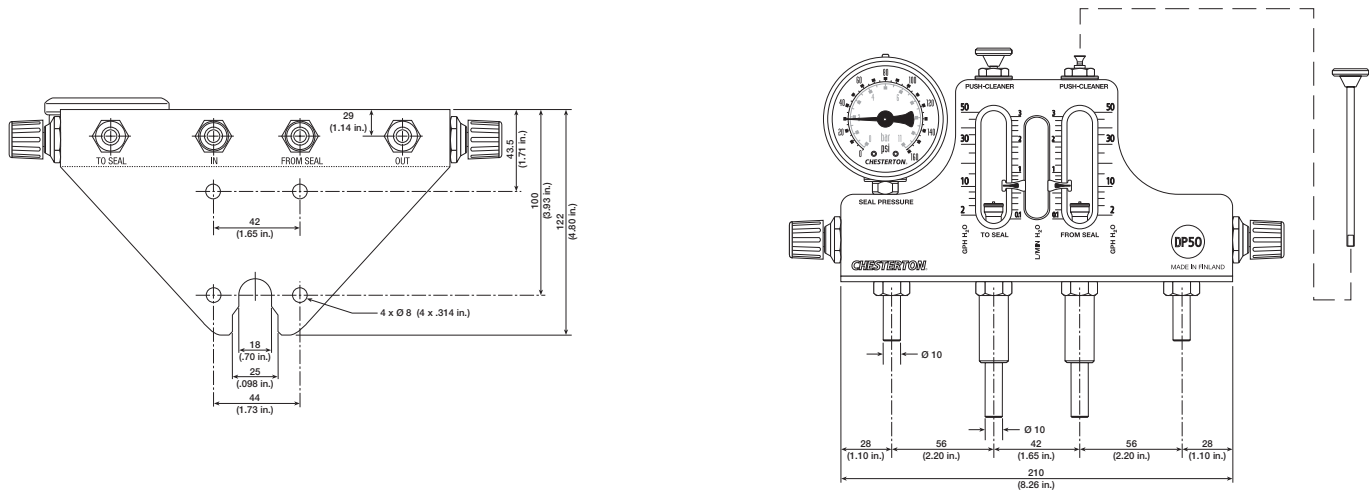
**Do not leave water in the metering tube during shutdown in cold conditions.** Freezing of the water left in the metering tube will break or weaken the tube. Freezing is avoided by purging the meter or fluid and by isolating it from the process.

**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 ftlbs) for all threaded connections.

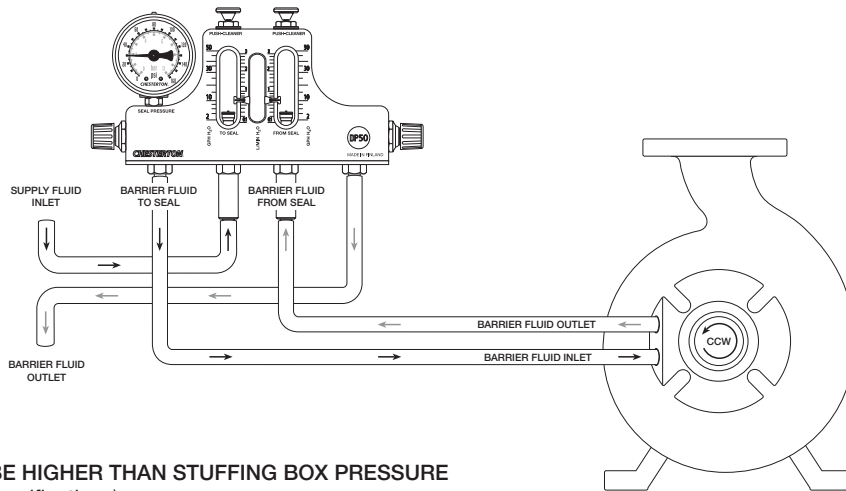
**FIGURE 1 - PARTS LIST**



**FIGURE 2 - DIMENSIONAL REFERENCE**



**FIGURE 3 - TYPICAL INSTALLATION in a Double Mechanical Seal Application**



**INSTALLATION NOTES:**  
**BARRIER PRESSURE TO BE HIGHER THAN STUFFING BOX PRESSURE**  
*(Consult Mechanical Seal Specifications)*



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