



# Installation Instructions

## Seal Gard™

Flowmeter

- Unitized construction
- Plug resistant float design
- Tamper resistant valve design
- Options available: Alarm, constant flow regulator, hoses, clamps, quick-connects, and wall, pipe stand, or pump flange mounting brackets
- Pressure gauge standard
- Check valve standard
- 0-20 gph or 0-40 gph standard

UKD00SG2020, **Seal Gard II**, 0-20 gph  
UKD00SG2040, **Seal Gard II**, 0-40 gph

UKD00SG1020, **Seal Gard I**, 0-20 gph  
UKD00SG1040, **Seal Gard I**, 0-40 gph



## Description

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The *Seal Gard* is engineered to regulate and monitor the flow of flush water, or other sealing fluids, to a seal chamber containing a single, double, or tandem Flowserve seal, or to protect compression packing. The *Seal Gard I* is equipped with a single flowmeter and one flow control valve to supply a flush to a single Flowserve seal, Plan 32 or to a lantern ring of a packed stuffing box. The *Seal Gard II* is equipped with dual flowmeters and two flow control valves. The two flowmeters are unitized and used to control and monitor both the inlet and outlet of a double seal barrier fluid system, Plan 54 or to and from lantern ring taps of a stuffing box with a "balanced" flush of compression packing. For a double seal, the barrier fluid is maintained at a pressure higher than that of the product. The *Seal Gard II* can also be used to monitor the buffer fluid between the inner and outer seal of a tandem Flowserve seal, Plan 52. Here the pressure between the seals is maintained at a pressure lower than that of the product acting on the inner seal.

### Tools needed for installation:

- Wrenches, piping, and fittings for 1/4 inch NPT.
- Screwdriver to set flow control valves.

## 1 *Seal Gard I* Installation (See Figure 1)

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### 1.1 Mount the *Seal Gard* body in a vertical position to a:

- **Control panel**, the *Seal Gard* is supplied with taps for panel mount.
- **Wall**, an optional wall mounting plate is available.
- **Pipe stand**, an optional pipe stand mounting plate is available.
- **Pump flange**, an optional pump flange mounting plate is available.

### 1.2 Locate the *Seal Gard* in a convenient location:

- In **easy view**. It may be best to locate the *Seal Gard* in easy view of the operator and run the necessary tubing / piping.
- **Accessible** for cleaning.
- **In an area free of vibration**, traffic, or other conditions or equipment that could damage the *Seal Gard*.

### 1.3 Provide a supply of flush liquid (usually water) to the *Seal Gard*.

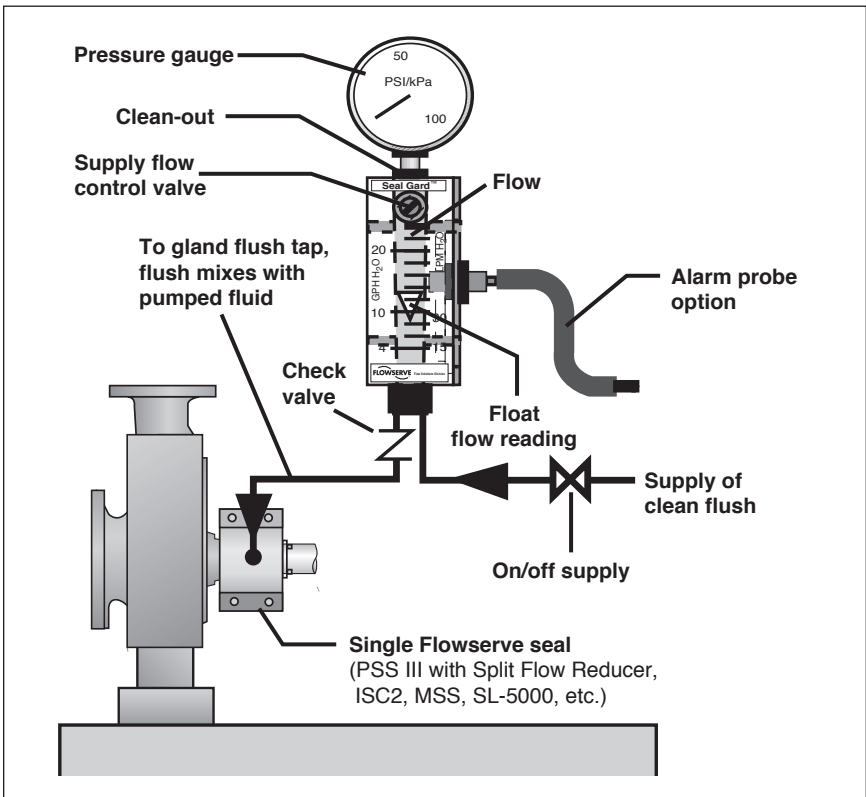
Supply must be:

- **reliable, clean, and compatible** with acrylic (no steam, alcohol, etc.).
- **constant pressure at least 1 bar (15 psi) above that of the product being sealed and below 7 bar (100 psi)**. The pressure upstream of the unit may have to be controlled by a pressure regulator if the supply pressure is variable. Options of a constant flow regulator and gauges with higher pressure ratings are available from Flowserve.
- **Install a valve in the supply line** (normally full open) to be closed while cleaning or repairing the *Seal Gard*.
- A **bypass may be installed** from the supply line to the line to the seal to maintain a flush to the seal during cleaning of the *Seal Gard*.

- 1.4 Remove the plastic pipe plugs from the *Seal Gard* and **pipe the seal flush liquid to the SUPPLY female 1/4 inch NPT fitting** on the bottom front of the *Seal Gard*.
  - **use caution, do not strip the threads** in the acrylic body of the *Seal Gard*.
- 1.5 **Pipe the seal flush liquid from the female 1/4 inch NPT fitting of the check valve fitted to the TO SEAL tap** on the bottom back of the *Seal Gard* to the flush tap of the Flowserve seal gland. (In the case of packing, pipe to the lantern ring tap of the stuffing box housing)

### Seal Gard I

Figure 1



## 2 Seal Gard II Installation (See Figure 2)

2.1 Follow steps 1.1 through 1.4 above.

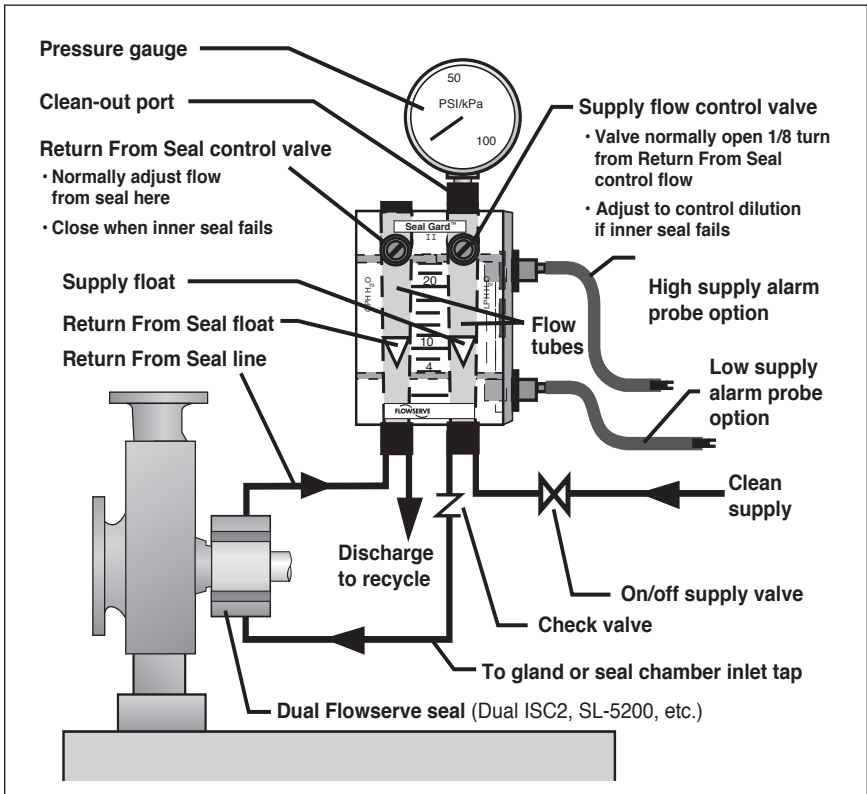
2.2 Pipe the seal flush liquid from the female 1/4 inch NPT fitting of the check valve fitted to the TO SEAL tap on the bottom back of the Seal Gard to the flush tap of the seal chamber. (In the case of packing, pipe to the bottom lantern ring tap of the stuffing box housing).

2.3 Pipe the seal flush liquid from the top flush tap of the seal gland to the female 1/4 inch NPT fitting on the Seal Gard marked FROM SEAL tap on the bottom front of the Seal Gard. (In the case of packing, pipe from the top lantern ring tap of the stuffing box housing).

2.4 Pipe the seal flush liquid from the female 1/4 inch NPT fitting marked DISCHARGE on the bottom back of the Seal Gard to a seal water recovery system.

Seal Gard II

Figure 2



### 3 Operation

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Following these recommendations will ensure maximum MTBPM of the Flowserve seal being protected by the *Seal Gard*.

- 3.1 A clean source of seal water, or compatible sealing fluid, must be supplied to the *Seal Gard* at a constant pressure at least 103 kPa (15 psi) above the product pressure acting on the seal chamber or stuffing box. The *Seal Gard* is constructed of 316 SS and acrylic resin. The acrylic is not compatible with alcohol or steam. It will resist corrosion by most chemicals. However, do not expose *Seal Gard* to steam, alcohol, or other materials that will attack acrylic resins. The *Seal Gard* body will turn white and it will be impossible to see the float to set the flow rate.

#### 3.2 *Seal Gard I* for a Single Flowserve seal

Clean External Flush, Plan 32  
(also for Packed Stuffing Box)

**Type of Installation**                      Single Flowserve seal or flush to lantern ring

#### **Flush Plan 32**

<b>Part Codes</b>	UKDOOSG1020	0 to 20 gph
	UKDOOSG1040	0 to 40 gph

#### **Operation** (See Figure 1)

- Open flush supply valve
- Open control valve
- Start up equipment
- Set control valve flow rate adequate to remove seal generated heat and to prevent product contamination of the seal while limiting product dilution
- Set optional low flow alarm
- Record flow and pressure on the operators log

This arrangement can also be used to quench the outboard side of a single Flowserve seal, Plan 62; supply buffer fluid between the inner and outer seals of a tandem Flowserve seal, Plan 52; or supply seal water to the lantern ring tap of a packed stuffing box.

### 3.3 Seal Gard II for a Double Flowserve seal

Circulation of Clean External Flush, Plan 54  
(also for a Tandem Flowserve seal or a Packed "Balanced" Stuffing Box)

**Type of Installation** Double Flowserve seal or flush to and from lantern ring taps

#### Flush Plan 54

<b>Part Code</b>	UKDOOSG2020	0 to 20 gph
	UKDOOSG2040	0 to 40 gph

#### Operation (See Figure 2)

- Open flush supply valve or flush to and from
- Open supply control valve and close return-from-seal control valve
- Start up equipment
- Set return-from-seal valve to flow needed to remove seal generated heat
- Gradually close supply control valve until flow in return-from-seal drops slightly, then open supply control valve 1/8 turn
- For packing, balance the flows of the two meters to minimize product dilution and product loss
- Record supply flow, return-from-seal flow, and pressure on operators log. Flows will not match exactly,  $\pm 10\%$ , due to system pressure drop,
- Set optional low flow alarm
- Set optional high flow alarm

Note: With double or tandem seals, any outer seal leakage can be observed and reported. The condition of the inner seal in a double seal can be checked by closing the outlet valve. If the supply flowmeter shows no flow, the inner seal is intact. If the supply flowmeter shows a flow, the inner seal is leaking and repairs should be scheduled. As a temporary measure, leave the return-from seal valve closed and set the supply valve to minimize the flow of barrier water into the product.

This arrangement can also be used to supply the buffer fluid between the inner and outer seals of a tandem Flowserve seal, Plan 52. Here, the buffer fluid is maintained at a pressure below that of the product acting on the inner seal and is often atmospheric. Set the desired flow rate to remove seal generated heat by adjusting the supply control valve. Set the return-from-seal control valve to maintain the desired pressure between the inner and outer tandem seals. When the inner seal of a tandem seal fails, the flow from the seal assembly will be higher than the flush supply to the seal and the pressure gauge will show product pressure.

The optional alarm features can also be set to respond to a high or low flow or both high and low flows as needed. Two alarm probes are required to respond to both high and low flows. With this arrangement, the low flow alarm indicates inadequate flow to the seal. The high flow alarm indicates that the inner seal is leaking seal barrier or buffer fluid into the product. Close the *Seal Gard* return-from-seal valve and reset the supply control valve to minimize product dilution until the seal can be scheduled for repair.

## 4. Cleaning and Repairs

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### 4.1 To clean the *Seal Gard*:

- **shut down the pump** or provide a bypass flush system to the Flowserve seal.
- **close the valve** from the flush fluid supply line to *Seal Gard*.
- **relieve any pressure** on the *Seal Gard*.
- **remove the threaded cap(s)** from the top of the flow tube(s).
- **clean the flow tube(s)** using soap and water. (Steam and alcohol will turn the acrylic resin white and make the meter unreadable).
- **re-install the threaded cap(s)** making sure that the float(s) is in position.
- **open inlet valve** to renew flow to the seal
- **adjust flow control valves** as indicated in steps 3.2 or 3.3.

### 4.2 To repair the *Seal Gard*:

- **shut down the pump** or provide a bypass flush system to the Flowserve seal.
- **close the valve** from the flush fluid supply line to *Seal Gard*.
- **relieve any pressure** on the *Seal Gard*.
- **disconnect pipe connections and remove** the *Seal Gard* from its mounting.
- **remove the threaded cap(s)** from the top of the flow tube(s).
- **clean the flow tube(s)** using soap and water. (Steam and alcohol will turn the acrylic resin white and make the meter unreadable).
- **replace** the float(s), valve(s), and O-rings (repair kit available).
- **re-install *Seal Gard*** to its mounting and reconnect piping.
- **re-install the threaded cap(s)** making sure that the float(s) is in position.
- **open inlet valve** to renew flow to the seal
- **adjust flow control valves** as indicated in steps 3.2 or 3.3.

A *Seal Gard* can normally be reconditioned. Return the *Seal Gard* to Flowserve Corporation with an order marked "Repair or Replace." It will be inspected and, if repairable, it will be rebuilt, tested, and returned in its original condition.

## Use of the *Seal Gard* to troubleshoot sealing system problems

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Type of Installation	Observation	Cause	Suggested Action
<b>Flowserve seal</b>			
<b><i>Seal Gard I</i></b>			
Single	<ul style="list-style-type: none"> <li>• no flow in tube</li> <li>• low flow alarm</li> </ul>	<ul style="list-style-type: none"> <li>• seal fluid flow interrupted</li> <li>• pressure reversal</li> </ul>	<ul style="list-style-type: none"> <li>• check supply pressure</li> <li>• clean control valve</li> <li>• correct back pressure problem</li> </ul>
<b><i>Seal Gard II</i></b>			
Double	<ul style="list-style-type: none"> <li>• no flow in tube</li> <li>• low flow alarm</li> <li>• low pressure</li> <li>• high pressure</li> <li>• high flow alarm</li> <li>• low pressure</li> </ul>	<ul style="list-style-type: none"> <li>• seal fluid flow interrupted</li> <li>• pressure reversal</li> <li>• inner seal failure</li> </ul>	<ul style="list-style-type: none"> <li>• check supply pressure</li> <li>• clean control valves</li> <li>• correct back pressure problem</li> <li>• close return-from-seal control valve</li> <li>• adjust supply control valve to acceptable dilution &amp; schedule seal repair</li> </ul>
<b><i>Seal Gard II</i></b>			
Tandem	<ul style="list-style-type: none"> <li>• no flow in tube</li> <li>• low flow alarm</li> <li>• high pressure</li> <li>• product in outlet</li> </ul>	<ul style="list-style-type: none"> <li>• seal fluid flow interrupted</li> <li>• primary (inner) seal failure</li> </ul>	<ul style="list-style-type: none"> <li>• check flush source</li> <li>• close supply control valve</li> <li>• adjust return-from-seal valve to acceptable loss level</li> <li>• route discharge to approved disposal</li> <li>• schedule seal repair</li> </ul>



Type of Installation	Observation	Cause	Suggested Action
<b>Compression Packing Stuffing Box</b>			
<b><i>Seal Gard I</i></b>			
Normal flush of seal fluid to lantern ring, some drippage of flush to atmosphere, most of flush into product	<ul style="list-style-type: none"> <li>• no flow in tube</li> <li>• low flow alarm</li> <li>• some drippage</li> <li>• some dilution</li> <li>• excess drippage</li> <li>• excess dilution</li> </ul>	<ul style="list-style-type: none"> <li>• flush flow interrupted</li> <li>• normal</li> <li>• normal</li> <li>• flange out of adjustment</li> <li>• packing worn</li> </ul>	<ul style="list-style-type: none"> <li>• check flush source</li> <li>• clean control valve</li> <li>• none</li> <li>• none</li> <li>• adjust follower flange</li> <li>• replace packing</li> </ul>
<b><i>Seal Gard II</i></b>			
"Balanced" stuffing box with flow to and from lantern ring under pressure, with some drippage to atmosphere, minimum dilution of product, and most of flush returned to <i>Seal Gard</i>	<ul style="list-style-type: none"> <li>• no flow in tube</li> <li>• low flow alarm</li> <li>• excess drippage</li> <li>• excess dilution</li> <li>• drippage or dilution cannot be controlled</li> <li>• product in discharge</li> </ul>	<ul style="list-style-type: none"> <li>• flush flow interrupted</li> <li>• flange out of adjustment</li> <li>• packing worn</li> <li>• packing worn or misapplied</li> <li>• pressure fluctuations</li> </ul>	<ul style="list-style-type: none"> <li>• check flush source</li> <li>• clean control valves</li> <li>• adjust follower flange</li> <li>• replace packing</li> <li>• replace packing</li> <li>• change packing style</li> <li>• modify box arrangement</li> <li>• adjust flow control valves</li> </ul>

## **Seal Gard I and II Specifications:**

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Flow tube	Acrylic
Metal parts	316 SS
Fittings	316 SS
O-rings	Fluoroelastomer
Operating temperature:	max. 66°C (150°F) min. 0°C (32°F)
Connections	1/4 inch female NPT unless otherwise specified
Accuracy	± 10%
Repeatability	± 1%
Valve assembly	special, plug-resistant design
Flow range	0 to 1.3 lpm (0 to 20 gph) or 0 to 2.6 lpm (0 to 40 gph) other non-Seal Gard meters available for higher flows
Pressure rating	21 bar (300 psig) max.
Pressure gauge	standard 2 1/2" liquid filled 316 SS Dual Scale 0 to 7 bar (100 psi) other meters and gauges available for higher pressures
Check valve	standard, 316 SS
Tubing option	<b>OPTION IA and IIA</b> barb fittings, rubber tubing  <b>OPTION IB and IIB</b> above plus quick disconnects

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Mounting	Control panel mount standard Wall plate, pipe stand, and pump flange mountings optional
Temperature gauge	2½" dry gauge 316 SS 0 to 121°C (250°F)
Level alarm	AC or DC Proximity Sensor specify NO (normally open) or NC (normally closed) Cable length, 6.5 feet standard
Constant Flow Regulator	316 SS, 21 bar (300 psig) 0 to 2.6 lpm (0 to 40 gph)

For any special problems encountered during installation, contact your nearest Flowserve Representative.



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