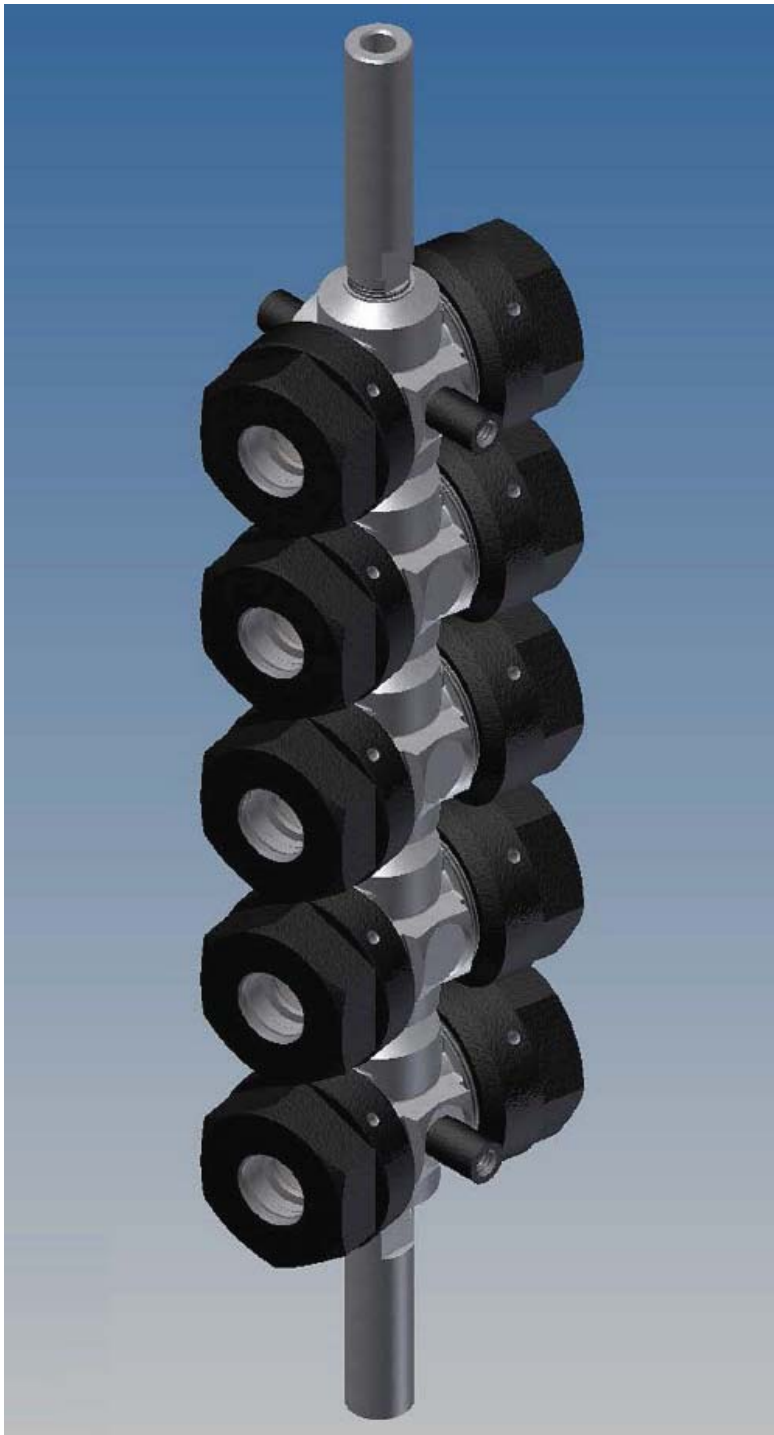


Simpliport 4000 Bi-color Gage Glass

Installation, Operation, and Maintenance Instructions



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NOTE: Industrial Power Boilers are one of the harshest environments for Level Gage Glasses. Actual service life will vary based on one or more of the following conditions: cycle frequency, temperature fluctuations, water quality, and other factors. Depending upon these factors, the average service life is from 6-18 months. Complete gage rebuilds are suggested on an annual basis for personnel and plant safety. This can reduce the number of maintenance intervals caused by the need to replace individual glass modules.

Boil-out procedure (Form E146A) must be completed prior to start-up

To place Simpliport P4000/P4100 in service:

NOTE: Bench torque all new Simpliport Gages to 100 ft-lbs before installing on the boiler!

1. Shut off water and steam water gage valves.
2. Make proper connection of SIMPLIPORT P4000/P4100 end nipples or flanges to the water gage valves.

Note 1: When end nipples are furnished, make sure that the window packing nuts are angled slightly to the **left** as observed by the viewer.

Note 2: Where expansion loops and flanges are furnished, models with a single expansion loop should be on the top side and the window packing nuts are angled slightly to the **left** as observed by the viewer. Flange bolting should be lubricated with a copper based high temperature anti-seize lubricant, or equal, and torqued to 85 ft-lbs.

3. With Cold Boiler:

- a. Open water and steam gage valves and allow the Simpliport Gage to heat up along with the boiler.
- b. Check each port window for leakage. A small mirror held opposite the leak-detector hole (found on the side of each packing nut) is useful here. If leakage is observed, shut off the water gage valves and replace the module of the affected port as described on page 3 of this manual.
- c. Mounting the Illuminator and Front Hood:
 - i. For Simpliport 180 Illumination refer to IOM #R500.E245A or IOM #R500.256A
 - ii. For Classified Area Illumination refer to IOM #R5400

4. With Hot Boiler:

- a. Open drain valve. Open steam and water valves far enough to allow a small amount of water and steam to pass through the gage for about 5 minutes. This permits a gradual warm-up of the Simpliport Gage Glass
- b. Close the drain valve and finish opening the steam and water valves.
- c. Check each port window for leakage, as in procedure 3b.
- d. Mount illumination as described in 3c.

CAUTIONS:

1. **NEVER APPLY TORQUE TO THE SIMPLIPORT GAGE GLASS UNDER PRESSURE.**
2. **DO NOT HOT TORQUE THE SIMPLIPORT P4000/P4100 GAGE GLASSES**
3. **DO NOT TORQUE THE PACKING NUTS GREATER THAN THE 100 FT-LBS SPECIFIED.**
4. **EXCESSIVE BLOWDOWNS MAY SHORTEN THE GAGE SERVICE LIFE (Refer to IOM R500.E156D).**

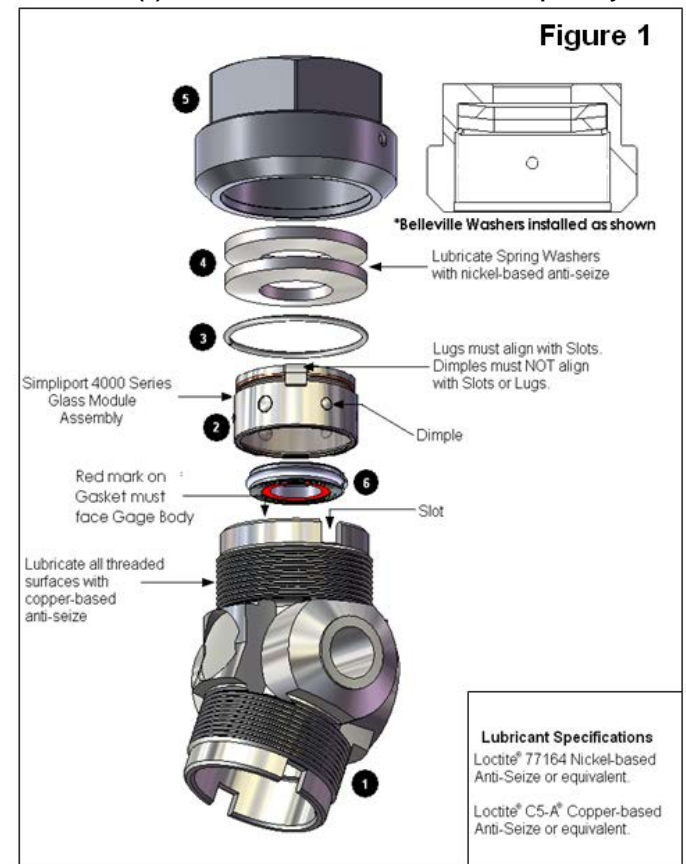
SIMPLIPORT 4000 SERIES COMPONENTS (Figure 1)

1. Simpliport 4000 Series Body Section
2. Glass Module (PW-87)
3. Spring Retainer (PW-40)
4. Spring Washers (PW-66)
5. Packing Nut (PW-65N)
6. Spiral Wound Gasket (PW-90I)

Notes:

1) PW-68N Packing Nut Assembly consists of items 3, 4 (2 req'd.), and 5. Item 5 is not sold separately.

2) Replacement Module Kit PW-87B consists of (1) PW-87 Glass Module and (1) PW-90I Gasket. Items are not sold separately.

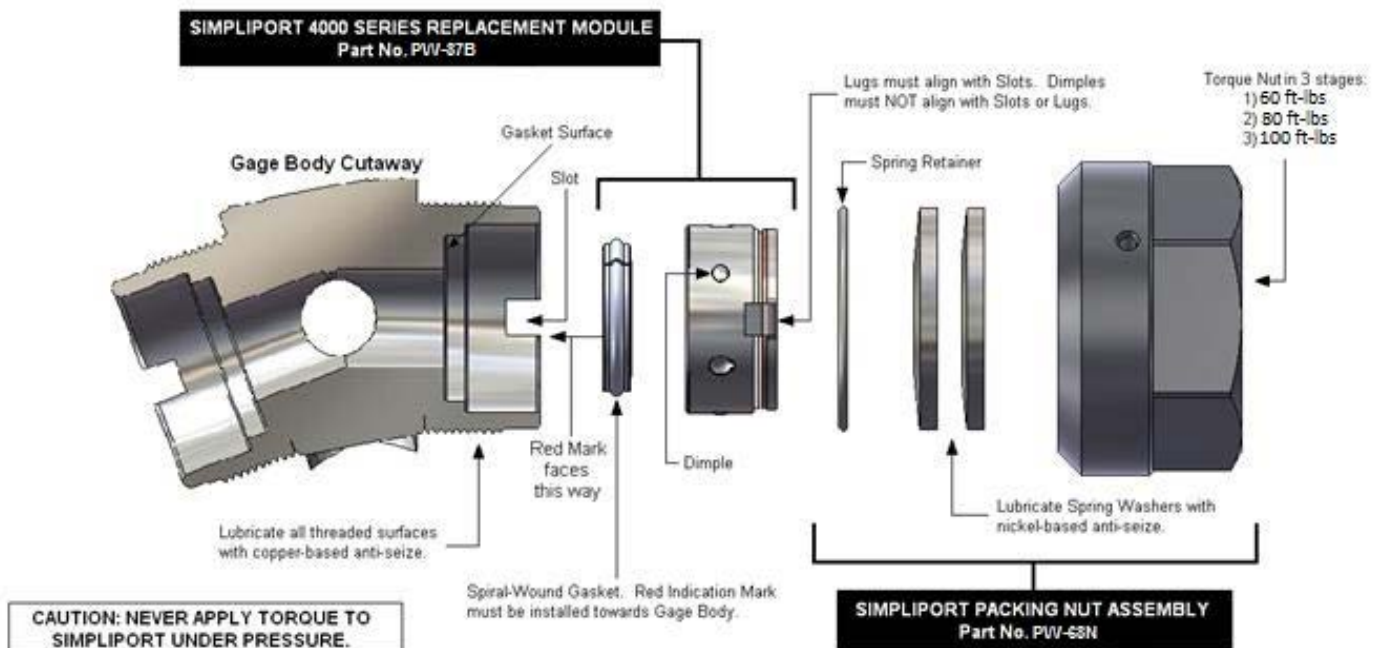


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INSTALLING SIMPLIPORT® 4000 SERIES REPLACEMENT MODULES

Tools Required: Calibrated torque wrench w/ 1 7/8" socket, Special Pliers (PW-35), PW-36 Lubricant
(See Maintenance Video at www.clark-reliance.com/4000video)

1. Shut off steam and water gage valves, then open the drain valve to relieve pressure in the Simpliport Gage Glass.
2. Remove Packing Nut (PW-68N) containing two 0.125" edge thickness Spring Washers – save for re-use.
3. Remove old module using Special Pliers (PW-35) and discard the module and gasket.
4. Wipe recess in gage body with a clean cloth, making sure the gasket surface at the bottom is perfectly clean and smooth. An electric drill with a stainless steel Crimped Wire End brush, 1" diameter, .005/.006 wire diameter bristle (Osborn #30083 or equal) may be used to polish the gasket surface if necessary. Wipe recess again if required.
5. Remove Spring Retainer and Spring Washers from the Packing Nut. Clean and inspect the Spring Washers for cracks or pitting. Damaged Spring Washers must **NOT** be re-used. **IMPORTANT: If replacing the Spring Washers, only use part number PW-66 (.125 thick washers).** Lubricate each washer with Loctite® 77164 Nickel-based Anti-Seize or equivalent, and re-insert into the Packing Nut in the orientation shown above. Insert the Spring Retainer, making sure it seats completely against the Spring Washers.
 - a. Do not sandblast or wire brush the Spring Washer. Clean with solvent only to prevent the removal of the nickel plating.
 - b. Clean the Packing Nut thoroughly with a soft wire brush. If excessive corrosion still exists or threads appear damaged, replace the Packing Nut assembly with a new one (PW-68N). Packing Nuts may be glass-bead cleaned to remove corrosion or dirt from threads.
6. Clean gage body threads with a soft wire brush and inspect for damage. Lubricate gage body threads and Packing nut threads with Loctite® C5-A® Copper-based Anti-Seize (P/N PW-36) or equivalent.
7. Insert the Spiral Wound Gasket into the gasket recess in the gage body. **IMPORTANT** – Make sure the Spiral Wound Gasket is installed with the red indication mark facing towards the gage body. The red indication mark should **NOT** be visible when the Spiral Wound Gasket is installed correctly. NOTE: A small amount of water applied to the red marked side of the gasket will help hold the gasket in place during installation.
8. Install Replacement Module (PW-87). Lugs must align with the slots in the body. Dimples must **NOT** align with slots.
9. Install the Packing Nut Assembly and turn the nut to "finger tight". Tighten the nut in 3 stages, waiting approximately 5 minutes between each stage: 60 ft-lbs first, 80 ft-lbs second and 100 ft-lbs last. Do **NOT** tighten the Packing Nuts completely from "finger tight" to 100 ft-lbs. NOTE after waiting about a minute re-torque nuts to 100 ft-lbs.
10. Close the drain valve. Slowly open the steam and water valves and allow the Simpliport 4000/4100 Gage Glass to reach operating pressure/temperature gradually (approximately 5 minutes) and observe that no leakage is detected.
11. Re-install the illuminator assembly per IOM #R500.E245A, IOM #R500.256A or IOM #R5400. **IMPORTANT: The Illuminator must be installed and in working order to comply with ASME Code, Section I requirements.**



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Notice to Plant Operators

The use of non-Original Equipment Manufacturer parts (such as glass, gaskets, probes, modules, etc.) will void the Agency Approval (FM, UL, CSA, CRN, ABS, etc.), pressure/temperature rating, and warranty of this equipment. Clark-Reliance requires the use of OEM parts for all repairs on this product in order to maintain plant and personnel safety, and reliable operation.

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16633 Foltz Parkway • Strongsville, OH 44149 USA Telephone: +1 (440) 572-1500 • Fax: +1 (440) 238-8828
www.relianceboilertrim.com • sales@clark-reliance.com