

STORAGE, INSTALLATION, OPERATION AND MAINTENANCE MANUAL - J.G. PAPAILIAS CO., INC. SERIES NW-BW, NW-RF & NW-FT 150# CIRCULAR SINGLE WINDOW SIGHT GLASSES

This manual has been prepared as an aid and guide for personnel involved in installation of maintenance. All instruction must be read and understood thoroughly before attempting any installation, operation or maintenance. *Failure to follow any instruction could possibly result in a malfunction of the sight flow indicator or glass breakage with resulting sudden release of pressure causing serious personal injury and/or property damage.*

ALWAYS WEAR SAFETY GLASSES WHEN INSTALLING OR SERVICING OR OPERATING A SIGHT FLOW INDICATOR.

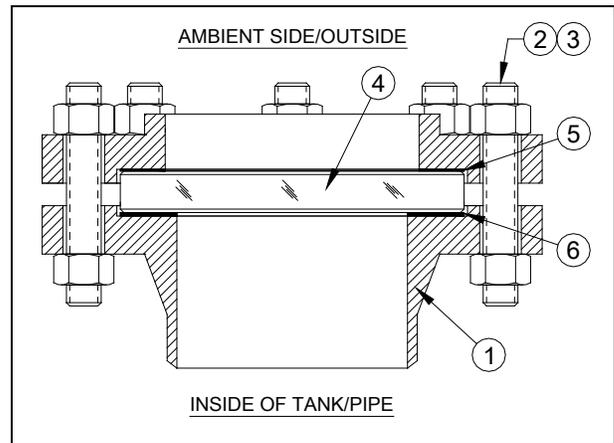
1.0 STORAGE AND HANDLING

J.G. Papailias Co. sight glasses are to be welded into position then assembled. All parts should be inspected for damage upon receipt in case it may be necessary to submit a claim to the carrier. The pieces should be carefully stored where they will be protected from damage, corrosion and the elements while awaiting installation. The lens requires special attention and should not be stored mixed with objects that may damage it. The lens should remain wrapped or boxed until installation.

2.0 INSTALLATION

CAUTION: ASME CODE CALCULATIONS AND ANY RESULTING ADDITIONAL MATERIAL NEEDED TO REINFORCE THE SIGHT GLASS OPENING AS NEEDED TO MEET ASME CODE IS THE RESPONSIBILITY OF THE VESSEL MANUFACTURER AND IS NOT INCLUDED IN THE DESIGN OF THIS SIGHT GLASS.

If welding the Sight glass to a vessel, tank or pipe a metal spacer plate must be installed in place of the lens and gaskets. The plate should be bolted in place securely using the bolt torque values for the particular sight glasses as a minimum. Welding should be done with minimal heat and in a manner to prevent warping. The seating area should be checked for flatness prior to the assembly with the lens. See Section 7.4.



Item	Part Description
1	Lower Flange
2	Studs/Bolt
3	Nut
4	Lens
5	Cushion
6	Seal Gasket

3.0 OPERATION

Sight glasses provide a relatively inexpensive means of visually checking a vessel's contents. Sight glasses neither measure nor control flow, but do add an important human evaluation for checking or double checking systems. Operating guides are not required, but it is imperative that the sightglass be installed properly for which it is rated.

4.0 START-UP

Gaskets frequently assume a compression set over a period of time. Some gasket materials tend to compression-relieve or creep. It is recommended that the sightglass have its fasteners re-torqued to the proper value before start-up.

CAUTION: DO NOT TIGHTEN ANY FASTENERS WHILE SIGHT GLASS IS IN OPERATION.

The value for torque shown in Fig 1 are representative for usual service conditions. Consult the factory if your service conditions are not covered in this chart.

If the sight glass is subjected to heat during operation, the system should be taken to ambient temperature and pressure after a few hours of operation and the fasteners should be re-torqued to proper values in 1 to 3 ft-lb increments.

Check the lens before start-up, to ensure that there are no chips, scratches or blemished. Use a flashlight or other bright, concentrated light to examine the lens carefully. If any type of flaw is apparent start-up should be delayed pending the replacement of lens and gasket. (Sect. 7.0)

5.0 ROUTINE MAINTENANCE

Periodic visual inspection should be made to ensure that no leaks are evident are that there is no clouding, scratching or blemishing of the lens. In new installations, daily inspection is recommended to establish a routine inspection cycle. Keep the lens clean using commercial glass cleaners (including Windex, Glass wax, household detergents, etc.). Cleaning should be done without removing the lens; this may require recirculation of the cleaning material if vessel side of the lens is not accessible. Never use harsh abrasive, wire brushes, metal scrapers, or other things which would scratch the lens.

CAUTION: DO NOT ATTEMPT TO CLEAN THE LENS WHILE THE SIGHTGLASS IS IN OPERATION.

To examine the lens for scratches, shine a very bright concentrated light (powerful flashlight will suffice) at about a 45° angle. Anything which glistens brightly should be closely examined. Any scratches fingernail' any star-shaped or crescent shaped mark which glistens is cause for replacement. If inner surface appears cloudy or roughened and will not respond to cleaning procedures, this is evidence of chemical attack and is cause for immediate replacement.

Once a lens has been removed from its mounting in process equipment, regardless for reason for removal, discard it and substitute a new piece. A used lens is proper for the service. Gaskets must always be replaced.

Should leakage around the lens occur, check the lens. If it is not broken, drop the system pressure to zero, and torque the fasteners to the recommended value. If leakage persists after depressurizing, disassemble according to section 7.0 and replace gaskets.

6.0 SERVICE INSTRUCTIONS

6.1 Preliminary Consideration

a. Confer with the maintenance supervisor or engineer to be sure that the proper lens and gasket are available for the sight glass.

b. A clean area should be available for placing the various component parts after disassembly.

CAUTION: SYSTEM PRESSURE AND TEMPERATURE MUST BE DROPPED TO ZERO BEFORE ATTEMPTING TO SERVICE THE SIGHT GLASS. FURTHERMORE, IT MUST BE ASCERTAINED THAT THE PRESSURE CANNOT BE PUT BACK INTO THE VESSEL, EVEN INADVERTENTLY, WHILE SERVICE IS IN PROGRESS.

7.2 Disassembly

a. The upper flange used on the sightglass is held in place with studs and nuts. They should be removed by turning them in a counter clock-wise direction. On rectangular sight glasses, loosen the end fasteners first working from alternate ends and sides the center.

b. Remove the upper flange, lens and gaskets. All parts should be carefully placed on a clean surface.

7.3 Inspection

The gasket seating surface should be carefully cleaned and checked to ensure that there are no pieces of old gasket material; chips, residue, dirt or other material on the surfaces. Any foreign particles left on the surface could cause high local stresses lens and might cause lens failure.

If the sight glass is being disassembled because of need to replace the lens, an examination of the lens is recommended in order to determine if the service life could be extended though another selection.

Erosion or corrosion of the inner surfaces could indicate chemical or steam attack of the lens by the media in the system. Frequently KEL-F or MICA shields can be used to avoid such attack. Consult the factory for advice.

Cracked lenses may be caused by pressures in excess of the lens rating, high local stresses due to uneven bolt torque or foreign particles on the gasket seating surface, or thermal shock of the lens. Simply putting in a new lens will not alleviate the cause for replacement.

7.4 Reassembly

a. General Instruction

Always reassemble sight glasses using a new lens and gasket. The potential of hidden damage makes a used lens a poor safety risk. Check the new lens to ensure that there are no bumps, chips or scratches or other imperfections, and be certain that the gaskets are clean.

The lens and gaskets should be verified as correct for the application. Generally, a direct replacement of the lens and the gaskets that were in the unit prior to disassembly should be correct. Check with the maintenance supervisor rather than take chances.

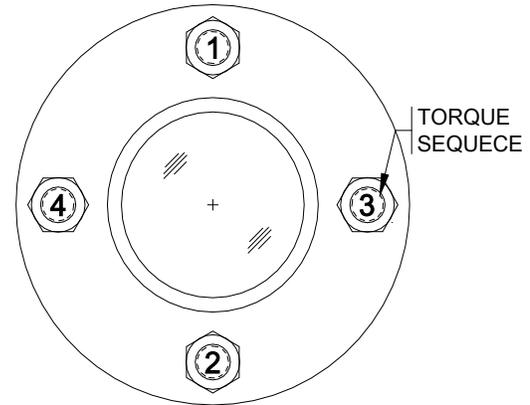
Use only the gaskets specified by the manufacturer the supervising engineer. Ascertain that they are clean and fresh with no bumps or tears.

The sealing gasket, generally the thicker and softer gasket is always placed on the media (pressure) side of the lens in the counter-bore of the lower flange. This forms the seating surface for the lens.

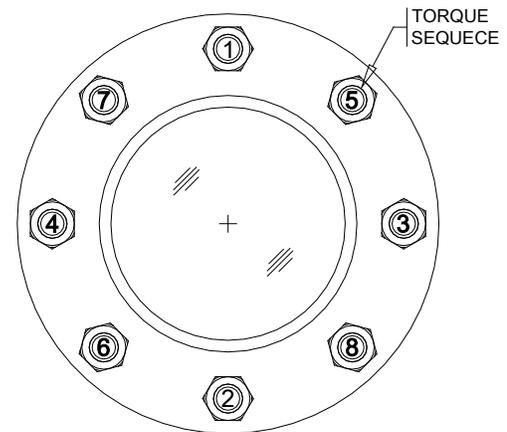
After insuring that all the gasket surfaces on the flanges are clean, assemble the gasket and lens into the seat of the lower flange. Be certain that the gasket is centered and is completely within the counter-bore provided. Care should be exercised in placing the lens in the seat so that the edges cannot be chipped. Place the upper flange and upper gasket over the lens, again being careful that the lens and gasket are completely seated in the counter-bore. Bring the fasteners to finger snug and slide the lens from side to side, or rotate it in its seat, to be certain that everything is seated properly.

Using a torque wrench, tighten the fasteners in regular pattern to avoid uneven loads on the lens. (Typical tightening patterns are shown in figure 2). Torque individual fasteners in small amounts, moving to the next fastener after each increment of torquing individual fasteners in small amounts, moving to the next fastener after each increment of torque. A maximum difference of 3 ft-lbs. Should be maintained on larger sight glasses and less on smaller ones. Continue torquing until the values shown in Figure 1 are attained. On smaller ones. Continue torquing until the values shown in Figure 1 are attained.

FIGURE 2 - BOLT TIGHTENING SEQUENCE



1", 2" & 3 : FOUR [4] BOLT 150# SIGHT GLASSES



4", 5", 6" & 8 EIGHT [8] BOLT - 150# SIGHT GLASSES

Size	# Bolts	EPDM or Neoprene	Expanded PTFE	Grafoil
1" 150#	4	10 Ft -Lbs	15 Ft -Lbs	13 Ft -Lbs
1½" 150#	4	10 Ft -Lbs	15 Ft -Lbs	13 Ft -Lbs
2" 150#	4	10 Ft -Lbs	15 Ft -Lbs	13 Ft -Lbs
3" 150#	4	15 Ft -Lbs	22 Ft -Lbs	20 Ft -Lbs
4" 150#	8	12 Ft -Lbs	18 Ft -Lbs	15 Ft -Lbs
5" 150#	8	18 Ft -Lbs	25 Ft -Lbs	22 Ft -Lbs
6" 150#	8	20 Ft -Lbs	30 Ft -Lbs	26 Ft -Lbs
8" 150#	8	30 Ft -Lbs	40 Ft -Lbs	36 Ft -Lbs