

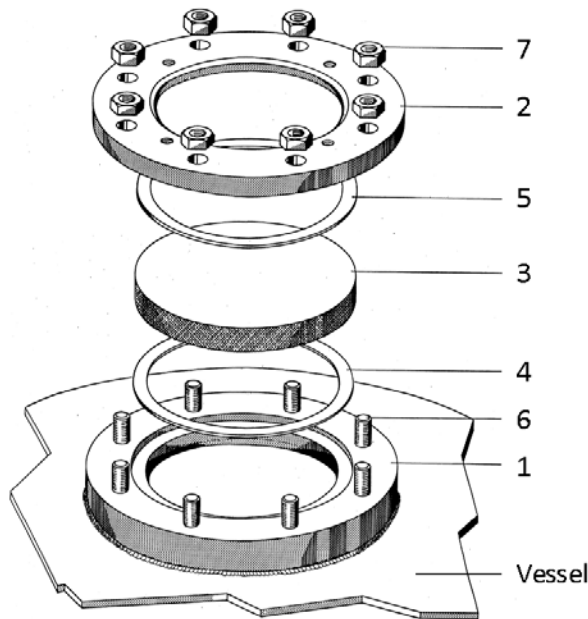
INSTALLATION, OPERATION, MAINTENANCE AND STORAGE MANUAL OF J.G. PAPAILIAS CO., INC. SERIES NW SINGLE WINDOW SIGHT GLASSES

1.0 STORAGE AND HANDLING

PAPAILIAS, Inc. sight glasses are to be welded into position prior to assembly. All parts must be inspected for damage upon receipt so if necessary a claim can be submitted the carrier. All parts must be careful stored and 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

Before welding Sight glasses 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 glass as a minimum. Welding should be done using minimal heat taking care 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	Weld Pad Flange
2	Lens Retainer/Upper Flange
3	Lens
4	Seal Gasket
5	Cushion
6,7	Studs & Nuts

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.

3.0 OPERATION

Sight glasses provide an easy means of visually checking a vessels contents. Sight glasses do not measure nor control flow, but add a important human evaluation for checking or double checking systems. Operating guides are not required, but the sight glass must be installed properly and in a system 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-torque 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 figure 2 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 in the unit 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 flaw is found start-up must be delayed pending the replacement of lens and gasket. (See Section 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 certain 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/AMBIENT 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.

6.2 Disassembly

a. The upper flange used on the sight glass 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.

6.3 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 through 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. Consultation with the factory may greatly extend the life and reliability of the sight glass.

7.4 Reassembly

a. 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.

b. 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.

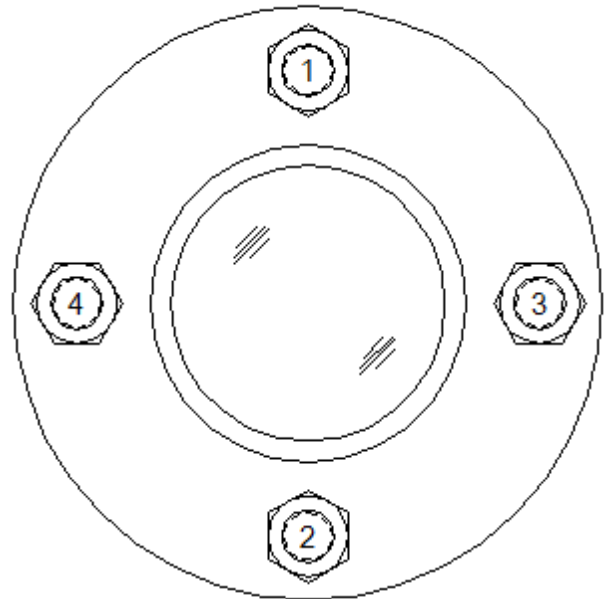
Using a torque wrench, tighten the fasteners in regular pattern to avoid uneven loads on the lens. (Typical tightening patterns are shown in figure 1). Torque individual fasteners in small amounts, moving to the next fastener after each increment of torque. A maximum difference of 3 ft-lbs. Should be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

Table 1 - Torque values (Ft-Lbs)

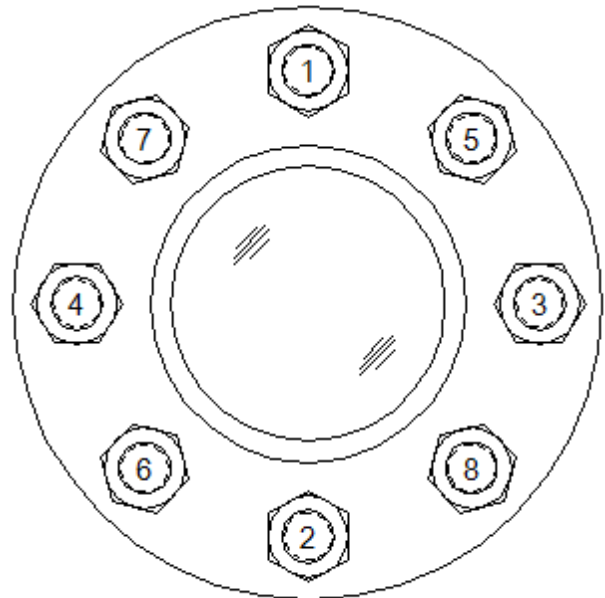
PAPAILIAS, Inc. Series NW Weld Pad Style Sight Glasses

Size	Rating	# Studs	EPDM Neoprene Silicone Fluoroelastomer	ePTFE Fiber	Graphite
NW50	150PSI	4	15	19	16
NW80	150PSI	4	20	29	26
NW100	150PSI	8	14	20	17
NW125	150PSI	8	22	30	27
NW150	150PSI	8	24	31	29
NW200	125PSI	8	37	47	43

FIGURE 1 - BOLT TIGHTENING SEQUENCE



**FOUR [4] BOLT SEQUENCE
[NW50 & NW80]**



**EIGHT [8] BOLT SEQUENCE
[NW100, NW125, NW150 & NW200]**