

Installation, Operation, Maintenance & Storage Manual for J.G. Papailias Co. Series LIF & LIS Full View Cylindrical Sight Flow Indicators.

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 INTRODUCTION

Sight Flow Indicators are simple devices for the observation of a pipeline's contents and/or the flow through a pipe. Sight Flow Indicators can be expected to perform reliably if they are properly specified, free of any shock loadings caused by rapid temperature changes or mechanical impacting and lastly, by using good workmanship in the installation and maintenance of the Sight Flow Indicator.

All personnel involved in the installation and maintenance of a Sight Flow Indicator should read and understand all instructions in this manual before attempting installation or maintenance. Personnel should also be familiar with any drawings depicting the Sight Flow Indicator and have the drawings, if available, on hand during installation or maintenance.

2.0 INSPECTION

2.1 RECEIVING INSPECTION

J.G. Papailias Company, Inc., Sight Flow Indicators meet or exceed all applicable specifications and standards when they are shipped from the factory. Sight Flow Indicators should be inspected carefully for shipping damage. If damage is evident, do not attempt installation and notify the carrier immediately. If damage is only suspected consult factory before attempting installation.

2.2 SOFTWARE INSPECTION

J.G. Papailias Company, Inc., Sight Flow Indicators are supplied with all documentation as required by applicable specifications and standards. Supplemental documentation, such as reports of special testing, is also supplied as required by the customer's purchase order. All documents should be reviewed by the appropriate quality assurance and/or engineering personnel. All Sight Flow Indicators components containing heat or serial numbers should be matched to applicable documents before installation.

3.0 STORAGE

Sight Flow Indicators should be carefully stored after inspection. They should be stored in such a manner as to be protected from adjacent equipment, the weather, dust, dirt, and any corrosive atmospheres. The lens or cylinder requires extra attention due to the fact that it is easily damaged. It is best to leave all Sight Flow Indicators in the original packaging while awaiting installation.

4.0 HANDLING

Personnel handling Sight Flow Indicators should have clean hands, free of dust, dirt, and grease. Sight Flow Indicators should only be placed on clean surfaces, preferably covered with clean cloth or clean paper.

5.0 INSTALLATION

Installation should only be done by qualified personnel who are familiar with Sight Flow Indicators and have read and understand all instructions in this manual and are also familiar with any available drawings depicting the Sight Flow Indicator. Before starting installation of the Sight Flow Indicator the cylinder should be examined for scratches, chips and other imperfections. Use a flashlight or other bright concentrated light to examine the cylinder carefully. If any flaw is found or suspected, installation should be delayed pending the replacement of the cylinder and gaskets. (Section 8.0)

WARNING: LENSES AND CYLINDERS THAT HAVE SCRATCHES OR OTHER IMPERFECTIONS ARE WEAKENED AND SHOULD NOT BE USED UNDER ANY CIRCUMSTANCE.

Gaskets frequently assume a compression-set over a period of time; therefore it is recommended that the Sight Flow Indicator have its fasteners re-torqued to the proper value before installation.

Bolt Torque values should be brought up to those recommended in Figures 1 or 4 by following the bolt tightening sequence as shown in Figures 2 or 5.

Sight Flow Indicators should be mounted into piping systems in such a manner to prevent piping stresses from being imposed into them. **SIGHT FLOW INDICATORS ARE NOT DESIGNED CARRY PIPING LOADS.** Piping must be properly supported and aligned with the Sight Flow Indicator connections.

Sight Flow Indicators should be positioned into the piping system in such a manner to be certain internal indicators, when specified, function properly.

- a) Series LIF Sight Flow Indicators supplied with a Drip Tube Indicators are suitable for Uni-Directional Flow in Vertical Down or Horizontal piping systems.
- b) Sight Flow Indicators containing no indicator or rotator indicator may be mounted in any acceptable orientation.
- c) Sight Flow Indicators containing flutter indicators are suitable for Bi-Directional Flow in any orientation.

5.1 PIPELINE CONNECTIONS

Series LIF Sight Flow Indicators are supplied with standard threaded (LIS) or flanged (LIF) connections. Connection to pipe line should be accomplished using customary plumbing techniques. Installation personnel should verify with the process engineer as to acceptable flange gasket materials or thread sealant tape or compounds. In the case of flanged Sight Flow Indicators, installation personnel should verify with the process engineer as to the type and material of fasteners to be used.

6.0 START - UP

6.1 PRE-OPERATIONAL EXAMINATION

- a) Verify that all installation procedures have been followed and completed.

- b) Check the cylinder in the unit before start-up, to insure that there are no chips, scratches or blemishes. Use a flashlight or other bright concentrated light to examine the lens carefully. If any flaw is apparent or suspected, start -up should be delayed pending the replacement of lens and gaskets. (See Section 8.0)

- C) Examine pipe line connection points for leakage.

7.0 OPERATION

J.G. Papailias Company, Inc., Series LIF Sight Flow Indicators provide a window for the observation of a pipeline contents and/or flow-through a pipe and as such does not require operation instructions. However, it is important that the Sight Flow Indicator was properly sized for the design conditions and installed properly. It is also important that the Sight Flow Indicator is not located in an area where objects may be dropped, thrown or generally allowed to come in contact with it. The Sight Flow Indicator should also be protected from thermal shock which can be a result of exposure to cold air blasts or cold water rinse. It's mandatory that all personnel using sight flow Indicators use safety glasses which meet industrial standards.

WARNING: SIGHT FLOW INDICATORS SHOULD BE BROUGHT INTO OPERATION SLOWLY TO AVOID EXCESS SHOCK OR STRESS ON LENS OR CYLINDER. RAPID PRESSURIZATION OF A SIGHT FLOW INDICATOR MAY CAUSE A LENS OR CYLINDER TO CRACK AND/OR BRAKE WITH RESULTING SUDDEN RELEASE OF PRESSURE, CAUSING SERIOUS INJURY TO PERSONNEL AND EXTENSIVE PROPERTY DAMAGE!

8.0 MAINTENANCE

8.1 ROUTINE MAINTENANCE

Daily inspection should be made to insure that there are no leaks and that the cylinder is free of scratches, chips or other blemishes.

The cylinder can be kept clean using a commercial glass cleaner such as Windex. Metal brushes, scrapers and similar instruments should never be used to clean the lens or cylinder as these objects will cause damage.

CAUTION: DO NOT CLEAN THE CYLINDER WHILE SIGHT FLOW INDICATOR IS UNDER PRESSURE. SIGHT FLOW INDICATOR MUST BE FREE OF POSITIVE OR NEGATIVE PRESSURE LOADS AND ALLOWED TO REACH AMBIENT TEMPERATURE BEFORE CLEANING.

8.2 OVERHAUL MAINTENANCE

Overhauling of a sight flow indicator should only be done by qualified personnel who are familiar with sight flow indicators, read and understand all the instructions in this manual and are also familiar with any drawings depicting the sight flow indicator assembly when available. Maintenance personnel must also use safety glasses which meet industrial standards.

It should be ascertained that the proper spare parts are available. An area covered with a clean cloth or clean paper should be available for placing the new spare parts as well as for the placing the reusable components of the sight flow indicators.

8.2.1 DISASSEMBLY

WARNING: SYSTEM PRESSURE MUST BE DROPPED TO ZERO AND ALLOWED TO REACH AMBIENT TEMPERATURE AND BE PURGED OF ALL MEDIA BEFORE ATTEMPTING TO SERVICE THE SIGHT FLOW INDICATORS. FURTHERMORE, IT MUST BE ASCERTAINED THAT THE PRESSURE CANNOT BE PUT BACK INTO THE PIPE LINE, EVEN INADVERTENTLY, WHILE SERVICE IS IN PROGRESS.

Remove the sight flow indicator from pipe line. Sight flow indicators should only be placed on clean surfaces, preferably covered with clean cloth or clean paper. Loosen nuts approximately 3/8" from back of one flange.

Remove flange by loosening the fasteners in the same tightening sequence shown in Figure 2. Generally it is recommended to physically number each fastener as illustrated in Figure 2 using a felt tip pen or some other marking device to prevent tightening sequence errors. It is recommended that a small clean container be available to place the fasteners as they are being removed to prevent loss. Once a Sight Flow Indicator has been disassembled, the cylinder and gaskets must be disposed of.

DO NOT UNDER ANY CIRCUMSTANCES ATTEMPT TO RE-USE THOSE ITEMS SINCE THEY MAY CONTAIN FLAWS, WHICH MAKE THEM A POOR SAFETY RISK.

Prepare for installation of a new cylinder and gaskets by first cleaning all gasket setting surfaces on the flanges. This should be done using a soft metal scraper to remove any rust or bits of old gasket material. Care should be used to prevent any damage to the sealing surfaces.

All fasteners should be cleaned of rust or corrosion before reassembly. Clean fasteners will insure more accurate torque resulting in more even loading on all seals and cylinders.

8.2.2 INSPECTION AFTER DISASSEMBLY

The glass seating surfaces should be carefully cleaned and checked to insure 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 a cylinder to fail.

If the sight flow indicator is being disassembled because of a need to replace the cylinder, an examination of the cylinder is in order to determine if the service life could be extended.

Erosion or corrosion of the inner surface of the cylinder may indicate chemical or steam attack of the lens by the media in the pipe.

Cracked cylinders can be caused by pressures in excess of the cylinder's rating, uneven bolt tightening or foreign particles on the cylinder seating surface, or thermal shock of the cylinder. It is important to determine the cause for the need to replace the cylinder. Simply putting in a new cylinder will not alleviate the underlying problem which precipitated the need for maintenance. Consultation with the manufacturer may greatly extend the service life and reliability of the Sight Flow Indicator.

8.2.2.3 REASSEMBLY

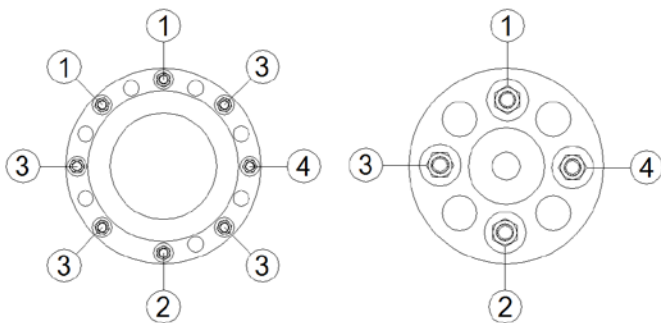
ALWAYS REASSEMBLE USING A NEW CYLINDER AND GASKETS. THE POTENTIAL OF HIDDEN DAMAGE MAKES A USED CYLINDER AND GASKETS POOR SAFETY RISK.

Check the new cylinder to insure that there are no bumps, chips, scratches, or other imperfections, and be certain that the gaskets are clean.

The cylinder and gaskets should be verified as correct for the application. Generally, as direct replacement of the cylinder and gaskets that were used before disassembly should be correct. Check with the maintenance supervisor prior to changing.

Place parts into Sight Flow Indicator following assembly view Figure 3. Care should be exercised in placing the seal gasket and cylinder into the center of the flange counter-bore so that the edge of the cylinder does not become chipped or damaged. Replace the seal gasket and second flange, again be careful not to damage the lens. Examine flange backside nuts, there should be approximately $\frac{3}{8}$ " clearance between the nut and flange surface. Make nuts on flange face side finger snug. Slide the cylinder from side to side, or rotate it in its seat, to be certain that it is centered and seated properly.

Using a torque wrench, tighten fasteners in a regular pattern to avoid uneven loads on the cylinder. Typical tightening patterns are shown in Figure 2. Generally it is recommended to physically number each fastener as illustrated in Figure 1 using a felt tip pen or some other marking device to prevent tightening sequence errors.

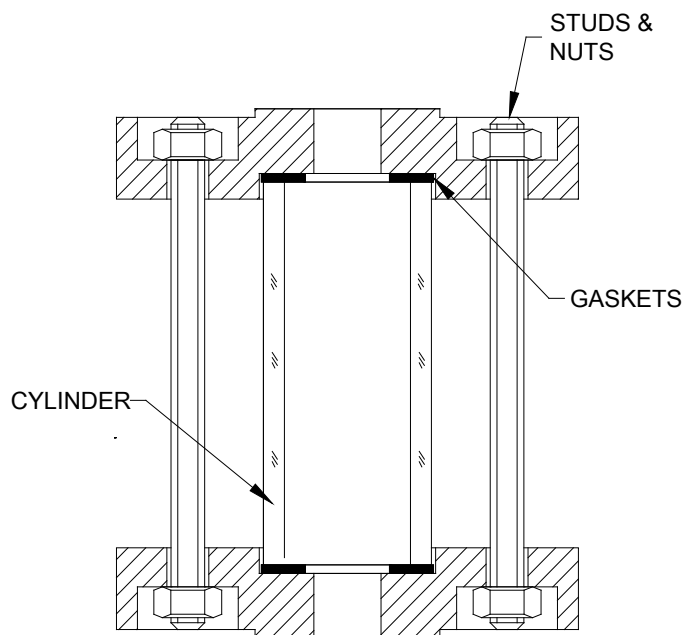


[FIGURE 1] BOLT TIGHTENING SEQUENCE

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 Flow Indicators and less on small ones. Continue tightening until the values shown in Figure 2 are attained. Upon completion of tightening nuts, the flange backside nuts should be tightened against the flange.

Size	Rating [PSIG]	Neoprene, TFE, Viton, Silicone	Non-Asbestos, Graphite
½"	150	7	7
¾"	150	7	7
1"	150	10	12
1¼"	120	12	14
1½"	120	12	14
2"	100	14	16
2½"	85	16	20
3"	100	16	20
4"	70	14	16
6"	45	14	16

[FIGURE 2] BOLT TORQUE VALUES IN FT-LBS.



[FIGURE 3] TYPICAL CYLINDRICAL SIGHT FLOW INDICATOR ASSEMBLY SERIES LIF & LIS