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JOHN C. ERNST LLC

PROCESS OBSERVATION SOLUTIONS

SIGHT FLOW INDICATOR

INSTALLATION, OPERATION & MAINTENANCE MANUAL

FOR SERIES: S13

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PRODUCT QUICK SPECS.

Material	Connection	Sizes	Standard Configuration Ratings[1]	Higher Pressure Configurations Ratings[1]
Carbon Steel	Threaded	¼" - 2"	200 PSIG @ 150°F 135 PSIG @ 250°F	400 PSIG @150°F 160 PSIG @ 400°F
	Flanged	¾" - 4"	200 PSIG @ 150°F 135 PSIG @ 250°F	285 PSIG @ 100°F 200 PSIG @ 400°F
		6" - 12"	150 PSIG @ 150°F	275 PSIG @ 100°F 200 PSIG @ 400°F
Bronze	Threaded	¼" - 2"	200 PSIG @ 150°F 135 PSIG @ 250°F	400 PSIG @150°F 160 PSIG @ 400°F
Stainless Steel	Threaded	¼" - 2"	200 PSIG @ 150°F 35 PSIG @ 400°F	400 PSIG @150°F 195 PSIG @ 400°F
	Flanged	¾" - 4"	200 PSIG @ 150°F 35 PSIG @ 400°F	275 PSIG @ 100°F 195 PSIG @ 400°F
		6" - 12"	150 PSIG @ 150°F	275 PSIG @ 100°F 195 PSIG @ 400°F
			Limited to Glass & Gasket Ratings	

[1] *with standard seals installed. Neoprene in Bronze & Carbon steel standard configurations. Fluorocarbon in Stainless steel and Higher pressure configurations.*

I. INTRODUCTION

This manual is a guide for the responsible personnel installing, operating and maintaining these items. It is imperative that instructions are read and understood thoroughly before attempting any installation, operation and maintenance. Failure to follow any of these instructions could result in a malfunction or failure of the Sight Flow Indicator, resulting in leakage, property damage, and/or physical injury to personnel.

Features and Specifications

John C. Ernst Modular Sight Flow Indicators are designed for use in liquid processing systems where it is desirable to observe the conditions internally, through a window in the pipe. Modular in the sense that the internal components of the sight flow indicators can be changed to offer four different types of observing flow:

- Plain: Used when color and clarity are of prime importance.
- Rotor: Ideal for opaque liquids and observations at a distance.
- Flapper: Bi-directional indicating at a glance which way the liquid is flowing.
- Drip Tube: Keeps product dripping on the glass. Ideal for gravity, extreme or impermanent flow.

Design Ratings at Maximum and Minimum Operating Temperatures

To determine maximum allowable working pressures at specific temperatures, the user should refer to 'Quick Product Specs', the valve set drawing, and the specific design limits on the John C. Ernst LLC. product proposal. All ratings are limited to the Glass & Gasket pressure & temperature limitations.

⚠ WARNING

Under no circumstances should these design ratings be exceeded. Exceeding these may cause property damage or physical injury to personnel.

SAFETY INSTRUCTIONS

Safety glasses should be worn when installing and/or operating a Sight Flow.

⚠ CAUTION

These units are NOT recommended for compressed gas applications.

II. INSPECTION

Receiving Inspection

Upon receipt, check all components carefully to ensure that damage did not occur. If damage is evident or suspected, do not attempt installation.

End User's Rating Inspection

The user(s) must confirm that:

- The operating conditions described in the purchase order agree with the actual operating conditions at the installation site.
- The materials of construction at the installation site are within the application data shown on the John C. Ernst Company Drawing or product proposal.
- The materials of construction of the gauge valves are compatible with both the contained fluid and surrounding atmosphere in the specific application.

NOTICE

If the Model Number, size and/or performance data of the sight flow as received does not conform with the criteria described in this section, do not proceed with installation. Contact a John C. Ernst Sales Representative.

III. INSTALLATION

Before installation:

- Check to ensure the lens is free from cracks,chips or scratches.
- Check and remove any foreign material from inside the sight flow.
- Determine direction of flow and install according to the arrow stamped on nameplate.

The unit is not designed to be a load bearing component, therefore the piping should be supported accordingly. Position the unit specific to the indicator configuration:

- Plain - Can be mounted in any plane or position
- Rotor - Can be mounted in any plane or position, except horizontal with nameplate facing down.
- Drip Tube - Only mount vertically with flow downward.
- Flapper - Should be mounted Horizontally or Vertically with a flow upwards.

IV. OPERATION

Pre-Operational Check

- Ensure that all installation procedures have been completed.
- Check that all connections are pressure tight.

Hydrostatic Test

- Take all precautions necessary to handle the possibility of leakage during the test.
- Pressure test assembly to 50 PSIG, and repair any leakage before proceeding.

Operating

⚠ WARNING

Sight Flows should be brought into service slowly to avoid excessive thermal shock and stress on the lens. Rapid pressurization of the sight flow may cause glass to break resulting in sudden release of pressure causing property damage or physical injury to personnel.

V. MAINTENANCE

⚠ DANGER

Do not attempt any maintenance service while the equipment is in operation. System pressure must be relieved and the product drained before attempting any service on the unit. The line must be locked out while service is in progress. Proper thermal relief must be provided at all times while equipment is being serviced.

⚠ DANGER

Proper seal and wetted material selections is critical for safe operation. Use only those materials compatible with fluids being handled. Please note material being supplied and make certain that it is suited for the intended service.

⚠ DANGER

These Products do not eliminate possible exposure to hazardous substances. The conditions are beyond John C. Ernst's control and we make no guarantee and assume no liability for damages or injuries related to the use of our products. Follow the safety precautions outlined in the Material Safety Data Sheets for the material being used. It is the responsibility of the user to comply with all federal and local regulations. Always employ proper safety precautions and handling techniques.

Maintenance should only be undertaken by qualified experienced personnel who are familiar with this equipment and have read and understood all instructions in this manual.

Preventive Maintenance

The user must create maintenance schedules, safety manuals and inspection details for each specific installation of a sight flow indicator. They must determine upon evaluation of their own operating experience an appropriate maintenance schedule necessary for the specific application. Realistic maintenance schedules can only be determined with full knowledge of the services and application situation involved.

When any leaks are found, have seals and glass replaced immediately.

Disassembly (Units up to 2")

1. For Drip Tube units, begin by removing the drip funnel. This may require you to push it out from the opposite end with some sort of rod. Be sure to use something relatively soft as to not damage the components inside.
2. Remove the bolts, washers, cover plate, and cushion.
3. Remove the O-ring seals, spacers, bridges and shaft, rotor/flapper (does not apply to drip tube units) and glass plates. You can apply a moderate pressure to the bottom glass lens and it should push everything above it out. If this fails, remove the top O-ring with a pick. If this is the case, discard the O-ring as it may have been damaged, and replace with a new one.
4. Thoroughly clean all sealing surfaces with a non-abrasive cleaning pad.

Assembly (Units up to 2")

1. Install flow Deflector (rotor unit only).
2. Lightly lubricate seals with a light oil. Press seal into body. Install PTFE spacer so it is fit inside the seal and is concentric to it. EPDM seals are NOT compatible with petroleum-based lubricants. A silicone-based lubricant must be used with EPDM.
3. Gently drop the first glass on top of seal and spacer, followed by bridge and shaft assembly. Be sure that the beveled edge of the glass faces retaining bridge.
4. Slide rotor/flapper onto shaft. (Drip tube units skip this step)
5. Orient second bridge so center boss faces inward. Press onto shaft until shoulder on shaft touches boss.
6. Lightly lubricate O-ring seal with light oil before pressing into ridge. EPDM seals are NOT compatible with petroleum-based lubricants. A silicone-based lubricant must be used with EPDM.
7. Press the second glass lens inside O-ring making sure beveled edge of glass is facing towards retaining bridge.

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8. Place cushion, plate and nameplate over glass. Make sure the chamfer in the center of the plate faces away from the glass.
9. Flow direction starts on the end with flow director (if rotor unit) and passes through the unit. Make sure to orient nameplate so flow direction arrow is correct. Drip Tube Units Only: Drop Drip Tube into body, through either end is fine, and press into place so shoulder on drip tube touches shoulder inside body. Hand-tighten bolts with wrench only.

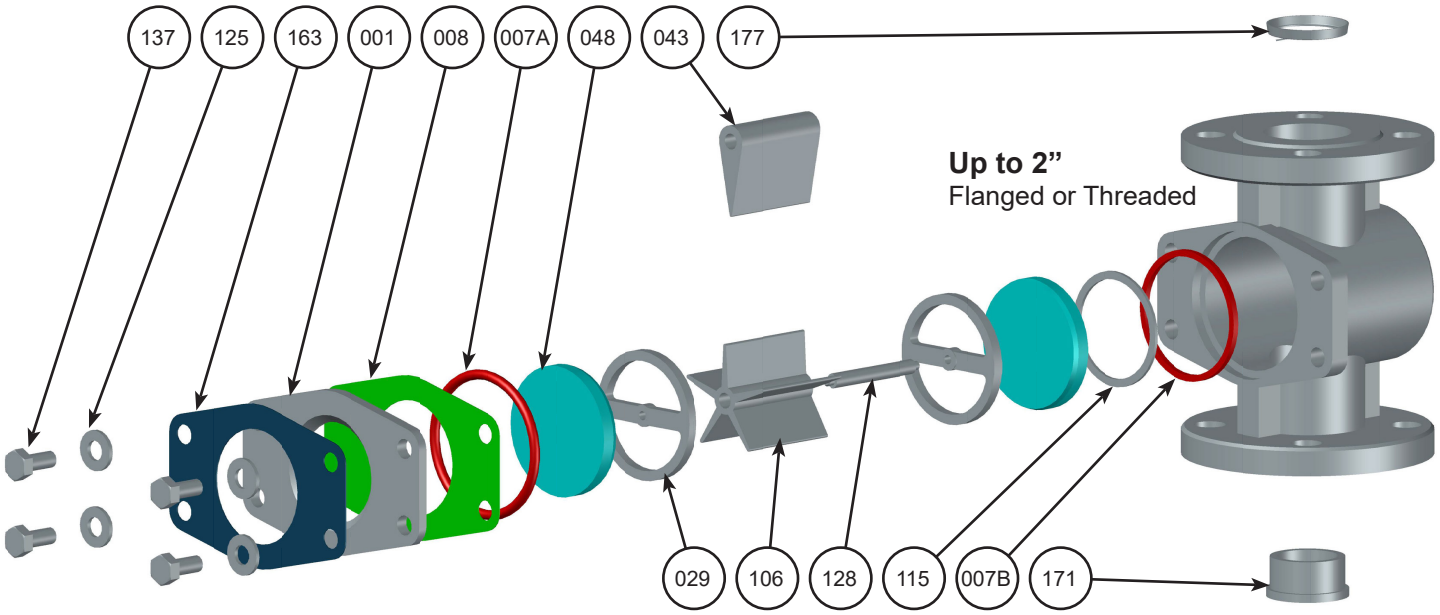
Disassembly (Units 3" and up)

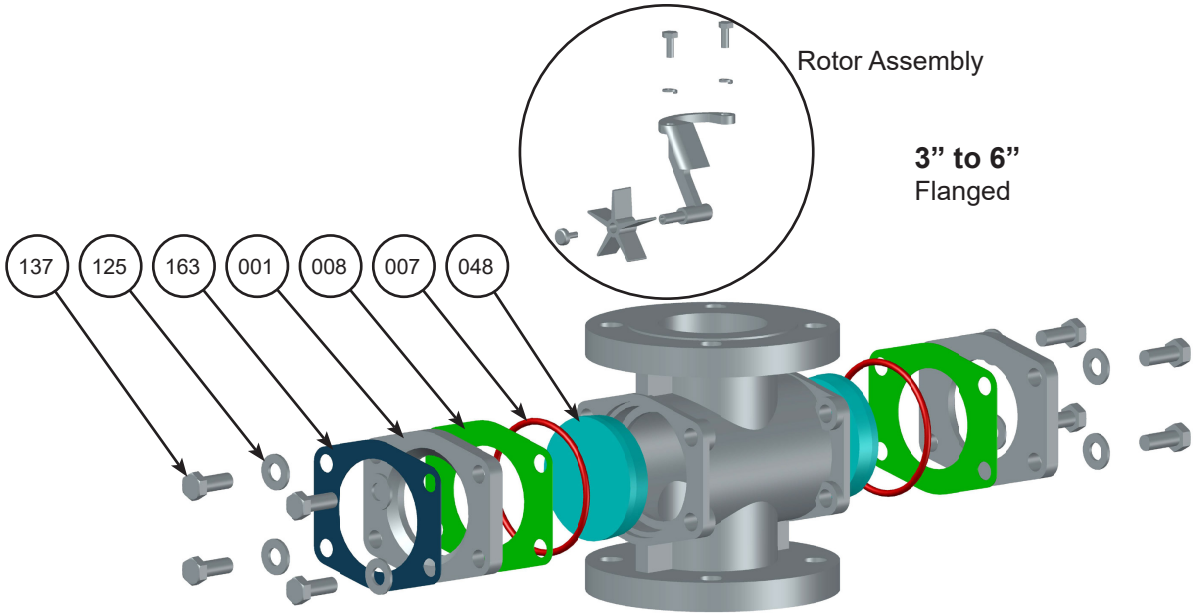
1. Remove bolts, washers, nameplate, plate and gasket.
2. Remove glass and O-ring.
3. Repeat process for other side.
4. Thoroughly clean all sealing surfaces with a non-abrasive cleaning pad.

Assembly (Units 3" and up)

1. Fit flapper/rotor assembly into body so bolt holes on support arm match with bolt ears on inside of body.
2. Secure with lock washers and bolts.
3. Press drip tube into end opposite bolt hole ears inside body. On stainless steel versions 3" & 4" units have a PTFE drip tube. All other 3" & up are welded in place.
4. For Flapper/Rotor versions start with whichever side exposes indicator retainer button. Otherwise either side is fine with plain or drip tube versions. Lightly lubricate O-ring with light oil before pressing into ridge. EPDM seals are NOT compatible with petroleum-based lubricants. A silicone-based lubricant must be used with EPDM.
5. Wedge beveled glass down inside O-ring with smallest diameter towards the center. Once glass begins to resist, stop.
6. Place a cushion and cover plate over glass. Make sure chamfered side of plate faces up.
7. With your palm, press down with even pressure until glass seats and cushion bottoms out.
8. Place nameplate on top of compressed components with flow direction facing the correct way. Flow direction for rotor can be determined by looking through the inside of body. Flow starts on the side with bolt ears, and travels to the opposite side. Drip tube version is opposite this. Flapper units do not have a flow direction.
9. Secure components with bolts and flat washers. Hand-tighten with wrench only.
10. Repeat on opposite side.

VI. SPARE PARTS INDEX





PARTS NO.	Name	NO.	Name
001	Retaining Plate	106	Rotor
007	Seal	115	Spacer
007A	Top Seal	125	Washer
007B	Bottom Seal	128	Pin
008	Cushion	137	Bolt
029	Bridge	163	Nameplate
043	Flapper	171	Drip Tube
048	Lens	177	Deflector

LIMITED WARRANTY

Period of Coverage
The John C. Ernst LLC. expressly warrants products to the original purchaser to be free from defects in the material and workmanship for 12 months from date of shipment. John C. Ernst LLC. will, at its option, replace or repair any products which fail during the warranty period due to defective material or workmanship. Evaluations, repairs, and replacements will most often occur in Sparta NJ 07871 USA, or another facility determined by the John C. Ernst LLC.. The warranty does not cover costs required to transport warrantied units to or from the John C. Ernst facility.

Limitations
The responsibility of the John C. Ernst LLC. is hereunder limited to repairing or replacing the product at its expense. This warranty shall not apply if the product has been disassembled, tampered with, repaired, subjected to misuse, neglect, accident, or otherwise altered in any way. The warranty does not guarantee products against normal wear, glass breakage, clouding, or corrosion. The John C. Ernst LLC. shall not be liable for loss, shipping costs, damage, or expenses related directly or indirectly to the installation or use of its products. It is expressly understood that the John C. Ernst LLC. is not responsible for damage or injury caused to other products, buildings, personnel, citizens, or property by reason of the installation or use of its products.
Advertised ratings apply only to units serviced with parts supplied by the John. C. Ernst LLC. Service must be done in accordance with the instructions of the product that is being serviced.
THIS IS JOHN C. ERNST, LLC's. SOLE WARRANTY AND IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED WHICH ARE HEREBY EXCLUDED, INCLUDING IN PARTICULAR ALL WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. WE WILL NOT BE LIABLE FOR INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES OF ANY NATURE.

How to get Warranty Service
Prior to submitting any claim for warranty service, the owner must submit proof of purchase, and obtain written authorization to return the product. All returns must be sent back with an MSDS for the application that the product was used in, and with a maintenance log of all service including inspections. Thereafter, the product shall be returned to the John C. Ernst LLC. with freight paid and packaged to prevent damage in transit. Should damage in transit occur the John C. Ernst LLC. will not be held liable.

GENERAL PRESERVATION

Recommended Practice for Long Term Storage of John C. Ernst Products

- All units should be inspected upon receipt to ensure that no damage has been incurred during transit. If there has been damage, a claim should be filed with the carrier immediately. Units should be stored in an area protected from the elements and corrosive fumes, in a secure manner where they can neither fall nor be struck by other objects. Care should be taken to protect the glass and the end connections from damage. Avoid placing any objects directly on the glass(es) at any time.
- Units should be checked to ensure that they contain no foreign matter and that the end connections are clean, undamaged, and in line with adjoining piping. Examine each glass carefully using a flashlight for any indications of chips, scratches, blemishes or cloudiness. Inspect for scratches, shining a bright concentrated light (powerful flashlight will suffice) at about a 45º angle. Any scratch that glistens and catches a fingernail, or star or crescent-shaped mark that glistens, is cause for replacement. Process surface that appears cloudy or roughened, after cleaning, is evidence of chemical attack and is cause for replacement. If any type of flaw is apparent, the unit should not be installed until the glass and gaskets have been replaced. Follow the torquing recommendations given by the gasket and piping manufacturers to achieve proper sealing pressures.
- Some products are shipped unassembled, as they are to be welded into position and then assembled. Individual pieces should be carefully stored in a manner to avoid damage until installation. The glass requires special attention. It should not be stored or mixed with objects that may cause damage and should remain wrapped or boxed until assembly.
- Gaskets frequently assume a compression-set over a period of time. Some materials, however, may compress/relieve or creep. Visually inspect the gaskets for gaps or looseness before start-up. If the gaskets are not compressed, adjust the unit gasket compression. Do not tighten any fasteners or clamps while the unit is in operation.
- Periodic visual inspection should be made to ensure that no leaks are evident and that there is no clouding, scratching, or blemishing of the glass. Keep glasses clean using commercial glass cleaners. Cleaning should be done without removing glass. This may require recirculation of cleaning material if process side of glass is not accessible. Never use harsh abrasives, wire brushes, metal scrapers, or anything that may scratch the glass. Do not attempt to clean glasses while equipment is in operation.
- Should leaking around the glass occur, first check the glass for damage. If the glass appears to be in good condition, the gasket seal should be checked, but only after the system pressure has been brought down to zero. If the gasket appears to be loose, or hardly compressed, the spacers must be adjusted. If the leak persists after repressurizing, disassemble and replace the gaskets.
- Glass, shields and gaskets that have been removed, MUST BE REPLACED. Used parts may contain hidden damage. Induced stress in glass and de-tempering are NOT visible to the naked eye. Be sure that the replacement glass is proper for the service.
- Inspect protective coating (if applied) for chipping.
- Store within the temperature extremes of the nameplate or specification documents – do not expose to direct sunlight or other UV sources.
- Products should be stored off of the floor on suitable skids, pallets, or racks and protected from dirt, debris, and exposure to direct sunlight, particularly to soft sealing surfaces.
- Store in a cool dry place, room temperatures between 40°F - 80°F with a relative humidity level between 40 – 75%.
- Store in dry areas, avoiding any contamination with any liquids. Products should be kept in a clean, heated, weather-tight (dry), well ventilated facility.
- If a flanged product is to be stored for any extended period of time, the flange or end protector should be examined to ensure they are fastened securely, and any other open areas should be sealed to prevent any moisture damage.
- Product assemblies with electrical components, pneumatic tubing, positioners, actuators, and other accessories should be protected from impact.
- Useful Life When Stored:
  - Unit: Indefinite, based on ideal storage conditions.
  - Spare Gaskets: Indefinite, based on ideal storage conditions.
  - After 9 months, the torque of the bolting should be checked as the gasket relaxes. This should be done for units not in service as well as those installed in process.
  - The useful life of the material, when the storage conditions differ from the recommended factors is not known. It has been established, however, that room temperature has a significant influence on the shelf life of material.
  - Spare Gaskets should be stored flat.
- Periodical checks at least every 6 months have to be carried out in the storage area to verify that the above mentioned conditions are maintained.

If there are any questions or concerns, please contact the John C. Ernst LLC. Sales Office at 888-943-5000.

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