JohnC. Ernst LLC. 21 Gail Ct, Sparta, NJ. 07871	Doc. No.: SIM.00S11.001		Replaces: E10033-D
	Date: 13-AUG-19	Created By: NPH	Approved By: GEW	Rev: --

JOHN C. ERNST LLC

PROCESS OBSERVATION SOLUTIONS

Sight Flow Indicators

INSTALLATION, OPERATION & MAINTENANCE MANUAL

FOR SERIES: S11

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Table of Contents

PRODUCT QUICK SPECS.

Model	Indicator Type	Window Type	FNPT	Body Material	Seal Material	Ratings	
						Pressure	Temperature
S11-C1P-XX	Rotor	**Single**	1/8" - 2"	Bronze	Buna-N	**125 PSIG**	**200°F**
S11-C2A-XX	Plain	**Double**					
S11-C2P-XX	Rotor	**Double**					

I. INTRODUCTION

This manual is a guide for the responsible personnel installation and maintenance of these items. All instructions must be read and understood thoroughly before attempting any installation, operation and maintenance.

⚠ CAUTION

Failure to follow instructions could result in a malfunction or breakage of the indicator, resulting in fluid escaping from the unit and fragmenting glass.

Always wear safety glasses when installing, servicing or operating Sight Flow Indicators.

Failure to follow precautions can result in personal injury and property damage.

Features and Specifications

These Sight flow Indicators are the most economical solutions that John C. Ernst LLC. offers for simple pipeline monitoring. These off-the-shelf, maintenance-free units use economic materials, which allow it to be one of the most cost effective solutions in the market. They are offered in plain and rotor indication styles in both single and double window configurations. Please contact our sales department if assistance is needed in choosing a unit specific for your application.

With the appropriate indication type, these Sight Flow Indicators can allow for monitoring of:

- **Flow Direction**
- **Media Color & Clarity**
- **Foam Presence**
- **Air/Bubble Presence**

These Sight Flow Indicators consist of five primary components

- **Body:** This provides a rigid, in-line capability for the Sight Flow Indicator. Each viewing end of the body has a flat machined cavity in which the retaining clip compresses the gasket and glass
- **Gasket(s):** These form the seal between the glass and the body
- **Glass Disc(s):** These are installed over the gaskets to provide the window for observation of the media passing through the body.
- **Retaining Clip(s):** These retain the above components by inserting into the corresponding notch in the body.
- **Indicator:** In appropriate models, this will allow assistance in viewing flow speeds, particularly with clear medias. These are mounted within the body, independent of the glass, gaskets and clips.

⚠ WARNING

Exceeding the design ratings or application's data limits will cause the glass to break, the unit to leak or sudden release of pressure. Failure to keep operations below design ratings may result in serious personal injury and property damage.

Design Ratings at Maximum and Minimum Operating Temperatures

To determine maximum allowable working pressures at specific temperatures, the user should refer to the 'Quick Product specs', the sight flow indicator 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.

II. INSPECTION

Receiving Inspection

Upon receipt of sight flow indicator 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:

1. The operating conditions described in the purchase order agree with the actual operating conditions at the installation site.
2. The materials of construction at the installation site are within the application data shown on the John C. Ernst Company Drawing or product proposal.
3. The user's purchase order, 'Product Quick Specs' and the technical drawing, all conform to the ratings stamped on the wring fitting surface as shown in Figure 1.

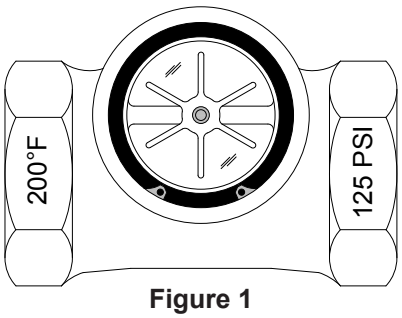

Figure 1

NOTICE

John C. Ernst Company does not have control over the manner in which its unit is handled, installed, or used, and John C. Ernst Company cannot and does not warrant or guarantee that a gage valve set is suitable or compatible with the user's specific application.

III. INSTALLATION

⚠ WARNING
Only qualified experienced personnel who are familiar with Sight Flow Indicator equipment and thoroughly understand the implications of the tables and all the instructions should assemble the sight flow indicator. Failure to read and comply could result in personal injury or property damage.

The user should refer to the John C. Ernst LLC. product proposal or drawing to obtain dimensional information for the specific size and model of the sight flow indicator.

General Precautions

- Do not impose system piping loads on the sight flow indicator. It is not designed to be a load bearing component.
- Examine glass carefully using a flashlight for any indications of scratches or cloudiness. If any type of surface flaw is apparent, the unit should not be installed.
- The Retaining Window Clip is crucial to the proper operation of this unit and safety of the operator. This should be checked for proper seating and periodically thereafter to ensure your operator's safety and media's containment.
- The orientation of these units may be used in both vertical and horizontal applications, with fluid movement in either direction.

Instructions

1. Prepare proper supports to insure that pipeline stresses will not be transferred to the sight flow indicator. Misalignment between adjacent connections must be corrected rather than forcing a fit-up. Large, heavy units should be independently supported to avoid piping stress. Ensure the Installation location provides access for viewing and maintenance, as well as precluding damage by external forces.
2. Install into adjoining pipe connections applying proper sealing torque to such connections.
3. Secure units and piping into supports that were prepared.

IV. OPERATION

Pre-Operational Check

- Assure that all installation procedures have been completed.
- Check to determine 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 (3.5 bar) and repair any leakage before proceeding.

Operating

These units should be brought to service slowly to avoid excessive shock or stress on the glass. Rapid pressurization of a sight flow indicator can cause the glass to fail and leak media.

V. MAINTENANCE

A maintenance schedule should be created for each Sight Flow Indicator installation. New Installations should be inspected daily until a routine inspection cycle is established. Regularly check the following:

- Glass for cleanliness and signs of damage or wear
- Signs of leakage around gaskets or connections
- Signs of internal or external corrosion

Preventive Maintenance

- **Glass** should be given regular and careful attention without removal. Keep glass clean using a commercial glass cleaner and a soft cloth. Inspect the surface, with a flashlight, for any chips, scratches, pits, cracks and/or bubbles. Glass that is even slightly damaged will focus any stress to the damaged area(s), and may break under pressure. Typical damaged areas will glisten brighter than surrounding glass area because the light is reflected. Detections of any damage, problem areas or surface wear is sufficient evidence to take the sight flow indicator out of service. Do not proceed with operation of the unit until it has been replaced.
- **Gasket** leaks must be repaired immediately. DO NOT proceed with operation of a sight flow indicator until all leaks have been resolved.
- **Thread** connection leaks should be corrected by tightening the NPT connection, or by taking the sight flow indicator out of service and reapplying Teflon® tape to all male threads.
- **Corrosion** may occur if improper materials were selected for the Sight Flow Indicator application. It is the responsibility of the user to choose materials of con-

struction compatible with the contained fluid and the surrounding environment. If internal and/or external corrosion are present, an investigation must immediately be performed by the user.

⚠ CAUTION

Do not remove the Sight Flow Indicator while it is in service. Unit must be allowed to reach ambient temperature, released from all pressure/vacuum and drained of all media before removal.

Troubleshooting

Problem: ***Leaking around main connections***
Solution:

- Debris could reside in threads. All male and female threads must be cleaned of debris.
- Insufficient Teflon® Tape applied during installation. 2.5 to 3 wraps is usually sufficient.
- Unit cross-threaded into pipeline. Carefully remove and re-thread.
- Damaged connection threads on unit or mating lines.
- Existing threading not for National Pipe Thread Taper (NPT). This unit can only be used with NPT Tapers.

Problem: ***Leaking around window***
Solution:

- Glass, Gaskets, and/or Retaining Clips may not be seated in unit correctly. Unfortunately, we cannot offer spare parts nor recommend field servicing. Please contact John C. Ernst Sales for a replacement unit to be shipped as soon as possible.
- If occurring after a period of time, the materials may not be compatible with media.

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. Use of parts during maintenance from other companies will void the warranty. 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

1. 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.
2. 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.
3. 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.
4. 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.
5. 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.
6. 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.
7. 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.
8. Inspect protective coating (if applied) for chipping.
9. Store within the temperature extremes of the nameplate or specification documents – do not expose to direct sunlight or other UV sources.
10. 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.
11. Store in a cool dry place, room temperatures between 40°F - 80°F with a relative humidity level between 40 – 75%.
12. Store in dry areas, avoiding any contamination with any liquids. Products should be kept in a clean, heated, weather-tight (dry), well ventilated facility.
13. 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.
14. Product assemblies with electrical components, pneumatic tubing, positioners, actuators, and other accessories should be protected from impact.
15. Useful Life When Stored:
    a. Unit: Indefinite, based on ideal storage conditions.
    b. Spare Gaskets: Indefinite, based on ideal storage conditions.
    c. 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.
    d. 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.
    e. Spare Gaskets should be stored flat.
16. 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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