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DIRECT-READING FLOW INDICATORS

Installation, Operation and Maintenance Instructions

1.0 Sight Flow Indicator Description

1.0.1 INTRODUCTION

JOGLER sight gages are classified as transparent armored tubular sight flow indicators. Their purpose is to provide visual verification of flow within a piping system. These simple, durable instruments are engineered and constructed to give safe and accurate indication of flow. Applications range from deionized water to highly corrosive chemicals and cryogenic fluids.

1.0.2.COMPONENTS

JOGLER flow indicators have either four or five components:

• One flanged armored shield. Materials can be carbon steel, 300 series stainless,or CPVC.

• Two PTFE Teflon SUPERSEAL inserts that seal each sight tube end.

• One sight tube for single tube flow indicators or two sight tubes for TUBE-N-TUBE flow indicators.

1.0.3 DESIGN

JOGLER sight flow indicators are manufactured to exact customer length and diameter specifications. SUPERSEAL inserts seal each sight tube end and are the raised sealing face of each flow indicator flange. All flow indicators provide unobstructed visibility with each shield section. Both armored and lantern style indicators are of grounded, all-welded construction.

1.0.4 INSPECTION ON RECEIPT

Upon receiving equipment, check all components carefully for damage incurred in shipping. Notify the shipping carrier immediately of any damage and request damage inspection. Confirm that the model number and ratings meet minimum application specifications. In addition ensure that the indicator material is compatible with the process media and surrounding environment.

1.1 Installation

1.1.1 INTRODUCTION

Please read and review all installation steps before attempting flow indicator installation. Failure to do so may result in equipment damage and void the product warranty (Section 1.7.0.). JOGLER flow indicators must be installed, operated and maintained with reasonable care and regard for the application if they are to provide maintenance-free performance.

CAUTIONS - PLEASE OBSERVE THE FOLLOWING CAUTIONS:

- To avoid imposing piping strains on the flow indicator, connect or mount the indicator so that it does not support or strain piping.
- Differential thermal expansion between the connection piping and flow indicator can impose severe mechanical loads on the equipment. This is especially true if the system contains hot or cryogenic fluids. This condition can be prevented by using a reasonably long run of piping.
- low indicators subject to excessive vibration should contain auxiliary mounting brackets. Support brackets will prevent overloading the process connections and piping.
- While unpacking, remove all flange protectors.
- Prevent tools and other loose objects from striking or scratching the sight tubing during flow indicator installation.
- Carefully align instrument flanges with connection flanges. If the flow indicator is too long or too short, do not attempt final installation. Consult the factory if dimensions are incorrect.
- Connection alignment is critical for sight flow indicators. If flow indicator connections are not plumb vertically or level horizontally, do not attempt installation until connections are properly aligned
- Apply even bolt torque to connection flanges. Improper flange bolt torque can distort the Teflon SuperSeal inserts, resulting in strain transmitted to the sight tubing.

Recommended Bolt Torque

Flange Size, inches	Torque, ft/lb
1.00	15
1.50	20
2.00	25
3.00	40
4.00	45
6.00	60
8.00	80

1.2 Operation

1.2.1 INTRODUCTION

Please read and review all installation steps before attempting flow indicator operation. Failure to do so may result in equipment damage and void the product warranty.

1.2.2 PROCEDURES

Warning: Make sure the operating temperature and pressure are within the maximum rating of the flow indicator (Section 1.9.0.). Do not attempt to operate if there is any question concerning process conditions and flow indicator ratings.

The flow indicator should be vertically plumb or horizontally level, as dictated by the application.

1. Verify that all process connection valves are closed.

CAUTION: FLOW INDICATORS SHOULD BE BROUGHT INTO SERVICE VERY SLOWLY, BECAUSE THERMAL SHOCK CAN LEAD TO FLOW INDICATOR FAILURE. THEREFORE, CONSIDER BOTH THE AMBIENT AND PROCESS TEMPERATURES WHEN PLACING THE INSTRUMENT INTO SERVICE. IF THE DIFFERENCE BETWEEN THESE TWO TEMPERATURES IS SIGNIFICANT, THE BOROSILICATE SIGHT TUBING SHOULD BE EXPOSED TO PROCESS TEMPERATURES AS SLOWLY AND EVENLY AS POSSIBLE. THE RATE OF TEMPERATURE CHANGE SHOULD NOT EXCEED 50 °F. (28 °C.) PER MINUTE.

2. Allow fluid entry into the flow system at a very slow rate. If the process media is at elevated temperatures, allow the flow indicator to warm up slowly with the influence of the media.

1.3 Removal from Service

1.3.1 INTRODUCTION

To remove the flow indicator from service, the following steps should be observed to prevent danger to personnel and damage to the equipment.

1. Close upstream valve or shutdown flow stream altogether allowing the pipeline to drain completely. The flow indicator must be empty before remova is attempted.
2. Remove all bolts except one at both flange connections. The remaining bolt should be on the side of the pipeline from which the flow indicator is to be removed.
3. Loosen the remaining two bolts and use them as a pivot. Rotate the flow indicator out slowly toward you.
4. After rotation, disconnect the remaining two pivot bolts and remove the flow indicator.
5. Inspect the SUPERSEAL insert thoroughly for seal and raised face for wear. If the raised face is worn or disfigured significantly, replace the part as warranted.
6. Inspect the connection flanges and shield for any signs of corrosion. If connection flanges are corroded from prolonged exposure, consideration should be given to replacing the entire flow indicator. All JOGLER shields are unexposed to the process media but the shields may be subject to atmospheric corrosion within a plant environment.
7. If the flow indicator shows no signs of corrosion, seal fatigue or sight tube defects, it can be cleaned without the removal of internal components. Refer to the cleaning procedures in this manual, Section 1.4.3.

1.4 Maintenance

1.4.1 INTRODUCTION

Maintenance should be conducted on a regular scheduled basis. Complying with a scheduled maintenance program and inspection will prolong equipment performance. Equipment that is neglected due to lack of maintenance is subject to safety hazards.

1.4.2 INSPECTION PROCEDURES

- Flow indicators should be isolated from the process system.
- Inspect the sight tubing on a regular basis for any signs of clouding or scratching. In new process applications, inspect the sight tubing daily.
- To examine for scratches, use a very bright concentrated hand light. Any imperfection that reflects distinctly should be examined closely. Visible scratches or crescent shaped markings that glisten are cause for sight tube replacement.
- If the inner sight-tubing surface appears cloudy or rough from chemical corrosion and will not respond to cleaning procedures, the sight tubing should be replaced.

1.4.3 CLEANING

- Sight tubing should be cleaned with any non-abrasive solvent. When regular cleaners are ineffective, dilute muriatic acid can be applied. Observe safety instructions when handling dangerous chemicals. AVOID USING STEAM.
- Never use harsh abrasives; wire brushes or metal scrapers, which can scratch sight tubing. This especially true with flow indicators containing PFA Teflon liners.
- If flow indicator components appear normal without signs of wear, cleaning can be performed without removing the sight tubing and inserts. Leave the sight tubing and inserts intact.
- Remove all but one of the connecting bolts and pivot the flow indicator outward for servicing.
- Do not attempt to clean sight tubing while equipment is in service.
- JOGLER does not recommend using steam for clean-out purposes. Steam injection can induce thermal shock on all borosilicate sight tubing, regardless of flow indicator rating capacity.

1.5 Spare Parts

1.5.1 INTRODUCTION

It is important to use only genuine JOGLER spare parts. Substitute parts will not seal effectively for any JOGLER flow indicator and will induce a potential safety hazard. JOGLER flow indicators vary in diameter, sight tube material and length. Also, JOGLER sight tubes are individually treated, (trued and annealed), to match the sealing tolerance of the SUPERSEAL insert perfectly.

1.5.2 ORDERING

Spare parts for all JOGLER flow indicators can be ordered through your sales representative or factory direct. All sales representatives, however, do not inventory spare parts. When ordering parts, please submit the serial number of the flow indicator. If the serial number is not available, please record the flow indicator type, exact overall length in inches, flanges size and sight tube diameter(s). This information is necessary and will be required in order to match all parts to the indicator subject for repair. Always order a new set of SUPERSEAL inserts when replacing the sight tubing. JOGLER cannot guarantee that old inserts will seal as effectively as new inserts. Many parts can be shipped on the same day ordered.

1.5.3 RECEIVING AND STORAGE

Upon receiving sight tubing and inserts, inspect containers and gage components for shipping damage. Keep sight tubing in packing containers until ready for installation. Many plant store rooms or warehouses will inventory JOGLER spare parts for flow indicators used frequently or of a common size. Contact JOGLER for details if a spare parts program at your facility is necessary.

1.5.4. LINED FLOW INDICATORS

PFA Teflon-lined sight flow indicators are not recommended for repair in the field. The PFA Teflon sight tubing is a separate liner that is flared over the flange raised face at the factory. If your Teflon lined flow indicator requires new PFA Teflon sight tube replacement, please return it to JOGLER for factory reinstallation.

1.6 Patents

1.6.1 INTRODUCTION

There are three JOGLER patents for flow indicators that are currently active. PATENT INFRINGEMENTS WILL BE ENFORCED.

1.6.2 SUPERSEAL INSERTS

The PTFE Teflon SUPERSEAL inserts seal the sight tubing and the raised face of every JOGLER sight flow indicator. Each insert seals the sight tubing without troublesome O-Rings or enveloping gaskets. SUPERSEAL inserts are patented products and registered trademarks of JOGLER, INC.

1.6.3 TUBE-N-TUBE FLOW INDICATORS

The basic design of TUBE-N-TUBE flow indicators provides insulation of the process media by means of a sealed dead air annulus surrounding the inner sight tubing. The external tube also provides additional sight tube protection within each gage section. TUBE-N-TUBE sight flow indicators are patented products and registered trademarks of JOGLER, INC.

1.6.4 PFA-LINED FLOW INDICATORS

PFA Teflon is used as a sight tubing, flared over the raised face, in flow indicators. These are patented products and registered trademarks of JOGLER, INC.

1.7 Warranty

1.7.1 INTRODUCTION

All JOGLER products are warranted against defects in material and workmanship for one year (365 days) from the date of shipment. JOGLER will repair or replace those products that fail to perform as specified within 365 days from shipment. This warranty does not apply to glass breakage or any other liability other than materials and workmanship.

1.7.2 CONDITIONS

The following conditions will void the standard JOGLER warranty as applicable:

- Products repaired or modified by persons that are unauthorized by JOGLER, INC.
- Products subject to operational misuse, negligence or accidents.
- Flow indicators that are placed into service with disregard to rating, operational conditions or those that are subject for repair before returning to service.
- Products that are improperly connected, installed or operated in such a way not in accordance with the manufacturer's instructions.
- This warranty supercedes any warranty expressed or implied by any party other than JOGLER.

1.7.3 PROVISIONS

Repairs and/or replacement of equipment under warranty shall be at the sole discretion of JOGLER based on the terms and conditions stated herein.

1.8 Terms and Conditions of Sale

1.8.1 INTRODUCTION

All orders are to be entered through your local sales representative or to the following address:

Jogler
6646 Complex Drive
Baton Rouge, LA 70809
Phone: 225-456-2495
Toll Free: 1-800-223-8469
email: inquiries@jogler.com

1.8.2 TERMS

The payment terms are Net 30 days to approved customers. Sales representatives may assume collection responsibility for new accounts at their discretion. Late charges will be added at the rate of 1.50% per month.

1.8.3 SHIPMENT

All shipments will be F.O.B. factory location, Baton Rouge, LA, USA, via motor freight insured. Freight charges are normally pre-paid and added to invoice unless specified otherwise.

1.8.4 RESTOCKING

Sight flow indicators that are custom designed and manufactured to exact customer specifications are not subject to a restocking option after shipment is made. Only stock sizes of flow indicators are subject for restocking.

1.8.5 CANCELLATION

Cancellation charges after order placement will be applied at the discretion of JOGLER, INC., and dependent upon the production phase of the product and percent completed. Customer is responsible for all production charges and material costs in the event of an order cancellation.

1.9 Pressure Ratings

1.9.1 INTRODUCTION

The flow indicator ratings listed below include full vacuum ratings. These are to be followed closely with no exceptions because failure to do so will void the warranty (Section 1.7.0.) and can induce a safety hazard. PFA Teflon sight tube liners do not increase or decrease ratings and are generally not recommended for full vacuum service.

1.9.2 HYDROSTATIC TESTING

The borosilicate sight tubing listed below has been hydrostatically factory tested to 200% of flow indicator rating. Standard hydrostatic tests conducted are to 150% of gage rating listed.

1.9.3 RATINGS @ 150° F

Factory Mutual ratings are based on seal and sight tubing tests conducted on single tube gages with carbon steel shields and ANSI 150 lb flanges. Flow indicators with CPVC or Fiberglass flanges are rated only to 150 psig. FOR SPECIFIC GAGE RATINGS AT ELEVATED TEMPERATURES UP TO 350° F, PLEASE CONSULT THE FACTORY FOR VERIFICATION.

Borosilicate Part number	Sight tube material	Gage ratings size, inches	ANSI 150 flange, psig
HP06	HP tubing	0.62	150
HP10	HP tubing	1.00	150
PI10	Standard pipe	1.00	150
PI15	Standard pipe	1.50	135
HW15	Heavywall	1.50	285
PI20	Standard pipe	2.00	115
HW20	Heavywall	2.00	285
PI30	Standard pipe	3.00	95
HW30	Heavywall	3.00	200
PI40	Standard pipe	4.00	85
HW40	Heavywall	4.00	150
PI60	Standard pipe	6.00	60
PI80	Standard pipe	8.00	40