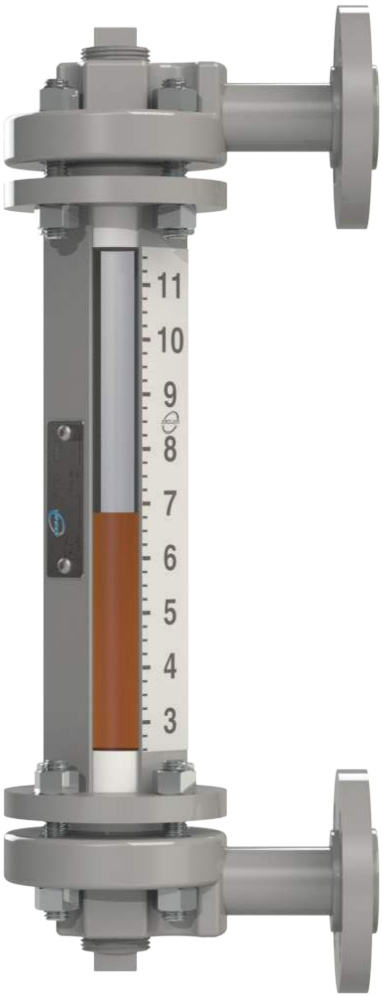
Direct Reading Liquid Level / Flow Indicator

Installation, Operation and Maintenance Instruction Manual





DIRECT READING LIQUID LEVEL / FLOW INDICATORS 10MM

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1.0 DIRECT READING LIQUID LEVEL / FLOW INDICATORS

1.0.0 DESCRIPTION

1.0.1 INTRODUCTION

JOGLER Direct Reading Liquid Level / Flow Indicators are classified as transparent armored tubular direct reading liquid level / flow indicators. Their purpose is to provide visual verification of liquid level in a vessel or tank or flow through piping. These simple, durable instruments are engineered and constructed to give safe and accurate indication of level or flow. Applications range from deionized water to highly corrosive chemicals and cryogenicfluids.

1.0.2 COMPONENTS

JOGLER level gauges are constructed with components:

1. One shield, with two flanges. Materials can be carbon steel, 316 stainless, or CPVC (available for gauge connectors only)
2. Two PTFE Teflon SUPERSEAL inserts that seal each sight-tube end.
3. One sight tube for single tube gauges or two sight tubes for TUBE-N-TUBE gauges.
4. Optional FEP Teflon liner
5. Optional Side Connectors

1.0.3 DESIGN

JOGLER Direct Reading Liquid Level / 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 gauge flange. All gauges provide unobstructed visibility with each shield section. Side-mounted gauge connectors are available for level gages, threaded or flanged, with or without BALL-N-BALL check and isolation valves.

1.0.4 INSPECTION

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 the gauge model number and ratings meet minimum application specifications. In addition, ensure the gauge material is compatible with both the process media and surrounding environment.

1.1 INSTALLATION

1.1.1 INTRODUCTION

Please read and review all installation steps before attempting gauge installation. Failure to do so may result in equipment damage and void the gauge warranty (Section 1.7.0.). JOGLER Direct Reading Liquid Level / Flow Indicators must be installed, operated and maintained with reasonable care and regard for the application if they are to provide maintenance free performance.

PLEASE OBSERVE THE FOLLOWING CAUTIONS.

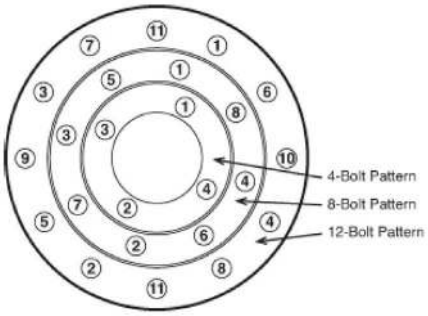
- Differential thermal expansions between the vessel and level gauge can impose severe mechanical loads on the equipment. This is especially true if the system contains hot or cryogenic fluids. This condition can be prevented by installing an expansion loop between the gauge and vessel or by using a reasonably long run of piping.
- Support brackets should be considered for level gauges longer than 10 ft or heavier than 75 lb. Gauges subject to excessive vibration should contain auxiliary mounting brackets. Support brackets will prevent overloading the process connections and piping.
- While unpacking, inspect all glass tubing for damage. If damage is present, please contact factory immediately. All gauges are packed in expanding foam before leaving factory.
- A good quality torque wrench which meets the torque values for each flange rating is needed for installation. The smallest value should be 15 ft-lbs and ranges up to 80 ft-lbs. It is crucial that even torque is applied following the Recommended Bolt Torque chart to guarantee that the glass will not break. The larger flanges requiring higher torque values will torque down until the seal settles on the end of the glass. It is imperative that torque is applied evenly and per the following guidelines to keep from damaging the glass. If further information is needed, please consult the factory.
    1. Hand tighten all bolting evenly on the gauge. Do not put any strain on any of the bolts while hand tightening the nuts.
    2. There will be three torque values to be followed during installation. Failure to follow these specifications can result in glass breakage or leaking of the gasket area once installed. 1st torque value is to be approximately 35% of the torque value specified in the following Recommended Bolt Torque Chart. All studs to be torqued to that value before continuing. 2nd torque value is to be approximately 70% of the torque value specified. Repeat the tightening sequence until all studs are torqued to this value. 3rd torque value to be 100% of the torque value specified. A technician should go over each stud to ensure that they have been torqued to 100% evenly.
- Prevent tools and other loose objects from striking or scratching the sight tubing through the viewing slot.

1.0 DIRECT READING LIQUID LEVEL / FLOW INDICATORS

1.1 DESCRIPTION

- Carefully align instrument flanges with connection flanges. If the gauge is too long or too short do not attempt final installation. Consult the factory if gauge is improperly measured.
- Connection alignment is critical with both level gauges. If gauge connections are not level vertically or are offset horizontally, do not attempt installation.
- Level gauges with flanged side-mounted gauge connectors will require gaskets between the connection flange and gauge connector. Check gasket material against process compatibility.
- Apply even bolt torque to connection flanges. Improper flange bolt torque can distort the Teflon sight tube inserts, resulting in strain transmitted to the sight tubing.

Note: Connection flanges are to be torqued to standard recommended values.



Recommended Bolt Torque

Flange Size, inches	Torque, ft-lb
1.00	15
1.50 – 4.00	20 – 30
6.00 – 8.00	30 – 50
10.00	50 – 80

1.2 OPERATION

1.2.1 INTRODUCTION

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

1.2.2 PROCEDURES FOR LEVEL GAUGE COMMISSIONING

WARNING: MAKE SURE THE OPERATING CONDITIONS, TEMPERATURE, AND PRESSURE ARE WITHIN THE MAXIMUM RATING OF THE GAUGE (SECTION 1.9.0). DO NOT ATTEMPT TO OPERATE ANY GAUGE IF THERE IS ANY QUESTION CONCERNING PROCESS CONDITIONS AND OVERALL GAUGE RATINGS.

1. Verify that the gauge is vertically plumb, as dictated by the application.
2. Verify that all level gauge connection valves are closed.

CAUTION: LEVEL GAUGES SHOULD BE BROUGHT INTO SERVICE VERY SLOWLY, BECAUSE THERMAL SHOCK CAN LEAD TO GAUGE 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.

3. When the level gauge is mounted correctly and ready for placement into service, PARTIALLY OPEN THE TOP PROCESS CONNECTION VALVE FIRST and very slowly to allow initial pressure and temperature equalization between the vessel and level gauge. This allows the process conditions of the vessel to equalize with the gauge slowly and reach operating conditions at a slow, even rate. If a BALL-N-BALL valve is opened fully upon initial installation, the process pressure will cause an overpressure condition and will force the ball-check to seat. This condition will prohibit additional process influx.

WARNING: DO NOT OPEN THE BOTTOM VALVE FIRST. IF THE BOTTOM CONNECTION VALVE IS OPENED FIRST WITH THE TOP VALVE CLOSED WHILE THE VESSEL IS UNDER ELEVATED TEMPERATURE AND PRESSURE, THE PROCESS MEDIA COULD INDUCE THERMAL SHOCK.

4. After the level gauge has reached process conditions, continue to open the TOP process connection slowly, allowing any liquid or condensate to enter the gauge. Liquid accumulation may occur through the top connection with the bottom connection closed if the level gauge is under elevated temperature and pressure.

5. When the level gauge has attained normal process conditions, open the BOTTOM connection valve slowly. This will allow proper fluid entry in the level gauge under normal operating conditions. When a fluid level becomes established,

continue opening the bottom valve completely. At this point, the level gauge installation should be complete. Allow at least 30 minutes for both top and bottom valve procedures.

6. Check for connection leaks.
   CAUTION: WHILE THE LEVEL GAUGE IS IN OPERATION, CONNECTION VALVES MUST BE OPENED COMPLETELY. A PARTIALLY OPENED VALVE WILL PREVENT THE AUTOMATIC BALL CHECKS FROM SEATING PROPERLY, WHICH COULD CREATE A SAFETY HAZARD AND LOSS OF PROCESS PRODUCT.

   NOTE: During a system shutdown, it is recommended to leave the level gauge connection valves open. This allows the gauge to cool and depressurize with the entire system.

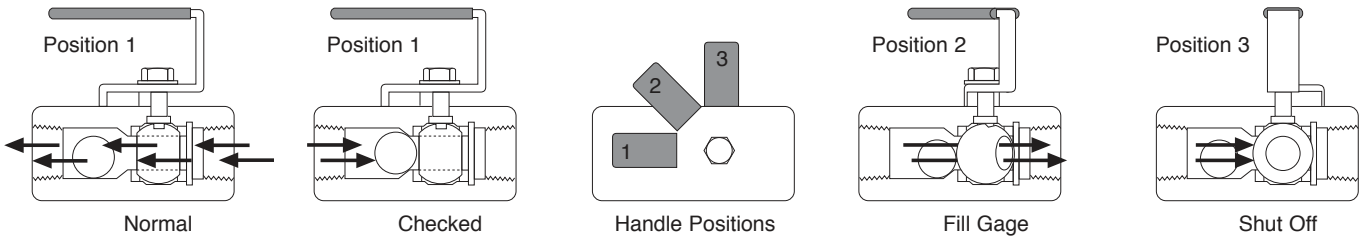
1.2.3 BALL-N-BALL VALVES (Patented)

BALL-N-BALL valves are a combination ball check and isolation ball valve designed to prevent immediate overpressure conditions from affecting level gauges. Refer to valve handle positions on each valve. BALL-N-BALL valves are recommended for all level gauge installations.

Valve Position 1 (Normal). The ball valve remains open in position 1 to allow normal fluctuations in process level within the gauge. If the process pressure within the vessel exceeds gauge pressure by three PSIG, the overpressure imbalance will force the ball check to seat immediately. When the ball check is seated, fluid is prevented from entering the gauge.

Valve Position 2 (Fill). To fill and return the gauge to normal level conditions, the rotary ball valve is opened halfway to position 2. At this setting, fluid transfer is allowed to slowly reenter the gauge column properly and the ball check is prevented from seating. When the fluid equilibrium is reestablished between the vessel and the level gauge, the ball valve can be opened and returned to the normal position 1 setting. Opening of the valve from position 2 to position 1 will allow the ball check to drop to the bottom of the ball check chamber and is free to reseat in the event of an overpressured condition.

Valve Position 3 (Isolation). For gauge isolation, or block-in, the ball valve is closed at position 3. The ball check chamber is located on the vessel side of the ball valve. By closing the rotary ball valve from position 1 to position 3, the level gauge becomes isolated from process conditions and the ball check becomes unseated.



1.3 REMOVAL FROM SERVICE

1.3.1 INTRODUCTION

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

1.3.2 PROCEDURES

1. Close the BOTTOM connection valve first to prevent additional influx into the gauge.
2. Close the TOP connection valve second to isolate the gauge from the process system.
3. Attach vapor collection equipment to the gauge vent connection if required.
4. Open the vent connection slowly to relieve remaining gauge pressure and allow air influx.
5. Attach the proper liquid collection equipment to the drain connection if required.

6. Open the drain connection slowly to remove remaining process liquid.
7. If the level gauge is equipped with vent and drain valves, do not use these valves for process pressure relief purposes. Doing so may damage parts of the gauge and may induce a safety hazard.
8. If the entire process system is subject for a shutdown in operations, it is recommended to keep both level gauge valve connections open. This will allow the level gauge to cool and depressurize evenly.
9. Remove all bolts except one at both flange connections. The remaining bolt should be on the side of the pipeline from which the gauge is to be removed.
10. Loosen the remaining two bolts and use them as a pivot. Rotate the gauge out slowly toward you.
11. After rotation, disconnect the remaining two pivot bolts and remove the gauge.
12. 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.
13. Inspect the connection flanges and shield for any signs of corrosion. If connection flanges are corroded from prolonged wear, consideration should be given to replacing the entire gauge. All JOGLER shields are unexposed to the process media but the shields may be subject to atmospheric corrosion within a plant environment.
14. If the gauge shows no signs of corrosion, seal fatigue or sight tube defects, the level gauge can be cleaned without the removal of internal components. Refer to the cleaning part of the 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

- Level gauges should be isolated from the process system by closing the upper and lower connection valves. Drain the level gauge through the blind flange, drain plugs or drain valves.
- The sight tubing should be inspected on a regular basis for any signs of clouding or scratching. In new process applications, the sight tubing should be inspected daily.
- To examine for scratches use a very bright concentrated hand light. Anything 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 etched 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 gauges containing PFA Teflon liners.
- If gauge 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 gauge 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 gauge rating capacity.

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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 gauge and will induce a potential safety hazard. JOGLER gauges vary in diameter, sight tube material and gauge length. In addition, 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 gauges 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 gauge. If the serial number is not available, please record the gauge 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 gauge subject for repair. Always order a new set of SUPERSEAL inserts when replacing the sight tubing. JOGLER cannot guarantee old inserts will seal as effectively as new inserts.

1.5.3 RECEIVING AND STORAGE

Upon receiving sight tubing and inserts, inspect containers and gauge 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 gauges used frequently or of a common size. Please contact JOGLER for details if a spare parts program at your facility is necessary.

1.5.4 LINED GAUGES

PFA Teflon lined level gauges 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 gauge requires new PFA Teflon sight tube replacement, please return it to JOGLER for factory reinstallation.

1.0 DIRECT READING LIQUID LEVEL / FLOW INDICATORS

1.6 WARRANTY

1.6.1 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.

1.6.2 CONDITIONS

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

- Products repaired or modified by persons that are unauthorized by JOGLER, LLC.
- Products subject to operational misuse, negligence or accidents.
- Gauges 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.

1.6.3 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.

1.7 TERMS & CONDITION OF SALE

1.7.1.INTRODUCTION

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

Adaptive Industrial Solutions
Phone: (877) 818-5009
Email: sales@adaptiveind.com
Website: www.adaptiveind.com

1.7.2 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.

1.7.3 SHIPMENT

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

1.7.4 RESTOCKING

Level gauges that are custom designed and manufactured to exact customer specifications are not subject to a restocking option after shipment is made.

1.7.5 CANCELLATION

Cancellation charges after order placement will be applied at the discretion of JOGLER, LLC. 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.

1.0 DIRECT READING LIQUID LEVEL / FLOW INDICATORS

1.8 PRESSURE RATINGS

1.8.1 INTRODUCTION

The gauge 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.

1.8.2 HYDROSTATIC TESTING

The borosilicate sight tubing listed below have been hydrostatically factory tested to 200% of gauge rating. Standard hydrostatic tests conducted are to 150% of gauge rating listed.

1.8.3 PRESSURE RATINGS @ 150°F.

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

Part #	Borosilicate material	Sight tube size, inches	Gauge ratings, ANSI 150 flange, psig
HP06	HP tubing	0.62	150
HW06	Heavywall	0.62	285
HP10	HP tubing	1.00	150
HW10	Heavywall	1.00	285
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

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