Titanium Wet Tap Sensor

Installation Manual

Critical Safety Information

NOTICE
The manufacturer is not responsible for any damages due to misapplication or misuse of this product including, without limitation, direct, incidental, and consequential damages, and disclaims such damages to the full extent permitted under applicable law. The user is solely responsible to identify critical application risks and install appropriate mechanisms to protect processes during a possible equipment malfunction.

Please read this entire manual before unpacking, setting up, or operating this equipment. Pay attention to all danger and caution statements. Failure to do so could result in serious injury to the operator and/or damage to the equipment.

Make sure that the protection provided by this equipment is not impaired. Do not use or install this equipment in any manner other than that specified in this manual.

Use of hazard information

 DANGER
Indicates a potentially or imminently hazardous situation which, if not avoided, will result in death or serious injury
 WARNING
Indicates a potentially or imminently hazardous situation which, if not avoided, could result in death or serious injury.
 CAUTION
Indicates a potentially hazardous situation that may result in minor or moderate injury.

Contents

Product Description

The Sensor consists of the sensor probe, titanium ball valve, and remover system. It is designed to be mounted using the installed ANSI 150 Flange. The sensor can be connected by either:

1. Halogen Display/Transmitter powered with 120VAC.
2. SCADA system using Modbus RTU protocol and 24VDC.

1 Features

- Low maintenance
- Replaceable wear parts
- No membranes or buffer solutions
- No waste stream or flow control
- Direct pipe insertion
- Self-cleaning
- Titanium housing

1.1 Specifications

Mechanical Specification	**Detail**
Operating temperature (Electronics)	0 to 50 °C (0 to 122 °F)
Storage temperature	–20 to 60 °C (–4 to 149 °F)
Panel dimensions (L x W x D)	130 X 130 X 8mm (5 x 5 x 3 in.) display
Sensor dimensions	561 X 4.5 mm (22" X 1.72") diameter
Weight Sensor	Approximately 1.5 kg (3 lbs.)
Weight display	<1 kg (0.5 lbs.)
Cable Length	Up to 1000 m
Cable Diameter	6 to 12 mm
In Pipe Flow rate (velocity)	0 to 5 m/s
Communication	Modbus RTU
	4-20 mA Outputs (2 to 4)

Electrical Specification	
Electrical Input	Sensor: 24VDC @ 100 mA
	Transmitter:85 to 265 VAC 50/60 Hz
Power Connection	Power: NEMA 3 Plug or Conduit
Sensor Connection	M12-4 Male (Supplied)
Power/Current	10 Watt
Terminal Wire Ranges	12 to 22 AWG
Relative Humidity	0 to 95% (non-condensing)
Pollution Degree	IP65
Over Voltage Category	2
Wet location	Yes

2 Remover Tool Guidelines

1. Remover tool is to be used to install or remove two nuts from threaded rods.

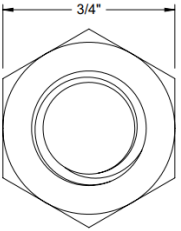


Figure 1: Remover tool drives nuts that are 3/4" wide and have a thread of 1/2”-13.

2. Remover tool to be used only to drive the sensor into and out of the valve assembly.

	CAUTION
	The remover tool can fail if used to release wrench-tight nuts or to tighten nuts.

3. It is highly recommended to drive the remover tool with a battery-operated 12V-20V drill with adjustable torque settings and a 1/4” hex bit as shown below.

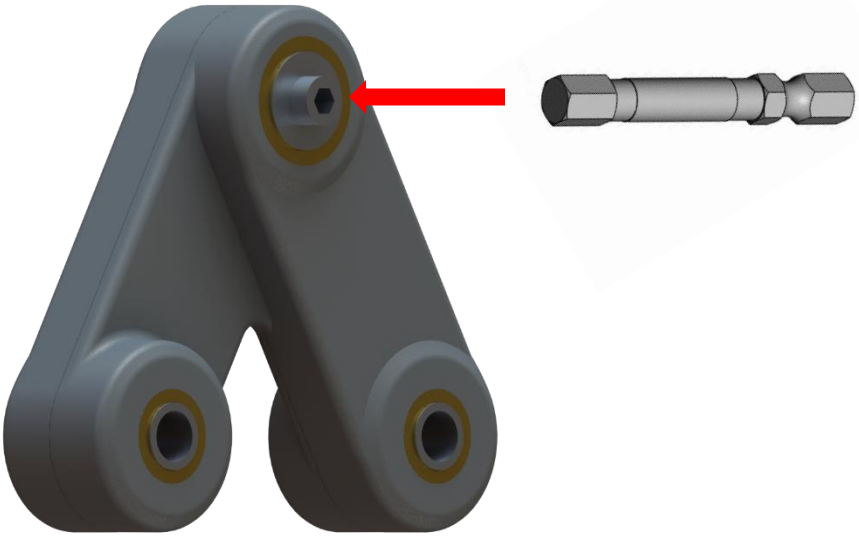


Figure 2: Quick-Release Hex Bit for Impact Driver 1/4" Shank Size to 1/4" Hex recommended to drive remover tool.

4. Nuts are to be inserted into the nut cut-outs to drive them evenly along the threaded rod.

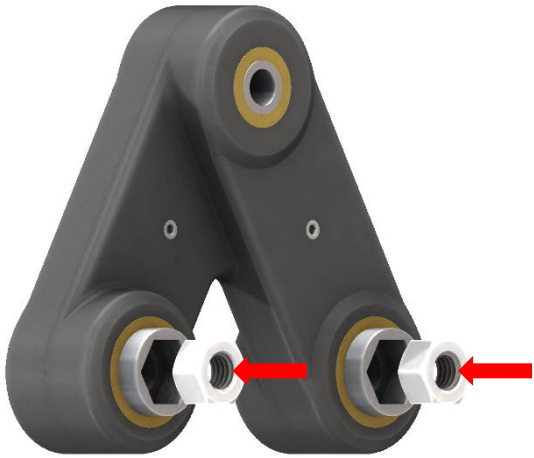


Figure 3: Nuts to be inserted into the remover tool before using.

3 Sensor Installation

DANGER

Multiple hazards. Only qualified personnel must conduct the tasks described in this section of the document.

The sensor is not affected by changes in flow rates. Flow velocities from zero to 15 feet per second result in a negligible change in signal.

2.1 Installation Location Considerations

1. Located in a straight length of pipe at least 1.5 times the pipe diameter.
2. The tip of the sensor should protrude into the pipe a minimum of 30mm.
3. Horizontal pipe installation: The valve should be installed into the pipe from 2 o'clock to 5 o'clock or 7 o'clock to 11 o'clock.
4. The sensor boss should be installed in a position on the pipe that will minimize sediment from accumulating or burying the sensor inlet.
5. The sensor should not be exposed to large debris.
6. Sensor ejection port should be oriented perpendicular to flow.
7. Max cable length for RS485 is 1000 m.

2.2 Component Labels

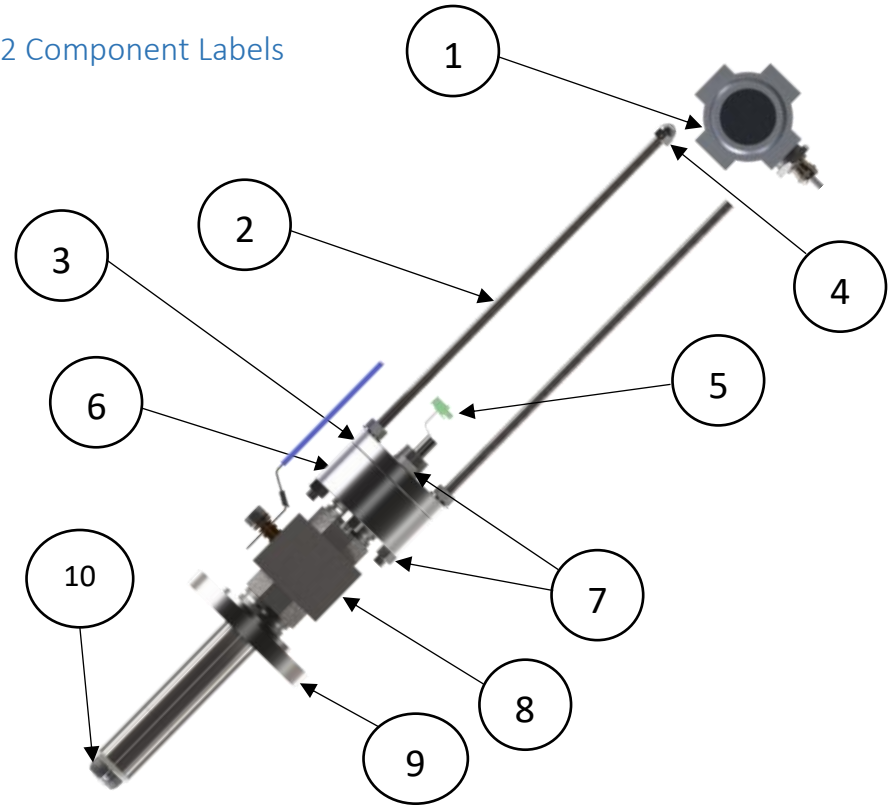


Figure 4. T-H1WT-SR installation components.

No.	Part Description
1	IECEx/ATEX Junction Box Assembly, 1” NPT
2	Super Duplex All-Thread Rod, ½” - 13 x 18” with 4x nuts and washers
3	Wet Tap Mater
4	Cap Nut ½” - 13
5	4-pin Terminal Plug Male 5.08 mm, 12 – 30 AWG
6	Wet Tap Cap
7	2x Hex Bolts, Nuts, and Washers, ½” - 13
8	2” NPT X 2” NPT Titanium Valve Assembly
9	2” NPT #150 ASME B16.5 Titanium Flange
10	Sensor End Assembly

2.3 Installation

This instruction assumes that the titanium valve assembly has been installed in the desired location in the pipeline. Care must be taken if the system is running during sensor installation.

A wide-opening adjustable wrench and a cordless drill with ¼" hex attachment are needed for installation.

1. Remove the tape from the wet tap cap.

Figure 5. Blue tape location on cap

2. Install the two all-thread rods into the Cap until flush with cap base. Thread rod into hex nuts until flush with the base of the nut. Tighten nuts wrench tight.

Figure 6. Valve-side of cap showing ½ inch protrusion of all-thread rod.

3. Slide sensor/mater assembly into the cap using all thread rods. Ensure the sensor sleeve is pushed past the two O-rings located inside the cap. Correct depth is indicated by the line on the sensor housing.

Figure 7. Cross-Section of Cap with sensor end pushed passed both internal O-rings.

4. While the valve is still closed, thread washers and nuts onto all-thread rods evenly using the remover tool as shown until they are flush with the mater. Insert the sensor into the valve assembly until the sleeve line is just below the mater. Do not force the sensor into closed ball valve.

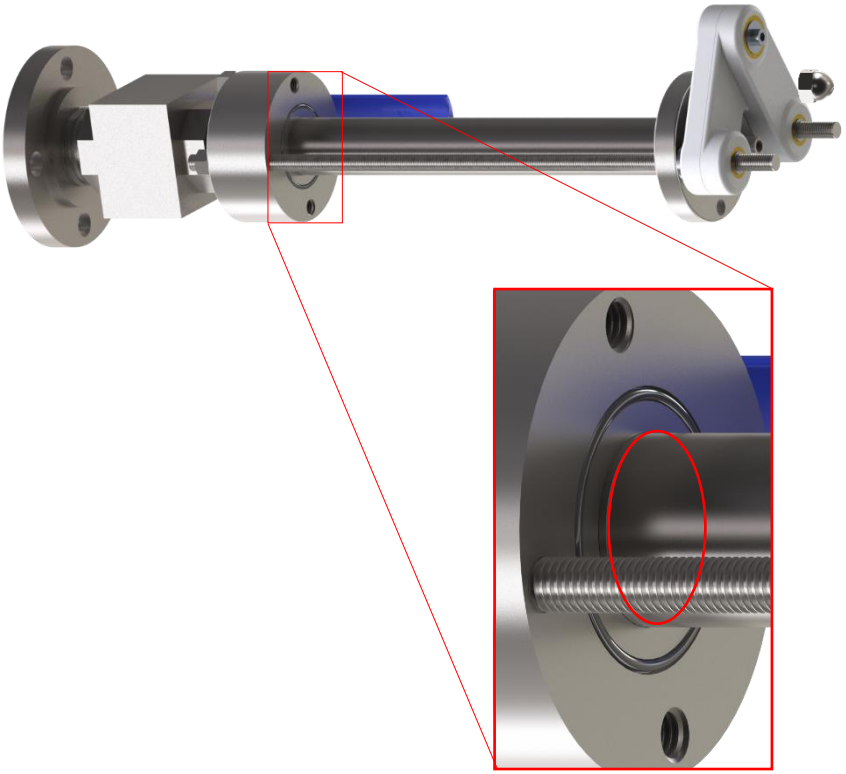


Figure 8. Wet tap assembly prior to opening the valve. The red circle indicates the notch that is visible on sensor housing.

DANGER

MUST INSTALL CAP NUT ONTO THREADED ROD END BEFORE VALVE IS OPENED.

5. Rotate the sensor so that the orientation sticker on the cable is facing perpendicular to the flow direction.

Figure 9. Orientation arrow depicting location of ejection port on sensor end. Line up perpendicular to flow direction.

6. Open the ball valve and insert sensor mater assembly completely into the process water stream using the remover tool and hex nuts. Mater should be completely flush with cap (as in figure 7).

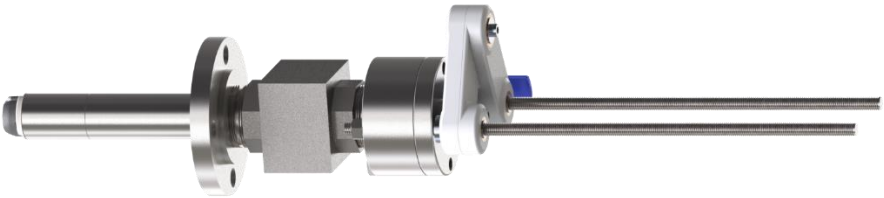


Figure 10. Wet tap assembly fully inserted into process stream.

7. While all-thread studs are still installed, secure the cap and mater using the two hex bolts, two washers, and two nuts. Wrench tighten.

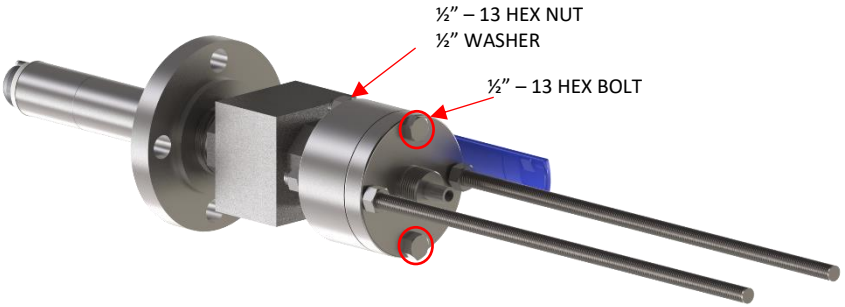


Figure 11. Wet tap assembly secured to valve assembly using hex bolts, washer, and nuts.

8. Once the hex nuts have been installed, remove all-thread studs by removing the lower all-thread nuts.
9. After removing lower nuts, all thread rods can be removed. Set aside: 2x rods, 4x hex nuts, and 2x washers; components listed must be re-installed for sensor removal.

10. Install junction box. Halogen wrench may be used to prevent spinning.

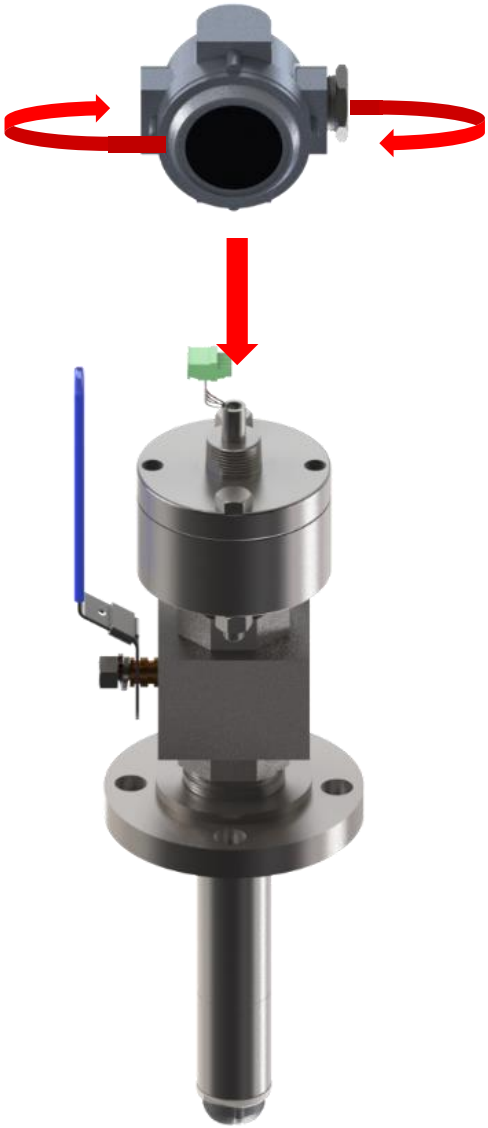


Figure 12. Junction box installation instruction.

11. Install the strain relief onto the junction box assembly until strain relief O-ring is snug against the junction box assembly.

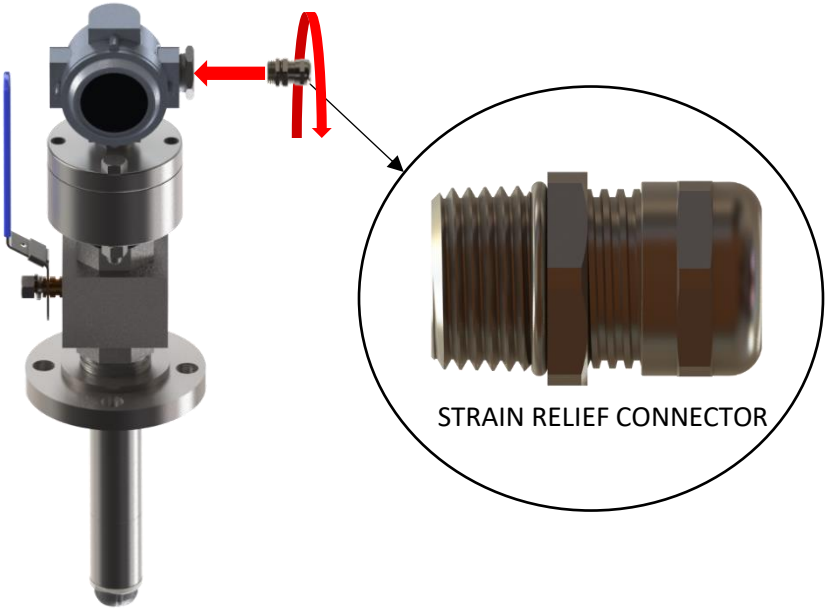


Figure 13. Strain relief is not attached to junction box assembly.

12. Remove the junction box lid.

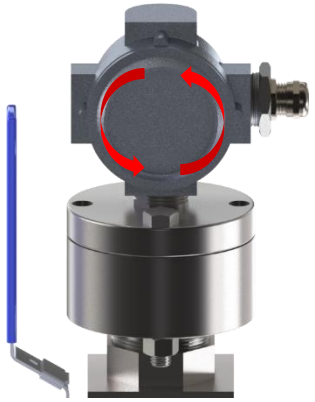


Figure 14. Junction box lid location and removal instruction.

13. Install cable per SealCon strain relief installation instructions. **Acceptable cable range**: 6 to 12 mm.

14. Connect 4-pin green terminal blocks as shown below, avoid excessive pulling or twisting of the wires.

Figure 15. Junction box lid removed, cable connection demonstration.

CAUTION
CONNECTING GREEN TERMINAL BLOCKS BEFORE JUNCTION BOX INSTALLATION WILL RESULT IN DAMAGED WIRES AND MAY RENDER THE UNIT DEFECTIVE.

15. Reinstall the junction box lid.

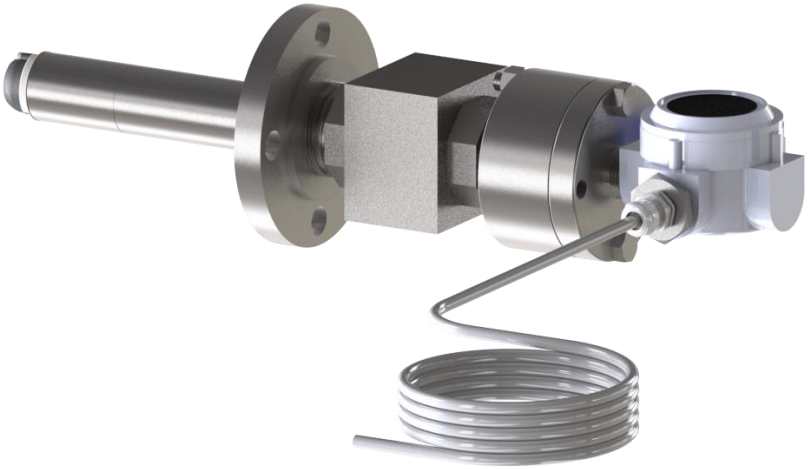


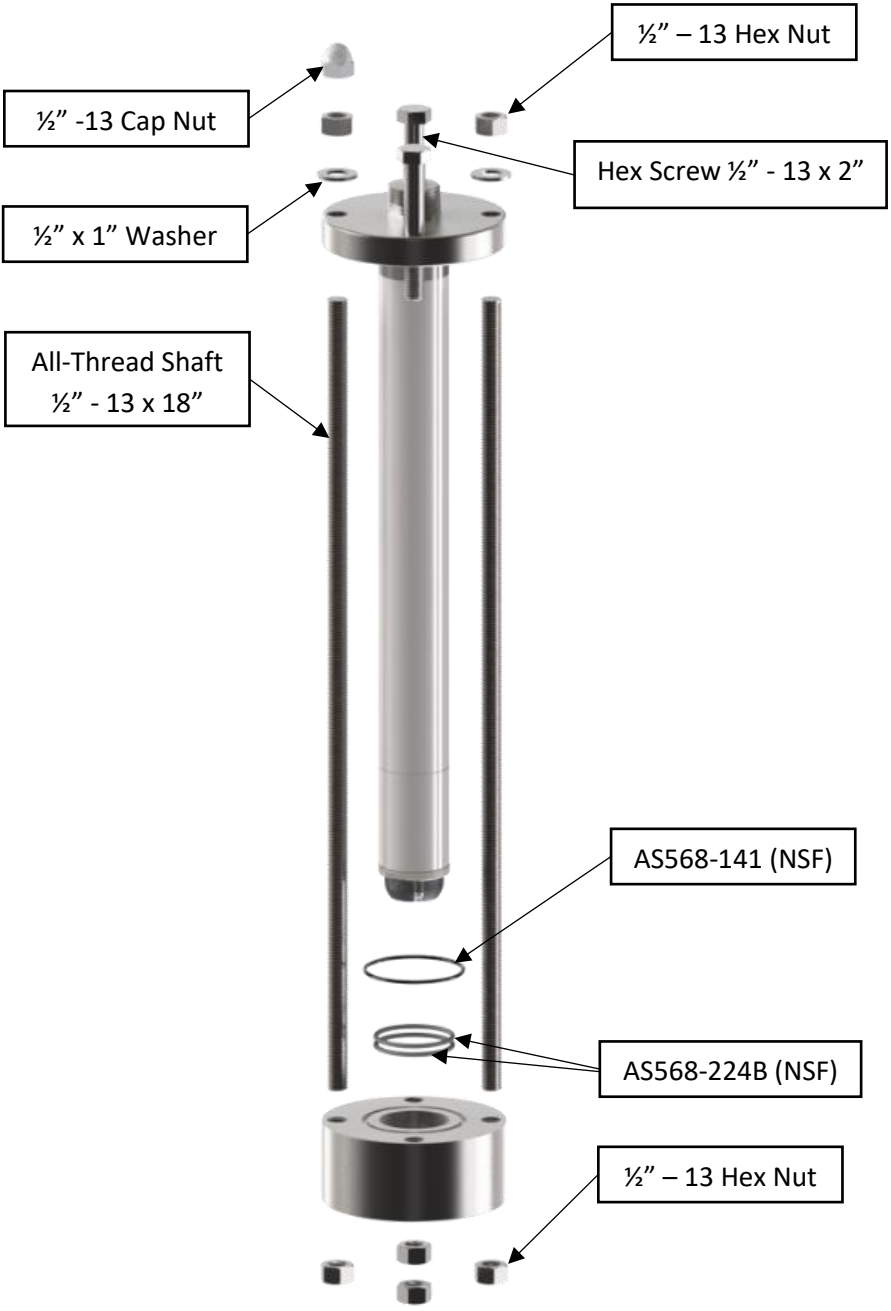
Figure 16. Fully installed sensor.

16. Connect the cable to Halogen Systems transmitter via included 4-pin M12 connector.
17. For maintenance/removal, follow the reverse order of installation instructions.

DANGER

THREADED RODS MUST BE INSTALLED FOR SENSOR REMOVAL. CAP NUT MUST BE FASTENED AT THREADED ROD END.

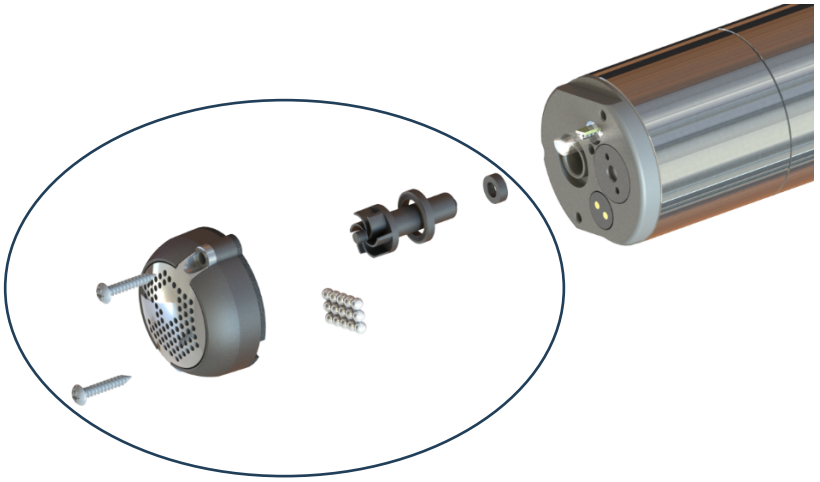
4 Remover Replacement Part Descriptions



5 Valve Assembly Replacement Part Descriptions

6 Sensor Wear Parts

Sensor wear parts are to be replaced annually with constant duty operation or every 24 months with intermittent operation. A wear parts replacement kit is available from Halogen Systems, Inc. All wear parts are included in KITS-0002.



Kit Contents:

1. Cover Screws (x2)
2. Sensor Cover (x1)
3. Cleaning Beads (x2 packs of 15 ea.)
4. Impeller (x1)
5. Wear Ring (x1)

7 Limited Warranty

Halogen Systems warrants its products against material workmanship defects for a period of one (1) year from the date of shipment.

In the event that a defect is discovered during the warranty period, Halogen Systems agrees, at its option, to repair or replace the defective product. Any product repaired or replaced under this warranty will be warranted only for the remainder of the original product warranty period.

Products may not be returned without authorization from Halogen Systems. To obtain authorization, please call Halogen Systems for a return material authorization number.

Limitations:

This warranty does not cover:

1) Damage caused by misuse, neglect (lack of appropriate maintenance), alteration, accident, or improper application or installation.
2) Damage caused by any repair or attempted repair not authorized by Halogen Systems.
3) Any product not used in accordance with the instructions furnished by Halogen Systems.
4) Damage caused by acts of God, natural disasters, acts of war (declared or undeclared), acts of terrorism, work actions, or acts of any governmental jurisdiction.
5) Freight charges to return merchandise to Halogen Systems.
6) Travel fees associated with on-site warranty repair.

This warranty is the sole expressed warranty made by Halogen Systems in connection with its product. All other warranties, whether expresses or implied, including without limitation, the warranties of merchantability and fitness for a particular purpose, are expressly disclaimed.

The liability of Halogen Systems shall be limited to the cost of the item giving rise to the claim. In no event shall Halogen Systems be liable for incidental or consequential damages.

This warranty is the sole and complete warranty for Halogen Systems. No person is authorized to make any warranties or representations on behalf of Halogen Systems.

Halogen Systems reserves the right to change or modify this warranty at any time.