

SWN- P+

Standard Sensor Installation Manual



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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 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.

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Product Description

The Sensor consists of the sensor probe, an optional Hot-tap mounting system, and an optional remote display unit.

1.1 FEATURES

- Measures TRO in samples having pH as high as 8.6
- Low maintenance
- No membranes or electrolyte replacement required
- No waste stream or flow control
- Direct pipe insertion
- Self-cleaning

1.2 Measurement Ranges

Refer to Operation and Maintenance Manual for complete measurement specifications.

| Measurement | Range | Notes |
|--------------|---------------------|--------------|
| TRO | 0 to 20 ppm | Auto-ranging |
| ORP | -1100 to 1100 mV | |
| Conductivity | 0 to 65,000 μ S | Auto-ranging |
| Temperature | 0 to 100° C | |

1.3 SPECIFICATIONS

Sensor

Sample requirements:

Pressure: -0.7 to 10 Bar

Temperature: -5 (non-freezing) to 50° C

Minimum Flow: N/A

Maximum flow: 5 m/Sec

Sample Salinity: 3 to 34 PSU at 0 to 25°C

Process connection: 3/8" OD tube connections

Wetted parts:

Teflon, PVC, platinum, PEEK

pH sensor: PVC, Buna N, glass, Stainless Steel 316

Response time to step change in TRO concentration: <130 sec to 95% of final reading.

Weight/shipping weight:

Model SWN-P: 3 kg

[rounded to the nearest 1 lb. (0.5 kg)]

Sensor housing: Stainless Steel 316

2 Sensor Installation



DANGER

Multiple hazards. Only qualified personnel must conduct the tasks described in this section of the document. Make sure ballast pipe isolation valves are closed and the ballast pipe is drained before installation.

The two main components of the TRO System must be mounted separately. The sensor is not affected by changes in flow rates.

2.1 Standard Sensor (SWN-P+CH) Chamber Installation

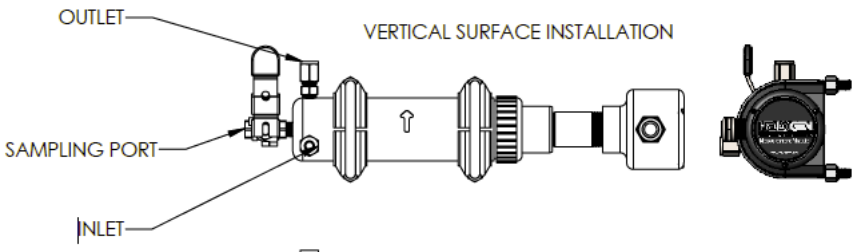


Figure 1: Chamber installation on a vertical surface. The label indicates the outlet port position. Label should face up. Inlet and outlet are 3/8" OD tube fittings.

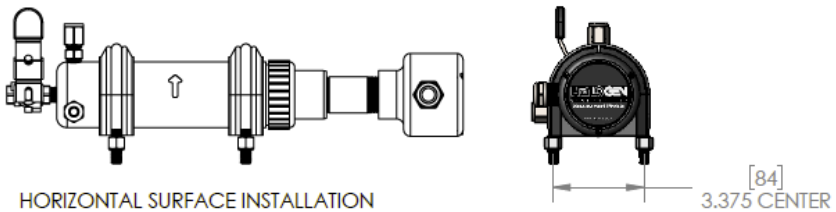


Figure 2: Chamber installation on a horizontal surface. Also shown is width between mounting holes

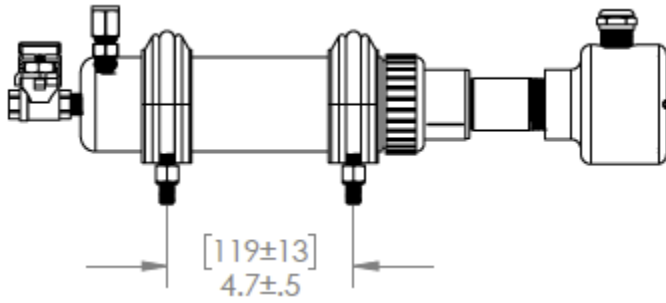


Figure 3: Distance between mounting holes- note brackets can be moved

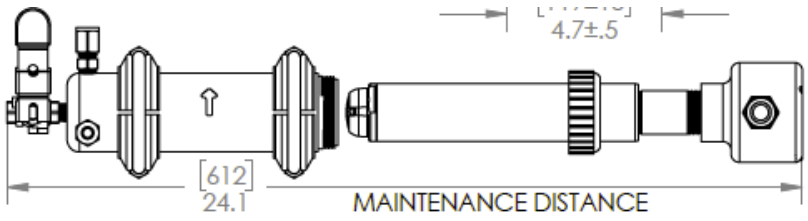


Figure 4: Required clearance require for maintenance

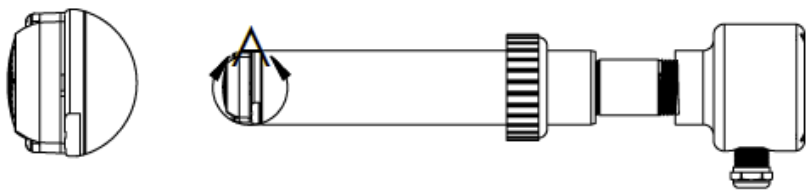
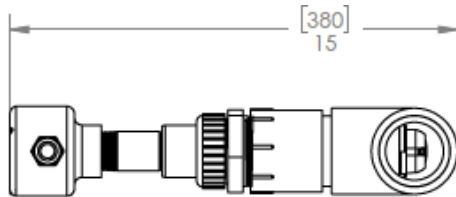


Figure 5: Outlet port orientation to ensure outlet port is "up" to purge air.

2.2 Standard Sensor (SWN-P+) Pipe Installation

Location of TRO Sensor in Pipe or Boss.

- LOCATED IN A STRAIGHT LENGTH OF PIPE AT LEAST 1.5 TIMES THE PIPE DIAMETER (BOTH IN FRONT AND BEHIND SENSOR).
- THE TIP OF THE SENSOR SHOULD PROTRUDE INTO THE PIPE A MINIMUM OF 30 MM. THERE IS NO MAXIMUM.
- ORIENTATION OF THE SENSOR SHALL BE FROM 90° TO 270° ANGLE OFF- a 90° Angle is ideal.
- THE SENSOR BOSS SHOULD BE INSTALLED IN A POSITION ON THE PIPE THAT WILL MINIMIZE SEDIMENT FROM ACCUMULATING OR BURYING THE SENSOR INLET.
- THE SENSOR SHOULD NOT BE EXPOSED TO LARGE DEBRIS.
- FLOW IN EITHER DIRECTION IN A VERTICAL PIPE IS OK. SENSOR OUTLET MUST BE PERPENDICULAR TO FLOW.
- Use low voltage instrumentation cable with 4 conductors and a braided shield such as Tricab 4c1mm²,
- See section on using Feed Through Cable Glands supplied on sensor junction box in Figure 12.



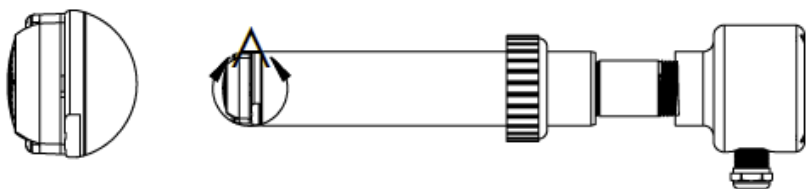
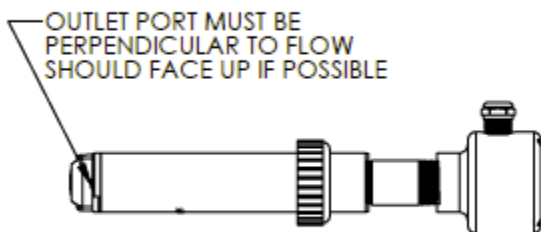
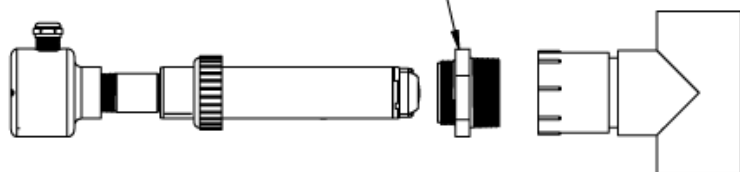


Figure 6: Outlet port orientation to ensure outlet port is "up" to purge air.



MOUNT ADAPTER (SUPPLIED BY MAKER)



The sensor is not affected by changes in flow rates. Flow velocities from zero to 10 feet per second result in a negligible change in signal. The sensor should be oriented as shown below:

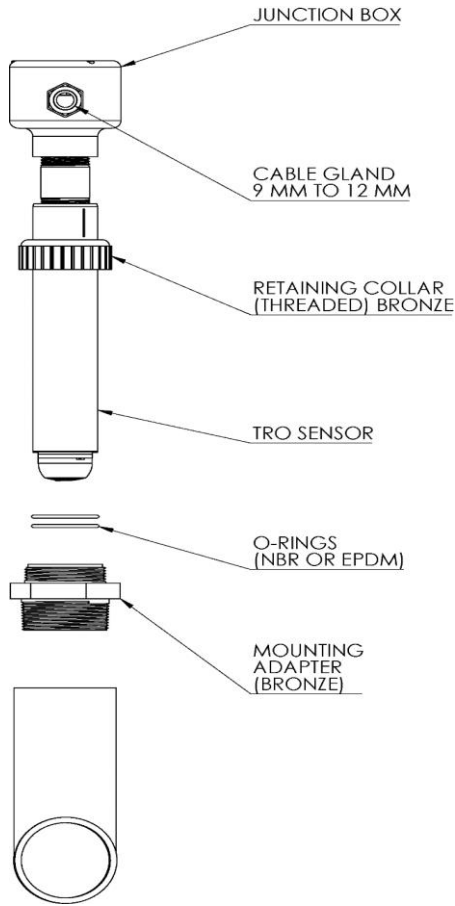


Figure 7:Detail of Installation Components.

Note: A sampling port should be provided near the sensor for calibration purposes.

2.3 Standard Sensor (SWN-P+) Pipe Boss Installation

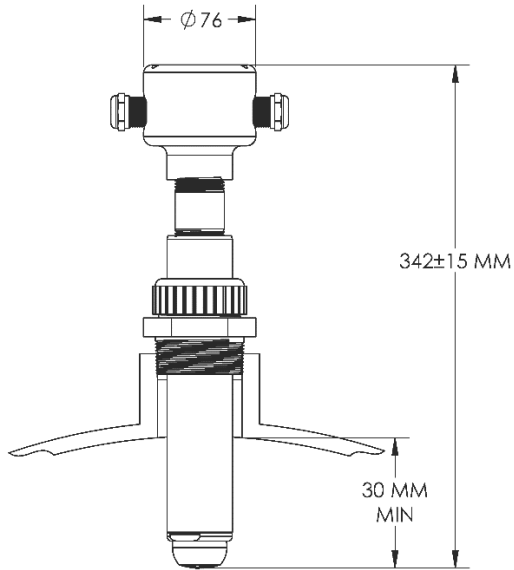


Figure 8: Standard Ballast Water unit installed in pipe.

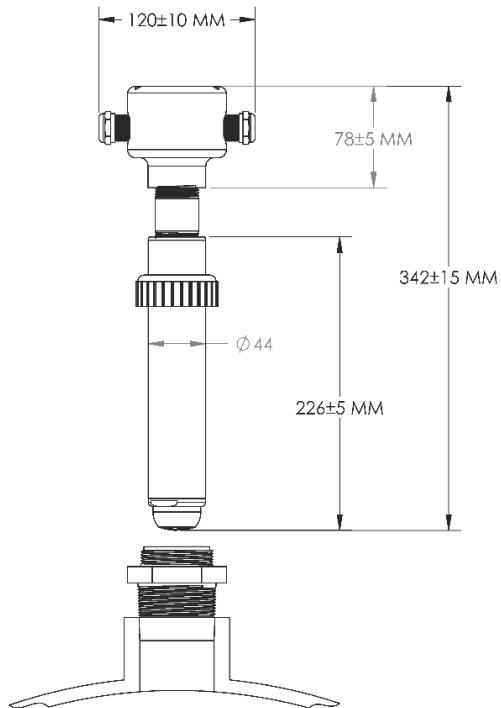


Figure 9: Remove the protective cap.

Figure 4: Remove the protective cap.

The Sensor Adapter (SD-40-010) should be installed in a 2" Female pipe thread fitting. Teflon tape can be applied to the threads or a paste pipe thread sealant such as a Teflon Thread Sealant (preferred). Thread the adapter (SD-40-010) into the pipe fitting. A wrench may be used on the flats on the adapter. Position of the sensor (SD-30-000) can be from 90° to 270° vertical. It should not be subject to exposure to large debris. Route the cable away from any high voltage conductors. Orient sensor (SD-30-000) with outlet facing up. Insert the sensor into the Adapter until it seats in the Adapter and tighten the Retaining nut (SD-10-040) to seal the sensor in the plumbing. Note: the Mount Adapter is used with metal pipe. If used in non-metallic pipe the Adpater must be grounded.

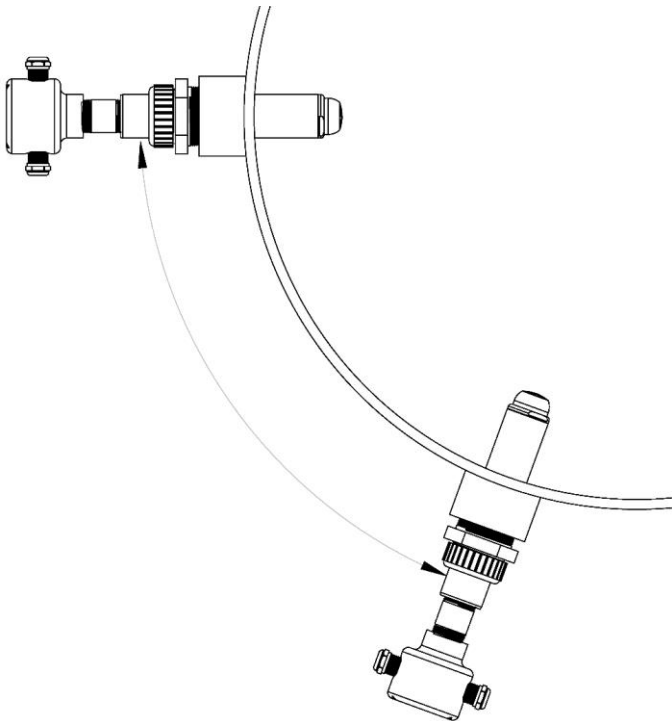


Figure 10: Sensor Orientation (Standard unit)

2.4 Display Mounting

The display should be mounted in a dry area, preferably at eye level using the tabs on the enclosure. The side with the single knockout should face downward.

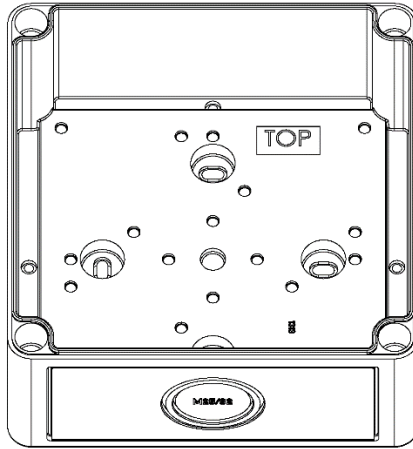
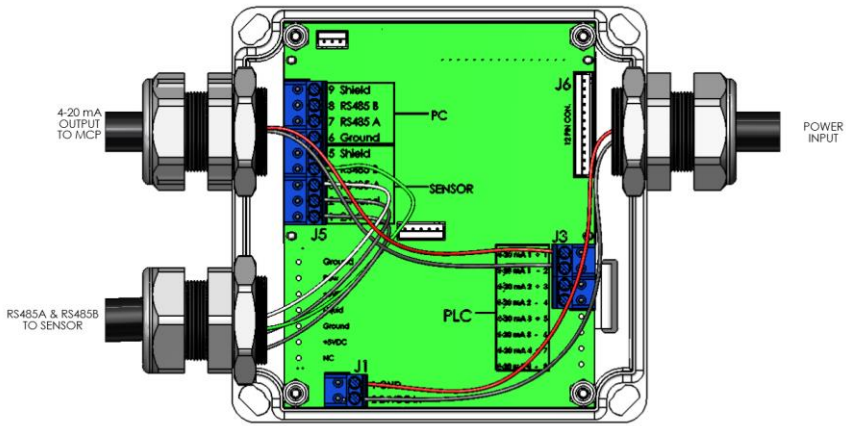


Figure 11: Display enclosure should be installed with the single knockout facing downward

2.5 Input Wiring

Ensure that there is a switch or disconnect to power down the system as necessary. Remove the enclosure cover by removing the four screws.

The Display should be wired for 24 VDC. The system is designed for use 120W 24V 5A Power Supply.



DETAIL A
SCALE 1 : 1

Sensor Module wiring note: the shield or external cable shield should make contact with the metal cable gland on the sensor module, which in turn, will provide contact with the metal sensor housing. If there is no external shield or armor then the shield should be exposed on the cable by removing the outer insulation jacket (Cable gland on Sensor only). This procedure is described in Figure 12

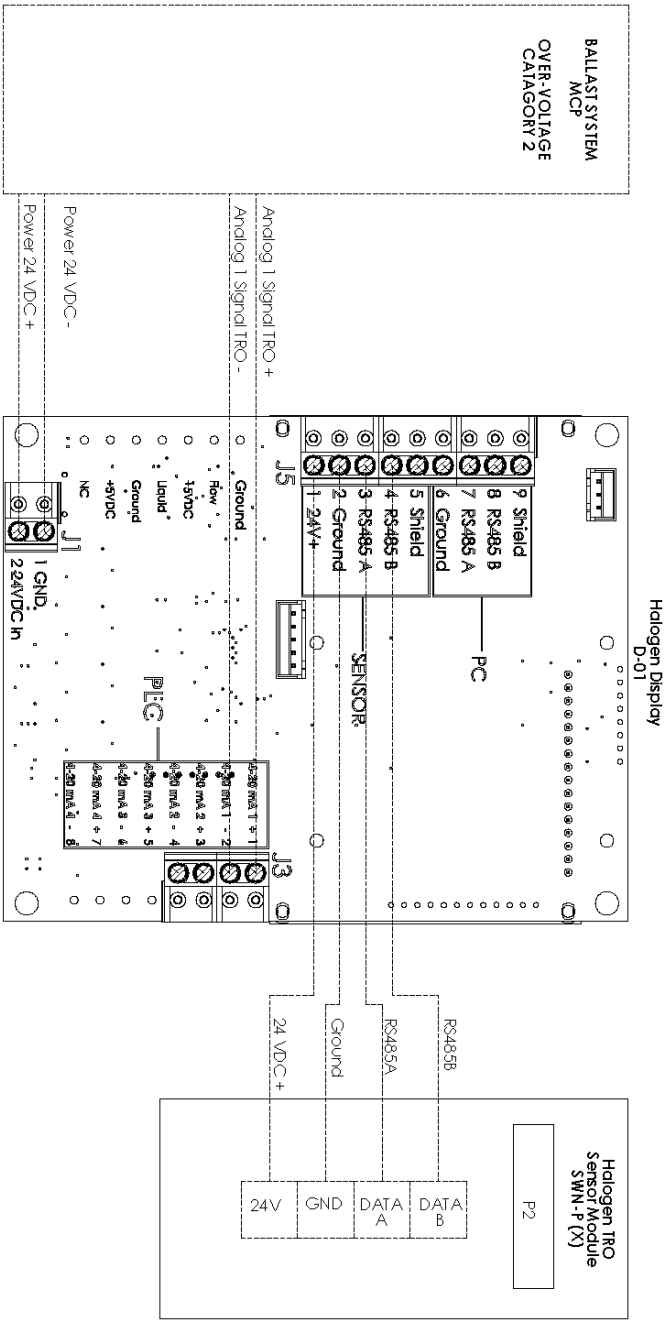


Figure 11: Wiring to Ballast MCP

3 Cable Gland Installation Instructions for Sensor




| Feed-Through (-FE) | |
|---|---|
|  | <p>Option 1 - Partial Jacket Stripping:</p> <ul style="list-style-type: none">• Expose shield approximately 7/16" (10 mm)• Insert cable into fitting until the foil or braid reaches the contact position• Tighten the dome nut• Finished |
|  | <p>Option 2 - Total Jacket Removed:</p> <ul style="list-style-type: none">• Remove cable jacket to expose the braid or foil• Insert cable into fitting until the braid reaches the contact point• Tighten the dome nut• Finished |
|  | <p>Option 3 - Fold Shield over Jacket:</p> <ul style="list-style-type: none">• Strip cable jacket & braiding to different lengths• For smaller cable diameters fold the braided shield back over the cable jacket• Insert cable into fitting until the braid reaches the contact point• Tighten the dome nut• Finished |

Figure 12: Cable Gland Installation Instructions

4 Limited Warranty

Halogen Systems warrants its products against material workmanship defects for a period of one 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 disaster, 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.