

SWN-P-HT2(+) Sensor Installation Manual



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Safety Considerations

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.

Contents

General.....	4
Sensor Installation.....	4
Location of Components.....	4
TRO Sensor.....	4
1.1 Installation.....	5
1.2 Sensor Installation.....	6
Sensor Preparation.....	9
HTV-01 Sensor Installation.....	9
HTV-02 Sensor Installation.....	9
Removal of the sensor.....	10
1.3 Display Mounting.....	10
Display Input Wiring Instructions.....	11
Cable Gland Installation Instructions.....	11
Limited Warranty.....	15
Operation and Maintenance Manual.....	16

General

Halogen Systems Inc. (HSI) Total Residual Oxidant (TRO) sensor is an online, amperometric sensor used for the detection and quantification of total chlorine concentration for use in ballast water treatment applications. that quickly and reliably report Total Residual Oxidizer, salinity, ORP, temperature and optional pH to ballast water management systems. HSI TRO sensors are not affected by changes in flow rate and experience negligible changes in signal in flow changes between 0 and 15 feet per second. This manual is intended as a general guide for direct pipe installation applications (Hot-Tap).

The sensor consists of the sensor probe, an optional Hot-Tap mounting system (HTV-01 or HTV-02), and an optional remote display unit. Packaging and sensor should be carefully inspected to verify that no visible damage has occurred during shipment. If parts received do not match those ordered, please contact the local distributor or Halogen Systems Customer Service. The main components of the TRO system must be mounted separately.

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.

Location of Components

TRO Sensor

1. LOCATED IN A STRAIGHT LENGTH OF PIPE AT LEAST 1.5 TIMES THE PIPE DIAMETER (upstream of the SENSOR).
2. THE TIP OF THE SENSOR SHOULD PROTRUDE INTO THE PIPE A MINIMUM OF 30 MM. THERE IS NO MAXIMUM.
3. ORIENTATION OF THE SENSOR SHALL BE FROM 90° TO 270°.

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. FLOW IN EITHER DIRECTION IN A VERTICAL PIPE IS OK. SENSOR OUTLET MUST BE PERPENDICULAR TO FLOW.
 7. ALWAYS BE ORIENTED PERPENDICULAR TO THE FLOW. THIS IS MOST IMPORTANT. IN THIS CASE OF INSTALLATION IN A VERTICAL PIPE, THE OUTLET WILL NOT BE FACING UP BUT RATHER SIDWAYS (TOWARD THE SIDE OF THE PIPE NOT FACING TOWARD THE OUTLET OR INLET).
1. FLANGE HOLES MUST LINE UP WITH HORIZONTAL AND VERTICAL DIRECTION OF PIPE.
 2. MAX CABLE LENGTH RS485: 1000m.
 3. LOCATE SENSOR AFTER HYDROGEN VENT.

1.1 Installation

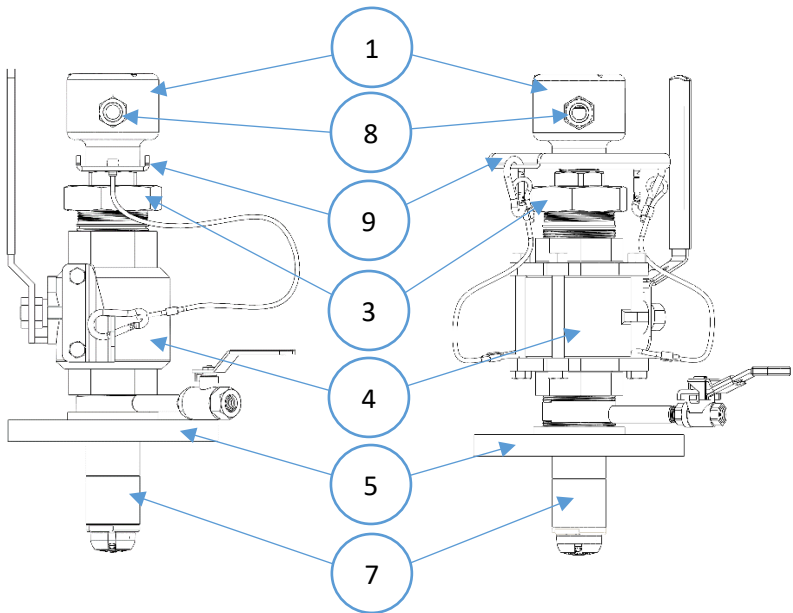


Figure 1: HTV-01 vs HTV-02 Components

NO.	DESCRIPTION	MATERIAL
1	JUNCTION BOX	ABS
3	UNION NUT	NICKEL ALUMINUM BRONZE
4	BALL VALVE 2 IN NPT	BRONZE
5	FLANGE JIS 10K-65A	SS316
7	HALOGEN SENSOR	VARIOUS MATERIALS
8	CABLE GLAND FOR 6-12 MM CABLE	NICKEL PLATED BRASS
9	LANYARD ASSEMBLY	SS316

1.2 Sensor Installation

The Hot-Tap (HT) Valve Assembly should be installed in a flange per the Ballast Water Treatment System (BWTS) instructions. JIS 10K 65A is standard used by HSI. JIS 5K 65A and JIS 10K 80A are available as a special order. Installation steps assume valve and flange installed to the ballast pipe per BWTS manufacturer specifications.

The sensor and valve assembly should be oriented in the ballast pipe as shown in the following figures. A sample port should be provided near the sensor. Optimum is horizontal orientation.

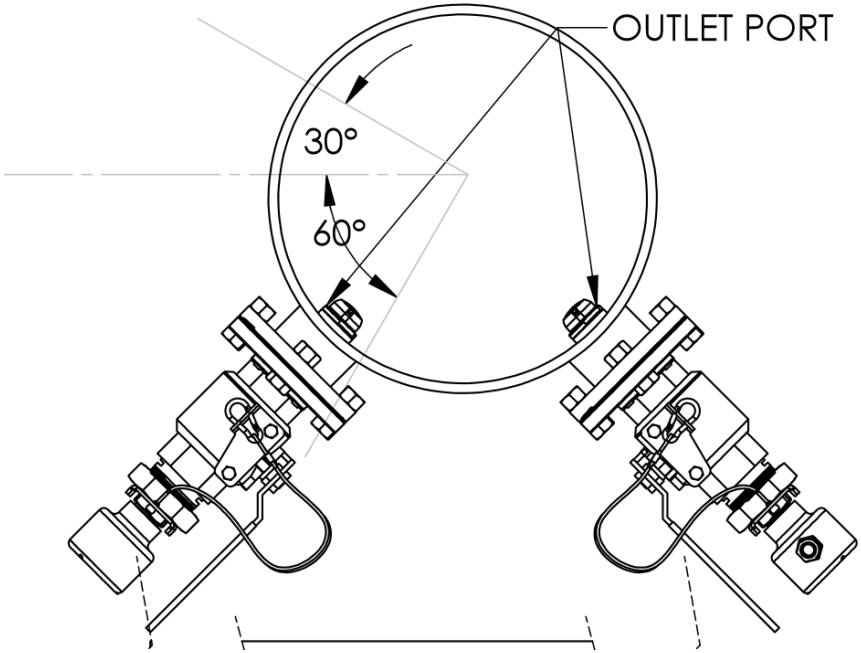


Figure 1: Horizontal Pipe Installation

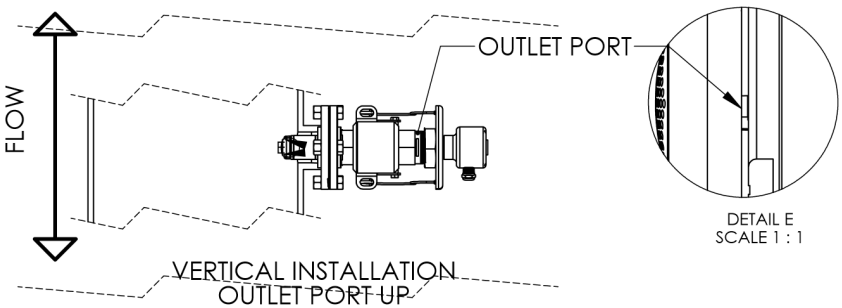


Figure 2: Vertical Pipe Installation

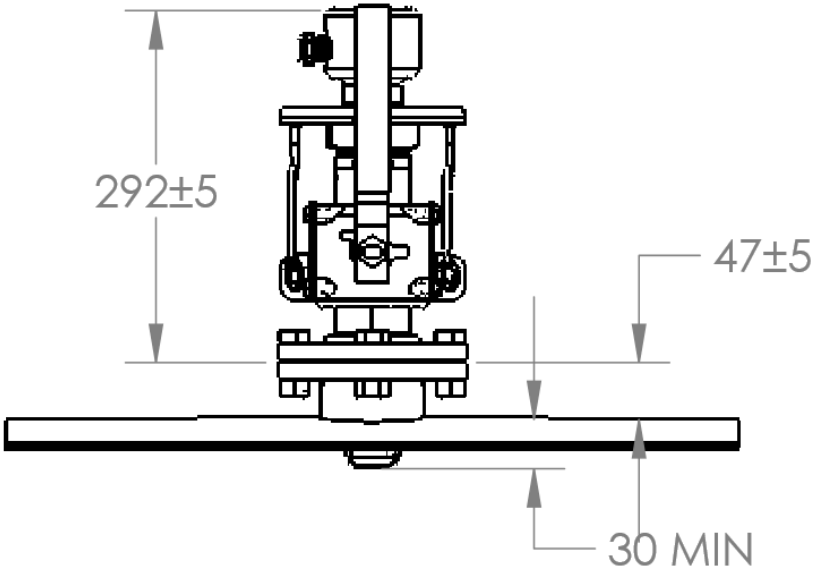


Figure 3: Illustration of valve and installation dimensions. Horizontal orientation shown only for ease of dimension understanding.

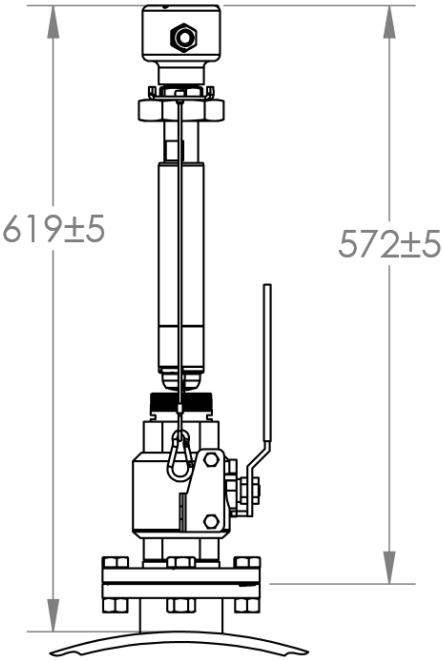


Figure 4: Maintenance Height

Sensor Preparation

- (1) If not already installed, install Union Nut assembly to 1" Male NPT thread on HSI sensor.
- (2) If not already installed, install Lanyard Assembly over Union Nut assembly as pictured in Figure 1.
- (3) Wrap PTFE Thread Sealing tape on to Union Nut assembly 1" Male NPT threads. (Should not need this since sealed by orings)
- (4) Install Junction Box assembly to Union Nut hand tight.
- (5) Open Junction Box assembly by removing 3x 4-40 Phillips Screws.
- (6) Wire sensor to Junction Box and Junction Box to PLC or Display Unit per Section 1.4. Route low voltage sensor cable away from any high voltage conductors.

HTV-01 Sensor Installation

- (1) Insert the sensor into the HTV-01 assembly until Union Nut assembly seats flush to the HTV-01 assembly. Additional silicone lubricant may be applied to valve O-rings to facilitate sealing.
- (2) Orient the sensor outlet port facing up (vertical, see drawing).
- (3) Tighten the Union Nut wrench tight to seal the sensor to the Ballast Pipe plumbing.
- (4) Attach Lanyard Assembly carabiners to valve lanyard brackets.

HTV-02 Sensor Installation

- (1) Insert the sensor into the HTV-02 assembly until Union Nut assembly seats flush to the HTV-02 assembly. Additional silicone lubricant may be applied to valve O-rings to facilitate sealing.
- (2) Tighten the Union Nut wrench tight to seal the sensor to the Ballast Pipe plumbing.
- (3) Remove valve body hex nuts from two opposing valve body hex screws.
- (4) Slide hex screw up and thread one lanyard cable eyelet over each hex screw.
- (5) Reinstall hex nut and lock washer. Torque to valve manufacturer specifications.

Removal of the sensor

Adequate clearance (577 mm) should be allowed during installation for maintenance of the sensors.

- (1) Ballast pump must be off.
- (2) Loosen Union Nut (3).
- (3) Withdraw sensor from valve until Lanyard is tight
- (4) Close valve handle
- (5) Push sensor down to provide slack
- (6) Unhook lanyard carabiners.
- (7) Remove sensor.

1.3 Display Mounting

The D01 display (DS-20-000) 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.

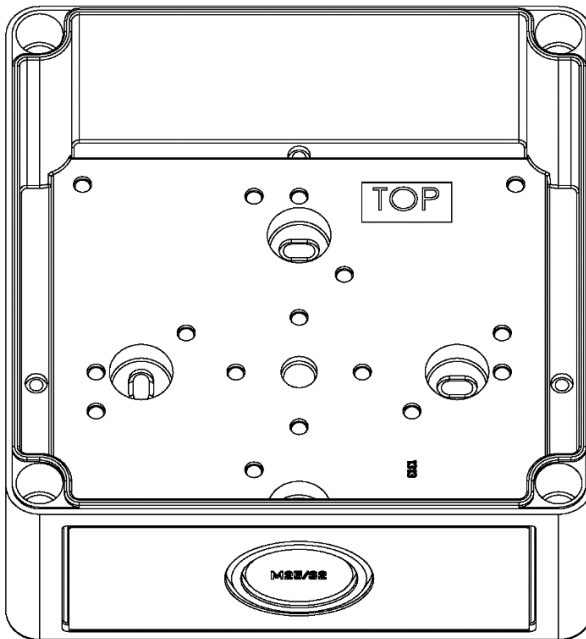


Figure 7: D-01 Display enclosure should be installed single knockout facing downward

Display Input Wiring Instructions

USE LOW VOLTAGE INSTRUMENTATION CABLE WITH 4 CONDUCTOR WITH BRAIDED SHIELD SUCH AS TRICAB 4c1mm2.

SEE FEED THROUGH CABLE GLAND INSTRUCTION **Error! Reference source not found..**

Remove the enclosure cover (DS-21-000) by removing the four screws (6-32 X 1.0" FHS).

The Display should be wired for 24 VDC. The system is designed for use with a a Weidmuller CP SNT 120W 24V 5A Power Supply or equivalent.

Cable Gland Installation Instructions

Ensure that there is a switch or disconnect to power down the system as necessary. It is recommended to use low voltage instrumentation cable with 4 conductors and braided shield such as Tricab 4c1mm2.

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 8: Cable Gland Installation Instructions

Sensor Module wiring note: the shield or external cable shield should contact the metal cable gland on the Junction Box, which in turn, will provide contact to 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 8.

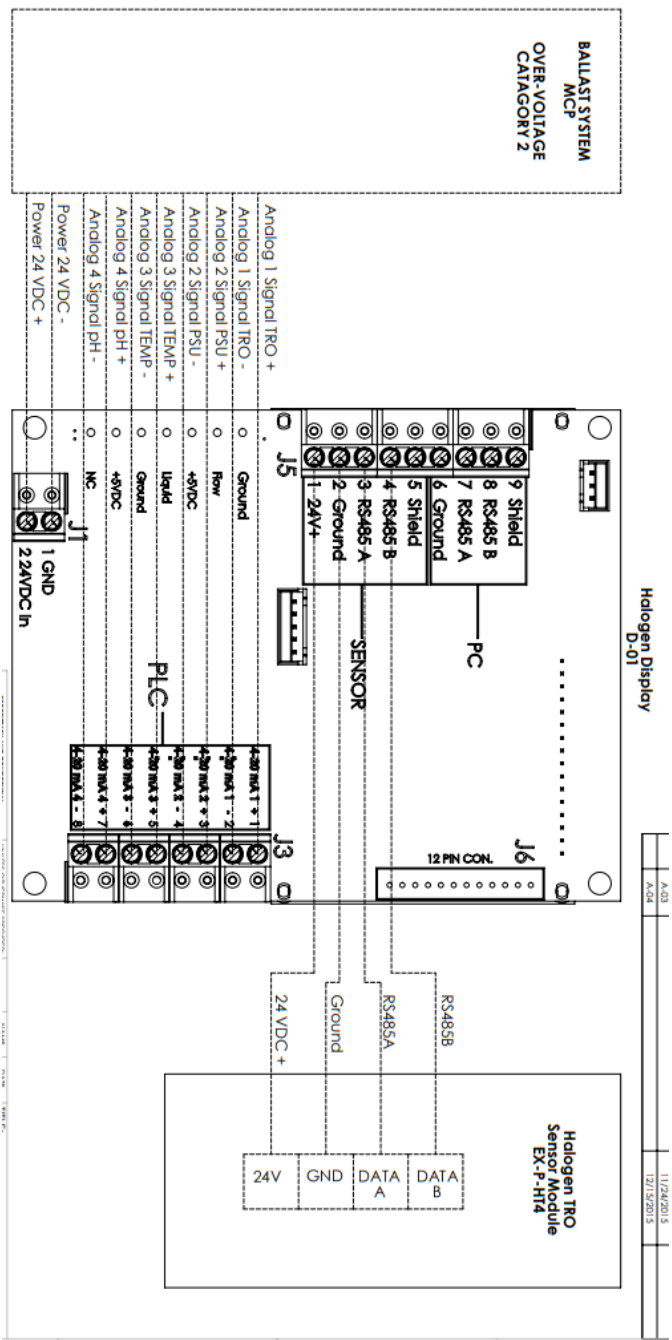


Figure 5: Wiring to Ballast MCP

DOCUMENT Version	REVISION DATE	REVISION DESCRIPTION
IM SWN-P- HT2+	6/30/2020	Initial Release
IM SWN-P- HT2+ Rev. B	10/28/2022	HTV-02 valve configuration added. Installation steps for Sensor, HTV-01 and HTV- 02 applications added. Logo and address updated.

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.

Operation and Maintenance Manual

