

WALCHEM

IWAKI America Inc.

Electrodeless Conductivity Sensors

ELECTRODELESS CONDUCTIVITY PASSIVE SENSOR Instruction Manual

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1.0 Introduction

The electrodeless conductivity sensors measure an induced current in a loop submerged in solution. Two coils are enclosed within the sensor, which is immersed in the chemical whose conductivity is of interest. An AC signal applied to one of the coils induces a current in the other coil, which is directly proportional to the conductivity of the solution.

2.0 Specifications

2.1 Measurement Performance

Conductivity Range:	500 $\mu\text{S}/\text{cm}$ – 2,000,000 $\mu\text{S}/\text{cm}$
Conductivity Resolution:	1 $\mu\text{S}/\text{cm}$, 10 $\mu\text{S}/\text{cm}$, or 100 $\mu\text{S}/\text{cm}$ (varies with controller range)
Conductivity Accuracy:	$\pm 1\%$ of reading
Temperature Range:	-5 to 80 $^{\circ}\text{C}$, 20 to 180 $^{\circ}\text{F}$ (CPVC) -5 to 88 $^{\circ}\text{C}$, 20 to 190 $^{\circ}\text{F}$ (PEEK)
Temperature Resolution:	0.1 $^{\circ}\text{C}$ (0.1 $^{\circ}\text{F}$)
Temperature Accuracy:	$\pm 1\%$ of reading

2.2 Mechanical

Part Number:	191639	191638
Sensor Material:	PEEK	CPVC
O-Ring Material:	N/A	FKM (in-line only)
Mounting Adapter Material:	316SS	CPVC (in-line only)
Dimensions:	7" long x 1" diameter	7" long x 1.75" diameter
Sensing Coil:	0.5" (1.3cm) aperture	0.5 (1.3cm) aperture
Pressure Rating:	0 to 140 psi (0 to 0.98 MPa)	0 to 140 psi (0 to 0.98 MPa)
Mounting:		
Submersion	1" NPTF thread	1" NPTM thread
In-Line	2" NPTM adapter	2" NPTM adapter

3.0 Installation

3.1 Mechanical Installation

General Guidelines

- Mount the sensor as close as possible to the controller.
- Take care to shield the cable properly.
- Maximum cable length is 20 feet.
- Position the sensor such that a fresh, representative sample of the solution is available.
- Position the sensor such that air bubbles will not be trapped within the sensing area.
- Position the sensor where sediment or oil will not accumulate within the sensing area.
- Do not place the sensor in the direct path of the flow of electrical current in the sample
- If cable is installed in metal conduit (recommended), either flexible conduit should be used or some other provision made for removal of sensor from the process for maintenance.

Submersion Installations

The submersion sensor requires a standard 1” NPTF coupling (user supplied) for connection to standard compatible pipe. The sensor should be immersed away from the walls and floor of the tank by a minimum of 2 inches. The support pipe must be long enough to be above solution level. It should be sealed at the top, with a user supplied cable clamp, to prevent moisture from filling the pipe. See Figure 1. This pipe will usually be suspended from a bracket attached to the lip of the tank.

If the cable run will be exposed to moisture (rain, hosing, etc.), it must be protected with flexible conduit (preferably metal).

In-Line Installations

CPVC (Part Number 191638)

Thread the custom bushing into the end port of a 2” or larger diameter tee as shown in Figure 4A. Note that the top of the sensor has a dimple drilled in the side to indicate the direction of the flow channel. Align this dimple with the tee exit. 2” to ¾ “adapters may be used on the entry and exit ports to allow for the use of ¾” pipe.

Caution: *It is important that the flow direction is in the end port and out the side port (as shown in Figure 2) to provide maximum cleaning of the sensor.*

If the sensor will be exposed to moisture (rain, hosing, etc.) the cable end must be protected.

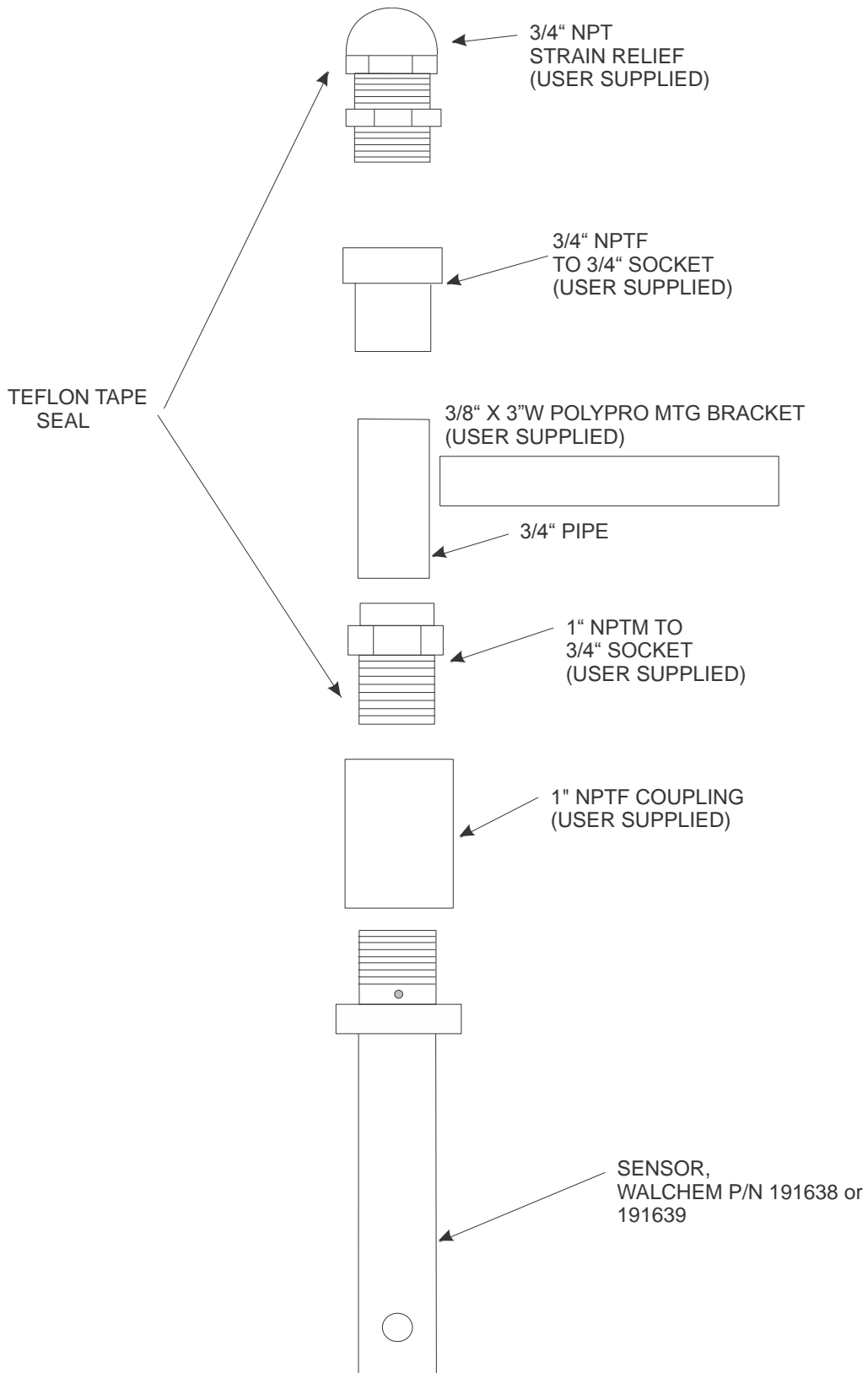


Figure 1 Submersion Installation, P/N 191638 and 191639

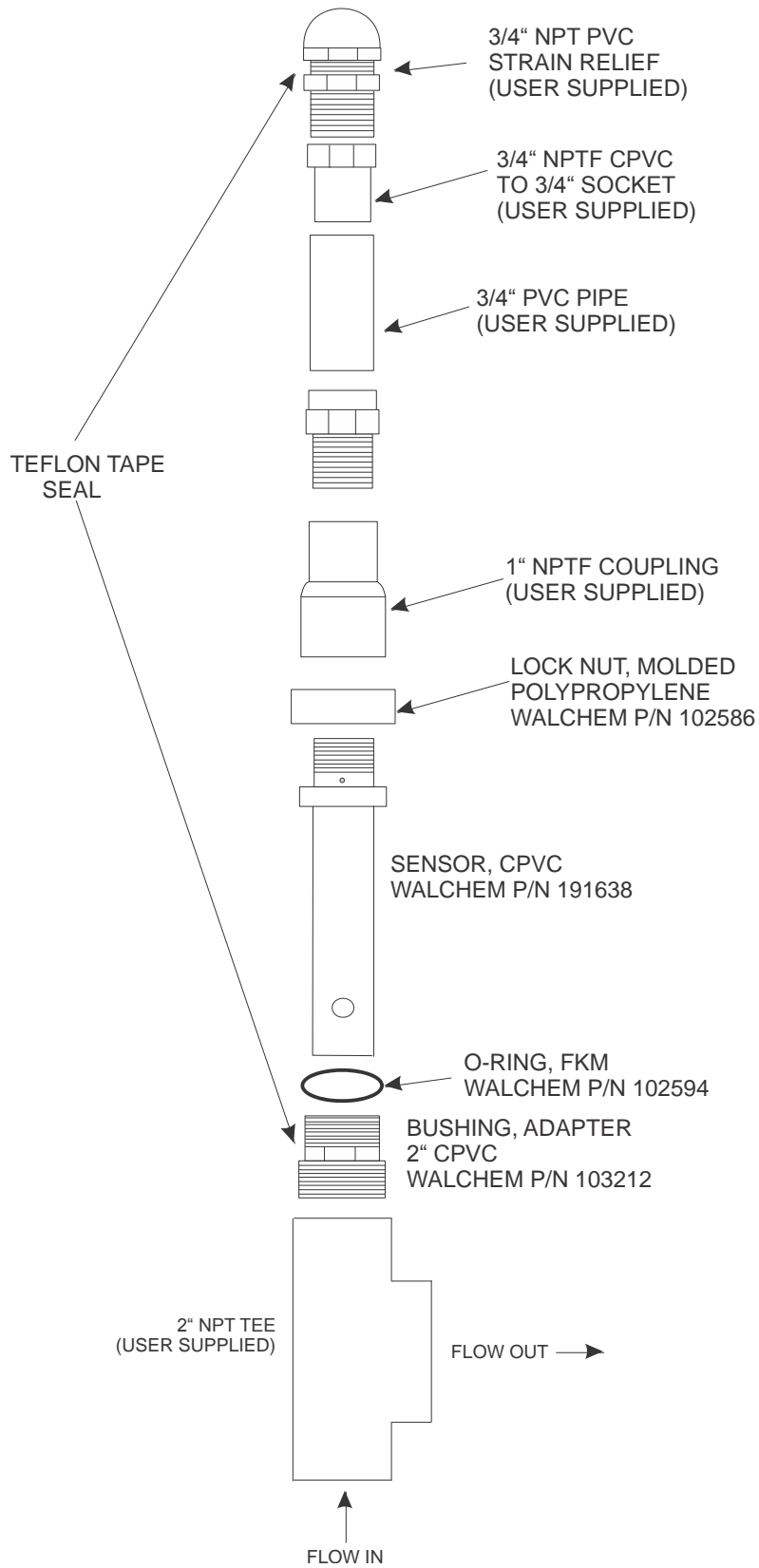


Figure 2 In-Line Installation – P/N 191638 CPVC Sensor

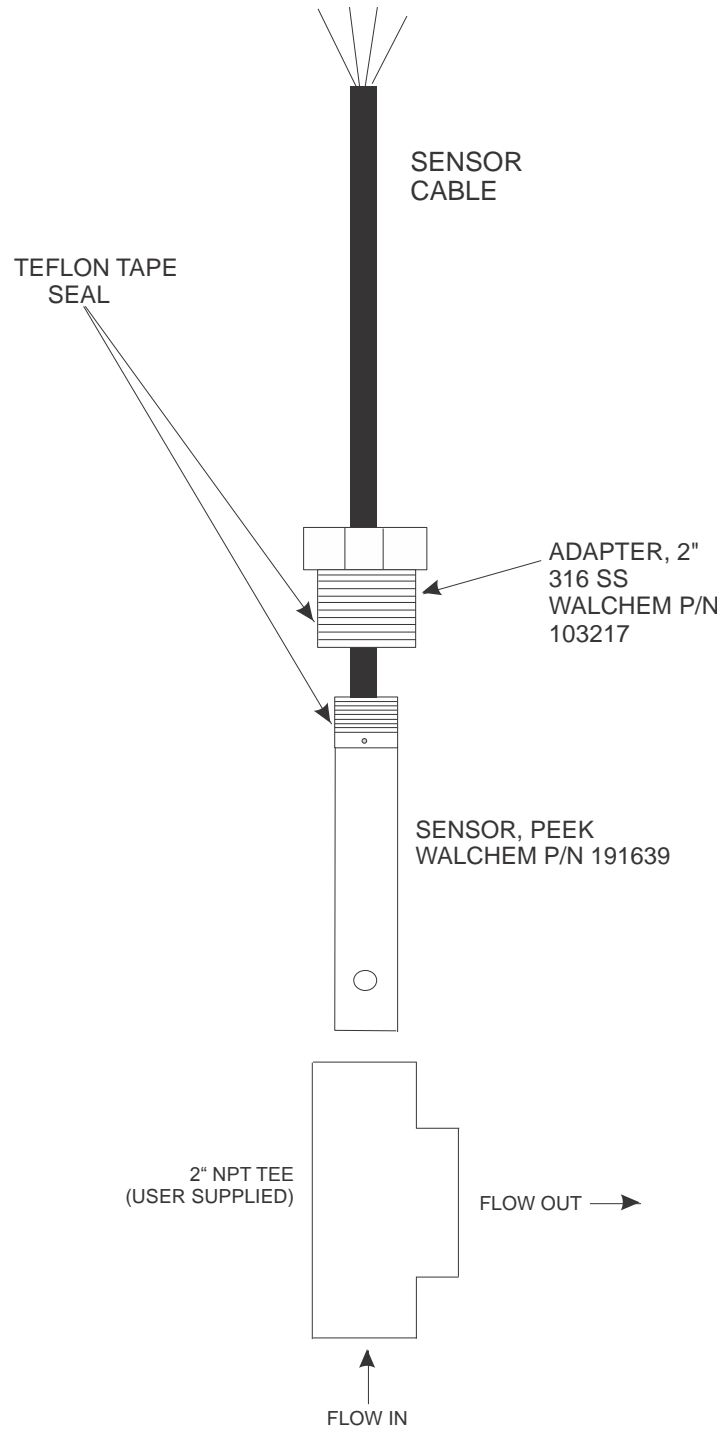


Figure 3 In-Line Installation – P/N 191639 PEEK Sensor

3.3 Electrical Installation

Route the cable through one of the water tight cable glands on the WCN series controller, and connect the wires matching the wire label with the terminal block label.

4.0 Maintenance

4.1 Cleaning the sensor

Note: the controller must be recalibrated after cleaning the probe.

- The probe should be cleaned periodically. The frequency required will vary by installation. In a new installation, it is recommended that the probe be cleaned after two weeks of service. To determine how often the probe must be cleaned, follow the procedure below:
 1. Read and record the conductivity.
 2. Remove, clean and replace the conductivity probe.
 3. Read conductivity and compare with the reading in step 1 above.

- If the variance in readings is greater than 5%, increase the frequency of probe cleaning. If there is less than 1% change in the reading, the probe was not dirty and can be cleaned less often.

Cleaning Procedure

An accumulation of dirt or debris on the sensor can affect the accuracy and the thermal time constant. This accumulation should be removed periodically. This can be accomplished by scrubbing with a toothbrush or stiff bottle brush. Soap or hand cleaner may help. Harsh abrasives should be avoided. Rinse the sensor thoroughly before returning to service.