Sensorex

UVT-LED

UVT-LED Sensor
Installation and Operation Manual

UVT-LED-H

UVT-LED-SW

Sensorex

Parts covered by this product instruction sheet include: UVT-LED-H, UVT-LED-SW, and all accessories and mounting hardware

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Parts covered by this product instruction sheet include: UVT-LED-H, UVT-LED-SW, and all accessories and mounting hardware
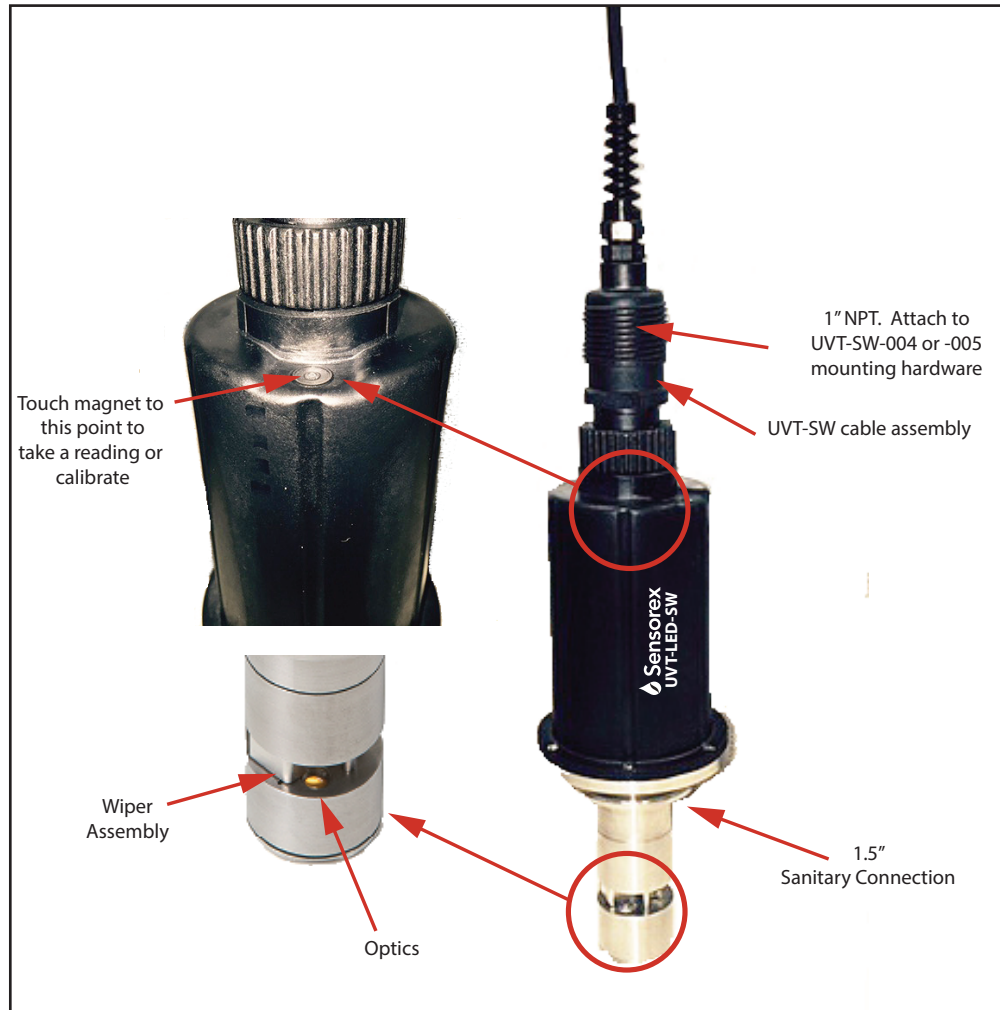
Welcome to Sensorex UVT-LED!

Thank you for choosing our UVT-LED UV-transmittance sensor.

For over forty years, Sensorex has been the preeminent supplier of leading edge technology and innovative products to measure and monitor the quality of water. Today, we remain focused on the continual advancement of water quality monitoring products and technology. The UVT-LED is the latest Sensorex innovation and our first optical-based measurement system designed specifically for simple, reliable UV-transmittance monitoring. The Sensorex UVT-LED is the world's first family of UV-T monitors that uses a UV-C LED instead of a mercury-based lamp as a light-source. The use of a UV-C LED in the UVT-LED ensures extremely stable readings in all conditions, over an extended lifetime.

Getting to know your UVT-LED Sensors

Backlit LCD display

READ/CALIBRATE button

Optics

5-Pin Connector
Connects to
UVT0002 cable
assembly (UVT-PW)
or charging cable
(UVT-LED-H)

Product Label
Includes:
Version, Serial No.,
patent information

UVT-LED-H

Used for benchtop and off-line field measurements. Unit comes standard with a rechargable internal battery and charging cord for cordless operation.

Parts covered by this product instruction sheet include: UVT-LED-H, UVT-LED-SW, and all accessories and mounting hardware

Getting to know your UVT-LED Sensors (cont.)

1" NPT. Attach to UVT-SW-004 or -005 mounting hardware

UVT-SW cable assembly

Touch magnet to this point to take a reading or calibrate

1.5" Sanitary Connection

Wiper Assembly

Optics

UVT-LED-SW

Used for all open channel applications in which the unit is completely submerged, or in-line applications utilizing a 1.5" sanitary connection. Unit is wiped using patented technology. Use in water with a higher concentration of dissolved and suspended solids.

Parts covered by this product instruction sheet include: UVT-LED-H, UVT-LED-SW, and all accessories and mounting hardware

Warnings

To avoid risk of damage to monitor, do not open the device. Refer servicing to qualified personnel only.

Do not place device in a location near heat sources, or in a place subject to direct sunlight, excessive dust or mechanical shock.

Do not operate sensor above 50°C because this can damage the UV Light source

Monitor contains a UV LED emitting device. Do not look at the probe of an operating monitor without wearing proper eye and skin protection.

Install unit so that power cord is protected from mechanical damage and can be easily unplugged from device.

Do not use the provided power/data cord if it is damaged. Use of a damaged cord may result in damage to the device or fire.

Do not pinch the power/data cord between heavy objects

Device should only be used with provided 24V DC power supply or used with a site supplied 24V DC source.

Parts covered by this product instruction sheet include: UVT-LED-H, UVT-LED-SW, and all accessories and mounting hardware
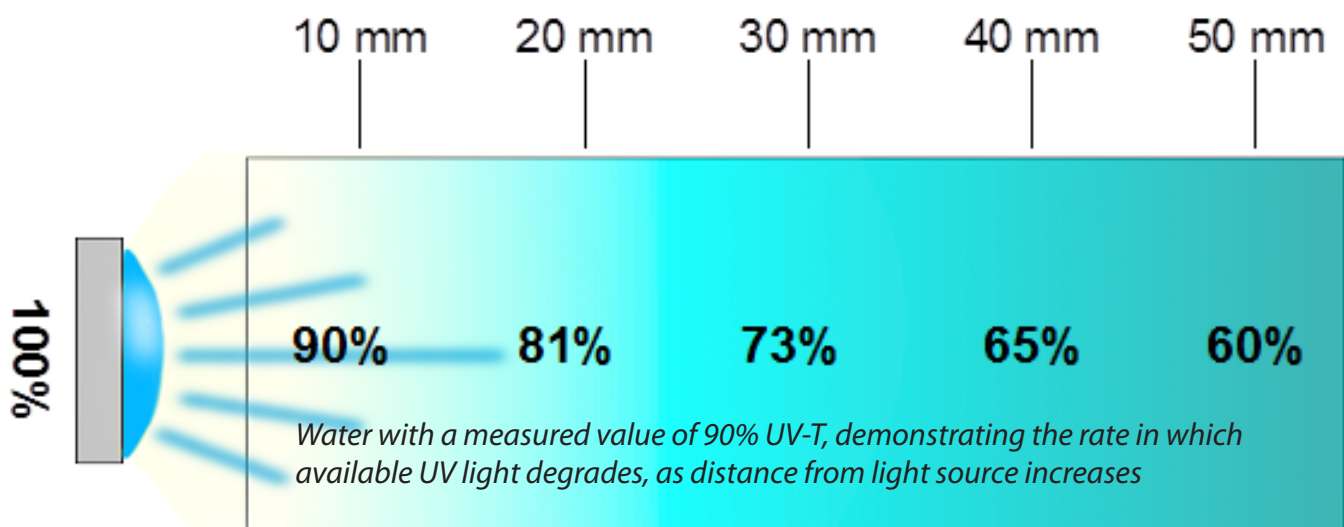
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Introduction

UV-T is a measure of the amount of UV energy remaining after passing through a material (e.g., water sample or quartz) over a specific distance. UV Absorbance is a measure of the amount of UV light that is absorbed by a substance (e.g., water, microbial DNA, lamp envelope, quartz sleeve) at a specific wavelength (e.g., 254 nm). UV-Transmittance is related to UV Absorbance by the following equation (for a 1-cm path length): % UVT = 100 x $10^{-A.}$

UV-Transmittance is typically;
- **measured at 254 nm**, corresponding to the peak output of mercury-based UV lamps
- measured over a **path length of 1-cm**
- represented as a percentage

UV-T has a strong effect on the dose delivery of a UV treatment system. As UV-T decreases, the intensity throughout the reactor decreases, which reduces the dose the treatment system delivers. UV treatment systems are sized to deliver the required UV dose under specified UV-T conditions for the application. UV-T will typically vary over time due to changing concentrations of compounds, seasonal effects and changes in biological activity of microorganisms within the water source.

UV-T monitors are commonly used as an input to a dose control strategy of a UV treatment system, helping to reduce over or under dosing. They are also used to monitor water quality to help diagnose operational problems.
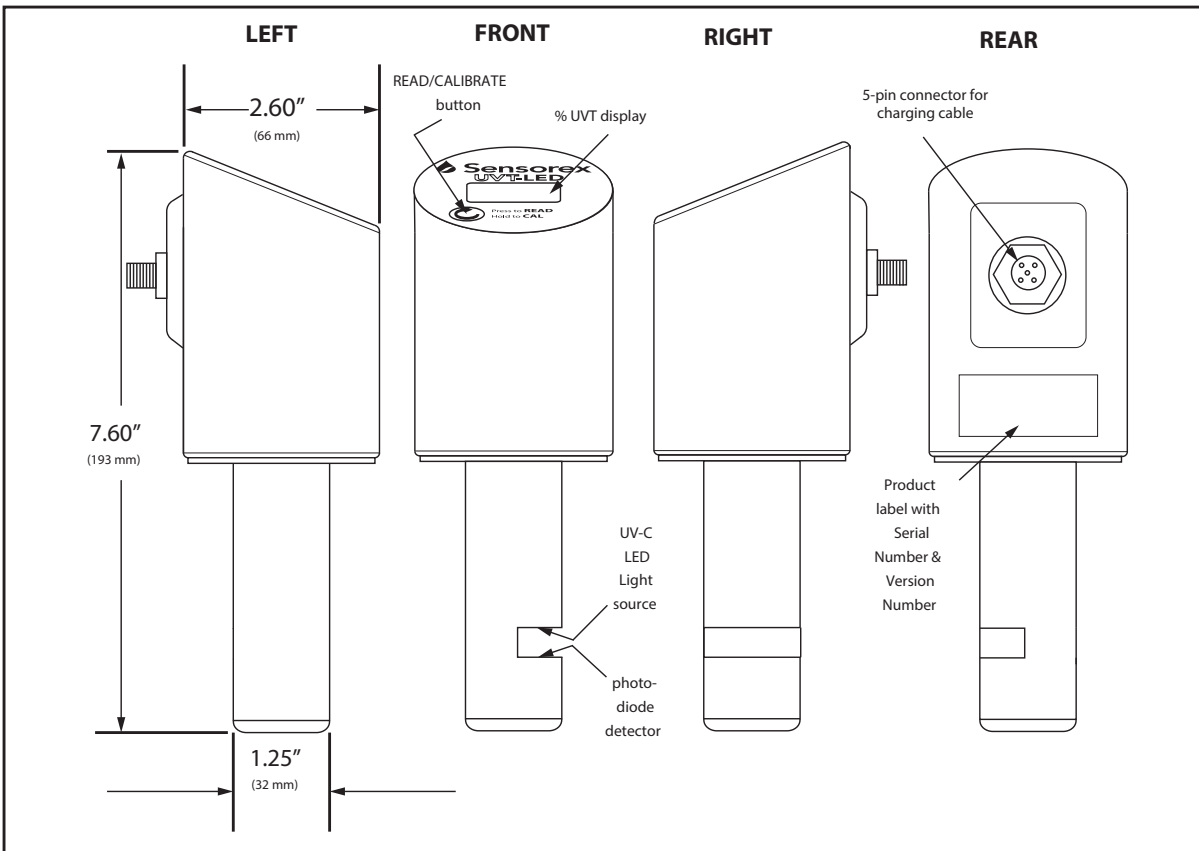

Water with a measured value of 90% UV-T, demonstrating the rate in which available UV light degrades, as distance from light source increases

Parts covered by this product instruction sheet include: UVT-LED-H, UVT-LED-SW, and all accessories and mounting hardware

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Specifications

Measurement Technique:	UV absorption method (single beam technique), reagent-free
Measurement Wavelength /Pathlength:	254nm/1cm
Measurement Range:	10 -100% UV transmittance (UVT)
Accuracy:	1.0% T @ >50% T
Sample Flow Rate/ Maxium Pressure:	n/a, 150psig
Display:	LCD with LED backlight
Measuring Interval:	60 seconds (UVT-LED-SW only)
User Maintenance:	1hr/month typical
Power Supply:	20-28V DC, 5A, maximum 200Ohm load, customer supplied (UVT-LED-PW & -SW) 24V DC to charge battery (UVT-LED-H)
Output:	0-100% UVT (UVT-LED-H-WD, UVT-LED-H-NA only), 4-20mA (UVT-LED-SW)
Temperature Range:	32-122 °F (0-50 °C)
Weight:	UVT-LED-H - 0.78lbs (353g), UVT-LED-PW - 1.58lbs (717g), UVT-LED-SW -1.78lbs(807g)
Dimensions:	7.60"H x 2.60" cap x 1.25" probe (19.1cm H x 6.4cm Dia) - UVT-LED-H & -PW only, 9.4"H x 3.00" cap x 1.25" probe (23.9cm H x 7.6cm Dia)
IP Ingress Rating:	IP66 housing, IP68 measurement head
Certifications:	CE
Warranty:	One Year Limited Warranty
Wetted Materials:	SS316 body and wiper holder, PPS top cap, PTFE Wiper Blade

Parts covered by this product instruction sheet include: UVT-LED-H, UVT-LED-SW, and all accessories and mounting hardware
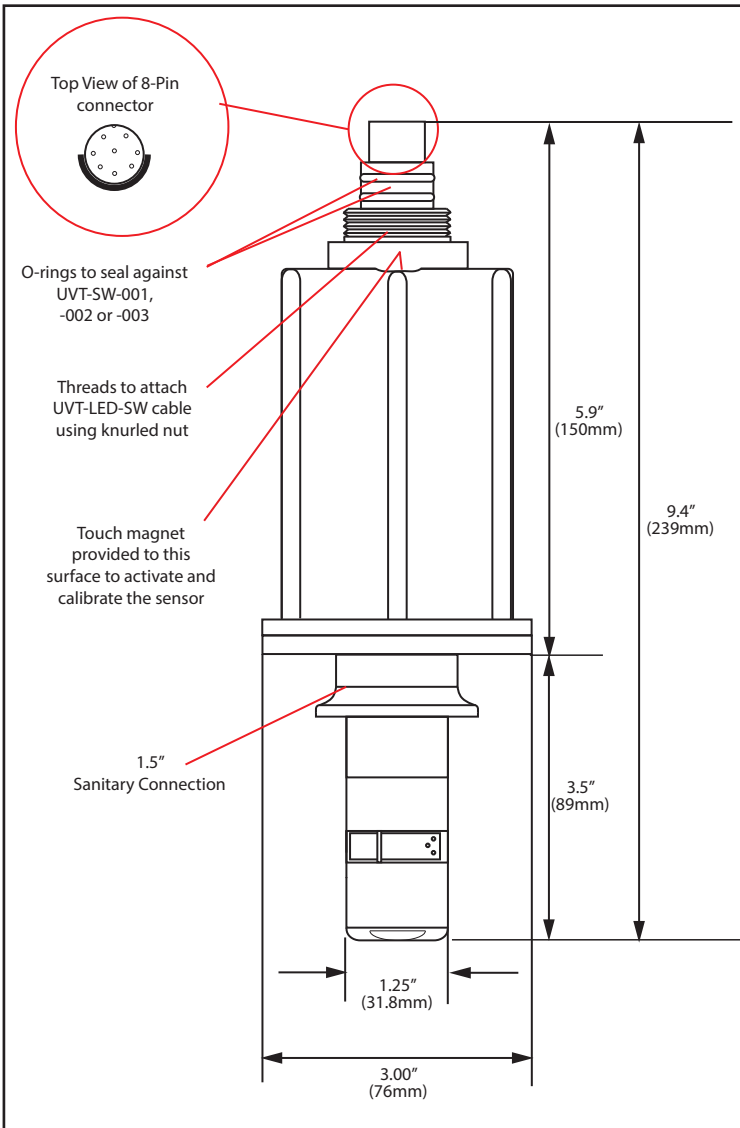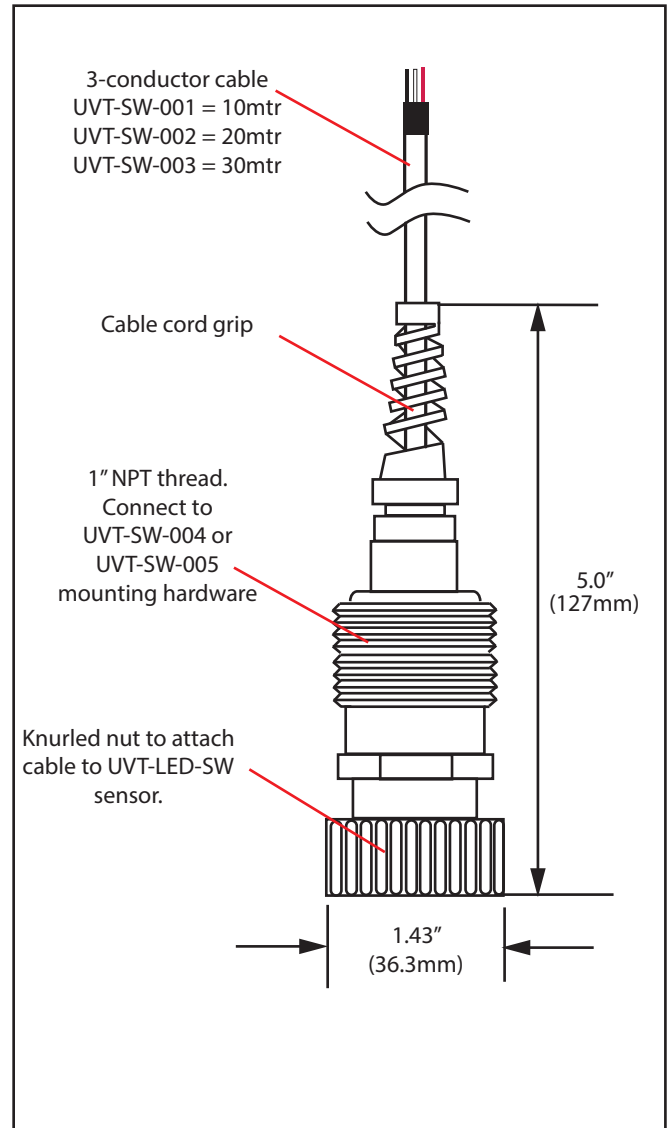
Outline and Dimensions

UVT-LED-H

LEFT   **FRONT**   **RIGHT**   **REAR**

2.60"
(66 mm)

7.60"
(193 mm)

1.25"
(32 mm)

READ/CALIBRATE button

% UVT display

5-pin connector for charging cable

UV-C LED Light source

photo-diode detector

Product label with Serial Number & Version Number

Parts covered by this product instruction sheet include: UVT-LED-H, UVT-LED-SW, and all accessories and mounting hardware

Outline and Dimensions(cont.)

UVT-LED-SW

Top View of 8-Pin connector

O-rings to seal against UVT-SW-001, -002 or -003

Threads to attach UVT-LED-SW cable using knurled nut

Touch magnet provided to this surface to activate and calibrate the sensor

1.5"
Sanitary Connection

5.9"
(150mm)

9.4"
(239mm)

3.5"
(89mm)

1.25"
(31.8mm)

3.00"
(76mm)

UVT-SW-001, -002, -003

3-conductor cable
UVT-SW-001 = 10mtr
UVT-SW-002 = 20mtr
UVT-SW-003 = 30mtr

Cable cord grip

1" NPT thread. Connect to UVT-SW-004 or UVT-SW-005 mounting hardware

Knurled nut to attach cable to UVT-LED-SW sensor.

5.0"
(127mm)

1.43"
(36.3mm)

Parts covered by this product instruction sheet include: UVT-LED-H, UVT-LED-SW, and all accessories and mounting hardware

UVT-LED-SW

Overview (-SW)

The Sensorex UVT-LED-SW is designed for use in both open channel/submersion UVT monitoring and in-line UVT monitoring of any type of water, including wastewater and drinking water. This patented UV-T monitoring device includes a UV-C LED light source, a UV sensor and wiper attached to a rotating measuring head.

It is operated by submerging the sensor mounted to installation hardware into a flowing water channel. The water sample flows through the measurement head, in between the UV light source and the UV sensor. The UV sensor measures the amount of UV light that the UV sensor is exposed to, measuring the amount of UV light that passes through the fluid sample. After the UV measurement of the water sample is collected, a quartz cylinder having a known UVT value is moved in between the UV light source and the UV sensor and another measurement is taken. By comparing the UV measurement taken through the quartz cylinder and the UV measurement taken through the fluid sample, a UVT value for the fluid is determined. In addition a third measurement is taken with the UV light source powered off providing a zero point calibration measurement for the UV sensor.

The sensor is calibrated by actuating with a magnet and placing in a sample of DI water. Measurements are taken by actuating the sensor again with a magnet and then measurements are automatic **every 3 minutes** and are output as 4-20mA scaled to 0-100% UVT.

When the quartz cylinder is rotated into a position between the UV light source and the UV sensor, a wiper, attached to the rotating mechanism, wipes the windows in between the UV light source and the water sample and the UV sensor and the water sample, thus removing any contaminants or buildup of constituents from the water sample on the windows. See FIG. 1. Note that UVT-LED-SW does not have a display but all other components match FIG 1.

Parts covered by this product instruction sheet include: UVT-LED-H, UVT-LED-SW, and all accessories and mounting hardware

UVT-LED-SW

First Time Setup and Preparation

Step 1 - Unpacking your UVT-LED-SW

Make sure you have all parts in the box. Review the Packing List included in the product box for details. Your UVT-LED-SW sensor is supplied with an alcohol cleaning swab and a 10mtr cable (UVT-SW-001).

Step 2: Cable Assembly Preparation:

A 10meter (33ft) cable assembly is included with each UVT-LED-SW. Assemble the cable to the 1" adapter of the UVT-SW mounting assembly. After the assembly is completely mounted then attach the sensor to the cable by aligning the connector parts and tightening the knurled nut clockwise until it stops (FIG 1). 1 inch of the cable jacket is stripped off for your convenience (see FIG 3). If you want longer leads, remove as much of the gray cable covering to reveal the length of wire you require. Next, strip the brown, white, and green wire tips to desired length and tin with solder to prevent wirings from fraying. Trim off braided shield and string filler even to cable jacket.

UVT-SW cable

Knurled nut to attach cable to UVT-LED-SW sensor

O-rings to seal against UVT-SW-001, -002 or -003

Threads to attach UVT-SW cable using knurled nut

UVT-LED-SW sensor

STEP 1: Align connector from UVT-SW cable with connector of UVT-LED-SW

STEP 2: Rotate **knurled nut** clockwise to tighten UVT-SW cable to UVT-LED-SW sensor
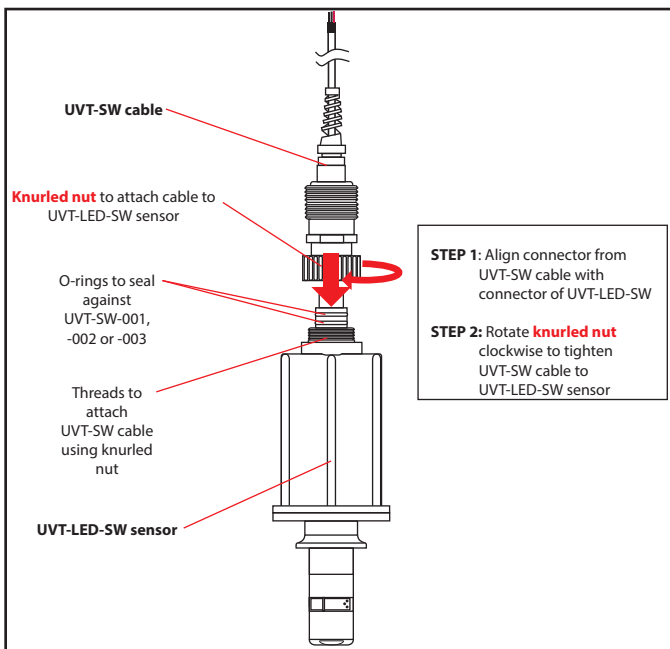
FIG. 1

Step 3 - Powering your UVT-LED-SW

After the cable assembly has been connected to the UVT-LED-SW in step 2, wire the stripped end of the cable BROWN, WHITE, GREEN wires to your 4-20mA input device as shown in FIG 2 and 3.
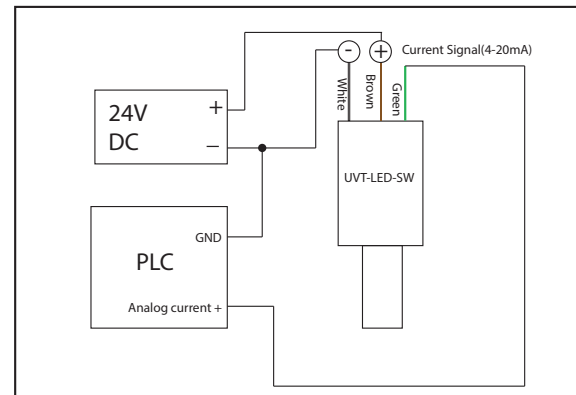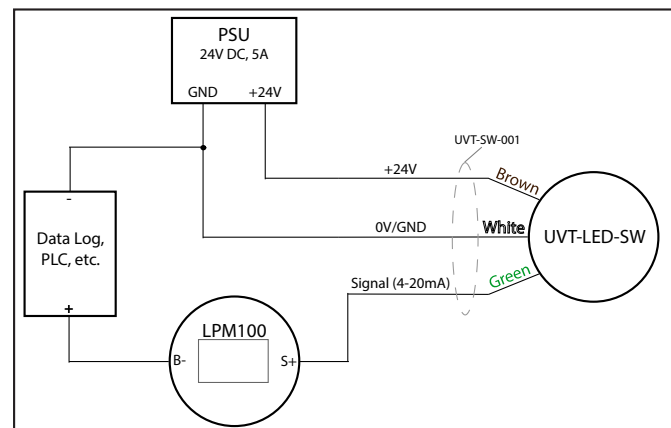

FIG. 2

FIG. 3 (with LPM100**)**

Parts covered by this product instruction sheet include: UVT-LED-H, UVT-LED-SW, and all accessories and mounting hardware

UVT-LED-SW

Cleaning Procedure

Cleaning with Deionized water is recommended every 30days followed by recalibration off-line.

When fouling of the quartz windows are suspected, The Sensorex UVT-LED-SW should be cleaned according to the following procedure:

1) Remove Sensorex UVT-LED-SW from the process.

2) Fill up a small container with a 15-20% solution of phosphoric acid (e.g. Calcium Lime and Rust remover - CLR) or food grade citric acid. Fill container high enough to completely submerge the measuring portion of the tip in the 15-20% solution of phosphoric acid or food grade citric acid (see FIG. 4).

3) While the unit is still powered, allow unit to soak for 30 minutes.

4) After 30 minute soak, rinse measuring tip with de-ionized water to rinse off excess cleaning solution.

5) Fill container with isopropanol, high enough to fully submerge measuring tip.

6) Submerge measuring tip in isopropanol for 10 minutes while unit is powered on.

7) Using the UVT-LED cleaning swab (part #UVT0011), gently clean the quartz measuring windows in front of the sensor and the UV-C light source.

8) Place unit in de-ionized water high enough to fully submerge measuring tip.

9) Submerge measuring tip in de-ionized water for 10 minutes.

10)   Re-calibrate monitor according to recalibration procedure.

Fill all solutions above level shown with red arrow

FIG. 4

Parts covered by this product instruction sheet include: UVT-LED-H, UVT-LED-SW, and all accessories and mounting hardware

UVT-LED-SW

Calibration

Calibration should be done every 30 days after cleaning with deionized water. It is also recommended to verify sensor accuracy weekly using a hand-held UVT-LED-H sensor.

Step 1 - Place your UVT-LED-SW into de-ionized (DI) water.
Make sure it is inserted as shown in FIG 19 so that it is above the opening for the wiper and LED. Shake to remove air bubbles.

Step 2 - Hold Magnet over white dot sensor actuation location for at least 3 seconds as shown in FIG 19. Wait for wiper to click. Remove magnet.
At completion of calibration, UVT-LED-SW will beep 7x.

FIG. 5

Taking Readings

Your UVT-LED-SW sensor will take readings every **3 minutes** after actuation of the wiper once the sensor is calibrated. You can take a reference reading at any time. To do this:

Step 1 - Place your UVT-LED-SW into a sample of your water.
Make sure it is inserted as shown in FIG 18 so that it is above the opening for the wiper and LED. Shake to remove air bubbles.

Step 2 - Hold Magnet over white dot sensor actuation location as shown in FIG 5.
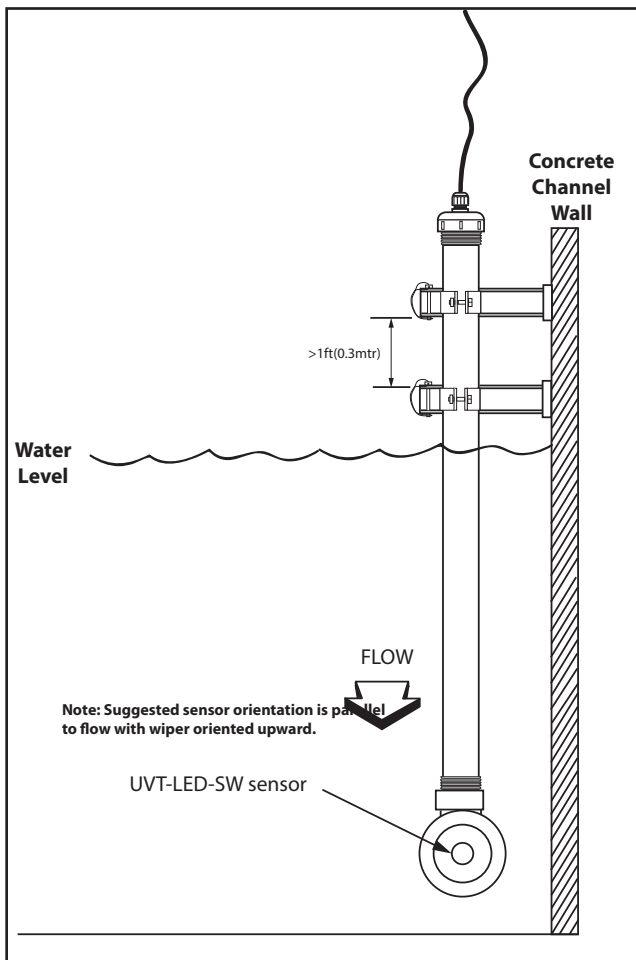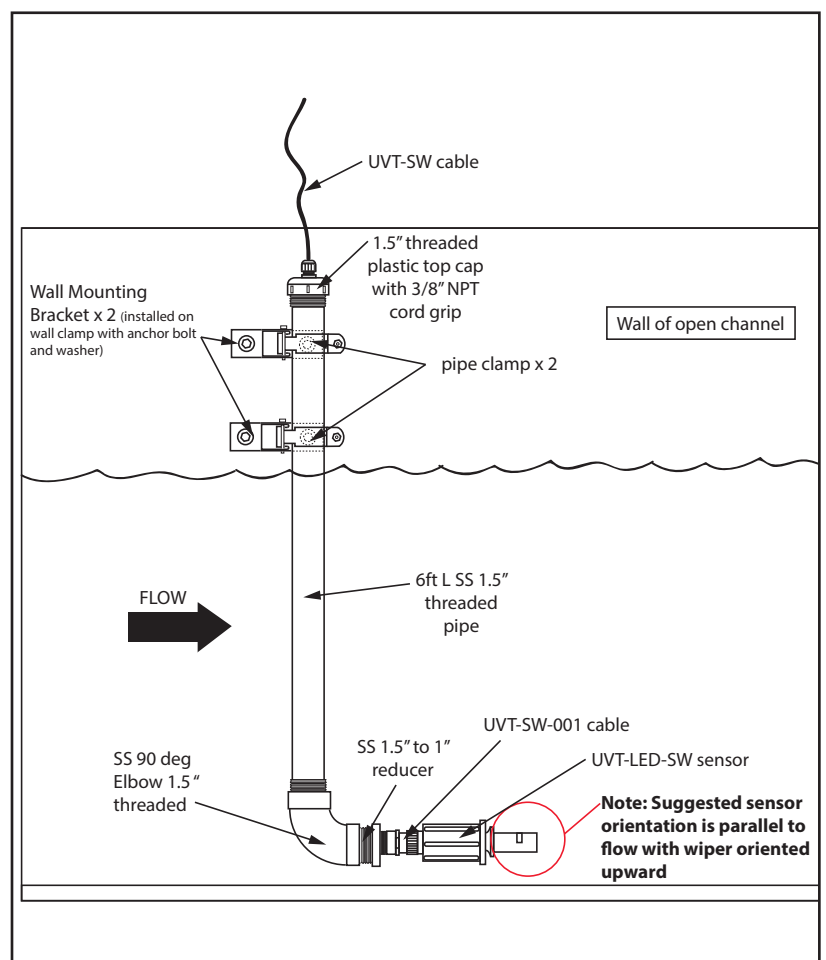Wait for 1 second. Remove magnet. UVT-LED-SW will beep 1x after reading is taken.

Parts covered by this product instruction sheet include: UVT-LED-H, UVT-LED-SW, and all accessories and mounting hardware

UVT-LED-SW

Installation

The UVT-LED-SW is designed for in-line and submersion mounting.
In abrasive solutions, install the sensor downstream of filtration to maximize sensor lifetime.

In-line mounting hardware for the UVT-LED-PW is also compatible with the UVT-LED-SW. Refer to pages 14-17 for in-line mounting options.

Submersion mounting hardware options include:
1. **UVT-SW-005: Complete installation kit that attaches to wall of channel.   See below and follwing pages for instructions and FIGURE references.**

2. **UVT-SW-004: Retrofit installation kit that attaches to existing installation brackets from other suppliers that require 1 1/4" pipe. See FIG 32 for description of hardware.**

FIG. 6

FIG. 7

Parts covered by this product instruction sheet include: UVT-LED-H, UVT-LED-SW, and all accessories and mounting hardware

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UVT-LED-SW

Installation (cont.)
1) UVT-SW-005 step by step installation procedure:

A)   Attach provided steel 90 degree elbow to pipe with sealing tape or paste (see FIG 8

B)   Atttach 1.5" x 1" reducing fitting to elbow with sealing tape or paste (see FIG 9)

C)   Attach UVT-SW cable assembly to reducer (1" threads on both) and seal with sealing tap or paste. See FIG 10

C)   Feed cable up through pipe and insert into top cap/cord grip assembly. Make sure cord grip is loose when feeding cable through. See FIG11.

D)   Seal top cap onto pipe (make sure cord grip is loose). See FIG 12

E)   Tighten cord grip after applying some slack to cable. See FIG 13.

F)   Attach brackets x 2 to pipe. Make sure bolts are not too tight so the brackets can be adjusted up or down the pipe to the correct height and spacing. Spacing will depend on wall bracket height and distance apart.

G)   Attach wall mounting brackets to concrete wall in channel using customer supplied concrete anchor bolts. Note that assembly weighs 33lbs(15kg). Holes in wall mounting bracket are 0.65" (16mm) OD. See FIG 14

H)   Remove pins from brackets. See FIG. 15

I)   Slide pipe assembly onto the wall mounting brackets. See FIG. 16.

J)   Adjust pipe depth into water so that UVT-LED-SW measurement pathway is fully submerged.

K)   Tighten bolts on pipe clamps to hold in position.

L)   Reinstall locking pins into wall mount brackets. See FIG 17

M)   To remove sensor for maintenance, remove the 2 locking pins and slide the pipe/assembly out of wall bracket channels.
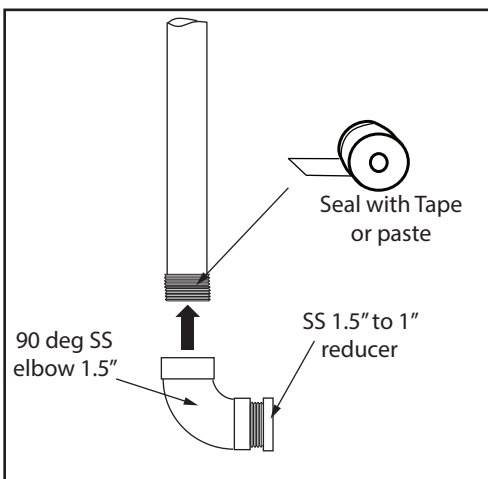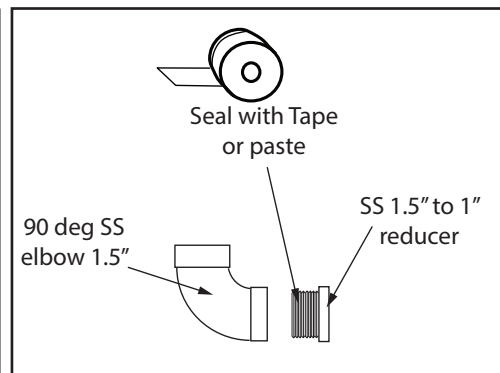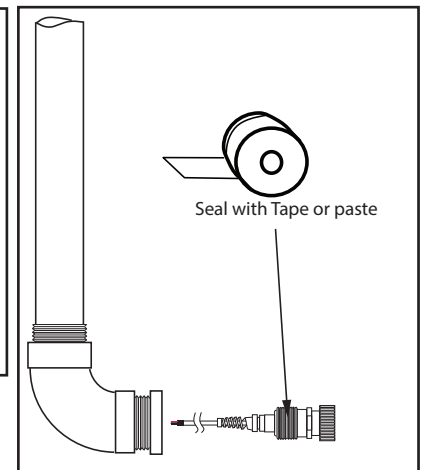

Seal with Tape or paste

SS 1.5" to 1" reducer

90 deg SS elbow 1.5"

FIG. 8

Seal with Tape or paste

SS 1.5" to 1" reducer
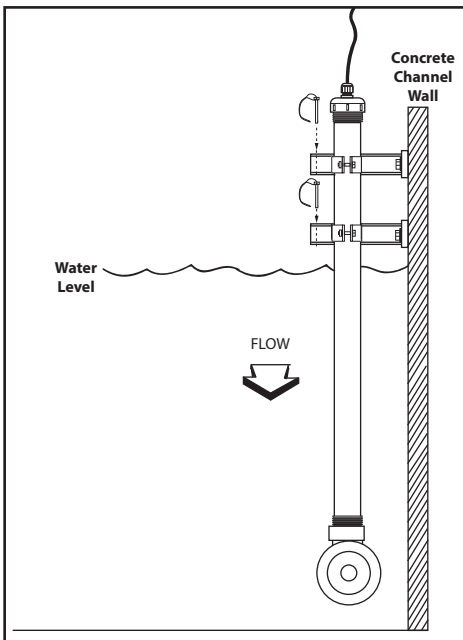
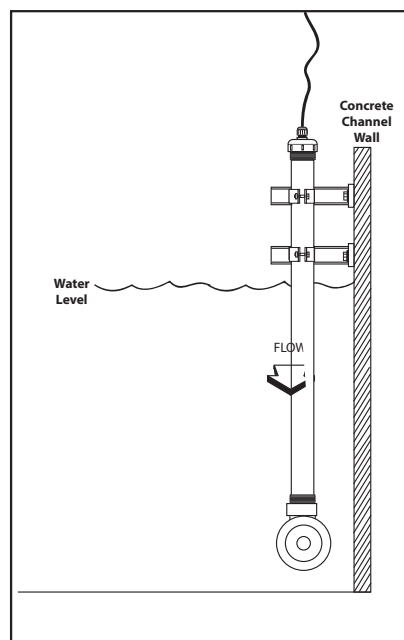90 deg SS elbow 1.5"

FIG. 9

Seal with Tape or paste

FIG. 10

Parts covered by this product instruction sheet include: UVT-LED-H, UVT-LED-SW, and all accessories and mounting hardware

UVT-LED-SW

Loosen nut on cord grip to feed cable through

1.5" threaded plastic top cap with 3/8" NPT cord grip

FIG. 11

Seal with Tape or paste

FIG. 12

Tighten cord grip

FIG. 13

Wall anchor bolts(customer supplied) *must be rated to support >30 lbs(14 kg)*, 2 each per bracket. Mount brackets above expected water level.

Concrete Channel Wall

>1ft(0.3mtr)

Water Level

FLOW

FIG. 14

Concrete Channel Wall

Water Level

FLOW

FIG. 15

Concrete Channel Wall

Water Level

FLOW

FIG. 16

WRAP LOOP AROUND BOTTOM OF PIN
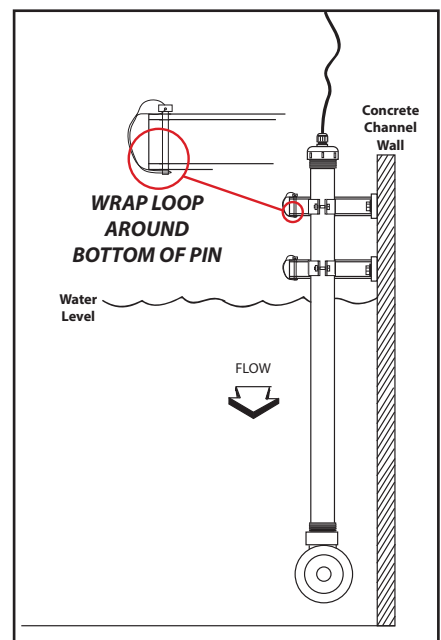
Concrete Channel Wall

Water Level

FLOW

FIG. 17

Parts covered by this product instruction sheet include: UVT-LED-H, UVT-LED-SW, and all accessories and mounting hardware

UVT-LED-SW

Installation (cont.)

2) UVT-SW-004: Retrofit installation kit that attaches to existing installation brackets from other suppliers that require 1 1/4" pipe. See FIG 18 for description of hardware.

Refer to FIG 22 - 27 for assembly procedure. After assembling, attach to existing clamps in place of 1.25" pipe from other supplier.
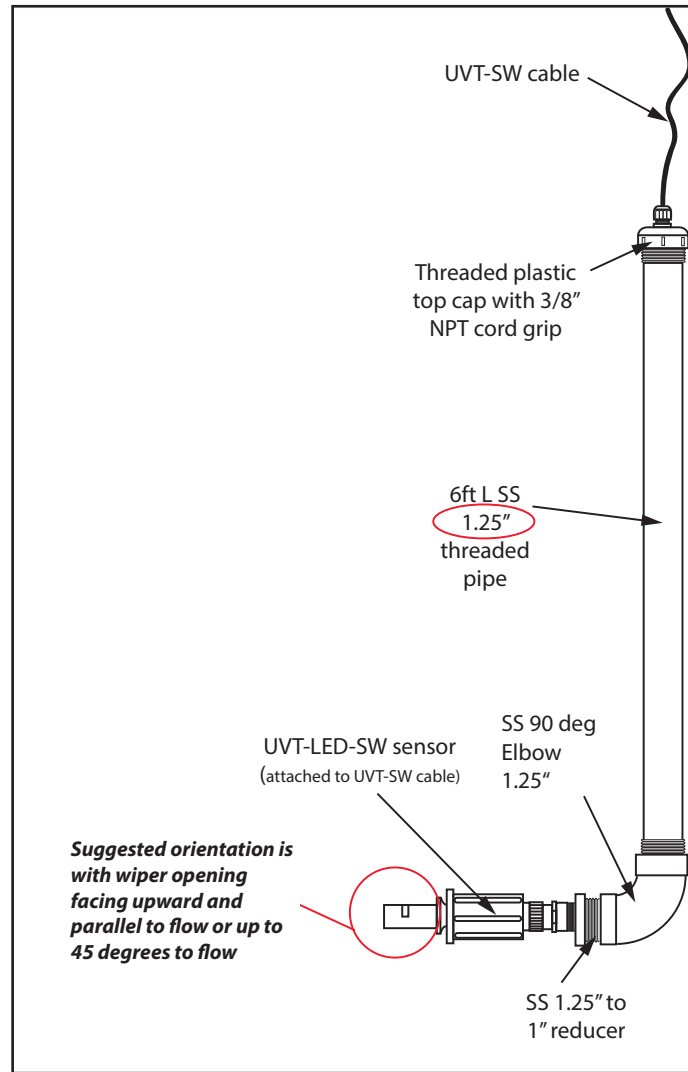

UVT-SW cable

Threaded plastic top cap with 3/8" NPT cord grip

6ft L SS 1.25" threaded pipe

SS 90 deg Elbow 1.25"

UVT-LED-SW sensor (attached to UVT-SW cable)

Suggested orientation is with wiper opening facing upward and parallel to flow or up to 45 degrees to flow

SS 1.25" to 1" reducer

FIG. 18

Parts covered by this product instruction sheet include: UVT-LED-H, UVT-LED-SW, and all accessories and mounting hardware

UVT-LED-SW

In-line Installation

In abrasive solutions, install the sensor downstream of filtration to maximize sensor lifetime.
The UVT-LED-SW can mount into a few different installation types:
        A) Weld on SS316 sanitary flange adapter (UVT0009) to pipe.
Weld #4 to pipe --> Install #2 into groove on top of #4 --> Insert #1 (UVT-LED-PW) into #4 --> Clamp in place with #3 by installing clamp around #4 and flange of #1, then tighten wing nut of #3 until tight and no leaking occurs. (see FIG. 19)
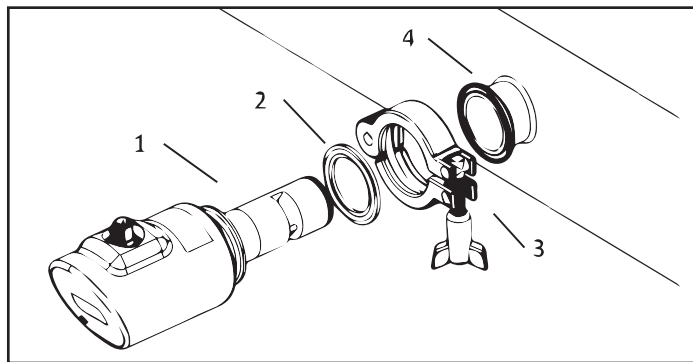

FIG. 19

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UVT-LED-SW

Installation Cont.

B) 2" NPT threaded adapter (UVT0008 - SS316, UVT0021 - PVC).

Apply threaded sealing tape or paste to threads of #4 --> Thread #4 into #5 (customer supplied) --> Install #3 gasket into groove of #4. --> Insert #1(UVT-LED-PW) into #4 --> Clamp in place with #2 by installing clamp around #4 and flange of #1 then tighten wing nut of #2 until tight and no leaking occurs (see FIG. 20). FIG 21 shows part detail.
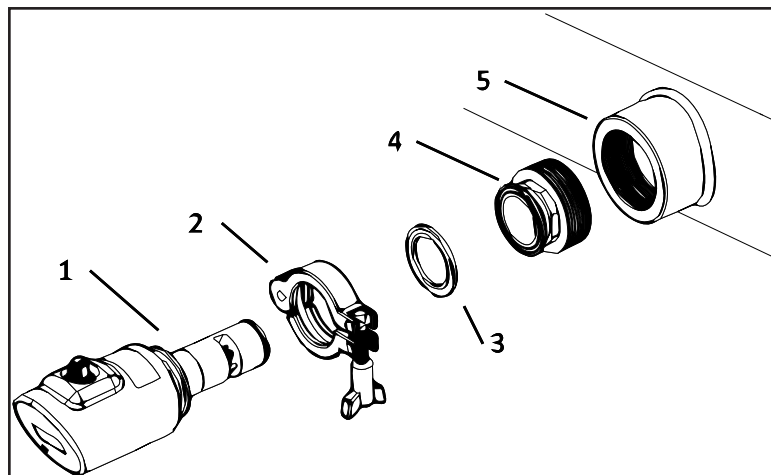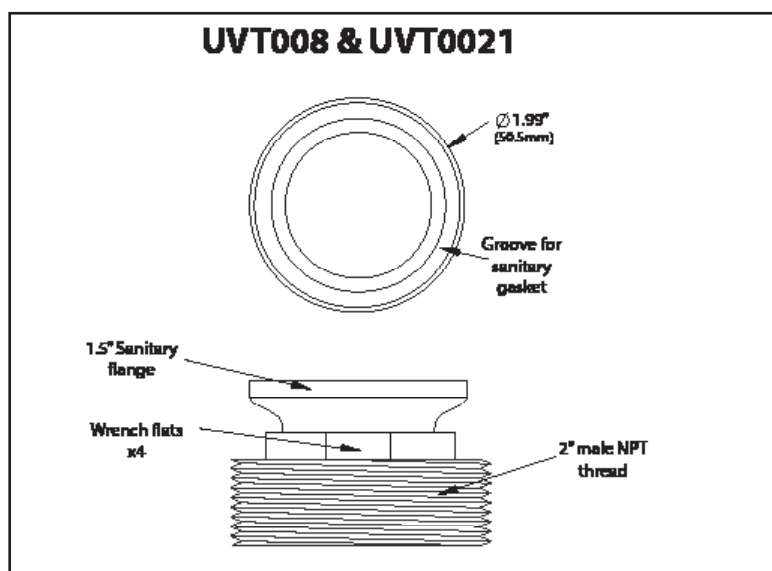

FIG. 20

UVT008 & UVT0021

FIG. 21

Parts covered by this product instruction sheet include: UVT-LED-H, UVT-LED-SW, and all accessories and mounting hardware

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UVT-LED-SW

Installation Cont.
C) 3" Sanitary tee kit (UVT0015) - refer to FIG. 12.   2" Sanitary tee kit (UVT0024) refer to FIG 22

Install #5 (x2) to grooves of #4 --> Install #6 (x2) to 4 with #5 (gasket) in-between --> Use clamp #7 (x2) to hold #6 (x2) to #4. Install #3 into groove on top of #4. Insert #1 into #4 . Clamp #2 around #1 and #4 and tighten using wing nut of #2 until #1 is installed tightly (no leaks) into #4. Thread #8 (x2) into #6 (x2) using sealing tape or paste to avoid leaks. It is recommended to install this into a bypass loop with valves on each side of the assembly and a flow meter on the inlet side. See FIG 23.
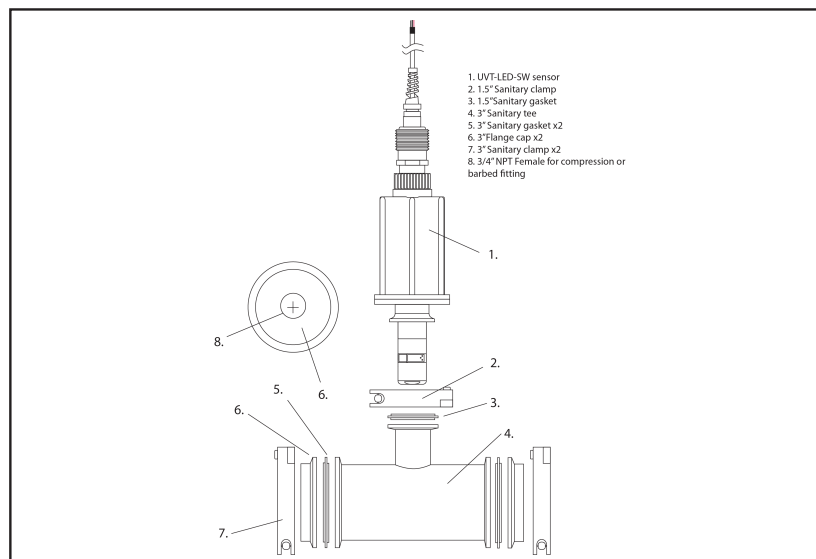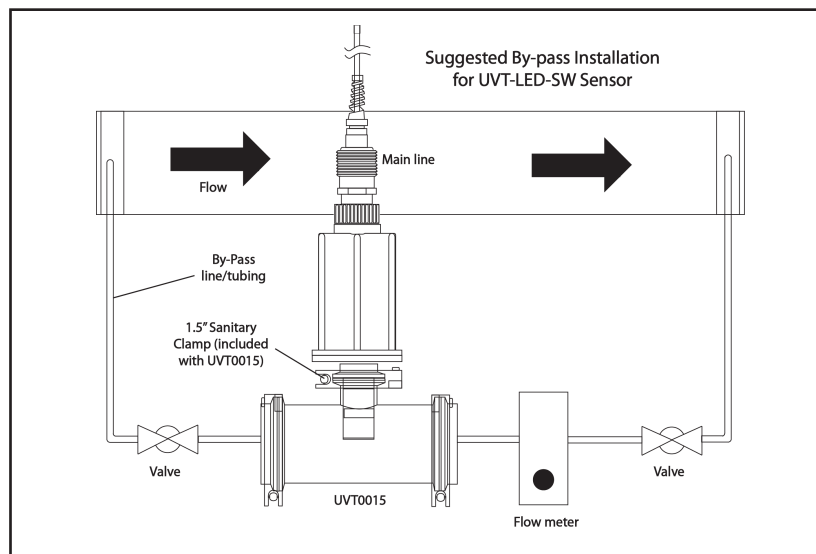

1. UVT-LED-SW sensor
2. 1.5" Sanitary clamp
3. 1.5"Sanitary gasket
4. 3" Sanitary tee
5. 3" Sanitary gasket x2
6. 3"Flange cap x2
7. 3" Sanitary clamp x2
8. 3/4" NPT Female for compression or barbed fitting

FIG. 22

Suggested By-pass Installation
for UVT-LED-SW Sensor

Main line

Flow

By-Pass line/tubing

1.5" Sanitary Clamp (included with UVT0015)

Valve

Valve

UVT0015

Flow meter

FIG. 23

Parts covered by this product instruction sheet include: UVT-LED-H, UVT-LED-SW, and all accessories and mounting hardware

UVT-LED-SW

Installation Cont.
D) 2" NPT PVC tee kit (UVT0023) - refer to FIG. 12

Note: Use sealing tape or paste on all threaded connections to avoid leaks.
Thread #6 (x2) into #5 --> Thread #7 (x2) into #6 (x2) --> Thread #8 (x2) into #7 (x2). Thread #4 into #5.
Install #3 into groove on top of #4. Insert #1 into #4 . Clamp #2 around #1 and #4 and tighten using
wing nut of #2 until #1 is installed tightly (no leaks) into #4. It is recommended to install this into a
by-pass loop with valves on each side of the assembly and a flow meter on the inlet side. See FIG 23.
See FIG 24 for all parts inlcuded in UVT0023. Suggested mounting orientation is shown in FiG 25.
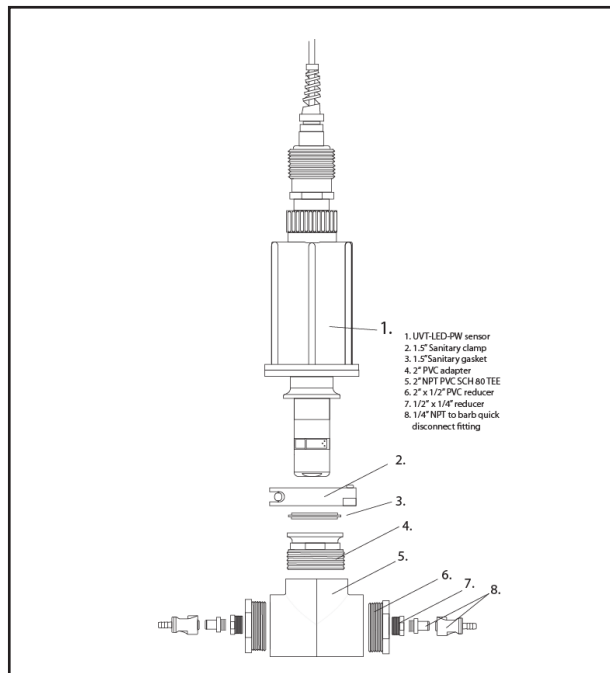

1. UVT-LED-PW sensor
2. 1.5" Sanitary clamp
3. 1.5" Sanitary gasket
4. 2" PVC adapter
5. 2" NPT PVC SCH 80 TEE
6. 2" x 1/2" PVC reducer
7. 1/2" x 1/4" reducer
8. 1/4" NPT to barb quick disconnect fitting

FIG. 24

20 DEG
UVT-LED-SW sensor
Wall or panel
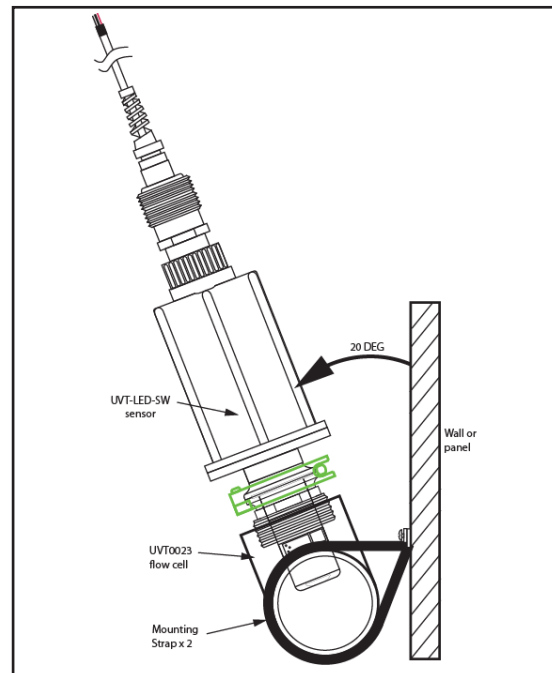UVT0023 flow cell
Mounting Strap x 2

FIG. 25

Parts covered by this product instruction sheet include:
UVT-LED-PW, UVT-LED-H, UVT-LED-SW, and all accessories and mounting hardware

Troubleshooting (UVT-LED-SW)

3 beeps from sensor indicate a failure for the UVT-LED-SW. See chart below for faults and possible solutions.

Fault	Possible Solution
UVT-LED-SW will not switch on	- Check connections in power cabinet to ensure 24V DC is being supplied. - Place magnet over **white dot sensor actuation location** and wait for wiper to actuate.
UVT reading is lower than expected	- During measurement an air bubble may have been present in the measurement area. Ensure no air bubbles are present and repeat the measurement. - Follow cleaning procedure to remove materials that may foul the sensor. - Unit needs to be recalibrated accoring to outlined calibration procedure.
UVT reading is higher than expectecd	- During calibration, an air bubble may have been present in the measurement area, Recalibrate unit. - Follow cleaning procedure on page 20.
UVT reading is not being transmitted to plant controls	- Check to make sure the 4-20mA signal loop has an external power source. - Ensure signal wires are connected per wiring diagram.
Analog scaling is not correct (-PW)	- Scaling should be set up for 4mA = 0% UVT and 20mA = 100% UVT.
UVT reading is ZERO	- During measurement an air bubble may have been present in the measurement area. Ensure no air bubbles are present and repeat the measurement. - Follow cleaning procedure. - Recalibrate unit. - LED or sensor has stopped working. Return for repair. - Water has high absorbance and is not allowing UV-C light to pass through.
Wiper Mechanism does not return to home position during cycle (-PW)	- Return sensor to supplier for repair/replacement.

Parts covered by this product instruction sheet include: UVT-LED-PW, UVT-LED-H, UVT-LED-SW, and all accessories and mounting hardware

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UVT-LED-H

Calibration

Step 1 - Place your UVT-LED-H into de-ionized (DI) water.
Make sure it is inserted as shown in FIG 26 so that it is above the opening for UV light source. Shake the sensor to remove bubbles. Remove from water and check for bubbles outside of the DI water. Re-insert into water if no bubbles are seen.

Step 2 - Press and hold the "READ/CAL" button for at least 3 seconds as shown in FIG 27 (Make sure LOW BATTERY indicator is not on before taking measurement). See FIG 28
The display will flash blue 7x after calibrating. When the display reads >99.8%, calibration is complete. This should take approxiamtely 10 seconds.

FIG. 26

FIG. 27

FIG. 28

USE DE-IONIZED WATER ONLY

Taking Meausurements

Step 1 - Place your UVT-LED-H into the water sample you want to measure the for UVT.
Make sure it is inserted as shown in FIG 26 so that it is above the opening for UV light source. Shake the sensor to remove bubbles. Remove from water and check for bubbles outside of the DI water. Re-insert into water if no bubbles are seen.

Step 2 - Reference measurment. Press the **"READ/CAL"** button and release when the screen flashes 1x. This is done to ensure no bubbles are on the measuring surface.

Step 3 - When the **screen flashes 2x** then the sensor is ready to take a new reading **(new readings can only be taken 30 seconds after the previous reading)**

Note: if sensor is not measuring for 10min, it will automatically turn off

Cleaning

Using the Sensorex UVT-LED cleaning swab (part #UVT0011) gently clean the quartz measuring windows in front of the sensor and the UV-C light source. Place unit in de-ionized water high enough to fully submerge measuring tip. Submerge measuring tip in de-ionized water tor for 10 minutes, according to recalibration procedure.

Charging Sensor - plug charging cable into sensor at connector at back of sensor. Charge for at least 2

hours when battery is discharged. *When not in use, keep sensor attached to charger and plugged into wall.*

Parts covered by this product instruction sheet include:
UVT-LED-PW, UVT-LED-H, UVT-LED-SW, and all accessories and mounting hardware

Troubleshooting (UVT-LED-H)

Fault	Possible Solution
UVT-LED will not switch on	- Check connections in power cabinet to ensure 24V DC is being supplied. - Check 5-pin connector on back of sensor to make sure it is securely attached. - During measurement an air bubble may have been present in the measurement area. Ensure no air bubbles are present and repeat the measurement.
UVT reading is lower than expected	- On battery-operated models, battery is low and unit should be plugged in to recharge battery. You can take measurements while UVT-LED-H is charging. - Follow cleaning procedure on page 13 (-PW), 22 (-H) to remove materials that may foul the sensor. - Unit needs to be recalibrated accoring to outlined calibration procedure. - Make sure flow cell/pipe is full enough to completely submerge the measurement pathway. If not, adjust orientation.
UVT reading is higher than expectecd	- During calibration, an air bubble may have been present in the measurement area. Recalibrate unit. - Follow cleaning procedure. - Make sure flow cell/pipe is full enough to completely submerge the measurement pathway. If not, adjust orientation.
UVT reading is not being transmitted to plant controls (UVT-LED-PW ONLY)	- Check to make sure the 4-20mA signal loop has an external power source. - Ensure signal wires are connected per wiring diagram. - Check 5-pin connector on back of sensor to make sure it is securely attached.
Analog scaling is not correct (-PW)	- Scaling should be set up for 4mA = 0% UVT and 20mA = 100% UVT.
UVT reading is ZERO	- During measurement an air bubble may have been present in the measurement area. Ensure no air bubbles are present and repeat the measurement. - Follow cleaning procedure. - Recalibrate unit. - LED or sensor has stopped working. Return for repair. - Water has high absorbance and is not allowing UV-C light to pass through.
Wiper Mechanism does not return	- Return sensor to supplier for repair/replacement to home position during cycle (-PW).

Parts covered by this product instruction sheet include: UVT-LED-PW, UVT-LED-H, UVT-LED-SW, and all accessories and mounting hardware

Ordering Information

Part Number	Description
UVT-LED-SW	Submersion Mount Process UV Transmittance Monitor (with wiper/auto cal.), includes 10m(33ft) detachable cable, cleaning swab
UVT-LED-H	Handheld, Off-Line Transmittance Monitor with power supply (outside of North America), case, cleaning swab x 1
UVT0001	Carrying Case for UVT-LED-H (included with UVT-LED-H-WD and UVT-LED-H-NA kits)
UVT0005	Worldwide Power Supply
UVT0006	North American Power Supply
UVT-SW-001	Detachable Power/Communication Cable for UVT-LED-SW, 10m (33 ft)- *included with UVT-LED-SW*
UVT-SW-002	Detachable Power/Communication Cable for UVT-LED-SW, 20m (66 ft)
UVT0011	Cleaning Swabs (pack of 50)
UVT0008	Installation Fitting, 2" NPT 316SS
UVT0009	Installation Fitting, Stainless Steel Pipe (requires welding)
UVT0015	Installation Kit, Sanitary Flow Cell (3")
UVT0021	Installation Fitting for PVC Pipe (2" NPT)
UVT0023	Installation Kit, PVC Flow Cell (2") with connections for barbed fitting with quick-disconnect
UVT0024	Installation Kit, Stainless Steel Flow cell (2") with 1/4" barbed fittings
UVT0025	1.5" Sanitary Flange Cap, Stainless Steel
UVT-SW-004	UVT-LED-SW Installation Kit, retrofit to other supplier installation kits that accept 1.25" diameter pipe.
UVT-SW-005	UVT-LED-SW Installation Kit, Complete

Parts covered by this product instruction sheet include:
UVT-LED-PW, UVT-LED-H, UVT-LED-SW, and all accesso-
ries and mounting hardware

Product Warranty

This UVT-LED product, as supplied and by Sensorex, or an authorized Sensorex distributor, and delivered new, in the original carton is warranted by Sensorex against manufacturing defects in materials and workmanship for a limited warranty period of:

One (1) year on all components

The limited warranty commences on the date of shipment. To make a warranty claim, the purchaser must contact Sensorex or distributor for problem determination and receipt of an RMA number. The serial number must be presented for warranty processing to begin.

Sensorex will repair, or replace, any part found to be defective, in our opinion and at no charge as stipulated herein, with new or reconditioned parts during the limited warranty period specified above. All replaced parts and products become the property of Sensorex and must be returned to Sensorex. Replacement parts and products assume the remaining original warranty, or ninety (90) days, whichever is longer.

This limited warranty covers manufacturing defects in materials and workmanship encountered in normal use of this product, and shall not apply to the following, including but not limited to: wear and tear to quartz window wiper blades, damage which occurs in shipment; delivery and installation; applications and uses for which this product was not intended; altered product or serial numbers; cosmetic damage or exterior finish; accidents, abuse, neglect, fire, water, lightning or other acts of nature; use in applications with water temperature and ambient air temperature over 100 degrees F, with water pressure greater than 150 psi (PW only); use of products, equipment, systems, utilities, services, parts, supplies, accessories, applications, installations, repairs, external wiring not supplied or authorized by Sensorex, or which damage this product or result in service problems; incorrect supply voltage, fluctuations and surges in electrical supply; customer adjustments and failure to follow operating instructions, cleaning and maintenance instructions that are covered and prescribed in the Operations and Maintenance manual.

There are no express warranties other than those listed and described above, and no warranties whether expressed or implied, including, but not limited to, any implied warranties of merchantability or fitness for a particular purpose, shall apply after the express warranty periods stated above, and no other express warranty or guaranty given by any person, firm or corporation with respect to this product shall be binding on Sensorex. Sensorex shall not be liable for loss of revenue or profits, failure to realize savings or other benefits, or any other special, incidental or consequential damages caused by the use, misuse or inability to use this product, regardless of the legal theory on which the claim is based, and even if Sensorex has been advised of the possibility of such damages. Nor shall recovery of any kind against Sensorex be greater in amount than the purchase price of the product sold by Sensorex and causing the alleged damage. Without limiting the foregoing, purchaser assumes all risk and liability for loss, damage or injury to purchaser and purchaser's property and to others and their property arising out of the use, misuse or inability to use this product sold by Sensorex not caused directly by the negligence of Sensorex. This limited warranty shall not extend to anyone other than the original purchaser of this product either from Sensorex directly or through an authorized Sensorex distributor, it is non-transferable and states the exclusive remedy.