TurbiTech UVT
Operator's Manual

이 기기는 업무용 환경에서 사용할 목적으로 적합성평가를 받은 기기로서 가정용 환경에서 사용하는 경우 전파간섭의 우려가 있습니다.
R-R-iSI-TurbiTech UVT

For regulatory compliance information including local compliance representatives and the product Declaration of Conformity, see www.in-situ.com/compliance-information.

Contents

Introduction

Instrument Description

The TurbiTech UVT uses light absorbance technology to measure UV transmittance. It is ideal for use in controlling UV disinfection in wastewater treatment operations. The instrument may also be programmed with a correlation to estimate Total Suspended Solids (TSS).

EASY TO CONFIGURE AND CONNECT

The 7300 monitor automatically detects the instrument after a quick search, and requires minimal configuration to get started monitoring right away. You can also integrate the instrument with your own custom Modbus system.

RUGGED TWIST-LOCK CABLE

In-Situ's RuggedCable® system is designed with integrated Kevlar® strands and a titanium connector to lead the industry in quality, strength, and reliability. It's easy to remove the sensor from the Twist-Lock connector, and it is interchangeable with any other Twist-Lock instrument.

RUGGED INSTRUMENT DESIGN

The titanium connector and impact-resistant plastic body are protected from both physical damage and chemical attack. The quartz measurement probes resist scratches and damage to the optical surfaces, and metal guards protect the measurement probes when they are extended.

ANTIFOULING TECHNOLOGY

TurbiTech's unique cleaning system scrapes the grime off the optics and protects the optical rods from fouling between readings. No compressors or pressurized water are needed with this method of cleaning, and the only required maintenance is a simple process of replacing the seals every 2 years.

BREAKTHROUGH DETECTION

The optical sensors use two different wavelengths to optimize detection of both organic and inorganic solids for an accurate view into the process.

Safety

Safety and Damage Warnings

Read the safety information on this page before deploying or configuring your instrument. If you have questions, contact In-Situ Technical Support for assistance.

- Do not submerge the Twist-Lock connector or expose the connector to liquid when it is not attached to a cable.
- Isolate the 7300 Monitor from power before attempting to wire the instrument.
- When not in use, store the instrument in a cool, dry area with the probes retracted.
- Do not allow lubricant, debris, or water to get into the connector. Use the dust cap to protect the o-ring and connector when the cable is not attached.
- Do not look directly at the sensors when in use or point them at the eyes. Doing so can cause eye damage.
- Do not use abrasive cleaning agents that could scratch or break the optical probes.
- Do not use solvents to clean the instrument.
- Do not run the cleaning mechanism dry during normal operation. It will cause excessive wear on the seals and increased maintenance needs. You can occasionally extend or retract the probes dry for service or shipping.

Intended Use

The TurbiTech UVT UVT instrument is designed to be safe:

- during indoor or outdoor use;
- in ambient temperatures from -5 to 50° C;
- in any relative humidity levels;

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Technical Support

For service, repair, or technical support, scan the QR code or visit www.in-situ.com/technical-support to contact our skilled support team in your area by chat, email, or phone. Be sure to have the following information available:

- Product model
- Serial number located on the instrument label
- Description of the problem, including how the product was used and the conditions noted at the time of the malfunction

Your equipment was carefully inspected before shipping. Save packing materials for future storage and shipping of your equipment. Check the equipment for any physical damage sustained during shipment. Notify In-Situ and file a claim with the carrier if there is any such damage. Do not attempt to deploy or operate the equipment.

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R-R-iSI-TurbiTech UVT

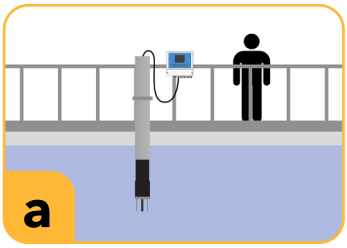
TurbiTech UVT
Quick Start Guide

Box Contents

1. TurbiTech UVT
2. Connector Dust Cover
3. Grease

Getting Started

1 Prepare instrument and deployment site.



Select an installation location representative of process conditions. See manual for guidelines.

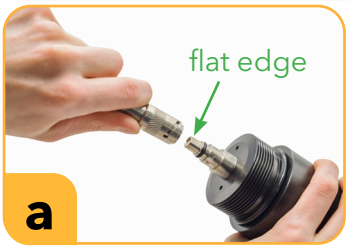
If using a threaded mounting system, remove the collar from the instrument.

Remove protective caps from instrument and cable.

Apply a small drop of grease to the O-ring if it is dry.

2 Connect cable and install in process.

See the following pages for the most common mechanical and electrical installation configuration. See the full manual for guidelines on choosing an installation location and additional installation options.



Align flat edges of cable and connector.

Twist and push the sleeve until you hear a click.

Install the instrument in the mounting system at the selected site in the process.

Wire instrument to 7300 monitor as described on the following pages.

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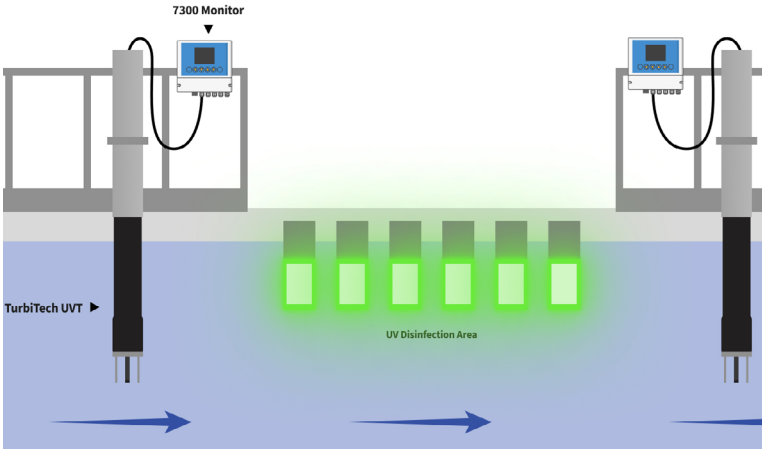
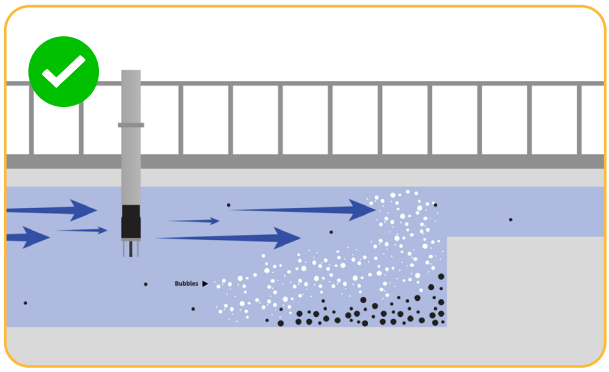
Choosing an Installation Location

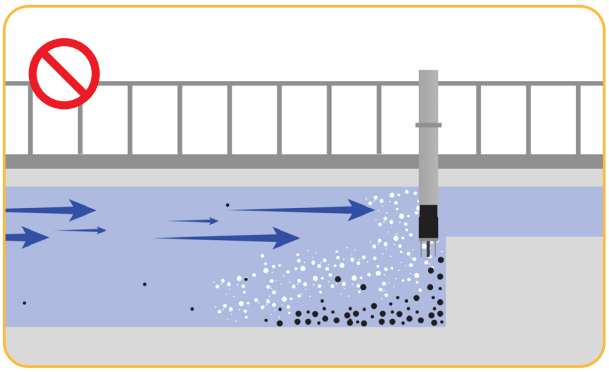
It's most common to deploy the instrument at the influent or of UV Disinfection to optimize UV lamp power use. Follow the best practices below to ensure accurate data and ease of maintenance.



CHOOSE A LOCATION REPRESENTATIVE OF THE PROCESS

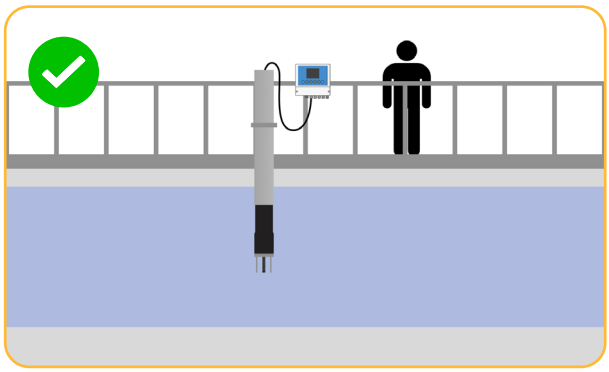


Choose a location that is representative of process conditions.

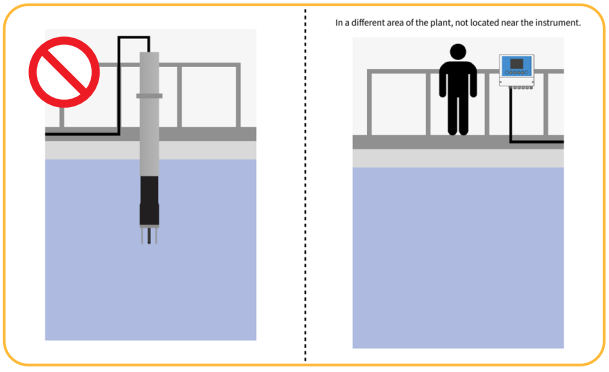


Avoid areas where solids or bubbles might collect at higher or lower levels than the rest of the process.

DESIGN FOR EASY ACCESS, OPERATION, AND CALIBRATION

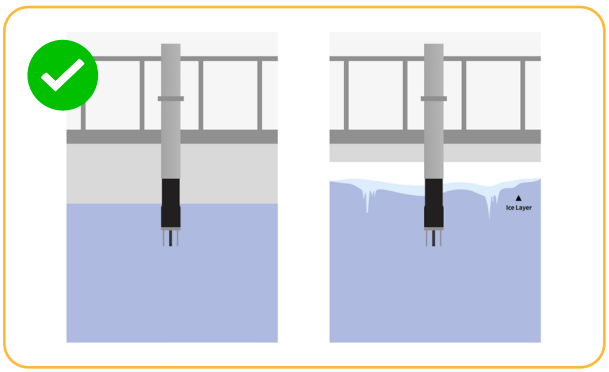


Mount the instrument within sight of the 7300 Monitor where it is easy for operators to access.

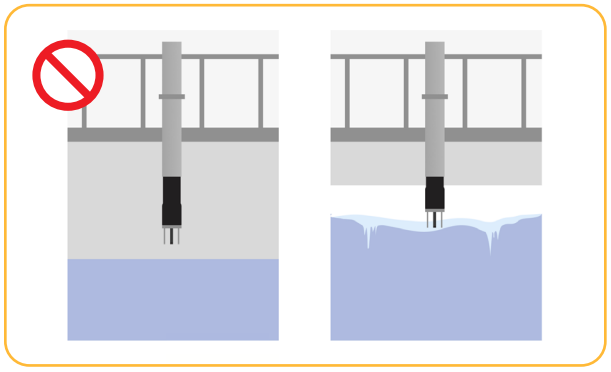


Long distances between the instrument and monitor can make calibrations difficult for operators.

KEEP INSTRUMENT SUBMERGED IN WATER AT EXPECTED CONDITIONS

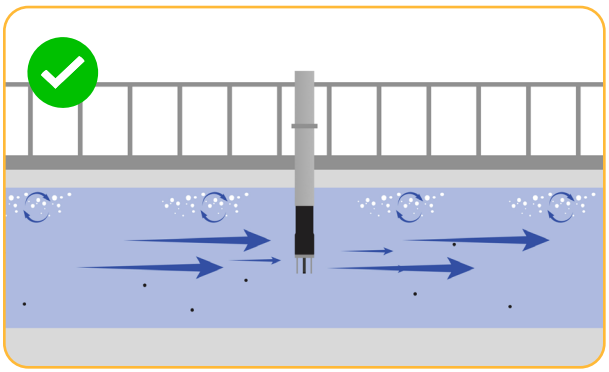


Mount the instrument in a location where it will be submerged in liquid water in the full range of expected operating conditions.

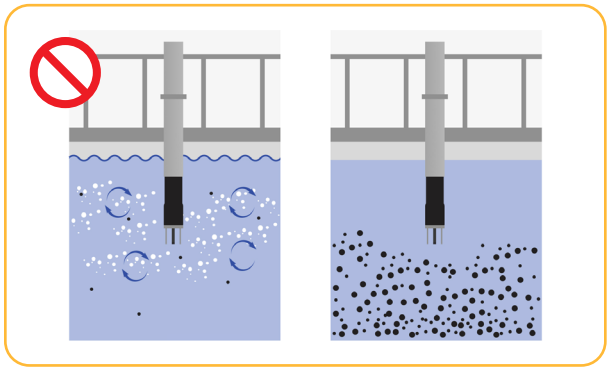


Cleaning the instrument dry can wear down the seals and lead to increased maintenance needs. Freezing conditions can cause damage to the cleaning mechanism or the optical tubes.

CHOOSE AN AREA WITH CONSISTENT FLOW

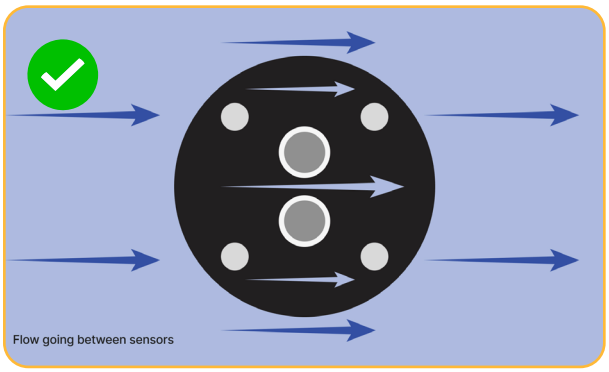


Choose a location that gets enough flow to keep solids suspended without too much turbulence. Immerse the sensor deep enough to get past surface flow patterns.

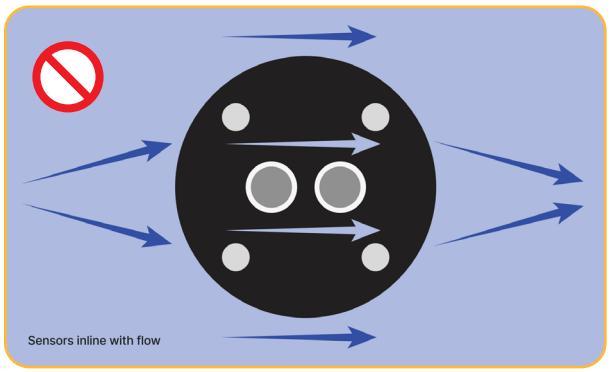


Air bubbles or from high turbulence or surface vortices can affect reading accuracy. Too little flow will not provide a representative sample of the process.

ORIENT DOWNSTREAM WITH PROCESS FLOW



Orient the instrument so the flow path is between the sensors. Angle the instrument either vertical or pointing downstream to help keep it clean.



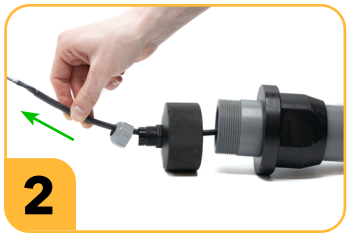
Flow may not be representative if the flow path is in line with the sensors. Pointing the instrument upstream can lead to buildup on the metal plate.

Mechanical Installation

Installing the Instrument with the FlexTech Mounting Shaft

Use the shortest shaft necessary so the instrument can be easily removed for calibration and maintenance.

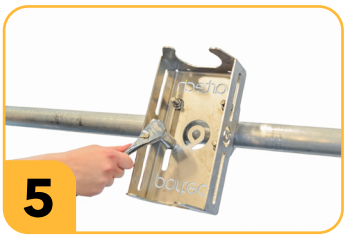
Remove threaded collar. Connect the Twist-Lock cable to the instrument.



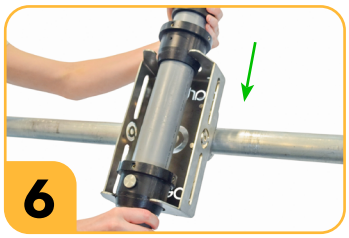
Loosen the cable gland. Feed the cable leads through the FlexTech shaft.

Twist the shaft around the instrument to tighten the threaded connector.

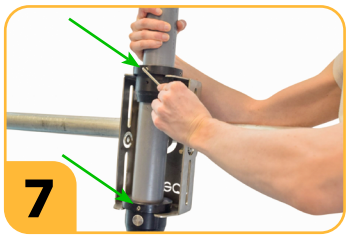
Remove slack in the cable. Tighten the cable gland.



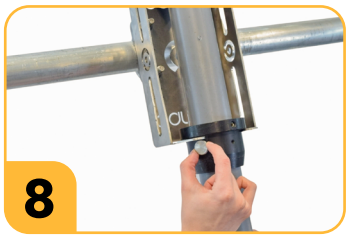
Use the U-bolts to secure the bracket to the handrail.



Slide shaft into the bracket, with the flat side of the holders toward the back.



Use an allen key to loosen the holders and adjust the depth of the instrument.

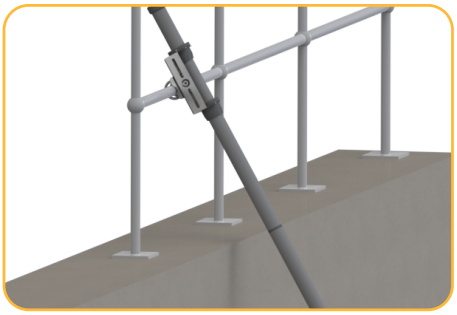


Move the bottom screw to the side to lock the shaft in place (optional).

Fixed Mounting Options

Use the systems below to hold the instrument at a fixed location in the process for long-term deployments.

FLEXTECH MOUNTING SHAFT



Use the FlexTech Mounting Shaft to hold the instrument at a fixed location in the process.

FLOWCELL

Install the instrument in a flowcell with representative sample flow.

THREADED FITTINGS

Install the instrument in your own custom system that accepts BSPP 2 in threads.

Temporary Deployments

These options allow you to temporarily hang the instrument for site selection or spot checks, or profiling at multiple locations.

HANG FROM CABLE

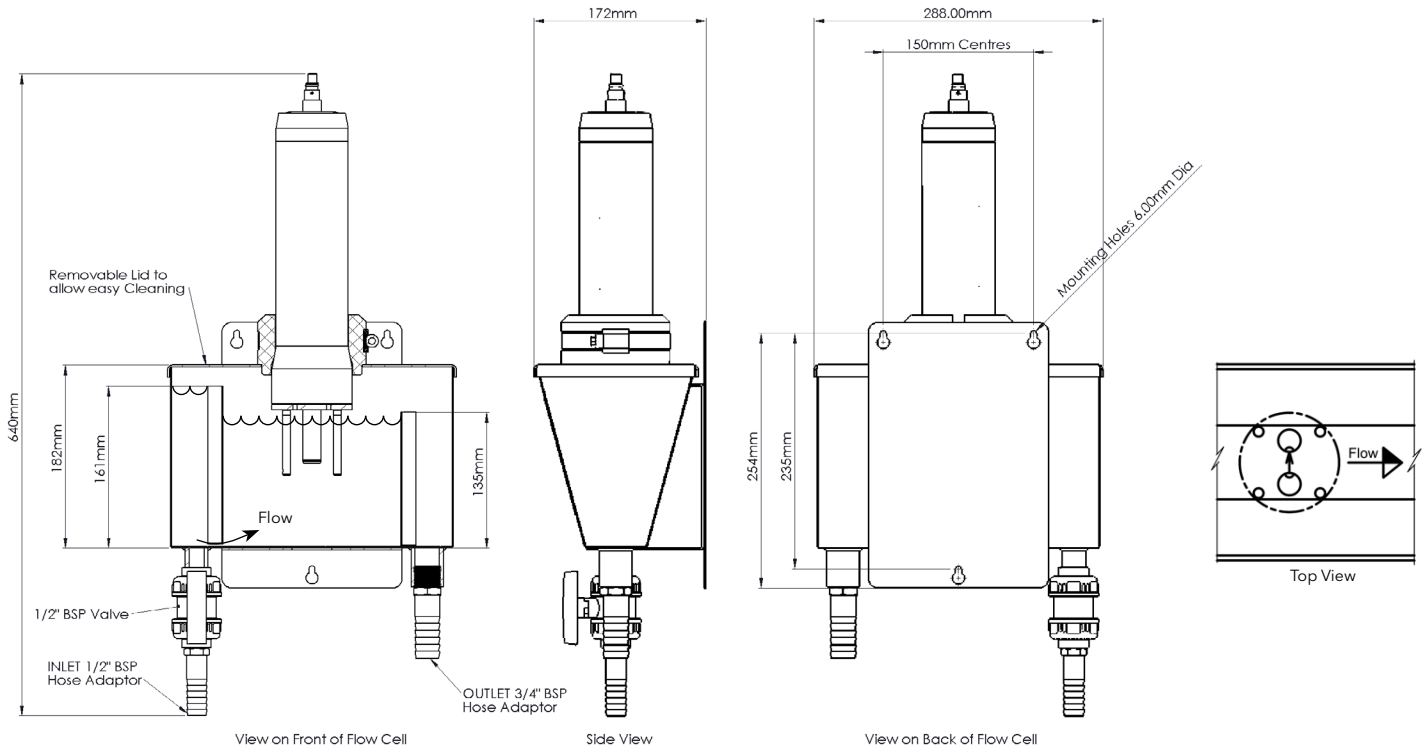
Use the twist-lock connector to suspend the instrument.

HANG FROM BAIL

Connect bail kit to screws, then use the bail to hang the instrument.

Installing the Instrument in a Flowcell

FC8 flowcells are not designed to contain pressure. Route the outlet to waste at atmospheric pressure.



You can view the flow through the cell with the lid removed. Open the inlet valve until there is enough flow to keep solids suspended, typically 0.5 to 5 liters per minute.

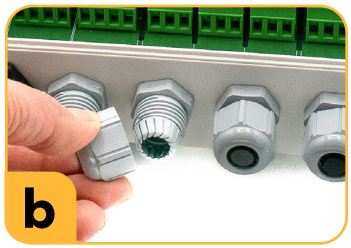
Electrical Installation with 7300 Monitor

If you are using a different system than the 7300 Monitor, see the PLC and Modbus sections of the manual for wiring diagrams and programming information.

Wiring the Instrument

Isolate the monitor from power before installing wires to reduce the risk of electric shock.

Isolate the monitor from power. Remove the cover from the monitor.



Unscrew the cable gland cap from the monitor.

Thread the cable leads through the cap.

Thread leads through the cable gland opening. Remove terminal plug and loosen terminal screws.

Insert each colored wire into the corresponding terminal. Tighten screws and insert plug back into the terminal block.

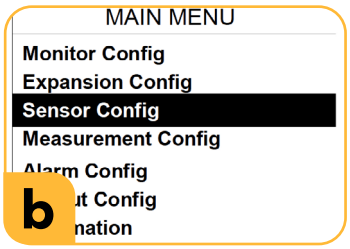
Isolate the brown and white wire leads with tape, or clip them after you have confirmed communication.

Tighten cap securely onto cable gland.

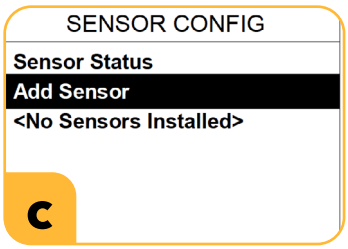
Screw the cover back onto the monitor. Connect power to monitor.

Viewing Live Readings

Press **Menu** on the monitor.



Use arrow keys to select **Sensor Config**. Press **OK.**



Use arrow keys to select **Add Sensor.** Press **OK.**

Select **TurbiTech UVT.** Press **Menu** twice to view data.

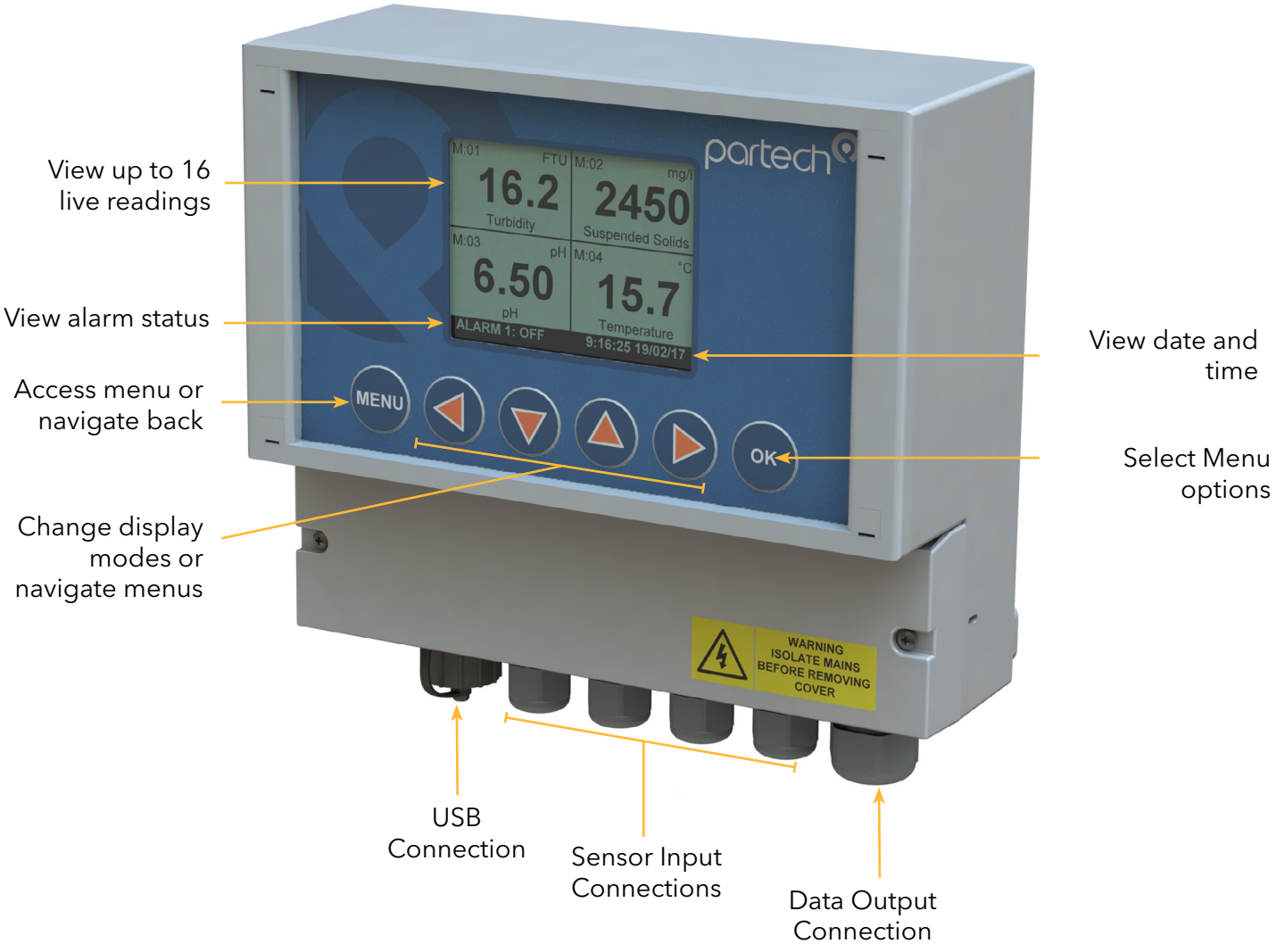
Using the 7300 Monitor

Use the 7300 Monitor to program your instrument and view readings. You can view more information about the monitor and available settings in the 7300 Monitor manual.

Monitor Navigation

You'll need to configure which measurements are displayed on the monitor. First, add each sensor from the **Sensor Config** menu. Then, configure measurements from the **Measurement Config** menu.

After you have added sensors and measurements, you will see the measurement display screen when the display is on. Here's how to navigate the main features of the monitor:



Main Menu Items

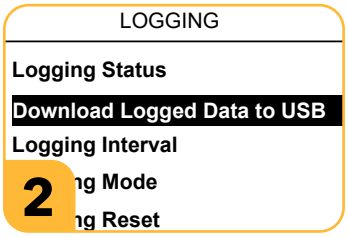
The **Sensor Config** and **Measurement Config** menus are unique to each instrument. You can learn more about these menus on the following pages of this manual. For all other menus, see the 7300 Manual.

MAIN MENU	
Enable Cal Mode	← Temporarily ignore readings during calibration or maintenance.
Monitor Config	← Adjust monitor display settings, date/time, and language
Expansion Config	← Connect an expansion box with additional sensors
Sensor Config	← Add sensors and configure sensor settings
Measurement Config	← Add measurements and configure measurement settings
Alarm Config	← Add alarms and configure alarm settings
Output Config	← Add analog ouptuts and configure analog settings
Information	← View software version and contact information
Lock Config	← Set password and configure lock settings
Logging	← Download data log and configure log settings

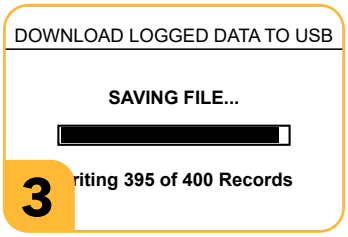
Downloading Data

The 7300 Monitor automatically logs data and can store up to 10,000 log records. Use the **Logging** menu to download data from the monitor to a USB memory stick. See the 7300 Manual to learn more about custom log settings.

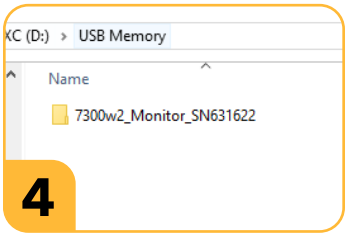
Insert a USB stick into the USB connection on bottom left side of the monitor.



From **Logging** menu, select **Download Logged Data to USB** and press OK.



The monitor will confirm when the download is complete.



Plug the USB stick into a computer and find the data in a folder named **7300w2_Monitor_ SNxxxxxx**.

The file will be a CSV with the following name format:
YYMMDD_HHMMSS_7300w2_Monitor_SNxxxxxx_logged_data.csv

Sensor Configuration

The monitor leaves the factory with no sensors pre-installed. Use the **Sensor Config** menu to connect to your instrument and configure instrument settings.

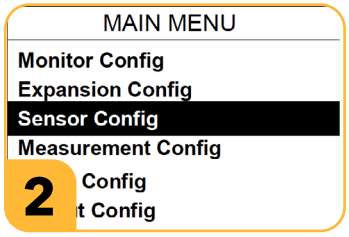
Sensor Status

View the status of the 8 sensor channels. All channels will display **Not Installed** until a sensor has been added. Once a sensor has been installed the display will indicate the type of sensor and its serial number.

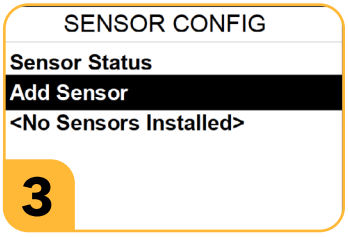
Add Sensor

Add each sensor one at a time to avoid address conflicts. The monitor will search all available addresses for new sensors.

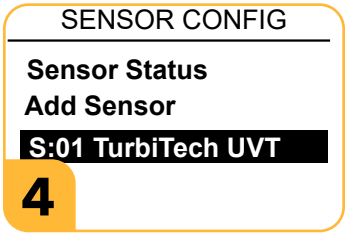
Physically connect the instrument to the monitor.



From the main menu, highlight **Sensor Config** and press OK.



Highlight **Add Sensor** and press OK to initiate the search.



The Monitor will display a list of sensors found.

Repeat this process to add up to 8 sensors. You will need to update each sensor address from the **Sensor Config** menu before adding a new sensor. An expansion box may be required to add additional sensors.

After you have added a sensor, highlight it in the **Sensor Config** menu to access settings for that sensor. See the next section of this manual for more details.

Sensor Settings

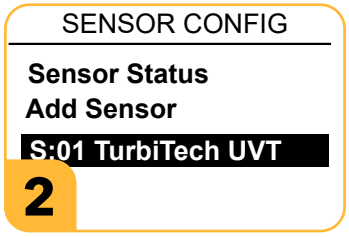
After you have added a sensor, select it in the Sensor Config menu to access these settings.

Manual Clean

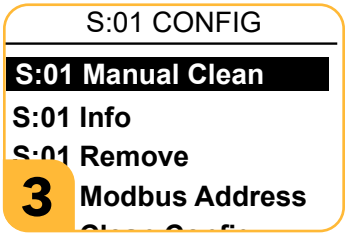
Initiate a cleaning cycle and test that cleaning is working well. This may be useful during commissioning, in heavy fouling applications, or as part of routine sensor maintenance.

> ⚠ Always moisten the glass tubes with water to lubricate the seals before initiating a manual clean.

Moisten the sensor glass tubes with clean water.



From **Sensor Config** menu, choose the active sensor and press OK.



Highlight **Manual Clean** and press OK to initiate the cleaning cycle.

The tubes will retract and extend as part of the cleaning cycle.

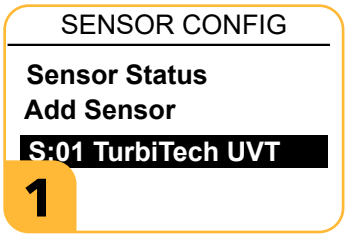
Info

View diagnostic information requested by Technical Support during troubleshooting.

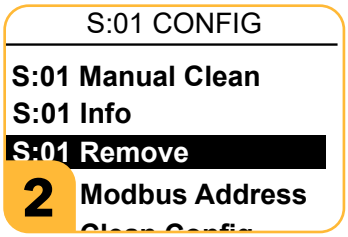
Remove

Permanently delete a sensor and its configured settings from the monitor.

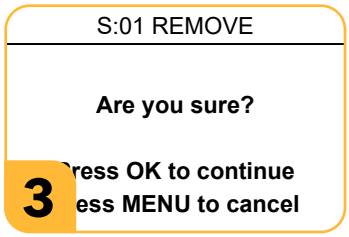
> ⚠ Removing a sensor will also delete all Measurements, Alarms, and Analog outputs that have been configured for that sensor.



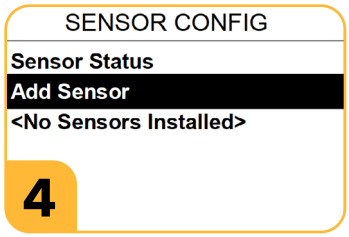
From **Sensor Config** menu, select the sensor to remove and press OK.



Highlight **Remove** and press OK to remove the sensor.



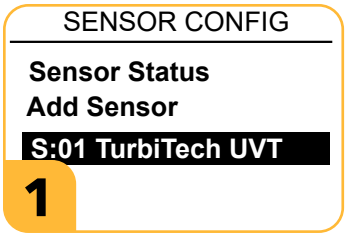
Press OK to confirm or Menu to exit without removing the sensor.



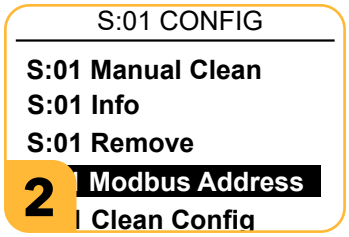
The sensor and its measurements will be removed from the monitor.

Modbus Address

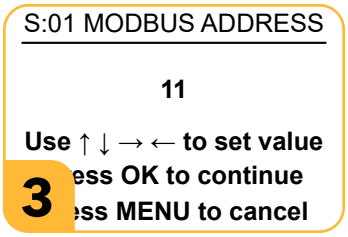
View the current Modbus address, or set a custom address.



From **Sensor Config** menu, choose the sensor to update and press OK.



Highlight **Modbus Address** and press OK.



Use the arrow keys to set a new address.

Press OK to apply the new address to the instrument.

Cleaning Configuration

CLEANING INTERVAL

Set an automatic cleaning schedule between 5 and 7200 minutes. The factory default is 360 minutes (6 hours).

Shorter cleaning intervals will cause the seals to wear out and need replacement faster. Most applications do not require a cleaning interval shorter than 60 minutes.

CLEANING INTERVAL	SEAL REPLACEMENT INTERVAL (BASED ON 3600 CYCLES)
2 minutes	5 days
12 minutes	30 days
30 minutes	75 days
60 minutes	5 months
120 minutes	10 months
240 minutes	1.5 years
360 minutes	2.5 years
720 minutes	5 years
1200 minutes	8 years
1440 minutes (1 day)	10 years

CLEAN MODE

- **Normal**: Leave the probes extended during normal operation and retract them during cleaning.
- **Off:** Pause cleaning during maintenance or troubleshooting.
- **Reverse:** Leave the probes retracted during normal operation and extend them only during a reading. This mode may be useful in applications with aggressive scaling or fouling.

Reverse cleaning mode will cause the seals to wear out and need replacement faster. Make sure to check seal life frequently and replace the seals before they fail.

SERVICE LIFE

Adjust the number of cleaning cycles before recommending seal replacement service. The factory default is 3600 cleans between services (~2 years at 6 hour cleaning interval). Use a shorter service life in abrasive environments.

CLEAN SERVICE

Reset the service life cleaning counter after you have replaced the seals.

CLEAN INFO

View the number of cleans since the last reset, the time of the next clean, and estimated service life

CLEAN ERROR RESET

Clear the clean error flag. After an error, this flag will remain set until you clear it.

RETRACT

Retract the probes to protect them during installation, storage, or shipment.

EXTEND

Extend the probes after retracting them.

Measurement Configuration

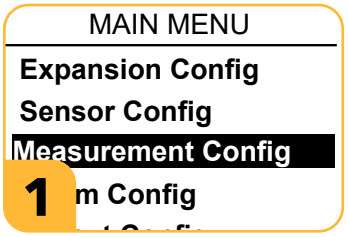
When you add a sensor to the monitor, the default measurements are automatically added for that sensor. Use the Measurement Config menu to add additional measurements and adjust measurement settings.

Measurement Status

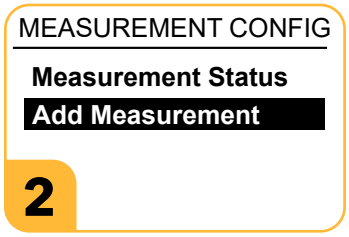
View the status of the 16 available measurement channels. All channels will display **Disabled** if no measurements have been added. Once you have added a measurement, the display will show the type of measurement and information about the sensor providing the measurement

Add Measurement

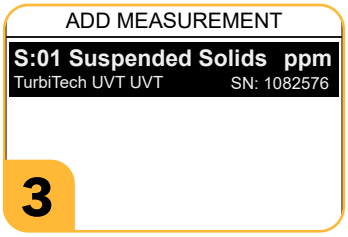
Follow the instructions in the previous section to add a sensor before configuring measurements.



From the main menu, highlight **Measurement Config** and press OK.



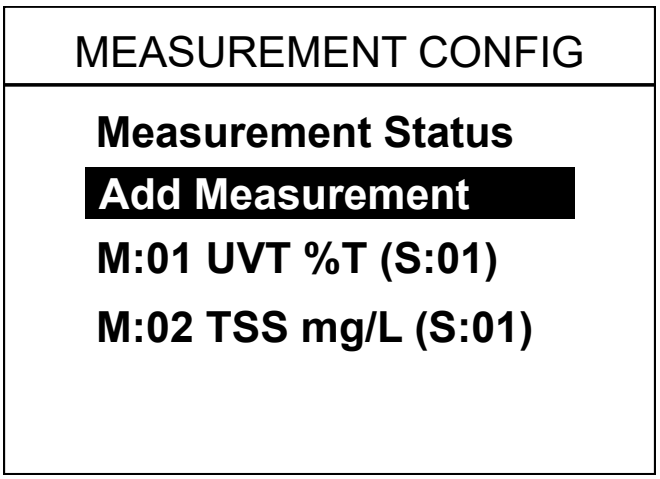
Highlight **Add Measurement** and press OK to show a list of available measurements.



Highlight the measurement you wish to add.

Press OK. Repeat to add up to 16 total measurements. Each measurement will be automatically assigned a number from M:01 to M:16.

After you have added a measurement, highlight it in the **Measurement Config** menu to access settings for that measurement. See the next section of this manual for more details.



Measurement Settings

After you have added a measurement, select it in the **Measurement Config** menu to access these settings.

The parameter and units are fixed for each measurement. To view a different parameter or units, add a new measurement with the configuration you wish to view.

Info

View diagnostic information requested by Technical Support during troubleshooting.

Title

Create your own custom title for the measurement with up to 20 characters. This only changes the display label for the measurement and does not apply any conversions to the measurement value.

Set Zero

Set the calibration zero point for all measurements. See the **Calibration** section of this manual to learn more.

Calibrate

Set the calibration span point for this measurement. See the **Calibration** section of this manual to learn more.

Take Sample

Store a sample value and enter calibration results later. See the **Calibration** section of this manual to learn more.

Sample Result

Enter calibration results for a stored sample value. See the **Calibration** section of this manual to learn more.

Averaging

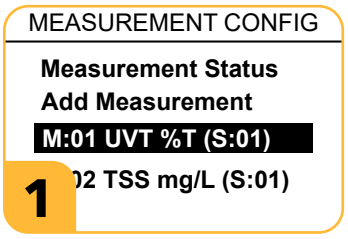
Choose a level of data averaging to reduce noise in the readings and adjust the response time to data fluctuations.

DAMPING RATE	RESPONSE TIME (T63)	TYPICAL USE
Very Fast	1s	
Fast	30 s	Final effluent monitoring
Medium	1 m	
Slow	2 m	Activated sludge (MLSS) applications
Very Slow	5 m	Applications with high levels of air bubbles or turbulence

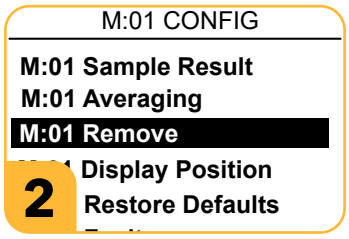
Remove

Permanently delete a measurement and its configured settings from the monitor.

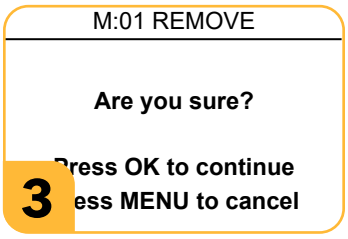
Removing a measurement will also delete all Alarms, and Analog outputs that have been configured for that measurement.



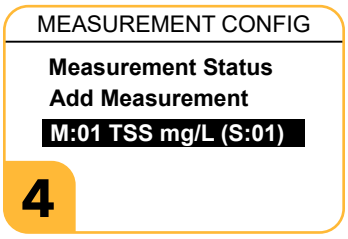
From **Measurement Config** menu, select the measurement to remove and press OK.



Highlight **Remove** and press OK to remove the measurement.



Press OK to confirm or Menu to exit without removing the sensor.

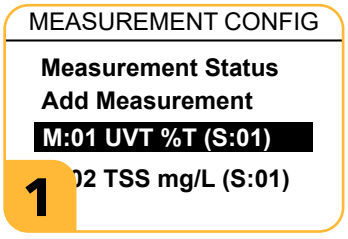


The measurement and its associated settings will be removed from the monitor.

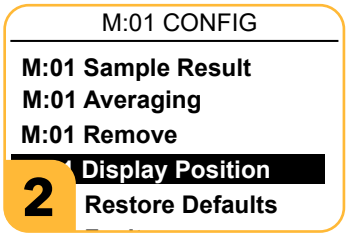
Display Position

Configure where the meausrement shows up in the main display. The screen will always display the measurements in order from M:01 to M:16.

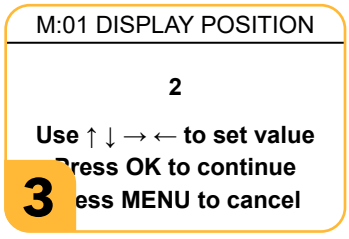
Updating the display position for a measurement will also update all alarms and analog outputs to match the new position. You don't need to reconfigure any of these settings after changing the display position.



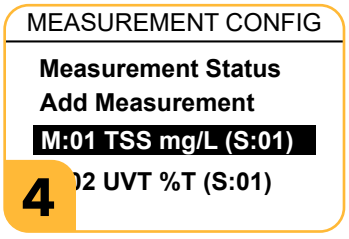
From **Measurement Config** menu, select the measurement to move and press OK.



Highlight **Display Position** and press OK to view the current display position.



Use the arrow keys to set a new display position.



Press OK to apply the new display position. If another measurement is in that position, the measurements will be swapped.

Parameter Information

UV % Transmittance (UVT) - Derived from 254 AU

The instrument provides UVT based on a correlation with the 254 AU wavelength. You can adjust the correlation for this parameter based on a known sample value. You can find instructions for adjusting the UVT correlation in the **Calibration** section of this manual.

Total Suspended Solids (TSS) - Derived from 850 AU

The instrument can derive an estimate for TSS based on a correlation with the 850 AU wavelength. Scale factors for TSS are unique for each deployment site, so you must set a span point based on a known sample value. You can find instructions for adding a TSS correlation in the **Calibration** section of this manual.

Calibration Frequency Requirements

In-Situ sensors are factory calibrated across the entire range of each sensor, and thus achieve a very high degree of linearity with a simplified user calibration.

SENSOR	RECOMMENDED USER CALIBRATION FREQUENCY	RECOMMENDED FACTORY CALIBRATION FREQUENCY	NOTES
Zero Point	Upon initial commissioning, then as needed based on readings in clean water	12 months	Sets the zero point for all parameters. Calibrate the zero point before adding a TSS correlation.
TSS	Upon initial commissioning and 4 weeks later, then every 6 months or as needed to capture process changes	N/A	This measurement depends on the nature of the suspended solids. Update the correlation any time process changes may affect the solids.
UVT	Not required. May be adjusted to match a known value from another instrument.	N/A	

Factory Calibration

Factory calibration includes a thorough cleaning, full functionality check and sensor adjustments. We recommend a factory calibration every 12 months or when the unit appears to drift significantly.

Calibration

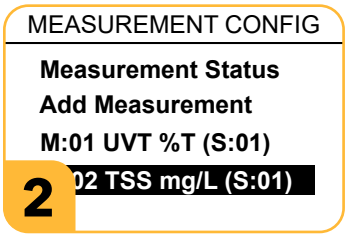
After installing a new system, allow the instrument to stabilize in the new process conditions for 4 hours before calibration.

Zero Point Calibration with Clean Water

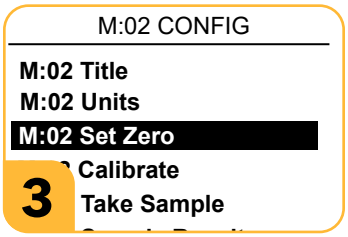
The clean water calibration will set the zero point for all parameters on the instrument.

Calibrate the zero point upon initial commissioning, prior to any correlation or take sample, or as needed based on readings in clean water.

Clean and dry the instrument, container, and cable before calibration.



From the **Measurement Config** menu, select any parameter.



Select **Set Zero** and press **OK**.

Place sensor in a dark container of organic free water for best results, away from ambient light and bubbles. Ensure the gap between the sensors is clear. For best results allow for a few minutes of stabilization then press **OK** to accept the calibration.

TSS Correlation Sample Options

Use any of the sampling methods below to create a correlation for TSS. Choose a sample representative of the operating conditions you expect for the installation site.

LARGE GRAB SAMPLE:

Collect a grab sample of at least 5 L and immerse the sensor directly into the sample.

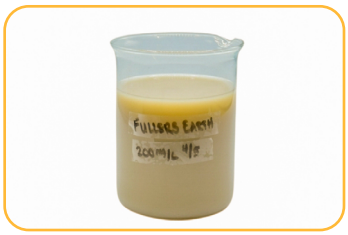
SMALL GRAB SAMPLE:

Collect a grab sample next to the sensor for laboratory analysis.

REFERENCE DEVICE:

Submerge a calibrated reference device next to the sensor, at the same depth and conditions as the sensor.

FULLER'S EARTH:

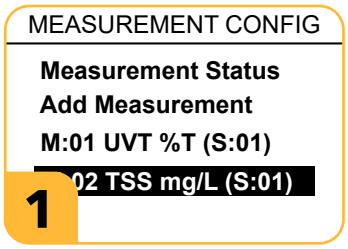


Prepare a Fuller's earth sample according to your site standard operating procedures.

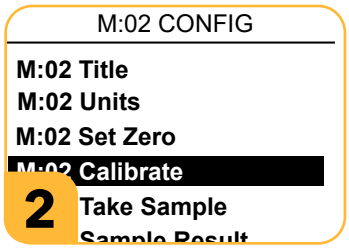
To ensure correlation accuracy, use a dark container and shield the sample from ambient light. Ensure the sample is well-mixed and free of bubbles. For best results allow for a few minutes of stabilization.

Use **Calibrate** if you are using a known value or a reference device. Use **Take Sample** to store a sample reading now and enter the results of laboratory analysis later.

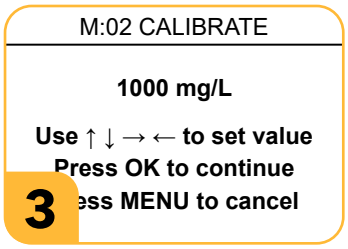
TSS Correlation - Known Value



From the **Measurement Config** menu, select the TSS parameter.



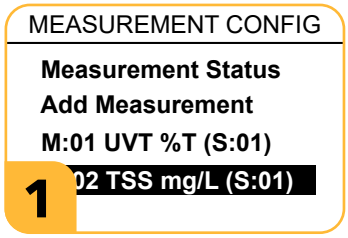
Select **Calibrate** and press **OK**. The monitor displays details about the sensor and most recent sample. Press **OK**.



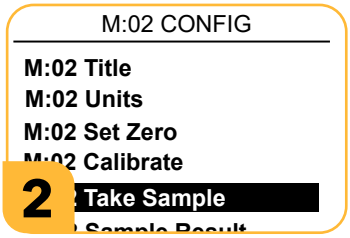
Use the arrow keys to enter the known value of the sample.

Submerge the sensor. Ensure that the sample is well-mixed, free of bubbles, and shielded from ambient light. For best results allow for a few minutes of stabilization then press **OK** to apply the correlation.

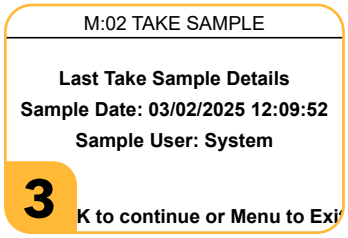
TSS Correlation - Lab Sample



From the **Measurement Config** menu, select the TSS parameter.



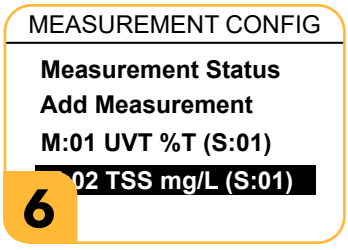
Select **Take Sample** and press **OK**.



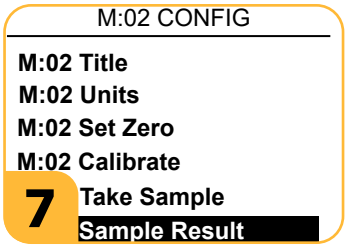
The monitor displays details about the sensor and most recent sample. Press **OK**.

Submerge the sensor. Ensure that the sample is well-mixed, free of bubbles, and shielded from ambient light. For best results allow for a few minutes of stabilization then press **OK** to apply the correlation.

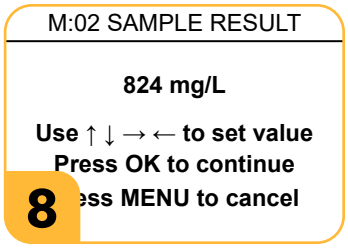
Determine the true value of the sample with laboratory analysis.



To enter results from the **Measurement Config** menu, select the TSS parameter.



Select **Sample Result** and press **OK**. The monitor displays details about the sensor and most recent sample. Press **OK**.



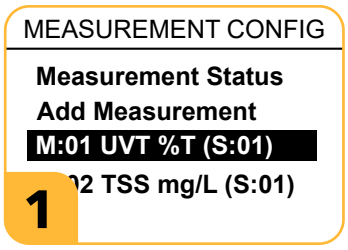
Use the arrow keys to enter the analyzed value of the sample. Press **OK** to apply the correlation.

Adjusting the UVT Correlation

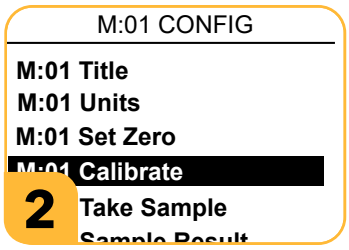
You can set a custom UVT correlation if you are comparing the instrument to a known sample or a reference device. Use **Calibrate** if you are using a known value or a reference device. Use **Take Sample** to store a sample reading now and enter the results of laboratory analysis later.

To ensure correlation accuracy, use a dark container and shield the sample from ambient light. Ensure the sample is well-mixed and free of bubbles. For best results allow for a few minutes of stabilization.

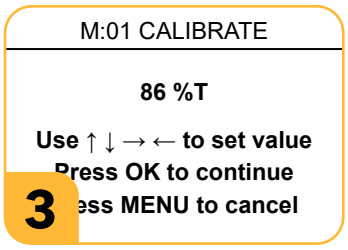
UVT Correlation - Known Value



From the **Measurement Config** menu, select the UVT parameter.



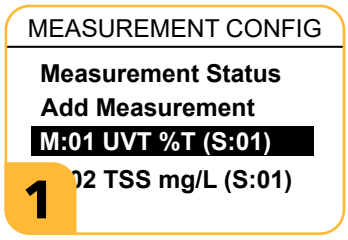
Select **Calibrate** and press **OK**. The monitor displays details about the sensor and most recent sample. Press **OK**.



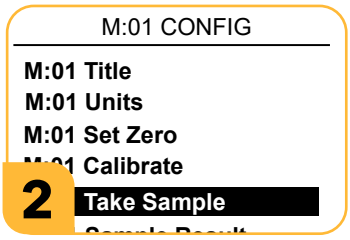
Use the arrow keys to enter the known value of the sample.

Submerge the sensor. Ensure that the sample is well-mixed, free of bubbles, and shielded from ambient light. For best results allow for a few minutes of stabilization then press **OK** to apply the correlation.

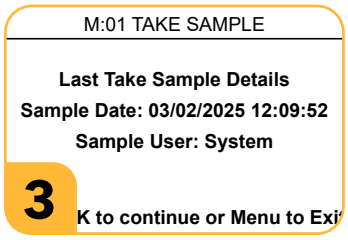
UVT Correlation - Lab Sample



From the **Measurement Config** menu, select the UVT parameter.

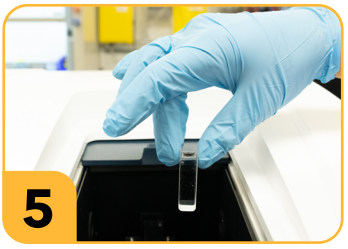


Select **Take Sample** and press **OK**.

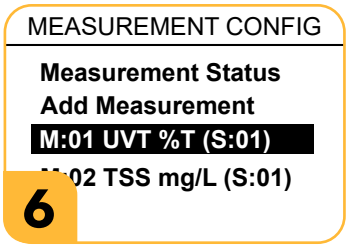


The monitor displays details about the sensor and most recent sample. Press **OK**.

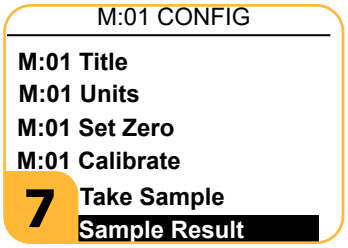
Submerge the sensor in a sample that is well-mixed, free of bubbles, and shielded from ambient light. For best results allow for a few minutes of stabilization then press **OK** to apply the correlation.



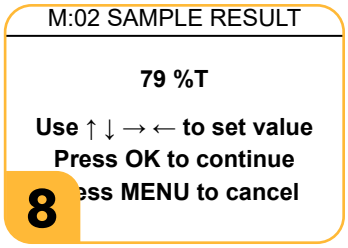
Determine the true value of the sample with laboratory analysis.



To enter results from the **Measurement Config** menu, select the active parameter.



Select **Sample Result** and press **OK**. The monitor displays details about the sensor and most recent sample. Press **OK**.



Use the arrow keys to enter the analyzed value of the sample. Press **OK** to apply the correlation.

Cleaning and Inspection

Cleaning the Instrument

Do not use solvents or abrasives to clean the instrument.

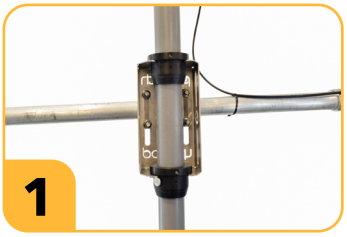
Use a plastic scraper to remove solid fouling from the instrument body.

Wipe the instrument with a soft cloth, dish soap, and warm water.

Rinse and dry the instrument.

Inspecting the Instrument

Clean and inspect the instrument regularly to maximize operational life.

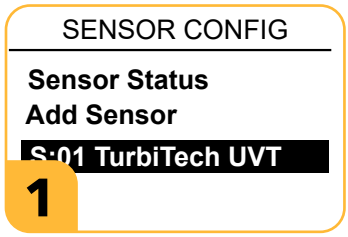


Check the brackets and cable for damage or instability.

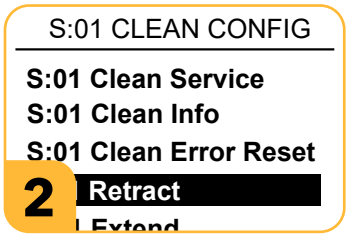
Remove the instrument and clean it with soap and water.

Inspect the glass tubes for staining, scouring, cracks, chips, or moisture which may require factory service.

Storage



From **Sensor Config** menu on the monitor, choose the instrument and press OK.



Select **Cleaning Configuration.** Then select **Retract**.

After the probes have retracted, disconnect the instrument from power.

Install a dust cover to protect the Twist-Lock connector.

Maintenance

Replacing Instrument Seals

Replace the seals as recommended by the 7300 Monitor (default 3600 cleaning cycles). It's easiest to perform this procedure with the probes extended.

Clean the instrument and disconnect it from power.

Unscrew the four guard rods. You can insert an Allen wrench into the hole on each rod to loosen the rod.

Thread two of the rods into the two alignment holes on the center of the metal plate.

Stabilize your thumbs on the glass tubes. Pull the metal plate and seal assembly from the instrument.

Do not allow water or debris to enter the instrument when the seal assembly is removed.

Remove the rods from the seal assembly. Discard the old wiper rings and seal assembly.

Stack the new seal assembly, wiper rings, and metal plate as shown. Reinstall the rods in the center holes.

Align the metal plate with the four outside holes and press it into the instrument.

Reinstall the guard rods in the four outside holes. You can insert an Allen wrench into the hole to tighten rods.

Install the rods in the center alignment holes before installing the assembly back in the instrument. This prevents strain on the glass tubes when aligning the seal assembly. After reinstalling the guard rods and completing the seal assembly replacement, thoroughly clean the probes to remove any grease, debris, or residue from installation. This ensures accurate readings and maintains instrument performance.

Replacing Connector O-Ring

Replace the connector O-ring if it becomes brittle or damaged.

Remove the old O-ring from the connector.

Clean the groove to remove any dirt or debris.

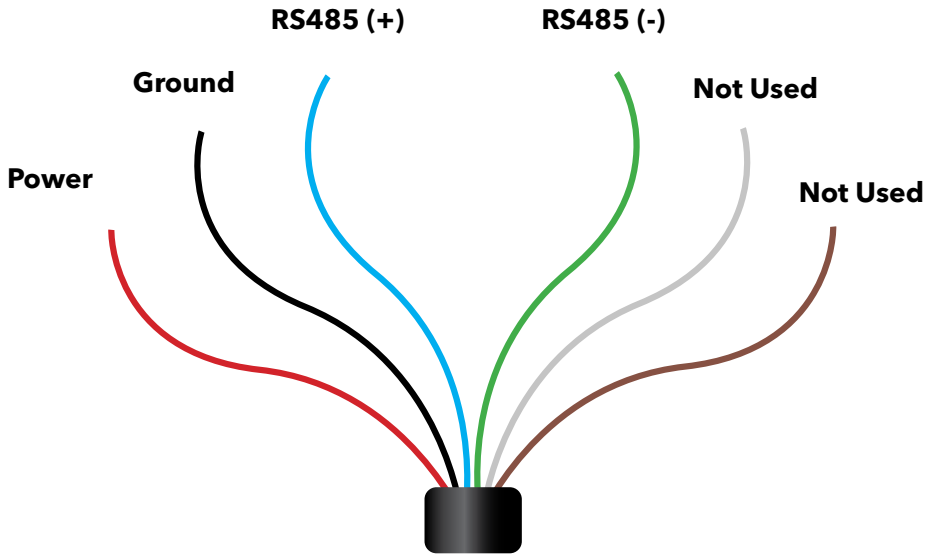
Install the new O-ring in the groove.

Apply a pea-sized amount of grease to the new O-ring.

Electrical Installation with a PLC

Flying Leads Wire Diagram

For the best experience, use the instrument with the 7300 Monitor. If you are using a different PLC, refer to the information on the following pages for PLC wiring diagrams and programming information. Unused leads should not be touching.



WIRE COLOR	SIGNAL
Red	External Power
Black	Ground
Blue	RS485 (+)
Green	RS485 (-)
White	Not Used
Brown	Not Used

Modbus (RS-485) Wiring Diagram

Modbus PLC Interface

Overview

The Modbus PLC Interface is a simplified method of communicating with the TurbiTech UVT using the Modbus protocol. For information about the specific Modbus registers and Unit IDs for your TurbiTech UVT, see Appendices A and B. This instrument conforms to the Modbus standard. For more information about Modbus, see www.modbus.org.

Programming the PLC

This setup uses the instrument's factory default settings. If the instrument has been connected to the 7300 Monitor, some communication settings may have changed.

1. Set up the serial communication to match the instrument communication settings based on whether the instrument is at default settings or has been connected to a 7300 Monitor:

SETTINGS	MODE	START BIT	BAUD RATE	DATA BITS	PARITY	STOP BIT
Default	RTU	1	19200	8	Even	1
7300	RTU	1	9600	8	None	2

2. Set the device address match the instrument address. The default device address is 1.
3. Select the register to read on the PLC using the information in the following sections.
    a. If your PLC requires a register address, subtract 40001 from the holding register number. For example: Holding Register Number 45451 corresponds to Register Address 5450.
4. Read the parameter value register to wake up the instrument. The instrument will return Device Busy while it is preparing to take readings. Continue trying to read the parameter value register until readings are provided.
5. Set the type of register to: 32-bit float
    a. If asked by the PLC this is 2 registers
6. Set the byte order to: Big Endian (MSB). This should be the default and may not be configurable on all PLCs

Reading Device Information

Use the following registers to read general information about the instrument.

HOLDING REGISTER NUMBER	REGISTER ADDRESS	SIZE (REGISTERS)	DATA TYPE	DESCRIPTION
49001	9000	1	uint16	Device Id: 45 = TurbiTech UVT
49002	9001	2	uint32	Serial Number
49007	9006	1	uint16	Firmware version (100 = 1.00)

Reading Parameters

Each parameter contains a block of 7 registers as shown in the table below. To read measurements for a specific parameter, look up the starting register for that parameter from the list of Parameter Numbers and Locations in Appendix A. Once you have the starting register, add the number of offset registers for additional information about the reading.

REGISTER OFFSET	SIZE (REGISTERS)	MODE (R/W)	DATA TYPE	DESCRIPTION
0	2	R	float	The measured value from sensor
2	1	R	uint16	Data Quality ID: 0 = No errors 3 = Error reading parameter For additional errors or information, contact technical support.
3	1	R/W	uint16	Units ID for this parameter. See: Appendix B.
4	1	R	uint16	Parameter ID for this parameter. See: Appendix A.
5	2	R/W	float	Off line sentinel value: The value that's returned on error or if the parameter isn't available. The default sentinel is 0.0

For example, you can apply this information to collect a reading for UVT.

From the list in Appendix A, you can find that the starting register for UVT is 46081. A reading from holding register number 46081 will return the measured value of UVT.

Some PLC devices use the holding register number directly in programming statements, others use register addresses. Refer to PLC manufacturer instructions to determine which programming style to use.

You can use the register offsets listed in the table above to collect additional information about the reading. Adding the register offset of 2 to the starting register, you can find that holding register number 46083 will return the Data Quality ID for the most recent UVT measurement. Likewise, holding register number 46084 will return the Units ID, which can be interpreted from Appendix B. Register number 46085 will return the Parameter ID, which can be interpreted from Appendix A. Register number 46086 will return the sentinel value for this parameter.

The Units ID and Sentinel Value are writeable registers. Measurements can be changed to other units using the Units ID as shown in Appendix B. For example, if holding register number 45664 (Total Suspended Solids Units ID) returns 117, Total Suspended Solids is configured to report in mg/L. Looking at Appendix B, you can find that µg/L is also a valid unit which can be set by writing Units ID 118 to holding register number 45664.

TurbiTech UVT Sensor

THE TURBITECH UVT SENSOR USES LIGHT ABSORBANCE TECHNOLOGY TO MEASURE UV TRANSMITTANCE TO EVALUATE LOAD LEVELS OF CONTAMINANTS AND OPTIMIZE UV DISINFECTION PROCESSES. THE TurbiTech UVT ALSO PROVIDES TOTAL SUSPENDED SOLIDS (TSS) MEASUREMENTS FOR BREAKTHROUGH DETECTION.

RADIAL CLEANING

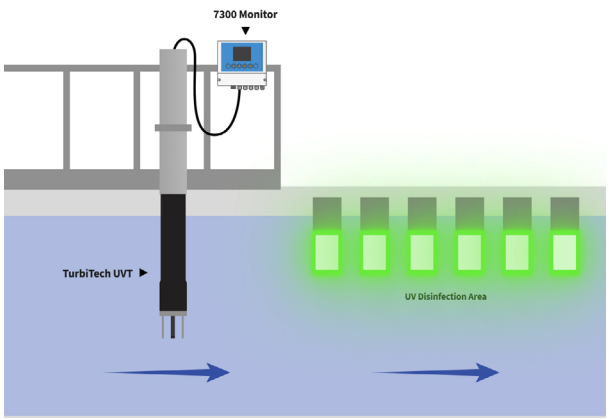
TurbiTech's unique optical cleaning system continuously maintains sensor performance by actively scraping grime from the optics and preventing fouling between readings. Designed for ease of use, the system features user-replaceable seals and scrapers, enabling quick, in-field maintenance without the need for additional equipment such as compressors or pressurized water.

ENHANCED RELIABILITY

Built for durability and long-term performance, TurbiTech UVT features

- Waterproof twist-lock metal connectors that offer significantly longer life than plastic alternatives.
- Sensor housing made from machined, impact-resistant plastic to enhance durability and chemical compatibility.
- Titanium rods that safeguard the quartz optical rods, which are highly resistant to scratching and surface damage.

The TurbiTech UVT has a large sample area volume which minimizes the effect of small debris on the reading accuracy. Additionally, by avoiding the use of epoxy as a primary seal, the design ensures greater reliability in field conditions.



LOW COST OF OWNERSHIP

The system supports long operational cycles, with recommended seal replacement every 3,600 cleaning cycles. This typically equates to about two years in wastewater applications and approximately three years in drinking water environments.

INTEGRATED SOLUTION

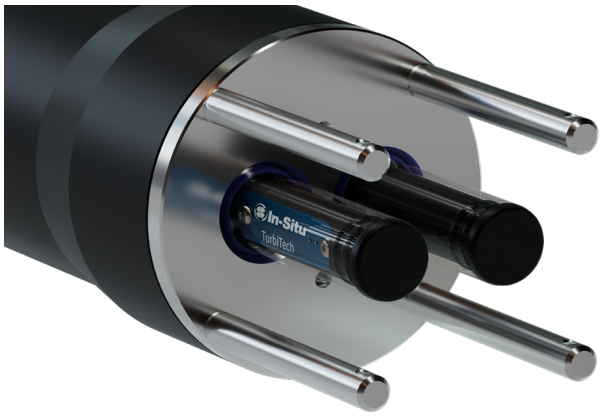
The TurbiTech UVT is part of a complete digital portfolio of process sensors, which connect to the 7300 monitor, to log, display and transmit data to the plant SCADA system.

EASY INSTALLATION

The TurbiTech UVT can be supplied with a FlexTech mounting shaft and bracket for easy installation on a handrail or wall at the point of monitoring. The instrument can also be used with the FC8 Flow Cell, or even threaded into a custom mounting solution.

TWIST-LOCK QUICK RELEASE CABLE

In-Situ's rugged IP68 Twist-Lock cables are designed for convenience and flexibility, with a universal connection that allows seamless swapping between standalone probes and multiparameter instruments, simplifying fieldwork, reducing system costs, and eliminating the need to purchase or install new cables.



Applications:

- **Wastewater UV Disinfection**
- **Raw Water Intake**

GENERAL	TURBITECH UVT
WETTED MATERIALS	Acetal, 316 Stainless Steel, Fused Silica, Polyurethane, Buna , Titanium
OPERATING TEMPERATURE	-5 to 50°C (non-freezing)
STORAGE TEMPERATURE	-40 to 65°C
DIMENSIONS	Length: 397 mm Maximum Diameter: 80 mm
WEIGHT	3.5 lbs
MAX PRESSURE RATING	1 bar (14.5 psi)
COMMUNICATION OPTIONS	Modbus RS485
SAMPLING INTERVAL	Selectable (see manual for details)
ENVIRONMENTAL RATING	IP67 without cable installed, IP68 up to 1m with cable installed
EXTERNAL POWER	8-36 VDC
COMMUNICATION DEVICE	7300 Monitor
CABLE OPTIONS	In-Situ Rugged Cable
COMPLIANCE	CE, FCC, WEE, RoHS
SOFTWARE SUPPORT	7300 Monitor Interface
UVT PARAMETER	
RANGE	0.00-100.00 %T
UNITS OF MEASUREMENT	%T
DEFAULT UNITS	%T
TSS PARAMETER	
ACCURACY	±5% of reading or ±100 mg/L TSS whichever is greater
LINEARITY	R2>0.999[1]
RANGE	0-20,000 mg/L
UNITS OF MEASUREMENT	ppb, ppm, µg/L, mg/L, g/L, %
DEFAULT UNITS	mg/L

NOTES: [1]For serial dilutions of Fuller's Earth Standard

WARRANTY: 2 year warranty

in-situ.com

Accessories

Accessory Part Numbers

PART NUMBER	PART NAME
Configurable - contact sales	FlexTech Mounting Shaft
Configurable - contact sales	7300 Monitor
Configurable - contact sales	Cable with Flying Leads Termination
0079780	Instrument Bail Kit
1025480	Seal Replacement Kit
223980	FlexTech Mounting Bracket
158930	FC8 Flow Cell

Instrument Bail Kit
Instruction Manual

Contents

- Bail hanger with installation plate
- 2 Installation screws
- Screwdriver

Installing the Bail Kit

Installing the Bail Kit

Use the bail kit to support the weight of your instrument for deployment. The bail hanger can keep your instrument secured in place for deployments with strong water movement.

Align holes on installation plate with the holes on instrument.

Tighten screws to hold bail in place.

Reinstall Twist-Lock cable.

Hang instrument securely for deployment.

Test that the deployment is secure by moving the instrument around to simulate water movement before leaving it unattended.

2026-01-14 | 1033810

Seal Replacement Kit
For TurbiTech UVT

Contents

- 2 Wiper Rings
- Seal Assembly
- Twist-Lock Connector O-Ring with 2 Spares
- O-Ring Grease

Tools (not included)

- Small Allen wrench (optional)

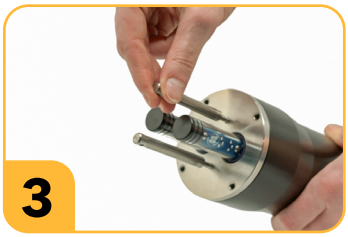
Replacing the Seals

Replacing Instrument Seals

Replace the seals as recommended by the 7300 Monitor (default 3600 cleaning cycles). It's easiest to perform this procedure with the probes extended.

Clean the instrument and disconnect it from power.

Unscrew the four guard rods. You can insert an Allen wrench into the hole on each rod to loosen the rod.



Thread two of the rods into the two alignment holes on the center of the metal plate.

Stabilize your thumbs on the glass tubes. Pull the metal plate and seal assembly from the instrument.

Do not allow water or debris to enter the instrument when the seal assembly is removed.

Remove the rods from the seal assembly. Discard the old wiper rings and seal assembly.

Stack the new seal assembly, wiper rings, and metal plate as shown. Reinstall the rods in the center holes.

Align the metal plate with the four outside holes and press it into the instrument.

Reinstall the guard rods in the four outside holes. You can insert an Allen wrench into the hole to tighten rods.

Install the rods in the center alignment holes before installing the assembly back in the instrument. This prevents strain on the glass tubes when aligning the seal assembly.

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Replacing Connector O-Ring

Replace the connector O-ring if it becomes brittle or damaged.

Remove the old O-ring from the connector.

Clean the groove to remove any dirt or debris.

Install the new O-ring in the groove.

Apply a pea-sized amount of grease to the new O-ring.

Appendix

Appendix A: Parameter Numbers and Locations

ID	PARAMETER NAME	HOLDING REGISTER NUMBER	HOLDING REGISTER ADDRESS	DEFAULT UNITS
31	Total Suspended Solids	45661	5660	117 = mg/L
91	UVT	46081	6080	370 = %T

Appendix B: Unit IDs

CONCENTRATION (113-128)		
113	ppm	Parts per million
115	%	Percent concentration
117	mg/L	Milligrams per liter
118	µg/L	Micrograms per liter
120	g/L	Grams per liter
121	ppb	Parts per billion
ABSORBANCE (369-384)		
370	%T	Percent Transmittance