



The ULTRA TOUGH Dissolved Oxygen Galvanic Smart Sensors have high-stability thick membranes for inline, immersion, submersion, sanitary & hot-tap installations

Ultra Tough Dissolved Oxygen Galvanic Smart Sensor

Features

- Designed for abrasive slurries, high levels of organic and biological content, high turbidity and viscosity
- Direct Smart Sensor with on-board data processing and digital output
- Continuous measurement
- Quick connect plugs – eliminate hard-wiring of sensors and allow for instant hot-swap
- Low maintenance in clean water applications
- Communication: Direct Smart Sensor (Modbus RTU)
- Also available in conventional analogue output to connect with most brands of analysers

Installation types

- Immersion
- Fully Submersible
- Inline Twist Lock
- Inline Sanitary or Hot Tap

ULTRA TOUGH
Dissolved Oxygen
Galvanic Smart Sensor,
Immersion configuration





Ultra Tough Dissolved Oxygen Galvanic Smart Sensor



Immersion

Inline Sanitary

Inline Twist Lock

The ULTRA TOUGH series of Dissolved Oxygen Galvanic Smart sensors are an excellent choice for most industrial applications. The sensor probe is very rugged, easy to use and a proven solution for measurements for tough industrial, municipal, environmental and aquaculture and other difficult service condition applications. It provides extremely high stability, with up to 1 year between calibration in clean water and the membrane lasting up to 5 years. Available in inline, immersion and submersible configurations.

Special features

- Thick-wall TEFLON membrane ensures very high stability, low-drift and high durability in aggressive industrial applications and minimises the frequency of membrane replacement
- Galvanic dissolved oxygen cell with true zero means only a slope (span) calibration performed clean and dry in the air is required, no calibration solutions are ever required for calibration
- On-board micro-processor to store and process measurement data
- Membrane and electrolyte solution is simple to replace allowing for extremely low ongoing cost of ownership and a theoretically unlimited service lifetime
- Automatic temperature compensation

Customise for your process

Our ULTRA TOUGH sensors are available with the following options to configure the sensor for your application:

- Back-end waterproofing for fully submersible installation
- Cable protection
- 12m cable

SMART Sensor Technology

SMART Sensors have revolutionised the way our customers manage and maintain sensors. Unlike most other SMART sensors, Turtle Tough provides the option of a propriety digital signal or an open-source Modbus RTU signal that is universally accepted. It allows the sensor to connect directly to your industrial network without the need for proprietary hardware. We also provide state-of-the-art analysers and controllers should you require a turnkey control solution. Turtle Tough SMART sensors have the benefit of storing a detailed performance history and diagnostics on-board enabling superior sensor management. Sensors can be cleaned and calibrated offline to facilitate a hot-swap maintenance regime. To learn more about hot-swapping [click here](#).



DO



Guard for immersion



Quick Connect Plugs

Sensor installation types

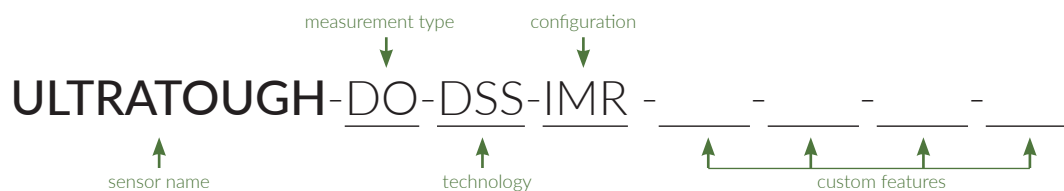
Order Code	Configuration	Description
IMR	Immersion	¾"x¾" RYTON body with fast response TC in sensor tip
TWL	Inline Twist Lock	1" RYTON Inline body with fast response TC in sensor tip
SAN	Inline Sanitary or Hot Tap	¾" RYTON Inline body with fast response TC in sensor tip

Custom options

The ULTRA TOUGH Dissolved Oxygen Galvanic Smart sensors can be customised to suit your application. Your Turtle Tough representative will assist you in determining what upgrades might be necessary from the base sensor specification. The following list provides a description of the available upgrades and how they might benefit your application. Some options may incur additional charges.

Order Code	Features	Description
SUB	Fully Submersible	Back-end waterproofing for a fully submersible waterproof assembly
CP	Cable Protection	4m of vinyl tubing encapsulates the sensor cabling for added protection from harsh environments or strain relief on cable
12M	12m Cable	Increase the standard cable length from 6m to 12m
AP	Analogue with preamplifier	Analogue sensors with Preamplifier

To order add the codes of the features you want to add to your sensor to suit your application:



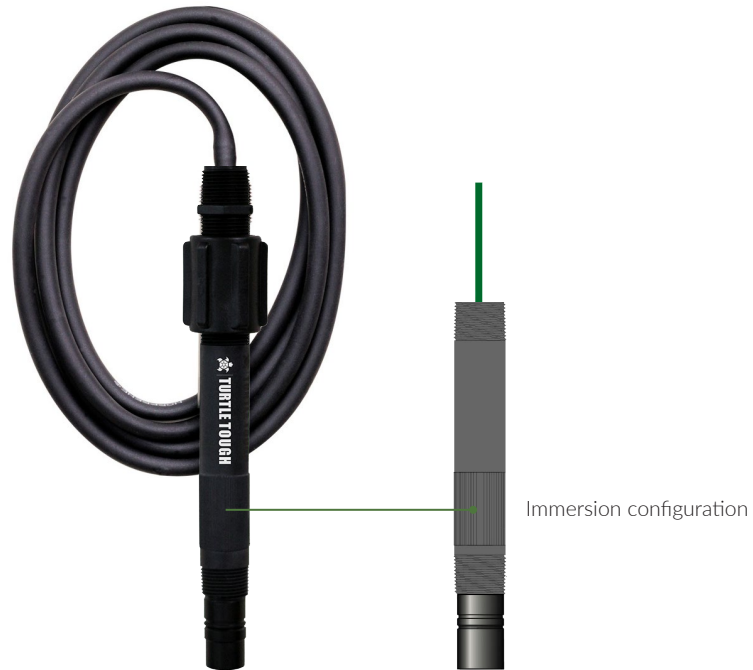
Fully Submersible

Order code: SUB

All ULTRA TOUGH Dissolved Oxygen sensor configurations (Immersion, Inline Twist Lock and Inline Sanitary/Hot-Tap) are available for fully submersible installations with the use of an immersion rod when a suitable back-end waterproofing sealing option is factory installed. This option must be installed at time of order and cannot be installed subsequently.

Features

Provides complete back-end isolation from process for long-life when fully submerged



Cable Protection

Order code: CP

This back-end sealing provides complete cable isolation from the liquid process and protects the cable from damage and process ingress.

Features:

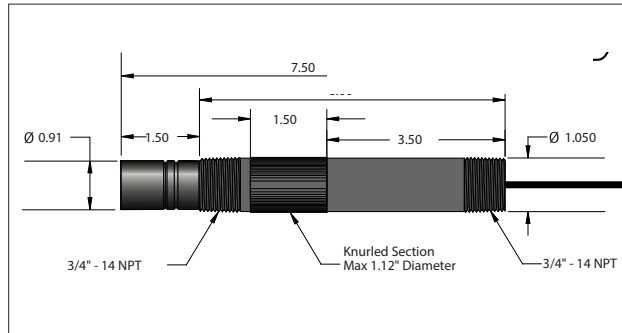
- Complete isolation of back-end and protection of cable from corrosion and chemical attack
- Suitable for most applications
- Excellent choice for immersion
- Cost effective waterproofing option
- Not recommended for submersible installations



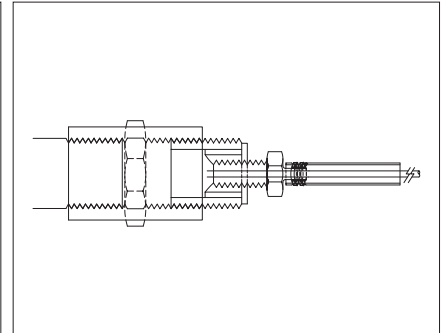
Back-end waterproofing sealing option for a fully submersible waterproof assembly is factory installed. This option must be installed at time of order and cannot be installed subsequently.

ULTRA TOUGH Immersion Dissolved Oxygen Galvanic Smart Sensor

Ordering code: IMR



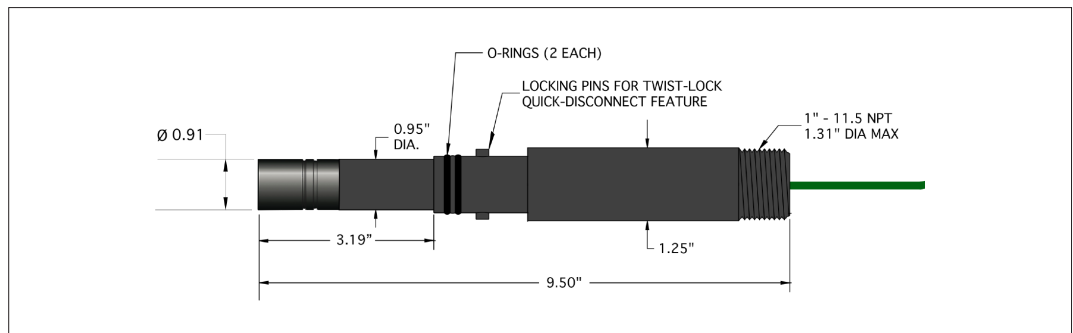
Ryton body, 3/4" front-end x 1" back-end MNPT for immersion interface



Option: Back-end waterproofing for a fully submersible assembly. Order code: -SUB

ULTRA TOUGH Inline Twist Lock Dissolved Oxygen Galvanic Smart Sensor

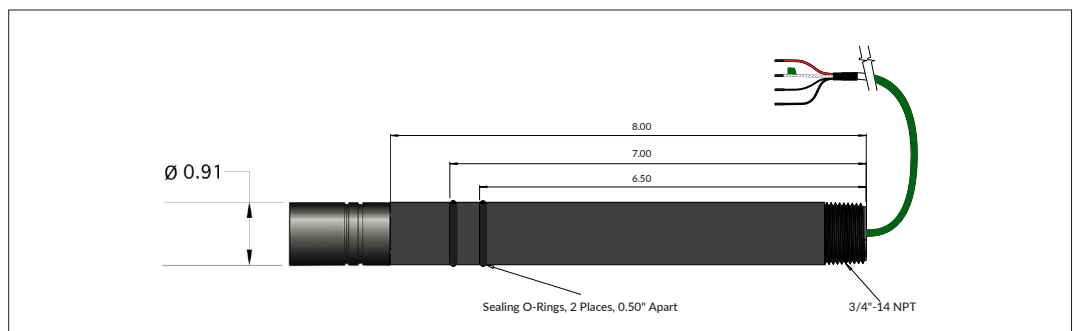
Order code: TWL



Ryton body with double O-Ring seals for twist lock interface, 1" MNPT back-end

ULTRA TOUGH Inline Sanitary Dissolved Oxygen Galvanic Smart Sensor

Order code: SAN



Ryton body with double O-Ring seals for Inline Sanitary interface, 3/4" MNPT back-end

Sensor name	ULTRA TOUGH Dissolved Oxygen Galvanic Smart Sensor
Measuring type	Dissolve Oxygen
Sensor installation types	Immersion (IMR), Fully Submersible (SUB), Twist Lock Inline (TWL), Inline Sanitary & Hot Tap (SAN)
Output types	Direct Smart Sensor Technology (DSS). This open-source digital signal output (Modbus RTU) is compatible with a wide range of devices that can accept a Modbus signal*.
Pressure range	Typical inline installations are 10 psig or less; Submersible to 50 meters (165 feet)
Temperature range	-5 to +65°C (+23 to +149°F)
Body material	RYTON (Poly-Phenylene-Sulfone, PPS)
Membrane material	DELRIN (Polyoxymethylene, POM)
Concentration range standard	0 to 150 ppm or 0 to 400% saturation is the standard full range
Concentration range special	0.0 to 60.0 ppm or 0 to 600% saturation ranges available as a special order option
Resolution	0.01mV and 0.01 ppm absolute anywhere in the range
Lowest displayed limit of detection	0.01 ppm (Recommended for applications that are typically 0.10ppm or higher)
Cable length	6m (12m optional)
Connection	Quick Connect Plug - NEMA 6P
Typical applications	Industrial and mining abrasive slurries as well as any solution with high turbidity. Ideal for high sulfide containing media since the ULTRA TOUGH DSS sensor is insensitive to hydrogen sulfide gas. Any measurement where rugged process conditions may exist.
Sample flow requirements	Continuous flow, Minimum 1cm per second for stable readings
Specifications	Membrane covered galvanic cell generates an internally temperature compensated mV signal linear to dissolved oxygen in air or liquid. Typical response is 10 to 40 mV per ppm as is determined from dry in air slope (span) calibration.
Analyser/Interface	Compatible with all Turtle Tough Smart DSS analysers
Special features	Corrects for temperature, pressure & salinity effects on % saturation incalibration & measurement modes
Storage	Item should be kept at room temperature with closed protector cap, filled with storage solution in an upright position. Shelf life warranted for 12 months from the date of purchase
Warranty	12 month conditional warranty. Go to turtletoughsensors.com/support/warranty-returns

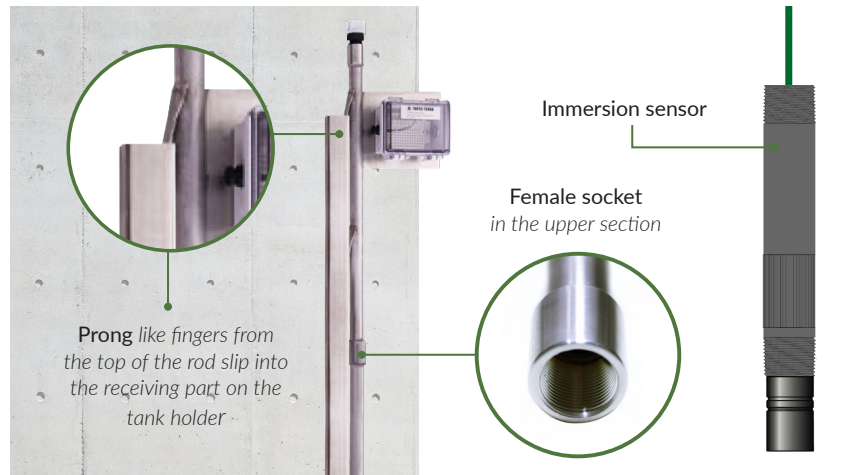
3m Immersion Rod

Code: TT-ACC-UNI-IROD-SS-3M

The 3-metre stainless steel immersion rod allows easy access from the top of tanks direct into critical measurement locations. The unique design allows the immersion rod to be held in place without any bolts, screws or fittings allowing for instant insertion and retrieval from the tank without any tools.

Features

- Allows sensor installation from the top of a tank
- 316 Stainless steel
- 3 metres long
- Supplied as 2 pieces of 1.5m length
 - a) Rod top section
 - b) Rod bottom section
- Comes with:
 - Tank holder assembly
 - Female fittings for sensor attachment
 - Mounting plate for Junction Box*
 - and cable gland



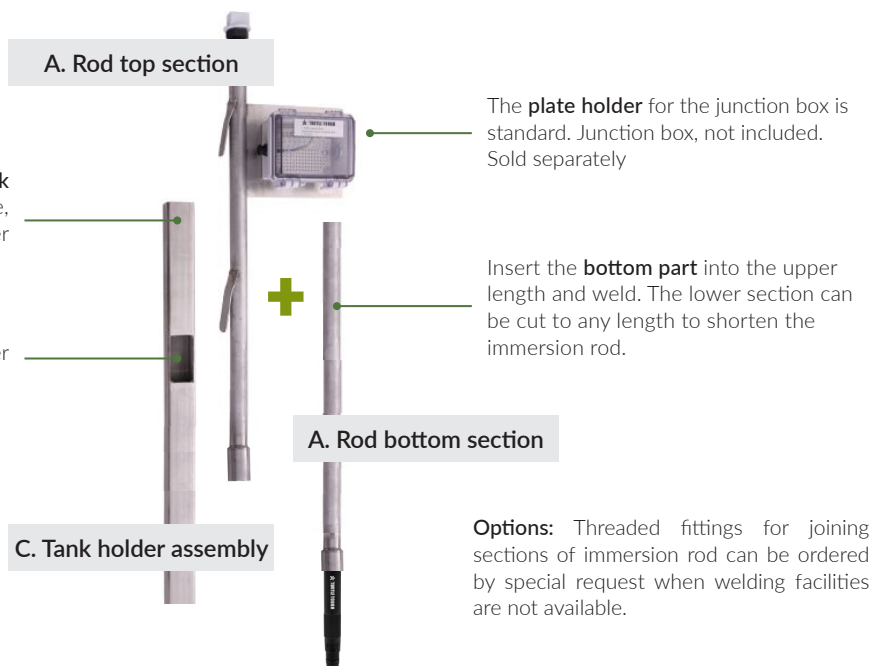
Immersion Rod Parts

Part A Immersion Rod Top x 1	316SS 20NB Sch 40 Pipe 1500mm long
Part B Immersion Rod Bottom x 1	316SS 20NB Sch 40 Pipe 1500mm long with 1" MNPT socket at the bottom for sensor install.
Part C Tank Holder Assembly x 1	316 SS 38mm x 38mm SHS – 900mm in length with a slot cut out on one side.
Guard Rail Clamp (Optional)	Galvanised Clamp for Immersion rod retrieval
Junction Box (Optional)	Single Junction box for mounting at the top

Installation

To start the installation, weld the **tank holder** assembly to any tank structure, typically a guardrail at the tank perimeter or walkway.

The **side slot** must be in the upper position and facing outward to the tank.



Immersion Rods and Junction Boxes are not included and must be purchased separately. Immersion Rods can be ordered in any custom length. Please contact your representative for a quote.

Hot-Tap Inline

Code: TT-ACC-UNI-HTA

The unique Turtle Tough Hot-Tap assembly allows fast and easy insertion and removal of sensors directly into process tanks or pipes at pressures up to 100 psig.

Features

- 316 Stainless steel
- Flush sensors with cleaning solution before removal from process
- Single or double ball valve available
- Stainless, Duplex or SAF available
- 2", 1" or ½" available
- Comes with:
 - Valve
 - Body with Pressure relief valve
 - Top threaded fitting

Required components for complete assembly (sold separately):

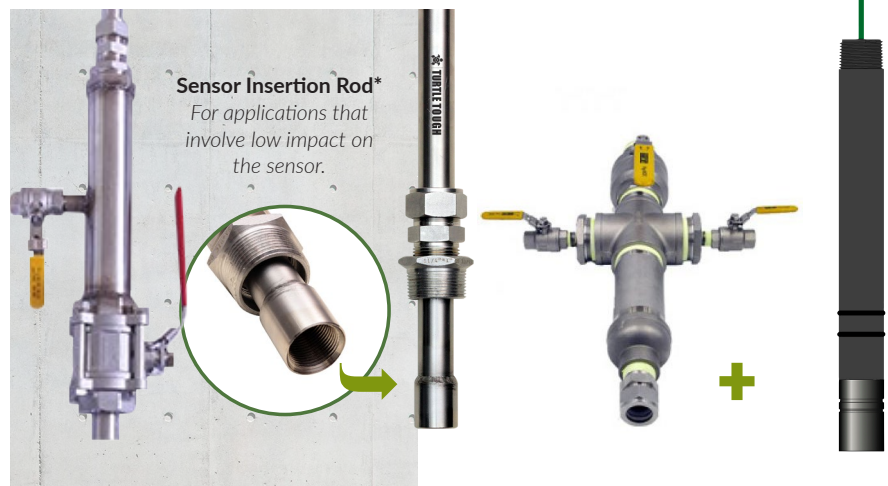
- Sensor Holder
- Extension Tube



Hot Tap
valve retractable assembly



Hot Tap Dual port flush
purge valve retractable assembly



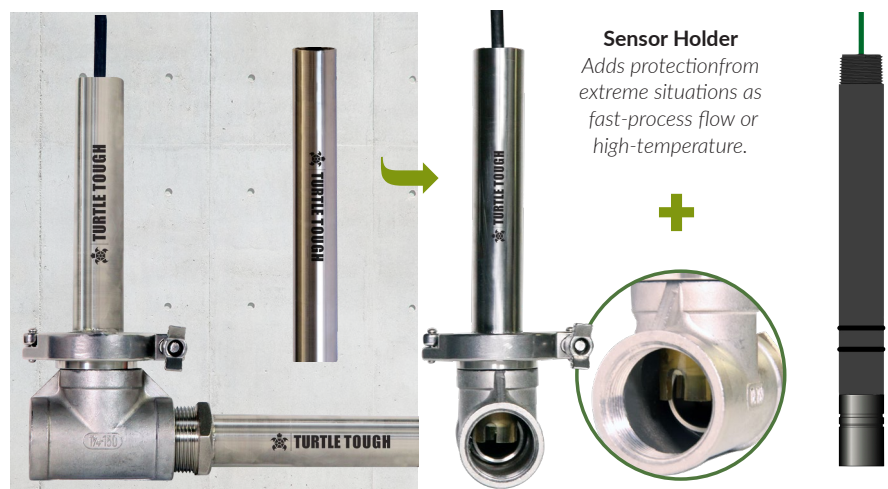
Sanitary Tri-clover Inline

Code: TT-ACC-UNI-SSHOLDER

The Turtle Tough Sanitary Sensor holder has been designed for installations with Tri-Clover fittings.

Features

- FDA 3A Grade 316SS Sanitary sensor holder
- Allows accurate sensor insertion
- Custom lengths and sizes available on request
- Includes:
 - Sensor holder stainless steel
 - Custom sanitary flange sizes:
 - 1½", 2", 2½"
 - Cable gland (IP69K optional)



Hot-Tap and Sanitary Tri-clover inline accessories are not included. Required components for complete assembly as: sensor holder, extension tube, sensor insertion rod are sold separately. Please contact your representative for a quote.

Twist Lock Receptacles

The twist lock, bayonet style, quick disconnect inline installation assembly, allows for a rapid insertion and removal of the sensor inline applications.

Features

- Fits together with any suitable mating 1" Turtle Tough Twist Lock Sensor
- Designed to interface with a 1" FNPT pipe tee fitting.
- Compatible with Turtle Tough Twist Lock Sensor body
- Allows for easy line installation and removal
- Available in Kynar or PEEK plastic
Kynar – 50 psig
PEEK – 100 psig
- 1" MNPT male thread for line installation



KYNAR for up to 50 psig



PEEK for up to 100 psig



Twist Lock Receptacles are not included and must be purchased separately. Cable Protection option must be installed at the time of manufacture. It cannot be added once a sensor has been fabricated. Please contact your representative for a quote.