



**TURTLE
TOUGH**

The pH & ORP Sensor for Nickel has been used in Nickel extraction and refining process (HPAL) for more than 20 years.

Application specific pH & ORP sensor for Nickel

Code: TT-Ni-pH

Features

- Designed Specifically for **HPAL**
- RADEL with ¾" Front-end – 1" MNPT Back-end
- -5°C to 135°C
- Kynar Reference
- 7.5m Cable (Analogue) / 6m Cable (Digital)
- Acid/Fluoride/Sulphide Resistant
- Dissolved Gas Resistant
- Triple Junction
- Proprietary Tough Glass
 - Virtually Unbreakable
- **Digital Smart Sensor Technology (DSS)** (*optional*)
 - No hard wiring – plug-n-play connectivity
 - Sensor stores calibration data, analyser configuration and sensor history
 - Hot-swap for quick sensor change-out
 - No interaction with analyser – sensor data auto uploads





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Application specific pH & ORP sensor for Nickel

Code: TT-Ni-pH

There is perhaps no other sensor that we are more famous for than our TT-Ni-pH Nickel pH & ORP Sensor which has been used in Nickel extraction and refining process (HPAL) for more than 20 years.

Ammonia injection and solvent extraction are two critical components of nickel extraction in process environments. Dissolved gas ingress into the sensing elements of pH sensors is a common cause of premature sensor failure. Solvent extraction also presents some unique challenges to pH measurement, as the presence of organic solvents will dissolve many common materials of construction while the small water volumes in the extraction process frequently present very extreme pH measurements.

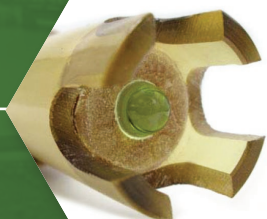
The TT-Ni-pH Nickel pH & ORP Sensor utilises special body plastics and sealants to resist solvent attack and our sensing elements are protected from dissolved ammonia gas ingress through triple junction references and high impedance glass electrodes. Optionally, additional cable isolation can be added to provide more resistance to the electrical components of the sensors. The sensor is rated to above 150psi allowing the sensor to perform its task in high pressure acid leach and solvent extraction environments. Turtle Tough have developed a range of mating interfaces, including immersion, submersion and hot-tap assemblies to ensure you can obtain your

process measurement right where it is needed, rather than just settling on an easy access point.

Digital Smart Sensor Technology (DSS)

This sensor is available with our Digital Smart Sensor technology.

- **With a quick connect fitting**, this plug and play sensor eliminates the need for hard wiring to the analyser.
- **The on-board sensor memory** allows the storage of calibration data, analyser configurations and sensor service history. This allows the sensor to be conveniently maintained and calibrated off-site or in the laboratory and pre-programmed with calibration data and analyser configurations.
- **One device to calibrate and interface with ALL sensors.** The stored information automatically uploads to the analyser upon connection and eliminates the need for any interaction with the analyser, simplifying the change-out of sensors. A service log stored on the sensors is ideal for maintenance and quality assurance records.



pH



ORP



TURTLE TOUGH

Specifications

Application Specific pH & ORP sensor

General Specifications

Description	Application Specific pH & ORP Sensor for Nickel
Part Number	TT-Ni-pH
pH Range	0 to 14 pH
Temperature Range	-5°C to 135°C
Pressure	6.9 to 1035 kPa (1 to 150 psig)
Body Type	RADEL with ¾" Front-end & 1" MNPT Back-end
Junction Material	KYNAR (Poly-Vinylidene-Fluoride)
Dimensions	Length: 216mm, Maximum Diameter: 33.3mm
Cable Length	7.5m (Analogue) / 6m (Digital)
Temperature Compensation	PT1000
Preamplifier	N/A
Waterproofing	Immersible, Submersible if threaded on sealed immersion rod with sufficient sealing tape
Connection Analogue	Tinned leads
Connection Digital	Quick Connect DSS4M - NEMA 6P
Special Features	Acid/Fluoride/Sulphide Resistant, Triple Junction, Fast Response TC
Options	Oxidation-Reduction Potential (-ORP), Direct Smart Sensor (-DSS), Preamplifier (-P), Quick Connect Plugs (-QC7M), Fast Response TC (-FTC), Teflon Silicone Sealing (-TS), Water Protection (-WP)

pH Sensor Specifications

Measuring Glass Type	Proprietary Tough Glass
Glass Dimensions	8.0mm (0.315") Diameter
Initial Impedance	<800 M Ohms @ 25°C
Sodium Ion Error	< 0.15 pH in saturated Na ⁺ solutions at pH 14.00
Acidic Errors	< 0.05 pH in HCl solutions at 0.00 pH

Reference System Specifications

Type	Triple Junction
Reference Half Cell	Ag/AgCl, Saturated KCl
Primary & Secondary Junction	Primary Junction Porous Ceramic, Saturated KCl in Cross-linked polymer, interfaced to tertiary junction
Tertiary Junction	Solid-State Non-Porous Cross-Linked Polymer embedded in Kynar Support Matrix holds excess KCl assuring saturation at all temps for stability & long sensor service life

Application Specifications

Recommended Applications	Specifically designed for the Nickel industry, chemical, food & beverage, semiconductor, pharmaceutical & wastewater. Any measurement where aggressive chemical cleaning is needed to remove fouling or low maintenance operation is required with minimal cleaning and re-calibration
Analyser / Interface	All Turtle Tough pH Analysers
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 Please see www.turtletooughsensors.com/support/warranty-returns

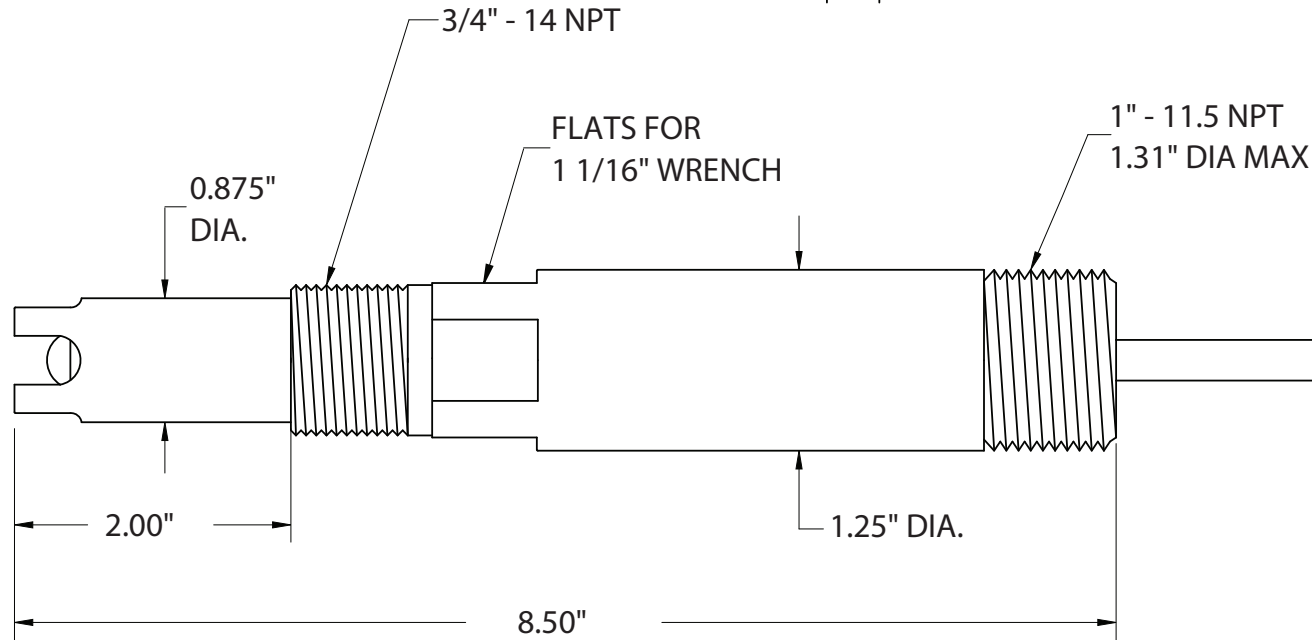
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REVISION HISTORY

REV	DESCRIPTION	DATE	APPROVED



NOTES

- All dimensions are in inches, unless otherwise indicated with tolerances as detailed below.
- Sensor body material of construction is RADEL, PEEK or RYTON.
- Drawing shown in the standard with protective tines configuration (4 places, 90 degrees apart).
The 2 protective tines only configuration (2 places, 180 degrees apart) is optional.
- In the alternate without tines configuration, the sensor body is exactly 8.0 inches in length.
The max displacement for hemispherical pH glass is 0.3" yielding a max insertion depth of 1.8 inches past threads & overall max length of 8.3 inches.
- Do not use any sensor beyond the factory defined maximum temperature or pressure rating.

TOLERANCES	
1 Place: $\pm .1$	3 Places: $\pm .005$
2 Places: $\pm .01$	4 Places: $\pm .0005$
Angular: $\pm 0.25^\circ$	

DRAWN BY

RH

CHECKED BY

TADP

APPROVED BY

MJP



Turtle Tough Sensors
turtletoughsensors.com

TITLE

3/4"-1" MNPT Inline / Immersion / Submersible

SIZE

B

PROJECT

IMMERSION

DRAWING NO.

6-1 pH SENSORS

REV

/

SCALE Not to Scale

MODEL 6X31,6X41,6X51,6X52

SHEET 1 OF 1

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