

Triton® TR82

The ECD TR82 Turbidity Sensor is a rugged, high-performance nephelometric sensor designed for continuous turbidity and suspended solids measurement in water and wastewater applications. Utilizing a near-infrared light source and 90-degree scattered light measurement in accordance with ISO 7027, the TR82 delivers stable, repeatable results across a wide range of process conditions.



Triton TR82 Series Turbidity & Suspended Solids Sensors

» Intelligent Sensor Technology

- Factory calibration stored in sensor self monitoring diagnostics

» Interfaces with T80 Universal Transmitter

- Modbus
- Hart
- 4 to 20 mA
- Relay Outputs

» Multiple Installation Methods

- Immersion Assembly
- Flow Through Assembly
- Gas De-bubbler Assembly

» Self Cleaning Design

- Parallel sensor design to enhance self cleaning with moderate flow
- Spray cleaning option or with flow cells that can be fitted with spray cleaners

» True Nephelometric Measurement

- Complies with industry-standard 90° scattered light measurement for accurate, low-drift turbidity readings.

Consult our Technical Support staff for additional configuration options at +1-714-695-0051 or email: sales@ecdi.com

Description

The Triton® TR82 is a nephelometric turbidity sensor designed for use in water and wastewater. Turbidity, the cloudiness or haziness of water sample, is caused by particles suspended in the water, typically clay and silt.

Since bacteria and viruses can be attached to these particles, turbidity has become a critical indicator of the overall water quality. The Triton® TR82 uses an optical method for determining the turbidity. A light beam is directed into the sample where it is scattered by suspended particles in the water.

The amount of scattering depends on the amount of material in the water, the wavelength of light, the size and composition of the suspended particles. The Triton® TR82 uses a near infrared LED light source and the 90° scattered light method in accordance with ISO 7027 / EN 27027 to assure accurate turbidity values under standardized and comparable conditions.

The TR82 response depends on the size, shape and composition of the suspended particles.

For this reason, mg/L, ppm and % solids measurements must be calibrated with suspended solids from the waters to be monitored. Turbidity measurements (NTU, FNU) can be calibrated with calibration standards such as:

- Formazin
- StablCal
- SDVB Beads

The Triton® TR82 sensors are available in (4) different ranges. The sensors are 10 inch by 1 inch diameter with CPVC sensor body.

The Triton® TR82 sensor ranges are:

- < 40 NTU
- 0 - 1000 NTU
- 0 - 4000 NTU
- 0 - 5000 NTU
- 5000 - 10,000 mg/L (MUD)
- 50,000 - 100,000 mg/L (SAND)

Applications

Clear Water Sensor

- All phases of drinking water processing
- Control of Clear Rinse Water
- Filter rupture or backwash
- Monitoring WWTP discharge
- Monitoring Surface waters

Suspended Solid Sensor

- Activated sludge WWTP
- Return & Digested sludge WWTP
- Filtrate in paper manufacturing
- Blending Mixing Applications
- Monitoring Environmental runoff

The Triton® TR82 sensors can interface with ECD T80 Transmitter or the ECD LQ800 Multi-Channel Controller.

The T80 is a single or dual channel transmitter with one or two 4-20 mA outputs with MODBUS RTU and an optional (3) Alarm Relays or HART 7 communication.

The T80 Transmitter allows the turbidity or suspended solids measurement to be combined with other measurements using the following:

- S80 pH
- S80 ORP
- S80 pIon
- Conductivity
- Dissolved Oxygen
- DO82 Sensors and other ECD Sensors

The ECD LQ800 is an 8 channel controller interfacing with all ECD analytical sensors, analyzers and other process sensors such as level, flow or pressure.

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Description

The Triton® TR82 uses a nephelometric 90° NIR scattered light optical method for determining turbidity or suspended solids. A light beam is directed into the sample where it is scattered by suspended particles in the water.

Triton® TR82 is suitable for most aqueous applications. It is not suitable use in organic solvents or in its solutions with an extreme pH value, only use when the pH is between 2 - 12 pH.

The temperature range for the sensor is 0° to 50° C.

TR82 installation is accomplished with:

- 1" Stand Pipe for immersion service
- PVC Flow Cell for an in-line flow through application
- Valve Retractable
- De-bubbler for micro air bubble applications

Typically, applications < 30 NTU range use a flow cell or de-bubbler assembly and must be calibrated as an assembly with the sensor for best accuracy.

The standard cable is a 4 conductor cable available in the following lengths:

- 10 ft (3m)
- 20 ft (6.1m)
- 30 ft (9.1m)

Longer cable is available for special order

The optical surface must remain clean for accurate measurements. The sensor sensing face of the TR82 should be oriented so that the flow of the water can clean remove particles that could adhere to the sensor face.

Optional self cleaning functions are available such as; spray cleaning attachments and flow cell with automated spray cleaning. In simple immersion applications, periodic cleaning is required for all turbidity sensors, which could entail simply removing the sensor and wiping the optical surface with a soft cloth to remove any dirt or biofilms.

Air bubbles in the water reflect light and will interfere with the measurement. Micro air bubbles can form when a water sample is depressurized.

Care must be taken to ensure the water sample at the measurement point has a higher head pressure than the incoming sample. Water siphoning out from the measurement point can release dissolved gases in the flow cell and create noisy erratic readings.

If air bubbles cannot be removed from the sample, an optional de-bubbler flow cell can be used which removes air bubbles that are entrained in the sample flow.

The Triton® TR82 sensors are factory calibrated in formazine, NTU (Nephelometric Turbidity Units) and are ready to use in most clean water applications.

The factory calibration is permanently stored in the sensor's memory and these values are also used for diagnostic purposes throughout the sensor's life. Additional nonvolatile memory are used to log user initiated calibration data.

The TR82 combines rugged optical construction, self-diagnostics, and 90° nephelometric NIR measurement to deliver accurate, low-maintenance turbidity monitoring

Factory calibrated in NTU, the TR82 Turbidity Sensor offers true plug-and-play operation for easy installation and dependable measurement.



Process Fitting



Flow Through Assembly



De-bubbler



Valve Retractable

Specifications

Measuring Principal	Particle caused back scattering of near infrared light 90° scattered light method in accordance with ISO 7011 / EN27087
Measuring Range	-1 Sensor 0.00 - 1000 mg/L or 0...1000 NTU, FNU
	-3 Sensor 0.00-5000 or greater mg/L or 0...4000 NTU, FNU, ppm, mg/L and % solids
	-4 Sensor 0.00 - 40 NTU, FNU
Process Temperature Range	5 - 50° C (23 to 122° F)
Temperature Compensation	Internal Temperature Compensation
Process Pressure Range	50 psi / 3.5 bar max in Flow Cell
Wetted Materials	Sensor body: CPVC, Polypro optional Sensing end: Epoxy
Process Connections	1" NPT Nylon Compression Fitting
Electrical Connection	4-Wire Measuring Cable (Standard)
Cable Length	• 10 ft (3.0 m) • 20 ft (6.1 m) • 30 ft (9.1 meters)
Resolution	0... 40 NTU, FNU; +/-2% Full Scale; 0.01 NTU

Dimensions

RANGES

0-40 NTU
0-1000 NTU
0-4000 NTU

CABLE TYPES

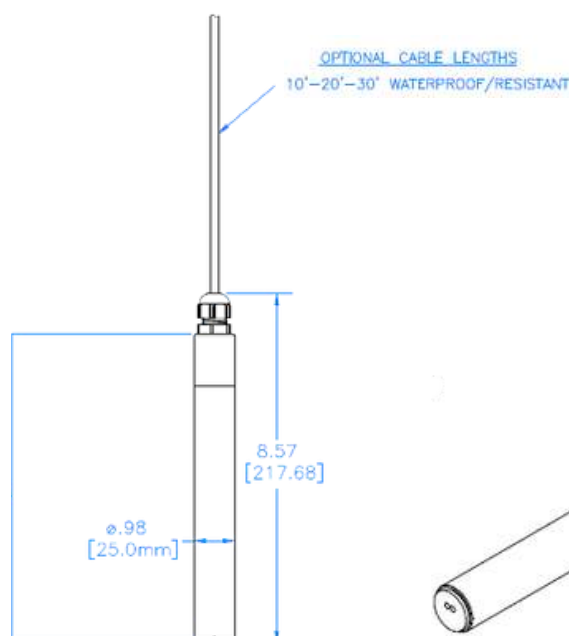
WATERPROOF
WATER RESISTANT

CABLE LENGTHS

10 FEET
20 FEET
30 FEET

HOUSING

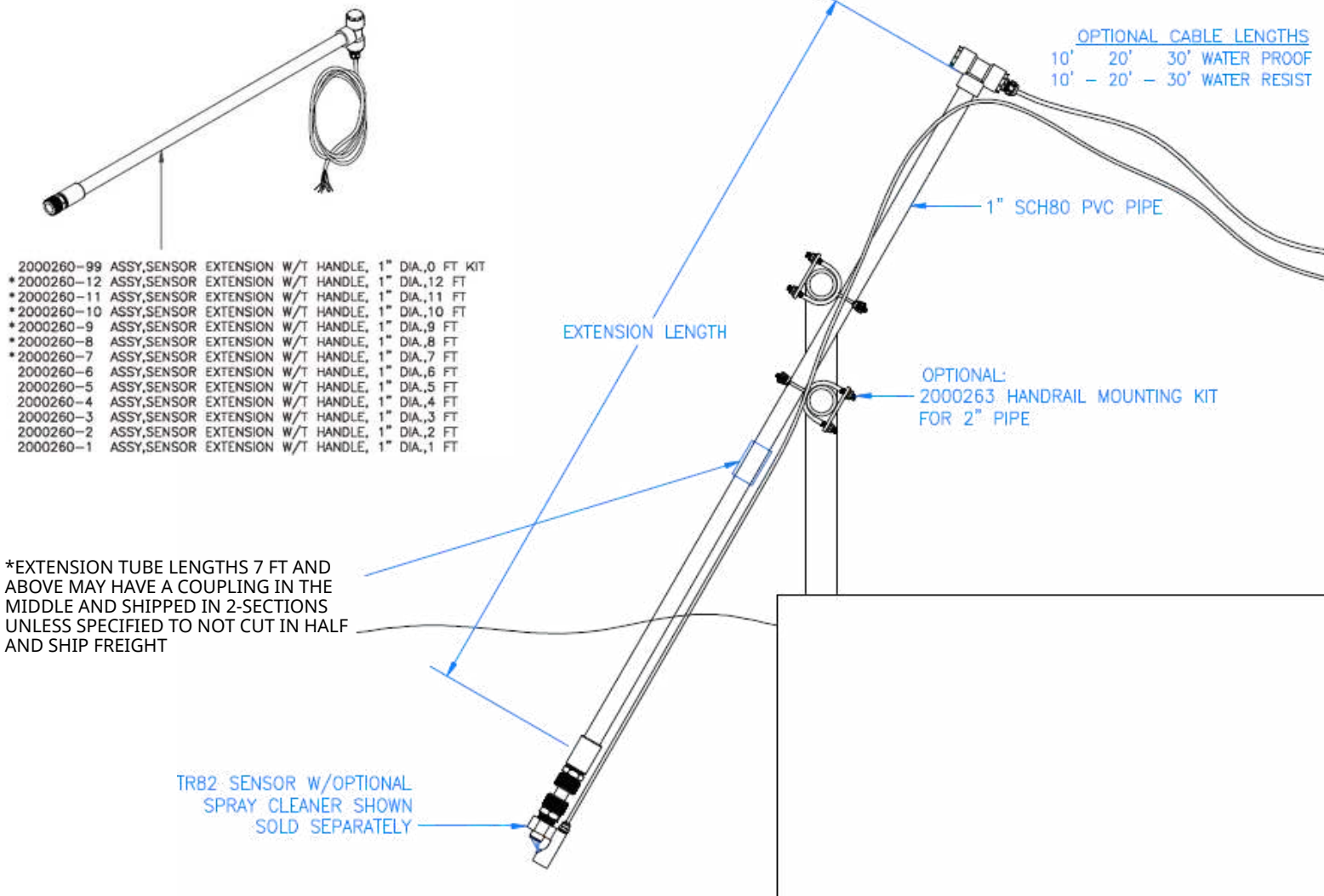
CPVC
POLYPRO
STAINLESS STEEL



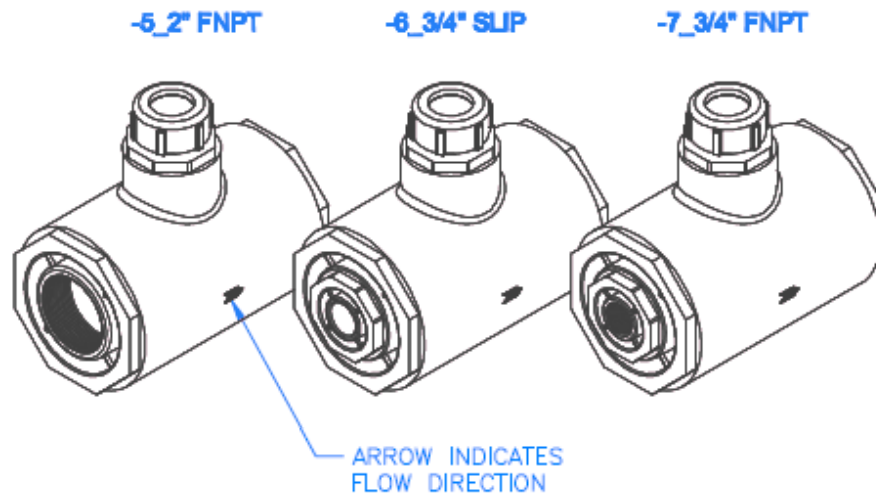
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Specifications

Immersion



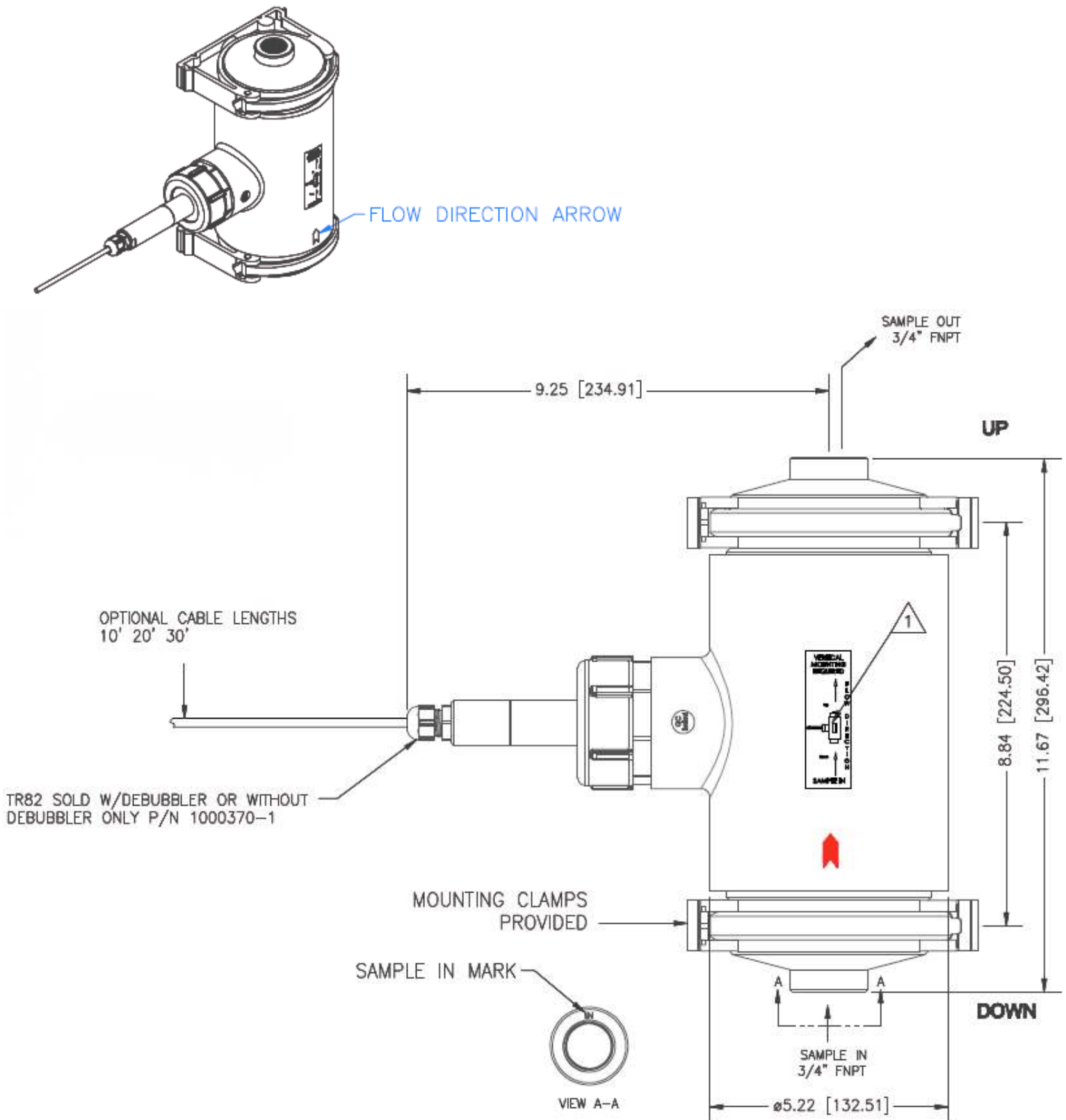
Flow Cell



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Specifications

Debubbler



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Order Information

A	B	C	D	E	Sample Order
TR82	1	0	01	2	TR82-10012

- (A)** Triton® TR82 Turbidity/Suspended Solids Sensor
- (B)** Front Mounted Optics / CPVC Body
- (C)** None
- (D)** 10 ft (3.0 meters) (Waterproof/Submersible Cable Style)
- (E)** 0 - 4000 NTU

A. Triton® TR82 Turbidity Sensor

Part No.

TR82 Triton® TR82 Turbidity/Suspended Solids Sensor

B. Optical Style / Material

Part No.

- 1** Front Mounted Optics / CPVC Body
- 2 Front Mounted Optics / Polypropylene Body

C. Process Connection

Part No.

- 0** None
- 1 1" MNPT PVC Gland Fitting
- 2 Flow Through Cell, 2 x 2" FNPT Entries, 1 x 1" FNPT Sensor Port
- 3 Flow Through Cell, 2 x ¾" Slip Entries, 1 x 1" FNPT Sensor Port
- 4 Flow Through Cell, 2 x ¾" FNPT Entries, 1 x 1" FNPT Sensor Port
- 5 Flow Through Cell, 2 x 2" FNPT Entries, 1 x 1" FNPT Sensor Port, w/ Spray Cleaner
- 6 Flow Through Cell, 2 x ¾" Slip Entries, 1 x 1" FNPT Sensor Port, w/ Spray Cleaner
- 7 Flow Through Cell, 2 x ¾" FNPT Entries, 1 x 1" FNPT Sensor Port, w/ Spray Cleaner
- 8 De-Bubbler ¾" FNPT Entries
- 9 De-Bubbler Collar Only

D. Cable Type and Length

Part No.

- 01** 10 ft (3.0 meters) (Waterproof / Submersible Cable Style)
- 02 20 ft (6.1 meters) (Waterproof / Submersible Cable Style)
- 03 30 ft (9.1 meters) (Waterproof / Submersible Cable Style)
- 11 10 ft (3.0 meters) (Water Resistant Cable Style)
- 12 20 ft (6.1 meters) (Water Resistant Cable Style)
- 13 30 ft (9.1 meters) (Water Resistant Cable Style)

E. Measurement Range

Part No.

- 0 0 - 1000 NTU
- 2** 0 - 4000 NTU
- 4 < 40 NTU (Calibrated in Flow Cell / De-Bubbler)

Controllers for Triton® TR82 Sensors

Part No.

T80-1X-XXX-XX	Model T80 Version (Please See T80 Spec Sheet for build list)
LQ800-80-288-01	Model LQ800, 8 Channel Controller (Please See LQ800 Spec Sheet for build list)

Represented By:

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 **World Headquarters:** 1500 North Kellogg Dr. | Anaheim, California, USA 92807
 **Phone:** 714-695-0051  **Fax:** 714-695-0057  **Email:** sales@ecd.com
 **www.ecdi.com**

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Equipment and Specifications may be updated periodically to enhance performance and reliability.



Order Information

A	B	C	D	E	Sample Order
TR82	1	0	01	2	TR82-10012

(A)	Triton® TR82 Turbidity/Suspended Solids Sensor
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(C)	None
(D)	10 ft (3.0 meters) (Waterproof/Submersible Cable Style)
(E)	0 - 4000 NTU

Triton® TR82 Accessories

Part No.	Mountings
3600066.PP	1" MNPT Polypropylene Gland Fitting
1000222-2	NEMA 4X Junction Box, (2) cable glands, terminal strip, PVC box, 6" x 3" x 2" LWD
1000251-4	Retractable Valve Assembly TR Series
1000154	Hydro Cleaning Nozzle and Tube Fittings (1" Sensor)
2000260-5	Immersion Assembly, 5 ft x 1" OD Standpipe, w/ 1" compression fitting and T-Handle cable feed through
2000260-99	Immersion Assembly Kit (User Supplied 1" OD Standpipe) includes 1" compression fitting, 1" PVC FNPT to slip adapter and T-Handle style cable feed through
1000280-1	Flow Through Assembly, 4" PVC Tee with 2" FNPT Entries and Compression fitting for TR82 Sensor
1000280-2	Flow Through Assembly, 4" PVC Tee with ¾" Slip Entries and Compression fitting for TR82 Sensor
1000280-3	Flow Through Assembly, 4" PVC Tee with ¾" FNPT Entries and Compression fitting for TR82 Sensor
1000305-1	Flow Thru Cell, 2 x 2" FNPT Entries, 1 x 1" FNPT Sensor Port w/ Spray Cleaner
1000305-2	Flow Thru Cell, 2 x ¾" Slip Entries, 1 x 1" FNPT Sensor Port w/ Spray Cleaner
1000305-3	Flow Thru Cell, 2 x ¾" FNPT Entries, 1 x 1" FNPT Sensor Port w/ Spray Cleaner
2000263	Rail Mounting Brackets, (2) Quick Release "U" Clamps for 2" Guard Rail
2200040-X	Cable Assembly, In-Line Quick Disconnect (XX = Length in feet)
2000130	In-Line Cable Quick Disconnect Connector
1000370-2	De-bubbler w/ ¾" FNPT Entries *must have TR82 w/ De-bubbler Style
Calibration	
1000030-3	4000 NTU Calibration Kit, 1 L Cal Cup, 50/100/200 mL graduated cylinder, volumetric cylinder, 4000 NTU Calibration Standard (Formazine), 500 mL
1000030-4	4000 NTU Calibration Kit, 1L Cal Cup, 50/100/200 mL graduated cylinder, volumetric cylinder
2010004	Cal Solution 4000 NTU Formazine, 500 mL
Data Logger	
1000300-1	4-20 mA USB Data Logger
9130007	Spare Battery for USB Data Logger *Dangerous Goods

Note: This is a partial list of available configurations. For additional options or customization, please contact Electro-Chemical Devices Support Toll Free at: **(800) 729-1333** or your local ECD representative.

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📠 **Fax:** 714-695-0057

✉️ **Email:** sales@ecd.com

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