

**Thermo Scientific AquaSensors  
DataStick measurement system  
for universal plug & play**

## Thermo Scientific AquaSensors DataStick

### Toroidal Conductivity Measurement System



#### Markets/Applications

- Chemical production
  - Leak detection in heat exchangers
  - Acid and caustic dilution
- Metal finishing
  - Plating bath control
  - Parts cleaning & rinsing
  - Pickling bath control
  - Waste streams
- Semiconductors
- Pulp & paper
  - Black, white, or green liquor
  - Pulp bleaching
- Food processing
  - Chemical peeling
  - Sanitization (CIP)
- Pharmaceutical
  - Chemical concentration control
- Environmental
  - Wet chemical scrubbers
  - Cooling towers

#### AquaSensors Toroidal Conductivity DataStick™

- High resolution measurement
- Pre-calibrated (no field calibration required)
- Plug & play sensor heads
- 0 to 2 S/cm range
- Offered in a variety of materials
- Direct data reporting (24-bit)
- Plug & play industrial communications adapters

Connect this toroidal conductivity sensor directly to a PLC (Programmable Logic Controller) for seamless integration with industrial control systems.

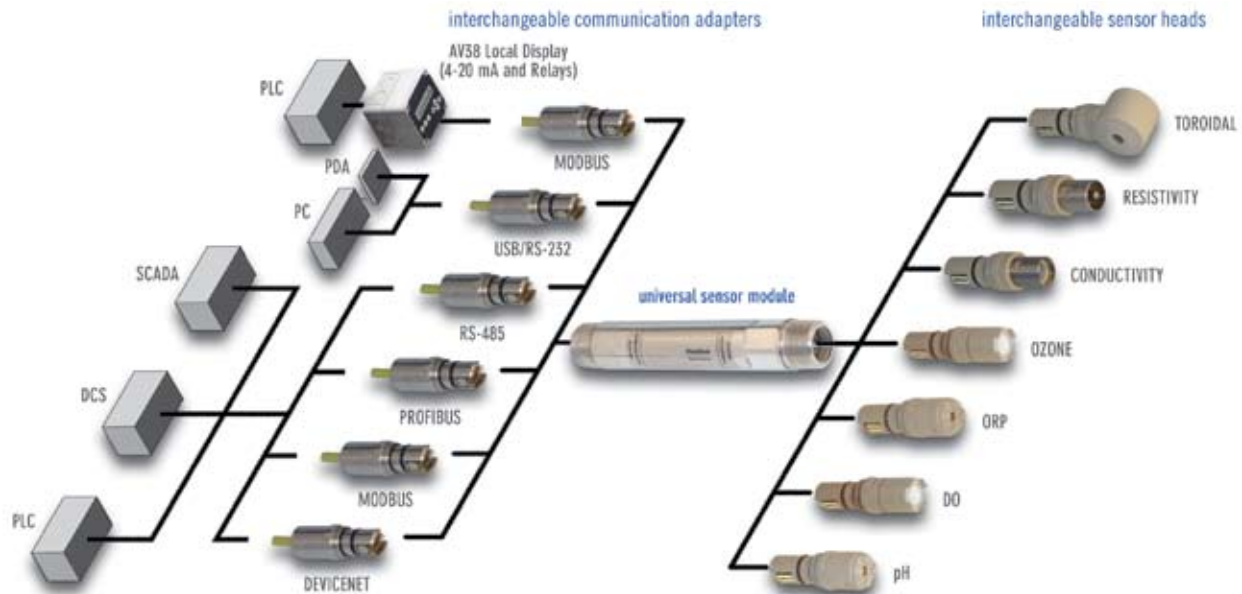
Use any computer to display data, calibrate and customize the measurement without an intermediate analyzer electronics box. Sensor heads are pre-calibrated and can be replaced or exchanged with any other type of sensor without taking the system down. Save space, time and money.

DataStick Provides universal conversion of sensor signals and interactive communications for measurement, calibration, configuration and diagnostics.

Engineering Specifications

1. The toroidal conductivity sensor shall have a diameter of 1.5 inches. It will have 1  $\mu$ S/cm resolution and will measure up to 2 S/cm at 25°C. The sensor body will have a tightly controlled wall thickness to prevent cracking with heating and cooling cycles.
2. The sensor shall have hex-shaped wrench flats to facilitate mounting, and shall be constructed of a material with exceptional chemical resistance and mechanical strength. This material shall enable the sensor to be installed in metal fittings without leakage usually caused by heating and cooling cycles when dissimilar materials are threaded together.
3. The sensor shall have interchangeable, pre-calibrated plug-in sensor heads and communications adapters that can be installed without powering down the system.
4. The sensor shall have 1 inch NPT threads on both ends to mount into a standard 2 inch union mounting, a sanitary tee, 2 inch ball valve or immersion hardware.
5. The built-in electronics of the sensor shall be completely encapsulated and O-ring sealed for protection from moisture and humidity.
6. The sensor shall have a built-in pre-amplifier, universal signal conditioning electronics, universal engineering units conversion, and interactive communications with a host computer or display interface using one of several protocols including Modbus® RTU, DeviceNet, Profibus, USB, CANopen, or Ethernet.
7. The sensor shall have an integral temperature sensor to automatically compensate measured values for changes in process temperature.
8. The sensor shall be Thermo Scientific AquaSensors Toroidal Conductivity DataStick.

Thermo Scientific DataStick Analytical System



Key Components

DataStick

Provides universal conversion of sensor signals and interactive communications for measurement, calibration, configuration and diagnostics.



Toroidal Conductivity Sensor Head

Pre-calibrated for conductivity and temperature. Can be plugged into any DataStick to yield accurate 24-bit data.



Communications Adapter

Plugs into the DataStick to provide power and direct interactive communications with control systems.

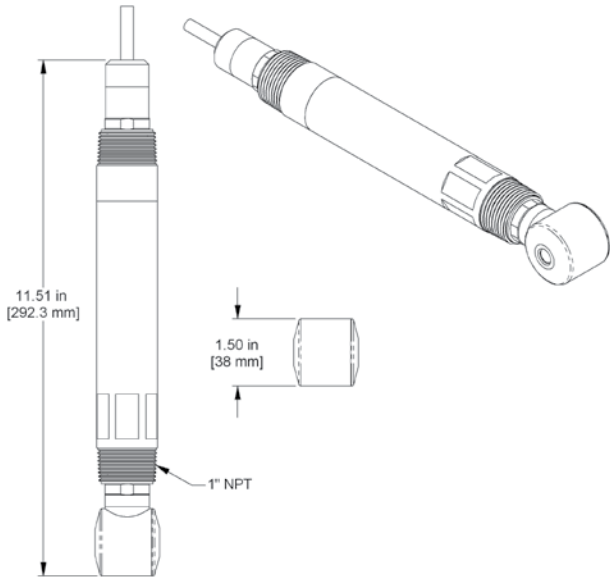


AV38 Local Display/Controller

2 line display and 7 key navigation. Data reporting with up to 2 current outputs. 2 Form C relays. Digital communications.



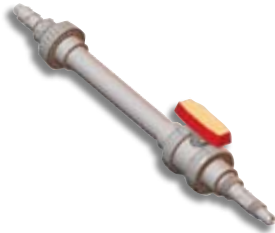
**Thermo Scientific AquaSensors Toroidal Conductivity DataStick Data Sheet**



Mounting adapters, junction boxes and recharge kits are available.



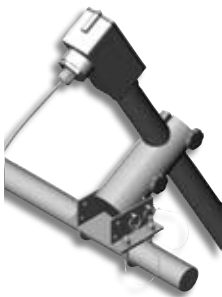
**2.0 Inch Union Mounting**



**2.0 Inch Ball Valve**



**Sanitary Mount**



**Hand Rail Mounting Assembly**



**1 Inch Immersion Mounting with Junction Box**

(7 foot extension is standard)

**Specifications**

<b>Measurement System Performance†</b>	<p><b>Range:</b> 0 to 2,000,000 <math>\mu\text{S/cm}</math> (2 S/cm)</p> <p><b>Resolution:</b> 4.5 significant digits</p> <p><b>Accuracy:</b> 0.1% of reading</p> <p><b>Step Response Time:</b> 90% in 30 seconds</p>
<b>Operational Environment</b>	<p><b>PEEK Sensor Head</b></p> <p><b>Temperature Range:</b> <math>-5\text{ }^{\circ}\text{C}</math> to <math>100\text{ }^{\circ}\text{C}</math></p> <p><b>Maximum Pressure:</b> 200 psig @ <math>100\text{ }^{\circ}\text{C}</math></p> <p><b>Maximum Flow Rate:</b> 10 ft/second</p> <p><b>CPVC Sensor Head</b></p> <p><b>Temperature Range:</b> <math>-5\text{ }^{\circ}\text{C}</math> to <math>75\text{ }^{\circ}\text{C}</math></p> <p><b>Maximum Pressure:</b> 85 psig @ <math>75\text{ }^{\circ}\text{C}</math></p> <p><b>Maximum Flow Rate:</b> 10 ft/second</p>
<b>Power Requirements‡</b>	<p><b>Voltage Range:</b> 10 to 30 VDC</p> <p><b>Maximum Power:</b> 200 mW</p> <p><b>Typical Power:</b> 120 mW</p>
<b>Construction</b>	<p><b>O-rings:</b> Viton® (other materials available)</p> <p><b>Sensor Head Material:</b> CPVC, PEEK</p> <p><b>Weight</b></p> <p>1.2 lbs (PEEK or CPVC)</p> <p>2.6 lbs (316 Stainless Steel)</p>
<b>Units of Measure</b>	<p><b>Measurement Units:</b> <math>\mu\text{S/cm}</math>, TDS, % conc.</p> <p><b>Temperature Units:</b> <math>^{\circ}\text{C}</math>, <math>^{\circ}\text{F}</math></p>
<b>Calibration††</b>	<p><b>Zero:</b> In dry air</p> <p><b>Span:</b> 1 point</p> <p><b>Temperature:</b> 1 point</p>
<b>Temperature Compensation Options##</b>	<p><b>Linear:</b> % per <math>^{\circ}\text{C}</math></p>
<b>Other Configuration Options</b>	<p><b>Sensor Filter:</b> 0 to 100 seconds</p> <p><b>Temperature Filter:</b> 0 to 100 seconds</p> <p><b>Concentration Table:</b> User 10-point</p>
<b>Approvals and Ratings</b>	<p><b>Immunity &amp; Emissions:</b> CE Certified 89/336/EEC: CISPER 11, EN61000 (-4-2,-4-3,-4-4,-4-6, 4-8)</p> <p><b>Safety:</b> cULus Listed; 367G E303570</p> <p><b>Hazardous Locations:</b> Haz Loc Class 1, Division 2, Groups A, B, C, D. Max Ambient <math>80\text{ }^{\circ}\text{C}</math></p>

† Note: Typical at  $25\text{ }^{\circ}\text{C}$  Performance unaffected by cable length

‡ Note: Class II DC power supply required

†† Note: Toroidal are pre-calibrated at the factory

## Note: Temperature can be entered manually

### Thermo Scientific AquaSensors Toroidal Conductivity DataStick

- Global support — with experience that comes from supporting our customers for over 35 years throughout the world, our water quality specialists and customer support teams offer a quick, thorough and professional response to any problem encountered.
- Focus on user benefits — we work closely with you to define your needs, and ensure you are using the monitor in a way that improves your bottom line. For more information, contact your local water quality specialists, or visit [www.thermo.com/processwater](http://www.thermo.com/processwater).

#### Toroidal Conductivity DataStick Ordering Information

Part No.	Description
<b>DS-b-t</b>	<b>DataStick</b>
<b>Body Material (b)</b>	1 = 316 Stainless Steel 2 = CPVC 3 = PEEK
<b>Mounting (t)</b>	1 = NPT front/back 2 = 1 inch NPT front only 4 = 2 inch Tri-clamp 5 = 2.5 inch Tri-clamp
<b>TC-b</b>	<b>DataStick</b>
<b>Body Material (b)</b>	2 = CPVC 3 = PEEK
<b>CA-b-nw-x-y</b>	<b>Communications Adapter</b>
<b>Body Material (b)</b>	1 = 316 Stainless Steel 2 = CPVC 3 = PEEK
<b>Communications (nw)</b>	<b>1A</b> = RS232 ASCII <b>7R</b> = Ethernet <b>2B</b> = Modbus RTU <b>5R</b> = DeviceNet <b>2A</b> = Modbus RS232 <b>8R</b> = USB <b>4B</b> = CANopen
<b>Cable Length (x)</b>	1 = 10 feet 2 = 20 feet 3 = 30 feet
<b>Cable Termination (y)</b>	<b>A</b> = Stripped Wires

#### Accessories Ordering Information

Part No.	Description
<b>Conductivity Solutions, 500 mL bottles</b>	
<b>SOL1000</b>	1000 µS/cm Calibration Solution
<b>SOL2000</b>	2000 µS/cm Calibration Solution
<b>SOL5000</b>	5000 µS/cm Calibration Solution
<b>Mounting Hardware</b>	
<b>MH1032</b>	2 Inch Union Mount, CPVC
<b>MH1031</b>	2 Inch Union Mount, 316 Stainless Steel
<b>MH1032</b>	2 Inch Ball Valve, CPVC, Low Pressure
<b>MH1172</b>	2 Inch Ball Valve, 316 SS, Low Pressure
<b>MH1171</b>	2 Inch Ball Valve, CPVC, High Pressure
<b>MH1182</b>	2 Inch Ball Valve, 316 SS, High Pressure
<b>MH1242</b>	Hand Rail Mounting Assembly, Swivel/Immersion, PVC
<b>MH3083</b>	1 Inch Immersion Mounting with Junction Box, PVC (7 foot extension is standard)
Consult factory for additional configurations and accessories.	

©2008 Thermo Fisher Scientific Inc. All rights reserved. ® Viton is a registered trademark of E. I. Du Pont De Nemours & Company. Modbus is a registered trademark of Schneider Automation, Inc. All other trademarks are the property of Thermo Fisher Scientific Inc. and its subsidiaries.



Environmental Instruments  
Water Analysis Instruments

**North America**  
166 Cummings Center  
Beverly, MA 01915 USA  
Toll Free: 1-800-225-1480  
Tel: 1-978-232-6000  
Dom. Fax: 1-978-232-6015  
Int'l Fax: 978-232-6031

**Europe**  
P.O. Box 254, 3860 AG Nijkerk  
Wallerstraat 125K, 3862 BN  
Nijkerk, Netherlands  
Tel: (31) 033-2463887  
Fax: (31) 033-2460832

**Asia Pacific**  
Blk 55, Ayer Rajah Crescent  
#04-16/24, Singapore 139949  
Tel: 65-6778-6876  
Fax: 65-6773-0836

[www.thermo.com/water](http://www.thermo.com/water)

**Thermo**  
SCIENTIFIC