

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

## **Thermo Scientific AquaSensors DataStick**

### **Wide-Range Turbidity Measurement System**



#### **Market/Applications**

- Drinking water
  - Raw water monitoring
  - Back wash monitoring
- Wastewater effluent
- Process clarity monitoring

#### **AquaSensors Wide-Range Turbidity DataStick™**

- 0 to 4000 NTU measurement range
- Conforms to ISO 7027
- 90 degree and 180 degree light paths
- Rugged, foul resistant construction
- Local and remote configuration and diagnostics
- Temperature measurement included
- Direct data reporting
- Plug & play industrial communications adapters

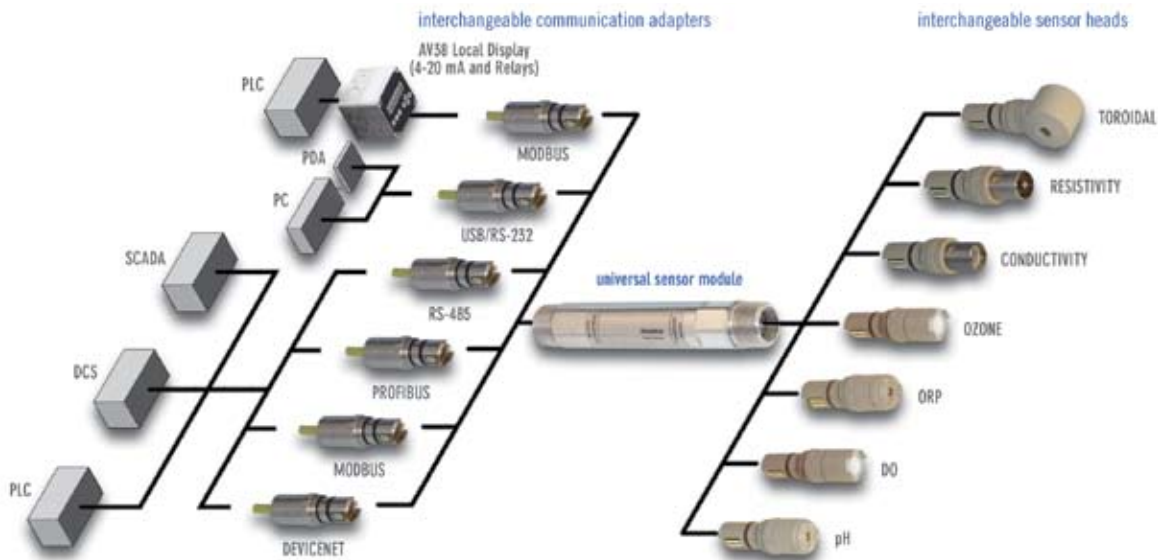
Connect this wide-range turbidity sensor directly to a PLC (Programmable Logic Controller) for seamless integration with industrial control systems. Use any computer to display data, calibrate and customize the measurement without an intermediate analyzer electronics box.

This wide-range turbidity sensor head is pre-calibrated for turbidity and temperature. Can be plugged into any DataStick communications adapter for interactive measurement, calibration, configuration and diagnostics with industrial computers or Thermo Scientific AquaSensors AV38 Local display.

Engineering Specifications

1. The Wide-Range Turbidity sensor shall use the method described in ISO 7027 to measure turbidity. The turbidity measurement range shall be 0 to 4000 NTU. Resolution shall be 0.1 NTU.
2. The Wide-Range Turbidity sensor will be capable of measuring 180 degree light to compensate 90 degree measurements.
3. The sensor 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.
4. The sensor shall have interchangeable, pre-calibrated plug-in sensor heads and communications adapters that can be installed without powering down the system.
5. The sensor shall have 1 inch NPT threads to mount into a standard 2 inch union mounting, or immersion mounting hardware.
6. The built-in electronics of the sensor shall be completely encapsulated and O-ring sealed for protection from moisture and humidity.
7. 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, Ethernet.
8. The sensor shall have an integral temperature sensor to measure temperature independently.
9. The sensor shall be Thermo Scientific AquaSensors wide-range turbidity DataStick.

Thermo Scientific DataStick Analytical System



Key Components

Wide-Range Water Turbidity Sensor Head

Precalibrated for turbidity and temperature. Can be plugged into any DataStick communications adapter for interactive measurement, calibration, configuration and diagnostics with industrial computers or AquaSensors AV38 local display.



Communications Adapter

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



Wash Head

In applications where the sensor head is quickly fouled with sediment, a wash head assembly can be attached. The head slips on the body of the sensor and the wash nozzle is aligned with the sensor fingers. Actuation is controlled by an AV38 wash relay that is programmed with a wash interval and duration.

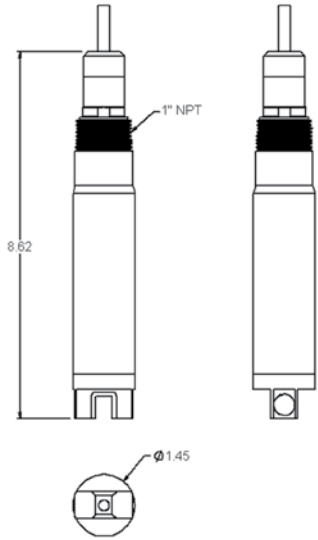


AV38 Local Display/Controller

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



**Thermo Scientific AquaSensors Wide-Range Turbidity DataStick Data Sheet**



Provides universal conversion of sensor signals and interactive communications for measurement, calibration, configuration and diagnostics. Mounting adapters, junction boxes and recharge kits are available.



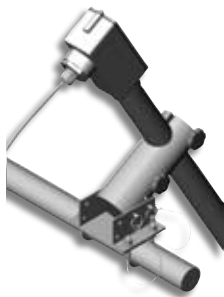
**Ball Float Assembly**



**1.5 Inch Union Mounting**



**1.5 Inch Ball Valve**



**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 4000 NTU</p> <p><b>Resolution:</b> 0.1 NTU</p> <p><b>Accuracy:</b> 1% of reading</p> <p><b>Step Response Time:</b> 90% in 15 seconds</p>  |
| <b>Operational Environment</b>         | <p><b>Temperature Range:</b> -5 °C to 50 °C</p> <p><b>Maximum Pressure:</b> 65 psig @ 50 °C</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>Windows:</b> Quartz</p> <p><b>Optical Topology:</b> Detection at 90 degrees and 180 degrees to source</p> <p><b>O-rings:</b> Viton®</p> <p><b>Sensor Head Material:</b> Polycarbonate</p> <p><b>Weight:</b> 1.2 lbs</p>   |
| <b>Units of Measure</b>                | <p><b>Turbidity Mode:</b> NTU</p> <p><b>Temperature Units:</b> °C, °F</p>   |
| <b>Calibration††</b>                   | <p><b>Sample:</b> 1 and 2 point</p> <p><b>Zero:</b> 1 point</p> <p><b>Temperature:</b> 1 point</p>  |
| <b>Measurement Modes</b>               | <p><b>Turbidity:</b> 90 degree/180 degree, narrow beam, IR light</p> <p><b>Temperature:</b> Automatic from -5 °C to 50 °C</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>  |
| <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. T5 Max Ambient 50 °C</p> |

† Note: Typical at 25 °C Performance unaffected by cable length

‡ Note: Class II DC power supply required

†† Note: Turbidity and Temperature are precalibrated at the factory

**Thermo Scientific AquaSensors Wide-Range Turbidity 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).

**Turbidity DataStick Ordering Information**

| Part No.   | Description  |
|--|--|
| <b>RT-b-x-y-z</b>                                | <b>DataStick and Communications</b>  |
| <b>Measurement Mode (b)</b>                      | 1 = Turbidity  |
| <b>Back-Body and Communications Material (x)</b> | 1 = 316 Stainless Steel<br>2 = CPVC  |
| <b>Communications (y)</b>                        | 4 = Modbus® RTU<br>5 = DeviceNet<br>6 = CANopen<br>7 = Ethernet<br>8 = USB |
| <b>Cable Length (z)</b>                          | 1 = 10 feet<br>2 = 20 feet<br>3 = 30 feet                                  |

**Accessories Ordering Information**

| Part No.   | Description   |
|--|---|
| <b>Local Display/Controller Interface</b>                      |   |
| <b>AV38</b>  | ¼ DIN, Outputs, Relays, Digital Communications Options                          |
| <b>Formazin Calibration Solutions and Accessories</b>          |   |
| <b>FOR40</b>   | 40 NTU CAL Kit  |
| <b>FOR4K</b>   | 4000 NTU Stock, 500 mL Bottle   |
| <b>MH1222</b>  | Wash Head Assembly  |
| <b>Mounting Hardware</b>                                       |   |
| <b>MH1042-RT</b>   | 1.5 Inch Union Mounting, CPVC   |
| <b>MH1041-RT</b>   | 1.5 Inch Union Mounting, 316 Stainless Steel                                    |
| <b>MH1112</b>  | 1.5 Inch Ball Valve, CPVC, Low Pressure   |
| <b>MH1111</b>  | 1.5 Inch Ball Valve, 316 SS, Low Pressure                                       |
| <b>MH1122</b>  | 1.5 Inch Ball Valve, CPVC, High Pressure  |
| <b>MH1121</b>  | 1.5 Inch Ball Valve, 316 SS, High Pressure                                      |
| <b>MH1042</b>  | Hand Rail Mounting Assembly, Swivel/Immersion, PVC                              |
| <b>MH1052</b>  | Hand Rail Mounting Assembly, Swivel/Immersion with Ball Float                   |
| <b>MH3083</b>  | 1 Inch Immersion Mounting with Junction Box, PVC (7 foot extension is standard) |
| Consult factory for additional configurations and accessories. |   |

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