Thermo Scientific AquaSensors AquaClear

Low-range turbidimeter

Thermo Scientific™ AquaSensors™ AquaClear™ turbidimeter for accurate, real-time turbidity measurements.

Markets/Applications

- Drinking water
- Filter monitoring membrane filtration
- Distribution monitoring
- Wastewater effluent (clarified)
- Packaged water systems
- Food & beverage processing
- Pharmaceutical process water

Product Benefits

- Meets or exceeds USEPA method 180.1
- Pre-calibrated measurement
- Plug & play sensor heads (digital versions only)
- Simple to operate

AquaClear system with digital AV38 display

AquaClear system with analog AV88 display

Thermo Scientific AquaSensors AquaClear Turbidity Measurement System

The Thermo Scientific AquaSensors AquaClear low-range turbidimeter system delivers accurate turbidity measurements in drinking water applications and other process applications to monitor water quality. The AquaClear turbidimeter uses a pre-calibrated plug-in optical sensor head. The sensor is inserted into a sample chamber specifically designed to condition the water for turbidity measurements. The measurement chamber removes bubbles from the water so that solid particles can be accurately detected.

Maintenance costs are low with the AquaClear system. The lamp provides collimated white light for a minimum of three years and is easily changed. The volume of the measurement chamber is 135 mL and requires a small amount of formazin to perform EPA-mandated calibrations, thus making the AquaClear turbidimeter a cost-effective investment.

The AquaClear system is offered in three convenient versions: a digitally networked version without a local display that can interface digitally with industrial control systems; a digitally networked version with a local display (AV38); and an analog version with a local display (AV88) that cannot digitally communicate to a host system but provides two analog outputs, two relays, and AC/DC power options. Both AV38 and AV88 local displays offer standard commands for calibration, configuration, diagnostics, and troubleshooting.

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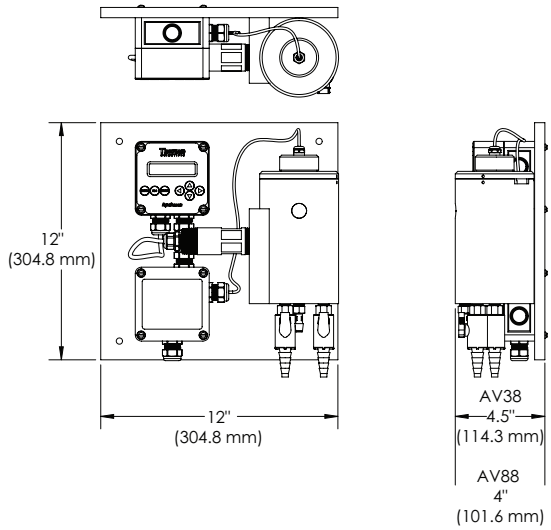
AquaSensors AquaClear Turbidimeter with Digital Communication

The AquaClear digital version is part of the Thermo Scientific™ AquaSensors™ DataStick™ family of measurement products. The DataStick system can be configured with any AquaSensors sensor head and can communicate directly with industrial computer systems using a variety of communications adapters. This DataStick system can be digitally networked to a computer interface directly or to a local display (AV38 version only). This system provides universal conversion of sensor signals and interactive communications for measurement, calibration, configuration and diagnostics. Mounting adapters, junction boxes and recharge kits are available.

The AquaClear AV88 analog version is offered with two relays, 4-20 mA outputs and AC/DC power options. Both AV38 and AV88 local displays offer standard commands for calibration, configuration, diagnostics, and troubleshooting.

AV38/AV88



Engineering Specifications

1. The turbidity monitoring system is capable of functioning independently utilizing a local or remote display or in an expandable network of systems that can be calibrated, configured or diagnosed by a remote computer.
2. The turbidimeter continuously measures turbidity in the range of 0.001 to 100 NTU and is a microprocessor-based, on-line nephelometric instrument meeting all design and performance criteria specified by USEPA method 180.1.
3. Light is directed through the surface of the sample and the detector is immersed in the sample, eliminating glass windows and flow cells. Optical components are mounted in a sealed head assembly that can be removed easily for calibration/service.
4. The sample chamber is constructed of corrosion-resistant ABS plastic, and includes an internal bubble removal system to vent entrained air from the sample stream.
5. Accuracy is ±2 % of reading or ±0.015 NTU (whichever is greater) from 0 to 10 NTU; ±5 % of reading from 40 to 100 NTU.
6. Displayed resolution is 0.001 NTU from 0 to 100 NTU.
7. User selectable signal averaging, bubble removal, alarm and diagnostics are included.
8. The sensor has 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.
9. The sensor has an integral temperature sensor to measure temperature independently.
10. All system components are C-UL-US Listed (367G E303570 E327739). For EMC immunity and emissions, system components are CE-Certified 89/336/EEC: CISPER 11, EN61000 (-4-2, -4-3, -4-4, -4-6, 4-8). Max Ambient 50 ºC.
11. The sensor is Thermo Scientific AquaSensors AquaClear low-range turbidimeter.

Product Benefits

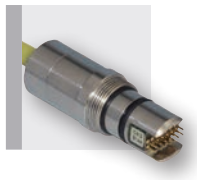
- Meets or exceeds USEPA method 180.1
- 135 mL sample chamber
- 0.001 NTU resolution
- 3-year light source
- Compact mounting footprint
- Digital network interface
- Local interface with current outputs and relays
- Low flow rate
- Temperature measurement included
- Plug and play industrial communications adapters

Use this system when very accurate turbidity measurement is needed in drinking water and other critical water quality monitoring applications. Connect this system 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. Report data with standard current outputs and set alarms with optional relays. Save on calibration cost with smaller volumes of formazin standard. Save space, time and money.

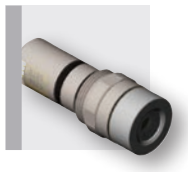
Key Components (AV38 Version)

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

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



Optical Sensor Head
Yields accurate 24-bit data.



AV38 Local Display/Controller
2 line display and 7 key navigation. Data reporting with up to 2 current loops. 2 Form C relays. Digital communications.

Key Components (AV88 Version)

Optical Sensor Head
Accurate optical turbidity sensor and cable connection for AV88 controller.

AV88 Local Display/Controller
2 line display and 7 key navigation. Data reporting with up to 2 current loops. 2 Form C relays. Analog communications.

Specifications

Measurement System Performance	Range: 0 to 100 NTU Resolution: 0.001 NTU Accuracy: ±2 % of reading or ±0.015 NTU whichever is greater. ±5 % of reading above 40 NTU
Operational Environment	Water Temperature Range: -5 ºC to 50 ºC Air Temperature Range: -20 ºC to 60 ºC Maximum Flow Rate: 500 mL/min (7.9 gal/hr) Minimum Flow Rate: 250 mL/min (4 gal/hr)
Power Requirements	Voltage Range: 24 VDC or 100-240 VAC Maximum Power: 8 W with AV38/88 DataStick & light source Typical Power: 6 W with AV38/88 DataStick & light source
Construction	Light Source: White light (tungsten) Sample Chamber Material: ABS plastic Sample Chamber Volume: 135 mL Light Source Housing: Anodized aluminum Mounting Plate: 12 x 12 inches, 4 mounting holes Sensor Head Material: Quartz glass, anodized aluminium Weight: 5.6 lbs (2.5 kg)
Units Of Measure	Measurement Units: NTU Temperature Units: ºC, ºF
Calibration	Sample: 1 point Zero: 1 point Temperature: 1 point
Interface	Display: 2 lines, 16 characters, 7 key menu navigation Current Outputs: 1 standard, 2nd optional Relays: 2 form C (optional)
Other Configuration Options	Sensor Filter: 0 to 100 seconds Temperature Filter: 0 to 100 seconds
Approvals And Ratings	Immunity & Emissions: CE certified 89/336/EEC: CISPER 11, EN61000 (-4-2, -4-3, -4-4, -4-6, 4-8) Safety: cULus listed; 367G E327739

† Note: Typical at 25 °C performance unaffected by cable length
‡ Note: Class II DC power supply required
††Note: Turbidity and temperature are pre-calibrated at the factory

Thermo Scientific AquaSensors AquaClear Low-range Turbidity Measurement System

Turbidity System Ordering Information

AV38 Version

Part No.	Description
AQT-x-y-z	**Turbidity System**
Display Configuration (x)	1 = Integral 2 = Remote with 20 ft cable
AV38 Configuration (y)	A = 1 current output and 24 VDC power B = 2 current outputs, 2 relays and 24 VDC power C = 1 current output and 100-240 VAC power D = 2 current outputs, 2 relays and 100-240 VAC power
Host Communications (z)	0 = None 4 = Modbus RTU 5 = DeviceNet 6 = CANopen 7 = Ethernet

AV88 Version

Model Number

AQT Turbidity measurement system. 0 to 100 NTU range. Precalibrated sensor, temperature measurement, sample chamber with bubble trap, lamp, junction box, mounting plate and AV88 local display.

Display Configuration
1 Integral

AV88 Display Configuration

DC

AQT1DC User Interface with 2 current outputs, 2 relays. 24 VDC power.

AC

AQT1AC User Interface with 2 current outputs, 2 relays. 100 VAC to 240 VAC power.

AQT			Turbidity Measurement System Part Number

Accessories Ordering Information

Part No.	Description
TDWLS00	Lamp and cable
TDWCC01	Chamber lid
TDWSC01	Turbidity sample chamber
DW21	Turbidity sensor head
Part No.	**Description**
FOR40	40 NTU formazin calibration kit
FOR4K	4000 NTU formazin stock
TDWCAL01	Cal stick validation
TDWAV88	AV88 Controller for AquaClear turbidimeter
TDWSS88	Sensor and cable for AV88 AquaClear turbidimeter

Key Components Ordering Information

Part No.	Description
DS21	DataStick measurement system
DW21	Turbidity sensor head
CA-b-nw-x-y	**Communications Adapter**
Body Material (b)	1 = 316 stainless steel 2 = CPVC 3 = PEEK
Communications (nw)	1A = RS232 ASCII 2B = Modbus RTU 2A = Modbus RS232 4B = CANopen 7R = Ethernet 5R = DeviceNet 8R = USB
Cable Length (x)	1 = 10 feet 2 = 20 feet 3 = 30 feet
Cable Termination (y)	A = Stripped wires
Part No.	**Description**
AV38-v-w-x-y-z	**AV38 Local Display/Controller**
Current Outputs (v)	B = 1 C = 2 with 2 relays
Mounting (w)	B = ¼ DIN NEMA 4X wall-mount enclosure
Host Communications (x)	0 = None 1 = RS232 ASCII 2 = Modbus RS232 4 = Modbus RTU 5 = DeviceNet 6 = CANopen 7 = Ethernet
Relays (y)	A = 0 C = 2 with 2 current outputs selected
Power (z)	1 = 24 VDC 2 = 100-240 VAC

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