HF scientific
Water Quality Measurement Solutions

MicroTOL

ONLINE TURBIDIMETER SPECIFICATIONS

Instrument Overview

The MicroTOL OnLine Turbidimeter is specifically designed for measuring turbidity continuously in filtered water, raw water, waste water final effluent and industrial applications.

The Optional HF OnLine software allows graphical trending, alarms and filter analysis for multiple networked turbidimeters.

The optional Auto Clean Ultrasonic cleaning system automatically cleans the optical chamber for Finished or Raw water applications.



Standard Features

- **Meets USEPA method 180.1 and ISO 7027 design and performance criteria.**
- **Range of 0 - 1000 NTU**
- **One-piece design eliminates the need to mount more than one module per turbidimeter.**
- **Fast response time and inexpensive calibration due to low (30 ml) sample volume.**
- **Modular design reduces overall costs.**
- **Removeable sample cuvettes allow for easy cleaning and calibrating.**
- **Optics are not in contact with the sample which reduces the chance of false low readings.**
- **Convenient reusable primary calibration standards.**

Features

Optical Design
New optical design allows consistant readings with laboratory and portable turbidimeters.

Bubble Rejection System
The optical chamber of the MicroTOL has been designed to eliminate air in the sample while simultaneously creating a vortex cleaning action throughout the optical chamber.

Calibration
Calibration with primary standards is completed using sealed cuvettes, similar to laboratory procedures. This dry method of calibration is fast, clean and reusable. On-screen menu items guide you through the calibration procedure quickly and easily.

Certification
Listed or Certified to CE, UL, CSA (ETL,ETLc)

New Design
One-piece mounted design allows for simple mounting and minimal use of space. Increased range of 0-1000 NTU allows for use of low NTU filtered water or raw water. New optical design increases accuracy and provides more consistent readings with online, laboratory and portable turbidimeters.

Light Source
White light is recommended for use in turbidimeters reporting results under US EPA (US standard) jurisdiction. HF scientific has developed NEW krypton filled white light technology with lamp life expectancy up to 7 years.
Infrared light is recommended for use in turbidimeters reporting results under ISO 7027 (European standard) jurisdiction. Infrared light is also recommended for waste water final effluent and industrial applications where color is present in the sample stream.

Regulatory
USEPA, ISO 7027, Standard Methods

Optional Data Network Interface Acquisition System
The data acquisition system is designed to sequentially collect data from a series of interfaced HF scientific turbidimeters. The software system stores data, prints reports, graphs and alarms on each individual turbidimeter. In addition it can compare filters and monitor individual or multiple filter efficiency.

MicroTOL Sample Specifications

The continuous monitoring system shall include a single modular unit with power supply, display and sensor as one single unit. The turbidimeter shall meet all requirements specified by the USEPA Method 180.1 (White Light Model), ISO 7027 (Infrared Model) and Standard Methods 2130B. The turbidimeter shall have a similar optical design to a laboratory turbidimeter, for accuracy. The turbidimeter shall have consistent readings with laboratory and portable turbidimeters. The turbidimeter shall be Modbus compatible. The turbidimeter shall have the option of using an automatic ultrasonic cleaning system in finished or raw water applications. Accuracy shall be 2% of reading or plus or minus .02, whichever is greater, from 0-40 NTU, and 5% of reading or plus or minus .02, whichever is greater, from 40-1000 NTU. Resolution will be 0.0001 NTU (selectable).

The sensor shall consist of a rotational flow through assembly with a 30ml cuvette. The specially designed flow head bubble rejection system eliminates the need for a bubble trap and ensures an immediate response time. The sensor shall be able to accommodate grab samples. Calibration and standardization will be accomplished using small volumes (30ml) of reusable primary standards in a cuvette. The Primary Standards shall be reusable for multiple online turbidimeters and be interchangeable with laboratory turbidimeters. Calibration procedures can be completed without disrupting the sample flow. The lamp source and detector shall not come in contact with the sample, eliminating false low readings. The turbidimeter shall use menu driven software for user ease. The turbidimeter enclosure shall be NEMA 4X (IP66) and suitable for outdoor installation. The Online Turbidimeter shall be HF scientific MicroTOL Online Turbidimeter.



Ultrasonic Cleaning System

Keeps the optical chamber clean in finished or raw water applications.



MicroTOL with Calibration Cuvettes
A complete primary calibration can be completed in less that five minutes

Specifications for MicroTOL OnLine Turbidimeter

Range	0 - 1000 NTU
Measurement Principle	Nephelometry (90 degrees)
Accuracy	2% of reading or ± 0.02 below 40 NTU 5% of reading above 40 NTU
Resolution	0.0001 Selectable
Response Time	Adjustable (5 to 500 seconds) (0 - 1000 NTU)
Input Pressure	1 - 200psi (built in regulator set at 15psi)
Standard Outputs	4-20 ma Galvanic Isolated or RS-485
RS-485 Protocols	Modbus, HF Simplebus, HF Online Interface
Light Source	White Light - 7 year life, Infrared Light (850nm LED) - 10 year life
User Alarms	2 High / Low Alarms
Alarm Contacts	FORMC 250 VAC 2A
Display	Multiline Custom Backlight LCD
Security Code	Prevents unauthorized access
Built in Diagnostics	Yes
Storage Temperature	-4°F to 140°F (-20°C to 60°C)
Operating Temperature	32°F to 122°F (0°C to 50°C)
Wetted Surfaces	Nylon, Borosilicate Glass, Silicon, Polypropylene, Stainless Steel
Enclosure	Designed to meet NEMA 4X, IP66
Outdoor Installation	32°F to 122°F (0°C to 50°C))
Certifications	USEPA, ISO 7027, CE Approved, ETL Listed to UL 3111-1 and ETL Certified to CSA 22.2 No. 1010-1-92
Dimensions	14 " x 12" x 12" (35 cm x 30 cm x 30 cm)
Shipping Weight	2.5 kg (5.5 lbs.)

Specifications subject to change without notice.

Ordering Information*

Catalog No.	Model	Range in NTU	Ultrasonic Autoclean	USEPA Method 180.1	ISO 7027
20053	#2 White Light	0 - 1000		X	
20054	#2 Infrared	0 - 1000			X
20055	#3 White Light	0 - 100	X	X	
20056	#3 Infrared	0 - 100	X		X
20063	#4 White Light	0 - 1000	X	X	
20064	#4 Infrared	0 - 1000	X		X

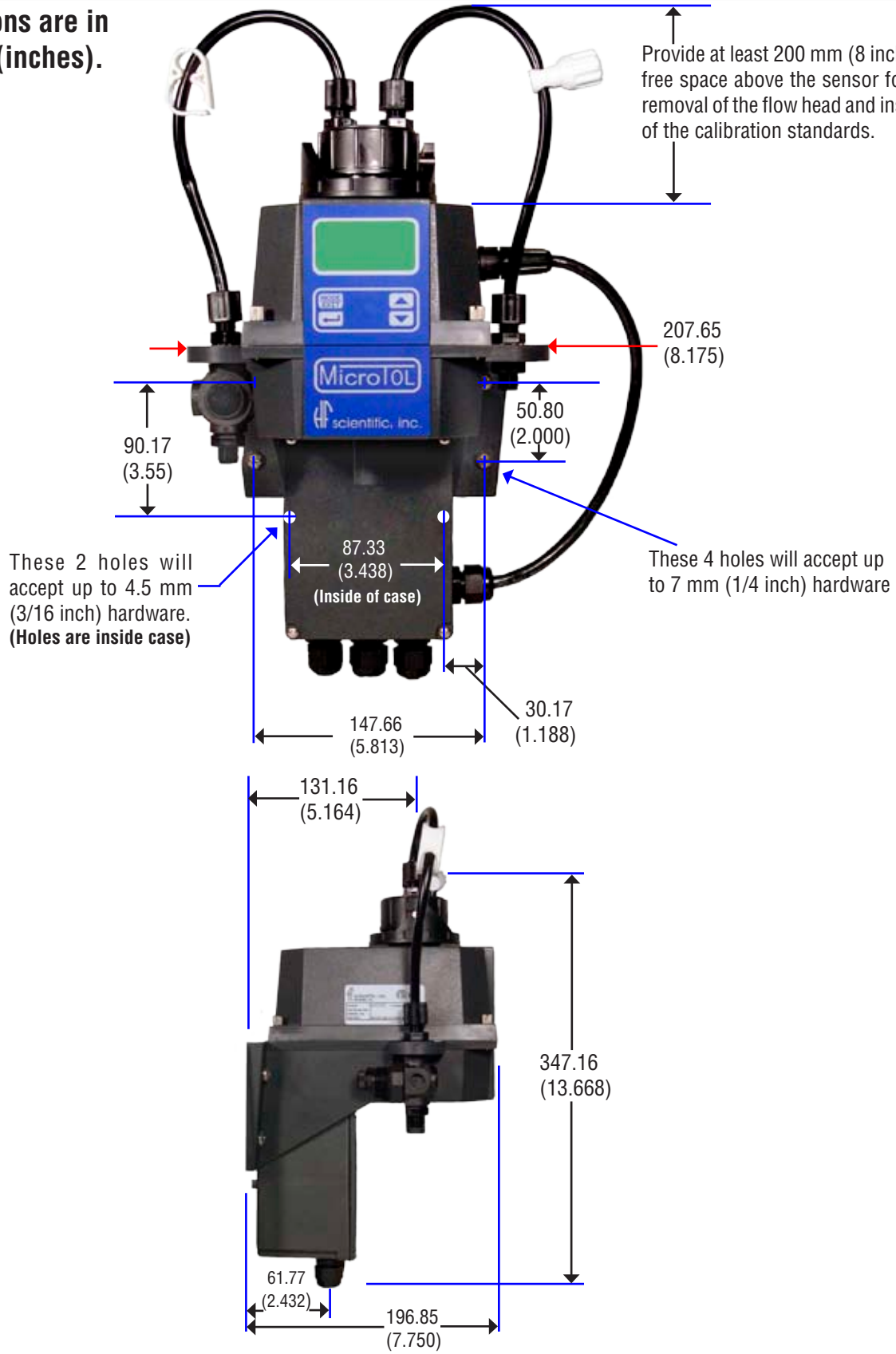
*All models are delivered fully calibrated and include 4-20ma, backlight display, RS-485/Modbus, inline pressure regulator, desiccant, universal power supply (100-240 VAC) & quick start guide. Model 2 also includes spare measuring cuvette w/light shield.

Accessories

19783	HF OnLine Windows Software for data collection and reporting
19609	Remote Display for an additional digital readout
29953	PRIMETIME Primary Calibration Kit, .02 & 10 & 100 NTU
29957	PRIMETIME Primary Calibration Kit, Full Range, .02, 10 & 1000 NTU
21555R	Desiccant Refill
20779S	Power Cord - 120VAC / 240 VAC

Dimensions for MicroTOL OnLine Turbidimeter

All Dimensions are in Millimeters (inches).



Dimensions for MicroTOL OnLine Turbidimeter

Shutoff Clamp allows for shutoff of the intake flow during cuvette cleanings and replacements.

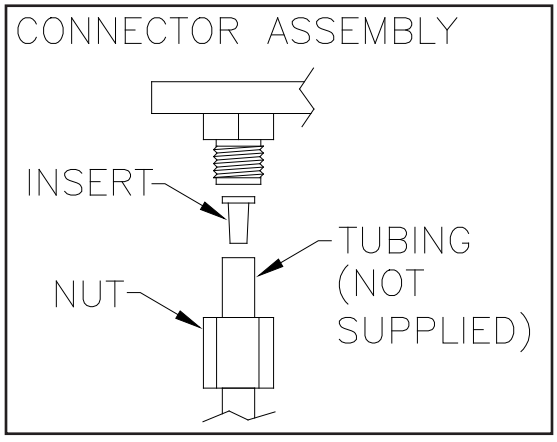
Backpressure Valve allows adjustment of the amount of back pressure, which will help to control flow rate and eliminate small bubbles.

Inline Pressure Regulator
Max. Input 1380 kPa (200psi)
Factory set to 103.5 kPa (15 psi)



Intake Tubing Connection
4.75 mm (3/16 inch) I.D., 8 mm (5/16 inch) O.D. tubing should be connected here to supply the sensor with a dependable sample flow.

Drain Tubing Connection
4.75 mm (3/16 inch) I.D., 8 mm (5/16 inch) O.D. tubing should be connected here to route the sensor drain tubing to a suitable site drain.



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