

Laboratory & On-line Turbidimeter System



The MTOL+ Online Turbidimeter has been specifically designed for measuring filtered water, raw water, re-use water and many industrial applications and to be compatible with the M100+ touchscreen laboratory turbidimeter. The two units share calibration standards eliminating the variable of different calibration between laboratory and process NTU monitoring.

The MTOL+ features built-in Ultrasonic Auto Clean, is easy to set up, maintain and calibrate using Pro Cal EPA approved NTU Calibration standards.

On-site User Selectable

Ranges include: 0 - 10, 0 - 100*, and 0 - 1000 NTU

*factory default

MTOL+ Standard Features:

- Meets USEPA Method 180.1 and ISO 7027 design and performance criteria
- Ranges 0 - 10 NTU, 0 - 100 NTU or 0 - 1000 NTU (User-Selectable - Factory Set to 0 - 100 NTU)
- One-piece design eliminates the need to mount more than one module per turbidimeter
- Local Display/User Interface provided with each instrument
- Fast response time and inexpensive calibration
- Low (30 ml) sample volume
- Modular design reduces overall costs
- Removable sample cuvettes allow for easy cleaning and calibrating
- Ultrasonic Cleaning Function
- Optics are not in contact with the sample - reduces chance of false low readings
- Convenient reusable primary calibration standards
- USE WITH BOTH Lab & On-line units
- Same Standard set for both versions



HF scientific, inc.
Model MTOL+ Turbidimeter System

The continuous monitoring NTU system shall include for the on-line model single modular unit with power supply, display, user interface 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 online turbidimeter shall have an ultrasonic auto-clean system. Accuracy shall be 2% of reading or plus or minus 0.02, whichever is greater, from 0-40 NTU, and 5% of reading or plus or minus 0.02, whichever is greater, from 40-1000 NTU. Resolution will be 0.001 NTU (user selectable).

The sensor shall utilize a rotational flow through assembly with a 30ml cuvette. The specially designed flow head bubble rejection system can eliminate the need for a bubble trap and ensures an immediate response time. Keeping the sample under pressure continually ensures that the sample stream will not be exposed to open atmosphere in the measurement optics which can cause elements of the sample stream to precipitate in some circumstances. Precipitation of oxidized sample constituents can result in false NTU readings. The sensor shall be able to accommodate grab samples without the need to stop sample flow to the flow head.

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 also with the laboratory turbidimeter detailed below. Calibration procedures can be completed without disrupting the sample flow. Details of calibration (date and time of last successful calibration) will be stored on the analyzer. Also considered to be part of the turbidimeter system is the inclusion of a laboratory instrument specifically designed to use the same calibration standards, glassware and light shields. The required laboratory instrument is an HF scientific M100+ touchscreen model with USB data logging and ability to store the date/time of the last calibration. Note: Detailed specifications for the M100+ are available on request.

The process turbidimeter and the laboratory turbidimeter lamp source and detector shall not come in contact with the sample, eliminating false low readings. The turbidimeters shall use menu driven software for user ease. The online turbidimeter enclosure shall be designed to meet NEMA 4X (IP66) and suitable for outdoor installation. The Online Turbidimeter shall be HF scientific MTOL+ Online Turbidimeter. The Online turbidimeter will have data-logging features, will store the latest date/time of calibration and be user selectable for ranges of 0 – 10 NTU, 0 – 100 NTU (factory default) or 0 – 1000 NTU.

The complete NTU system must include start up and training by a factory certified training provider. Certification of the trainer must be provided with the proposal.

MTOL+ Features & Benefits:

Optical design

Optical design allows consistent readings with M-100+ laboratory turbidimeter. The unique optical design ensures that the same calibration standards used for the online MTOL+ can be used for the complementary laboratory unit, the M100+.

Bubble rejection system

The optical chamber of the 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 method of calibration is fast, clean and reusable. On-screen menu items guide you through the calibration procedure quickly and easily. The layout for both the MTOL+ and M100+ have a similar "feel" making the UI transition from one to other seamless.

Modular design

One-piece mounted design allows for simple mounting and minimal use of space. Wide range of measurement (0-1000 NTU) allows for measurement of both low NTU filtered water or raw water with one analyzer, eliminating the need to learn multiple models. Optical design increases accuracy and provides more consistent readings with online, laboratory and portable turbidimeters. Calibrate the new M100+ laboratory turbidimeter with the same standards as the MTOL+ for greatly improved comparison functionality between lab and online.

Light source

White light is recommended for use in turbidimeters reporting results under US EPA (US standard) jurisdiction. HF scientific has developed Krypton filled white light technology with lamp life expectancy of 5 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 method 180.1

Technical Specifications

	MTOL+	M100+
Range Options	0-10 NTU, 0-100 NTU, 0-1000 NTU	0-4000 NTU
Measurement Principle	Nephelometric (90 degree scattered light)	same as MTOL+
Accuracy	2% of reading or +/- .02 NTU (below 40 NTU) 5% of reading (above 40 NTU)	same as MTOL+com
Resolution	0.001 (Selectable)	0.0001 (Selectable)
Response Time	Adjustable (5 – 500 seconds)	Selectable
Flow Rate	0.026 - .26 gpm (100 ml/min – 1000 ml/min)	NA
Standard Outputs	4-20 ma Galvanic Isolated or RS-485 Modbus	NA
User Alarms	2 User Settable Alarms	NA
Optional Flow Alarm	(Factory Installed Only)	NA
Security Code	User Selectable - Prevents Unauthorized Access	TBA
Storage Temperature	-4oF to 140oF (-20oC to 60oC)	NA
Operating Temperature	34oF to 122oF (1oC to 50oC)	(34°F – 104°F)
Input Pressure	1 – 101psi (built in regulator set at 15psi)	NA
Enclosure	NEMA 4X (Secondary enclosure suggested outdoors)	Lab Environment
Certifications	USEPA 180.1, ISO 7027, CE Approved Conforms to CE	LC mark tested to UL/CSA Listed or Certified to CE, UL

Ordering Information EPA 180.1 System:

Cat No:	Model	Description
28053	MTOL+	White Light Process NTU
28060	M100+	White Light Laboratory NTU

Calibration Kits

39953	0 to 100 Range - 0.02, 10 & 100 NTU standards
39957	0 – 1000 Range – 0.02, 10 & 1000 NTU standards
39950	0 – 10 Range – 0.02, 1 and 10 NTU standards

Spare Parts

21555R	Desiccant Pack (Spare)
21466S	Ultrasonic Cuvette (Spare)
50036	Spare cuvettes for M100+ (3 pk.)

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Sample Inlet and Outlet
1/4" OD push to connect fittings



Provide at least 8 inches of free space above the sensor to allow for removal of the flow head for maintenance and calibration.

Sensor Base Installation
Allows up to 1/4" hardware



Power supply / JBox Installation
Allows up to 3/16" hardware