

HI 847491 • HI 847492 • HI 847493

## Haze Meters

for Beer Quality Analysis



- Utilizes Fast Tracker—Tag Identification System
- LED optical system
- PC Compatible via USB
- Good Laboratory Practice (GLP)
- Log-on-demand
- Large, backlit LCD

No more  
judging  
by eye!

### Professional Quality Analysis of Haze in Beer

The HI 847491, HI 847492, and HI 847493 are auto diagnostic haze in beer meters. Each instrument features a different measuring unit or light source to comply with different standard requirements.

**HI 847491** is specially designed according to the ISO standard for haze in beer measurements.

**HI 847492** is specially designed, according to the ASBC (American Society of Brewing Chemist) standard for haze in beer measurements.

**HI 847493** is specially designed, according with the MEBAK (Central European Brewing Commission) standard requirements, for haze in beer measurements.

These instruments compensate a beer color to guarantee accurate readings during the brewing process. The optical system consists of an LED and multiple detectors. A two, three or four point calibration can be easily performed at any time using the supplied or user prepared standards.

These meters have all the necessary GLP (Good Laboratory Practice) features to allow maximum traceability of data. Features include a real time clock, log-on-demand (up to 200 measurements), and Fast Tracker™—Tag Identification System.

It has a continuous measurement mode to measure the settling rate of suspended matter, and a signal average (AVG) mode to accumulate multiple readings giving a final average value. The average mode is particularly useful to measure samples with suspended particles with different dimensions.

All 3 meters feature a user-friendly interface, with a large backlit LCD (Liquid Crystal Display). Acoustic signals and displayed codes to guide the user step by step through routine operations.

This splash proof portable turbidity meter is supplied in a rigid carrying case that offers protection for harsh environments.

## Why this instrument is so important

### Beer haze

Beer haze may be defined as an insoluble or semisoluble particulate matter which is small enough to form a colloidal suspension in beer. These particles scatter transmitted light and are observed as a degradation in the transparency of the beer.

The beer clarity is a parameter constantly controlled in brewery, and to assure a consistent product quality, the brewmaster needs more than visual inspection.

Several substances can cause haze in beer, but the most frequently encountered problem is due to a cross-linking of polyphenol and protein.

A range of stabilization treatments are available for avoiding haze problems. The products have to be controlled on several steps during brewing process, in particular after filtration and before the beer enters the single tanks.

*FastTracker™*  
A new revolution in organized data management



**iButton® Tags are Easy to Install**

Install TAGs near your sampling points for quick and easy iButton® readings. Each TAG contains a computer chip with a unique identification code encased in stainless steel. You can install a practically unlimited amount of TAGs. These tags do not use batteries to operate. Additional TAGs can be ordered for all of your traceability requirements.

**Fast Tracker—Tag Identification System**

HANNA is the first manufacturer of portable turbidity meters that have the unique Fast Tracker™—Tag Identification System. The Fast Tracker™ system is designed to meet users’ needs for traceability and data management.

The system has been created for both scientific and industrial applications. Using the Fast Tracker™ system provides a way to prove that samples have been truly taken at pre-established locations—making them ideal for safety audits or routine inspections.

The system is as easy to install and operate. Just fix the iButton® tags near the sampling site. Each tag has a unique identification code making the number of tags than can be installed practically unlimited.

Immediately after installation of the tags you can start collecting data. The tag contains an embedded computer chip and is designed to withstand the harsh indoor and outdoor environments. Use the meter to take measurements and store test results by pressing the LOG key. Next, the instrument will ask for the tag identification. Simply touch the iButton® with the instruments connector to identify and authenticate logging. The meter will store all the necessary information. Transfer all test data to your PC using our HI 92000 Windows® compatible software for further data management. Data can then be exported for use in popular spreadsheet programs.

It is also possible to add new tags later on to increase an already existing database. Each time the PC software recognizes an unregistered tag, it will ask for a description of the new sampling location.

**Methods**

Many methods were used to measure turbidity over the years. The Jackson Candle Turbidimeter was used to measure turbidity as Jackson turbidity units (JTU). The method is visual and are not considered very accurate. To obtain more accurate readings a nephelometer should be used as a turbidity reading instrument.

The HI 847491 reports the measurements in FNU (Formazin Nephelometric Units), HI 847492 reports the measurements in FTU (Formazin Turbidity Units). FTU units are equal to NTU units (Nephelometric Turbidity Units). The HI 847493 reports the measurements in EBC (European Brewery Convention). The conversion table between these measurement units is shown below:

	NTU/FNU/FTU	EBC	ASBC	HELM
1 NTU				
1 FNU	1	0.25	17.5	0.1
1 FTU				
1 EBC	4	1	69	40
1 ASBC	0.057	0.014	1	0.579
1 HELM	10	0.025	1.725	1



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SPECIFICATIONS	HI 847491	HI 847492	HI 847493
Range	0.00 to 9.99 FNU 10.0 to 99.9 FNU 100 to 1000 FNU	0.00 to 9.99 FTU 10.0 to 99.9 FTU 100 to 1000 FTU	0.00 to 9.99 EBC 10.0 to 99.9 EBC 100 to 250 EBC
Range Selection	Automatic		
Resolution	0.01 FTU from 0.00 to 9.99 FNU 0.1 FTU from 10.0 to 99.9 FNU 1 FTU from 100 to 1000 FNU	0.01 FTU from 0.00 to 9.99 FTU 0.1 FTU from 10.0 to 99.9 FTU 1 FTU from 100 to 1000 FTU	0.01 EBC from 0.00 to 9.99 EBC 0.1 EBC from 10.0 to 99.9 EBC 1 EBC from 100 to 250 EBC
Accuracy	±2% of reading plus 0.05 FNU    ±2% of reading plus 0.05 FTU    ±2% of reading plus 0.02 EBC		
Repeatability	±1% of reading or 0.02 FNU, whichever is greater	±1% of reading or 0.02 FTU, whichever is greater	±1% of reading 0.01 EBC, whichever is greater
Stray Light	< 0.1 FNU	< 0.1 FTU	< 0.03 EBC
Light Source	IR LED @ 890nm	LED @ 580nm	LED @ 650nm
Light Detector	Silicon Photocell		
Method	Ratio Nephelometric Method.		
Display	60 x 90mm backlit LCD		
Calibration	Two, three or four point calibration		
LOG Memory	200 records		
Serial Interface	RS232 or USB		
Environment	0 to 50°C (32 to 122°F); max 95% RH non-condensing		
Power Supply	4 x 1.5V AA alkaline batteries or AC adapter		
Auto Shut-off	After 15 minutes of non-use		
Dimensions	224 x 87 x 77 mm (8.8 x 3.4 x 3.0")		
Weight	512 g (18 oz.)		

**HI 847492****HI 920005 Tag holders with tags****HI 731318 Cuvet Cleaning Cloth****HI 731331 Measuring Cuvets**

## ORDERING INFORMATION

**HI 847491-01** (115V) and **HI 847491-02** (230V) are supplied with HI 98501-1 Checktemp® thermometer, Checktemp® instruction manual, (6) sample cuvetts and caps, (4) calibration cuvetts (HI 847491-11), (4) 25 mL glass vials with caps, tissue for wiping the cuvetts, (4) 1.5V AA batteries, power adapter, instrument quality certificate, rigid carrying case and instruction manual.

**HI 847492-01** (115V) and **HI 847492-02** (230V) are supplied with HI 98501-1 Checktemp® thermometer, Checktemp® instruction manual, (6) sample cuvetts and caps, (4) calibration cuvetts (HI 847492-11), (4) 25 mL glass vials with caps, tissue for wiping the cuvetts, (4) 1.5V AA batteries, power adapter, instrument quality certificate, rigid carrying case and instruction manual.

**HI 847493-01** (115V) and **HI 847493-02** (230V) are supplied with (6) sample cuvetts and caps, (4) calibration cuvetts (HI 847493-11), (4) 25 mL glass vials with caps, tissue for wiping the cuvetts, (4) 1.5V AA batteries, power adapter, instrument quality certificate, rigid carrying case and instruction manual.

## ACCESSORIES

- HI 93703-58** Silicone oil (15 mL)
- HI 847491-11** Calibration cuvet kit (HI 847491)
- HI 847492-11** Calibration cuvet kit (HI 847492)
- HI 847493-11** Calibration cuvet kit (HI 847493)
- HI 731331** Glass cuvetts (4 pcs)
- HI 731335N** Caps for cuvetts (4 pcs)
- HI 93703-50** Cuvetts cleaning solution (230 mL)
- HI 731318** Cloth for wiping cuvetts (4 pcs)
- HI 740220** 25 mL glass vial with cap (2 pcs)
- HI 740231** Replacement LED for haze turbidimeter (HI 847491)
- HI 740232** Replacement LED for haze turbidimeter (HI 847492)
- HI 740233** Replacement LED for haze turbidimeter (HI 847493)
- HI 92000** Windows® compatible software
- HI 920011** RS232 connection cable
- HI 920005** 5 tag holders with tags
- HI 740027P** 1.5V AA battery (12 pcs)
- HI 710005** Voltage adapter, 115V to 12VDC (US)
- HI 710006** Voltage adapter, 230V to 12VDC (EU)