

# DewTrace

## High Precision, Fast, Low Dew/Frost Point Chilled Mirror Hygrometer

The DewTrace is a high precision, bench top, laboratory standard dew/frost point hygrometer capable of measuring very low frost points using the primary method chilled mirror measurement technique. It incorporates novel ice nucleation technology to reach low frost points in minutes, giving it superior performance over a wide dynamic range from ambient to trace moisture concentration levels.

The DewTrace is based on the proven Edgetech Instruments DewMaster platform configured with the X3 chilled mirror sensor. It is primarily designed to measure trace moisture in gas streams to  $-85^{\circ}\text{C}$  frost point or lower, but can be configured to measure ambient levels of moisture to 95% RH. Combining the X3 stainless steel sensor with an ice nucleation feature makes the DewTrace extremely fast to reach and stabilize at very low frost points.

The DewTrace can operate as a multi-range trace moisture analyzer that accurately measures from high levels of moisture concentrations to very low, trace concentrations. It is ideal for measurement that begins in ambient air and is then purged to very low moisture levels. A built-in heater that dries the sensor for fast dewpoint dry-down, also allows high temperature dewpoint measurement by elevating the sensor mirror temperature to above the dewpoint temperature. The Edgetech Instruments chilled mirror sensor is not compromised by exposure to high levels of moisture. No isolation or other precautions are required for the DewTrace to operate over its entire range.

A unique feature of the DewTrace is a self compensated, LED based, sensor optical system combined with Automatic Balance Control for auto-calibration. Together with the very robust X3 chilled mirror sensor, the ability to easily clean the mirror, Bluetooth wireless communication and data logging options, plus the capability of measuring from low to high concentrations of moisture, the DewTrace offers a set of available features not found in other moisture measurement devices even at higher prices.

**Applications include:** Primary method, NIST traceable measurement in metrology and calibration labs, semiconductor production monitoring, scientific study, pharmaceutical quality test labs, glove box environments, aeronautics, high purity welding, environmental chambers, wind tunnels, and many more.

**The Analyzer Console:** The analyzer console provides the human interface and signal interface. It features a full function display and keypad along with terminal block interface for I/O.

**The Sensor Module:** The DewTrace implements a unique sample handling system consisting of the X3 precision chilled mirror sensor, a nucleation system, a sensor heater, a chilled liquid heat exchanger, a pressure transducer, a temperature sensor and a flow switch. Remotely mounted sensor options are available.

**The X3 Sensor:** The X3 Sensor is chemically resistant to eliminate sensor failures when measuring dew/frost point in aggressive background gases. Its chamber design and high efficiency heat exchanger result in the ability to measure very low dew points rapidly.



### The DewTrace Hygrometer With Nucleation System

**The Nucleation System:** When the DewTrace senses a delay in acquiring frost on the mirror, its nucleation system injects a pulse of partially dried air into the sample gas. This “seeds” the mirror surface with microscopic ice crystals. When successful ice nucleation is detected, the nucleation system is isolated from the sample stream. This process greatly accelerates acquisition of final frost formation.

**Automatic Balance Control (ABC):** Automatically corrects for most mirror contaminants and re-standardizes the instrument. ABC may be initiated manually or at preset intervals.

**Pressure and Temperature Sensors:** The pressure of the sample gas at the sensor is measured using a pressure transducer for calculation of parts per million water vapor by volume. Similarly, the temperature is measured using a temperature sensor for relative humidity calculations.



 **Edgetech Instruments**

ISO/IEC 17025:2017 Accredited  
ISO 9001:2015 Registered

## Technical Specifications

### Sensor:

X3LC: Liquid Cooled. Frost point range -75 to 95°C, depression 100°C with 0 to 20°C secondary cooling.  
Frost point range -85 to 95°C, depression 110°C with -20 to 0°C cryogenic secondary cooling.

### Sensor Materials:

Wetted parts: chromium, glass, epoxy, 316 stainless steel. Non-wetted parts: steel, Delrin.

### Accuracy, All Sensors:

±0.2°C (0.36°F) dew/frost point standard  
±0.1°C (0.18°F) dew/frost point optional  
±0.5% of full scale pressure

### Display Resolution:

0.1°C or °F  
0.01 psia  
0.1 ppm<sub>v</sub> below 1000 ppm<sub>v</sub>  
1 ppm<sub>v</sub> above 1000 ppm<sub>v</sub>

### Weight:

27 lbs. (12.5 kg)

### Dimensions:

11 in. W x 11.5 in. H x 21 in. D  
(28 mm W x 29 mm H x 54 mm D)

### Mounting:

Bench-top

### Power Requirements:

90 to 230 Vac ±10%, 50 to 400Hz

### Operating Temperature:

Control Unit: -10 to 60°C (15 to 140°F)  
Sensors: -40 to 100°C (-40 to 212°F)

### Auxiliary Coolant:

To augment temperature depression capability of sensor when necessary:

Water (or other liquid): 0.5 gal/min (2 l/min) at 100 psia maximum. Contact Edgetech Instruments for availability of auxiliary cooling systems.

### Sample Flow Rate:

0.5/5.0 SCFH (0.25 to 2.4 l/min)



**The DewTrace Hygrometer**  
Keyboard and display are positioned  
for easy benchtop use.

### Outputs (Multiple outputs available):

4 to 20 mA, 0 to 5 Vdc, RS-232,  
Bluetooth and datalogging options available.

### Track or Hold:

Outputs (analog and digital) and alarms can be set to track or hold while in Automatic Balance Control or programming mode (-148 to 212°F) from keyboard or via RS-232. Alarms can be latched or unlatched.

### Alarms:

Two Form C, SPDT alarm relays rated for 3 A at 24 Vdc, 120 Vac. Alarm mode (high or low) programmable from keyboard or RS-232. Alarm set points programmable from -99.9 to 99.9°C.

### Display:

8 line LCD graphic data display, backlight  
3 parameters display simultaneously.



**Made in USA**



**Edgetech Instruments**

ISO/IEC 17025:2017 Accredited  
ISO 9001:2015 Registered

Toll Free: 800-276-3729 Ph: 978-310-7760 Fax: 978-310-7767

E-mail: [CustomerFirst@edgetechinstruments.com](mailto:CustomerFirst@edgetechinstruments.com)

Web: [www.edgetechinstruments.com](http://www.edgetechinstruments.com)

Rev. v10