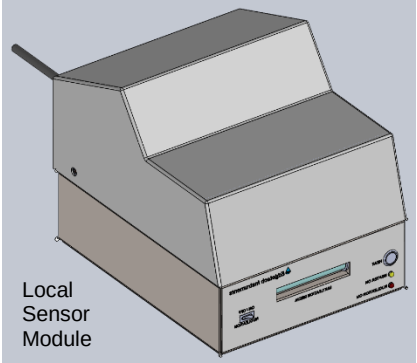
Edgetech Instruments

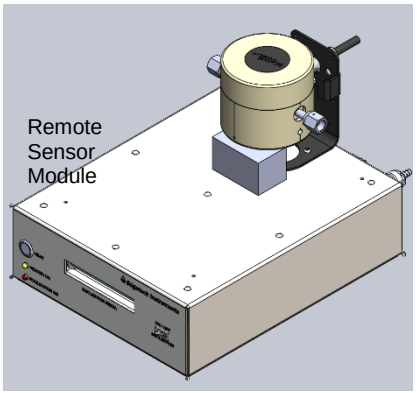
2018 PRICE LIST
Rev 4 December 13, 2017

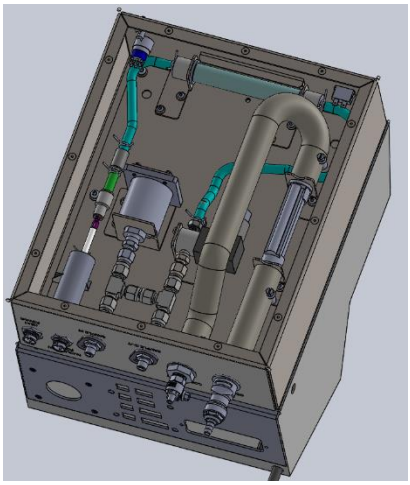
DewTrace – Trace Moisture w/ Wide Range Hygrometer

APPLICATION: The ***DewTrace*** is a precision hygrometer designed to measure very low dewpoint using the chilled mirror primary measurement technique. To express Low Dew points as trace moisture in units of PPMv, the DewTrace also includes a precision pressure transducer. Pressure and DewPoint are used to calculate PPMv. Being able to measure dynamic environments that traverse from ambient level moisture concentrations to very low, the DewTrace lends itself to many unique applications. For example, some glove box applications begin in ambient level moisture and then are purged down to low dew point. Users want to monitor this transition. In a similar manner, the DewTrace can be configured to include a precision temperature sensor for converting DewPoint temperature into RH%. Having such a wide range of measurement capabilities is a unique feature of the DewTrace. Other applications include Primary Standard Measurements in metrology labs, calibration labs, semicon process, scientific study, pharmaceutical quality test labs, process control, aeronautics, high purity welding, environmental chambers, wind tunnels, and many more.



DESCRIPTION: The **DewTrace** is based on the DewMaster platform but is configured with the X3CC precision chilled mirror sensor. It is primarily designed to measure very low dew point gas streams- down to -95C dewpoint or lower but can be configured to also measure up to ambient air levels of moisture (up to 95% RH). As a standard feature, the DewTrace also includes a pressure transducer so that moisture content can also be expressed in absolute terms of PPMv (trace moisture). The chilled mirror technique of measuring dew point is a primary method and offers absolute accuracy. Another unique feature of the DewTrace is the ABC function which serves as an auto-calibration. Combined with a very long life (10+ years), ability to clean the mirror in the field, and the capability to measure from low to high concentrations of moisture, the X3 chilled mirror sensor in the DewTrace offers the USER a unique set of features not found in any other moisture measurement system. It is generally configured as a table top unit but is also available in rack mount, panel mount and NEMA4. Please inquire for non-table top configurations. The X3CC sensor requires liquid cooling and thus the USER must include a chiller system to provide a flow of cold liquid (down to -20C). Edgetech Instruments offers a line of chillers for those customers not currently equipped with one. The X3 sensors include a sensor module that conditions and controls the sample gas/ cold liquid before input to the sensor. The special configurations of the sensor module and the DewTrace system are mentioned





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below. You can select local or remote sensor, mirror types for chemical compatibility concerns, pressure ranges, and several interface options and accessories.

STANDARD FEATURES:

The Sensor Module: To measure low moisture concentrations accurately and efficiently, the DewTrace requires the use of an external chiller to remove heat from the TEC stack on the chilled mirror. Additionally, the DewTrace implements a unique sample handling system. It consists of 5 main sub-systems:

- X3CC Precision Chilled Mirror Sensor
- Nucleation System
- Sensor Heater
- Chilled Liquid Handling System
- Pressure Transducer
- Sample flow meter and metering valve

X3CC Chilled Mirror Sensor: Features ¼ VCR metal gasket seals for measuring dry gases that can range below -60°C frost point (approx. 10 PPMv) gas. It can also be used for high levels of moisture (may require adjustment of the chiller temperature and mirror control) Please inquire for other type sample fittings. In addition to their ability to measure very low concentrations of moisture, the X3CC sensor also offers the ability to measure moisture concentrations in chemically aggressive background gases. It also has a fast response time in comparison to traditional chilled mirror sensors. The X3 family features 3 stage TECs. The X3CC features ¼ inch VCR inlet/ outlet ports. The X3 also feature flip top easy access lids protected by screw top caps. This allows easy and un-obstructed access to clean the mirrors. The X3CC requires liquid cooling to remove heat from the TEC stack. A customer supplied refrigerated chiller that can generate chilled liquid temperatures down to -20°C or lower is required to make effective use of the X3 sensor. Edgetech Instruments also offers a series of chillers for purchase.

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. Other features include:

BTDAQ Converts Serial output from DewTrace to Bluetooth and captures the data into an EXCEL spreadsheet on Windows 7,8 or 10 based System. Requires Customer supplied EXCEl loaded onto PC. PC must include 2 available USB Ports. Wireless BT antenna is mounted on DewTrace chassis.

BTDAQ Kit Includes:

- Serial to Bluetooth Adapter w/ Antenna: mounted within DewTrace
- Bluetooth to USB dongles for customer PC
- USB Memory stik w/ ETI Install software
- Installation/ Operation Manual

Automatic Balance Control (ABC) Automatically corrects for most mirror contaminants. Automatically re-standardizes the instrument. You choose time and interval of re-standardization.

Dual alarm capability User programmable. Can be set for latching or auto-reset mode. Form C.

Analog outputs. 0-5 VDC, 4-20 mA, 0-10 VDC, or 0-20mA User scalable to drive peripheral devices. Available simultaneously, one output per measurement parameter. Scalable throughout the entire operating range of psychrometric variables. Program via front panel or remote serial port.

Full Function 8 Line LCD Display: Graphic data, backlight, 3 parameters simultaneously displayed

Sensor Module Configuration Choices:

Remote or Local Sensor Module: The DewTrace is configured for positive pressure sample input gas. Sample gas is extracted from the measured process point and directed to the sensor module. The sensor module is a separate chassis that can be affixed directly to the bottom of the DewTrace analyzer module or mounted remote. In the remote configuration, the module is connected to the DewTrace module via a signal umbilical cable. The cable end at the sensor connection features quick connect electrical fittings. The remote module allows mounting close to the sample take-off.

Choosing mirror type The X3 chilled mirror platform is constructed of 316 SS and features a flip top access lid for easy access to cleaning the optics. The mirror comes standard with chrome finish but can be configured as stainless steel or platinum depending on the application requirements. See the compatibility table.

X3- Sensor Module:

Nucleation System: At very low moisture concentrations, it may take several hours for ice crystals to form on the chilled mirror surface, thus delaying timely measurements. To speed up the process of forming a dew or frost on the mirror in very dry gas atmospheres, the DewTrace implements an ice nucleation system. This system consists of a pump, precision dryer tube, check valve and solenoid valve. When the DewTrace senses a delay in acquiring a dew (frost) on the mirror in dry atmospheres, the pump sends room air through the precision dryer tube that reduces the air moisture to just a couple of PPM. The solenoid valve energizes and injects a pulse of the slightly moist air into the sample gas. This “seeds” the mirror surface by allowing some microscopic ice crystals to nucleate. When successful nucleation is detected, the solenoid valve de-energizes and the nucleation system is once again isolated from the sample stream to the sensor. This process speeds up acquisition of the final dew formation in a fraction of the time.

Sensor Heater: When the system is not in use, room air moisture can migrate into the sensor. When the system is returned to measure low moisture concentrations, there may be a delay to accurate measurements because the moisture that is entrained within the sensor body must be expelled or purged. To speed this process up, the DewTrace features a sensor heater that is triggered via a manually controlled switch. When starting the DewTrace, it is recommended to engage the sensor heater while admitting a dry gas through the sensor. The heating of the sensor helps free moisture molecules from the sensor surfaces so that the dry gas can sweep it away quickly and effectively. The X3 sensor itself is shut off from power when the sensor heater is switched ON and the liquid chiller should be turned off during this 1-2 minute heat expulsion of entrained moisture.

Chilled Liquid Handling System: The X3CC requires external liquid cooling of the sensor. If chilled liquid is not flowing through the X3 sensor during normal operation, the TECs can be damaged. To prevent damage, a liquid flow switch is mounted within the chilled liquid flow through the sensor heat exchanger. Typical operation requires 5 LPM of chilled liquid flow through the X3 heat exchanger ports. If insufficient flow is detected, the X3 sensor is automatically shut down and an error message is shown on the DewTrace display. The sensor will not operate until normal chilled liquid flow is restored.

Pressure Transducer: To convert the measured dew point (FP) into PPMv units of trace moisture concentration, the pressure of the sample gas at the sensor is measured using a pressure transducer. You must select the range of pressure measurement. **The DewTrace can operate as a multi-range trace moisture analyzer that accurately measures high level of moisture concentrations (ambient) down to very low trace (sub-PPM). Great for processes that begin in ambient air and then get purged to very low trace levels of moisture. The Edgetech Chilled Mirror is not compromised by exposure to high levels of moisture. No special isolation valve system is required. See the manual for settings in the DewTrace to measure high moisture levels.**

Sensor Module Connections: The sensor module can be mounted to the bottom of the DewTrace analyzer display unit or can be mounted remote.

- Sensor Signal Interface Cable: The remote configuration features a 10' (3m) cable that connects the sensor module to the DewTrace. When configured as remote, the maximum cable length is fixed to 10' (3m). A quick electrical connection is made on the cable at both the sensor module and at the DewTrace. For local mount, the electrical connections are factory made.
- Sensor Heater Power Input
- Nucleation system power input
- Chilled Liquid Port Connections (inlet/outlet): positive, valved, quick connect fittings are provided for the input of cooling liquid from the external chiller to the sensor module and return to the chiller. 3/8 Tube.
- Sample Inlet/ Outlet Ports: The ports are ¼ inch VCR metal gasket. (gaskets are included).

The **DewTrace** comes complete with a full function display showing measured parameters, optics performance, and operational status/ alarm information. Functionally, the DewTrace provides Automatic Balance Cycle (ABC), Programmable Balance Cycle (PABC), Manual Balance Cycle (MABC), real time clock w/date, measurements in C or F, scalable voltage and current outputs, RS232, two programmable alarms, Control Servo for Mirror temperature overrides (Heat and Cool), One year warranty and instruction manual. Optional temperature probe is available for %RH measurements and air temperature measurement. ***Chilled Mirror sensor selection is required.**

The Standard DewTrace sensor module includes the X3CC sensor, Ports for chilled liquid, chilled liquid flow sensor, Nucleation system (vacuum pump, metered desiccant tube, solenoid valve, inline check valve), sensor heater for moisture expulsion upon startup, and power switches.

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TO ORDER THE DewTrace:

a. Determine type of measurement: DewPoint, PPMv, Relative Humidity, Pressure, Temperature. The AT temperature probe is required for Relative Humidity.
b. Your application determines whether to select local mounted sensor or remote
c. We need to know the country to be used so that we provide the proper power cord

1. Select Sensor Type- X3CC remote or local mount
2. Select Mirror Type: Chrome (standard), Stainless Steel (enhanced),Platinum (maximum) chemical resistance
3. Select Options such as temperature sensor for RH%
4. Identify Country for power cord configuration
5. List as separate line items additional choices such as Accessories, Calibration Packages, and Ext Warranty.

DTRACE-L- [ ] - [ ] - [ ] **Local Sensor**

$18,885 Mirror Type Options Country

DTRACE-R- [ ] - [ ] - [ ] **Remote Sensor**

$19,995 Mirror Type Options Country

Example 1: DTRACE-L-STD is a DewTrace with local mounted sensor module and standard (chrome) mirror
$18,885 + $0 = $18,885

Example 2: DTRACE-R-MAX is a DewTrace with remote mounted sensor module & max resistance (platinum) mirror
$19,995 + $440 = $20,435

Notes:

1. The DewTrace offers many features that allow the User to understand how the Chilled Mirror Sensor is operating. These include the ability to program an ABC or manually force maximum heating or cooling of the TEC.
2. The X3 body is constructed of 316SS and may be used in many aggressive background gases.
3. The X3CC sensor is designed as liquid cooled and requires connection to external chiller system
4. For Oxygen service, please inquire to the factory. It requires the X3 sensor configured and cleaned for O2 service.
5. Standard DewTrace is not rated for use in Hazardous areas.
6. The Sensor Heater Function is used to dry down the sensor upon start-up after exposure to ambient level of moisture. It disengages the TEC operation on the X3 sensor to prevent over heating the TECs. It is enabled by a manual switch. If the switch is left on while trying to measure with the DewTrace, the sensor will never acquire dew point.
7. The Sensor Nucleation system injects a small amount of moisture into the chilled mirror sensor when the system has failed to form ice crystals on the mirror when measuring very dry gases (dryer than -65C dew point). This is automatic and can re-energize whenever there is a problem acquiring dew point. If the chiller cannot deliver sufficiently cold liquid to the sensor heat exchanger, the DewTrace may continue to "hunt for the dew point".
8. The maximum length of sensor signal cable is 10' (3m) in the remote sensor configuration.

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STEP 1: SELECT SENSOR MIRROR, add $ this to the price configuration:

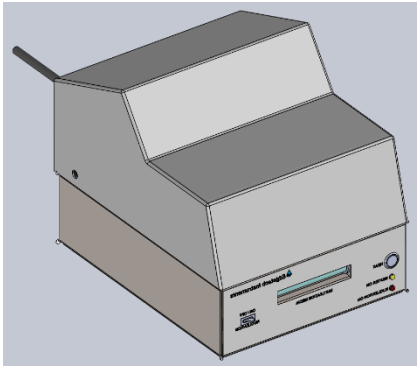
X-Type, Chemical Resistant, High Performance			Choose Mirror		
	Description	Depression	STD	ENH	MAX
X3CC	3 Stage, SS Body, High Efficiency- Liquid Cooled, 1/4T VCR Gasket	120C	$0	$200	$440

Applications CM Configuration	General Purpose Gases	Acids	Caustics	Salts	Organics	Nuclear Application	High Temperature
STD: Standard Chrome	A	D	D	C	C	D	C
ENH: Enhanced SS	A	B	B	B	B	C	B
MAX: Maximum Platinum	A	A	A	A	A	A	A

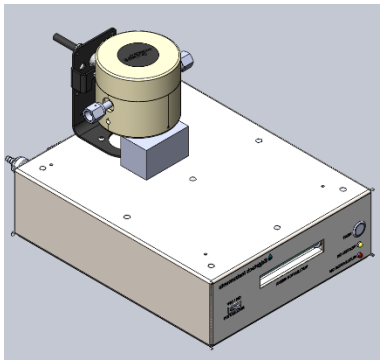
A	Excellent
B	Very Good
C	Good
D	Not recommended

STEP 2: SELECT REMOTE or LOCAL SENSOR MODULE:

-LOCAL	Local Mounted Sensor Module (at DewTrace Chassis)	**$18,885**
-REMOTE	Remote mounted sensor control module (X3 sensor and sample system) Includes sensor interface cable 10' (3m)	**$19,995**



DewTrace-L- Local Sensor
$18,885



DewTrace-R- Remote Sensor Module
$19,995

STEP 3: Choose OPTIONS:

-ATDM	Air temperature probe, stainless steel sheath with 10ft cable and connector (add $5/ft for additional)	**$ 231.00**
-SA/.1	0.1°C Special accuracy, traceable to NIST (Certified)	**$ 660.00**
-SA/.15	0.15°C Special accuracy, traceable to NIST (Certified)	**$ 550.00**

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LIST ACCESSORIES/ SPARE PARTS/ SPECIAL SERVICES AS SEPARATE LINE ITEMS:

MODEL 601
Low Temp Chiller
-15°C Chill Capacity
$6,583.50

MODEL TEC-300
TEC Chiller
-10°C Chill Capacity
$3,360.00

Insulated Hose Kit for Chiller: $175.00

CASE 1690

511 SS Tag	STAINLESS STEEL IDENTIFICATION TAG, can be riveted or wire connected to the instrument, CUSTOM ETCHED PER CUSTOMER REQUIREMENTS 1" High x 2" Wide x 16 gage SS Tag, Laser Etched, ¼ inch lettering, 3 lines Advanced Graphic Engraving (includes 2)	**$ 125.00**
CASE1690	Foam lined transportation case specified to protect instrumentation during shipping, tabletop version	**$ 750.00**
SFVCR	SS Sintered Filter inline filter adapts to sample inlet port, rated for 5 micron particulate	**$ 450.00**
VCRE	Filter Element Kit, Qty 3	**$ 83.00**
SMU	Sample Module Universal, 115/230 VAC operation	**$ 770.00**

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Extended Warranty/Calibration Options: Please list as separate line items:

3EXTW	3 Year Extended Warranty includes repairs covered in the warranty statement	**10% of TOTAL PRICE**
3YNIST1P	3 NIST Traceable Calibrations for the price of 2 (1 Parameter)	**$ 1,210.00**
3YNIST2P	3 NIST Traceable Calibrations for the price of 2 (2 Parameters)	**$ 1,430.00**

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