PDM75-X3SF Application Note

Edgetech Instruments

The PDM-75 (Portable DewMaster) Chilled Mirror Hygrometer

The Model PDM75 is an acronym for “Portable DewMaster”. It is a portable, multi-function, optical chilled mirror hygrometer designed to accurately measure the moisture content in gases. It offers precision dew point measurement in a robust, transportable carrying case. The PDM-75 uses the chilled mirror dew point temperature condensation principle to determine the water vapor concentration in gas mixtures and a precision platinum resistance thermometer to measure the mirror temperature. The chilled mirror uses a thermo-electric device to control the temperature of the mirror in determining dew or frost point. It is a direct measurement of dew or frost point and thus a primary method technique.

The PDM-75 is highly regarded by calibration technicians and manufacturing facilities for its portability, accuracy, quick dry down, fast response in detecting upset conditions and long-life characteristics.

The PDM75 may be fitted with a precision gas temperature sensor (needed to determine relative humidity), pressure transducer, and a high efficiency chilled mirror dew/frost point sensor.

The PDM75-X3SF uses the X3SF high efficiency chilled mirror sensor to determine the dew/frost temperature of a flowing gas sample over a very wide range. See the PDM75-X3SF data sheet for measurement range and other specifications.

The PDM75-X3SF may be used in a wide array of applications including monitoring ambient air, glove boxes, HVAC ducts, environmental test chambers, circulation pipes, refrigerated storage rooms and engine test filter rooms.

Applications

Dryer Systems
Diffusion Furnaces
Product Drying Chambers
Environmental Testing
Food Packaging
Medical Packaging
Heat Treating/ Annealing Ovens
Chemical Reactors
Data Center Air Makeup
Fuel Cell Testing
Compressed Air Systems
Pharmaceutical Powder Drying

The PDM-75 offers many standard features including:

- Primary method measurement via the chilled mirror measurement technique
- ISO/IEC 17025 certification with NIST calibration traceability certificate
- Automatic Balance Control (ABC) automatically re-standardizes and corrects for contaminants
- Programmable Balance Control: ABC at programmed intervals or MABC (Manual ABC)
- Real time clock with date
- Two selectable analog outputs (4-20 mA, 0-20 mA, 0-5 Vdc, 0-10 Vdc scalable)
- RS-232 Serial Interface
- Two programmable electrically isolated alarm relays
- Integral flowmeter for control and viewing sample flow
- Universal Vac power input

Benefits of the Edgetech Instruments PDM-75:

- Portable unit for troubleshooting and making remote measurements with high accuracy
- The chilled mirror sensor is a direct, primary method measurement method, NIST traceable
- Improving quality control with high precision, stabile measurements
- Reducing maintenance costs: the sensor is robust with no routine recalibration needed
- Rapid dry-down time in comparison to other technologies
- Eliminating scrap or lost time with fast response when responding to upset process conditions

To Prepare the PDM 75 for Operation:

1. Connect the PDM 75 to a source of AC Power.
2. If the Remote Mounting Kit was ordered, connect Dew Point Sensor Cable between the Instrument and the dew point sensor.
3. Connect air temperature sensor (if supplied) to the proper connector.
4. Install optional pressure sensor if required.
5. Wire analog outputs and alarm relay connections as needed.
6. Connect serial port if needed.
7. Install sampling system to dew point sensor ports as needed.
8. Set power switch to ON position.
9. Wait for equilibration and SERVOLOCK indication on display.

Reprogramming a Setting:

1. Press ENT on Keypad to enter selection menu.
2. Using the UP and DOWN and LEFT and RIGHT arrow keys, scroll to the desired location of the parameter to be changed.
3. Press ENT again to begin changing the setting.
The selected parameter will flash.
Use left and right Arrow keys as required to scroll to the location of the digit to be changed.
Use the numerical keypad to input the change.
4. When programming is completed, press ENT to accept the new setting and ESC to exit the menu.
The KEEP CHANGES? screen will appear. Press ENT to lock in the change, or ESC to discard the change and return to the previously programmed value.

Sensor Mirror Cleaning:

The Automatic Balance Cycle (ABC) greatly minimizes cleaning requirements of the internal chilled mirror sensor. Contaminants in the air will gradually build up on the mirror, to the point where manual cleaning is eventually required. Periods of 90 days between cleanings are typical, depending on the air source. An indication of CLEAN MIRROR on the Display, after an ABC Cycle, will tell the user when cleaning is needed. Use cotton swabs and isopropyl alcohol for mirror cleaning.

Filter Element Replacement:

If a sampling system is used with the PDM75, mirror cleaning can be minimized by using an in-line air filter in the system. Depending upon the quantity of contaminants in the incoming air, the air filter element may have to be replaced after a substantial period of operation. Remove the air filter cover, replace the filter with a new one, and reassemble.

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