

DP-1

Chilled Mirror Dew Point Meter



The DP-1 is new generation of high-speed chilled mirror dew-point meters for repeatable, fast and accurate moisture content measurements at high temperature and low dew point in the field.

- Chilled Mirror
- Especially designed for high temperature and low dew point measurement
- Four-Stage Peltier Thermoelectric ($\Delta T=107^{\circ}\text{C}$)
- Cooling Technology: Heat Being Dissipated through Heat Pipe
- Only takes 3-5 minutes to complete a high-precision and accurate humidity measurement

Features

- Software filter Technology
- Anti-supercooled water Technology
- Anti-SF6 Gas Liquefaction Technology
- Intelligent Response System
- Fuzzy Control Technology
- Heat Transfer Medium: Soft Metal (Instead of Thermo Grease)
- Unique Heat Dissipation Technology
- Automatic Measurement
- Dew point/humidity direct reading
- Thermal Printer
- Battery powered

Applications

- Dew point in natural gas processing and pipelines
- Monitoring of desiccant dryers for compressed air or plastic moulding equipment
- Moisture measurement in high-voltage switchgear quench gas
- Moisture measurement in petrochemical refineries
- Industrial gas production and transportation
- Medical gas quality



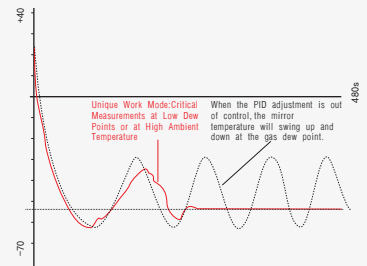
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High temperature and low dew point measurement mode

It is specially designed for the measurement of dew point below -50°C in high temperature environment above 40°C .

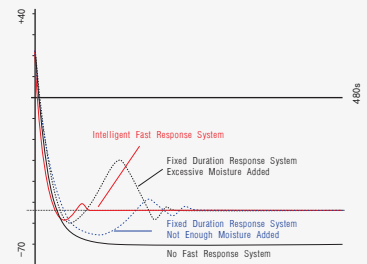
The feature of this mode is to use the software to control the mirror frost layer in the process of the frost thinning. Thus lower dew points get the results in a shorter time and effectively solving the problem that low dew point cannot be measured in high temperature environment.



Intelligent Response System

This system continuously monitors the frost thickness of mirror and its changing rate through the variation of light energy, consequently calculating the moisture content in the penetration tube.

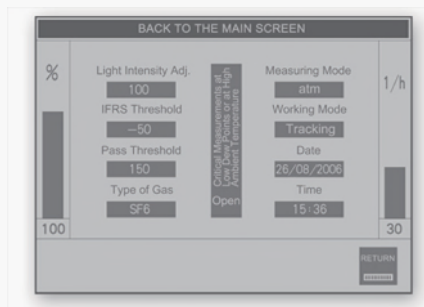
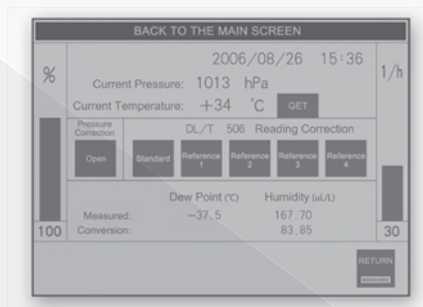
The frost layer of the mirror quickly established to a "specific thickness" to overcome the influence of environmental humidity on the humidification effect, so that the establishment of a "specific thickness" frost layer time from a few minutes or even tens of minutes shortened to a few seconds.



Humidity calibration based on ambient temperature and measured pressure

★ DP-1 has built-in China Electric Power Industry standard DL/T 506-2007, using a micro sensor to correct the dew point value measured at different temperatures to the value at standard condition 20°C .

★ DP-1 has an internal micro pressure sensor. Because the pressure in the dew point chamber is the fundamental influence of the measurement results, So the micro pressure sensor can make sure the test results are more accurate.



Four-Stage Peltier Thermoelectric Cooler, Soft Metal and Heat Pipe combined Technology

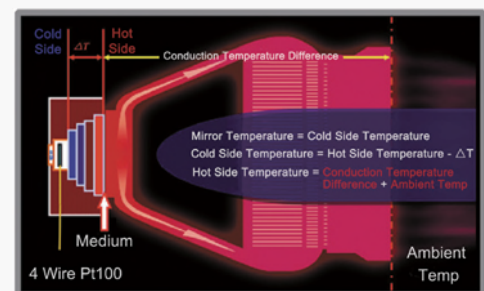
DP-1 uses a four-stage enhanced Peltier Thermoelectric Cooler (TEC) with a theoretical temperature difference of 107°C between the 'hot' side of the TEC and the 'cold' side of the TEC and with strong cooling, which makes it possible to measure lower dew points in high temperature environments.

The heat conduction efficiency of heat pipe dissipation is tens of times even hundreds of times higher than ordinary pure copper.

The soft metal can make the heat pipe and the 'hot' side of the TEC tightly and seamlessly connected, and its thermal conductivity is nearly 30 times of thermal grease.

The application of the combined technology prevents heat accumulation at the 'hot' side of the TEC, and exerts the extreme cooling capacity of the TEC, which is not only shortens the time of the system to cooling temperature close to the dew point or even lower than that, but also allows the product to obtain a wider measurement range in a wider temperature environment.

So DP-1 has more advantages when measuring the dew point in high temperature.



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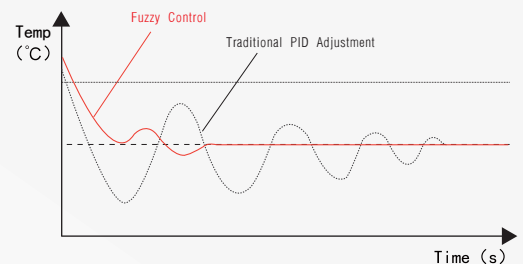
Gas Sampling Pipeline Self-sealing Design

In order to effectively shorten the drying time of the gas circuit for the next measurement, DP-1 has made a rapid sealing design for the gas circuit, which can quickly seal the relatively dry sample gas in the internal gas circuit and external sampling pipeline of the DP-1.

Advanced control system

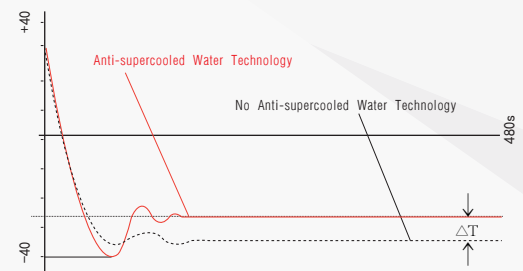
★ A high-speed computing digital control processing platform based on DSP (digital signal processor), combined with optimized fuzzy control algorithms and software filtering technology, makes the measurement faster and more accurate.

★ When the traditional PID adjustment is out of control, the mirror temperature will oscillate at the gas dew point. The use of DSP-based fuzzy control technology eliminates the temperature oscillations and greatly shortens the stabilization time of the measurement system.



Anti-supercooled Water Technology

It is possible for moisture to exist as a liquid at temperatures down to -40°C . The difference in condensation temperature between water and ice can be 10% of the reading. Anti-supercooled Water Technology determines whether the dew-point of the sample is in the temperature zone where supercooled water can exist. It will refrigerate to -40°C to ensure the formation of mirror frost layer, effectively prevent the measurement error caused by the supercooled water.

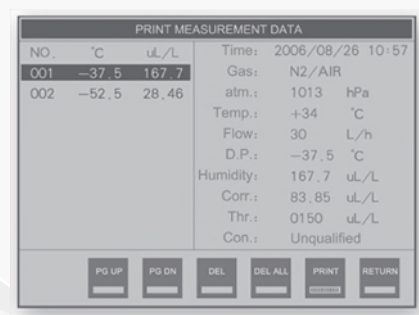
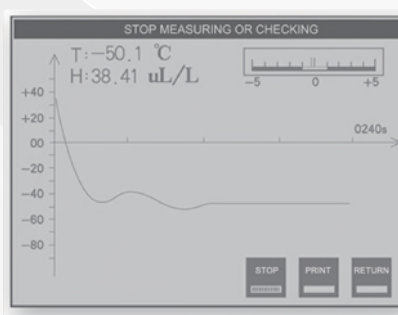
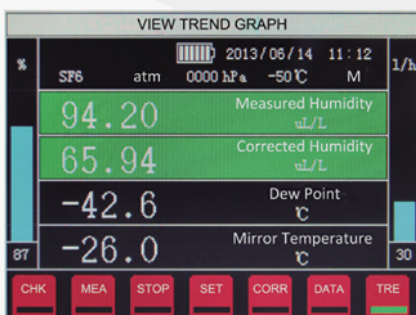


Process monitoring

The real-time trend chart tracks the temperature change of the mirror surface during the stable process of measurement, and the humidity value is automatically displayed when the mirror surface is controlled to reach the same rate of condensation and evaporation. This makes the measurement process clearly visible and convenient to read the measurement results in time.

Touch screen

LCD touch screen, with rotary photoelectric encoder, intuitive and quick operation.



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Technology	DP-1
Unique Work Mode Suitable for critical measurements at low dew points or at high ambient temperature	✓
Unique Heat Transfer Technology	✓
Fast Response System	Intelligent Response System
Fuzzy Control Technology	✓(Based on DSP)
Software Filter	✓
Anti-supercooled Water Technology	✓
Anti-SF6 Gas Liquefaction Technology	✓
-60°Cto ±20°C dp (10 - 24,000ppmV) Reading is corrected to 20°C	✓
-60°Cto ±20°C dp (10 - 24,000ppmV) Reading is corrected to 1 atm	✓
Sample Gas Circuit Self-sealing Design	✓
Function	
Operation Mode	Automatic/Manual/Tracking Mode
Measurement Data Types	Ambient Temperature, Atmosphere/Equipment Pressure, Dew Point, Humidity, Density
Direct Reading of Dew Point and Humidity Values	✓
Monitoring during Measurement	✓
Automatically Save Data in case of unexpected power failure	✓
Silently Print Data and Trend Graph Fast	✓
Upgrade Software Via USB Memory Stick	✓
Low Sample Flow Warning	✓
Excessive Sample Flow Warning	✓
Low Light Intensity Warning	✓
End of Measurement Warning in Automatic mode	✓
System Language	English
Configuration	
High-speed Data Processing System based on DSP	✓
Four-Stage Peltier Thermoelectric Cooler[$\Delta T=107^{\circ}\text{C}$]	✓
Heat Dissipation through Heat Pipe System	✓
Heat Transfer Medium: Soft Metal (instead of Thermal Grease)	✓
Human Machine Interface	3.8 ColorLCDwithTouchscreen and Rotary Photoelectric Encoder
HD Screen	Optional
Electronic Mass Flow Meter	✓
Flash Memory	✓
Data Storage Capacity	100 Records
Printer	Thermal
Powered by Batteries	Optional
Dew-Point Sensor Performance	
Measurement Range	-76 dp at +10°C (Ambient Temperature) -65 dp at +20°C (Ambient Temperature) -58 dp at +35°C (Ambient Temperature) -54 dp at +45°C (Ambient Temperature)
Accuracy	±0.1°C
Repeatability	<0.1°C
Measurement Time	1.5-3 Minutes (Normal mode) 5-7 Minutes (Unique Work Mode)
Sample Flow Rate	15-60 L/H, Generally 25-30 L/H
Sample Gas Pressure	1 MPa (10 barg) max
Case Dimensions	360mm×145mm×375mm
Weight	About 10kg
Environmental Conditions	-20 to +45°C, max 90% RH

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Including:	DP-1
Main control unit	●
Four-Stage Peltier Thermoelectric Cooler [$\Delta T=107\text{ }^{\circ}\text{C}$]	●
Fixed Duration Response System	●
Software Filter	●
Anti-supercooled Water Technology	●
Anti-SF6 Gas Liquefaction Technology	●
Heat Dissipation through Heat Pipe System	●
Heat Transfer Medium: Soft Metal (instead of Thermal Grease)	●
Electronic Mass Flow Meter	●
Chilled Mirror H2O Dew Point sensor	●
Pump back components	optional
SO2 sensor-Electrochemical	●
Power adaptor	●
USB with software	●
User manual	●
Carring case	●

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