PhyMetrix®

YK-SM-1805-10

DPT-600Plus

Portable Moisture Analyzer

Read this manual before using the analyzer.
Keep the manual properly ,you can read it at any time.
Make sure you thoroughly understand the contents before installing, using, or maintaining this analyzer.

Manual

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All materials not authorized may not be redirected or for other usages.
NOTE: In order to improve product performance, the specifications of this product may change without further notice.

1 Precautions

For personal and system safety, and for optimum product performance, make sure you thoroughly understand and follow this contents.

Safety instructions
Precautions

Safety instructions

The following symbol text panels are used to classify and describe the risk, damage, and property damage levels that may be caused by ignoring signs and performing improper operations.

DANGER

Indicates that death or severe personal injury **will** result if proper precautions are not taken.

WARNING

Indicates that death or severe personal injury **may** result if proper precautions are not taken.

CAUTION

Indicates that minor personal injury can result if proper precautions are not taken.

NOTES

Indicates that property damage can result if proper precautions are not taken.

The following symbols are used to classify and describe the types of instructions that need to be followed.

	These symbols are used to warn the user that a specific action step cannot be performed.
	This symbol is used to warn the user to follow a characteristic operation step to ensure safe operating equipment.

DANGER

It may cause fire and personal injury.

- Do not allow this product to be hit by falling, or exert greater pressure on the product.
  If the environment is prone to impact, damage or distortion of the product, please stop using it immediately.
- When measuring inflammable, explosive and poisonous gases, be sure to discharge the gas to safety and proper places.
- When measuring high pressure gas (no more than 50psia), the system must decompress before connecting or removing the sample tube.

- Avoid overheating (e.g. proximity to fire, strong light source).

WARNING

It may lead to fire or electric shock.

- Please do not make any operation that may damage the charger.
  Do not continue to use the damaged charger.
  Please contact the technical support department for maintenance.
- Do not plug/pull charger plug with wet hand.
- Please do not disassemble this product.
- Do not place liquid containers or metal objects on top of this product.

- If a failure or problem occurs, stop using it immediately.
  If the following failure occurs during charging, unplug the charger plug immediately.
  Damage of this product, Smoke, No change in charge value (percentage of power).
- Regularly clean the charger plug with dust and other dirt.
  If the plug is filled with dust or other dirt and moisture, the insulation may be damaged.
- Plug the charger plug completely.
  Do not use damaged or loose ac power sockets.
- The charger is designed specifically for the device attached to it. Do not attempt to use it for other electronic devices.

CAUTION

Indicates that there is a risk of minor injury.

- Do not move the product if the charger plug is connect.
- Do not let the charger be hit.
  Do not continue to use charger after a strong impact.
  Please contact the technical support department for maintenance.

- Be sure to use the charger attached to this product.
- Do not use the non-original charger.
  (the product attached or sold separately as an attachment).

Can cause personal injury.

- Do not place this product on an uneven surface.
- Shall not be stacked.

It can lead to burns, low temperature burns, or frostbite.

- When used in hot or cold environment, keep your skin away from the product

NOTES

Indicates that there is a risk of property damage.

- Do not force the actuator knob; there is only approximately 40mm of travel.
- Do not measure gases containing contaminants and liquids, avoid corrosive gases.
- Do not allow rain to avoid extreme temperature, pressure, mechanical shock.
- The recommended temperature of the sample gas is -10~45°C.
- The gas pressure of the sample is recommended to be 10~20psia.
- The recommended flow rate of the sample gas is 4SCFH.
- Keep the product away from strong magnetic fields, The data in the product may be lost.
- If you do not use the product for a long time (one month or longer), please charge or discharge (use) the product to 50%~80% of the remaining power, store it in a cool and dry place, and charge it every three months. Electricity to supplement the self-discharge effect of the battery.

User agreement

Qualified Personnel

The product / system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of PhyMetrix products

Note the following:

⚠ **WARNING**
PhyMetrix products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by PhyMetrix. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

Trademarks

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Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

2 Basic information

This section contains the functions and basic information of DPT-600Plus

Introduction
Operation Principle
List of articles detail
Graphic Description
Key Function

Introduction

There are two types of DPT-600Plus, namely DPT-600Plus and DPT-600Plus B. DPT-600plus integrates a dew point sensor using nanometer microporous metal oxide film technology, and DPT-600Plus-B integrates a dew point sensor based on thin film polymer technology. The analyzer be used in a variety of dew point measurement applications.

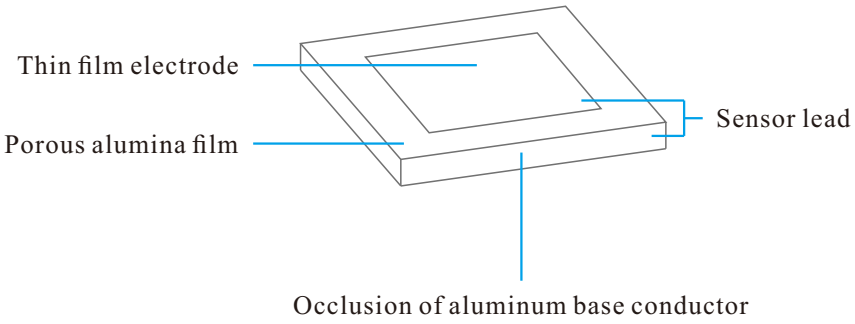
Operation Principle

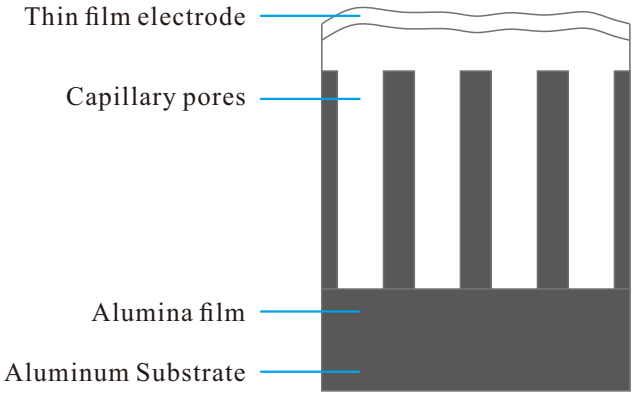
Alumina humidity sensor

The working principle of the alumina moisture sensor is based on the adsorption equilibrium of porous alumina layer to the measured gas. Its core is an absorbent layer of alumina. Alumina layer is made by special processing method, which is anodized on the surface of the plate or cylinder of pure aluminum to form porous alumina. The electrode film on the alumina layer is generally made of gold, platinum, palladium, nickel-chromium alloy, etc. The method of film formation is generally adopted by spraying or vacuum coating method. The aluminum substrate and the gilded layer form two electrodes, which are the two electrodes of the alumina capacitor.

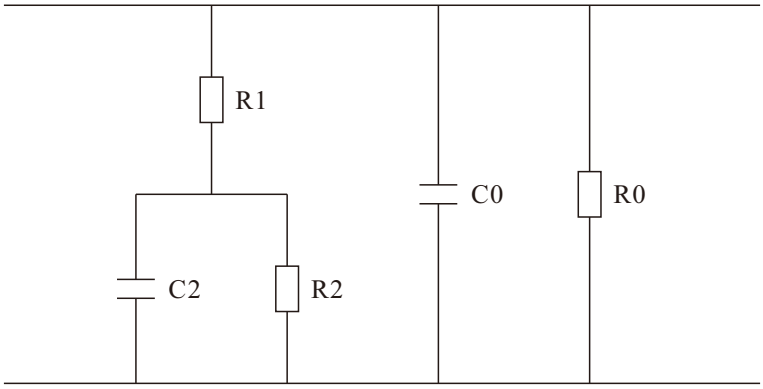
Since water is needed to pass directly through the gold electrode film into the alumina layer, the thinner the gold electrode film, the better. Thin copper wire or gold wire is used for conducting the electrode, and silver conductive paint is used to stick on the film, and the wire keeps close mechanical contact with the film. Aluminum base wire can be occluded by aluminum strip and fixed by epoxy resin. The sensor is generally in the form of sheet or rod, and different forms adopt different structures. The sensor is fixed on a base with electrical insulation and mechanical stability.

Porous aluminum oxide layer has a large specific surface area, the water vapor has a strong adsorption ability, with the development of nanotechnology, nanotechnology based on pore structure design of the sensor under the condition of the water content is very little, using the capillary action of against moisture sensor internal and external balance, both inside and outside water concentration index proportion, so even if the sensor water content changed little, the capacitance variation is enough to test.



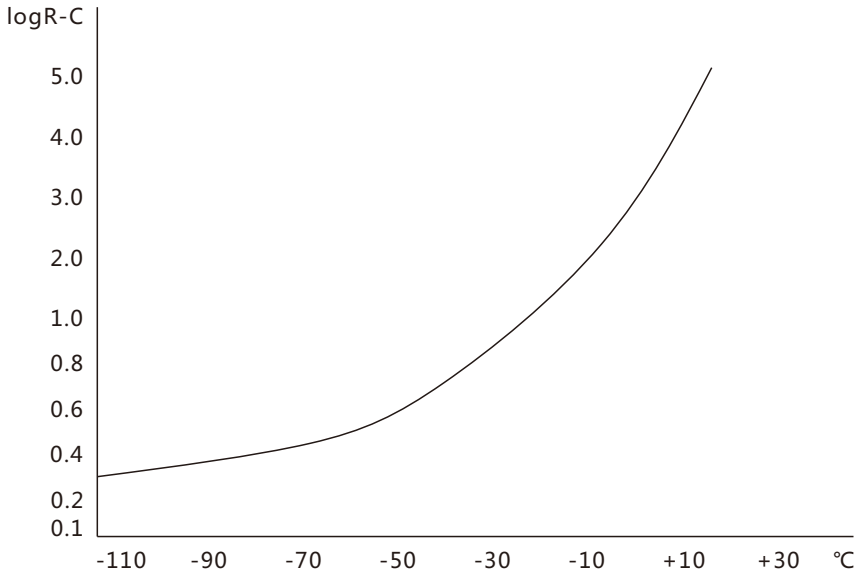


Alumina humidity sensor



Sensor equivalent circuit
R0- solid alumina resistor R2-hole resistor R1- variable resistor
C0- total oxide capacitance C2 hole capacitance

The diagram above shows the equivalent circuit of the working principle of the sensor, in which the oxide layer is divided into two parts, with the resistance R2 and capacitance C2 representing the base layer, the alumina layer containing holes being marked with R0 and C0, and the total reactance of this unit also includes the influence of the variable resistor R1, which is determined by the water content absorbed on the hole wall.



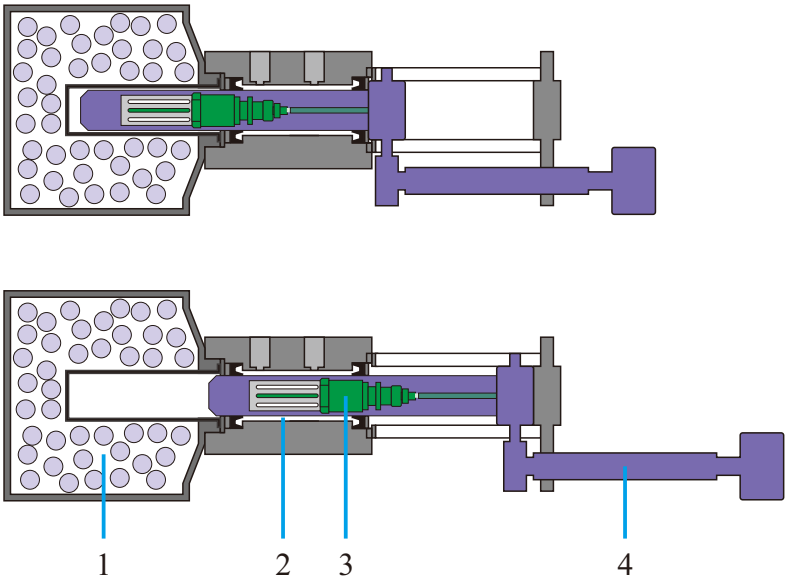
Dewpoint - signal curve

The nanopore sensor utilized in this analyzer measures the amount of water vapor molecules that have entered its pores. This amount is directly proportional to the partial wa ter vapor pressure in the gas surrounding the sensor, and the partial water vapor pressure is dependant on the water vapor content of the gas and the total pressure of the gas. Thus to compute the water vapor content of the gas under measurement the analyzer has to “know” the total pressure of the gas.

NOTE: If the analyzer was purchased with the pressure sensor option then the total pressure is measured and utilized by the analyzer, if there is no built-in pressure sensor then the user should enter the total pressure into the analyzer, this can be easily done by entering atmospheric pressure (the analyzer default setting) and measuring at atmospheric pressure by allowing the outlet (exhaust) port to vent without restrictions.

Sampling Mechanism Operating Principle

The analyzer is equipped with a built-in sampling system which has the required tight seals to measure low moisture content while also allowing the sensor to move seamlessly between the desiccant chamber and the sampling chamber. The gas under measurement is exposed only to the stainless steel walls and Teflon seals of the sampling system. When not being used, with a simple push of the actuator knob the sensor can be stored in the desiccant chamber and kept at moisture levels well below 1 part per million.



1	Desiccant Chamber
2	Sample Cell
3	Sensor Actuator
4	Handle

NOTE: This method of performing spot measurements by a portable analyzer allows the user to perform the next measurement from conditions where the sensor will most likely be getting wetter from its previous state, or does not have to dry down very much. Thus facilitating a fast measurement by eliminating the requirement for lengthy sensor dry down.

Moisture System Considerations

This section is offered as background information. There are several considerations in keeping your system at a stable and pure moisture level, free of contamination from ambient air moisture:

The integrity of the materials isolating the pure gas from the external air, including leaks from poorly secured fittings.

The backflow of moisture through the exhaust outlet, the exhausts of both the analyzer and the user system under measurement should be considered.

The effects of temperature on the equilibrium of moisture and the surrounding materials, often observed as diurnal cycles in the measurement.

Integrity of the Materials of the User's System

Before considering the materials of a system where a specified dewpoint level must be maintained, one should review two concepts.

Compared to the structure of solids the water molecule is much smaller. This is true compared to even the crystalline structure of metals but especially important in the polymer structure of plastics.

Water vapor pressure in gasses obeys Dalton's law of partial pressures, which states that the overall pressure of a gas is the sum of its constituent gases. And each gas seeks to equilibrate its pressure across gradients of only its own gas pressure.

Let's consider air in a pipe at a total pressure of 100 psia, which has been dried down to -40°C dewpoint. The partial water vapor pressure in the pipe is 0.13mB. If the ambient temperature is 22°C with relative humidity of 30%, then the partial water vapor pressure in the surrounding atmosphere is 7.9mB or approximately 60 times great er than the partial water vapor pressure in the pipe. Thus even though the total pressure in the pipe is much greater that the pressure outside, the reverse is true for the water vapor pressure, and as we discussed earlier the water vapor seeks to equilibrate its pressure thus it "wants" to flow from the outside to the inside and will do so through the cracks in the joints, as well as through the walls of pipes tubes and other vessels.

The integrity of the system is extremely important in maintaining a stable low dewpoint; for dewpoints below -60°C always use stainless steel or PTFE, while for higher dewpoints you can use copper or galvanized steel; but never use rubber, Tygon, Nylon or other plastic or tubing. Pressure regulators often use rubber diaphragms, check and if necessary replace with a stainless steel diaphragm regulator. Filter bowls should be stainless steel or glass, plastic bowls should be avoided. If a flow meter is placed at the inlet of the analyzer it should have a glass tube and be rated for the expected pressure levels, however in general it is best to place flow meters at the analyzer exhaust.

Another material consideration relates to materials sealed in the system such as paper filters; these may not contribute to leak s but will greatly slow down the measurement because they will adsorb and desorb water molecules as the system dewpoint is changing.

Moisture Backflow Along the Walls of the Exhaust Tubing

The linear velocity of gas flowing in a tube is close to zero immediately along the wall of the tube. This coupled with the previously discussed "need" for the moisture to flow from the higher water vapor pressure to the lower one, allows for water molecules to flow against the flow through the exhaust outlet into the sampling chamber of th e analyzer. The fact that water molecules are highly polar further enhances their ability to migrate against the gas flow at the sampling chamber outlet. To prevent this backflow of moisture from influencing the measurement, the analyzer should have at least 12" in length of 1/8" dia. stainless steel tubing at its exhaust port, and a minimum flow of 1.5 l/min (3SCFH) should be maintained; higher flows will produce faster equilibrium time and thus are desirable for quick measuring. the analyzer has internal tubing and exhaust flowmeter thus does not require a pigtail.

Temperature Dependant Equilibrium

The effect of ambient temperature on the gas partial water vapor pressure of a system can change the moisture content of the gas. This is not the temperature sensitivity of the measuring analyzer, rather the actual change of partial water vapor pressure in the user's system due to increase in ambient temperature and thus the increase of energy of the water molecules on and in the walls of the system (tubing, vessels etc…).

A typical example would be the observation of a daily cycling of the measurement in a system with tubing or other components exposed to direct sunlight. During the day as the sun transfers energy into the system , the dewpoint will appear to increase, while at night the dewpoint will appear to decrease. There may be other reasons for this daily dewpoint cycling such as the effect of sun / temperature on the efficiency of gas dryers etc. It is possible to minimize this effect using sun shields and tubing insulators.
Alternatively one may study the response of the particular system to ambient temperature, by logging data over several days during different seasons, and compensating the measurements for this effect. The temperature effect will vary greatly depending on the size and materials of the system, for example stainless steel walls will have a much smaller effect than brass or copper walls.

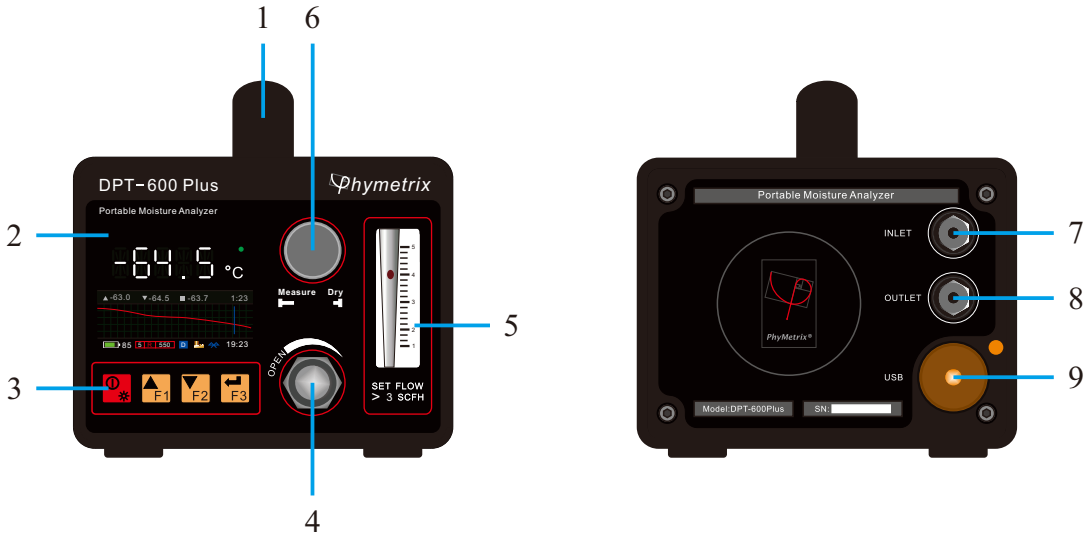
Sensor signal measurement

The signal generated by the sensor is processed by the most advanced digital circuit based on a low-power microprocessor. In the first stage, the signal is amplified; in the second stage, the low-frequency noise is eliminated; in the third stage, a high-frequency filter is used to compensate for the signal output changes caused by environmental temperature changes. So the measurement is a very stable signal. Amplification circuit interfaces are designed to have maximum resolution without increasing errors due to inaccurate summation of electronic components. Circuit design minimizes electronic noise. The amplifier circuit is physically close to the sensor, thereby reducing contact with the electromagnetic "noise" of the external environment.

List Of Articles Detail

When sending the analyzer, including all materials for installation and measurement preparation, open the package carefully, check the product options according to the following checklist, check for damage, and notify the transportation agent immediately if there is any damage.
Standard configuration: DPT-600Plus, charger, data cable, instructions for use, factory report, 1/8" F46 pipeline, portable case.
Optional configuration: pump (built-in), portable printer, data management software.

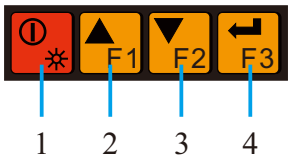
Graphic Description



1	Handle
2	Display
3	Keys
4	Needle Valve
5	Flowmeter
6	Sensor Knob
7	Outlet
8	Inlet
9	Hermetic Seal(USB, Communication)

NOTE: The Graphic may be different from your product, please refer to the actual product.

Key Function



1	Power	ON/OFF the analyzer(3S), Adjust the brightness(1S)
2	F1	Up/Value+, Change theme, ON/OFF the pump
3	F2	Down/Value-, Clear the curve
4	F3	Menu(1S), Start/stop recording(3S)

NOTE: Start / stop recording(if have), ON / OFF the pump(option)
Clear the curve(Valid in theme 1)

3 Using the analyzer

This section describes the principle of operation and basic operating method of DPT-600Plus

Installation and measurement

Display

Menu

Installation and measurement

Installation

DPT-600Plus moisture Analyzer is fully operational from the shipping container with the sensor installed and calibrated at the factory prior to shipment. Users can install necessary or optional components such as pressure reducing valve, filter, gas cooling coil, pump, printer, data management software, etc.

Check the application environment to ensure that the sample gas is suitable for analysis.

Pressure and Flow rate: The recommended sample gas pressure is 5~10psia. If the pressure is too high, a pressure reducing regulator can be installed.

Sample gas flow rate: recommended is 4SCFH.

Moisture and Particulates: Do not allow water or particles to enter the sample system. They can block pipes and damage optional components such as pumps and sensors. A suitable filter is required to remove condensate, moisture or Particulates from the sample gas to prevent erroneous analytical readings and damage to the sensor or optional components.

Contaminants: Depending on the field environment, a gas scrubber and flow indicator may be placed upstream of the analyzer to remove interfering gases that may produce erroneous readings and reduce the life expectancy of the sensor.

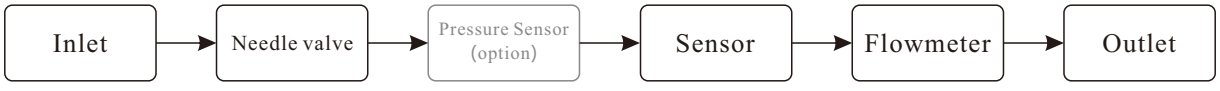
Gas Connections: Inlet and outlet require 1/8" diameter tubing preferably metal.

Power Connection: Locate a source of AC power to meet area classification and to plug in the charger.

Calibration: Refer to Chapter 4 Calibration section.

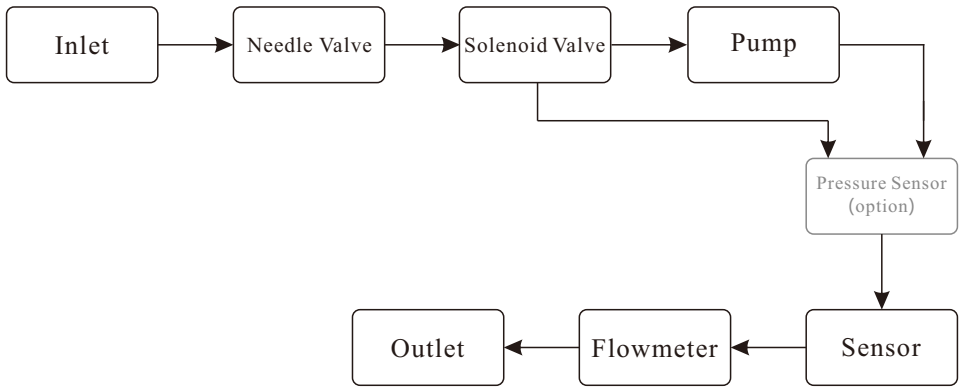
NOTE: Users must be aware of the product's operating environment and related considerations. If in doubt, users can consult the factory for suggestions on the correct selection and installation of optional components.

Gas process



DPT-600Plus Typical gas process

NOTE: Typical gas process for DPT-600Plus is factory standard.



DPT-600Plus gas process(option)

NOTE: DPT-600Plus optional gas process is customized configuration, through the state control of solenoid valve and pump, the sample gas positive pressure or atmospheric pressure, slight negative pressure measurement, please refer to Chapter 4 Optional Components for details.

Sampling Techniques

Sample Conditioning

Particulate and liquid contaminants can effect the measurement, especially the response time. Sample conditioning may be necessary to remove contaminants and improve the measurement and the longevity of the sensor. Make sure that sample conditioning components are made of suitable materials. Avoid paper or other fiber filter elements, use stainless steel instead.

For expected dewpoints below -50°Cdp (39 PPMv), avoid plastic filter bowls, use stainless steel or glass instead. Make sure that highly hygroscopic contaminants (e.g. Triethylene Glycol used in drying Natural Gas) do not reach and coat the sensor as they will disturb the sensor to system equilibrium and can greatly affect the measurement and response time when the analyzer is used at other locations.

Sample Pressure

Pressure variations will effect the measurement. Higher pressure is more likely to produce condensation and thus erroneous readings or even damage the sensor. If the sample pressure needs to be reduced use a suitable pressure dropping device such as a stainless steel needle valve or pressure regulator with a stainless steel diaphragm or a flow control orifice. Make sure Joule-Thomson effects do not cool the gas below hydrocarbon and water dewpoints.

Tubing and Fittings

Make sure all tubing is constructed of materials suitable for low dewpoint measurement, i.e. stainless steel or Teflon, do not us e rubber or plastic tubing. Check for leaks after connecting. Flow meters can be a source of moisture ingress especially if they have a plastic flow tube; ensure flow meters are connected at the analyzer exhaust, not at inlet. However the metering valve should be at the inlet in order to maintain constant atmospheric pressure in the sampling chamber.

Choosing a Measurement Site

Portable analyzers because of the nature of the situation (spot checking) perform extractive measurements. It is important to choose an appropriate sampling location that is representative of the moisture content of the system of interest.

Operating the Analyzer

Confirm that the needle valve is closed

This item needs to be confirmed when measuring or replacing the test point for the first time.

Press to turn on the analyzer

If the analyzer cannot be started up, it may be that the analyzer has no power, so it needs to charge the analyzer and preheat it for 30 minutes to establish the thermal balance of the whole system.

Connect sample gas

After the user accesses the gas pipeline, it is necessary to check the tightness, and select reasonable gas treatment according to the actual use environment.

Adjust the sampling flow rate to 4SCFH

It is recommended that the user install a flow indicator with a regulating valve at the front of the analyzer to control the flow rate through the analyzer to 3SCFH. For best performance, the recommended gas flow is 4SCFH.

Purge the pipeline for more than 3 minutes

It is recommended to purge the pipeline for more than 3 minutes to improve the measurement accuracy.

Pull out the sensor position knob all the way (moves approximately 40mm)

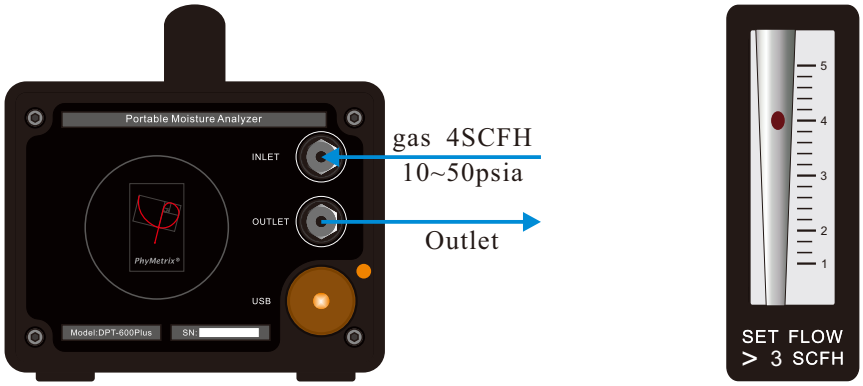
Read the measurement result after the data is stable

The analyzer's response time and data stability depend on many factors such as the dewpoint of the measured sample gas. If the measurement goes from dry to wet, the expected response time is a 95% step change within 3 minutes. If low dew point is measured, the sampling line must be dried and the purge must wait longer for balance.

Push the knob into the desiccant chamber and close the needle valve after measurement

When not being used, with a simple push of the actuator knob the sensor can be stored in the desiccant chamber.

Disconnect the sample gas and press to turn off the analyzer



DPT-600Plus measurement (positive pressure)

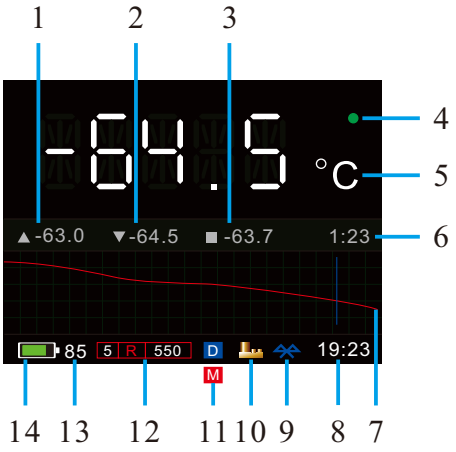
CAUTION:
- Confirm the temperature, pressure, cleanliness, etc. before connect the sample gas.
- Check the hermetic seal after connecting the gas pipeline.
- Sampling gas pressure is prohibited to exceed 50 psia.
- Sampling flow is prohibited to exceed 10SCFH.
- When the gas flows to the sensor, do not place your finger on the outlet to test the flow.
- Exclude particles, liquid or condensate from the sample gas.
- To finish push the knob all the way in to dry storage when non-measured state.

DPT-600Plus measurement (atmospheric or slightly negative pressure application)

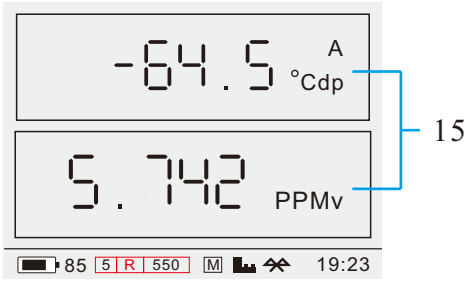
If the sample gas pressure is atmospheric pressure or slightly negative pressure, For accurate oxygen measurements, an optional external sampling pump should be positioned downstream of the sensor to draw the sample from the process, by the sensor and out to atmosphere. open the needle valve completely to avoid drawing a vacuum on the sensor and placing an undue burden on the pump. If pump loading is a consideration, a second throttle valve on the pump's inlet side may be necessary to provide a bypass path so the sample flow rate is 3SCFH.

CAUTION: When the user calibrates the analyzer, connects the positive pressure gas, and closes the needle valve, it is forbidden to open the pump. For information about the sampling pump, please refer to the optional components in chapter 4.

Display



Display Mode 1



Display Mode 2

1	Maximum Curvilinear Coordinates	2	Minimum Curvilinear Coordinates
3	Average in time	4	Value indicates stability
5	Dew Point	6	Time of Curve
7	Dew Point Curve	8	System time
9	Bluetooth	10	Pump
11	Dry/measurement	12	Storage
13	% of power	14	Battery
15	Other display information		

NOTE: 9 Storage, 10 Pump, 12 Bluetooth if have

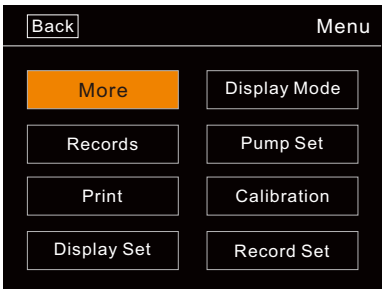
15 Other display information: In display mode 2, press F1 and F2 (3S) to select the different unit. Press F3 to confirm.

The information available for display includes: $^{\circ}C_{dp}^{A}$ (dew point under atmospheric pressure), $^{\circ}C_{dp}^{P}$ (dew point under other working pressure), LBS/MMSCF, $^{\circ}F_{dp}$, PPMv, PPMw, Psia, μB, mg/m3.

User can choose any model. e.g. Mode 2 maybe the best in the sun.

Menu

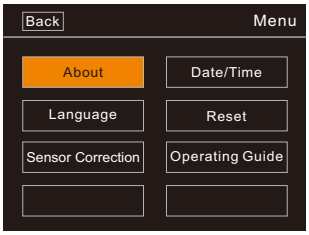
Press F3 to enter the main menu
Press F1 F2 to choose one sub menu and set



Main Menu

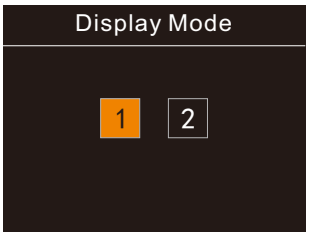
NOTE: The main menu contents may be different from your products, please refer to the actual operation of the product.

More



Choose More to enter

Display Mode



Change display model

Records

Start/Stop Recording
Reference Record Set

Pump Set

Adjust the sampling pump output

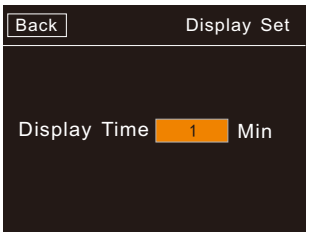
Print

Print
Refer to Chapter 4

Calibration

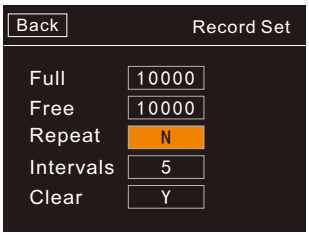
Calibration
Refer to Chapter 4

Display Set



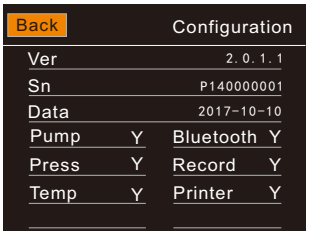
Set display time:0~30 minutes
0:the curve keep cumulative

Record Set



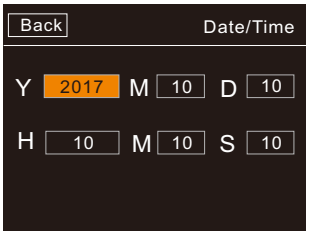
Repeat:
Y(Recover the data)
N(Stop record after full)
Intervals:
Interval time for record:
5-60s
Clear:
Clear stored data

About



System information

Date/Time



Set system time

Language

English or Chinese

Reset

Reset the analyzer
Please be careful and contact us.

Sensor Correction

Sensor error correction

Operating Guide

Operating Guide and Cautions

4 Maintenance

This chapter provides information on how to maintain DPT-600plus.

Cleaning

Recharging the battery

Calibration

Option

Cleaning

The analyzer should be cleaned only as recommended by the manufacturer. Wipe off dust and dirt from the outside of the unit with a soft damp cloth then dry immediately. Do not use solvents or chemicals.

CAUTION: Clean is forbidden when charging.

Recharging the Battery

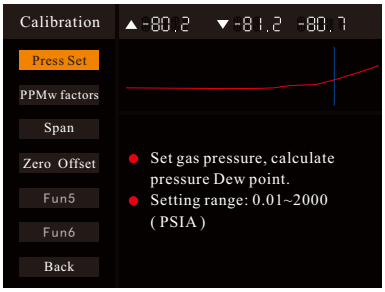


1	Charging / Power ON
2	Charging / Power OFF

NOTE: If you do not use this product for a long time (one month or more), please charge or discharge the product until the remaining electricity is 50%~80%. Store it in a cool and dry place and charge it every three months to supplement the self-discharge effect of the battery.
It is forbidden to overcharge for more than 5 hours. If it is not fully charged after 5 hours of continuous charging, please stop charging immediately and contact technical support department.

Calibration

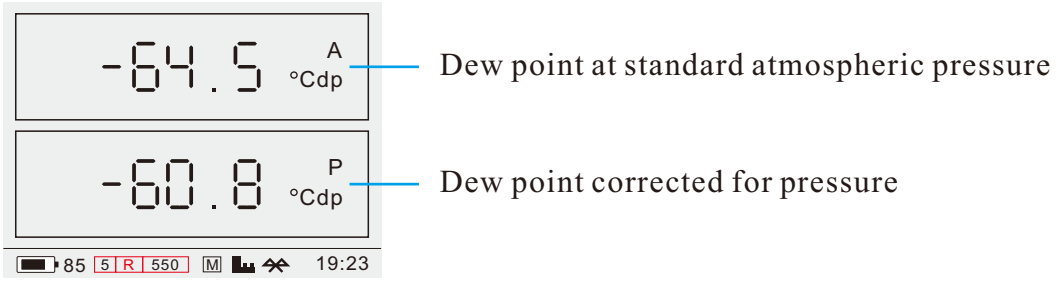
Users can enter the analyzer calibration submenu through the main menu calibration option.
This analyzer includes pressure setting, PPMw factors setting, span calibration, air calibration, user can carry out analyzer calibration according to the way we suggest.



Calibration Submenu

The pressure setting

Pressure setting refers to the correction of gas pressure. By inputting the gas pressure value, the user can get the dew point value under the corresponding pressure parameter.
The setting range is 0.01Psia-2000Psia, and the analyzer defaults to 14.69Psia, which is one standard atmospheric pressure.
In Theme 2 mode, click F1 or F2 (about 3 seconds) to select the upper or lower window to display the pressure-corrected dew point.



PPMw factors

allows the user to select the method of PPMw computations.
The user can select measurement in gas and the molecular weight of the gas or measurement in liquid and henry' constant associated with the liquid.

Span calibration

The span calibration is based on the current calibration range of the standard gas humidity. The user can calibrate the device by accessing a gas with a known water content. The range is determined by the moisture content of the current gas.

Air calibration

Air calibration uses air as the standard gas to correct the full range of dew point values and correct it in about 5 minutes.

Pull out the sensor handle to expose the sensor to the air;
The air humidity reaches the set value (generally above 0 °C) and lasts for 300S;

Option

This analyzer can be matched with fast connector, pump, gas pre-processor, printer, data recording and other components. Users can choose matching according to their own needs. This section will describe the use of optional components in detail. For more details, please contact the technical support department.

Pump

In order to cope with the measurement of atmospheric pressure or negative pressure of sample gas, sampling pump is needed. Sampling pump is optional for this product and is integrated into the analyzer. To realize the sample gas as positive pressure, atmospheric pressure, slightly negative pressure and other measurement environment.

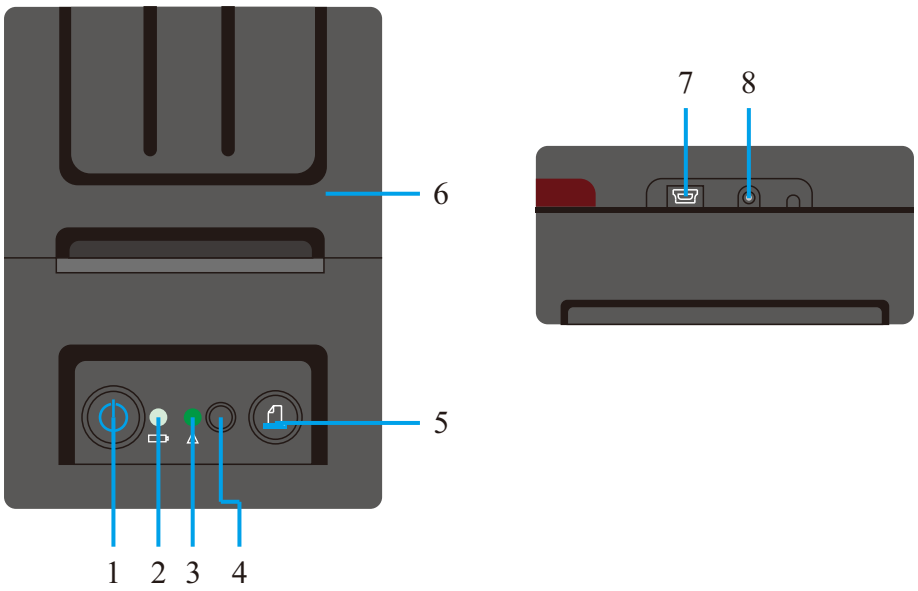
CAUTION: When measuring atmospheric/negative pressure gas, confirm that the sampling inlet push-in fitting (optional) is properly connected and the needle valve is open.
Do not turn on the pump in the following cases:
Positive pressure gas
Calibration
Plug connector not connected (option)
Needle valve is closed

Gas pretreatmen

In order to extend the life of the sensor and improve measurement stability and accuracy, we recommend that the user install the sample gas treatment unit according to the site environment. Such as gas cooling device, pressure reducing valve, particulate dust filter, gas-liquid separator, gas scrubber, and the like. Through the sample gas pretreatment means, the gas temperature of the access analyzer is -10~45 °C, the pressure is 10~20psia, the flow rate is 4SCFH, and there is no particle, dust or interference gas.

NOTE: The cleanliness of the sampled gas determines the various indicators of the product measurement, and the user can match the gas filter device according to the site conditions. For details, please contact the technical service department.

Print



1	Power Button	2	Power Indicator
3	Status Indicator	4	SEL Button
5	LF Button	6	Paper Case Cover
7	Interface Connector	8	Power Connector

Replacing the Paper Roll

- Open the paper case cover.
- Insert the paper roller into the printer, Pull out a small amount of paper.
- Close the paper case cover. Press the platen roller back to the printer head.
- Power the printer on, then press LF button to make the printer head to run, the paper will come out.

Operation Specification

- After Press the power button and hold on for 3 seconds, then the poweris on. The status indicator flashes.
- In the power-on state, press the power button and hold on for 3 seconds, then the power is off.The status indicator light turns off.
- Press the paper feed button (LF button), the printer start feeding. If release the button, it will stop feeding paper.

Power Connection

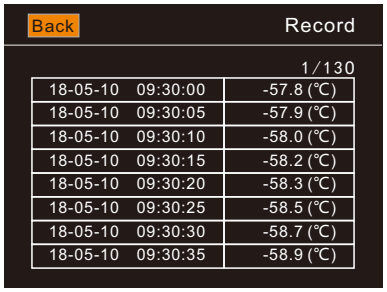
- In the printer working process, the remaining capacity is greater than 50%, green light keep bright.
- When the battery power 50% ~30%, the yellow light keep bright.
- When the battery is less than 30%, the red light keep bright.
- When the battery power is too low to support normal printing, the printer will automatically shut down. In the process of charging, the charger-color indicator light shows red.
- When charging is completed, three-color indicator light turns green.

Printing

- Open the power source hermetic of the analyzer.
- Turn on the printer and analyzer.
- Connect printer and analyzer with data cable.
- Perform the printing operation on the analyzer.
- Enter the menu page, select Print.

Date Storage

Data storage function open:
In measuring interface, long press determine key (about 3 S), will open storage function, at the same time, the central position in the bottom of the screen to see icon flash storage tips.
Data storage function closed:
With the method of open, long press determine key (about 3 S), will be closed storage function,Storage icon disappeared.
Download the data stored already:
Open the “the power source hermetic”, through the USB data interface and instrument computer connections, this operation must in the security area.
This module need to purchase separately, if necessary, please contact us.
Users can view the stored measurement data through Records and press F1 F2 to turn the page.

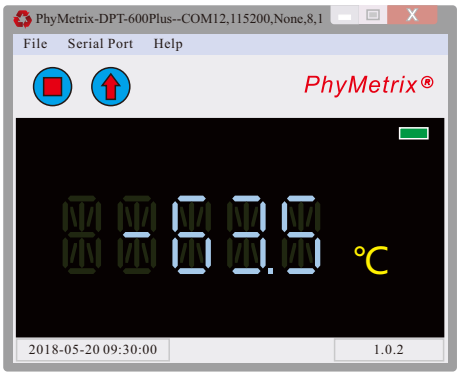


Download the stored data:
Open the sealed cap of the analyzer (charging/communication), and connect with the computer through the Type-C interface of the back of the analyzer.This operation must be performed in a safe area. This module needs to be purchased separately. If necessary, please contact the technical service department.



Data download

PC software: phymetrix. exe, password: Phymetrix
Instructions:
Open Configure Serial Port through the menu bar Serial Port.
Set the device COM port number, other parameters default.
Execute the menu bar Serial Port and Open Serial Port option to Open the Port.
Click ▶ to set the data store path and confirm.
Data documents are saved in CSV and PDF file formats.
Click ⬆ to download the stored data of the analyzer.
Support:
Windows 10 (32-bit or 64-bit)
Windows 8.1 (32-bit or 64-bit)
Windows 8 (32-bit or 64-bit)
Windows 7 (32-bit or 64-bit)
Windows XP (32-bit or 64-bit)
Windows Server 2012 R2 (64-bit)
Windows Server 2012 (64-bit)
Windows Server 2008 R2 (64-bit)



5 Troubleshooting

This section introduces typical problems and solutions of DPT-600Plus.

Solving Typical Problems

Help

Saturation Correction

Solving Typical Problems

Measurement is dryer than is expected	
Likely Source of Proble	Analysis-Remedy
Equilibrium	Before concluding that there is an incorrect measurement, equilibrium? Use the mode 1 display and wait for equilibrium.
Sampling point	Consider if the sampling point could be dryer than the rest of the system? If necessary find a more appropriate sample point.
Damage, Corrosion Abrasion	Contaminants can damage the sensor abrasion. Remove contaminants from the sample and increase the filter element of stainless steel.
Needs recalibration	The calibration cycle may be shortened. Calibration cycle: 1 year(recommendation).

Measurement is wetter than is expected	
Likely Source of Proble	Analysis-Remedy
Equilibrium	Before concluding that there is an incorrect measurement, equilibrium? Use the mode 1 display and wait for equilibrium.
Sampling point	Consider if the sampling point could be dryer than the rest of the system? If necessary find a more appropriate sample point.
Condensation	Refer to the “Measurement is not changing”.
Damage, Corrosion Abrasion	Contaminants can damage the sensor abrasion. Remove contaminants from the sample and increase the filter element of stainless steel.
Incompatible materials in system with low dewpoint	The rationality and compactness of the material used in the sampling system. Replace inappropriate materials.
Leaks	Check for leaks around all interconnections. Tighten fittings. Repair the leaks.
Needs recalibration	The calibration cycle may be shortened. Calibration cycle: 1 year(recommendation).

Measurement is slower than is expected	
Likely Source of Proble	Analysis-Remedy
Equilibrium	The rate at which the system will reach equilibrium depends on the system particulars, such at ambient temperature, internal pressure, flow rates, system materials of construction, surface area of system internals. Previous experience may be indicative of the response time. It is common for systems to take hours to equilibrate.
Sampling point	Is the sampling point in the direct flow of the system gas, or is it at a dead end of the distribution system? Sample in the direct flow
Contamination	Are there hygroscopic contaminants? Install filters.
Out-gassing	Are there materials in the system that could be out-gassing? Replace the hygroscopic materials.
Leaks	Check for leaks around all interconnections. Tighten fittings. Repair the leaks.
Large diameter sampling tubing	Larger diameter tubing have larger surfaces. Use smallest practical tubing diameter, 1/4" recommended.
Low flow rate	Response time is normally greatly influenced by flow rate, but if the measurement value is influenced by flow rate there may be a leak. Flow rate should be greater than 2l/min.

Measurement has a daily cycle	
Likely Source of Proble	Analysis-Remedy
Thermally induced water vapor pressure change	The increase of ambient temperature increases the kinetic energy of the water molecules in the system, and the water vapor pressure in the system is changed to a certain extent. Use insulation to reduce the temperature. Record the data of several days in different seasons, and compensate the data of temperature impact measurement. The sampling line and filter are replaced by stainless steel.

Measurement is not changing, close to ambient temperature	
Likely Source of Proble	Analysis-Remedy
Condensation	Condensation may have occurred from a slug of water or from previous conditions where the gas dewpoint was greater than than the ambient temperature. Condensation typically accumulates in filter bowls or other low points in the system, Then evaporates and produces a high dewpoint. Drain the condensate and allow the system to dry down.

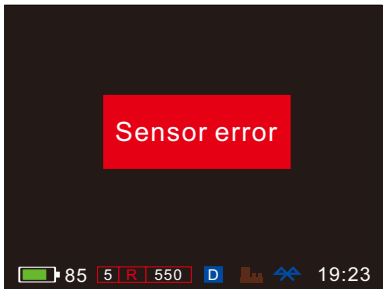
Help

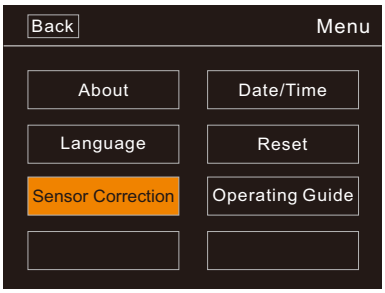
If the measurement is suspected to be erroneous, before calling for support, it may be helpful to have the following information:

- Type of gas being measured.
- Expected dewpoint.
- Nominal pressure (consider back pressure).
- Nominal temperature.
- Nominal flow rate though the analyzer.
- Flow diagram or description of system, showing items and their materials of construction. Include materials of filer elements, regulator diaphragms, and valve seats.
- Possible contaminants (particulates, liquids, oil, glycol, cleaning solutions, etc.).
- Are the pipes and analyzer purged before measuring? How long? Flow rate? With the same gas that will be measured?
- If other equipment was used to verify the dewpoint, what is the equipment (include model number)? What is its specified measuring range? When was it last calibrated / certified?
- If using bottled gas for reference: Manufacturer? Content and accuracy markings? What is the pressure in the bottle at time of comparison? What is the ambient temperature where the bottle is stored? What are the materials of construction of the pressure regulator, especially the diaphragm?

Saturation Correction

According to the characteristics of alumina humidity sensor, sensor over saturation may occur when the sensor is overexposed to air, placed in a saturated environment greater than +20°C and exposed to liquid water for a long time.
The analyzer displays a sensor error message. The user can make saturation correction.





CAUTION: Saturation correction for dpt-600plus.
Use this function when the device displays 'sensor error'.
If the correction is unsuccessful, you can run the correction multiple times.
After the correction, air calibration must be run, otherwise the measurement accuracy will be affected.

6 Specifications

This section describes the technical specifications of DPT-600Plus.

DPT-600Plus specifications

Environment

DPT-600Plus specifications

Range	-110°C ~ +20°C
Accuracy	±2°C
Repeatability	0.8°C
Response time	T90<10S°C (-60→+20°C), T90<10min (-20→-60°C) (25°C / 0.1MPa / 4SCFH)
Temperature Sensor	-40°C ~ +70°C, ±2°C
Pressure Sensor	0 to 300 PSIA ±1%, 316L stainless steel wetted parts (Option)
Flowmeter	Styrene Acrylonitrile, Max pressure: 50psi(3.4 bar)
Electrical	Charger: Input 100 ~ 240VAC,50/60Hz, 0.3A Output 5.35VDC, 2.0A USB Type-C Iithium-ion rechargeable battery Pump(option): 30~50kpa(Positive pressure) -30~-40kpa(negative pressure), 0.5~1.8l/min
Gas	Temperature: -10 ~ 45°C Pressure: 10 ~ 20psia Flow rate: 3 ~ 5SCFH
Environment	Temperature: -10 ~ 45°C Humidity: <80%RH
Sensor Life	>5 years (Normal)
Calibrating Period	1year (recommend)
Calibration conditions	Under the condition of ambient atmospheric pressure and humidity control, temperature ±0.5°C NIST calibrations
Dimension	Dimensions L : 128 W: 214 H: 140 (mm), Weight Total: 2.2kg
Gas Port	1/8" Stainless steel tube fittings

Environment

Temperature	Enclosure: -40°C ~ +60°C Electronics: -40°C ~ +85°C LCD operating: -20°C ~ +70°C Storage: -10°C ~ +80°C
Relative Humidity	Using the analyzer: 10% ~ 80%, Non-refrigerated Storage: 85% Max (-10°C ~ +80°C)

7 Appendix

This section provides instructions for using DPT-600Plus-B.

Introduction to DPT-600Plus-B

DPT-600Plus-B specifications

Introduction to DPT-600Plus-B

DPT-600Plus-B integrates a dewpoint sensor based on thin film polymer technology. The analyzer has excellent long-term stability, rapid response time, withstands condensation and recovers rapidly, resistant to particulate contamination, oil vapor. The analyzer can meet the requirements of varying dewpoint measurement applications.



Functional Description

Auto calibration: The auto calibration feature of the analyzer is an automatic procedure which greatly reduces the possible drift in the dry end of the dew point measurement. It is performed at 1-hour intervals, and when the power is switched on. When measuring very dry conditions, the transmitter performs the auto calibration at shorter intervals. Auto calibration will also be activated when the dew point or temperature changes greatly. Note: The auto calibration function cannot replace the periodic calibration of the analyzer.
Sensor Purge: Sensor purge is also an automatic procedure that minimizes the drift at the wet end readings of the dew point measurement. Sensor purge is performed once a day or when the power is switched on. The sensor is heated for several minutes which will then evaporate all excess molecules out of the sensor polymer. This, together with auto calibration, results in a very small drift of the sensor due to the very linear characteristics of the polymer technology.
Sensor Warming: In high humidity, sensor warming prevents the sensor and filter from becoming wet. High humidity may be present when the dew point temperature rises close to the gas temperature. Sensor warming is switched on automatically when the humidity in the measured gas increases to a level where dew can start to form. The advantage of sensor warming is the rapid response of dew point measurement.

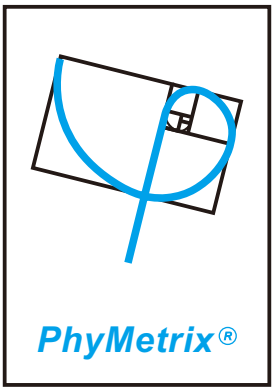
Measurement

- Turn on the analyzer
  Normal operation and output is typically achieved no later than 6 minutes after startup.
- Connect sample gas
- Adjust the sampling flow rate to 4SCFH
- Purge the pipeline for more than 3 minutes
- Read the measurement result after the data is stable
- Disconnect the sample gas and turn off the analyzer

NOTE: Except for the measurement, DPT-600Plus-B has the same function as DPT-600Plus. Users can refer to DPT-600Plus operation manual.

DPT-600Plus-B specifications

Range	-80°C ~ +20°C, -60°C ~ +20°C
Accuracy	±2°C
Repeatability	0.8°C
Response time	T90<10S°C (-60→+20°C), T90<10min (-20→-60°C) (25°C / 0.1MPa / 4SCFH)
Temperature Sensor	-40°C ~ +70°C, ±2°C
Pressure Sensor	0 to 300 PSIA ±1%, 316L stainless steel wetted parts (Option)
Flowmeter	Styrene Acrylonitrile, Max pressure: 50psi(3.4 bar)
Electrical	Charger: Input 100 ~ 240VAC,50/60Hz, 0.3A Output 5.35VDC, 2.0A USB Type-C Iithium-ion rechargeable battery Pump(option): 30~50kpa(Positive pressure) -30~-40kpa(negative pressure), 0.5~1.8l/min
Gas	Temperature: -10 ~ 45°C Pressure: 10 ~ 20psia Flow rate: 3 ~ 5SCFH
Environment	Temperature: -10 ~ 45°C Humidity: <80%RH
Sensor Life	>5 years (Normal)
Calibrating Period	2year (recommend)
Calibration conditions	Under the condition of ambient atmospheric pressure and humidity control, temperature ±0.5°C NIST calibrations
Dimension	Dimensions L : 128 W: 214 H: 140 (mm), Weight Total: 2.3kg
Gas Port	1/8" Stainless steel tube fittings


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