

Model DPC3500

Continuous Low-Range Dew Point Analyzer
PRODUCT MANUAL

Introduction:

Thank you for selecting Super System's DPC3500 as your Continuous Low Range Dew Point Analyzer. Please keep this manual in a secure place for future reference.

Unpacking

Carefully unpack the unit. The shipment should contain the following components:

- 1 Model DPC3500 12" x 10" x 6" Enclosure
- 1 Low Range Dew Point Sensor
- 20' Sensor Wire
- 1 Remote Mounting Assembly
- 1 Product Manual

If any of these components are missing or damaged, please contact SSI immediately at (800) 666-4330.

General Description:

The DPC3500 is designed to detect moisture content in gas samples from -148°F to +20°F (-100°C to -7°C) dew point. The readings are remotely displayed in either Fahrenheit or Celsius on the door of the enclosure. In addition to the visual display, the DPC3500 also provides 4-20mA and RS232 outputs for data collection.

The DPC3500 is designed to provide continuous readings. Response times are rapid as long as the sensor remains bathed in a sample gas stream that has a low dew point. If the sensor is allowed to reach ambient dew point (greater than 40°F or 4°C), it will take a considerable amount of time for it to achieve readings at the low level. When installed and operated properly, the Remote Mounting Assembly (supplied by SSI) will allow the sensor to be continuously exposed to a low-dew atmosphere, which will result in rapid response times.

It is important to note that this analyzer is designed to measure dew point in gases that are non-corrosive. Some gases that can cause damage or failure to the sensor are trace amounts of SO₃, high concentrations of NH₃, Chlorine, HCL, and any other gases that could cause corrosion.

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Specifications:

Measurement Range	-148°F to +20°F (-100°C to -7°C)
Accuracy -75°F to +20°F (-59°C to -7°C)	+/- 1.8°F (+/- 1°C)
Accuracy -148°F to -76°F (-100°C to -60°C)	+/- 3.6°F (+/- 2°C)
Outputs	4 to 20 mA
Display	°F or °C
Sensor Material	Metalized Ceramic
Sensor Guard	80 μ Sintered Metal Guard
Operating Pressure	Vacuum to 5,000 PSIG
Operating Temperature	-40°F to +140°F (-40°C to +60°C)
Sample Flow Rate	5-10 SCFH Recommended
Power Requirements	120 VAC, 1 Phase, 60 Hz

Operation:

The DPC 3500's sensor is manufactured from a ceramic tile that is plated and vapor-deposited to form a surface that varies its electrical capacitance when exposed to small changes in water vapor pressure. This information, along with temperature readings from the tip of the sensor, is used by the microprocessor to determine dew point.

The dew point of the gas in the sample line is displayed on the front panel. A switch to the right of the display toggles between showing the readings in degrees Fahrenheit and degrees Celsius. An indicator light to the right of the display will indicate the display's operating mode.

Startup:

The DPC3500 was calibrated before it was shipped from Super Systems, Inc. After the unit is properly installed (see "Wiring Connections" and "Sample Cell Installation"), power can be applied immediately. The flow meter on the Remote Mounting Assembly should be adjusted to provide approximately 5 to 10 SCFH of sample gas to the sensor. The rate of sample flow does not have any impact on the measured dew point, but a higher flow rate will result in a faster response time.

At the time of installation, the sensor will be reading the ambient dew point. It will take between 3 and 6 hours of immersion in the sample stream for the unit to thoroughly "dry out" the sensor before it stabilizes at the correct readings. This delay is only at initial startup when the system is installed for the first time. The unit is intended to operate with a constant, steady stream of sample gas continuously bathing the sensor. This will prevent the sensor from absorbing moisture from ambient air, and will allow for continuous real-time monitoring of the sample stream.

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Sample Cell Installation:

The cell must be installed in the Remote Mounting Assembly (SSi Part Number 13123), which is provided with the unit. All of the necessary components for installing the sensor are included in this kit. Although this installation does allow for some design flexibility, it is important that only stainless steel tubing and fittings are used to carry the sample gas to the sensor.



P/N 13123
Remote Mounting Assembly

When installing the unit, verify that all fittings are tight, since any leaks will cause inaccurate readings.

During the operation of this unit, sample gas will constantly be flowing through the sensor and out of the vent. Depending upon the type of gas being sampled, appropriate safety precautions should be taken for proper venting of the sample gases after they exit the sampling assembly.

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Sample Tubing Materials:

When determining the moisture content of gas samples, the materials used to transport the gas samples are extremely important. As the gas passes through tubing, the polarity of the moisture molecules will cause them to be attracted to the tubing. Any moisture that remains on the wall of the vessel does not have the opportunity to travel to the sensor, so it will reduce the sensor's response time.

Also, some tubing materials (rubber, copper, PVC, etc.) are porous enough to allow for moisture penetration directly through the walls of the tubing, even in cases where there is considerable positive pressure.

Super Systems, Inc. recommends that only stainless steel is used as the tubing material for measuring low dew points (below -50°F). It is also important to note that to maintain the integrity of the entire sampling system, all of the necessary valves and fittings should also be constructed of stainless steel. These material precautions do not need to be followed "downstream" (after the sensor), since the moisture content of the gas at this point is unimportant.

Calibration:

The calibration of the DPC3500 is traceable to National Institute of Standards and Technology (NIST) standards. Each sensor has a unique serial number, and the calibration data can be found on the Certification Sheet located at the back of this manual. Due to the sensitivity and complexity of the metalized ceramic moisture sensor, this unit cannot be user calibrated and must be returned to SSI for recalibration and recertification. It is recommended that the sensor be recalibrated every twelve months. Each sensor is interchangeable without the need for display recalibration, so only the sensor needs to be returned for recalibration, not the entire panel.

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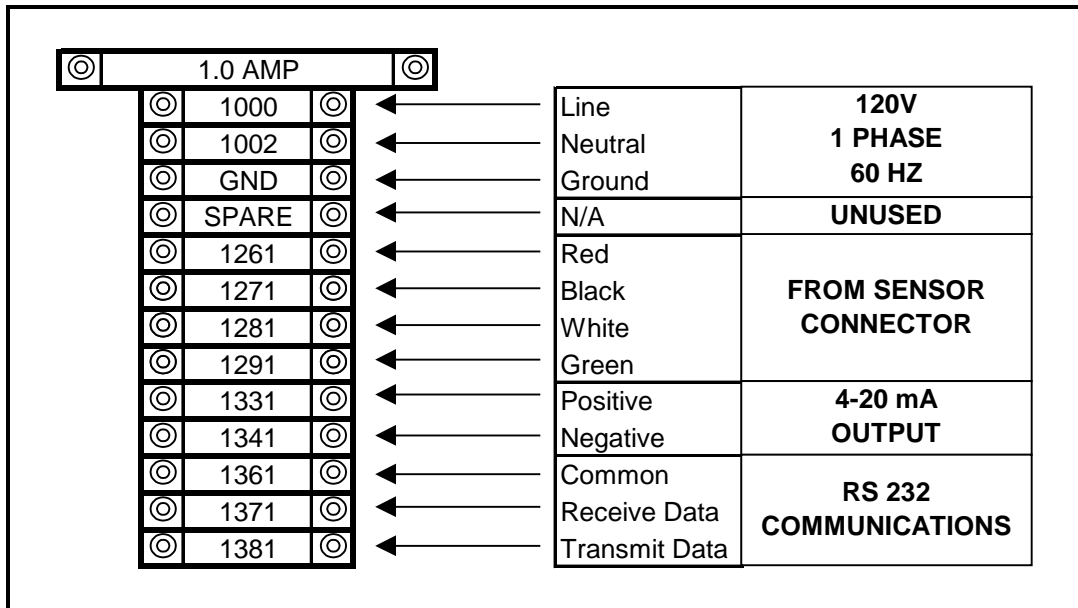
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Wiring Connections:

The power and communications wires for the sensor are connected to a plug that is attached to the head of the sensor. The wires will already be attached to this plug at SSI, however for reference the wiring for this plug is:

- Sensor Plug Terminal #1: Green Wire (to location #1291 on terminal strip)
- Sensor Plug Terminal #2: White Wire (to location #1281 on terminal strip)
- Sensor Plug Terminal #3: Red Wire (to location #1261 on terminal strip)
- Sensor Plug Terminal #4: Black Wire (to location #1271 on terminal strip)

20 feet of sensor wire is included with the unit, however it is capable of operating over substantially longer distances if required. When attaching the necessary wires to the terminal strip inside the panel, all connections should be made according to the following diagram:



Communications:

The 4-20 mA output correlates to a dew point range of -148°F to 32°F (-100°C to 0°C).

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Spare Parts:

<u>Description</u>	<u>Part Number</u>
Factory Calibration & Re-Certification	13122
Sample Tubing Assembly	13123
Sensor Wire (50')	T.B.D.
Low Dew Point Sensor	31413
+15 VDC Power Supply	31330

Revision History:

Rev.	Description	Date
-	Initial Release	11/26/01
A	SSi Address Update, General Update	04/14/05
B	Updated flow rate, fuse rating, and other modifications	11/14/06