Portable Dew Point Monitor

Model 8074A

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Contents

Specifications

DEW POINT RANGE (varies with ambient air temperature)	+10°F to +70°F (at 73°F air temp) 0°F to +50°F (at +50°F air temp) +35°F to +90°F (at 100°F air temp)
TYPICAL ACCURACY	±3°F
MAX. PROCESS AIR TEMP.	275°F
ALARM SET POINT	+50°F dew point (adjustable)
SENSOR PART NUMBER	1826-2
ANALOG OUTPUT SCALING	-40°F to +70°F, 0-5V and 4-20mA
ANALOG OUTPUT PORT	3 pin M8 male jack
POWER REQUIREMENTS	115VAC 50/60HZ 0.15A max (230VAC optional)
DIMENSIONS	10.75” X 9.75” X 4.75”
NET WEIGHT	7.0lbs

Product Overview

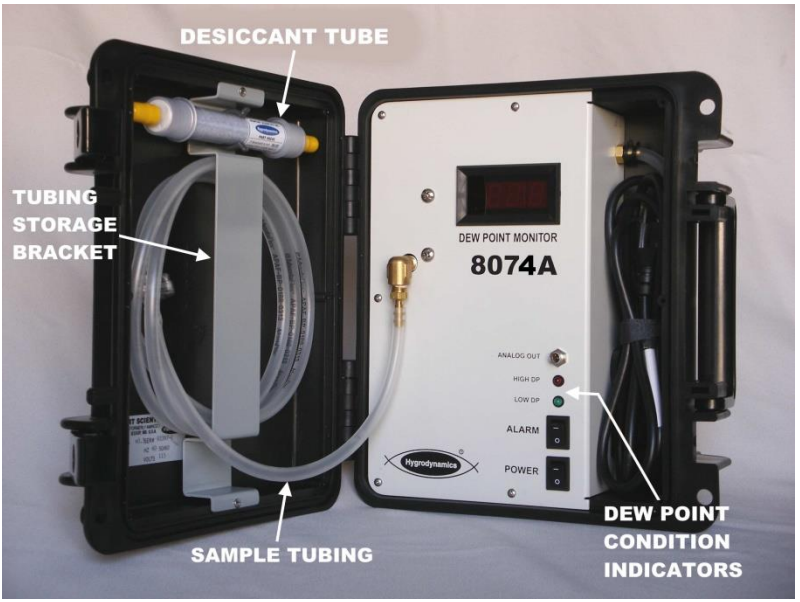
The 8074A dew point monitor is used to test the moisture content of industrial process air. The measurement range of the 8074A makes it ideal for testing the function of refrigerant dryers, dehumidifiers, and hot air dryers.

The 8074A has an integrated vacuum pump which continuously draws in a small sample of process air and provides real-time indication of dew point on an LED display. The sampling system allows dew point testing of process air at atmospheric pressure, typically seen in bulk material drying, food processing, and environmental systems. Because the sensor is contained in the monitor, only a thin tube is required to access and sample the process air. This allows testing in applications where a sensor won't fit or its presence might disturb or contaminate the underlying process.

In addition to the numeric LED display, the monitor includes dew point condition indicator lights, an audible alarm, and a linear signal output.

Features and Accessories

The dew point monitor and its accessories are housed in a heavy-duty portable carrying case. When not in use, all parts of the product are contained within the case, protected from the elements and safeguarded from loss.



POWER SWITCH	Turns monitor ON and OFF.
ALARM SWITCH	Enables local audible alarm when dew point exceeds the alarm set point.
LINE CORD	Provides connection to power.
BEEPER (not shown)	Gives audible signal when the measured dew point is above the alarm set point.
DEW POINT CONDITION INDICATORS	Green light is on when dry air is detected, red light is on when measured dew point is above the alarm set point.
SAMPLE TUBING	Six feet of heat resistant tubing draws in process air to be measured.
AIR FILTER	Installed in-line with sample tubing, removes fine particulates from sample air.
DESICCANT TUBE	Provides dry air for testing the monitor's response.
TUBING STORAGE BRACKET	Allows storage for sample tubing and desiccant tube when not in use.
ANALOG OUT	4-20mA and 0-5V output for remote monitoring or data logging. Mates with standard 3 pin M8 female cable.

NOTE: The 8074A is shipped with a paper desiccant pack which can be discarded when the unit is unpacked.

Operation

The 8074A is designed to sample process air that is near atmospheric pressure, *NOT* compressed air. If you are attempting to monitor compressed air, consult the factory for other model options.

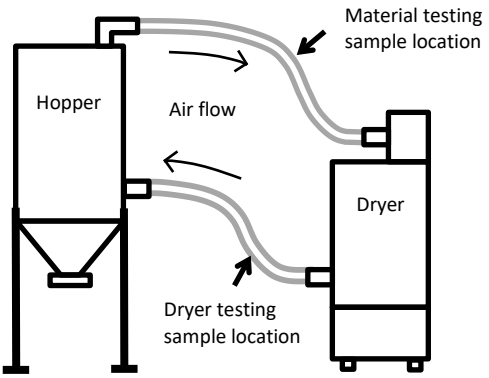
CAUTION: The carrying case is not heat resistant. It may melt or distort if left resting on the hot parts of a heated dryer. If a surface is too hot to touch, it is too hot for the monitor!

Sample Tubing Connection

To enable testing of your process air, you must provide fittings in your system that will accept the 8074A's 3/16" ID sample tubing. This can be a barbed hose fitting or a piece of ¼" copper tube that provides access to the process air. The point of attachment must be secure and leak-free.

The plastic sample tubing supplied with the monitor can tolerate temperatures up to 275°F (135°C). Higher process air temperatures can be cooled to a safe level by sampling through a few feet of ¼" copper tubing.

Select the sample locations based on your testing needs (refer to diagram below). It is suggested that you have permanently accessible sample points at both the dryer output and return hoses. If your dryer has threaded test ports on the inlet and outlet connections (typically for thermocouples) use these to make points of connection. Some dryer manufacturers provide a port for air sampling.



Typical material drying system

NOTE: When storing the 8074A, carefully coil the sample tubing and tuck it behind the tubing storage bracket. This will prevent kinks from forming in the tubing when the lid is closed.

Power Connection

The 8074A is supplied with a 6 foot line cord for connection to power. Always connect the monitor to the correct supply voltage. Do not attempt to replace the line cord with a different plug type to accommodate other supply voltages. The 8074A will be damaged if connected to incorrect supply voltage.

Dryer Performance Testing

The performance of a dryer can be evaluated by measuring the dew point of its output air.

Connect the 8074A sample tubing to a point on the dryer's output line, before the hopper. Make sure not to exceed the sample tubing temperature rating.

Turn on the 8074A and allow the reading to stabilize. The initial reading will reflect the current room dew point until all the ambient air is purged from the monitor's tubing and internal fittings. After a few minutes, the reading should start to reflect the actual process dew point. It can take 30 minutes or more for the unit to stabilize when first turned on.

Leave the 8074A connected and turned on during material drying and processing. The built in red light and audible beeper will indicate dryer trouble within moments of a dew point rise.

A constantly high reading on the 8074A may indicate a malfunctioning dryer or one that is overloaded by damp material in the hopper. If you suspect that the 8074A is giving an incorrect high reading, perform the Dry-Down Test described in the Troubleshooting section of this manual.

Material Dryness Testing

The dryness of material in a hopper can be inferred from the dew point of air exiting the hopper.

Connect the 8074A sample tubing to a point in the hopper's air output. Make sure not to exceed the sample tubing temperature rating.

Turn on the 8074A. When a hopper is initially loaded with material, high dew points at the hopper's air return are normal while moisture is removed. If drying time is expected to be all day, leave the 8074A sample tubing connected, but keep the

monitor turned off. Every few hours, turn on the 8074A and allow time to obtain a stable reading. As the material dries, the 8074A dew point reading will start to drop. Material processing can begin when the dew point reading is at an acceptable level.

If the 8074A reading is stuck at a high dew point, change the sampling point to the output of the *dryer.* Follow the instructions for Dryer Performance Testing described above to make sure the dryer is providing low dew point air to the hopper.

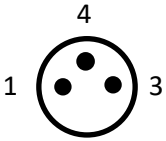
Remote Monitoring/Data Logging

The 8074A analog output jack can be used to monitor or log dew point over a period of time.

The output jack is a 3 pin male M8 type connector. This connector accepts standard threaded or snap fit female M8 cables.

Pin No.	Wire Color*	Signal
1	Brown	4-20mA (current sourcing)
3	Blue	Ground
4	Black	0-5V

* standard wire color code of M8 cable assemblies



Connector pinout
(front view)

Note that the output scaling is -40°F to +70°F.

Maintenance and Adjustments

Newport Scientific offers a maintenance and calibration service for the 8074A. This service should be performed annually. Alternatively, most wearable parts can be replaced by the user.

To access the serviceable parts inside the monitor, the 8074A panel must be removed from the carrying case.

Monitor Disassembly and Assembly

WARNING: Unplug the 8074A from power before disassembly. Even with the power switch off, voltages are present inside the unit.

Slide the sample tubing off of the front panel elbow.

Use a screwdriver to remove the 5 screws along the perimeter of the panel holding it in the case. Use the sample tubing elbow to help lift the panel straight up and out of the case.

When re-assembling the panel into the case, make sure sensor cable wires are tucked in and not pinched under the panel as you lower it into the case.

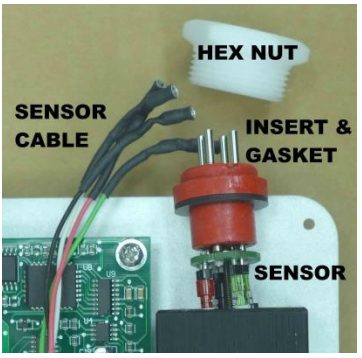
Install the 5 mounting screws, taking care not to cross thread the screws as you proceed. The screws only need to be snug to the panel, do not overtighten!

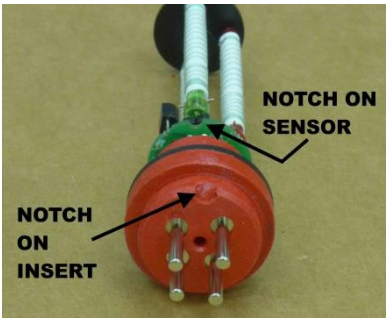
Sensor Replacement

The internal sensor should be replaced on a yearly basis. It is difficult to verify the accuracy of the sensor in the field. For most users, an annual sensor replacement can assure good operation of the monitor. It is recommended to replace the sample tubing and air filter whenever the sensor is replaced.

With the panel removed from the case, locate the sensor housing and pull the individual sensor wires from the 4 pin insert. The wires will unplug straight out.

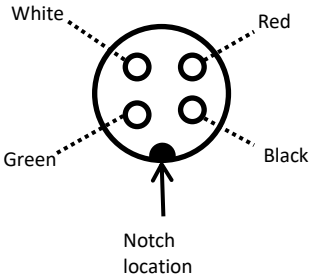
Unscrew the hex nut from the top of the sensor housing. With the hex nut unscrewed, remove the sensor and 4 pin insert along with gasket. The sensor will then unplug from the insert. You may use a non-metal object to pry between the sensor PC board and the insert to start the separation of the parts.





Plug the new sensor into the 4 pin insert. Align the notch on the sensor PC board with the notch on the back of the 4 pin insert. Push in firmly by holding the PC board. The sensor will not seat fully down into the insert, this is normal.

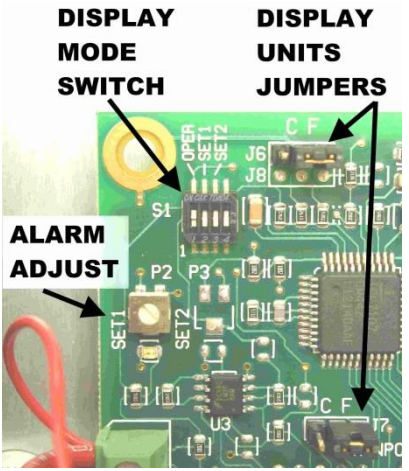
Carefully replace the sensor, gasket, and insert back into the housing and reconnect each wire as shown. Note the location of the notch on the insert and use that as a reference point to orient each wire as shown below.



4 pin insert wire connections (viewed from wire side)

Thread the hex nut into the housing, securing the 4 pin insert and sensor. The nut should only be hand-tightened.

Display Units



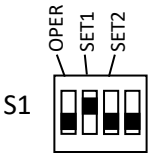
The 8074A is factory set to display dew point in °F. The display can be changed to °C by jumper configuration. With the 8074A panel removed from the carrying case, locate the configurable parts near the upper left corner of the PC board. Move J6 and J7 jumpers to the C position to display dew point in °C.

Alarm Set Point Adjust

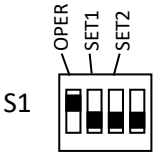
To change the dew point at which the monitor indicates an alarm (high dew point indication), refer to the DISPLAY MODE SWITCH labeled S1 and the ALARM ADJUST potentiometer labeled SET1 located on the circuit board.

WARNING: The alarm set point adjustment is performed with the 8074A powered on. Avoid touching live electrical parts during this procedure as hazardous voltages are present!

Apply power to the unit and turn it on with care, making sure not to touch any electrical terminals inside.



Configure the S1 switch as shown here, with SET1 position ON and all others OFF. In this configuration, the front panel display will indicate the current alarm set point. Adjust the SET1 potentiometer to the desired set point.



When the front panel display indicates your desired set point, return the S1 switches to the normal operating configuration. The front panel display will now show the actual measured dew point.

Remove power and reinstall the 8074A panel into the carrying case.

Troubleshooting

Dry-Down Test

The desiccant tube is used to provide a reliable source of dry air for field testing the monitor's response. Follow this procedure if the monitor indicates a constant high dew point but you suspect that your process air is dry. The desiccant tube generates a dew point well below the measurement capability of the 8074A, so it won't test the accuracy of the monitor, but it can help troubleshoot a damaged sensor or internal air leaks.

NOTE: Make sure the desiccant is blue in color. If the desiccant is fully pink, it will not produce dry air and you should purchase a new desiccant tube before testing.

Remove the yellow caps from the ends of the desiccant tube- save them for re-use. Connect the sample tubing to one end of the desiccant tube, and the sample air outlet to the other end. This will create a closed loop of dry air flow through the monitor and desiccant tube. Turn on the dew point monitor. In a few minutes, the reading should start to drop. If the monitor doesn't respond, refer to the troubleshooting hints for more information. Replace the desiccant tube caps when done.

Troubleshooting Hints

Monitor display is stuck near 70°F

Possible Cause	Corrective Action
Damp sample tubing or sensor housing	If high dew point air was recently sampled, there may be condensation in the tubing and fittings. Perform the Dry-Down test to purge the system of moisture.
Sensor damaged or contaminated	Using a fresh desiccant tube, perform the Dry-Down test. If response is slow, replace sensor.

Monitor reads near 0°F when turned on and doesn't change

Possible Cause	Corrective Action
Sensor cable disconnected	Disassemble the monitor and make sure sensor wires are plugged into the 4 pin insert. Confirm that the wires are in the correct order (refer to Sensor Replacement section).
Sensor or circuit board damaged	Disassemble the monitor and locate the white and green sensor wires on the terminal block (terminals A and B). Place a jumper across terminals A and B and turn monitor on. Check for a high dew point indication on display. If display responds, the sensor is likely damaged, if the display shows no response, the circuit board may be the problem.

Monitor is slow to respond

Possible Cause	Corrective Action
Inadequate sampling suction	With monitor on, use finger to block sample tubing. If you don't feel suction, the vacuum pump may be worn or damaged, or the 4 pin insert holding the sensor may be cracked and leaking. Monitor should be serviced.
Sensor worn or contaminated	Most often, a slow response if caused by an aged sensor. Using a fresh desiccant tube, perform the Dry Down test. If response is slow, replace sensor.
Sample tubing or air filter is dirty	Inspect sample tubing and air filter and replace if loaded with dust.

Spare Parts & Accessories

Item	Part No.
Sensor	1826-2
Air filter	3305005
High temp sample tubing (per ft)	4100133
4 pin insert	0900104
Gasket for insert	1000613G
Desiccant tube	6245
Field wireable analog out connector	0300201

Warranty

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