

# HYGRODYNAMICS

## DIGITAL DEW POINT MONITOR

MODEL 8097  
8097-230VAC

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**DEW POINT MONITOR  
MODEL 8097**

## **SPECIFICATIONS**

<b>Dew Point Range:</b>	-40°F to +15°F (-40°C to -9°C)
<b>Recorder Output:</b>	4-20mA Scaled as -40°F to +70°F
	$\text{mA} = \frac{\text{DP} + 67.5}{6.875} \quad \text{or} \quad \text{V} = \frac{\text{DP} + 40}{22}$
	-40 = 4mA or 0V      70 = 20mA or 5V
<b>Alarm Indication:</b>	Red Light and Audible Alarm With Silencer Switch.
<b>Alarm Output:</b>	5AMP @ 115VAC Rated Contact. Normally Open and Normally Closed Dry Contacts.
<b>Alarm Set Point:</b>	-10 F (-23 C) (Adjustable, see Maintenance)
<b>Accuracy:</b>	±2°F Dew Point
<b>Sensor Part No.:</b>	1205DM
<b>Dimensions:</b>	10½" x 8½" x 6
<b>Net Weight:</b>	6 lbs.
<b>Enclosure:</b>	Lexan NEMA-12 Electrical Box, CSA Approved. Wall Mountable or Portable With Removable Front Cover.
<b>Power Requirements:</b>	115VAC ±10%, 50-60 Hz, 0.1 Amps ( <b>230V available</b> )
<b>Pressure Range:</b>	0 - 300 psig

## **PRINCIPLE OF OPERATION**

The 8097 Dew Point Monitor is designed to monitor the dew point of compressed air in the range of -40 °F to +15°F. The unit is equipped with a remote sensor in a pipe fitted housing. The Dew Point Monitor is connected to the sensor by a 10 ft electrical cable.

The HYGROSENSOR consists of a bifilar winding of palladium wire wound on an insulating core. The surface is coated with a thin film mixture of LiBr and PVA (polyvinyl alcohol). The sensor varies its electrical resistance inversely proportional to the moisture in the surrounding atmosphere.

The 8097's internal circuit excites the sensor with a regulated AC voltage and measures the dewpoint in terms of electrical current. The signal is used to drive the digital meter and a comparator circuit which provides relay contact closure.

## **INSTALLATION**

### **Choosing A Sampling Location**

Start by finding a suitable location for the sensing element. An ideal location would be free of oil, particulates, and possible condensation. Also, the sensor should see an airflow of 5SCFH or more for best response. The ideal air temperature at the sensor is 80 F, however the sensor can operate up to 140 F.

Install a tee fitting with a 1" NPT female thread to accept the sensor mount assembly. Orient the tee such that the sensor will be on the top or sides of the pipe. Avoid having the sensor near the bottom of the pipe since condensation and particulates may settle there.

- 1) Press the sensor into the pipe mount with moderate hand pressure.
- 2) Screw pipe mount into 1" NPT female fitting.
- 3) Do not tighten the packing nut more than hand tight.

### **Mounting the Enclosure**

Remove the screws that hold the brackets on the backside of the unit. Re-install brackets so the flanges extend beyond the top and bottom of the enclosure. Mount the enclosure to a chosen location with bolts.

### **Remote Alarm Connection**

**NOTE:** The built in audible alarm can be silenced with the ALARM switch on the front panel. This switch does not affect the status of the remote alarm output.

Refer to the wiring diagram for details on alarm connection.

- 1) Route wires through the liquid tight fitting on the side of the dew point monitor.
- 2) Connect wires to terminal block on PC Board.
  - 5 & 6 are normally closed. They make continuity when the dew point is below set point (green light).
  - 4 & 5 are normally opened. They make continuity when the dew point is above set point (red light).
- 3) Gently tighten the liquid tight fitting.

### **Recorder Output Connection**

- 1) Route wires through the liquid tight fitting on the side of the dew point monitor.
- 2) Connect wires to terminal 7 & 8 of the PC Board. Terminal 7 is positive, 8 is common.
- 3) Gently tighten the liquid tight fitting.

## **MAINTENANCE**

The Dew Point Monitor normally does not require calibration, and in most applications the sensor will provide years of service. However, the easiest and most reliable way to insure consistent accuracy is to replace the sensor annually.

### **Sensor Replacement Procedure**

Replacement of the sensor is recommended on a **yearly** basis.

**\*\* Remove power to the Dew Point Monitor before servicing.**

- 1) Remove the pipe mount from air line.
- 2) Pull sensor out of pipe mount.
- 3) Press new sensor into pipe mount.
- 4) Screw pipe mount into air line. Do not tighten the packing nut more than hand tight.

### **Electronic Test Procedure**

- 1) Disconnect sensor cable at pipe fitting.
- 2) With power on, check the Dew Point Monitors' display for  $-40^{\circ}\text{F} \pm 2^{\circ}\text{F}$ .
- 3) Place a jumper across the sensor cable's terminals.
- 4) Check the Dew Point Monitors' display for  $+15^{\circ}\text{F} \pm 2^{\circ}\text{F}$ .
- 5) Remove jumper and connect sensor cable to pipe fitting.

If the monitor fails to display these values, contact Newport Scientific for factory service.

### **Alarm Set Point Adjustment**

**\*\* Remove power to the Dew Point Monitor before servicing.**

- 1) Remove the front cover.
- 2) Locate the set point switch (SW1) on the PC Board.
- 3) Move the switch to the upper position and apply power to the Dew Point Monitor.
- 4) View the set point on the digital display and adjust P3 for desired set point.
- 5) Remove power, return SW1 to the lower position and replace the front cover.

### **Recorder Output Selection**

**\*\* Remove power to the Dew Point Monitor before servicing.**

- 1) Remove the front cover.
- 2) Locate jumper J9 on the PC Board.
- 3) Refer to the wiring diagram to select either 4-20mA or 0-5V jumper position.
- 4) Replace the front cover.

### **Display Units Selection**

**\*\* Remove power to the Dew Point Monitor before servicing.**

- 1) Remove the front cover.
- 2) Locate jumpers J10 and J11 on the PC Board.
- 3) Refer to the wiring diagram to select either F or C jumper positions. Both J10 and J11 must be in the same position for proper operation.
- 4) Replace the front cover.

## **APPLICATION HINTS**

1. Replace the sensor on a yearly basis.
2. Do not expose the sensor to temperatures greater than 140 F.
3. Avoid installations with oil or separated water in the line. These contaminants cause premature sensor failure.

4. Maintain an air-flow of approximate 5 SCFH.
5. Never connect the sensor to a DC voltage. Keep in mind an Ohmmeter cannot be used to measure the sensor resistance as it provides a DC excitation signal.
6. To test the sensor install it in a 1" NPT pipe tee with a small orifice to maintain a back pressure of 100 psig, then purge the 1" NPT pipe tee with a Zero Grade Nitrogen (available in tanks) or air of a known certified dew point.

## **REPLACEMENT PARTS**

1205DM.....Hygrosensor  
6146A.....Pressure Mount

# HYGRODYNAMICS

## ***LIMITED WARRANTY***

NEWPORT SCIENTIFIC, INC. warrants that all equipment manufactured by NSI shall be free from defects in material and workmanship which might impair its usefulness. SELLER DOES NOT WARRANT THAT THE EQUIPMENT IS FIT FOR ANY PARTICULAR USE. THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF; the obligation under this warranty is limited to repairing or replacing, at Seller's factory, any defective parts which, when returned by the buyer, **transportation prepaid**, examination discloses to have been factory defective. The time limit of this warranty is ONE YEAR from date of shipment of new equipment, SIX MONTHS from date of shipment of Hygrodynamics Wide-Range Sensors and THREE MONTHS from date of shipment of Hygrodynamics Narrow-Range Sensors and repaired equipment. THIS WARRANTY IS EXPRESSLY IN LIEU OF OTHER WARRANTIES. Seller shall not be held liable for any special, indirect, consequential damages arising out of this warranty or any breach thereof, of any defect in or failure or malfunction of the equipment and materials are further subject to tolerances and variations consistent with usages of trade. This warranty shall run in favor only of the purchaser from Seller and may not be passed on or represented on behalf of Seller to any subsequent purchaser.

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In the case of special equipment or modifications to standard equipment manufactured at the request of the buyer, under buyer-approved specifications, buyer will indemnify Seller against the risk damages due to patent infringement.