

## M2-PLUS CHILLED MIRROR MONITOR



The Model M2 Plus is a general purpose chilled mirror hygrometer with advanced capabilities, suitable for use in a large number of applications. Two models are available: The Model M2 Plus-PR and the M2 Plus-RH. Both have dual analog outputs, and an assignable alarm relay. The model M2 Plus-RH measures temperature, dew point, and calculates %RH. All three parameters can be displayed or conditioned out. The model M2-PR measures pressures and dew point, and calculates PPMV, grains per pound, and other parameters. The Model M2 Plus is a benchtop indicator (rack mount and panel mount adapter available). The unit can be mated with any one of five Chilled Mirror sensors to provide an overall

measurement range from  $-80^{\circ}$  to  $+85^{\circ}\text{C}$  ( $-112^{\circ}$  to  $+185^{\circ}\text{F}$ ) dew/frost point or 0.002% to 100% RH.

The Model M2 Plus utilizes advanced microprocessor control, and includes General Eastern's patented PACER™ technology. PACER™ is designed to reduce contamination induced errors, and provide long, unattended operation in industrial applications. 4-20mA and 0-5 VDC analog outputs, and RS-232C digital output are provided. The RS-232C port allows the analog outputs to be scaled, and provides direct communications with a host computer.

### Features:

- State of the art dew/frost point, relative humidity, pressure, and temperature monitor which requires no calibration
- Choice of five interchangeable Chilled Mirror sensors
- Temperature sensor or pressure sensor option
- On-board microprocessor to calculate and display relative humidity
- NIST traceability
- Two front panel digital displays and mirror control status indicator
- Four-wire PRT temperature measurement
- Two independent 4-20mA and 0-5 VDC analog outputs with programmable scaling
- Form C alarm relay, 5 AMP
- Digital communications via RS-232C port
- PACER™ circuitry for reduction of contaminant error



**PERFORMANCE: Accuracy (complete system at 25°C):**

**Temperature:**  $\pm 0.15^{\circ}\text{C}$  ( $\pm 0.27^{\circ}\text{F}$ )

**Relative Humidity:**  $\pm 1\%$  of reading\*

**Sensitivity:**  $> 0.05^{\circ}\text{C}$  ( $0.09^{\circ}\text{F}$ ) (Optional: Pressure:  $\pm 0.5\%$  of scale)

**Repeatability:**  $\pm 0.05^{\circ}\text{C}$  ( $\pm 0.09^{\circ}\text{F}$ )

**Hysteresis:** None

**Measurement Ranges:**

**Chilled mirror sensors:** 1111H, D-2, SIM-12H, 1311DR, 1311XR

**Temperature Sensors:** T-100,  $-80^{\circ}$  to  $+100^{\circ}\text{C}$  ( $-112^{\circ}$  to  $+212^{\circ}\text{F}$ )

**Pressure Sensors (PR):**

PT-30A, 0 to 30 psia (0 to 2 bar); PT-300A, 0 to 300 psia (0 to 21 bar) or User-supplied 4-20mA signal

**Required Sample Flow:** 0.5 to 5.0 scfh (0.25 to 2.5 L/min)

**Maximum Cooling Rate, Dew/Frost Point:**  $1.5^{\circ}\text{C}$  ( $2.7^{\circ}\text{F}$ )/sec (typical, above  $0^{\circ}\text{C}$  ( $32^{\circ}\text{F}$ ))

**Response Time: Temperature:**  $< 7$  sec. ( $+25^{\circ}$  to  $+70^{\circ}\text{C}$  ( $+77^{\circ}$  to  $+158^{\circ}\text{F}$ ) step change)

**Display Resolution:**  $0.1^{\circ}$  (dew/frost point, temperature), 0.1% RH

**Update Time:** 3 seconds

\* - nominal from calculation

**PHYSICAL:**

**Weight:** 4.3 kg (9.5 lb.)

**Shipping Weight:** 6.6 kg (14.5 lb.)

**Environmental:** General purpose bench or rack mount.

**FUNCTIONAL:**

**Outputs**

**Analog:** Two: 4-20 mADC, 500 ohm max., 0-5 VDC, 5mA

**Dew/Frost Point:**  $\pm 0.2^{\circ}\text{C}$  ( $\pm 0.36^{\circ}\text{F}$ ) max.

**Analog Scaling (std.):**

**Dew/Frost Point:**

*Sensors 1111H, D-2:*  $-40$  to  $+60^{\circ}\text{C}$  ( $-40$  to  $+140^{\circ}\text{F}$ )

*SIM-12H:*  $-25$  to  $+100^{\circ}\text{C}$  ( $-13$  to  $+212^{\circ}\text{F}$ )

*1311DR, 1311XR:*  $-80$  to  $+20^{\circ}\text{C}$  ( $-112$  to  $+68^{\circ}\text{F}$ )

**Relative Humidity (opt.):** 0% to 100% RH

**Temperature (opt.):**  $-40^{\circ}$  to  $+60^{\circ}\text{C}$  ( $-40^{\circ}$  to  $+140^{\circ}\text{F}$ )

**Pressure (opt.):** PT-30A, 0-30 psia (0 to 2 bar); PT-300A, 0 to 300 psia (0 to 21 bar)

**Digital:** RS-232C

**Alarm:**

**Relay:** Form C, SPDT, 5A, 250 VAC

**Service Alarm:** TTL compatible. Service bit also available on RS-232C output.

**PACER™ status:** TTL compatible. Status bit also available on RS-232C output.

**Displays:** 2 displays, 3 1/2 digit LED

**Power:** 100, 115, 230 VAC (+15%, -20%) switch selectable, 50-60HZ, 50 watts max. (specify)

**Operating Ranges:**

**Sensors:**

**Ambient Temp.:**  $-15^{\circ}$  to  $+95^{\circ}\text{C}$  ( $+5^{\circ}$  to  $+203^{\circ}\text{F}$ ) depending on sensor

**Pressure:**  $-14.7$  to 300 psig (0 to 22 bar) depending on sensor

**Electronics:**

**Ambient Temp.:**  $0^{\circ}$  to  $+50^{\circ}\text{C}$  ( $+32^{\circ}$  to  $+122^{\circ}\text{F}$ )

**Relative Humidity:** 85% max.

**ACCESSORIES:**

**PM-M2,** 19" rack mount adapter with dust cover

**T-100,** temperature sensor

**PT-30A, PT-300A** pressure sensor