

M3-Series

HYGROCLIP[®]

Humidity goes Digital



Programmable Transmitter for Humidity, Temperature and Dew Point

- Fully interchangeable probe eliminates maintenance downtime
- Proven sensor technology provides $\pm 1.5\%$ RH / $\pm 0.3^\circ$ C accuracy
- Dew Point accuracy $\pm 0.5^\circ$ C ($\pm 0.9^\circ$ F) over normal operating range
- Long term stability of better than 1% RH per year
- Potentiometer free – digital calibration
- On-site validation and calibration with HygroPalm 3 calibrator
- Networkable through RS485 serial port
- Duct, wall, and remote mount configurations

rotronic[®]

LEADING IN HUMIDITY MEASUREMENT

The Digital Advantage

The M3-series transmitters use the very latest digital technology. Digital signal processing significantly benefits humidity and temperature measurement in the following key areas:

1. Measurement Accuracy

Digital processing of the sensor signals by the HygroClip probe and associated electronics provides more scope and greater flexibility when compensating sensor characteristics such as linearity and temperature coefficient. The ROTRONIC HYGROMER™ capacitive humidity sensor has always been the leader both in precision and stability. With the application of digital technology, sensor performance is now further enhanced.

2. Maintenance and Calibration

Unique HygroClip™ digital technology virtually eliminates downtime during maintenance. When it is time for a scheduled calibration, the HygroClip probe can be 'hot swapped' in seconds with a calibrated replacement HygroClip probe. There is no need to remove the complete transmitter to a calibration laboratory or workshop.

Calibration and sensor data are retained permanently within each HygroClip probe. Software-based calibration is simple and precise; there are no hard-to-reach, hard-to-adjust potentiometers. Multiple calibration points can be selected across the full measurement range.

Overview

The HygroClip M3 series are 3-wire humidity temperature transmitters designed for use in industrial and scientific applications within the temperature limits of -40 to 85°C (-40 to 185 °F) at the probe. Humidity and temperature are measured with the HygroClip S digital plug-in probe. From these two values, the M3 series can compute a variety of psychrometric parameters such as dew point, enthalpy, mixing ratio, etc. The combination of microprocessor based electronics and digital probe provide the M33 with unparalleled accuracy, stability and versatility.

Configurable Analog Outputs

The two analog outputs of the M33 series are factory configured depending on the parameters, output scaling and unit system specified when ordering. The analog outputs are also configurable by the user. The scale and output parameter of the analog outputs can be changed with Rotronic HW3 software. A common combination of output signals is temperature and dew point, although any combination of RH, Temperature, or computed parameter may be chosen.

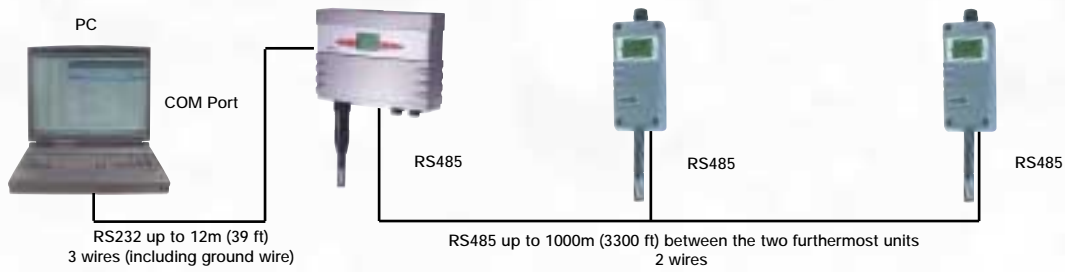
Ordering a M3 Transmitter

Rotronic M33 12...35 VDC/12...24VAC	M33						
D Duct mounting W Wall mounting							
D Digital display N No display							
Select output type and enter appropriate code							
1 4...20mA 3 0...1 VDC 5 0...10 VDC							
2 0...20mA 4 0...5 VDC							
Output signals							
1 RH and computed value 3 RH and Temperature							
2 Temperature and computed value							
Select a temperature span from the following							
1 0...100°F 3 -50...150°F 5 0...50°C							
2 0...200°F 4 0...100°C 6 -30...70°C							
For other temperature ranges enter an S and list as a separate line on PO.							
Select computed parameter. Enter X if none							
1 Dew Point 4 Absolute Humidity 7 Partial pressure							
2 Wet bulb temp. 5 Mixing ratio 8 Vapor conc, @ sat							
3 Enthalpy 6 Specific humidity							
Enter computed parameter range as a separate line on the purchase order.							

Networking the M-Series

Networking via a RS232/485 network provides an excellent alternative to the standard analog output signals provided by the M-3 transmitters. Up to 32 transmitters can be connected within one loop, with a total distance of 1000m (3300ft) between the first and last transmitter. The M-3 transmitters

include a RS485 terminal on the base plate. Using a HygroFlex transmitter as the master (RS232), up to 31 M-3 transmitters can be connected to form a network. Either Rotronic's HW-3 software or any standard RS-232 software can be used to inquire and read the network.



Field Service made easy with the M-Series

On-site validation and maintenance of sensors is made simple with the new M-series transmitters. In addition to the easy exchange of HygroClip probes for routine calibration requirements, the M-Series offers the following capabilities for on-site maintenance:

- Display of RH and Temperature values directly from transmitter on the HygroPalm 3.
- Single point calibration of the M33 probe using a reference probe attached to the HygroPalm 3.
- Single and multipoint calibration of the M33 probe against a known reference environment using the HygroPalm 3.
- Fixed value HygroClip probes (example 35%RH, 25°C) can be used in place of a M33 probe to provide a known value to the transmitter to verify the signal conversion of the transmitter and validate the entire measuring loop.

Service cables for the M3-Series

MODEL NUMBER	OUTPUT SIGNAL	CONNECTORS	DESCRIPTION
ACML232	All signal types	D-sub9/HE14-10	Configuration and calibration of the transmitter using a PC and Rotronic's HW3 software
ACRLXB5	All signal types	B5/HE14-10	Use to connect the M33 transmitter to the HygroPalm 3. This allows for a single point adjustment against the reference probe on the HygroPalm 3. In addition it also allows single/multipoint adjustment against a reference environment.

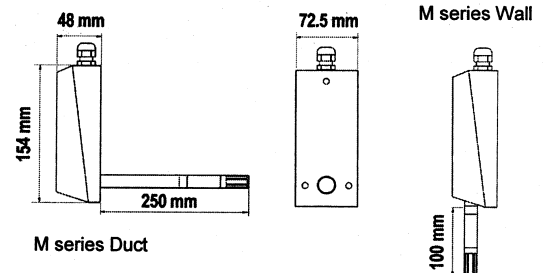


Specifications for M33

FEATURES	M33
Probe type	HygroClip S
Humidity Sensor	Rotronic™ C94 thin film capacitive
Temperature Sensor	Pt100 RTD
OUTPUTS	M33
Circuit type	3 wire
Signal type	0...20mA, 4...20mA, 0..1V, 0...5V, 0...10V (user selectable)
2 Analog outputs (scalable)	Relative humidity or temperature and one of the following parameters: dew point, wet bulb, enthalpy, vapor concentration, specific humidity, mixing ratio, vapor concentration at saturation, partial pressure of water vapor, saturation pressure of water vapor, or a user defined calculation.
Temperature output ranges	0...100°F (other optional ranges available, see order matrix on page 2)
RS485 network	Up to 31 M-3 transmitters on one network connected as slaves to one HygroFlex 2 or 3 RS232 master. RS232 to PC
Display option	LCD 2 line numeric, 1 line Alphanumeric, 1/4 character height, resolution 0.1%RH/°C/°F
SPECIFICATIONS	M33
Operating limits at Transmitter	0...99%RH non condensing, -40...60°C, with display -30...60°C
Operating limits at probe	0-100% RH, -40...85°C (-40...185°F)
Accuracy (at 23°C)	±1.5 %RH / ±0.3°C (±0.5°F) Dewpoint: ±0.5°C (0.9°F) over normal range
Repeatability	Better than 0.3%RH / 0.1°C (0.2°F)
Humidity Sensor Stability	Better than 1% RH per year
Power supply	12...35VDC (65 mA max) or 12...24VAC
Maximum load for current outputs	250 Ohm
Minimum load for voltage outputs	1000 Ohm
Electrical connections	Cable grip and terminals
Housing material	ABS
Sensor protection	Type D15G, stainless steel wire mesh, PPS frame
Protection grade	IP65/NEMA4
Housing dimensions (w/o probe)	154 x 72.5 x 48 mm (6.06 x 2.86 x 1.89")
Weight	ca 300 g

Accessories

ORDER CODE	DESCRIPTION
HW3	HW3 software (CD ROM)
HygroPalm 3	HygroPalm 3, field calibrator
HygroClip S	Replacement probe for M series transmitter, probe for HygroPalm 3
MOK-xx-DAT05	Probe extension cable for M33W, or HygroPalm 3 (xx = 2 or 5 meter)
MOKX-03-WIN	Calibration cable for HygroClip probe. Use with HW3 software and a PC. Cable length 3 meter (9.8 ft).
HygroClip Sxx/yy	HygroClip S probe simulator where xx = relative humidity in %RH and yy = temperature in °C (fixed values). Standard values are 35%RH/25°C, 50%RH/25°C, 80%RH/25°C
EAXX-SCS	Humidity standard, SCS certified, pack of 5 where xx = 00 (0 %RH), 05 (5 %RH), 10 (10 %RH), 20 (20 %RH), 35 (35 %RH), 50 (50 %RH), 65 (65 %RH), 80 (80 %RH), 95 (95 %RH)
ER-15	calibration device for HygroClip S probe



Installation - The M-Series transmitters use Rotronic's proven enclosure which provides:

- Separation of wiring base plate and electronics module.
- Installation of base plate during any stage of construction. Electronics module is then simply plugged in after all construction is complete.
- Electronics module can be removed without any changes to transmitter wiring.