

Technical Specification

Construction

Body: Stainless Steel (AISI 304)
Endcap: Stainless Steel (AISI 304)
Faceplate: Syalon Ceramic

Fixing

A 127mm diameter hole is cut in the mixer wall or floor and the supplied fixing plate is welded over it. The sensor is held by a clamp ring which is secured to the fixing plate by means of three M10 bolts. This permits sensor position to be adjusted as wear plate erodes.

Note: Thickness of mixer base (including wear plate) should be 60mm or less.

Range of Moisture

Sensor will measure up to saturation of material. Usually around 15% in standard concrete mixes, higher in lightweight aggregates.

Penetration of Field

Approximately 75-100mm dependent upon material.

Power Supply

+15V to +30V DC, 4W max.

Operating Temperature

0-60°C. The sensor will not detect moisture in frozen materials.

Refresh Rate

Digital Outputs are updated approximately 25 times per second.

Analogue Output

Configurable 4-20mA or 0-20mA current loop source. For 0-10V DC output an external 500R load resistor should be connected across the output at the control system end.

Discrete Inputs

To synchronise data collection and masking to an external trigger (ie paddle proximity indicator) or to select between moisture and temperature analogue output.

Digital (Serial) Communications

Opto-isolated RS 485 2 wire port.

Grounding

Sensor body is connected to cable shield. An external earth lug is also provided. Ensure equipotential bonding of all exposed metalwork. In areas with high risk of lightning strike, correct and adequate protection is essential.

Suitable Cables

HM05T
 5 pair twisted cable with overall screen
 7/0.2mm (24awg, 0.22mm²)
 Impedance 92 W/Km Capacitance 98pF/m
 Maximum Length 400m with 24V supply
 (90 m with 15V)

HM05C
 4 core cable with overall screen
 16/0.2 mm (0.5mm²)
 Impedance 40W/Km Capacitance 98pF/m
 Maximum Length 110m to
 Hydro-View/Hydro-Control IV

Ordering

The following products and accessories are available – please ask for further details.

Code Description

HM05T	Hydro-Mix V – standard mode with linear output for normal digital or analogue connection.	0115	Power supply – for up to 4 sensors
HM05C	Hydro-Mix V – compatible with the Hydro-View interface or Hydro-Control IV	0049	RS232-485 adapter – 9 pin type
0071	4 metre, 7 core unterminated connecting cable for HM05T	0049A	RS232-485 adapter – DIN rail mounting
0069	4 metre, 4 core screened cable terminated with 6 pin Bulgin connector (for connecting to extension cable)	0050	Hydro-Link diagnostic software for communicating with sensor
		D0151	User Guide for Hydro-Mix V
		0021	Fixing plate for welding to mixer (see diagram)



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HM:05:2000

Hydro-Mix V

PRODUCT INFORMATION SHEET

*the ultimate intelligent
 microwave sensor for
 measurement of
 moisture in mixers*



Hydronix



Hydro-Mix V

defining the standards of microwave moisture measurement

The Hydro-Mix V microwave sensor uses the unique Hydronix digital measuring techniques to provide a greater accuracy of measurement over a wider range of moisture contents than any other sensor on the market. Designed for rugged wear in all types of mixer, the Hydro-Mix V sensor with integral signal processing provides a linear output (both analogue and serial) that may now connect directly to any control system or interface in 'compatibility' mode with Hydronix control and interface equipment.

Measuring in the mixer

Reading at 25 times per second the sensor detects rapid changes in the moisture in the materials throughout the mix cycle.

Sensor configuration

The sensor is configured remotely using the Hydro-Link diagnostic software. A large number of parameters are selectable, including the type of output, filtering characteristics etc.

Sensor response

The sensor response may be adjusted remotely using the Hydro-Link diagnostic software to eliminate the effects of mixer blades and air voids within the mix thereby ensuring optimum performance for any particular type of mixer.

Auto-track – mix OK?

Another important unique feature of the sensor is the inbuilt facility to indicate when the mix is homogeneous, such that the moisture reading is truly representative of the entire mix. Typically, the sensor averages moisture readings for 10 seconds after homogeneity is detected to achieve very high accuracy of measurement.

Graphic display

Using the Hydro-Link software (or when interfacing with other Hydronix equipment) a graphic trace may be viewed to assist in selecting the most suitable set up parameters. This information may also be used to determine the effectiveness of the mixing action and whether any adjustments to the mixer configuration are required.

Synchronised readings

The sensor may be programmed only to read after a given time period after an input from (typically) a proximity switch that detects a passing blade. This facility is useful when the sensor is covered by material for only part of the mix cycle.

Sensor outputs

Two modes of operation are selectable that change the sensor output.

1. Standard mode:

The sensor provides both a digital (serial) and analogue linear output, that may be scaled internally or externally.

2. Compatibility mode:

The output simulates that of the previous range of Hydronix analogue sensors, and is used when replacing this type of sensor or when interfacing with the Hydro-View or Hydro-Control IV units.

Calibration

The linear unscaled output requires calibration to provide a meaningful moisture reading. When the sensor is connected directly to the control system, calibration should be performed in the system, or alternatively using Hydronix interface/control equipment. The facility to internally calibrate the sensor using the Hydro-Link software is also available.

Temperature measurement

Temperature output is available to provide readout of material temperature.

Accuracy of measurement

All measurements may if required be calibrated to oven dried laboratory tests to an accuracy of $\pm 0.1\%$.

Wear life

The ceramic faceplate is the only part exposed to wear when installed in the mixer. The special composition of the material used has been selected, after many years experience, for its exceptional wear characteristics. Under normal use the sensor will last for many years.

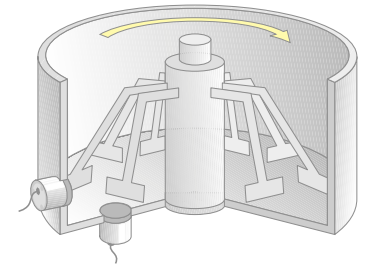
Flexible positioning

The Hydro-Mix V sensor may be used successfully with all static pan type mixers as indicated, and only one sensor is required. However, it is important that it is positioned in the moving flow of material where no build up on the sensor face is likely to occur.

For rotating pan mixers the Rotating Pan Adaptor Kit will be required.

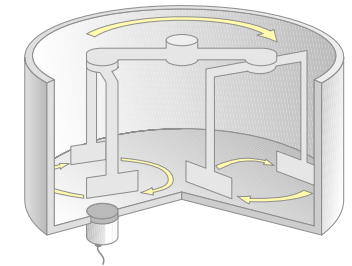
Turbo mixers

The sensor may be positioned in the base of the mixer, or in the side wall providing there is sufficient material to cover the sensor. In this position the sensor is less susceptible to accidental damage and is more accessible. Bottom edge of sensor is positioned approximately 50mm above mixer floor.



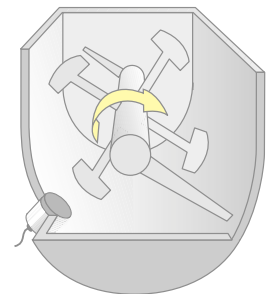
Planetary mixers

Mount the sensor in the base of the mixer. Position of sensor centreline is set in from the side wall of the mixer by approximately 1/4 to 1/3 of mixer radius.



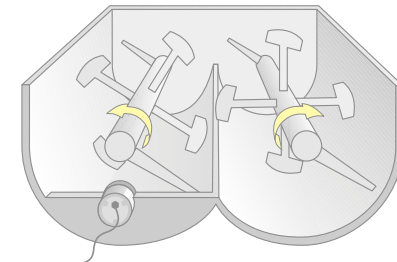
Single horizontal shaft mixers

Position sensor on the upside of the blade movement. Centreline of sensor mounted at approximately 10° angle from the vertical



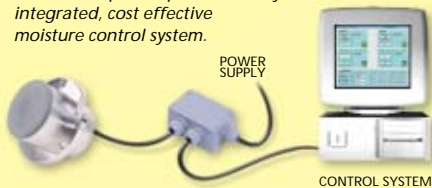
Twin shaft mixers

Sensor positioned in end wall at the opposite end to the motors, with bottom edge of the sensor approx 75mm above mixer floor, and vertically below the centreline of the shaft.



1 Digital connection

Direct with control system in 'Standard' mode using the linear analogue or serial output, to provide a fully integrated, cost effective moisture control system.



2 Hydro-View connection

Displays and communicates moisture to control system.



3 Hydro-Control Jr connection

A simple but accurate way of controlling the addition of water in the mixer, this system is easy to install, simple to use and extremely cost effective. Can be used 'stand alone' or with a control system.



4 Hydro-Control IV connection

Completely controls the mixing cycle to provide the correct addition of water irrespective of variation in the aggregates. This operates to a level of accuracy unachievable with any other system and operates in such a manner to reduce mix cycle time to a minimum consistent with the production of a homogenous mix.

