

# PROGRAMMABLE HIGH-FREQUENCY TYPE MOISTURE METER & CONTROLLER

MTFM-Series

## Introduction:

MTFM series of moisture meters/controllers are available in more than 10 different modes, virtually offering solutions to moisture measurement/control for pulp paper in moisture range from 75-96%. These meters are offered in material like SS-316 (ceramic/Teflon coating), polypropylene, derelin etc to make up with corrosion, thermodynamical and other pertinent physical parameters of grain under measurement/control. On account of above, these moisture sensors system are first choice for agro, biomedical, petrochemical, , organic/inorganic chemical, textiles, beverages,

## Operating Principle:

These hybrid resistance/capacitance type moisture controllers measure moisture/ flow rate/temperature of grain using moisture/mass flow/thermal signal conditioner respectively. Grain moisture meter /signal conditioners measures/conditions the capacitance/resistance using high frequency/voltage pulse to measure %resistance/capacitance, which is proportional to moisture in grain. These high frequency co-axial pulse type moisture sensors are able to finely detect/measure any change in the grain flow and give instant feedback signal to master controller which after considering the status of grain mass flow rate/temperature/inlet water flow rate, correct the dosing of water using sliding mode control technique to ensure set moisture level. Accuracy of these controllers is further strengthened by intelligent software (Kalmam-filtering), which takes into account dynamic change in atmospheric temperature/density of grain. Moisture Vs grain mass flow and moisture Vs water flow rate is given as under....

$$F = K_1 \cdot Mg/M - K_2 \cdot T/M^{0.6-0.8}$$

F= water flow rate, M=moisture flow, T= Amb. Temperature, Mg = Grain flowmeter



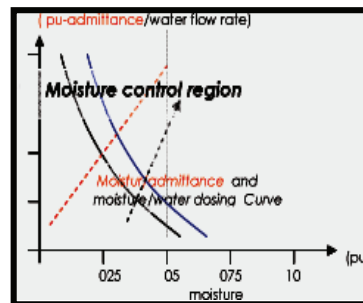
Moisture flow sensor

In-line moisture sensor(MRFMM-0010)



Sectional view of grain moisture sensor

MRFMM-0075



Characteristic of moisture flow control system/sensor

effect of moisture of admittance

## Electrical Mechanical specification of moisture sensor for Powder/Grain/Lump/Solid:

model	% moisture measurement	Particle sie micron	Spec. resistance measurement	Temperature measurement	Accuracy/ Repeatability	Electrode Material	Cooling
MRFMM-0010	6-30	<0.001	2.5 MΩm...100 TΩm	11...110 °C	99.5 100	golsd coated brass/ss	Air/oil
MRFMM-0020	6-30	<1.000	2.5 MΩm...100 TΩm	11...110 °C	99.5 100	golsd coated brass/ss	Air/oil
MRFMM-0030	6-30	<100.0	2.5 MΩm...100 TΩm	11...110 °C	99.5 100	golsd coated brass/ss	Air/oil
MRFMM-0050	6-30	<5000.0	2.5 MΩm...100 TΩm	11...110 °C	99.5 100	golsd coated brass/ss	Air/oil
MRFMM-0075	6-30	lump	2.5 MΩm...100 TΩm	11...110 °C	99.5 100	golsd coated brass/ss	Air/oil
MRFMM-0100	6-30	Soild slab	2.5 MΩm...100 TΩm	11...110 °C	99.5 100	golsd coated brass/ss	Air/oil

## SPECIFICATION OF SENSOR FOR IDENTIFICATION OF MOISTURE PARAMETER OF POWDER/GRAIN/LUMP/SOLID :

### General electrical/mechanical Source specifications:

Operating voltage 220 volts, 1phase, 40-60 Hz  
 Range of moisture measurement: 85-960%  
 Resolution of moisture: 100000  
 Resolution of Temperature measurement: 1:100000  
 Repeatability for moisture: 100%  
 Operating temperature range: -30-100degree cel  
 Accuracy: 99.990% have reading  
 Fringe effect: 0.000001% of set point  
 Burden: less than 100 micro volt/full scales current or better  
 Input capacitance: 10 nF  
 Repeatability: 100 of reading  
 Linearity adjustment: upto 100 nano volt  
 Input imedence: ultra low (<1000 nano volt burdon),  
 Filtering: low pass (adjustable)  
 Offset: variable upto 10,000 nano volts (manual/auto)  
 CMMR: >80 db at 50-60 Hz  
 Isolation: > 100 giga ohm  
 Temperature coefficient of variation: < 10<sup>-9</sup>12ppm  
 Connector: BNC-9 pinx2 and BNC-25 pinx2  
 Internal rechargeable battery 1 x 12V / 7.2Ah  
 Display 5 1/2 & 6 1/2 digit LED display  
 OTHER OPTION: DC/AC/PULSE (100-10000 PULSE/SEC) precision moisture display unit  
 Protection over voltage/short ckt  
 Option: These power supplies may offer in pulse mode.  
 Interface: RS-232/U.S.B. Operating voltage: 220 volt A.C. (50-20,000 Hz)/ 12 volts D.C.  
 Option: ADDITIONAL SOFTWARE to plot V/I OR ANY DESIRED INFERENTIAL PARAMETER. THESE SPECIFICATIONS OR PART THERE OF MAY BE MODIFIED TO MEET ANY TAILOR MADE SOLUTION



moisture meter for solid slab



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