DFMC

MA

Microwave Moisture Analyzer

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Microwave Moisture Analyzer

1. Product Overview

Microwave Moisture Analyzer (MA) is one kind of new online material moisture detection equipment of non-contact type. This series of products have a very good adaptability and a mature solution to some special cases like under environment of complicated material shape, running at a high rotation speed, acid and alkaline corrosion, etc. Meanwhile, it is a fully automatic online detecting system based on embedded operating system platform. It can not only detect moisture accurately, but also continuously provide reliable moisture data as one link during the automatic control of industrial processes. The real-time measurement results of this product can be directly involved in automatic process control.

MA I Microwave Moisture Analyzer

MA II Microwave Moisture Analyzer

MA Ⅲ Microwave Moisture Analyzer

2. Product Principle

Microwave moisture measurement technology is used by this analyzer. The ability of material to absorb microwave is mainly decided by the dielectric loss factor. The microwave absorption coefficient of moisture is scores of times more than the material, so when the microwave penetrates the detecting material, power attenuation and phase shift of microwave is mainly affected by the moisture content of the material. The measurement principle of this equipment is to calculate the moisture content in the materials by testing the changes of these two kinds of physical natures of microwave after it passes through the material.

3. Product features

- Non-contact measurement: it will not wear the probe, it will not stick to the material, and it will not affect the production process.
- Measure the overall moisture of material: the sum of surface moisture and Inherent moisture; the measurement results are more representative.
- Strong adaptability: it won't be affected by material color, temperature, particle size and environment, dust, water vapor.
- Quick and real-time measurement results: The sampling rate reaches the microsecond level, which can provide real-time measurement value for process monitoring.
- Wide range of application: Almost all (non-conducting) substances can be measured.
- High safety: high safety and reliability, no radioactive nuclear source.

- Low emission energy: do not change the nature of the material; it is safe and reliable.
- Humanized operation interface: it is user-friendly for on-site application.

4. Technical Data

Applied way	Microwave emission measurement
Working frequency	2.4 – 2.5 GHz (ISM wave band), depending on local regulations
Transmitting power	< 10mW (< 10 dBm)
Application	Measurement of moisture of bulk materials on the belt

1) Host unit

Shell	Wall shell is made of stainless steel
Protection grade	IP 65
Weight	About 12kg
Ambient conditions during operation	-20 ~ +45°C (253 ...318 K), relative humidity: max.85%, no condensation
Ambient conditions during storage	-20 ~ +70°C (253~343 K) relative humidity: max.85%, no condensation
Achievable accuracy	I Type：0.5weight % ~ 1.0weight % (standard deviation) II Type: 0.3weight % ~ 1.0weight % (standard deviation) depending on product and sensor
Display/operation	5.7 inches 640*480 graphic dot matrix, 65K color TFT touch LCD
Power supply	Depending on the instrument version: 100 ~ 240 V AC, 50/60 Hz
Power consumption	Maximum 30 VA (AC/DC), Depending on the configuration

Cable section	Minimum 1.0 mm^2 (power supply)
Cable interface	5*m20*1.5
High-frequency cable	Cable length is 1.5-3m, 50Ω, SMA interface, (inside of C-type frame)
Current output	One current output: 4 ~ 20 mA, Maximum 750 Ω
Digital input	The second digital input for following three forms Function description: 1. Measurement (startup/stop) Disconnection: Stop measurement Close: Measurement startup or measurement operation 2. Product selection Disconnection: Product 1 (P1) Close: Product 2 (P2) 3. Start sampling Disconnection: No action Close: Start sampling measurement
Serial interface	RS 485: Data transmission rate 57600 baud, 8 data-bits, 1 stop bit, no parity, no signals

2) Technical data of the sensor

Name	High gain directional antenna
Application	Detecting moisture of materials on the belt without steel wires
Shell material	Aluminum
Weight	About 2 kg
Operating temperature	-10 ~ +55°C (263 K-----323 K) No condensation
Storage temperature	-20 ~ +60°C (253 ----33 K) No condensation

Name	Ultrasonic thickness sensor
Application	Thickness detection of solid materials
Shell material	CPVC
Protection grade	IP65
Weight	About 0.5 kg
Ambient temperature	-40 ~ +140°C (233 K~413 K) No condensation
Storage temperature	-40 ~ +266°C (233 K ~ 539 K) No condensation
Output mode	4-20mA

3) C-type frame of mechanical device

Frame material	Q 235
Protection grade	IP65
Weight	38kg

Note: the technical specifications of analyzer are the performance parameters of analyzer in the standard environment, and the specific degree of implementation depends on the field working conditions.

5.Product Application

Microwave Moisture Analyzer is suitable for online detection of various non-conductor substances, including coal, wood, sugar, bagasse, sand and chemicals.

Common materials: coal, chemical fertilizer, sand etc.

Textile industry: fiber tow package, cotton bag etc.

Grain cereals: wheat, rice, corn, sorghum, corn, cereals, feed etc.

Bio fuels: bagasse, sawdust, wood chips, wood sheets etc.

Moisture detection of coal as fired

Moisture detection of fiber bundles

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