



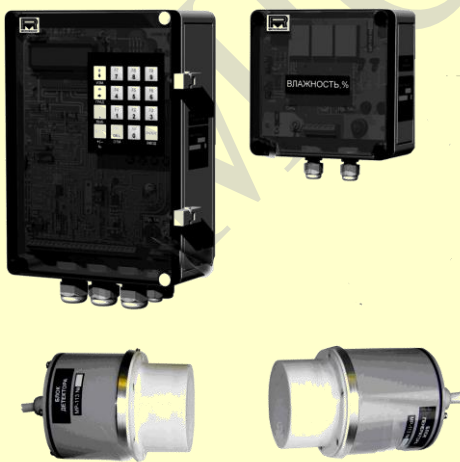
MICRORADAR

Laboratory and on-line microwave moisture meters

Optimizing moisture content in butter production using on-line microwave moisture meter



In butter the Moisture content is the most important parameter to control. The EU regulation allows a maximum moisture content of 16.0%. A lower content reduces weight and margin. For effective monitoring and control of moisture content, all predicted moisture values are shown in essentially real-time in the measuring station and are available to all production employees. In this manner, staff have continuous access to information about the current status of the butter quality and can react immediately to production or quality issues. The investment has amortized in less than one year simply by reducing the range of moisture fluctuations in the butter.



The MR113K20M moisture meter is used for the continuous measurement of the moisture content in butter without additives. A device is suitable for application in the moisture range from 10 % to 20 % with a resolution of 0.01% moisture. Devices are easily incorporated into automatic process control systems. The sensors are easy to remove and do not interfere with system washing.

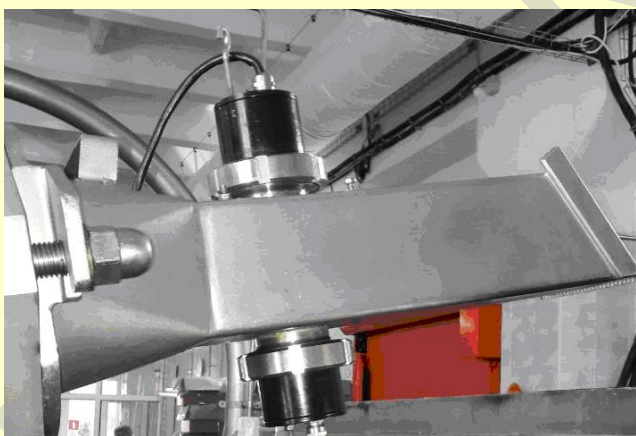
The operating principle of the moisture meter is based on measuring of microwave energy* absorption by a moist material and transformation this value to a numerical code relevant to the moisture of a material.

**The radiation consistence of a microwave generator is not more than 0,5 mwatt/sm² that doesn't exceed the International Standard limit (1910.97 – 10 mwatt/sm²) stated for nonionizing radiation, and so there is no need to take special protective measures.*

The moisture meter ensures self-acting correction of measuring results at a material temperature variation, has a current output and a serial port RS- 485 for data transmission to a computer. The sensors' signal is transmitted to a microprocessor processing unit, where moisture is evaluated. The value of moisture is displayed on a display diagram board of a microprocessor unit and is converted to analogue outputs 4-20 mA and 0-5 V.

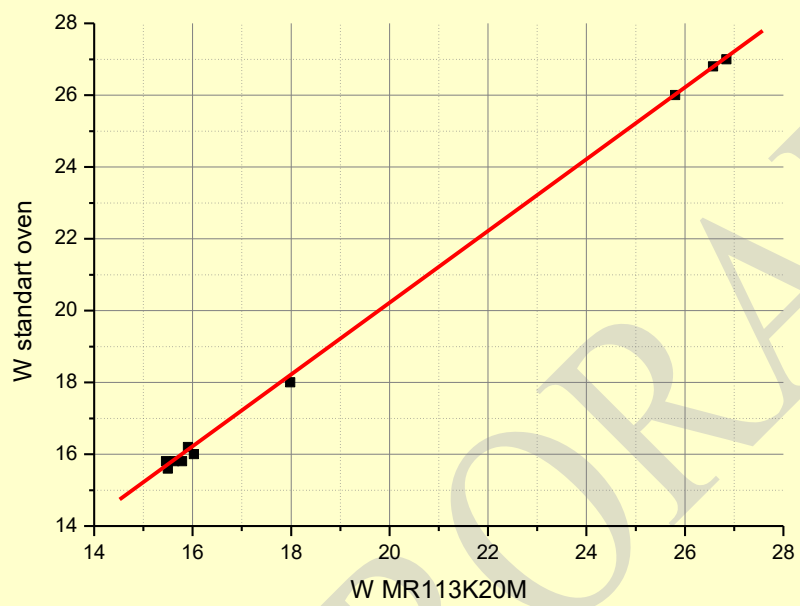
Through the channel RS485 moisture, temperature and the sensors' signals can be transmitted to the computer. The complete set of delivery of the device includes the program of storage and displaying of moisture real-time, that allows to enter into the computer, to watch, to store and to print the information on moisture for any span. A moisture measurement accuracy is from 0,15 % up to 1 % depending on a moisture range considering inaccuracies of the sample choice and moisture measuring by a standard method, for example, by oven.

Examples of mounting sensors on extruders :



The basic technical characteristics:

Parameter	Specification
Instrument Range for moisture measurement by meters %	From 10 to 30 according to the agreement with a customer
Main accuracy, %	Not more than 0,15 - 1 abs. according to the agreement with a customer
Temperature of the material under test, 0C	From +5 to + 25
Current output standard (optionally), mA	4-20
Current output capability, Ohm	Not more than 500
Output voltage range (depending on the chosen Current Output Standard), V: (4-20)mA	0,5-2,5
Measurement mode	Continuous
Power supply, V: AC 50 Hz	230(+22...-33)
Power consumption, V*A	Not more than 50



The installation of the MR113K20M on the machine MC9 SIMON FRERES. Moisture range 15-27%, standard deviation is 0.24%

