Matsushima
Matsushima Measure Tech

All-round for both liquids and bulk solids

80GHz Radar Level Transmitter

MWLM-FM80 series

User-friendly functions for various

User-friendly functions in the field

Easily confirmed by mobile

Easily confirmed by mobile or PC by bluetooth connection. No wiring required for adjustment. Can be operated from safe location even in difficult-to-reach sites.

Only Matsushima unique function

Easily angle adjustment after maintenance

Angle / dimension sensor system･After taking out the sensor for maintenance, it is easy to restore the sensor.

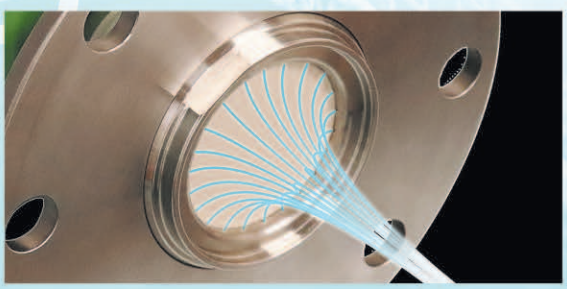
Acquired patent

Notification of adhesion alarm and inspection date

The adhesion alarm and inspection date are notified by making the beating signal of 4-20mA output, which avoids unstable measurement.

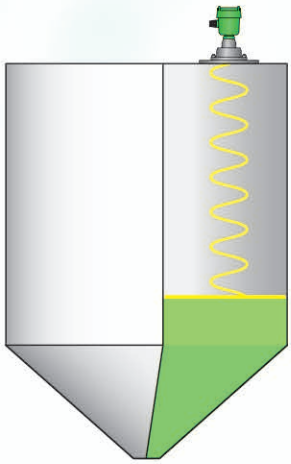
Adhesion prevention with 360° air purge mechanism

360° slit for purge contacting with the lens surface prevents adhesion to the lens surface.



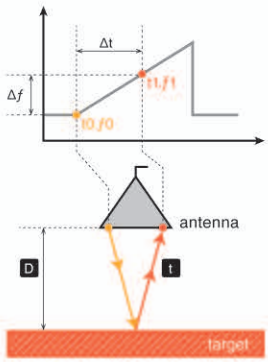
s industries! World top class quality hi

Operation principle



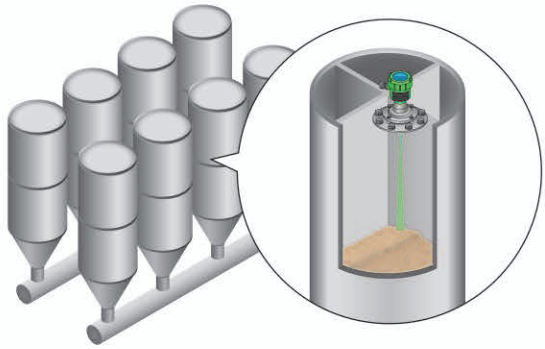
In the FM-CW method, the sensor transmits a high frequency radar signal while modulating the frequency at a constant cycle.
When it is reflected and received by the target, the frequency deviation from the transmitted signal is converted into round-trip time and measured as distance.

1. Transmit modulation frequency f0 from antenna.
2. Receive f0 reflected by the target with antenna.
   At this time, f0 is received at the timing of t1.
3. When f0 is received, the frequency is f1 shifted by Δt, which means that it was received with a shift of Δf.
4. This frequency deviation Δf can be converted to the propagation time t by correlating with Δt.
5. Calculate the distance D by operating the propagation speed of the radio wave with this propagation time t.



Special features

Applicable to narrow space

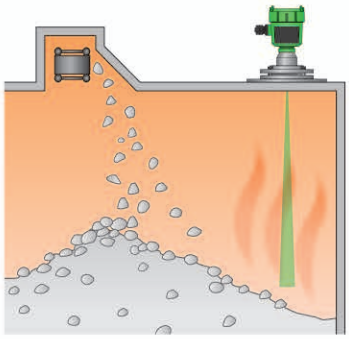


Measurement possible in narrow divided compartment of the silo (Food industry, etc.).

Stable under dusty or vapor conditions

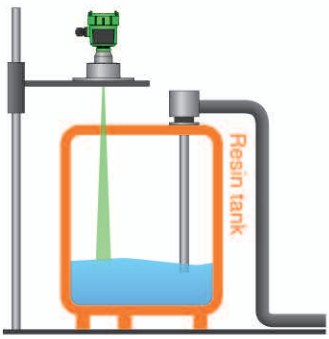
Stable measurement without influence of flying dust or vapor as millimeter wave can permeate objects smaller than ¼ size of the wavelength.

Applicable to high temperature target



No influence from temperature or gas on measurement performance and durable against max. 200degC ambient conditions.

Measurement through resin roof



Measurement through low permittivity material like resin is possible.
(ex. FRP tank, Plastic container, IBC container, etc.)

gh frequency Radar Transmitter!

Options suitable for measurement conditions

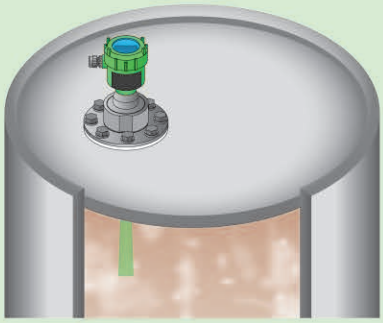
Option

Corrosion Resistance Isolation Flange

Stable measurement under corrosive gas condition by protecting the antenna from the condition.

PTFE Flange

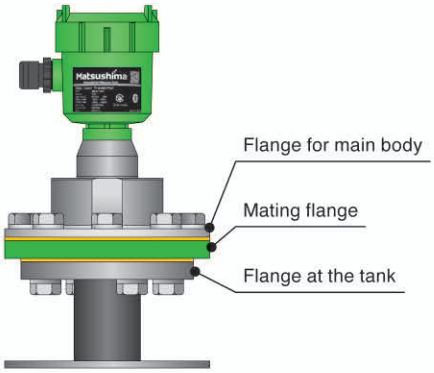
Applicable to corrosive gas environment



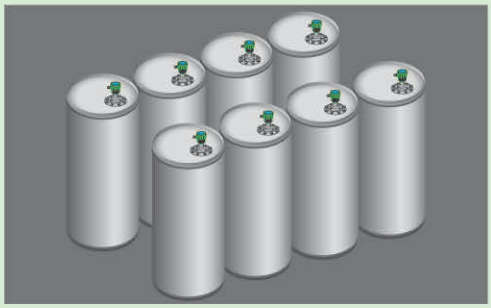
Option

Mating Flange

Mating flange to JIS65A (equivalent to 2-1/1") available for smaller liquid tanks.



Applicable to smaller tanks



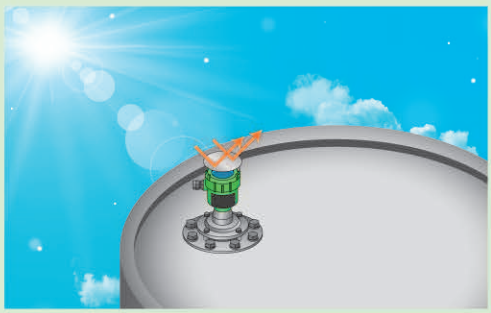
Option

Sunshade Cover

The Sunshade Cover relieves influence of sunlight and may extend the product lifetime.

Cover material: SUS

For product lifetime extension



Specifications

Model		MWLM-FM80					
Version		F03	F06	F12	S03	S06	S12
Power supply*1		DC 12V ～ DC 36V					
Power Consumption		800mW					
Mounting		Equivalent to JIS10K80A Flange			Equivalent to JIS10K100A Swivelling Flange		
Dead Zone		0.3m	0.4m	0.7m	0.3m	0.4m	0.7m
Max Measurable Distance*2		30m	60m	120m	30m	60m	120m
Transmitting Frequency		77GHz ～ 81GHz					
Accuracy		F03,S03：＜1.1m：±10mm、≧1.1m：±3mm F06,S06：＜1.1m：±20mm、≧1.1m：±5mm F12,S12：＜1.1m：±20mm、≧1.1m：±10mm					
Beam Angle		Approx.4°(including side beam approx. 8°)					
Measuring Cycle*3		Approx.0.5s - 4s(when 24VDC is supplied)					
Resolution		1mm					
Allowable level change rate		30cm/s					
Allowable Temp	Ambient Temp.*4	–20°C ～ +80°C (Without condensation)					
	Process Temp.	–40°C ～ +200°C (Without condensation)					
Allowable Pressure		Max.490kPa					
Enclosure		IP67(Housing cover and lead outlet firmly fixed)					
Lead outlet		1-G1/2(Applicable size：φ8mm to φ12mm)					
Output Signal		DC 4mA ～ DC 20mA					
Load resistance		Approx.545Ω (when 24VDC is supplied)					
Communication system		Bluetooth 5.0					
Mass		Approx.4.3kg			Approx.3.6kg		

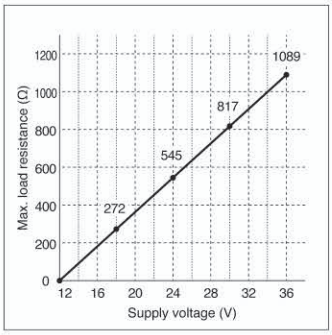
*1 The load resistance depends on supply voltage. The wiring load cannot exceed the max. load resistance of the applying power voltage. (cf. Figure 1)

*2 Max Measurable Distance : Distance from reference point

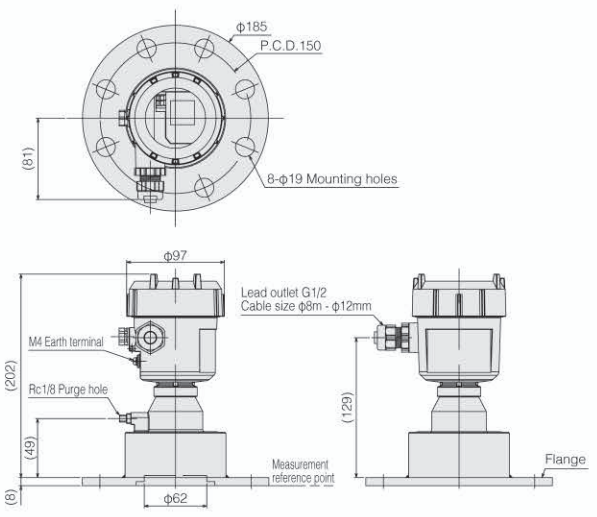
*3 Measuring cycle depends on power supply and analog output signal.

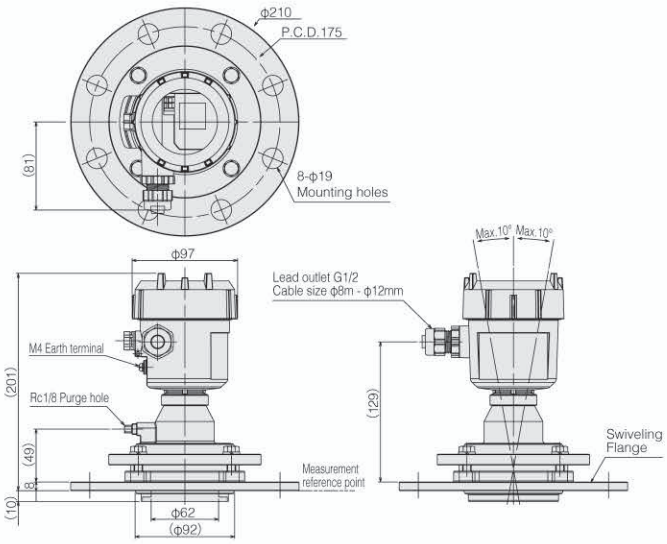
*4 The display turns off when the temperature is +70°C or higher.

Figure 1



Dimensions(mm)





Caution
- Read the instructions to ensure correct and suitable application of products.
- Contact our nearest sales office when using our products for any systems used in situations which may be life threatening.

Distributor

ISO9001 ISO14001
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Every necessary information integrated in this one unit (Option)

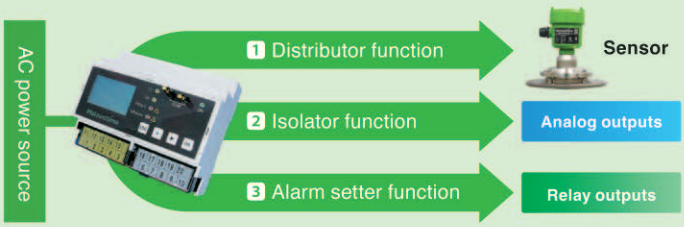
Only 106mm width palm size unit fits in narrow space in the panel.

Signal Conditioner is generally used with 2-wire powered field instruments or current output units. It imports current signal and accordingly outputs DC4-20mA or DC1-5V and dry relay contacts. It is possible to check visual indication on the LCD digital panel.

Two kinds analog outputs
Analog outputs
- Current: DC4-20mA
- Voltage: DC1-5V

Alarm & Fault alert relay
Relay outputs x 4SPDT
- Alarm x 2, Fault alert x 1,
Sensor fault x 1

3 functions in one unit. One Signal Conditioner do this and that.



Free power voltage AC85-264

Customer friendly constructions

HART sensor connection terminal

Detachable terminal blocks

Please refer to the Signal Conditioner catalog for more details.

Inspection facility "Wave Lab" convince performance

Large automatic inspection facility (simple anechoic chamber construction) named **"Wave Lab"** has been built for millimeter wave level transmitters.
It is a domestic largest class (20m) anechoic chamber facility.

Information for Wave Lab

Photo of the anechoic chamber in the Wave Lab

Remote maintenance

Supervising cost reduction and also emergent trouble-shooting by this remote maintenance/adjustment service.

1. Cost reduction as transportation and accommodation fee for supervisor is not necessary.
2. Safety training and entry permit process is not necessary.
3. Safe because no one need to be at the site.