Matsushima
Matsushima Measure Tech

Easiest use for every site in various industries

# 80GHz Radar Level Transmitter

MWLM-FM79 series

79GHz series

# User-friendly functions for
# World top class quality hi

## 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.

### Easily angle adjustment after maintenance

Only Matsushima unique function

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

### Notification of adhesion alarm and inspection date

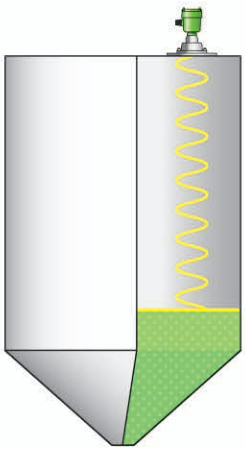
Acquired patent

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

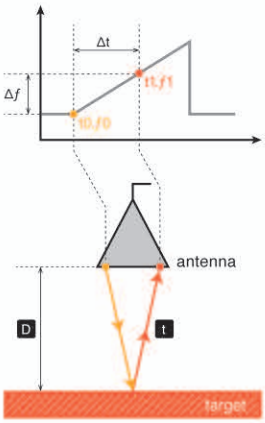
360° slit for purge contacting with the lens surface prevents adhesion to the lens surface.

## 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**.



# various industries!
# gh frequency Radar Transmitter!

## World's highest standard

**Specialized inspection facility, so called *"Wave Lab"*, guarantees the performance of the world's highest standards of 80GHz Radar Level Transmitter**

For 80GHz Radar Level Transmitter, we newly built a large automatic inspection facility *"Wave Lab"* with a darkroom structure. As a radiowave darkroom that is not affected by disturbance reflection, it is one of the largest (20m long) in Japan. It results in the world's highest level of measuring performance.

Darkroom in Wave Lab

## Special features

### Measurable in narrow space

Measurable in narrow space inside silo due to its high directivity.

### Measurable for low dielectric constant materials

Measurable for low dielectric constant materials which does not make enough reflection for former Radar Transmitter.

### Measurable for high temperature materials

A radio wave is not affected by temperature or gas. Because the max. temperature is 200 deg. C, it can be applied even in the inaccessible environment.

### Measurable at small liquid tank

Because the dead zone is 0.3 m from the reference point, it can measure up to upper limit of the tank.

## Matsushima style support and service

### Short lead time

Stable and short lead time by stock management for each part of Radar Transmitter.

### Remote service support

Remote technical service is provided in real time for commissioning and inspection of Radar Transmitter at local sites.

## Specifications

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Model | | MWLM-FM79 | | | | | |
| 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<br>F06,S06：＜1.1m：±20mm、≧1.1m：±5mm<br>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.4kg | | |

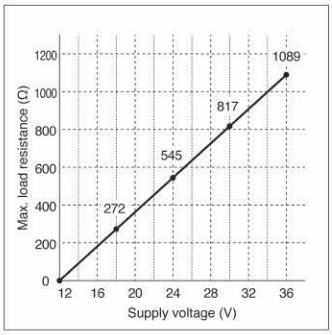
*1 The load resistance depends on supply voltage. The wiring load cannot exceed the max. load resistance of the applying power voltage. (cf. Figure 1)

*2 Max Measurable Distance : Distance from reference point

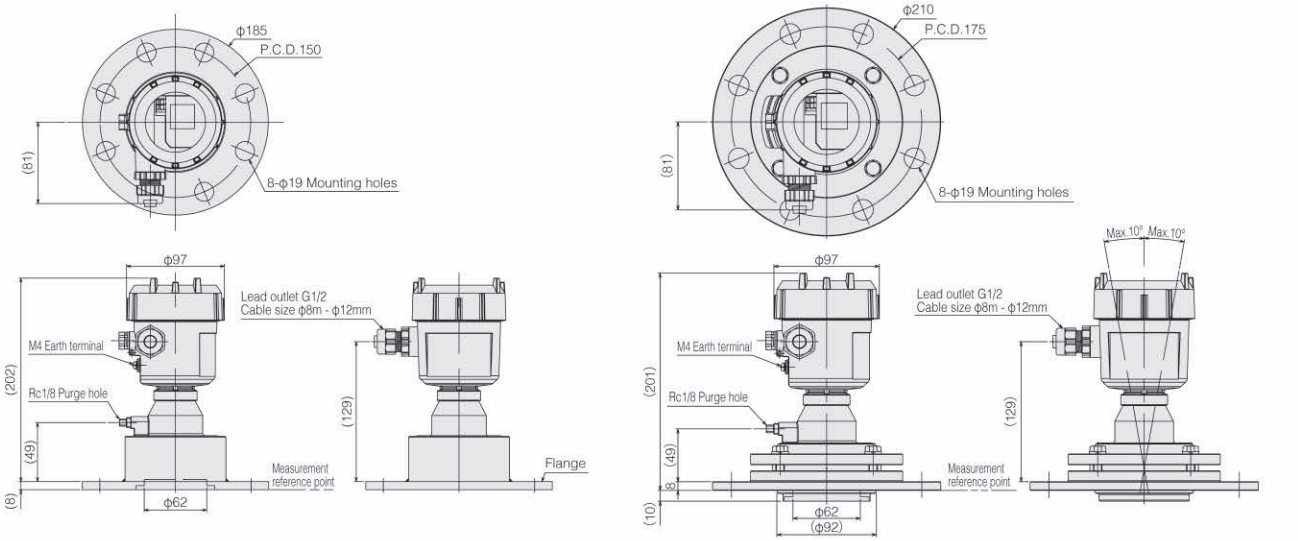
*3 Measuring cycle depends on power supply and analog output signal.

*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

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