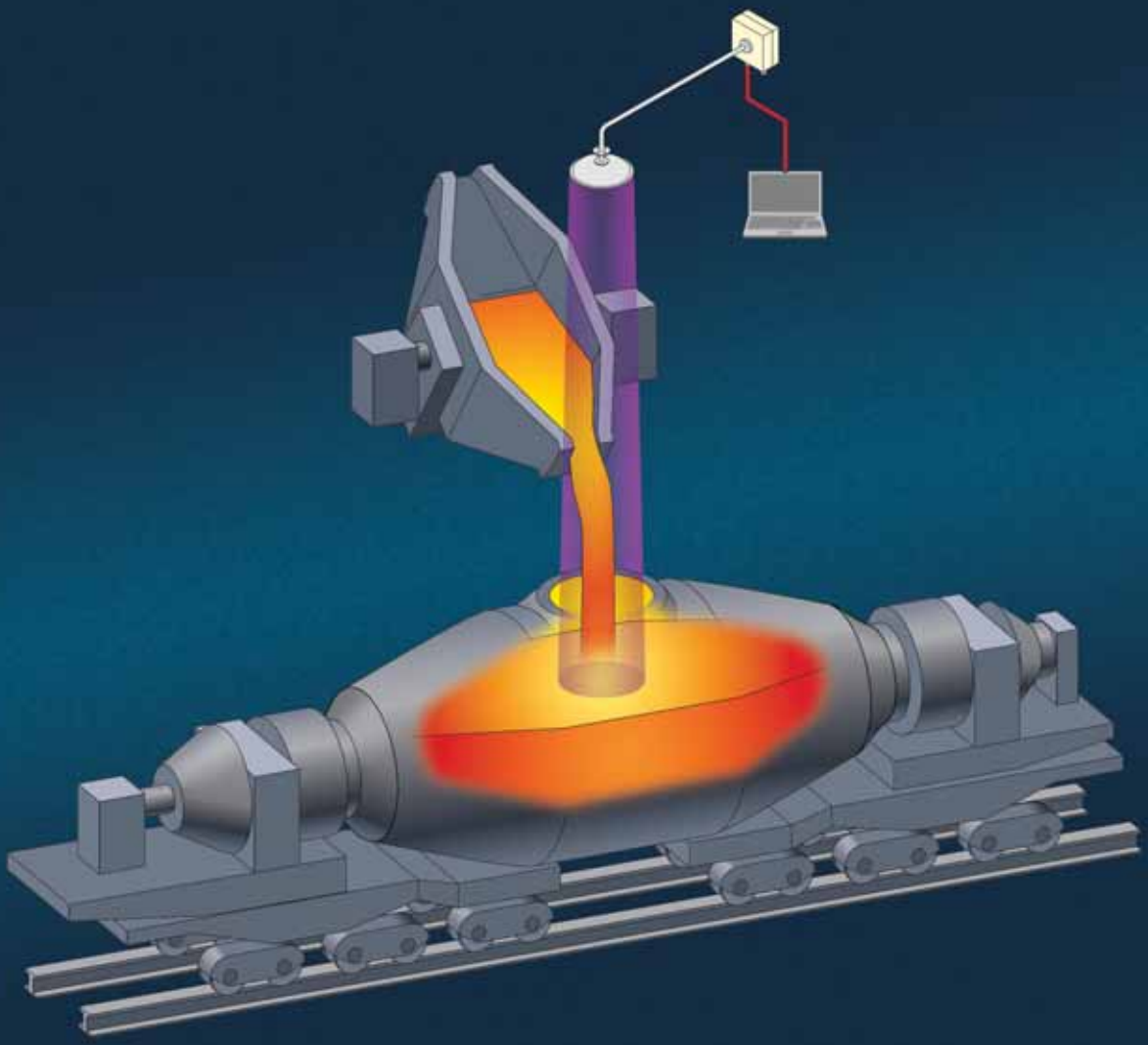
WADECO

MICROWAVE RANGE FINDER

MWS-10RF PAT.PEND.

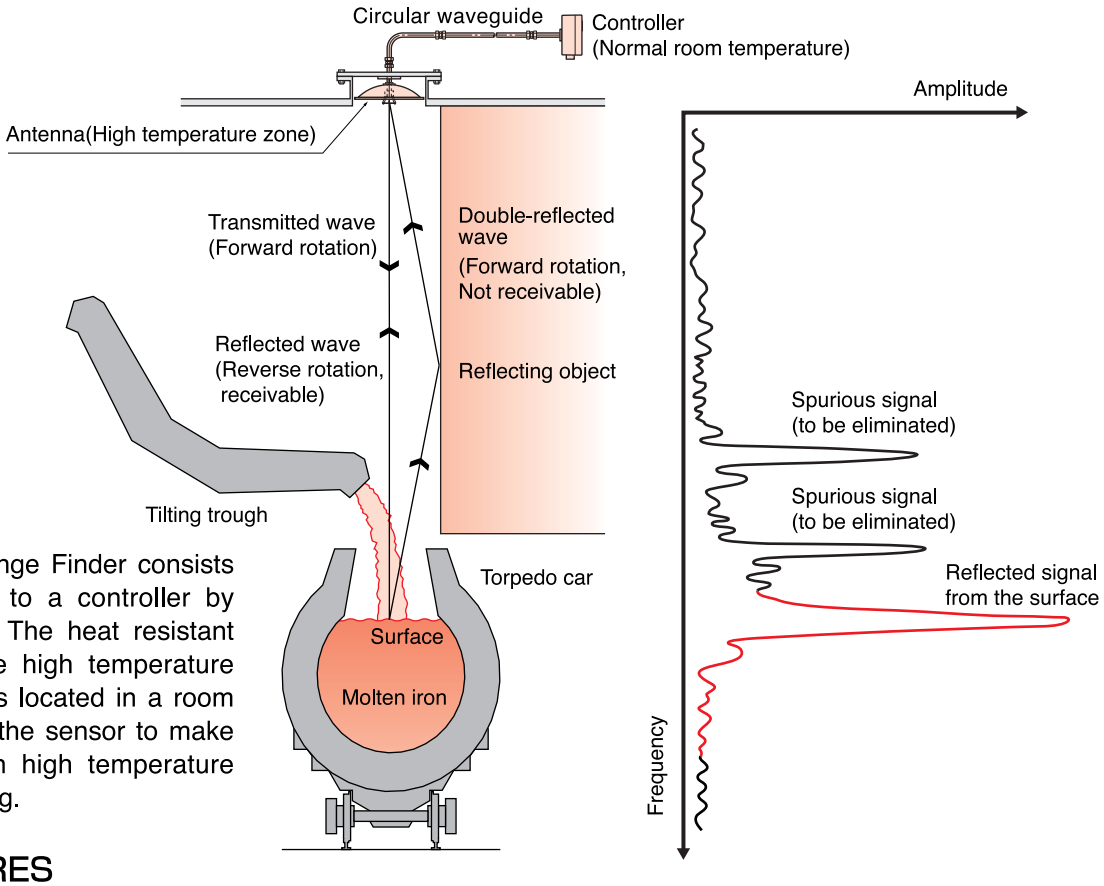
MICRO-RANGER

The Next Generation in FM/CW Radar !!



WIRE AUTOMATIC DEVICE CO.,LTD.

UNAFFECTED BY HEAT, FLAMES OR VAPOUR



MWS-10RF Microwave Range Finder consists of an antenna connected to a controller by circular waveguide tubing. The heat resistant antenna is installed in the high temperature zone, while the controller is located in a room temperature area allowing the sensor to make accurate measurements in high temperature areas without special cooling.

■SPECIAL FEATURES

1.UNAFFECTED BY ADVERSE CONDITIONS

- The antenna, which is the sensing head, can be installed in the high temperature zone without the need of additional cooling devices.
- The antenna and controller are easily connected by circular waveguide tubing, using special 90° turns and straight pieces.
- Microwaves are unaffected by temperature, flames, vapour, airborne particles or dirt.

2.HIGH ACCURACY AND RELIABILITY

- Error less than 10mm.
- False measurements caused by double-reflected waves are eliminated through the use of rotary microwaves.
- The accuracy of the measured range is not affected by fluctuating temperatures nor does it deteriorate over extended periods.
- Utilizes filters which eliminate spurious signals.

3.THE OPERATIONAL STATE IS SHOWN ON YOUR PERSONAL COMPUTER

- It displays a FFT spectrum, the received signal and various preset values.
- The received signal, FFT spectrum and the trend measurement are continuously displayed. This displayed data can be recorded and reviewed in real or accelerated time.
- Use of the recording and reviewing capabilities allows the system parameters to be optimised offline.
- The display indicates and outputs the internal temperature and any abnormal conditions. (i.e. a lowering of received signal power, rising temperature in the controller, software version mismatch and communication failures.)

4.CONVENIENT BUILT IN FUNCTIONS

- A reference point and the required range can be preset. The length of waveguide is easily subtracted from the overall distance measured.
- Compatible for use with a personal computer.
- Automatic power supply 90~240V, 50/60Hz.
- Communicates with computer by RS-232C.
- 4-20mA, analogue output.
- RS-422 digital output and input terminals.

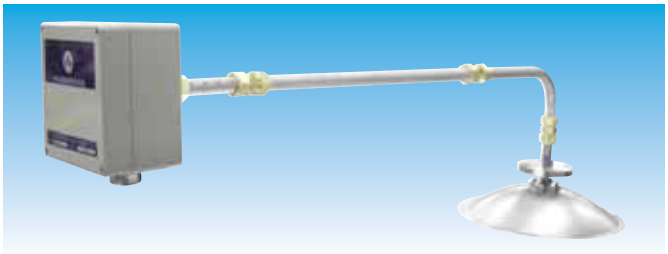
5.LIGHTWEIGHT AND COMPACT

- Portable (5.7kg controller only)
- Easy installation.

6.HIGH VERSATILITY

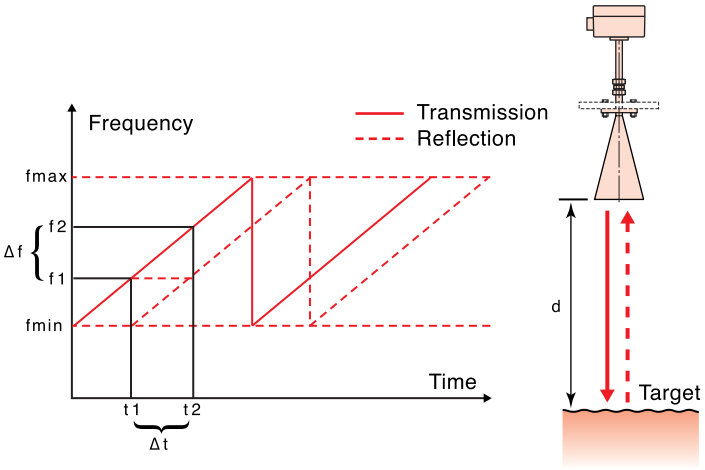
- Both hardware and software can be modified to suit your requirements.

Micro-Ranger with parabolic antenna and waveguide



PRINCIPLE

The Micro-Ranger transmits a microwave signal towards the target with a frequency that increases linearly with time. The microwave signal transmitted at time, t1, with frequency, f1, is reflected by the target and received by the antenna at time, t2. The total time to travel to and from the target is Δt. The transmitted frequency increases to f2 at time, t2. The difference in frequency, Δf, between the transmitted and reflected waves is proportional to the distance, d, to be measured. The Micro-Ranger mixes the transmitted and reflected signals together to extract the difference in frequency. This signal is analysed by a FFT (Fast Fourier Transform) analyser to output a distance signal. This is called the FM-CW method and is suitable for improving the accuracy of distance measurements.

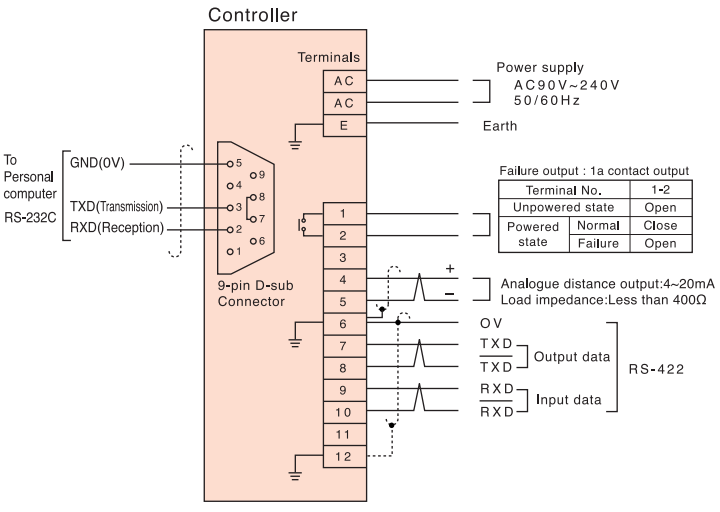


SPECIFICATIONS

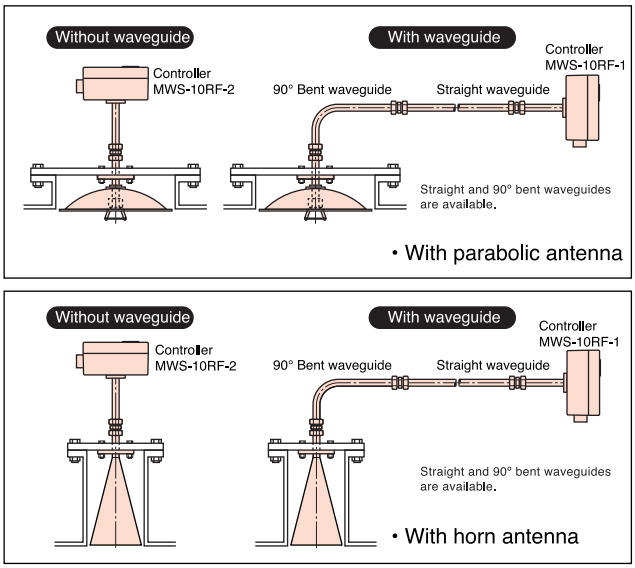
Type	Controller For with waveguide type····· MWS-10RF-1(Without indicator,Standard) MWS-10RF-1D(With indicator,Optional) For without waveguide type·· MWS-10RF-2(Without indicator,Standard) MWS-10RF-2D(With indicator,Optional) Antenna Parabolic Antenna····· P-450A-10 Horn Antenna····· H-200A
Power supply	AC90~240V, 50/60Hz
Power consumption	Approx. 15W
Microwave frequency	Approx. 10GHz
Microwave power	0.3mW
Modulation	FM-CW
Frequency analysis	FFT
Range	Max. 50m (Depending on target)
Accuracy	±10mm (Target : Metallic plate)
Response time	1 sec.
Distance indication	5-digit 00.000m (Optional)
Received power indication	2-digit (Optional)
Personal computer interface	RS-232C
Digital output	RS-422
Digital input	RS-422
Analogue distance output	Range····· 4mA~20mA Accuracy····· ±0.5% to full scale Max.Load resistance····· 400Ω
Abnormal output	1a relay contact (Relay is excited under normal condition.) DC30V 2A or AC250V 0.5A

Delay time from power on to function	Approx. 5sec.
Antennas (Either one)	Parabolic Antenna Type····· P-450A-10 Size····· 450A Radiation angle····· Approx. ± 3° (Angle in half of receiving value) Horn Antenna Type····· H-200A Size····· 200A Radiation angle····· Approx ± 6° (Angle in half of receiving value)
Ambient temperature	Controller····· -10°C~50°C Antenna····· -40°C~600°C
Noise tolerance	Square wave noise from noise simulator (Rising time : 1 nanosecond Width : 1 microsecond) ± 2KV(normal and common mode)with the frequency of the power supply in the 0°~360°phase.
Vibration resistance	10~55Hz, 0.75mm single amplitude in X,Y and Z directions, for 2hours each.
Construction	Controller····· Aluminium diecast Antenna····· SUS316
Colour	Controller····· Taupe
Weight	Controller MWS-10RF-1····· Approx. 5.7kg MWS-10RF-1D····· Approx. 5.7kg MWS-10RF-2····· Approx. 5.7kg MWS-10RF-2D····· Approx. 5.7kg Parabolic antenna P-450A-10····· Approx. 2.8kg Horn Antenna H-200A····· Approx. 2.4kg

TERMINAL CONNECTION

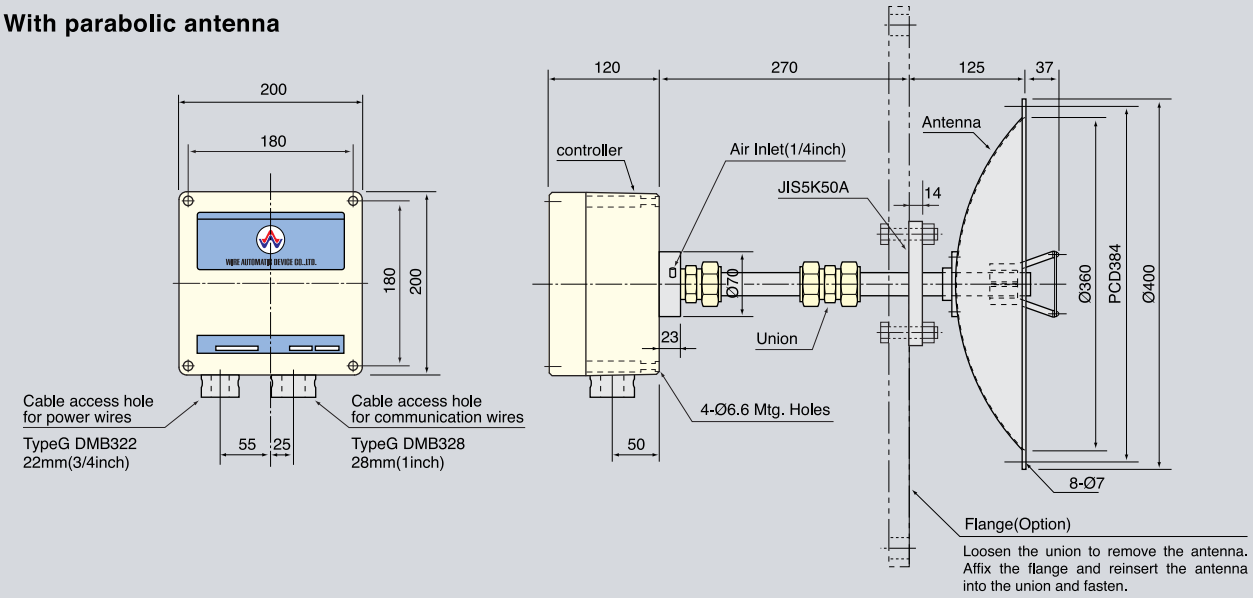


INSTALLATION EXAMPLES

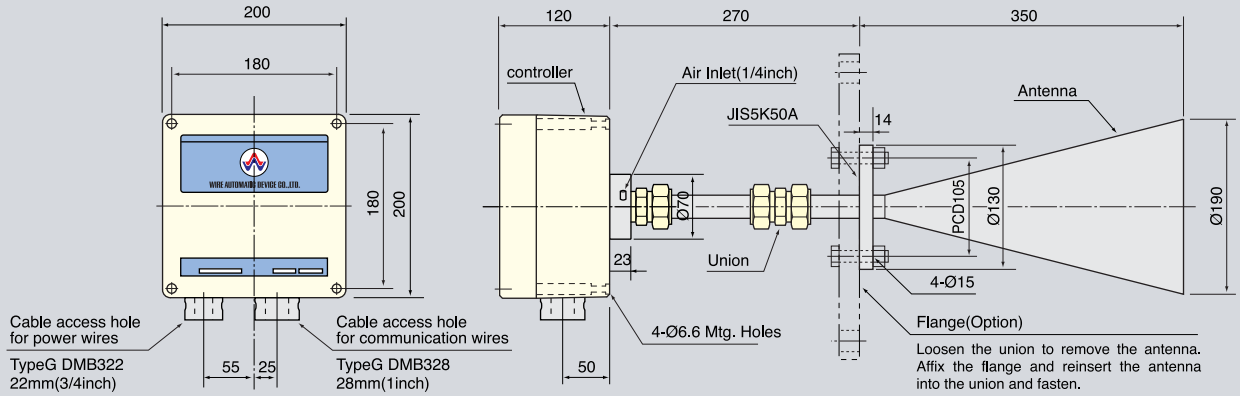


■DIMENSION

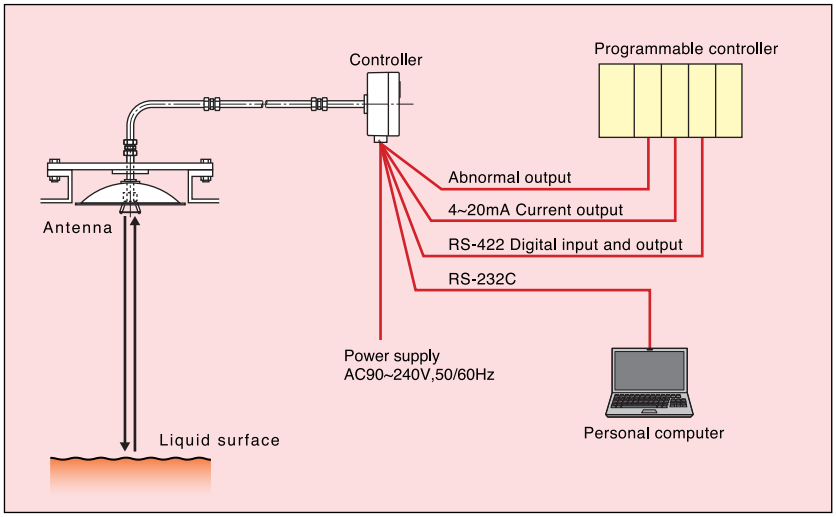
With parabolic antenna



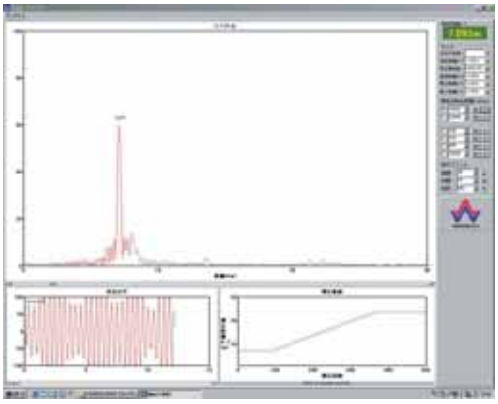
With horn antenna



■SYSTEM EXAMPLE



■COMPUTER DISPLAY



This specification may be changed without notice.

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