



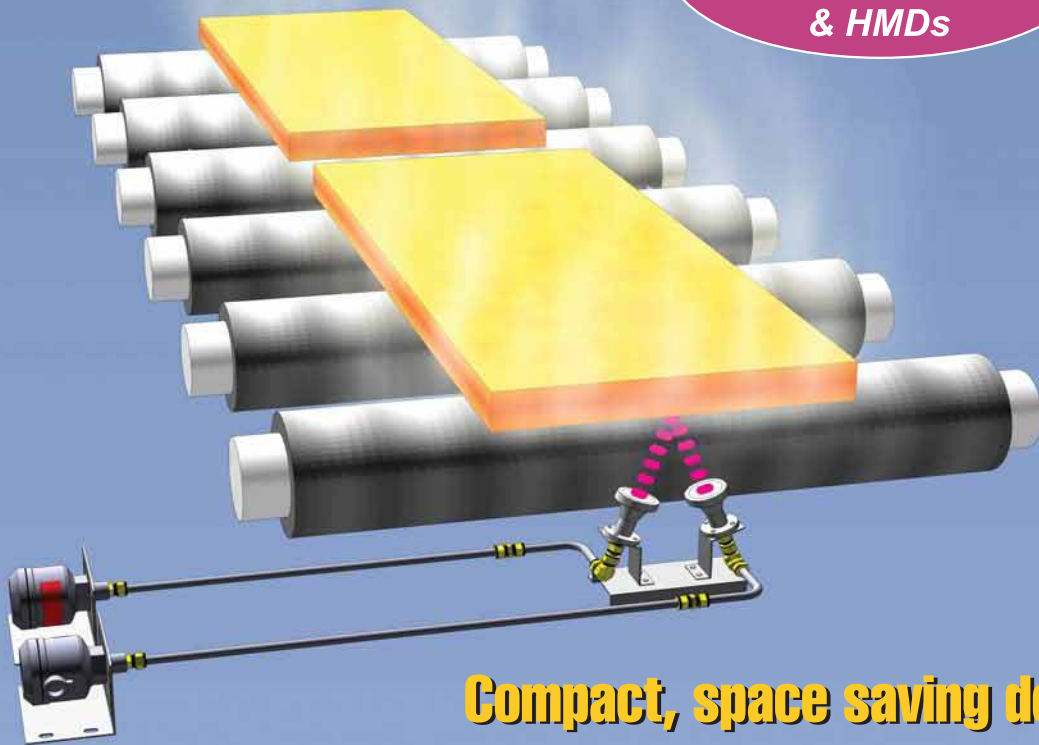
# PRODUCT TRACKING FOR THE STEEL INDUSTRY

**MWS-ST/SR-2WG-R**

## COMPACT TYPE MICRO-REFLEX

**UNAFFECTED BY HEAT, FLAMES,  
AIRBORNE PARTICLES  
OR VAPOR!**

*DESIGNED TO  
REPLACE LASERS  
& HMDs*



**Compact, space saving design  
simplifies installation!**

**WADECO CO.,LTD.**

# MICROWAVE SENSOR FOR HOT / COLD PRODUCT TRACKING

## UNAFFECTED BY HEAT, FLAMES, AIRBORNE PARTICLES OR VAPOR!

MWS-ST/SR-2WG-R Micro-Reflex consists of a pair of transmitting and receiving antennas, connected to separate controllers by circular wave guide tubing.

The antennas, which are unaffected by heat, are installed in the high temperature zone, while the controllers are located in normal room temperature areas. The detection signal outputs when the microwave beam is reflected by the slab/strip into the receiving antenna.

This maintenance free model operates perfectly in high vapor areas where optical and infrared based sensors will not. With a high degree of precision (repeatability), Micro-Reflex provides an economical, reliable and hazard free solution for Product Tracking in Continuous Casting and Rolling Mills.



Installation Example

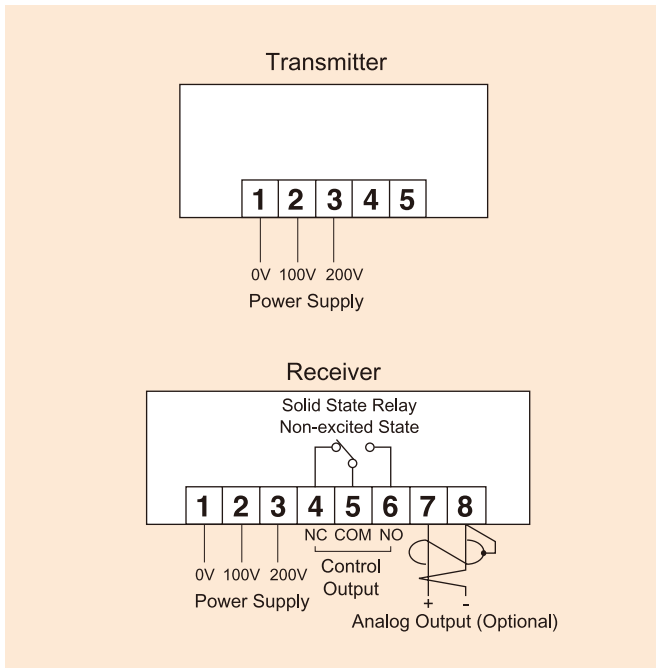
### Features

- **Increased operating range**  
The operating distance is three times that of the conventional model, thus allowing for use of longer waveguide extensions.
- **Unaffected by adverse environments**  
This sensor is unaffected by heat, flames, airborne particles dense vapor or product temperature variation.
- **Simple installation**  
The antennas and controllers come pre-mounted, on separate stands, further simplifying installation.
- **Selectable detection mode**  
Either unreflected beam (UNREFLECTED) or reflected beam (REFLECTED) detection method may be selected.
- **No set-to-set interference**  
Four channels are available, selectable by rotary switch. This permits the use of multiple units in close proximity to each other.
- **Power level & sensitivity indicators**  
The received power level and the sensitivity-set-point are indicated on a bank of 15 LEDs, allowing for easy visual adjustment and maintenance of the sensor.
- **Inspection window (optional)**  
The received power level and the sensitivity-set-point are easily seen, without removing the controller cover.
- **Solid state output**  
Highly reliable solid state output relay minimizes mechanical failure.
- **Enclosure rating IP65 equivalent**
- **Compact, space saving design simplifies installation**



# MICRO-REFLEX MWS-ST/SR-2WG-R

## Wiring



\* Phase of power supply must be the same for both the transmitter and the receiver.

\* If multi channel function is not required, and a faster response time is desirable, set the channel selector on both transmitter and receiver to CH0. Doing so will disable the multi channel mode: the phase of the power supply does not have to be the same for both the transmitter and the receiver.

## Selection of detection mode and relay configuration.

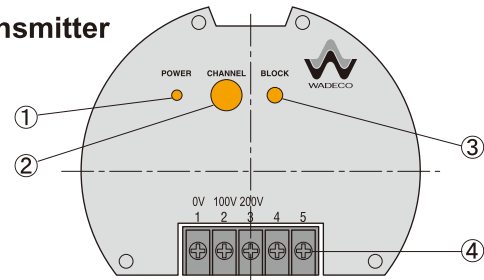
Detection mode		Beam Unreflected		Beam Reflected	
		UNREFLECTED	REFLECTED	UNREFLECTED	REFLECTED
Terminal number		4 & 5	5 & 6	4 & 5	5 & 6
Unpowered state		Closed	Open	Closed	Open
Powered state	Non-detecting state	Open	Closed	Open	Closed
	Detecting state	Closed	Open	Closed	Open

## Specifications

Type	Transmitter controller: MWS-ST-2WG Receiver controller: MWS-SR-2WG-R MWS-SR-2WG-RA (Analog output) Antenna: WG-6C (ceramic cover) WG-6G (heat resistant glass cover)
Power supply	AC100~120V or AC200~240V $\pm 10\%$ , 50/60Hz
Beam focal point	380mm from base of antenna stand
Frequency and transmission power	24GHz approx. Less than 10mW
Radiation angle	$\pm 8^\circ$ approx. (angle in half of receiving value)
Number of channels	4CH (multi-channel mode) or 1CH (single channel mode)
Received power level	Indicated by 1 of 15 LED indicators
Sensitivity-set-point	Indicated by 1 of 15 LED indicators
Control output	Solid state relay DC24V, 0.1A (standard) or 1C relay contacts AC250V, 2A, $\cos\phi = 1$ (optional)
Analog output(Optional)	Maximum allowable load resistance : 250 $\Omega$

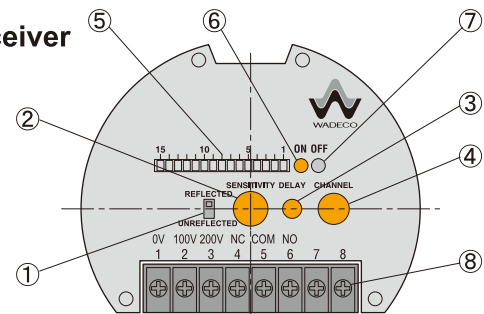
## Function of switches, indicators & rheostats

### Transmitter



	Part Name	Description
①	Power indicator	Green when power is on
②	Channel selector	CH1~4 or CH0
③	Block button	Blocks transmission
④	Terminals	

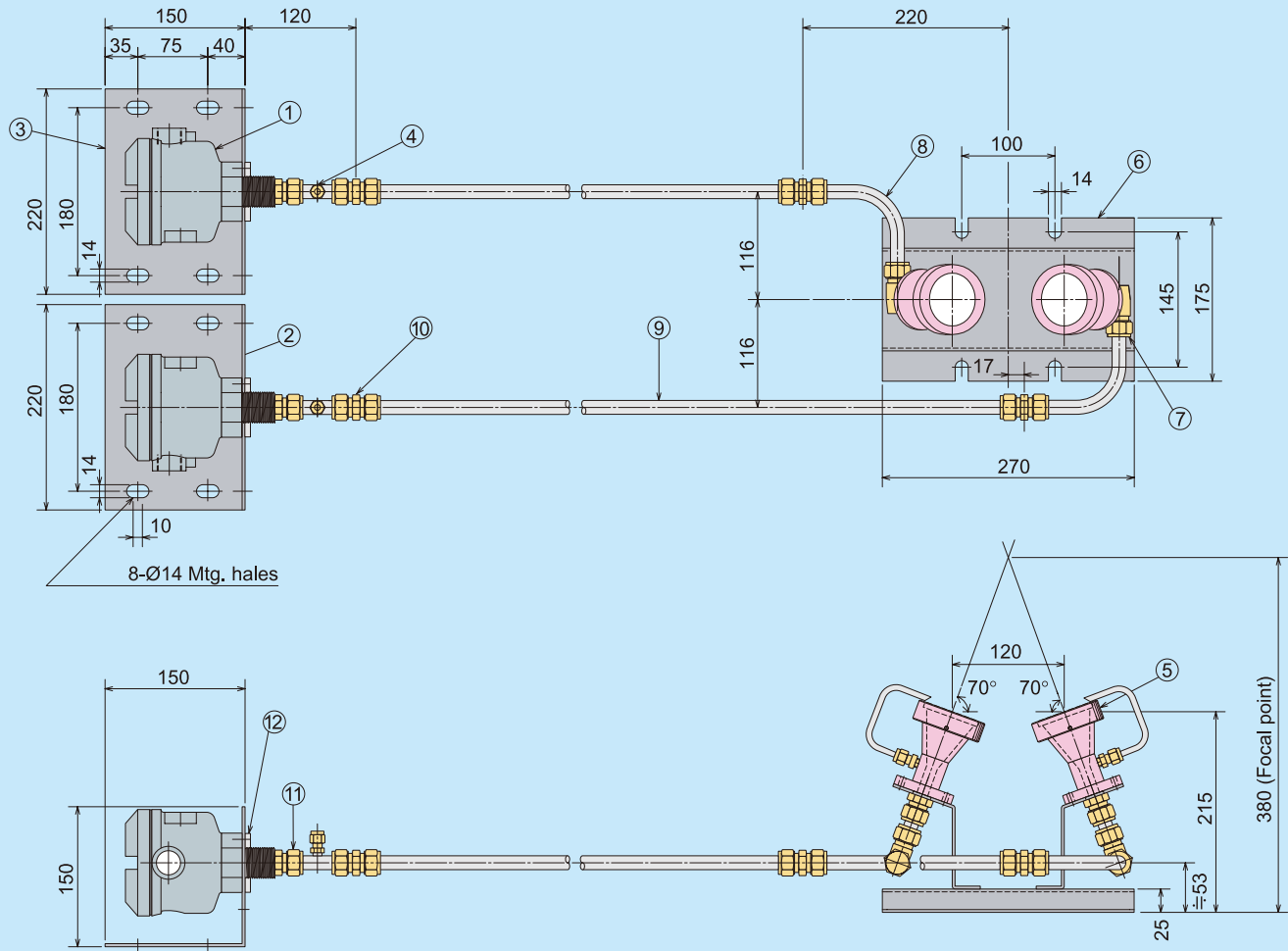
### Receiver



	Part Name	Description
①	Detection mode	UNREFLECTED: Outputs on unreflected beam REFLECTED: Outputs on reflected beam
②	Sensitivity rheostat	To adjust sensitivity
③	Off delay rheostat	0.1 ~ 10 sec.
④	Channel selector	CH1~4 or CH0
⑤	Received power level indicators	Received power level: indicated by one of 15 LEDs Sensitivity-set-point: indicated by one of 15 LEDs
⑥	Output indicator	ON (red): Illuminates on output
⑦	Output indicator	OFF (green): Illuminates on no output
⑧	Terminals	

Response time	15msec. (in multi-channel mode) or 5msec. (in single channel mode)
Delay function	Off delay 0~10sec. (adjustable)
Delay time from power on to function	5sec. approx.
Power consumption	Transmitter Controller: 2VA, Receiver controller: 2VA
Noise immunity	Pulse noise from noise simulator $\pm 1.5KV$ (normal and common modes)
Ambient operating temperature	Antenna WG-6C: Approx. $-50^\circ C \sim +600^\circ C$ WG-6G: Approx. $-50^\circ C \sim +600^\circ C$ Controller: Approx. $-10^\circ C \sim +55^\circ C$
Enclosure rating	IP65 equivalent
Construction	Antenna: SUS304, Controller: Aluminum diecast
Color	Metallic silver gray
Weight	Transmitter with stand : 2.2kg Receiver with stand : 2.2kg Antennas with stand and union elbow : 4.5kg

## Dimensions



No.	Description	Type	Material	Note
1	Transmitter controller	MWS-ST-2WG		
2	Receiver controller	MWS-SR-2WG-R		
3	Controller stand	MF-C2	SUS304	
4	Air inlet	WG-P	SUS304	
5	Antenna	WG-6CP WG-6GP	SUS304	Ceramic cover Vycor glass cover
6	Antenna stand	MF-A2	SUS304	With union elbow
7	Union elbow	B-15M0-9W	Brass	
8	90° Bent waveguide	WG-SS-R46A90 WG-C-R46A90	SUS304 Copper	
9	Straight waveguide	WG-SS-L2000 WG-C-L2500	SUS304 Copper	Length:2000mm Length:2500mm
10	Union	B-15M0-6W	Brass	
11	Controller union			
12	Nut		SUS304	

### Note

1. The quantity of bent/straight waveguides and unions depends on the distance and route from the antenna stand to the controllers.
2. The 90° bent waveguides from the antennas can exit from either side of the antenna stand and can be freely rotated around the union elbow.
3. The dimensions of the waveguides and the antenna stand may be customized on request.

This specification may be changed without notice.



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