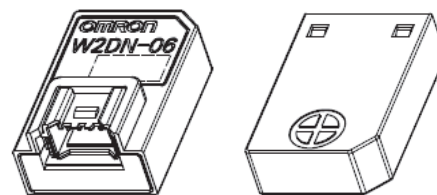


## ■ Features

- Highly sensitive magnetic sensor using the the magneto-impedance effect.
- Greatly improved ease of use by reducing variation in detection performance.
- Equipped with a door signal input terminal, the control on the main unit is simplified.
- Sensitivity switching terminal enables 4-level sensitivity switching.



## ■ Model Number Legend

W2DN - 06      (1) Wide-area magnetic sensor  
 (1)      (2)      (2) Series name

## ■ Specifications

Item	Ratings / Performance					
Detection area: Rx • Ry (*1)	Sensitivity setting	A	B	C	D	
	max.	155	140	125	70	
	typ.	145	130	115	60	
	min.	135	120	105	50	
Standard magnet	Magnet dimensions: 20 x 20 x 10 mm Surface magnetic flux density: 430 mT (millitesla) Magnetization direction: Thickness direction					
Power supply voltage	5 VDC -10% to 12 VDC +10%					
Current consumption	20 mA or less					
Output form	Open collector output Maximum output current: 20 mA or less, Output voltage: 16 VDC or less					
Output residual voltage	0.5V or less					
Output operation mode	When detected: Output transistor OFF When not detected: Output transistor ON In case of abnormality (*2): Output transistor holds OFF					
Response time	0.8 seconds or less					
Initial setting time (*3)	1.5 seconds or less					
Door signal (DOOR-IN)	Status		Door closed		Door open	
	Input condition		Low		Hi	
	For connection instructions, refer to Internal Circuitry and Recommended Connections.					
Sensitivity setting (SEL-IN)	Sensitivity setting		A	B	C	D
	Resistance value (Ω)		100 Ω or less (GND connection possible)	5.1 K	15 K	560K or more (NC possible)
	Terminal voltage (V)	MAX	1.0	1.8	2.6	2.61
		MIN	0	1.01	1.81	—
	Sensitivity is set by the connected resistor Rd value (J product recommended) The GND to which the resistor Rd is connected should be common to the GND of the sensor.					
Ambient temperature	Operating: -10 to 60°C (with no icing or condensation) Storage: -20 to 70°C (with no icing or condensation)					
Ambient humidity	25 to 85% RH					

\*1 For details on the detection area, refer to the description of the detection area on the next page.

\*2 The sensor has a built-in function to automatically adjust the detection area at the initial setting. This indicates that automatic adjustment could not be performed properly due to the influence of magnetism around the sensor.

\*3 Indicates the time required to output the detection status accurately after the sensor power is turned on.

## ■ Description of Detection Area

The detection area is defined by the installation conditions shown in the figure below, The reference point for the standard magnet must be the center of the magnet.

The specifications are defined by  $R_x$  and  $R_y$ , and  $R_{xy}$  must be treated as a reference value.

The figure is scaled for convenience.

### ◆ Sensitivity setting: A, B, and C

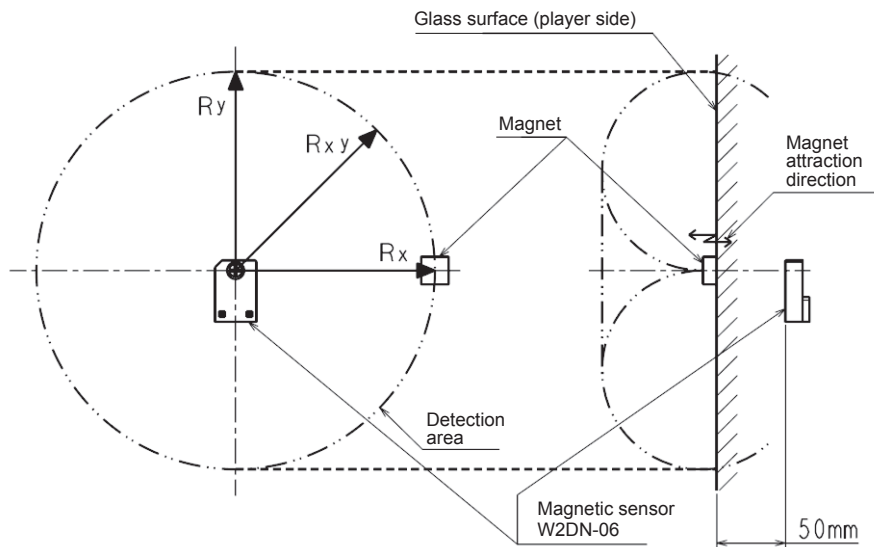


Fig. 1 Detection area: R

Fig. 2 Installation conditions

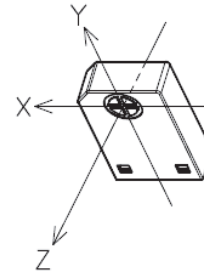


Fig. 3 Detection direction

### ◆ Sensitivity setting: D

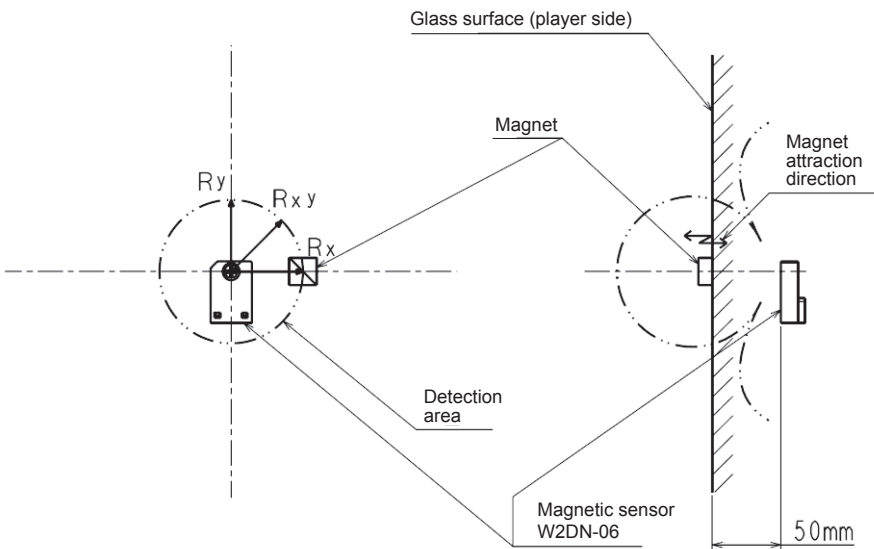


Fig. 4 Detection area: R

Fig. 5 Installation conditions

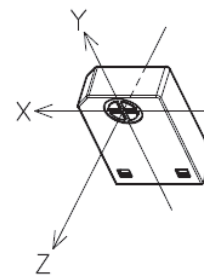


Fig. 6 Detection direction



## ■ Instructions for Use

### <Sensor Installation>

We recommend that the distance from the glass surface of the game equipment to the detection surface of the sensor be 40 to 60 mm in the arrangement shown in the figure.

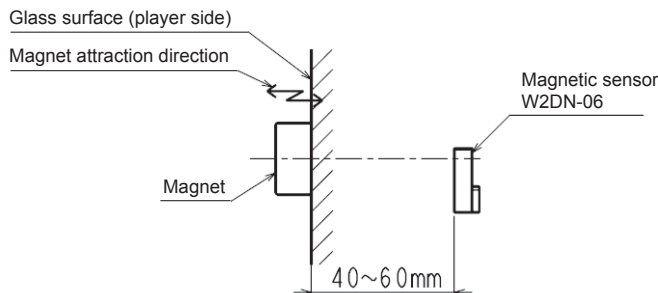


Fig. 7 Recommended layout diagram

### <Sensor Initial Setting Operation>

To correct the effects of surrounding magnetism, the sensor has an initial setting function.

The initial setting at power-on is executed when power is supplied to the sensor and the DOOR-IN input terminal is in the door-closed (Low) state. This initial setting allows for automatic adjustment of the detection area.

The automatically adjusted setting values are retained internally until the power is turned off.

Consider the following with regard to the initial setting.

- (1) The initial setting takes up to 1.5 seconds to complete. During this time, be considerate to avoid being affected by magnetism as much as possible. Not doing so may cause the detection area to fluctuate.  
[Example] Do not drive solenoids, motors, etc.  
Do not set the initial setting conditions of the sensor with the magnet in close proximity.
- (2) If the DOOR-IN input terminal becomes Door Open (Hi) during the initial setting at power-on, the initial setting will be canceled.  
The initial setting will restart when the Door Closed (Low) state is entered again while the power supply to the sensor is maintained. (For details, refer to the operation chart.)
- (3) The output transistor will remain OFF if the automatic adjustment could not be performed properly in the initial setting due to the influence of magnetism around the sensor.  
To release the OFF state, it is necessary to shut down the power supply to the sensor and then restart it, taking into consideration the influence of the surrounding magnetism so that the automatic adjustment can be performed properly.

### <Function of the DOOR-IN terminal>

The DOOR-IN input terminal is used to reduce the influence of the surrounding magnetism.

By using this input terminal, the following responses can be made.

- (1) Sensor initial setting start condition (first power-on)  
Response to events such as changes in the detection area and the output of magnetic detection signals due to a discrepancy between the initial setting state and the surrounding magnetic field environment in use when the initial setting of the sensor is executed with the gauge unit or the glass door open.
  - (2) Cancels the magnet detection signal when the door is open (disables the magnet detection inside the sensor when the door is open).  
Response to events such as magnetic detection signal output caused by changes in the surrounding magnetic field environment that occur when opening and closing the gauge unit or glass door during use.  
The magnet detection signal cancellation when the door is open continues for one second when the door is closed.
- For signal input to the DOOR-IN input terminal, if either the gauge unit or the glass door is open, input the signal as "Door open".
  - If you do not use this function, connect the DOOR-IN input terminal to the GND side.
  - The sensor will not function when it is open.

### <How to Set Sensitivity>

The sensitivity setting is selected by the resistor connected to the SEL-IN terminal.

Set the sensitivity to be used and connect it to GND through the resistor value listed on page 1.

Precautions for sensitivity setting function

- (1) The sensitivity setting is configured during initial setting of the sensor and is retained internally until the power is turned off.

**<Influence of Surrounding Magnetic Field>**

If the direction of the sensor changes due to operations such as opening and closing the game equipment, the surrounding magnetic field may affect the detection area and cause changes in the detection area and magnetic detection signals to be output.

Please take design considerations into account before use.

**<Influence of Surrounding Metals>**

When a magnetic body is placed around the sensor, the detection area may become narrower or the detection area may not be adjusted automatically, causing the output transistor to hold OFF. Please be sure to check the characteristics of this product thoroughly before using it.

In addition, magnetic bodies may become magnetized when brought close to a magnet, so please take this into consideration when designing your equipment.

**<Influence of Magnetic Flux Source>**

Magnetic flux generated by a solenoid, motor, etc. may cause the sensor to output a magnet detection signal.

When placing a source of magnetic noise near the sensor, please verify the impact and take appropriate design considerations into account.

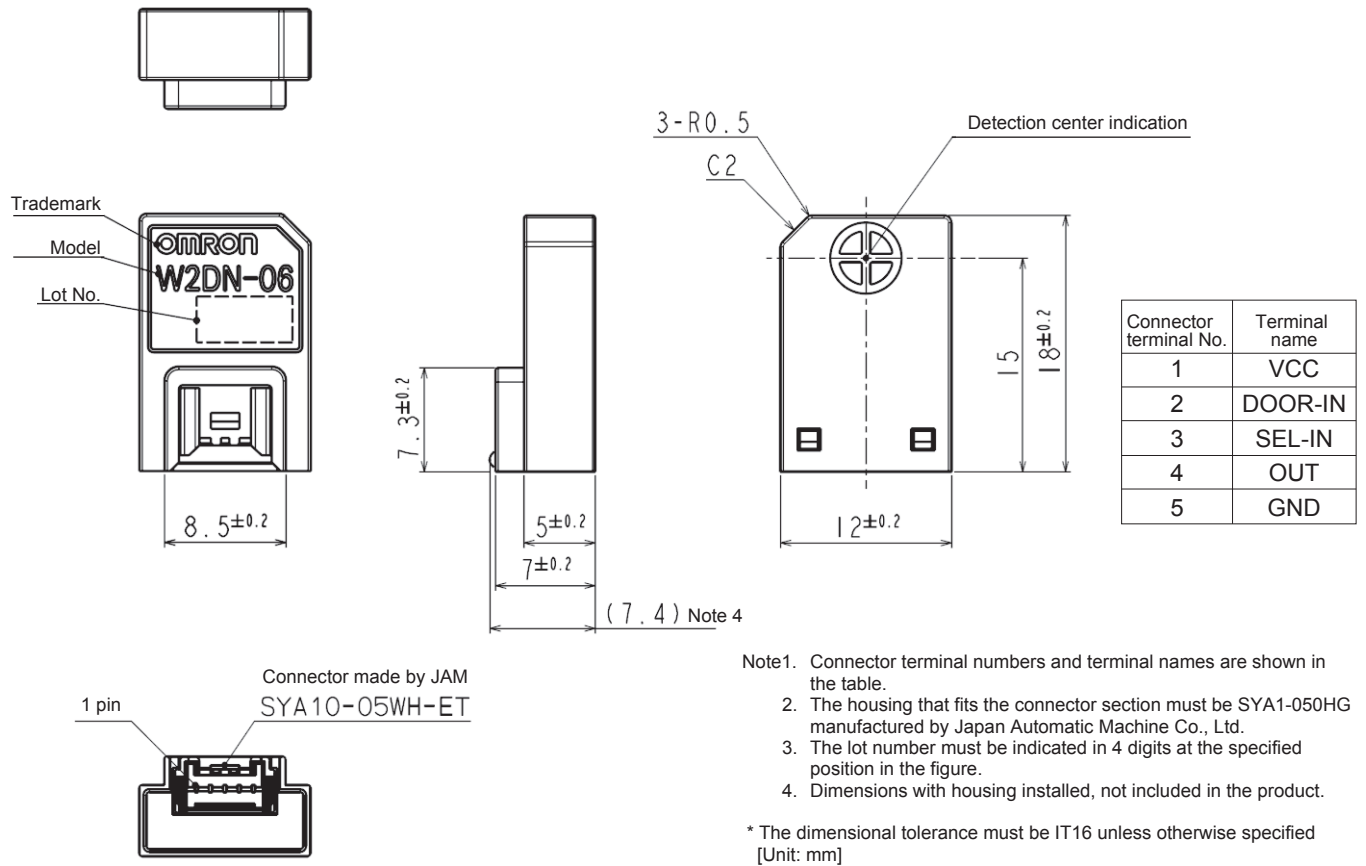
Note: Motors are generally more affected in the excitation locked state than in the normal drive.

**<Precautions for Environmental Changes After Initial Setting>**

The output transistor may hold OFF only when a metal around the sensor is magnetized by a strong magnet and when the sensor detects a magnetic field. In order to release the OFF state, the sensor must be turned off and on again.

Please take this into consideration when designing your equipment.

## External Dimension



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