

# Model MD-5C4S1 Thin Proximity Sensor for SUS Pachinko Balls (Open collector output / 12 / 15 V DC )

**PATENTED**



Model List	Operation Status	Frequency
MD-5C4S1	Normally closed	Standard
MD-5C4S1-B		Different

## Application

- Single or level detection of SUS pachinko balls
- Detection of medals and coins or their level detection

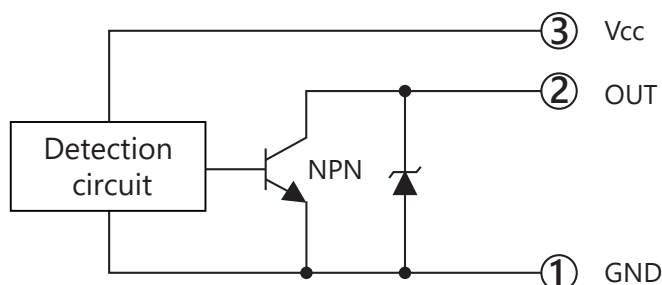
## Features

- Flat type proximity sensor (top surface detection type) exclusively for steel pachinko balls with a thickness of 4 mm (ultra-thin type) that can be used in common with the power supply 12 / 15 V DC.
- The 2-wire sensor requires an external output residual voltage processing circuit and an open collector output conversion circuit (interface IC, etc.). Since this sensor has these circuits built-in, the cost of the external circuit of the sensor can be significantly reduced. In addition, since this sensor has an open collector output, High / Low logic processing is possible, and it can be directly connected as an input signal of DC30V or less.
- Since the C-cut shape is used for the main body case, it is possible to prevent incorrect installation orientation.
- Features a keyway on the case side for an easy installation in one touch.
- Since the operation mode is normally closed, disconnection detection processing can be easily performed.

## Rating / Performance

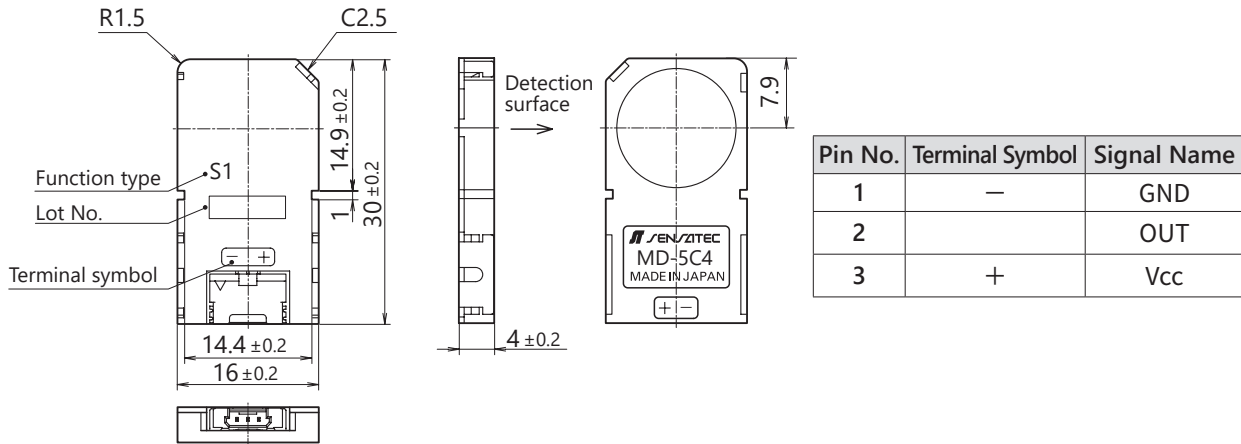
Model	MD-5C4S1
Detection Surface	Upper side detection
Detection Distance	SUS Pachinko ball 4.0 ± 0.5 mm (3.5 to 4.5 mm)
Hysteresis	0.1 to 1.5 mm
Standard Detection Object	SUS Pachinko ball (ø 11 ± 0.05 mm)
Power Voltage	12 V / 15 V DC (Operating voltage range : 10.8 V to 16.5 V DC)
Power Consumption	12 mA DC or less
Output	NPN transistor open collector 30 V DC, 20 mA DC or less
Output Residual Voltage	1 V DC or less (Load current 20 mA DC)
Operation Status	Normally closed(Output ON without detection / Output OFF when target is detected)
Response Frequency	100 Hz or more
Temperature Range	-20 to 70 °C (-25 to 70 °C during storage) (Without dew condensation or freezing)
Humidity Range	35 to 85 % RH (35 to 85 % RH during storage) (Without dew condensation)
Breakdown Voltage	500 V AC, 50/60 Hz for 1 min (Between live parts and casing)
Insulation Resistance	50 MΩ or more, at 500 V DC megger (Between live parts and casing)
Vibration Resistance	Durability : 10 to 55 Hz, Double amplitude: 1.5 mm in X-, Y-, and Z-direction, each 2 hours (Device not powered)
Shock Resistance	Durability : 200 m/s <sup>2</sup> (Approx. 20 G) in X-, Y-, and Z-direction, each 3 times (Device not powered)
Anti-static Electricity	15kV Between the detection surface and the GND of the 1st terminal of the connector (C=150 PF, Discharge resistance : 330 Ω)
Ingress Protection	IP50
Case Material	Case : ABS resin with glass (Blue), Cover : PC (Transparent)
Connector	Connector : DF14A-3P-1.25H(22)(3-pin) (from HIROSE ELECTRIC CO., LTD.) [Connections] Housing : DF14-3S-1.25C, Contact : DF14-2628SCF (from HIROSE ELECTRIC CO., LTD.)
Weight	Approx. 3.2 g
Options (Sold Separately)	Connector harness : CNH-DF1403S26-300

## Output Circuit



\*Because there is no reverse connection protection diode built-in, pay careful attention to the polarity of the power supply.

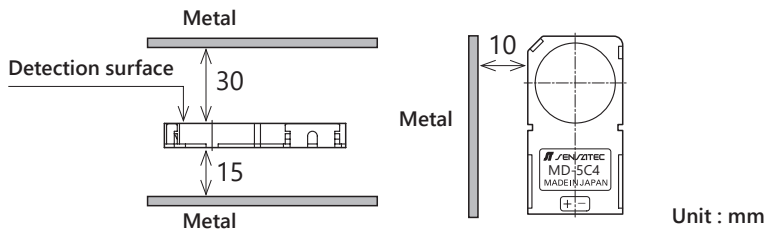
## Dimensions



## Precautions During Use

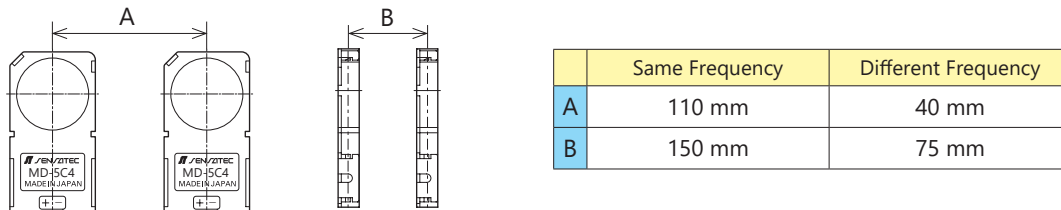
### Influence by surrounding metals

Do not place metal around the proximity switch (Within 30 mm from the detection surface and within 15 mm from the back of the detection surface, or within 10 mm for the side surface from one direction and within 15 mm for the side surface from two directions.) Otherwise, the detection distance may increase or other malfunctions may occur.

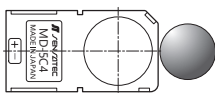


### Mutual interference

When two or more identical sensors are used, observe the minimum values shown in the figure below to prevent mutual interference. (The different frequency model type has "B" at the end of its model designation.)



## Installation



Do not use when metal is in close contact.

## Others

- Please note that this proximity sensor can detect SUS pachinko balls, but not Steel pachinko balls. Use "Model : MD-5C41" to detect Steel pachinko balls.
- When detecting pachinko balls one by one, keep them at least 30 mm apart.  
In addition, the range of output operation time varies depending on the passing position, passing distance, passing speed, ball material, and parallelism of the medal surface with respect to the sensor detection surface.
- Do not drop a detector such as a pachinko ball or medal directly on the detection surface. The internal ferrite core may be damaged by impact, and the sensor may deteriorate or fail. Also, do not directly hit or pass a detector such as a pachinko ball or medal against the detection surface of the sensor. Be sure to install an indirect materials (plastic, etc.) between the detector and the detection surface of the sensor for detection.
- Be sure to insert and remove the connector horizontally.  
If you insert or remove it at an angle, it may cause terminal deformation, case damage, or poor contact.
- For other precautions, refer to "General Precautions" for proximity sensors.  
\*For other detailed specifications, refer to the specification sheet of the corresponding model.