Model MD-HC4S1 Thin Pass-Through Type Proximity Sensor for SUS Pachinko Balls (Open Collector Output / Shield Type)

Model List	Standard Detection Target	Operation Status
MD-HC4S1	SUS Pachinko ball	Normally closed

Application

- SUS pachinko ball detection

Features

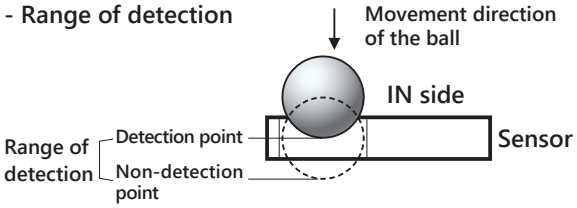
- The 2-wire sensor requires an external output residual voltage processing circuit and an open collector output conversion circuit (interface IC, etc.). Since this sensor has these circuits built-in, the cost of the external circuit of the sensor can be significantly reduced. In addition, since this sensor has an open collector output, High / Low logic processing is possible, and it can be directly connected as an input signal of 30 V DC or less.
- Achieves an ultra-thin sensor body with a thickness of 4 mm.
  Since it is a magnetic shield type, it can be mounted in close contact with the side of the sensor.
- SUS pachinko balls can be counted even when passing in an unbroken consecutive line.
- Since the C-cut shape is used for the main body case, it is possible to prevent incorrect installation orientation.
- A transparent cover allows easy check of the internal condition.
- Features a keyway on the case side for an easy installation in one touch.
- Combined use with EWD-271 (radio wave sensor) gives greater safety against radio interference.

Rating / Performance

Model	MD-HC4S1
Range of Detection	4.5 to 7.5mm (* Refer to "Characteristics")
Hysteresis	0.4 to 1.5 mm or more (* Refer to "Characteristics")
Standard Detection Object	SUS Pachinko ball (ø 11 ± 0.05 mm)
Power Voltage	12 V to 15 V DC (Operating voltage range : 10.8 V to 16.5 V DC)
Power Consumption	15 mA DC or less
Output Capacity	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 (At detection : output OFF)
Resolution	Balls passing continuously can be detected
Response Frequency	100 Hz or more
Temperature Range	-10 to 70 °C (Without dew condensation or freezing)
Humidity Range	35 to 85 % RH (Without dew condensation or freezing)
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 : 500 m/s² (Approx. 50 G) in X-, Y-, and Z-direction, each 10 times (Device not powered)
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 the case)
Anti-static Electricity	Between the outer cover (pachinko ball passage hole) and connector No. 1 terminal (GND) 15kV (C = 150pF, R = 330Ω)
Ingress Protection	IP50
Case Material	Case : PBT resin with glass (Blue), Cover : ABS resin (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. 1.9 g
Options (Sold Separately)	Connector harness : CNH-DF1403S26-300

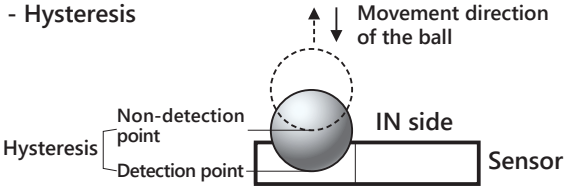
Characteristics

- Range of detection



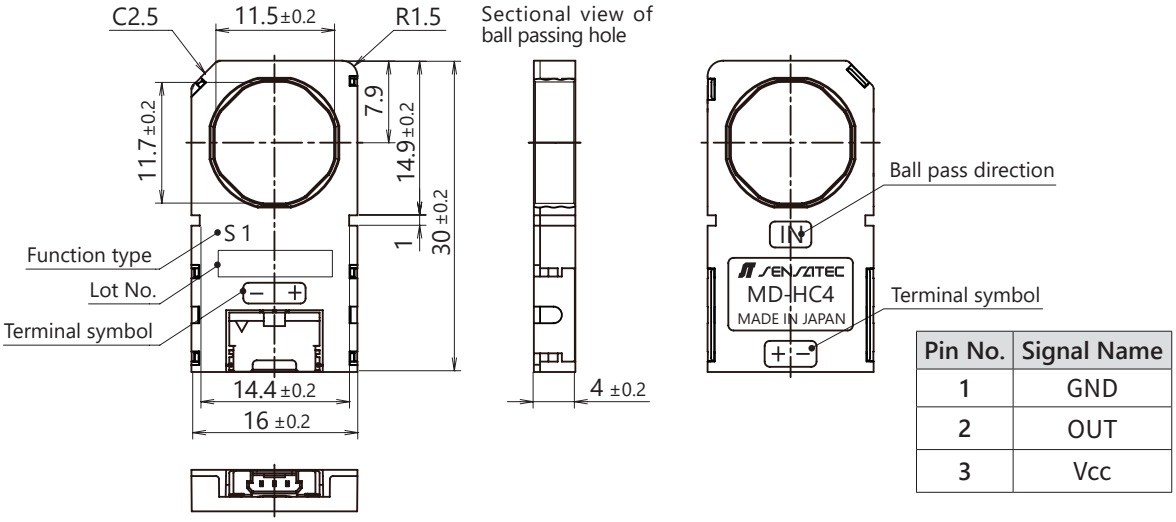
The pachinko ball is inserted from the IN side, and the distance from the detection point to the point where the detection point changes to non-detection is set as the detection range.

- Hysteresis



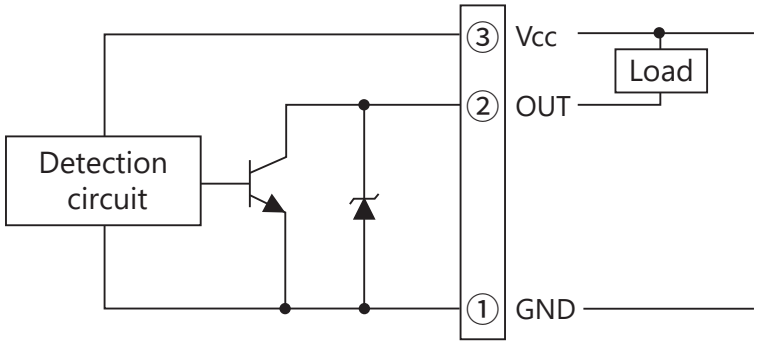
The pachinko ball is inserted from the IN side, the pachinko ball is moved in the opposite direction to the insertion from the point to be detected, and the distance from the point where the detection is changed to the non-detection is used as the hysteresis.

Dimensions



Pin No.	Signal Name
1	GND
2	OUT
3	Vcc

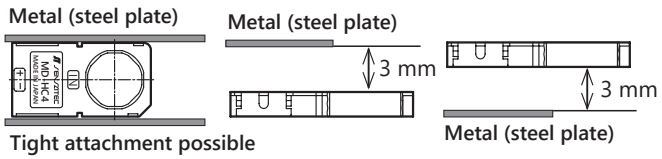
Output Circuit



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

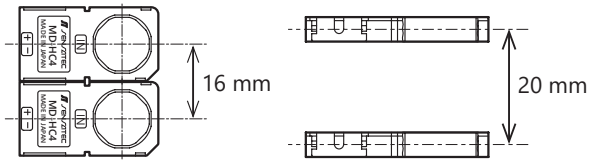
Precautions During Use

Influence by surrounding metals



Avoid metals in the surroundings, within 3 mm of the detection side and back side of the proximity switch. Otherwise, the range of detection may increase or other malfunctions may occur.

Mutual interference



When two or more identical sensors are used, position at least at the spacing shown in the figure on the left to prevent mutual interference.

Others

1. This sensor is a dedicated detection sensor for SUS pachinko balls.
   Although this sensor can detect steel pachinko balls, it does not give correct characteristics and should not be used.
   Please use model / MD-HC41 to detect Steel pachinko balls.
2. 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.
3. For other precautions, refer to “General Precautions” for proximity sensors.
   *For other detailed specifications, refer to the specification sheet of the corresponding model.