TAKEX

Optical wide sensor with built-in M/S function

SS20 SERIES Instruction Manual

(MET File No. E112919)

TAKENAKA ELECTRONIC INDUSTRIAL CO.,LTD.

Head office : 5-22 Higashino Kitainoue-cho, Yamashina-ku, Kyoto 607-8141, Japan
Telephone : +81-75-581-7111
FAX : +81-75-581-7118

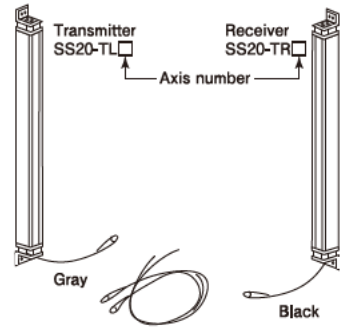
OUTLINE

- This sensor is a through beam type light curtain sensor with a 20㎜ optical pitch and detects opaque objects 32㎜ or more in diameter.
- This product can't be used as a safety sensor to protect human body.
- This product has no function to prevent disasters, accidents, death or injuries and doesn't comply with any standard or regulation for industrial safety.
- Takex PSG series is a safety sensor for power press machine certified upon Japanese standard.

SPECIFICATIONS

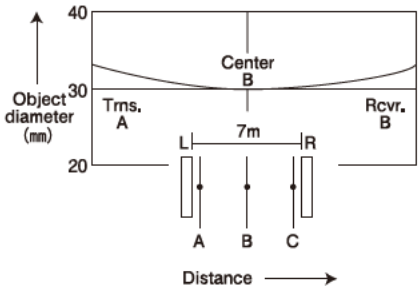
Model	NPN Output	SS20-T8	SS20-T12	SS20-T16	SS20-T20	SS20-T24	SS20-T28	SS20-T32	SS20-T40	SS20-T44	SS20-T48
	PNP Output	SS20-T8-PN	SS20-T12-PN	SS20-T16-PN	SS20-T20-PN	SS20-T24-PN	SS20-T28-PN	SS20-T32-PN	SS20-T40-PN	——	SS20-T48-PN
Detection method		Through beam									
Detecting distance		7m or less									
Detection object		φ32㎜ (Min.) Opaque object (Refer to the chart below right)									
No. of optical axis		8	12	16	20	24	28	32	40	44	48
Detecting width		140㎜	220㎜	300㎜	380㎜	460㎜	540㎜	620㎜	780㎜	860㎜	940㎜
Optical axis interval		20㎜									
Power supply		12 to 24 VDC ±10%, Ripple 10% or less									
Current consumption		70mA or less	80mA or less	90mA or less	100mA or less	110mA or less	120mA or less	130mA or less	150mA or less	160mA or less	170mA or less
Output mode	NPN Output	NPN Open collector Current Output : Sink current 100mA or less, 30 VDC or less									
	PNP Output	PNP Open collector Current Output : Source current 100mA or less, 30 VDC or less									
Operating mode		A/O mode selectabe, Mode A : The output transistor turns on when beams of all optical axes are received. Deactivated when beam of any optical axis is blocked. Mode O : The output transistor turns on when beams of any optical axis is received. Deactivated when beam of all optical axes are blocked.									
Response time		15ms or less									
Light source		Infrared LED (Wave length 950nm)									
Sencing device		Photo-diode									
LED Indicator		Transmitter : Power indicator (Green LED), M/S indicator (Red LED) Receiver : Operation indicator (Red LED), Stability indicator (Green LED)									
Switch		Trns. : Built-in M/S operation selectable switch (M side···Master operation, S side···Sleeve operation)···Lid on the back side Rcvr. : Built-in A/O operation selectable switch (A side···ON operation when all light axis lights on, O side ON operation when one light aixs lights on)···Lid on the back side									
Incidental Function		Built-in Output short circuit protection, discontinulity of transfer line protection and function preventing Interference when installing in parallel.									
Material		Case : Aluminum, Front cover and lends : Acrylic									
Connection		Connector 0.5㎟×4, Outer dia.φ6.8, 0.2m length, with 4 pins in the connector									
Weight	Transmitter	Approx 250g	Approx 300g	Approx 350g	Approx 400g	Approx 450g	Approx 500g	Approx 600g	Approx 700g	Approx 750g	Approx 800g
	Receiver	Approx 250g	Approx 300g	Approx 350g	Approx 400g	Approx 450g	Approx 500g	Approx 600g	Approx 700g	Approx 750g	Approx 800g
Ambient light		9,000 lx or less									
Ambient temperature		−10 to +55℃ (non-freezing)									
Ambient humidity		35 to 85%RH (non-condensing)									
Protective structure		I P 66 (IEC)									
Vibration		10 to 55Hz, 1.5㎜ Double amplitude 2Hr., 3 Directions									

MODEL DESCRIPTION



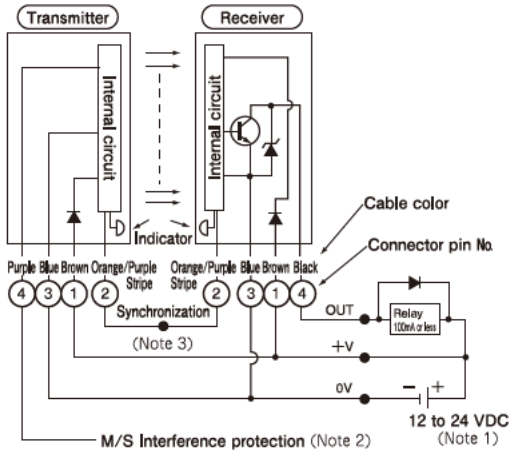
Cable for Transmitter : SS-H5L (Gray 5m)
Cable for Receiver : SS-H5R (Black 5m)

MINIMUM OBJECT DIAMETER

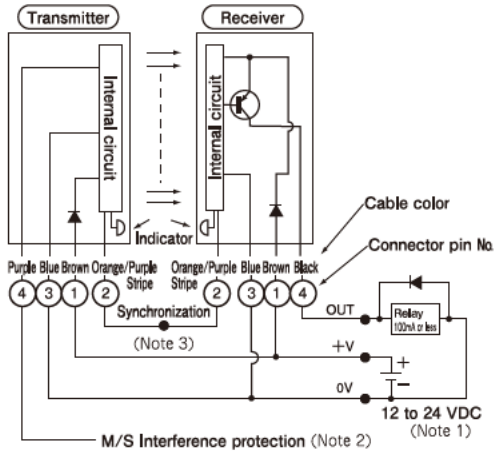


WIRING

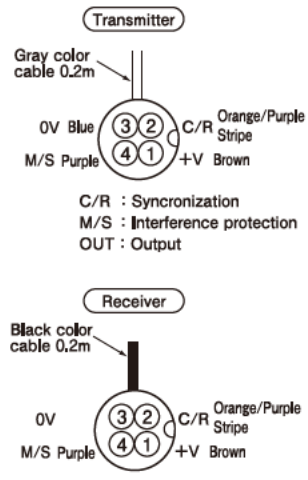
● NPN output



● PNP output



● Connector Pin. No.



- If a load short circuit or overload occurs, the output turns off. Check the load before restoring the power.
- Insulate the purple cable (Master/Slave for interference prevention) when the Interference Prevention Function is not used.

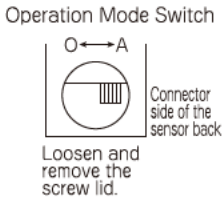
Note 1 : When using separate power units for the transmitter and the receiver, common the ground (0V) between the power units.
Note 2 : Insulate the purple cable (Master/Slave for interefence prevention) when the Interference Prevention Function is not used.
Note 3 : Do not connect the orange/purple stripe cable (Synchronization) or purple cable with 0V.

OPERATION MODE SWITCH

The Operation Mode Switch is located under the screw lid on the bottom back of the sensor unit.

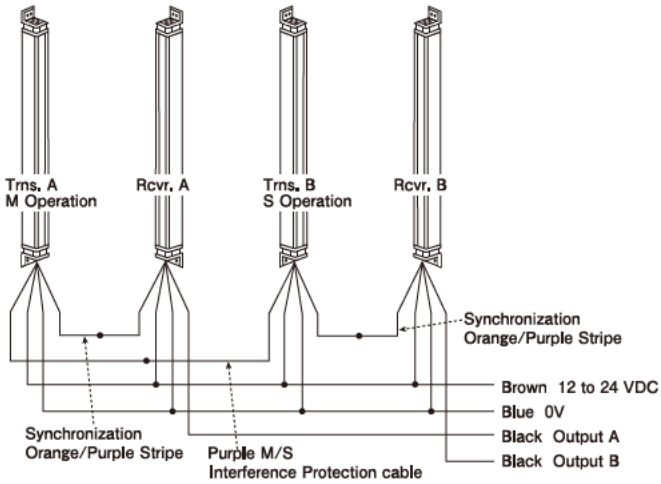
◆ Mode A is a factory setting.

Mode A : The output transistor turns on when beams of all optical axes are received. Deactivated when beam of any optical axis is blocked.
Mode O : The output transistor turns on when beams of any optical axis is received. Deactivated when beam of all optical axes are blocked.

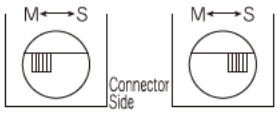


MUTUAL INTERFERENCE PREVENTION

1. See below for the connection when 2 sets are installed adjacently.
   · Connect the purple cables (Master/Slave for Interference Prevention) of the transmitter A and B.
   · Connect the blue cables (0V) of the all units (Transmitters A and B, and Receivers A and B) to the ground.



2. Loosen and remove the screw lid for M/S selector and set one (here the transmitter A) for M (Master) and the other (the transmitter B) for S (Slave).

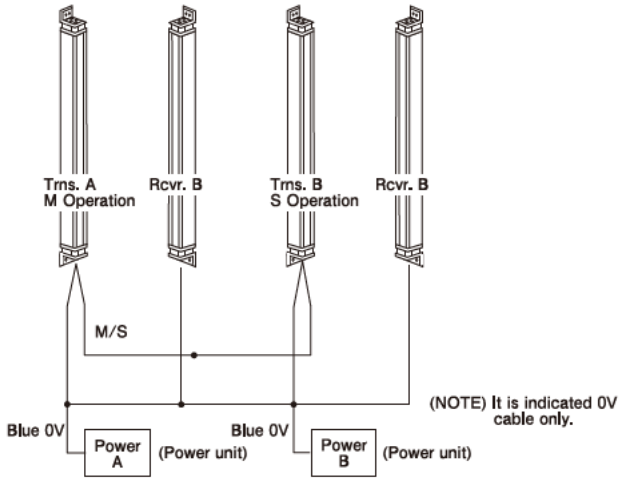


M(Master)/S(Slave) selector

Without the lid on the back side of transmitter.

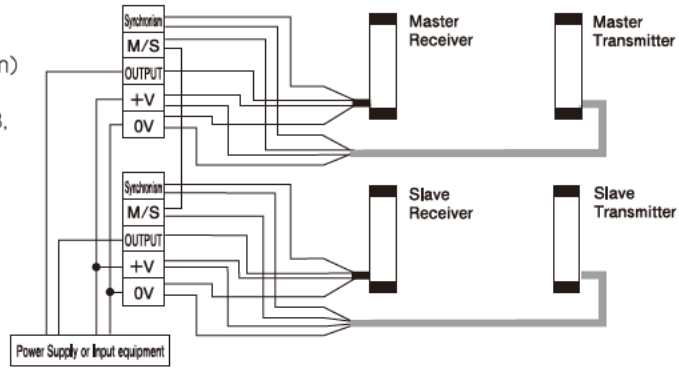
◆ M is the factory setting.
◆ Set M for a single set installation.

3. When using separate power units for the transmitter and the receiver, connect ground terminals of the power units and the blue cables (0V).



4. Confirm the M(Master)/S(Slave) indicator on the transmitter after supplying the power.
   Transmiter A (Master) : M/S indicator turns on.
   Transmitter B (Slave) : M/S indicator turns off.

5. Notice of wiring
   0V is commonly used for the Synchronization and the Mutual Interference Prevention. Malfunction like chatering may occur when the length of 0V cable and that of Synchronization and Mutual Interference Prevention cables are extremely different.

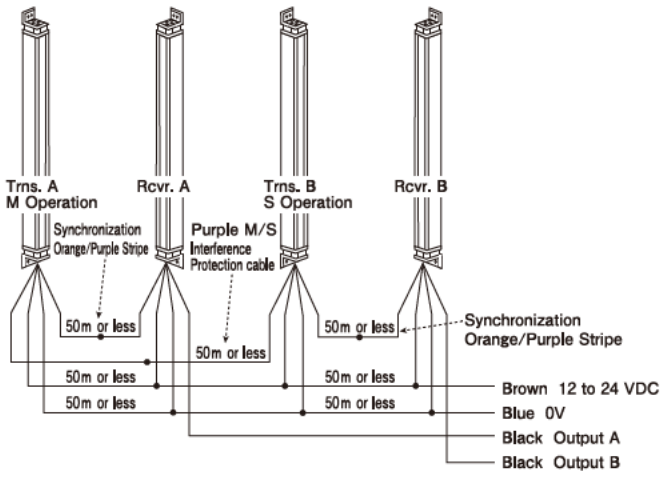


◆ Refer to Cable Extension for the cable length.
◆ The Synchronization cable should connect a pair of the transmitter and the receiver. Do not connect the Synchronization cables of a different pair. (Here do not connect between sensor A and sensor B.)
◆ Insulate the purple cable (Master/Slave for interference prevention) when the Interference Prevention Function is not used.

CABLE EXTENSION

When extending the wire, use 0.5㎟ cable or more. Each cable should be no longer than 50m.

- Synchronization cable (orange/purple stripe)
  The total length of the cable between the transmitter and the receiver should be 50m or less.
- M/S Mutual Interference Prevention cable (purple)
  The total length of the cable between the two transmitters should be 50m or less.

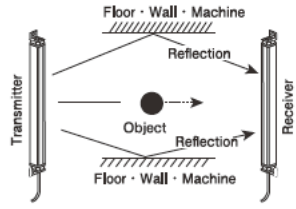


INSTALLATION AND ALIGNMENT

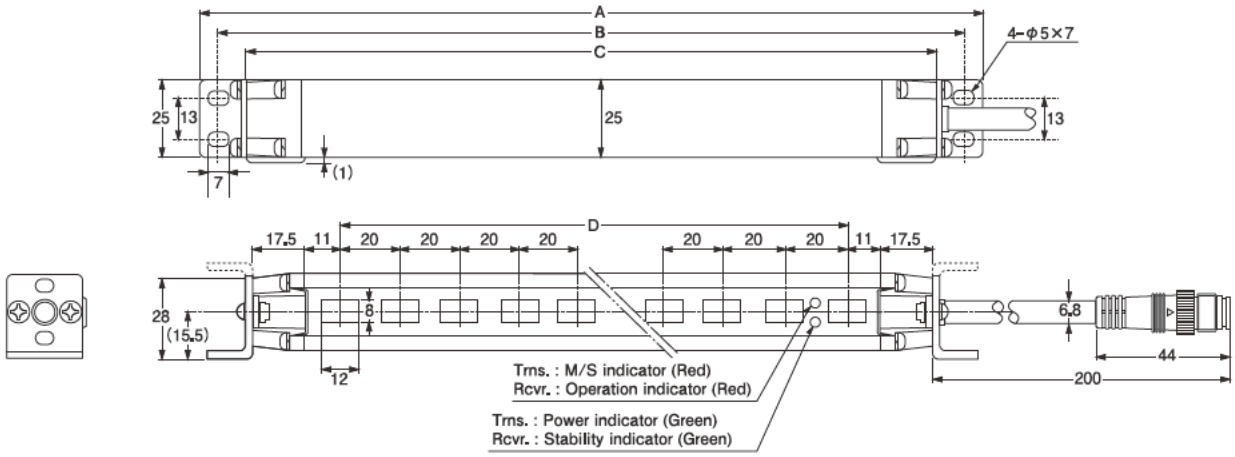
This sensor has a bracket providing four different mounting positions.
The bracket is fixed by 2 screws on the both ends of the sensor.
Loosen the screws and re-fit the bracket to change the position.
Tighten the screws with a torque of 0.8N·m or less.

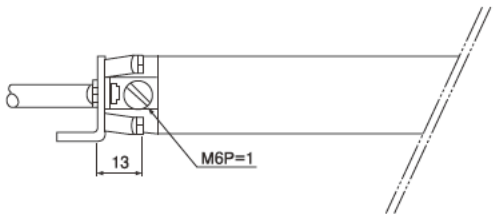
1. Align the cable outlet of the transmitter and the receiver in the same direction.
2. Install the transmitter and the receiver face to face.
3. Check the wiring connections.
4. Turn on the power and confirm the Power Indicator on the transmitter turns on.
5. Swing the receiver right and left and fix at the center of the direction where the Stability Indicator of the receiver turns on.
6. Move up and down the receiver and fix at the center of the range where the Stability Indicator turns on.
7. Block the light beams and confirm the output is issued correctly.

If there is a reflecting structure such as a wall, floor or machine close to the detecting range of the sensor, light beam may go around the detection object by reflection and the whole beams may not be blocked. Carefully check the operation.

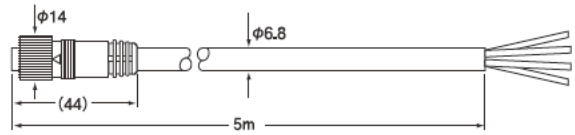


DIMENSIONS (in mm)





Cable



SS-H5L (Gray)
SS-H5R (Black)

Indicator operation

	Appellation	Color	Contents
Transmitter	Power Indicator	Green	Turns on when switching on power supply.
	M/S Indicator	Red	Turns on when operating as a Master. Turns off when operating as a Slave.
Receiver	Stability Indicator	Green	Turns on when the received light quantity is higher than the operation level. (120%)
	Operation Indicator	Red	Turns on when the transistor outputs. A mode : The transistor outputs when beams of all axes are received. O mode : The transistor outputs when beams of any optical axis is received.

Model selection

(in mm)

MODEL		A	B	C	D	optical axis
NPN output	PNP output					
SS20-T8	SS20-T8-PN	227	215	197	140	8
SS20-T12	SS20-T12-PN	307	295	277	220	12
SS20-T16	SS20-T16-PN	387	375	357	300	16
SS20-T20	SS20-T20-PN	467	455	437	380	20
SS20-T24	SS20-T24-PN	547	535	517	460	24
SS20-T28	SS20-T28-PN	627	615	597	540	28
SS20-T32	SS20-T32-PN	707	695	677	620	32
SS20-T40	SS20-T40-PN	867	855	837	780	40
SS20-T44	——	947	935	917	860	44
SS20-T48	SS20-T48-PN	1027	1015	997	940	48

NOTE

- Use a shielded cable to connect the Synchronization cables (orange/purple stripe) when using a same conduit for wiring of the Master and Slave units.
- Be sure to route the sensor wires separate from any power transmission or high voltage line. Use a same conduit or duct with high-voltage or power lines will cause malfunction or damage by induction.
- When using a DC power unit with an insulated transformer or a switching regulator, be sure to ground the frame ground (FG) terminal.
- Do not apply strong force to turn the switches.
- Do not use the sensor where water is splashing constantly, or under high humidity or dusty circumstances.
- Use UL class 2 power supply when using this product as MET approved equipment. Limit the current of the power supply (5A) in accordance with the size of the sensor cable.