

TH SERIES

Related Information

- General terms and conditions..... F-7
- Sensor selection guide..... P.885~
- General precautions..... P.1501



Quick, non-contact detection of hot melt glue (infrared)

ORDER GUIDE

| Type | Appearance | | Sensing range | Set model No. | Output |
|--------------------|-------------|------------|---|-----------------|-------------------------------|
| | Sensor head | Controller | | | |
| Spot | | | 40 ±10 mm 1.575 ±0.394 in | TH-11CS | NPN open-collector transistor |
| Long sensing range | | | 10 to 300 mm 0.394 to 11.811 in (Note) | TH-12CS | NPN open-collector transistor |
| | | | | TH-12CPS | PNP open-collector transistor |

Note: Teaching is possible for this sensing range.
 However, the sensing range varies with the size of the sensing object and its temperature, ambient temperature, etc.

A sensor head and its respective controller comprise a set. Make sure to use the sensor head and the controller specified in the set model No. together as a set.
 [Please refer to "SPECIFICATIONS (p.946, 947)" for more details.]

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- Hot Melt Glue Detection
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- Small / Slim Object Detection
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- Other Products

SPECIFICATIONS**TH-11CS**

Spot type

Sensor head

| Item | Model No. | TH-11 |
|-----------------------|-----------|--|
| Applicable controller | | TH-C1 |
| Sensing range | | 40 ±10 mm 1.575 ±0.394 in |
| Sensing object | | ø3 mm ø0.118 in or more hot melt glue (emissivity 0.9) at +85 °C +185 °F or more, under ambient temperature of +25 °C +77 °F (Note 2) |
| Ambient temperature | | 0 to +50 °C +32 to +122 °F (No dew condensation), Storage: -10 to +60 °C +14 to +140 °F |
| Visible targeting | | Red LED |
| Material | | Enclosure: Polycarbonate, Front cover: Sapphire glass |
| Weight | | Net weight: 77 g approx. |
| Accessories | | MS-TH-1 (Sensor head mounting bracket): 1 set, TH-B1 (Heat shield): 1 pc. |

Notes: 1) Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +20 °C **+68 °F**.
 2) A hot melt drop at +60 °C **+140 °F** or higher can be detected if it is ø5 mm **ø0.197 in** or more.

Controller

| Item | Model No. | TH-C1 |
|----------------------------------|-----------|---|
| Applicable sensor head | | TH-11 |
| Supply voltage | | 12 to 24 V DC ±10 % Ripple P-P 10 % or less |
| Current consumption | | 100 mA or less |
| Outputs (OUT 1, OUT 2) | | NPN open-collector transistor <ul style="list-style-type: none"> • Maximum sink current: 100 mA • Applied voltage: 30 V DC or less (between output and 0 V) • Residual voltage: 1 V or less (at 100 mA sink current) 0.4 V or less (at 16 mA sink current) |
| Output operation | | OUT 1: ON when hot melt adhesive is detected (Max. 1 sec. approx.), OUT 2: ON when the evaluated result is NG (Max. 1 sec. approx.) |
| Response time (operation freq.) | | 1 ms or less (1 to 200 Hz) |
| Warm-up time | | 40 sec. approx. |
| Sensitivity setting | | Teaching method (Push-button operation) |
| Level storage function | | Sensitivity levels of eight channels can be stored. |
| External channel select function | | Incorporated |
| Timer function | | Incorporated with approx. 40 ms fixed OFF-delay timer, switchable either effective or ineffective |
| Ambient temperature | | 0 to +50 °C +32 to +122 °F (No dew condensation), Storage: -10 to +60 °C +14 to +140 °F |
| Material | | Enclosure: Heat-resistant ABS, Terminal cover: Heat-resistant ABS, Front cover: Polycarbonate |
| Weight | | Net weight: 200 g approx. |

Note: Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +20 °C **+68 °F**.

FIBER
SENSORSLASER
SENSORSPHOTO-
ELECTRIC
SENSORSMICRO
PHOTO-
ELECTRIC
SENSORSAREA
SENSORSLIGHT
CURTAINS /
SAFETY
COMPONENTSPRESSURE /
FLOW
SENSORSINDUCTIVE
PROXIMITY
SENSORSPARTICULAR
USE
SENSORSSENSOR
OPTIONSSIMPLE
WIRE-SAVING
UNITSWIRE-SAVING
SYSTEMSMEASURE-
MENT
SENSORSSTATIC
ELECTRICITY
PREVENTION
DEVICESLASER
MARKERS

PLC

HUMAN
MACHINE
INTERFACESENERGY
CONSUMPTION
VISUALIZATION
COMPONENTSFA
COMPONENTSMACHINE
VISION
SYSTEMSUV
CURING
SYSTEMSSelection
GuideWafer
DetectionLiquid Leak
DetectionLiquid Level
DetectionWater
DetectionColor Mark
DetectionHot Melt Glue
Detection

Ultrasonic

Small / Slim
Object DetectionObstacle
DetectionOther
Products**TH**

SPECIFICATIONS

Long sensing range type

Sensor head

| Item | Model No. | TH-12 |
|------------------------|-----------|---|
| Applicable controllers | | TH-C2, TH-C2P |
| Sensing range | | 10 to 300 mm 0.394 to 11.811 in (Note 2) |
| Sensing object | | ø6 mm ø0.236 in (equivalent to 3 × 10 mm 0.118 × 0.394 in) or more hot melt glue (emissivity 0.9) at +100 °C +212 °F or more, under ambient temperature of +25 °C +77 °F |
| Pollution degree | | 3 (Industrial environment) |
| Ambient temperature | | 0 to +50 °C +32 to +122 °F (No dew condensation), Storage: -10 to +60 °C +14 to +140 °F |
| Material | | Enclosure: Polycarbonate, Indicator: Polycarbonate, Lens: Silicone |
| Weight | | Net weight: 120 g approx. |
| Accessories | | MS-TH-2 (Sensor head mounting bracket): 1 set, TH-B2 (Heat shield): 1 pc., OS-TH12 (Slit mask): 1 pc. |

Notes: 1) Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +20 °C **+68 °F**.
 2) Teaching is possible for this detection range. However, the detection range varies with the size of the sensing object and its temperature, ambient temperature, etc.

Controllers

| Item | Type | NPN output (for TH-12CS) | PNP output (for TH-12CPS) |
|----------------------------------|----------------------|---|---|
| | Model No. | TH-C2 | TH-C2P |
| Applicable sensor head | | TH-12 | |
| Supply voltage | | 12 to 24 V DC ±10 % Ripple P-P 10 % or less | |
| Current consumption | | 100 mA or less | |
| Outputs (OUT 1, OUT 2) | | NPN open-collector transistor • Maximum sink current: 100 mA • Applied voltage: 30 V DC or less (between output and 0 V) • Residual voltage: 1 V or less (at 100 mA sink current) 0.4 V or less (at 16 mA sink current) | PNP open-collector transistor • Maximum source current: 100 mA • Applied voltage: 30 V DC or less (between output and +V) • Residual voltage: 2 V or less (at 100 mA source current) |
| | Utilization category | DC-12 or DC-13 | |
| Output operation | | OUT 1: ON when hot melt adhesive is detected (Max. 1 sec. approx.), OUT 2: OFF when the evaluated result is NG (Max. 1 sec. approx.) | |
| Response time (operation freq.) | | Sensing distance 200 mm 7.874 in or less: 1 ms or less (1 to 200 Hz), Sensing distance 300 mm 11.811 in or less: 1.5 ms or less (1 to 100 Hz) | |
| Warm-up time | | 40 sec. approx. | |
| Sensitivity setting | | Teaching method (Push-button operation) | |
| Level storage function | | Sensitivity levels of eight channels can be stored. | |
| External channel select function | | Incorporated | |
| Timer function | | Incorporated with approx. 40 ms fixed OFF-delay timer, switchable either effective or ineffective | |
| Pollution degree | | 3 (Industrial environment) | |
| Ambient temperature | | 0 to +50 °C +32 to +122 °F (No dew condensation), Storage: -10 to +60 °C +14 to +140 °F | |
| EMC | | EN 60947-5-2 | |
| Material | | Enclosure: Heat-resistant ABS, Terminal cover: Heat-resistant ABS, Front cover: Polycarbonate | |
| Weight | | Net weight: 200 g approx. | Net weight: 140 g approx. |

Note: Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +20 °C **+68 °F**.

PRECAUTIONS FOR PROPER USE

Refer to p.1501 for general precautions.



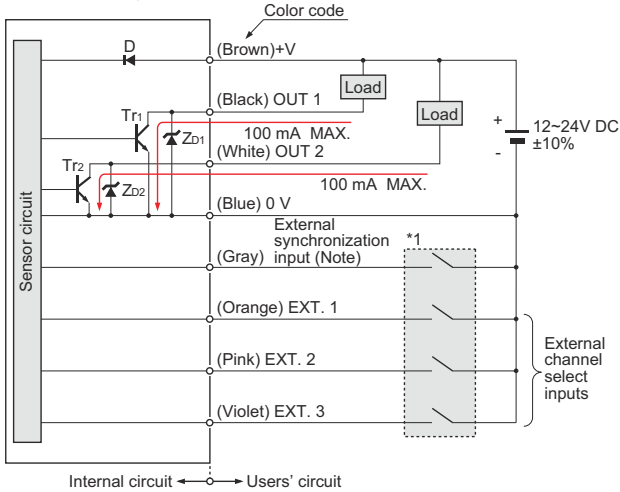
- Never use this product as a sensing device for personnel protection.
- In case of using sensing devices for personnel protection, use products which meet laws and standards, such as OSHA, ANSI or IEC etc., for personnel protection applicable in each region or country.

I/O CIRCUIT AND WIRING DIAGRAMS

NPN output type

I/O circuit diagram

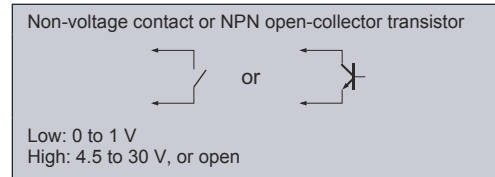
Controller / TH-C1, TH-C2



Note: The external synchronization input is active Low.

Symbols ... D: Reverse supply polarity protection diode
 ZD1, ZD2 : Surge absorption zener diode
 Tr1, Tr2 : NPN output transistor

*1



Specifying channel with external channel select inputs

| Channel No. | Input | EXT.1 (Orange) | EXT.2 (Pink) | EXT.3 (Violet) |
|-------------|-------|----------------|--------------|----------------|
| 1 | | L | H | H |
| 2 | | H | L | H |
| 3 | | L | L | H |
| 4 | | H | H | L |
| 5 | | L | H | L |
| 6 | | H | L | L |
| 7 | | L | L | L |
| 8 | | H | H | H |

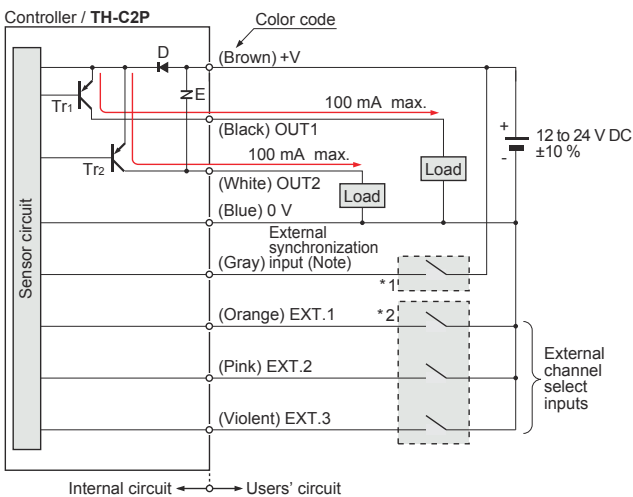
L: Low (0 to 1 V), H: High (4.5 to 30 V, or open)

- Notes: 1) The channel can be specified from the front panel only when all external channel select inputs (EXT.1, EXT.2, and EXT.3) are High (corresponding to Channel No. 8).
 2) The external channel select inputs take precedence over the front panel channel selection (except for Channel No. 8).
 3) If channel specification is changed from front panel operation to external channel select inputs and Channel No. 8 is to be selected by the external channel call inputs, make sure to specify a channel other than No. 8 before setting all the external channel select inputs (EXT.1, EXT.2, EXT.3) to High.
 If this operation is not done, channel specification by front panel operation gets precedence.

PNP output type

I/O circuit diagram

Controller / TH-C2P



Note: The external synchronization input is active High.

Symbols ... D: Reverse supply polarity protection diode
 E: Surge absorption varistor
 Tr1, Tr2: PNP output transistor

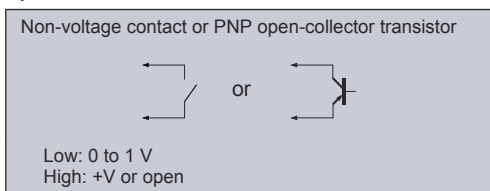
Specifying channel with external channel select inputs

| Channel No. | Input | EXT.1 (Orange) | EXT.2 (Pink) | EXT.3 (Violet) |
|-------------|-------|----------------|--------------|----------------|
| 1 | | L | H | H |
| 2 | | H | L | H |
| 3 | | L | L | H |
| 4 | | H | H | L |
| 5 | | L | H | L |
| 6 | | H | L | L |
| 7 | | L | L | L |
| 8 | | H | H | H |

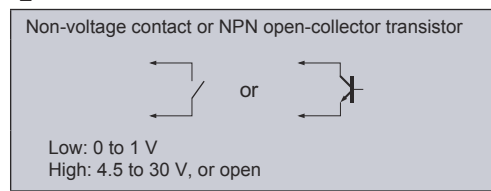
L: Low (0 to 1 V), H: High (4.5 to 30 V, or open)

- Notes: 1) The channel can be specified from the front panel only when all external channel select inputs (EXT.1, EXT.2, and EXT.3) are High (corresponding to Channel No. 8).
 2) The external channel select inputs take precedence over the front panel channel selection (except for Channel No. 8).
 3) If channel specification is changed from front panel operation to external channel select inputs and Channel No. 8 is to be selected by the external channel call inputs, make sure to specify a channel other than No. 8 before setting all the external channel select inputs (EXT.1, EXT.2, EXT.3) to High.
 If this operation is not done, channel specification by front panel operation gets precedence.

*1



*2



FIBER SENSORS

LASER SENSORS

PHOTO-ELECTRIC SENSORS

MICRO PHOTO-ELECTRIC SENSORS

AREA SENSORS

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PRESSURE / FLOW SENSORS

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WIRE-SAVING SYSTEMS

MEASUREMENT SENSORS

STATIC ELECTRICITY PREVENTION DEVICES

LASER MARKERS

PLC

HUMAN MACHINE INTERFACES

ENERGY CONSUMPTION VISUALIZATION COMPONENTS

FA COMPONENTS

MACHINE VISION SYSTEMS

UV CURING SYSTEMS

Selection Guide

Wafer Detection

Liquid Leak Detection

Liquid Level Detection

Water Detection

Color Mark Detection

Hot Melt Glue Detection

Ultrasonic

Small / Slim Object Detection

Obstacle Detection

Other Products

TH

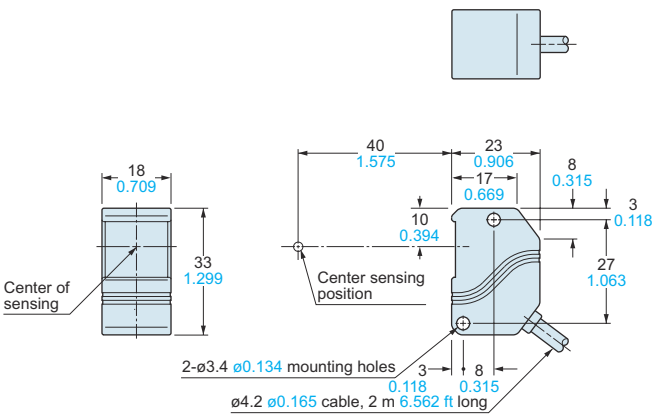
| |
|---|
| FIBER SENSORS |
| LASER SENSORS |
| PHOTO-ELECTRIC SENSORS |
| MICRO PHOTO-ELECTRIC SENSORS |
| AREA SENSORS |
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| FA COMPONENTS |
| MACHINE VISION SYSTEMS |
| UV CURING SYSTEMS |

DIMENSIONS (Unit: mm in)

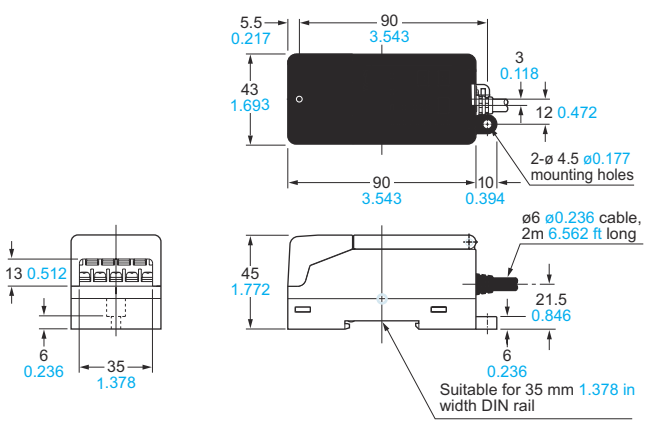
The CAD data in the dimensions can be downloaded from our website.

TH-11CS Spot type

Sensor head / TH-11

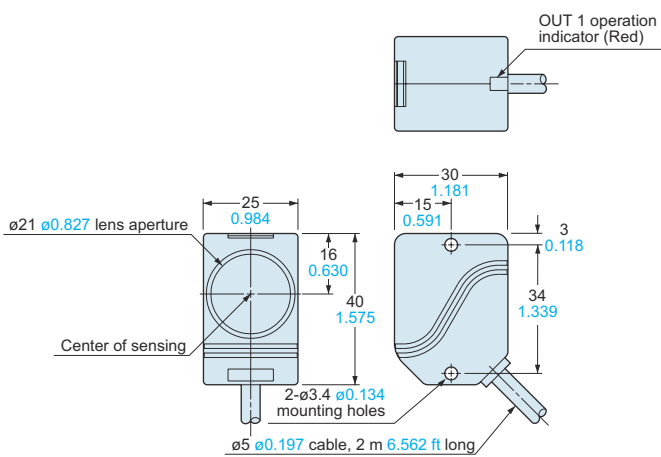


Controller / TH-C1

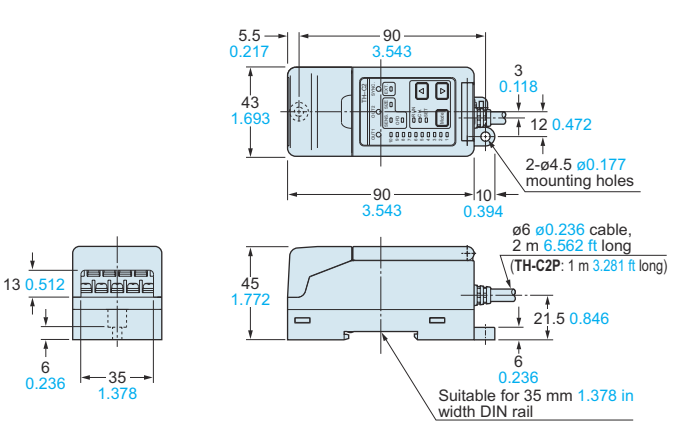


TH-12CS TH-12CPS Long sensing range type

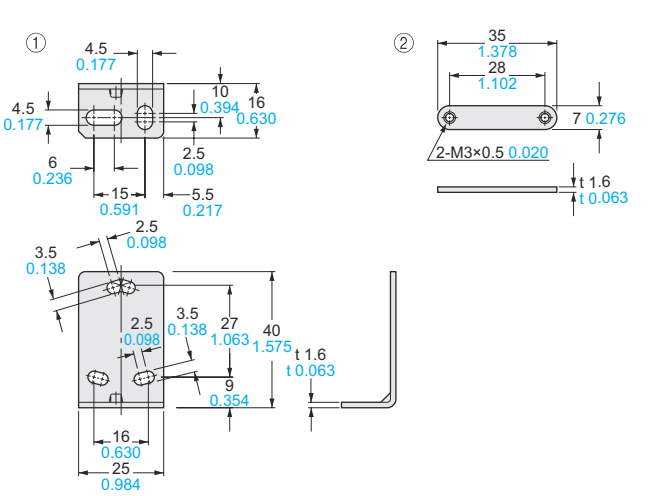
Sensor head /TH-12



Controller /TH-C2 TH-C2P

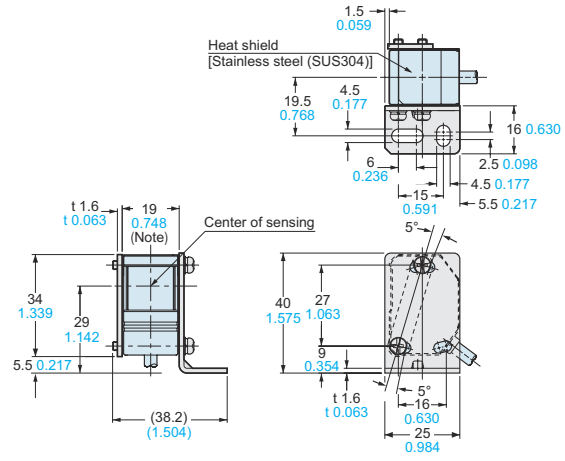


MS-TH-1 Sensor head mounting bracket for spot type (Accessory for TH-11)



Assembly dimensions

The drawing below shows **MS-TH-1** mounted on **TH-11** fitted with heat shield **TH-B1** (accessory).



Material: Cold rolled carbon steel (SPCC)
Two M3 (length 25 mm 0.984 in) screws with washers are attached.

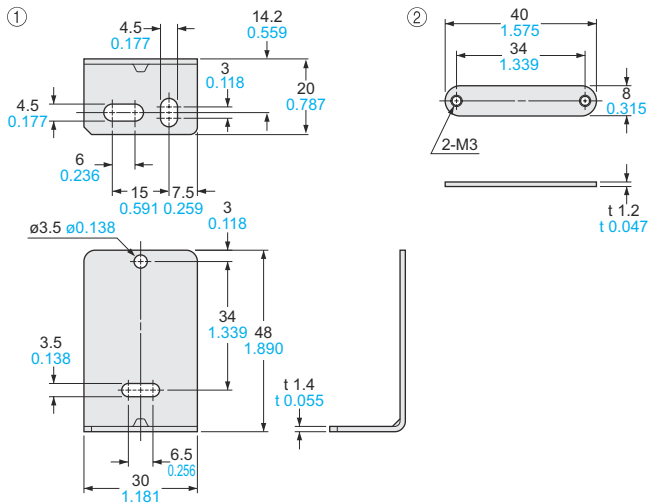
Note: 18 mm 0.709 in when the heat shield is not used.

DIMENSIONS (Unit: mm in)

The CAD data in the dimensions can be downloaded from our website.

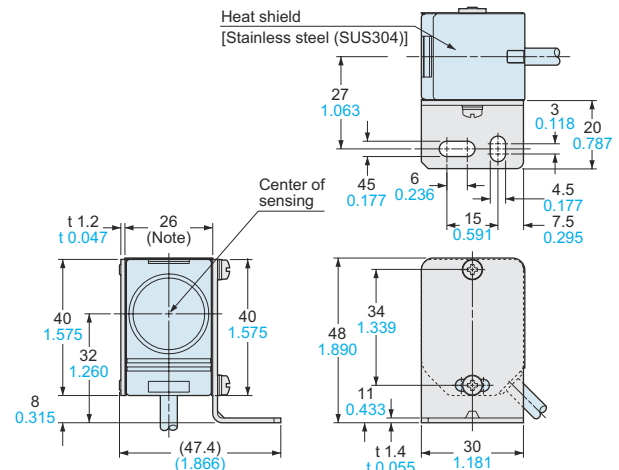
MS-TH-2

Sensor head mounting bracket for long sensing range type (Accessory for TH-12)



Material: Cold rolled carbon steel (SPCC)

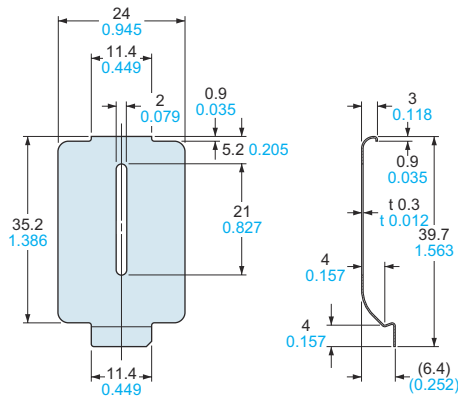
Two M3 (length 30 mm 1.181 in) screws with washers are attached.

Assembly dimensionsThe drawing below shows **MS-TH-2** mounted on **TH-12** fitted with heat shield **TH-B2** (accessory)

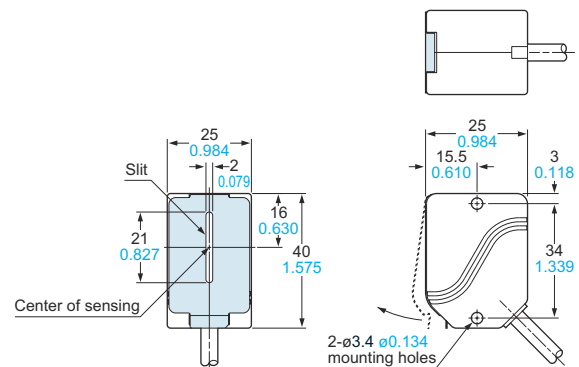
Note: 25 mm 0.984 in when the heat shield is not used.

OS-TH12

Slit mask for long sensing range type (Accessory for TH-12)



Material: Stainless steel (SUS304)

Assembly dimensionsFIBER
SENSORSLASER
SENSORSPHOTO-
ELECTRIC
SENSORSMICRO
PHOTO-
ELECTRIC
SENSORSAREA
SENSORSLIGHT
CURTAINS /
SAFETY
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FLOW
SENSORSINDUCTIVE
PROXIMITY
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USE
SENSORSSENSOR
OPTIONSSIMPLE
WIRE-SAVING
UNITSWIRE-SAVING
SYSTEMSMEASURE-
MENT
SENSORSSTATIC
ELECTRICITY
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DetectionHot Melt Glue
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DetectionOther
Products**TH**