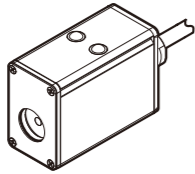


Instruction Manual

Non-contact thermometer stationary type

TI-S Series Sensor Head

TI-S30


OPTEX FA CO., LTD.

Thank you for purchasing the stationary type non-contact thermometer "TI-S Series" sensor head.
Before using this product, read this manual carefully to ensure proper use.
Read this manual thoroughly, and then keep this manual at hand so that it can be used whenever necessary.
For the controller to be connected, refer to the INSTRUCTION MANUAL of "TI-S Series Controller".

Download the TI-S user's manual, IO-Link configuration file (IODD), and index list from OPTEX FA website.
<https://www.optex-fa.jp>

Click here for online manual→



Safety Precautions

Safety precautions for ensuring safe operation of this product are displayed as follows with the following symbols.

Precautions listed here describe important information about safety. Make sure to follow them accordingly.

Safety Symbols

	WARNING	Indicates that any improper operation or handling may result in moderate or minor injury, and in rare cases, serious injury or death. Also indicates a risk of serious property damage.
	CAUTION	Indicates that any improper operation or handling may result in minor injury or property damage.

WARNING	
	Do not disassemble, repair, modify, deform under pressure, or attempt to incinerate this product. Doing so may cause injury or fire.
	This product does not have a function that stops the emission of light from the laser during disassembly. Do not disassemble the product.
	This product is not explosion-proof and should not be used around flammable or explosive gases or liquids. Doing so may cause ignition resulting in an explosion or fire.
	Do not use air dusters or any spray that uses flammable gas around the product or on the inside of the product. Doing so may cause ignition resulting in a fire.
	Do not install this product or its cables in any of the following locations. Doing so may cause a fire, damage, or a malfunction. 1. Locations where dust, salt, iron powders, or vapor (steam) is present. 2. Locations subjected to corrosive gases or flammable gases. 3. Locations where water, oil, or chemical splashes may occur. 4. Locations where heavy vibrations or impacts may occur. 5. Locations where the ambient temperature exceeds the rated range. 6. Locations subject to rapid temperature changes (or where condensation occurs). 7. Locations with strong electric or magnetic fields. 8. Outdoor locations or locations subject to direct sun light.
	Do not connect any power source other than the dedicated controller. Doing so may cause a fire or damage the product.
	This product cannot be used in applications that directly or indirectly detect human bodies for the purpose of ensuring safety. Do not use this product as a detection device for protecting the human body.
	Do not look directly at the laser beam or intentionally shine the laser beam in another person's eyes. Doing so may have adverse effects on the eyes, including temporary blindness.
	Do not use this product in a non-industrial environment. Doing so may cause induction or radiation interference.
	This product is not intended for use with nuclear power, railways, aviation, vehicles, medical equipment, food-handling equipment, or any application where particular safety measures are required. Absolutely do not use this product for any of these fields.
	Do not let the thermometer touch the object that is being measured. This product is a non-contact thermometer. Touching high temperature object may cause deformation of the meter, irreparable damage or incorrect measurement.
	Do not touch the lens in this product. Do not touch the lens with hard or sharp objects. Do not insert foreign objects into the light receiving part. Otherwise incorrect measurement will occur.
	Keep the thermometer away from sudden change in ambient temperature. Sudden temperature change may cause incorrect measurement. Start measurement when temperature has become stable after leaving the meter for a while.
	In the event of a malfunction such as smoke comes out from the product. If you detect any malfunction including emission of smoke, abnormal smells or sounds, or the housing becoming very hot, immediately stop operating the product and turn off the power to the controller. Repairing the product is dangerous and should in no way be performed by the customer. Contact the OPTEX FA sales office.
	In case water enters the product. If water or any other liquid enters the product or the cable, immediately stop operating the product and turn off the power to the controller. Using the product in this condition may cause a fire.

CAUTION	
	This product is not clinical thermometer and therefore, cannot be used for medical purposes.
	Follow the instructions in this manual or the specified instruction manual when wiring the product or the dedicated controller for the correct wiring method. Incorrect wiring can damage the product or the controller or cause a malfunction.
	Use the dedicated cable for connecting the product to the controller. Use of anything other than the dedicated cable may cause a malfunction or damage the product.
	Do not excessively twist or apply stress to the cable. Doing so may damage the cable or the connector.
	When connecting the cable, make sure to hold it by the connector portion, and do not apply excessive force to the cable.
	When disconnecting the connector, be careful not to touch the terminals inside the connector, and do not allow foreign objects to enter the connector.
	Route wiring separately from high-voltage circuits and power circuits. If the wires are routed together, induction may occur, which can cause a malfunction or damage the product. If this is unavoidable, use a conductive object such as a properly grounded conduit as a shield.
	Install this product as far away from high-voltage equipment, power equipment, equipment that generates large switching surges, welders, inverter motors, or any equipment that can be a source of noise.
	Use this product within the rated ranges.
	Install this product and the dedicated controller securely. Failure to ensure secure installation can result in the products falling and becoming damaged.
	Make sure to turn the power off before wiring the cable or connecting/disconnecting the connector. Performing work while the product is energized may damage it or cause electric shock.

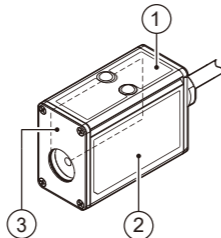
NOTICE

- After carefully considering the intended use, required specifications, and usage conditions, install and use the product within the specified ranges.
- All specifications may be changed without notice.
- When using this product, it is the responsibility of the customer to ensure necessary safety designs in hardware, software, and systems in order to prevent any threat to life, physical health, and property due to product malfunction or failure.
- Do not use this product for the development of weapons of mass destruction, for military use, or for any other military application. Moreover, if this product is to be exported, comply with all applicable export laws and regulations, including the "Foreign Exchange and Foreign Trade Act" and the "Export Administration Regulations," and carry out the necessary procedures pursuant to the provisions therein.
- If installing this product in your own equipment, ensure that the product is properly handled according to the laws and regulations of the relevant country or region.
- Detection characteristics values may vary depending on the state of the target object and variations among individual products.
- Before using this product, fully examine the applicable environmental laws and regulations, and operate the product in conformity to such laws and regulations. OPTEX FA does not assume any responsibility for damages or losses occurring as a result of noncompliance with applicable laws and regulations.

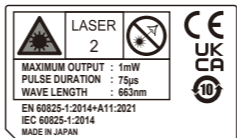
Precautions for Laser Use

- This product emits Class 2 visible laser beam that is compliant with JIS C6802 / IEC 60825-1 laser product safety standards. Labels for applicable standards are affixed to the product.
- If this product will be exported to the United States, approval must first be obtained from the FDA (Food and Drug Administration), the laser regulating body of the United States.
- A report for this product has been submitted to the CDRH (Center for Devices and Radiological Health).
- Use of controls or adjustments performance of procedures other than those described here may result in hazardous radiation exposure.

Laser warning label position



① Laser aperture label



② Laser warning label



③ FDA certification/ identification label

Type of laser used in this product

Type	Red semiconductor laser
Wavelength	663 nm
Maximum output	1 mW
Pulse duration	75 μs
Repetition Frequency	2.63 kHz

1. Included Items and Options

Included Items

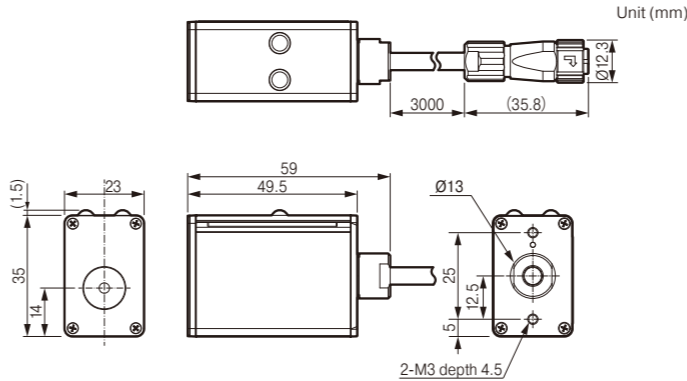
- Sensor head

- Instruction manual

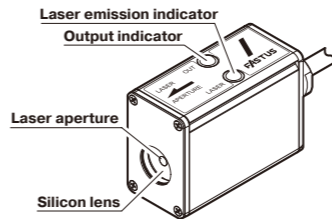
Options

- TI-SSA06-G3K (extension cable, 3m)
- BEF-TISH-A (Mounting bracket for wall mounted)
- BEF-TISH-AB (Mounting bracket for 2-axis mounted)
- HB-250 (Black tape for glossy objects)
- TI-SSA06-G10K (extension cable, 10m)
- BEF-TISH-B (Mounting bracket for floor mounted)

2. Dimensions



3. Part Names



Laser emission indicator: Lights green when the laser is emitted, and turns off when the laser is not emitted.

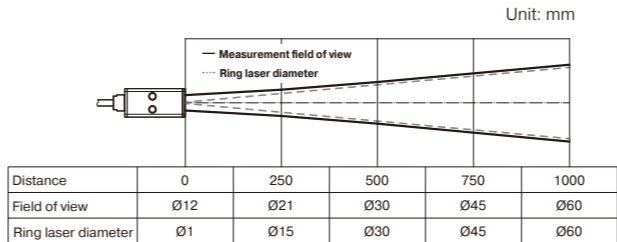
Output indicator: The lighting color and status change as shown in the table below depending on the output status and error/warning level.

Output indicator	Description
Lights green	Normal measurement
Lights red	Alarm output is ON
Blinks green	Low level warnings
Blinks orange	High level warnings
Blinks red	Errors

Note: For details on errors and warnings, refer to the "TI-S Series User's Manual".

4. Field of view

TI-S30



When the laser pointer is turned on, a ring-shaped laser beam is emitted. Install the sensor head so that the measurement target covers the entire ring laser. The field of view stated above is for an output response of 90%. The measurement object must be fit in the ring laser.

5. Maintenance

Lens

Dust, dirt and scratches on the lens can cause incorrect measurement. If the lens is dirty, remove the dust using a blower for cleaning lens. For stubborn dirt, apply a small amount of ethyl alcohol to a cotton swab or special lens cleaning cloth and gently wipe off the dirt. Wiping too hard may damage the lens surface.

Sensor head

If it is very dirty, moisten a cloth with a small amount of ethyl alcohol and gently wipe it off.

Calibration

Yearly calibration is recommended. For details, please contact OPTEX FA or the sales distributor.

6. Specifications

Model		TI-S30
Measurement range		-40 to +500 °C
Display range		-50 to +510 °C
Field of view		Ø30 mm at 500 mm
Optics		Silicon lens
Sensing element/spectral response		Thermopile 8 to 14 μm
Response time (operating mode)		High speed response, 50 ms, 100 ms, 200 ms, 500 ms, 1 s, 2 s, 5 s, 10 s, 20 s Output response 90%*1
Accuracy*2		-40 to 0 °C: ±1.5 °C +1 to +200 °C: ±1 °C +201 to +500 °C: ±0.5 % of reading value
Repeatability		±0.5 °C (When operating mode is 100 ms)
Temperature drift		Within ±0.25 °C/°C
Emissivity adjustment		0.100 to 1.200
Supply voltage		5 VDC (Supplied from controller)
Current consumption		30 mA or less/ 5 VDC
Connection type		Pigtail cable 3m Minimum bending radius: R 31 mm
Total cable length		Maximum 13 m (pigtail cable 3m + extension cable 10m)
Laser pointer	Medium	Red semiconductor laser
	Wavelength	663 nm
	Maximum output	1 mW
Laser class (JIS/IEC/FDA)*3		CLASS 2
Environmental resistance	Degree of protection	IP67 (IEC 60529)
	Ambient temperature	0 to +80 °C (up to +70 °C during laser emission)
	Ambient humidity	35 to 85% RH (no condensation)
	Storage temperature	-20 to +80 °C
	Vibration resistance	10 to 55 Hz Double amplitude 1.5 mm 2 hours in each X, Y, Z directions
Applicable regulations	Shock resistance	500 m/s ² (Approx. 50 G) 3 times in each X, Y, Z directions
	EMC	EMC Directive (2014/30/EU)
	UK EMC	UK EMC (The Electromagnetic Compatibility Regulations 2016) FCC Part 15 subpart B
	Environment	RoHS Directive (2011/65/EU), China RoHS (MIIT Order No.32) UK RoHS (The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012)
	Safety	FDA Regulation (21 CFR 1040.10 and 1040.11*)
Applicable standards		EN / IEC 61326-1
Material		Case: Aluminum, Front plate: Stainless steel
Weight		Approx. 180 g

*1: The response time is the time it takes for the output change to reach 90%.

*2: Measurement conditions: Emissivity; 1.000, Ambient temperature; 23 ±5°C, Size of the measurement target; sufficiently larger than the field of view.

*3: In accordance with the FDA provisions of Laser Notice No. 56, the laser is classified per the IEC 60825-1:2014 standard.

*4: Excluding differences per Laser Notice No. 56.

- Support for the China RoHS directive

For details on the support for the China RoHS (the Administrative Measure on the Control of Pollution Caused by Electronic Information Products), see the following website.
https://www.optex-fa.com/rohs_cn/

- Specifications are subject to change without notice.
- For more information, questions and comments regarding product, please contact us at the information below.

This device complies with part 15 of the FCC Rules.

Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

* This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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