

# Thermal condition monitoring device

# K6PM-TH

**Consistently and remotely monitor and analysis the temperature status of panel devices to achieve both labor-saving and significant risk mitigation of abnormal stop**

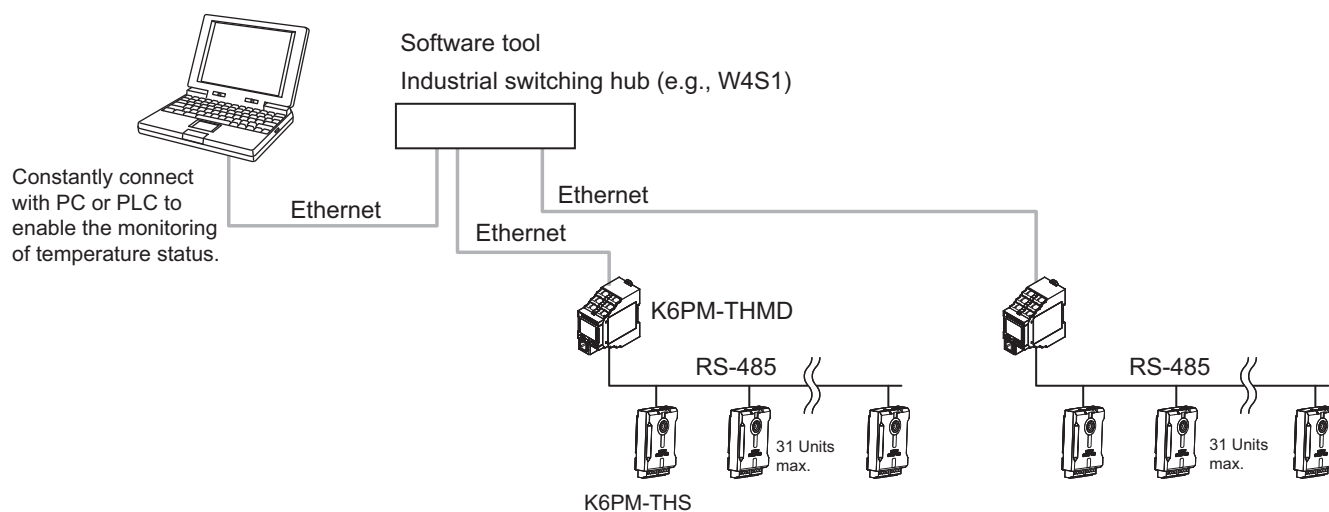
- Visualize the thermal status in a panel using the infrared thermal sensor (Special thermal image sensor) with a wide viewing angle in a compact body, specifically designed for mounting in a panel
- Detect abnormal symptoms by the algorithm analyzing the temperature status in a panel
- Setting tool to provide the constant remote monitoring system



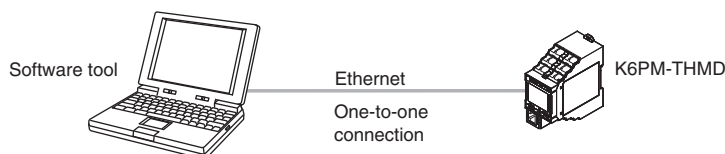
For the most recent information on models that have been certified for safety standards, refer to your OMRON website.

## System Configuration

With the software tool, K6PM-THMD devices can be connected via an Ethernet cable, and settings and monitoring can be performed.



**Note:** Only when setting the IP address, connect the PC and the K6PM-THMD device one to one with an Ethernet cable as shown below.



## K6PM-TH

### Model Number Structure

#### Model Number Legend

##### Main Unit

**K6PM- TH MD - EIP**  
(1) (2) (3)

| No. | Classification         | Symbol | Meaning                                            |
|-----|------------------------|--------|----------------------------------------------------|
| (1) | Product classification | TH     | Thermal condition monitoring device                |
| (2) | Product classification | MD     | Main Unit                                          |
| (3) | Communications method  | EIP    | Supports EtherNet/IP and Modbus TCP communications |

##### Infrared thermal sensor (Special thermal imaging sensor)

**K6PM- TH S 3232**  
(1) (2) (3)

| No. | Classification         | Symbol | Meaning                                                  |
|-----|------------------------|--------|----------------------------------------------------------|
| (1) | Product classification | TH     | Thermal condition monitoring device                      |
| (2) | Product classification | S      | Infrared thermal sensor (Special thermal imaging sensor) |
| (3) | Model classification   | 3232   | Number of K6PM sensor pixels: 32 × 32                    |

## Ordering Information

### Main Unit

| Power supply voltage | Model         |
|----------------------|---------------|
| 24 VCD               | K6PM-THMD-EIP |

### Infrared thermal sensor

| Resolution | Model        |
|------------|--------------|
| 32 × 32    | K6PM-THS3232 |

## EtherNet/IP communications cable recommended parts

Use a Category 5 or higher STP cable (shielded twisted pair cable).

### Cable with Connectors

| Item                                                                                     |                                                                                                                                                                                                | Recommended manufacturer | Cable length (m) | Model                |
|------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|------------------|----------------------|
| Wire Gauge and Number of Pairs:<br>AWG26, 4-pair Cable<br>Cable Sheath material: LSZH *2 | Cable with Connectors on Both Ends<br>(RJ45/RJ45)<br>Standard RJ45 plug type *1<br>Cable color: Yellow *3<br> | OMRON                    | 0.3              | XS6W-6LSZH8SS30CM-Y  |
|                                                                                          |                                                                                                                                                                                                |                          | 0.5              | XS6W-6LSZH8SS50CM-Y  |
|                                                                                          |                                                                                                                                                                                                |                          | 1                | XS6W-6LSZH8SS100CM-Y |
|                                                                                          |                                                                                                                                                                                                |                          | 2                | XS6W-6LSZH8SS200CM-Y |
|                                                                                          |                                                                                                                                                                                                |                          | 3                | XS6W-6LSZH8SS300CM-Y |
|                                                                                          |                                                                                                                                                                                                |                          | 5                | XS6W-6LSZH8SS500CM-Y |
| Wire Gauge and Number of Pairs:<br>AWG22, 2-pair Cable                                   | Cable with Connectors on Both Ends<br>(RJ45/RJ45)<br>Rugged RJ45 plug type *1<br>Cable color: Light blue<br> | OMRON                    | 0.3              | XS5W-T421-AMD-K      |
|                                                                                          |                                                                                                                                                                                                |                          | 0.5              | XS5W-T421-BMD-K      |
|                                                                                          |                                                                                                                                                                                                |                          | 1                | XS5W-T421-CMD-K      |
|                                                                                          |                                                                                                                                                                                                |                          | 2                | XS5W-T421-DMD-K      |
|                                                                                          |                                                                                                                                                                                                |                          | 5                | XS5W-T421-GMD-K      |
|                                                                                          |                                                                                                                                                                                                |                          | 10               | XS5W-T421-JMD-K      |

\*1. Cables with standard RJ45 plugs are available in the following lengths: 0.2 m, 0.3 m, 0.5 m, 1 m, 1.5 m, 2 m, 3 m, 5 m, 7.5 m, 10 m, 15 m, 20 m.

Cables with rugged RJ45 plugs are available in the following lengths: 0.3 m, 0.5 m, 1 m, 2 m, 3 m, 5 m, 10 m, 15 m.

For details, refer to the *Industrial Ethernet Connectors Catalog* (Cat. No. G019).

\*2. The lineup features Low Smoke Zero Halogen cables for in-cabinet use and PUR cables for out-of-cabinet use.

\*3. Cable colors are available in yellow, green, and blue. The last character of the model changes to "-G" or "-B".

### Cable/Connector

| Part name      | Manufacturer        | Model      |
|----------------|---------------------|------------|
| Cable          | Kuramo Electric Co. | KETH-SB *  |
| RJ45 connector | Panduit Corporation | MPS588-C * |

\* It is recommended to use the cable and connector in combination described above.

### Industrial switching hub (recommended parts)

| Recommended manufacturer | Appearance                                                                                                                                 | Functions                                                                                         | Number of ports | Model    |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-----------------|----------|
| OMRON                    |                                                         | Quality of Service (QoS):<br>EtherNet/IP control data priority<br>10/100BASE-TX, Auto-Negotiation | 5               | W4S1-05D |
| Cisco Systems, Inc       | Consult the manufacturer.<br><a href="https://www.cisco.com/">https://www.cisco.com/</a>                                                   |                                                                                                   |                 |          |
| Contec USA, Inc.         | Consult the manufacturer.<br><a href="https://www.contec.com/us/">https://www.contec.com/us/</a>                                           |                                                                                                   |                 |          |
| Phoenix Contact USA      | Consult the manufacturer.<br><a href="https://www.phoenixcontact.com/online/portal/pc">https://www.phoenixcontact.com/online/portal/pc</a> |                                                                                                   |                 |          |

# K6PM-TH

## Ratings and Characteristics

### Main Unit Specifications

#### Ratings

| Item                               |                                   | Model | K6PM-THMD-EIP                                                                                                          |
|------------------------------------|-----------------------------------|-------|------------------------------------------------------------------------------------------------------------------------|
| Power supply                       | Power supply voltage              |       | 24 VDC                                                                                                                 |
|                                    | Allowable operating voltage range |       | 85% to 110% of the power supply voltage                                                                                |
|                                    | Power supply frequency range      |       | ---                                                                                                                    |
|                                    | Power consumption                 |       | 1.6 W max.                                                                                                             |
| Input                              | Compatible sensor                 |       | K6PM-THS3232                                                                                                           |
|                                    | Number of connected K6PM sensors  |       | 31 units                                                                                                               |
| Output                             | Output form                       |       | Transistor output                                                                                                      |
|                                    | Number of outputs                 |       | 3 points:                                                                                                              |
|                                    | Rated voltage                     |       | 24 VDC                                                                                                                 |
|                                    | Maximum current                   |       | 50 mA                                                                                                                  |
| Ambient operating temperature      |                                   |       | -10 to +55 °C (with no condensation or freezing)                                                                       |
| Ambient storage temperature        |                                   |       | -20 to +65 °C (with no condensation or freezing)                                                                       |
| Ambient operating humidity         |                                   |       | 25% to 85% (with no condensation)                                                                                      |
| Storage humidity                   |                                   |       | 25% to 85% (with no condensation)                                                                                      |
| Exterior color                     |                                   |       | Black                                                                                                                  |
| Case material                      |                                   |       | PC UL94-V0                                                                                                             |
| Altitude                           |                                   |       | 2,000 m max.                                                                                                           |
| Applicable wires                   |                                   |       | Stranded wires, solid wires, or ferrules                                                                               |
| Applicable wire size               |                                   |       | 0.25 to 1.5 mm <sup>2</sup> (AWG24 to AWG16)                                                                           |
| Wire insertion force               |                                   |       | 8 N max. for AWG20 wire                                                                                                |
| Screwdriver insertion force        |                                   |       | 15 N max.                                                                                                              |
| Wire stripping length              |                                   |       | 8 mm *1, 10 mm, 12 mm                                                                                                  |
| Recommended Flat-blade Screwdriver |                                   |       | XW4Z-00B                                                                                                               |
| Current capacity                   |                                   |       | 10 A (per pole)                                                                                                        |
| Number of insertions               |                                   |       | 50 times                                                                                                               |
| Weight                             |                                   |       | Approx. 200 g                                                                                                          |
| Mounting *2                        |                                   |       | DIN Track mounting                                                                                                     |
|                                    |                                   |       | Screw Mounting                                                                                                         |
| Dimensions                         |                                   |       | 45 (W) × 90 (H) × 90 (D) mm                                                                                            |
| Setting method                     |                                   |       | Communications settings from software tool                                                                             |
| Other functions                    |                                   |       | Display value selection, Main Unit error and K6PM sensor error output, setting parameters initialization, running time |
| Accessories                        |                                   |       | Instruction manual                                                                                                     |

\*1. Without ferrules

\*2. For details on mounting on a DIN track and screw attachment, refer to *K6PM Thermal Condition Monitoring Device User's Manual* (H231).

## Characteristics

| Item                             |                                       | Model                     | K6PM-THMD-EIP                                                                                                                                                                                                                                                                        |
|----------------------------------|---------------------------------------|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Temperature measurement range    |                                       |                           | The temperature measurement range is described in the thermal sensor (K6PM-THS3232) performance.                                                                                                                                                                                     |
| Measurement temperature accuracy |                                       |                           | The measurement temperature accuracy is described in the thermal sensor (K6PM-THS3232) performance.                                                                                                                                                                                  |
| Sampling cycle for the sensor    |                                       |                           | Approx. 1 second/Unit                                                                                                                                                                                                                                                                |
| External trigger                 | External contact input specifications |                           | Short circuit: Residual voltage 1.5 V or less<br>Open: Leakage current 0.1 mA or less                                                                                                                                                                                                |
|                                  | Short circuit current                 |                           | Approx. 7 mA                                                                                                                                                                                                                                                                         |
| Alarm                            | Measurement parameters                |                           | Current temperature, differential temperature, sensor internal temperature                                                                                                                                                                                                           |
|                                  | Expression method                     |                           | Transistor output, alarm bar display                                                                                                                                                                                                                                                 |
|                                  | Number of variables                   |                           | Two threshold values per segment (Threshold 1 and Threshold 2)                                                                                                                                                                                                                       |
|                                  | Threshold setting range               |                           | 0.0 to 999.9°C (0.0 to 999.9°F)                                                                                                                                                                                                                                                      |
|                                  | Hysteresis                            |                           | 3.0°C width (5.4°F width)                                                                                                                                                                                                                                                            |
|                                  |                                       | Resetting method          | Manual resetting *1 or automatic resetting (switching)                                                                                                                                                                                                                               |
| LCD display                      |                                       |                           | 7-segment digital displays and individual indicators                                                                                                                                                                                                                                 |
| Display resolution               |                                       |                           | 0.1°C                                                                                                                                                                                                                                                                                |
| Applicable standards             | Approved standards                    |                           | UL61010-1 (Listing) installation location: Pollution level 2, South Korean Radio Law                                                                                                                                                                                                 |
|                                  | Conforming standards                  |                           | RCM                                                                                                                                                                                                                                                                                  |
|                                  | EMC                                   |                           | EN61326-1 (EMI: Class A EMS: Industrial Location)                                                                                                                                                                                                                                    |
| Recommended fuse                 |                                       |                           | T2A, time lag, high shut-off capacity                                                                                                                                                                                                                                                |
| Insulation resistance            |                                       |                           | 20 MΩ min.<br>Between all external terminals and the case<br>Between all power supply terminals and all other terminals<br>Between all RS-485 communications terminals, and all external trigger input terminals, all transistor output terminals and all Ethernet ports             |
| Dielectric strength              |                                       |                           | 2,000 VAC for 1 minute<br>Between all external terminals and the case<br>Between all power supply terminals and all other terminals<br>Between all RS-485 communications terminals, and all external trigger input terminals, all transistor output terminals and all Ethernet ports |
| Vibration resistance             |                                       |                           | Frequency: 10 to 55 Hz, 0.35-mm single amplitude in X, Y, and Z directions (10 sweeps of 5 min each)                                                                                                                                                                                 |
| Shock resistance                 |                                       |                           | 150 m/s <sup>2</sup> , 3 times each in X, Y, and Z axes, 6 directions                                                                                                                                                                                                                |
| Degree of protection             |                                       |                           | IP20                                                                                                                                                                                                                                                                                 |
| Warranty period                  |                                       |                           | 1 year                                                                                                                                                                                                                                                                               |
| Indicators                       | Alarm bar                             |                           | Red, yellow, and green                                                                                                                                                                                                                                                               |
|                                  | MS and NS                             |                           | Red and green                                                                                                                                                                                                                                                                        |
| Ethernet Communi<br>caitons      | Supported services                    |                           | EtherNet/IP (tag data link or CIP message communications)<br>BOOTP client<br>Modbus TCP                                                                                                                                                                                              |
|                                  | Physical layer                        |                           | 100 Base-TX                                                                                                                                                                                                                                                                          |
|                                  | Transmission specifications           | Transmission speed        | 100 Mbps                                                                                                                                                                                                                                                                             |
|                                  |                                       | Transmission medium       | Twisted pair cable (with shield: STP): Category 5 or higher                                                                                                                                                                                                                          |
|                                  |                                       | Transmission distance     | 100 m max. (distance between hub and node)                                                                                                                                                                                                                                           |
|                                  | Tag data link *2                      | Class1                    | Connection resource: 4 max.                                                                                                                                                                                                                                                          |
|                                  |                                       | Packet interval (RPI)     | 1,000 to 10,000 ms                                                                                                                                                                                                                                                                   |
|                                  |                                       | Timeout value             | Multiples of RPI (4 times, 8 times, 16 times, 32 times, 64 times, 128 times, 256 times, 512 times)                                                                                                                                                                                   |
|                                  |                                       | Connection type           | Point To Point Connection (fixed)                                                                                                                                                                                                                                                    |
|                                  | Explicit message *2                   | Class 3                   | Number of clients that can communicate at one time: 2 max.                                                                                                                                                                                                                           |
|                                  |                                       | UCMM                      | Number of clients that can communicate at one time: 2 max.                                                                                                                                                                                                                           |
|                                  | Modbus message *2                     | Modbus TCP                | Number of clients that can communicate at one time: 2 max.                                                                                                                                                                                                                           |
|                                  | Factory default values                | IP address.               | 192.168.250.30                                                                                                                                                                                                                                                                       |
|                                  |                                       | Subnet mask.              | 255.255.255.0                                                                                                                                                                                                                                                                        |
|                                  |                                       | The default gateway.      | 0.0.0.0                                                                                                                                                                                                                                                                              |
|                                  |                                       | IP address setting method | Static IP address                                                                                                                                                                                                                                                                    |

\*1. Manual resetting method: Press and hold the SEG/ALM RST Button

\*2. When you use tag data link, explicit message communications, and Modbus message communications simultaneously, limit the number of client nodes to 4 or less. If simultaneous communication is carried out with 5 or more nodes, a timeout may occur due to the communications load.

## Indicator specifications

| Symbol | Name           | Color | Status                    | Operating condition                                                                                                                                                                                                    |
|--------|----------------|-------|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MS     | Module Status  | Green | Lit.                      | Normal status                                                                                                                                                                                                          |
|        |                |       | Flashes at 1-s intervals. | BOOTP server connection error state                                                                                                                                                                                    |
|        |                | Red   | Lit.                      | One of the following fatal errors (Main Unit internal error)<br>• Internal CPU error<br>• Internal memory error                                                                                                        |
|        |                |       | Flashes at 1-s intervals. | One of the following conditions<br>• K6PM sensor communications error<br>• The detection of the K6PM sensor angle deviation<br>• Sensor type error<br>• Temperature measurement range exceeded<br>• Running time error |
|        |                |       | Not lit.                  | No power supply                                                                                                                                                                                                        |
| NS     | Network Status | Green | Lit.                      | Tag data link or message connection established                                                                                                                                                                        |
|        |                |       | Flashes at 1-s intervals. | No tag data link or message connection established                                                                                                                                                                     |
|        |                | Red   | Lit.                      | IP address duplication status                                                                                                                                                                                          |
|        |                |       | Flashes at 1-s intervals. | The connection has timed out                                                                                                                                                                                           |
|        |                | ---   | Not lit.                  | No power supply, or IP address not set                                                                                                                                                                                 |

## Transistor output specifications

| Name                   | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Transistor Output 1    | Threshold 1 excess output of comprehensive alarm.<br>Transistor output type can be set to Normally Closed or Normally Open.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Transistor Output 2    | Threshold 2 excess output of comprehensive alarm.<br>Transistor output type can be set to Normally Closed or Normally Open.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Transistor Output 3 *3 | <ul style="list-style-type: none"> <li>This is the output of the Main Unit or K6PM-TH sensor error *1, or the output that determines whether the Main Unit is in setting mode or monitoring mode.</li> <li>The output type of transistor output 3 is fixed as Normally closed.</li> <li>Depends on the setting of the <b>TR3 output mode</b> parameter. *2<br/> Set the <b>TR3 output mode</b> to 0: <i>Error existence</i><br/> Transistor output 3 is turned ON: No error occurred in the Main Unit or K6PM-TH sensor<br/> Transistor output 3 is turned OFF: Error occurred in the Main Unit or K6PM-TH sensor<br/> Set the <b>TR3 output mode</b> to 0: <i>Monitoring existence</i><br/> Transistor output 3 is turned ON: In monitoring mode, and no error occurred in the Main Unit or K6PM-TH sensor.<br/> Transistor output 3 is turned OFF: In setting mode, and an error occurred in the Main Unit or K6PM-TH sensor.</li> </ul> |

\*1. The Main Unit error and K6PM-TH sensor error specify any one of the following:

- Main Unit internal error (internal CPU error or internal memory error)
- K6PM-TH sensor communications error or sensor type error
- The detection of the K6PM-TH sensor angle deviation
- Temperature measurement range exceeded
- Running time error

\*2. **TR3 output mode** parameter can be operated with K6PM-TH Main Unit EIP Ver. 1.1 or later and Condition Monitoring Configuration Tool Ver. 1.2 or higher.

\*3. The operation of transistor output 3 is as described below.

| Transistor output 3                                |                                           | Condition                                                                                        |                                                          |
|----------------------------------------------------|-------------------------------------------|--------------------------------------------------------------------------------------------------|----------------------------------------------------------|
| TR3 output mode<br>0: Error existence<br>(default) | TR3 output mode<br>1: Monitored existence | K6PM-TH Main Unit                                                                                | Infrared Thermal Sensor                                  |
| OFF                                                | OFF                                       | Operating                                                                                        |                                                          |
|                                                    |                                           | Main Unit internal error                                                                         |                                                          |
| ON                                                 | OFF                                       | In setting mode<br>(K6PM-TH sensor search<br>mode or K6PM-TH sensor<br>position adjustment mode) | Before data acquisition                                  |
|                                                    |                                           |                                                                                                  | Normal                                                   |
| OFF                                                | OFF                                       |                                                                                                  | K6PM-TH sensor communications error or sensor type error |
|                                                    |                                           |                                                                                                  | The detection of the K6PM-TH sensor angle deviation      |
|                                                    |                                           |                                                                                                  | Temperature measurement range exceeded                   |
|                                                    |                                           |                                                                                                  | Running time error                                       |
| ON                                                 | ON                                        | In monitoring mode                                                                               | Before data acquisition                                  |
|                                                    |                                           |                                                                                                  | Normal                                                   |
| OFF                                                | OFF                                       |                                                                                                  | K6PM-TH sensor communications error or sensor type error |
|                                                    |                                           |                                                                                                  | The detection of the K6PM-TH sensor angle deviation      |
|                                                    |                                           |                                                                                                  | Temperature measurement range exceeded                   |
|                                                    |                                           |                                                                                                  | Running time error                                       |

## Measured value display

| Measurement level                                                                            | Methods for checking                                                             |                                                                                                                        |                                                                                                                                                                                 |
|----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                              | Main Unit (display)                                                              | Software tool                                                                                                          | Communicaitons                                                                                                                                                                  |
| Temperature of each segment and sensor internal temperature                                  | The segment display of each sensor can be switched on the Main Unit front-panel. | Can be checked on the Alarm setting screen.                                                                            | <ul style="list-style-type: none"> <li>• EtherNet/IP tag data link communications</li> <li>• EtherNet/IP message communications</li> <li>• Modbus TCP communications</li> </ul> |
| Differential temperature per segment from the K6PM-TH sensor internal temperature            | Not supported                                                                    | Not supported                                                                                                          | Not supported                                                                                                                                                                   |
| Temperature of each infrared thermal sensor                                                  | Not supported                                                                    | The past maximum value can be monitored on the Alarm setting screen.                                                   | Not supported                                                                                                                                                                   |
| Temperature of each pixel                                                                    | Not supported                                                                    | The temperature can be displayed when the cursor is placed on the thermal image on the Infrared thermal sensor screen. | <ul style="list-style-type: none"> <li>• EtherNet/IP message communications</li> <li>• Modbus TCP communications</li> </ul>                                                     |
| Alarms of each Main Unit (Alarms of all infrared thermal sensors connected to the Main Unit) | The occurrence of an alarm can be checked on the alarm bar.                      | The occurrence of an alarm can be checked on the Device List of logging screen.                                        | The occurrence of an alarm can be checked from the Main Unit status.                                                                                                            |

## Infrared thermal sensor

## Ratings

| Item                          |                                   | Model | K6PM-THS3232                                                      |
|-------------------------------|-----------------------------------|-------|-------------------------------------------------------------------|
| Power supply                  | Power supply voltage              |       | 24 VDC                                                            |
|                               | Allowable operating voltage range |       | 85% to 110% of the power supply voltage                           |
|                               | Power supply frequency range      |       | ---                                                               |
|                               | Power consumption                 |       | 0.4 W max./Unit at 24 VDC *1                                      |
| Ambient operating temperature |                                   |       | -10 to +55 °C (with no condensation or freezing)                  |
| Storage temperature           |                                   |       | -20 to +65 °C (with no condensation or freezing)                  |
| Ambient operating humidity    |                                   |       | 25% to 85% (with no condensation)                                 |
| Storage humidity              |                                   |       | 25% to 85% (with no condensation)                                 |
| Exterior color                |                                   |       | Black                                                             |
| Case material                 |                                   |       | PC UL94-V0                                                        |
| Altitude                      |                                   |       | 2,000 m max.                                                      |
| Applicable wires              |                                   |       | Stranded wires or solid wires                                     |
| Applicable wire size          |                                   |       | 0.25 to 1.5 mm <sup>2</sup> (AWG24 to AWG16)                      |
| Current capacity              |                                   |       | 8 A (per pole)                                                    |
| Weight                        |                                   |       | 50 g max.                                                         |
| Mounting                      |                                   |       | Mounting *2<br>Screw Mounting                                     |
| Dimensions                    |                                   |       | 43 × 60 × 25.1 mm (W×H×D) Terminals not included                  |
| Accessories *3                |                                   |       | Instruction manual, mounting bracket, magnet (for positioning) *4 |

\*1. The power consumption increases according to the number of connected devices. Take note of the choice of wiring and the wiring diameter.

\*2. A 1/4-20 UNC mounting hole is available (nuts are not provided).

\*3. The pan head is sold separately.

\*4. Use magnet mounting for positioning the sensor.



## Performance

| Item                    |                                    | Model                                                                                             | K6PM-THS3232                                                                                            |
|-------------------------|------------------------------------|---------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| Temperature measurement | Temperature measurement range      | Temperature measurement range: 0.0°C to 200.0°C (32.0°F to 392.0°F)                               |                                                                                                         |
|                         | Detection resolution               | 32 × 32 (1,024 pixels)                                                                            |                                                                                                         |
|                         | Temperature accuracy               | ±5°C (at an ambient temperature of 25°C) *1*2                                                     |                                                                                                         |
|                         | Emissivity                         | 0.94                                                                                              |                                                                                                         |
|                         | Reproducibility                    | 1°C (at an ambient temperature of 25°C) *2                                                        |                                                                                                         |
|                         | Temperature drift                  | 0.15°C                                                                                            |                                                                                                         |
|                         | Viewing angle [FOV]                | 90° × 90°                                                                                         |                                                                                                         |
|                         | Warmup time                        | 15 minutes                                                                                        |                                                                                                         |
| Other functions         | Over temperature measurement range | Temperature: 200.0°C or higher, sensor internal temperature: 80°C or higher                       |                                                                                                         |
|                         | Angle deviation detection *3       | Angle deviations of 5° (typ) min. and those that continue for 3 seconds min. can be detected.     |                                                                                                         |
| Output                  | Communications method              | RS-485 communications                                                                             |                                                                                                         |
|                         | Maximum cable length               | 500 m                                                                                             |                                                                                                         |
| Applicable standards    | Approved standards                 | UL61010-1 (listing) installation location: Pollution degree 2<br>Korean Radio Waves Act           |                                                                                                         |
|                         | Conforming standards               | RCM                                                                                               |                                                                                                         |
|                         | EMC                                | EN61326-1 (EMI: Class A EMS: Industrial Location)<br>Measured temperature fluctuation range: ±6°C |                                                                                                         |
| Recommended fuse        |                                    |                                                                                                   | T2A, time lag, high shut-off capacity                                                                   |
| Insulation resistance   |                                    |                                                                                                   | 20 MΩ min.<br>Between all terminals and the case                                                        |
| Dielectric strength     |                                    |                                                                                                   | 1,000 VAC for 1 minute<br>Between all terminals and the case                                            |
| Vibration resistance    |                                    |                                                                                                   | Frequency: 10 to 55 Hz, 0.35-mm single amplitude in X, Y, and Z directions (10 sweeps of 5 min each) *4 |
| Shock resistance        |                                    |                                                                                                   | 150 m/s <sup>2</sup> , 3 times each in 6 directions along 3 axes *4                                     |
| Degree of protection    |                                    |                                                                                                   | IP20                                                                                                    |
| Indicators              | Power indicator                    | Green (when power is on: lit, when power is not on: off)                                          |                                                                                                         |
|                         | Communications indicator           | Orange (when communications are performed: Lit, when communications are not performed: Not lit)   |                                                                                                         |
|                         | Alarm indicator                    | Red (when a sensor error occurs: Lit, when an angle deviation is detected: Flashing)              |                                                                                                         |

\*1. Accuracy may vary depending on the measured distance, the object's emissivity, and ambient temperature.

\*2. For details on temperature accuracy and reproducibility, refer to *K6PM Thermal Condition Monitoring Device User's Manual* (H231).

\*3. Make ON/OFF settings on the DIP switch Pin 2 (default value: OFF).

Since the operation is not stable at a location subject to vibrations, it may not be possible to detect angle deviation.

\*4. During screw mounting

Condition Monitoring Configuration Tool

Starting in February 2024, OMRON releases a software tool for configuring all models of condition monitoring devices. The unified configuration and verification environment of the software tool makes it easy to introduce condition monitoring devices. While the existing tools for condition monitoring devices will remain functional, be advised that OMRON has no plans to provide support for updates or related services. Going forward, use the Condition Monitoring Configuration Tool instead of the existing tools.

| Product name                               | Model   | Software Tool                      | The last day to download the tools |  | The new Tool will be available from February 2024 onwards |
|--------------------------------------------|---------|------------------------------------|------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------|
| Motor Condition Monitoring Device          | K6CM    | Motor Condition Monitoring Tool *1 | 30 November, 2024                  |                                                                                     |                                                           |
| Thermal Condition Monitoring Device        | K6PM-TH | K6PM-TH Software Tool              | 30 June, 2024                      |                                                                                     | Condition Monitoring Configuration Tool *2                |
| Insulation Resistance Monitoring Device    | K7GE-MG | K7GE-MG Logging Tool               |                                    |                                                                                     |                                                           |
| Heater Condition Monitoring Device         | K7TM    | K7TM Configuration Tool            |                                    |                                                                                     |                                                           |
| Advanced Motor Condition Monitoring Device | K7DD    | K7DD Support Tool                  |                                    |                                                                                     |                                                           |

\*1. The CD-ROM for the Motor Condition Monitoring Tool will no longer be supplied with K6CM manufactured in December 2024 or later.

\*2. It supports only the following models in the K6CM series.

- K6CM-CI2
- K6CM-VB (EIP CPU version 1.20 or later)
- K6CM-IS (EIP CPU version 1.20 or later)

Operating Environment

|                   |                                                                                                                                                                                                |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Supported OS      | Windows 10 (Version1607 or higher) and 11 (Japanese or English)<br>64 bit                                                                                                                      |
| PC specifications | CPU: 1 GHz or higher, 64 bit processor<br>Memory: 2 GB or higher<br>Disk reserved area capacity: 20 GB or more<br>Monitor resolution: 1920 × 1080<br>Others: LAN port (for network connection) |

How to obtain the Condition Monitoring Configuration Tool

Only download is available.

[https://www.ia.omron.com/cmc\\_tool](https://www.ia.omron.com/cmc_tool)

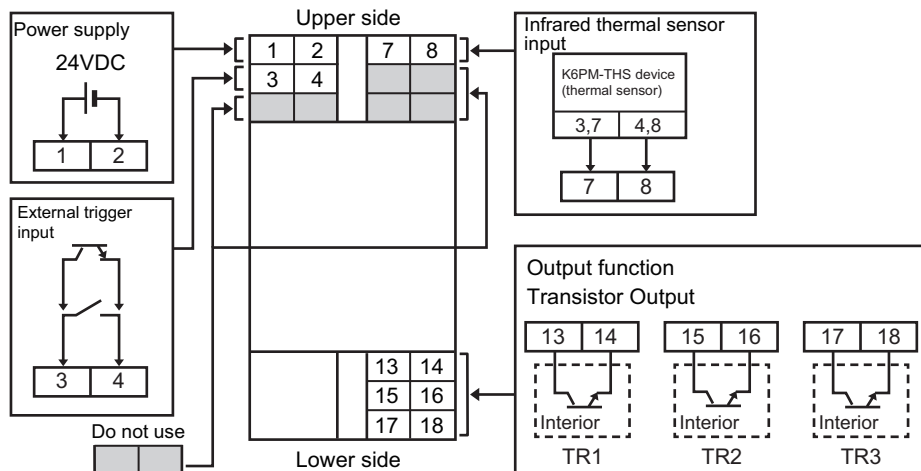
## Connection Diagram

### Main Unit

The diagram below shows the terminal layout of the following:

- 24 VDC
- External trigger input
- Infrared thermal sensor input
- Transistor output 1 to 3

All wiring connections are established by Push-In Plus terminals.

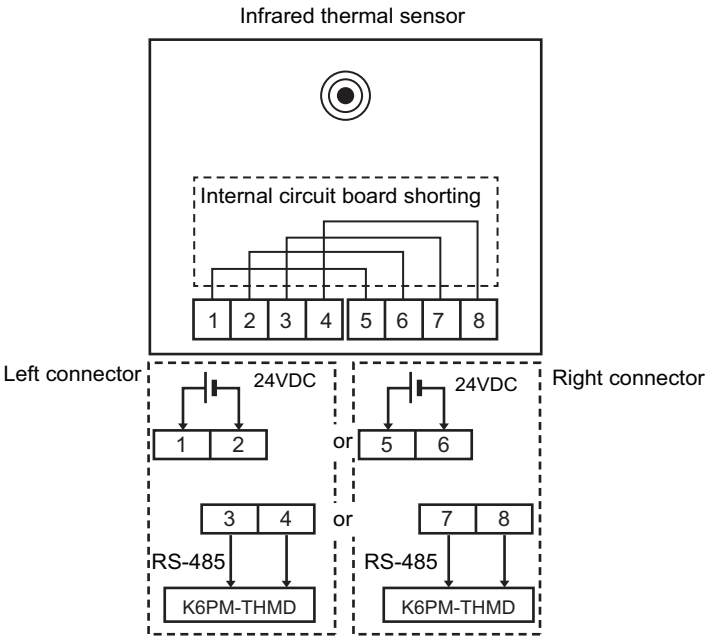


| Terminal number | Terminal name             | Function                                                                                             |
|-----------------|---------------------------|------------------------------------------------------------------------------------------------------|
| 1               | Power supply input        | 24 VDC input terminal (polarity)                                                                     |
| 2               | Power supply input        | 0 VDC input terminal (polarity)                                                                      |
| 3 or 4          | External trigger input    | ON: Interruption of temperature measurement                                                          |
| 7               | SDB(+)                    | RS-485 communications terminal (connected with sensor Number 3 or 7)                                 |
| 8               | SDA(-)                    | RS-485 communications terminal (connected with sensor Number 4 or 8)                                 |
| 13 or 14        | Transistor Output 1 (TR1) | Temperature error Threshold 1 exceeded                                                               |
| 15 or 16        | Transistor Output 2 (TR2) | Temperature error Threshold 2 exceeded                                                               |
| 17 or 18        | Transistor Output 3 (TR3) | Output to determine the Main Unit error and K6PM-TH sensor error, setting mode or monitoring mode *1 |

\*1. Transistor output 3 depends on the setting of the TR3 output mode parameter. Refer to K6PM-TH Thermal Condition Monitoring Device User's Manual (H231) for details on tool operation and parameters.

Infrared thermal sensor

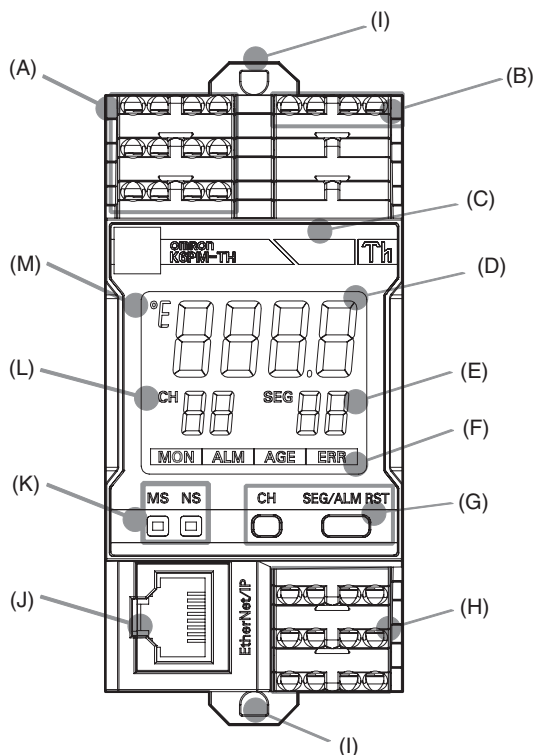
There are two connectors at the bottom of the infrared thermal sensor.  
These two connectors are shorted internally for crossover wiring.



| Terminal number | Terminal name             | Function                                                              |
|-----------------|---------------------------|-----------------------------------------------------------------------|
| 1 or 5          | Power supply input (+V)   | 24 VDC input terminal (polarity)                                      |
| 2 or 6          | Power supply input (-V)   | 0 VDC input terminal (polarity)                                       |
| 3 or 7          | RS-485 communications (B) | B (+) RS-485 communications terminal (connected with Main Unit no. 7) |
| 4 or 8          | RS-485 communications (A) | A (-) RS-485 communications terminal (connected with Main Unit no. 8) |

## Part names and functions

### Main Unit



| No. | Variable            | Function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (A) | Upper terminal      | Push-In Plus terminal <ul style="list-style-type: none"> <li>Power supply 24 VDC input to the Main Unit</li> <li>External trigger input</li> <li>ON: Measurement is interrupted.</li> <li>OFF: Measurement is performed.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| (B) | Upper terminal      | Push-In Plus terminal <ul style="list-style-type: none"> <li>Infrared thermal sensor input (RS-485 communications)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| (C) | Alarm bar           | Displays the following states of the Main Unit. <ul style="list-style-type: none"> <li>Normal (no alarm has occurred): Lit green</li> <li>No operation is being performed (power supply is not connected): Not lit</li> <li>Search or position adjustment mode: Not lit</li> <li>An alarm has occurred <ul style="list-style-type: none"> <li>Current temperature / differential temperature over threshold 1: Lights yellow</li> <li>Current temperature / differential temperature over threshold 2: Lights red</li> </ul> </li> <li>When the arrival prediction function is enabled: *</li> </ul>                                                                                                                                                                                                                                                                                                                                                                        |
| (D) | Numeric LCD display | Depending on the operating mode, the display differs as shown below. <ul style="list-style-type: none"> <li>Monitoring mode: Current temperature of the selected segment of the selected sensor <ul style="list-style-type: none"> <li>(a) When communications are not established with the sensor: "----" is displayed</li> <li>(b) When a K6PM sensor communications error occurs: "SErr" is displayed</li> <li>(c) When the sensor temperature exceeds the measurement range: The current temperature flashes</li> <li>(d) During measurement interruption due to an external trigger: The display is fixed as the value immediately before interruption</li> <li>(e) K6PM sensor search mode: "aa" is displayed for a sensor that sends a response, and "aFF" is displayed for a sensor that sends no response</li> </ul> </li> <li>K6PM sensor position adjustment mode: "RdJ" is displayed</li> <li>When a Main Unit internal error occurs: "8888" flashes</li> </ul> |
| (E) | SEG                 | The segment number or the number of currently-connected infrared thermal sensors is displayed. Depending on the operating mode, the display differs as shown below. <ul style="list-style-type: none"> <li>In monitoring mode: The segment number selected by the SEG/ALM RST Key is displayed. 0 to 15 Sensor internal temperature: 99</li> <li>In sensor search mode: The number of infrared thermal sensors currently connected to the Main Unit is displayed.</li> <li>In sensor position adjustment mode: The number of infrared thermal sensors currently connected to the Main Unit is displayed.</li> </ul>                                                                                                                                                                                                                                                                                                                                                         |
| (F) | Status display      | The status of the Main Unit is displayed as follows: <ul style="list-style-type: none"> <li>MON: K6PM sensor monitoring state. The indicator is not lit during measurement interruption due to an external trigger.</li> <li>ALM: Alarm occurrence state (lit only when the corresponding K6PM sensor number is being displayed)</li> <li>AGE: Running time reaches 100%</li> <li>ERR: Main Unit internal error</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| (G) | Operation Keys      | CH Key: Switching of sensor number<br>SEG/ALM RST Key pressed for less than 5 seconds: Switching of segment number<br>SEG/ALM RST Key pressed and held (5 seconds min.): Alarm latch released (Can be performed only by this operation. The latch cannot be released by the software tool and communications.)<br>CH Key and SEG/ALM RST Key simultaneously pressed and held (5 seconds min.): Initialization (Operation returns to the factory state.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| (H) | Lower terminal      | Connection is established by the Push-In Plus terminal. <ul style="list-style-type: none"> <li>Transistor output 1 to 3</li> </ul> For details, refer to <i>Transistor output</i> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

| No. | Variable                 | Function                                                                                                                                                                                                                                                                                                                             |
|-----|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (I) | DIN Track mounting hook  | Used for mounting to the DIN Track.                                                                                                                                                                                                                                                                                                  |
| (J) | Communications connector | Connects the communications cable of the EtherNet/IP network.                                                                                                                                                                                                                                                                        |
| (K) | Indicators               | Indicates the product status or network status by LEDs.<br>• "MS": Module Status. Displays the status of the Main Unit. It is green when it is normal.<br>• "NS": Network Status. Displays the state of the communications. It lights or flashes green when it is normal.<br>For details, refer to <i>Indicator specifications</i> . |
| (L) | Words                    | Indicates the K6PM sensor number. 1 to 31                                                                                                                                                                                                                                                                                            |
| (M) | °E Temperature units     | Displays the temperature unit. °C or °F.                                                                                                                                                                                                                                                                                             |

\* The display is as follows when the arrival prediction function is enabled.

- The predicted arrival temperature exceeds threshold 1, and the current temperature or differential temperature does not exceed the threshold: Flashes yellow
- Regardless of whether the predicted arrival temperature exceeds threshold 1, the current temperature or differential temperature exceeds threshold 1: Lit in yellow
- Regardless of whether the current temperature or differential temperature exceeds threshold 1, the predicted arrival temperature exceeds threshold 2: Flashes red
- Regardless of whether the predicted arrival temperature exceeds the threshold, the current temperature or differential temperature exceeds threshold 2: Lit in red

## Indicator specifications

| Symbol | Name                                                   | Color | Status                    | Operating condition                                                                                                                                                                                                    |
|--------|--------------------------------------------------------|-------|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MS     | Product and network status indications (Module Status) | Green | Lit.                      | Normal status                                                                                                                                                                                                          |
|        |                                                        |       | Flashes at 1-s intervals. | BOOTP server connection error state                                                                                                                                                                                    |
|        |                                                        | Red   | Lit.                      | One of the following fatal errors (Main Unit internal error)<br>• Internal CPU error<br>• Internal memory error                                                                                                        |
|        |                                                        |       | Flashes at 1-s intervals. | One of the following conditions<br>• K6PM sensor communications error<br>• The detection of the K6PM sensor angle deviation<br>• Sensor type error<br>• Temperature measurement range exceeded<br>• Running time error |
|        |                                                        | --    | Not lit.                  | No power supply                                                                                                                                                                                                        |
| NS     | Network status indication (Network Status)             | Green | Lit.                      | Tag data link or message connection established                                                                                                                                                                        |
|        |                                                        |       | Flashes at 1-s intervals. | No tag data link or message connection established                                                                                                                                                                     |
|        |                                                        | Red   | Lit.                      | IP address duplication status                                                                                                                                                                                          |
|        |                                                        |       | Flashes at 1-s intervals. | Connection timed out                                                                                                                                                                                                   |
|        |                                                        | --    | Not lit.                  | No power supply, or IP address is not set                                                                                                                                                                              |

## Transistor output

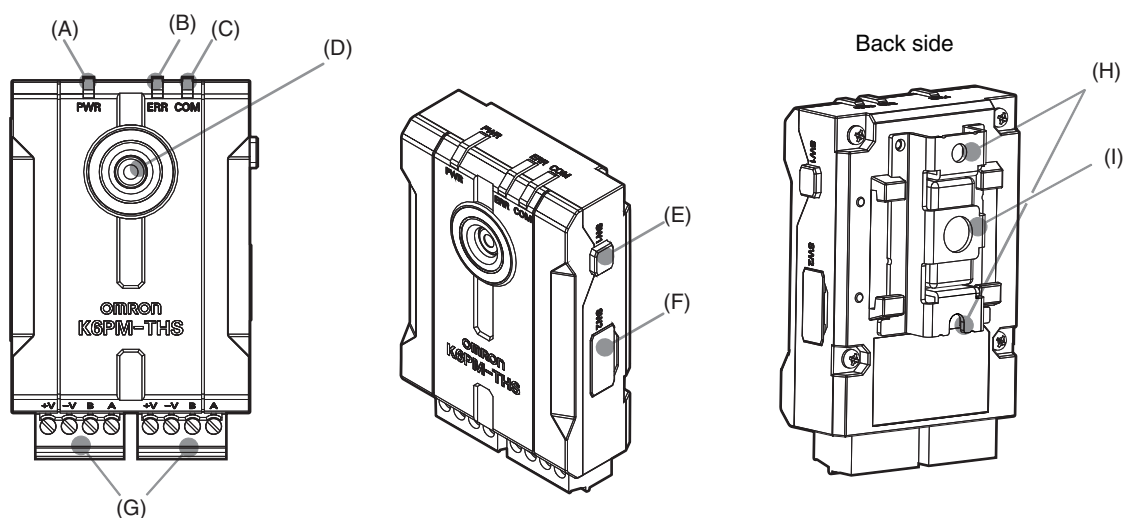
| Name                | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Transistor Output 1 | Threshold 1 excess output of comprehensive alarm.<br>Transistor output type can be set to Normally Closed or Normally Open.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Transistor Output 2 | Threshold 2 excess output of comprehensive alarm.<br>Transistor output type can be set to Normally Closed or Normally Open.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Transistor Output 3 | Determines Main Unit error and K6PM-TH sensor error output *1, or setting mode or monitoring mode *2 of the Main Unit, depending on the setting of the <b>TR3 Output Mode</b> parameter.<br><br>Set the <b>TR3 Output Mode</b> parameter to the <b>0: Error detection</b> .<br>Transistor output 3 changes to ON: Main Unit error and K6PM-TH sensor error has not occurred.<br>Transistor output 3 changes to OFF: Main Unit error and K6PM-TH sensor error has occurred.<br><br>Set the <b>TR3 Output Mode</b> parameter to the <b>1: Monitoring</b> .<br>Transistor output 3 changes to ON: The Main Unit is in monitoring mode and Main Unit error and K6PM-TH sensor error has not occurred.<br>Transistor output 3 changes to OFF: The Main Unit is in setting mode and Main Unit error and K6PM-TH sensor error has occurred. |

\*1. The Main Unit error and K6PM-TH sensor error specify any one of the following:

- Main Unit internal error (internal CPU error or internal memory error)
- K6PM-TH sensor communications error or sensor type error
- The detection of the K6PM-TH sensor angle deviation
- Temperature measurement range exceeded
- Running time error

\*2. The transistor output 3 will be changed to OFF, if the Main Unit is in monitoring mode and Main Unit error and K6PM-TH sensor error occurs.

## Infrared thermal sensor



| No. | Variable                                         | Function                                                                                                                                                                     |
|-----|--------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (A) | Power indicator (Green)                          | Lit when power is turned ON                                                                                                                                                  |
| (B) | Alarm indicator (Red)                            | <ul style="list-style-type: none"> <li>Lit in red: Measurement temperature or internal temperature over</li> <li>Flashing red: K6PM sensor angle deviation occurs</li> </ul> |
| (C) | Communications indicator (orange)                | <ul style="list-style-type: none"> <li>Communications: Lit</li> <li>Standby: Not lit (stopped)</li> </ul>                                                                    |
| (D) | Thermal sensor lens                              | ----                                                                                                                                                                         |
| (E) | Reset switch for the K6PM sensor angle deviation | Resets the sensor internal angle deviation occurrence flag.                                                                                                                  |
| (F) | DIP switches                                     | *                                                                                                                                                                            |
| (G) | Connector-Terminal Block Conversion Unit         | For Power supply and the RS-485 wiring                                                                                                                                       |
| (H) | Screw hole for fixing mounting bracket           | For direct sheet metal attachment                                                                                                                                            |
| (I) | Connector-Terminal Block Conversion Unit         | 1/4-20 UNC thread compatible                                                                                                                                                 |

\* The setting contents of the DIP switch pin are as follows:

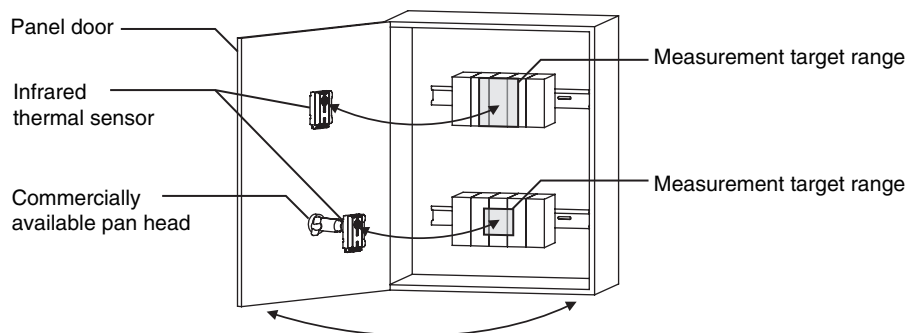
| SW     | Setting contents                                 | Value                                                                                                                                                                                           |
|--------|--------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 to 5 | K6PM sensor number setting                       | Set in binary with ON as 1 and OFF as 0 (Pin 1: Least significant bit, Pin 5: Most significant bit)<br>00001 to 11111: K6PM sensor number 1 to 31<br>00000: Not used.<br>Factory default: 00001 |
| 6      | RS-485 terminating resistance                    | OFF: Without terminating resistance (factory default)<br>ON: With terminating resistance                                                                                                        |
| 7      | The detection of the K6PM sensor angle deviation | OFF: No detection (factory default)<br>ON: With detection                                                                                                                                       |
| 8      | Reserved                                         | ----                                                                                                                                                                                            |

## Installation of the Infrared thermal sensor

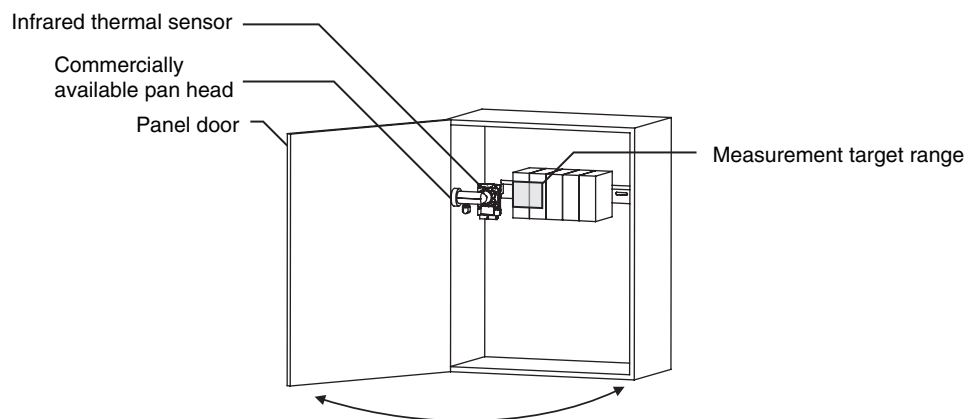
Install the infrared thermal sensor at the back of the panel door, or on the internal side surface of the panel.

The infrared thermal sensor can be installed either directly on the panel, or can be installed by using a commercially available pan head.

- Installing on the back of the panel door either directly or by using a commercially available pan head



- Installing on the internal side surface of the panel by using a commercially available pan head

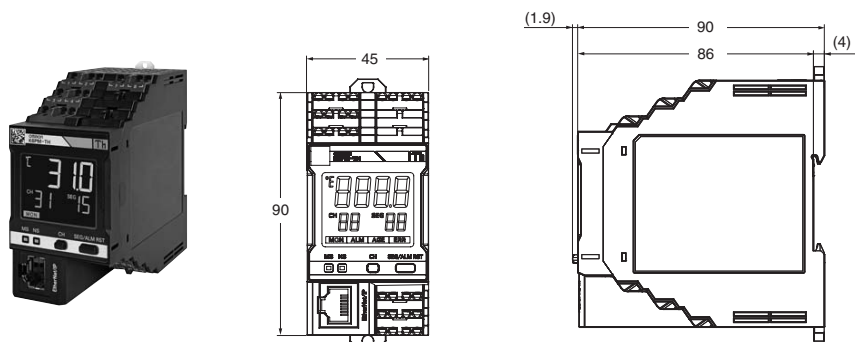




## Dimensions

### Main Unit

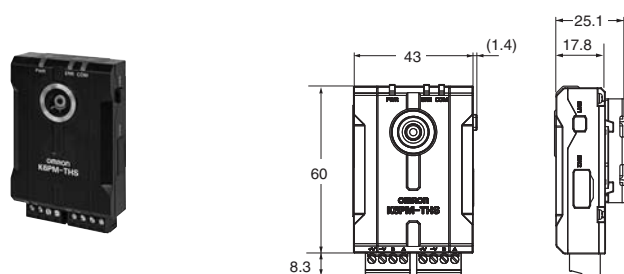
K6PM-THMD-EIP



### Infrared thermal sensor

K6PM-THS3232

With Mounting Bracket Attached



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