Sensor Selection Guide

OMRON's unique sensing technology responds to evolving needs.
OMRON's sensing technology contributes to creating a safe, secure and comfortable IoT society that serves its people.

OMRON's sensing technology meets evolving needs
OMRON’s sensing technology contributes to creating a safe, secure and comfortable IoT society that serves its people.

OMRON’s sensing technology meets evolving needs with advanced technologies such as:

- **Algorithm Technology**
- **Factory Automation**
- **Energy Management**
- **Smart Home**
- **Smart Building**
- **Distance**
- **Human Recognition**
- **Image Sensing**
- **Earthquake Detection**
- **Presence of Objects**
- **Displacement**
- **Gas Flow Rate**
- **Temperature**
- **Efficient Energy Saving**
- **Comfortable and Convenient**
- **Safe and Secure**
- **IoT Solution**

### Sensor Line-Up

**3D TOF Sensor Module**
- Distance

**Embedded Human Recognition Image Sensor**
- Face Detection
- Face Recognition
- Facial Expression
- Age
- Gender

**Seismic Sensor**
- Earthquake
- People’s Position
- Number of People

**MEMS Non-Contact Thermal Sensor**
- Temperature

**MEMS Flow Sensor**
- Air Flow

**Photomicro Sensor**
- Presence of Objects

**Limited Reflective Sensor**
- Presence of Objects

**Diffuse Reflective Sensor**
- Presence of Objects

**Color Sensor**
- Color Sensor

### Sensor Evaluation Board

**Sensor Evaluation Board**

### Optical Design Technology
- Presence of Objects
- Displacement
- Distance

### MEMS Technology
- Gas Flow Rate
- Temperature
### Photomicro Sensor  EE-S Series

#### Model **1**

<table>
<thead>
<tr>
<th>Model</th>
<th>EE-SX1320 /4320</th>
<th>EE-SX1321</th>
<th>EE-SX1330, 1330-2 /4330</th>
<th>EE-SX1340 /3340,4340</th>
<th>EE-SX1350 /3350,4350</th>
<th>EE-SX3173 /4173-P</th>
<th>EE-SX3162 /4162-P1(-Z), P2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensing Type (Termination)</td>
<td>Transmissive (SMD)</td>
<td>Transmissive (Connectors)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mounting Type</td>
<td>Surface Mount</td>
<td>Surface Mount</td>
<td>Surface Mount</td>
<td>Surface Mount</td>
<td>M3 Screw-mounting</td>
<td>M2 Screw-mounting</td>
<td></td>
</tr>
<tr>
<td>Sensing Distance</td>
<td>2mm</td>
<td>2mm</td>
<td>3mm</td>
<td>4mm</td>
<td>5mm</td>
<td>5mm</td>
<td>5mm</td>
</tr>
<tr>
<td>Output Configuration<strong>2</strong></td>
<td>PTr/P-IC</td>
<td>PTr</td>
<td>PTr/P-IC</td>
<td>PTr/P-IC</td>
<td>P-IC</td>
<td>P-IC</td>
<td>P-IC</td>
</tr>
<tr>
<td>Aperture Size</td>
<td>0.3mm</td>
<td>0.3mm</td>
<td>0.3mm</td>
<td>0.5mm</td>
<td>0.5mm</td>
<td>0.5mm</td>
<td>0.5mm</td>
</tr>
<tr>
<td>Dimensions (L×W×H)</td>
<td>5.1×4×4</td>
<td>5.1×4×4</td>
<td>6×4×5</td>
<td>8×4×5.5</td>
<td>9×4×9</td>
<td>13.6×14.8×14.7</td>
<td>13×16×14</td>
</tr>
<tr>
<td>Features</td>
<td>Super miniature</td>
<td>Output 2ch</td>
<td>Super miniature</td>
<td>Super miniature</td>
<td>Miniature</td>
<td>General purpose</td>
<td>Connector with lock</td>
</tr>
</tbody>
</table>

*1 EE-SX1~... Dark ON, EE-SX4~... Light ON
*2 PTr... Photo-transistor, P-IC... Photo-IC
*3 With a positioning boss... EE-SX199
*4 High-speed response type... EE-SX1330-2

#### Example Applications

**Rotation Detection**

- Robots

**Non-Contact Switch**

- Medication dispensers

**Passing Detection**

- Cash dispensers

**Origin Detection**

- 3D printers
Recommended Sensors

### SMD

**Surface mount models**

- One-step installation
- Easy, one-step installation thanks to usability with other products for reflow soldering.

**SMD type Surface mounting to board**

- Suitable for Small-Size Applications
- 2 to 5 mm slot widths available
- Photo-IC output models available for use in high-speed applications
- 2-channel models available for encoder functionality

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### Connector

- No mounting required reducing workload!
  - All-in-one design for improved miniaturization
  - Screw-based mounting for a more reliable installation
  - M3 screw-mounting model is added
  - Connector with cable (order separately) is available

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### Related information

- **Fundamentals of Photomicrosensors**
- Useful information for designers

- **Photomicrosensor Application Guide**
- Specific examples of applications, etc.
## Limited Reflective Sensor  B5W-LB Series

### Features

1. **Material Robustness**
   - Add shiny, white, black, reflective, or transparent objects to body

2. **Distance Robustness**
   - A wide sensing range to allow object shifting

3. **Lineup**
   - Suitable for embedding in commercial equipment

### Type

<table>
<thead>
<tr>
<th>Output type</th>
<th>Analog output type</th>
<th>Digital output type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exterior</td>
<td>Miniature type</td>
<td>Super miniature type</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Power supply voltage</th>
<th>5 VDC ±10%</th>
<th>24 VDC ±10%</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Output type</th>
<th>Analog (phototransistor output)</th>
<th>ON/OFF (NPN open collector output)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation indicator lamp</td>
<td>Not available</td>
<td>Available (orange)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Degree of protection</th>
<th>–</th>
<th>IP50 (IEC60529 standard, category 2) (not including terminals)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensing distance [Target object: white paper]</td>
<td>10 to 55 mm</td>
<td>2 to 10 mm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model</th>
<th>B5W-LB2101-1</th>
<th>B5W-LB2112-1</th>
<th>B5W-LB2122-1</th>
<th>B5W-LB2114-1</th>
<th>B5W-LB1112-1</th>
<th>B5W-LB1122-1</th>
<th>B5W-LB1114-1</th>
</tr>
</thead>
</table>

### Product / Technology Overview

#### Past problem
Sensing of shiny, black or transparent objects was unstable, requiring more man-hours for development and production processes.

#### Solution!
With OMRON's Light Convergent Reflective Sensors, unstable sensing of shiny, black or transparent objects is no longer a problem, meaning this product contributes to a reduction of man-hours.

#### Light Convergent Reflective Sensor Principles
The presence of an object is detected by the received light reflected off a sensed object. The sensor's optical system has a limited projection beam and light sensing area, so the system is capable of sensing objects only within a specific distance from the sensor (the range in which the projection beam and the light sensing area overlap).

### Example Applications

- **Cup detection**
  - Coffee makers

- **Hand detection**
  - Sanitation equipment

- **Tablet package detection**
  - Tablet Packaging

- **Container detection**
  - Analysis equipment

- **Human body detection**
  - Sterilization / deodorization equipment
**Diffuse Reflective Sensor**  
**B5W-DB Series**

### Type

<table>
<thead>
<tr>
<th>Sensing method</th>
<th>Appearance</th>
<th>Output type</th>
<th>Distance variable</th>
<th>Sensing distance</th>
<th>Operation mode</th>
<th>Model</th>
<th>Minimum number of deliverable units (unit: piece)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diffuse reflection</td>
<td>Super miniature</td>
<td>NPN open collector</td>
<td>-</td>
<td>550 mm Light-ON*</td>
<td>B5W-DB1452-1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>250 mm Light-ON*</td>
<td>B5W-DB1452-2</td>
<td>1,500</td>
<td></td>
</tr>
</tbody>
</table>

*1. In case of light-ON, control output is turned ON when a sensing object is detected.
*2. Vcc = 12 V, limiting resistor = 680 Ω, white paper
Vcc = 15 V, limiting resistor = 910 Ω, white paper
The sensing distance varies depending on the color, material, and other conditions of the object to be detected. Before using the product, please confirm that the product functions properly.

### Features

1. Super miniature long-distance diffuse reflective sensor that can be installed anywhere
2. Sensing distance can be varied according to the limiting resistance value external to the sensor (DB11A1-A□ only)
3. Designed to be immune to ambient light

### Example Applications

- Picking system (Hand detection)
- OA/FA equipment (Human body detection)
- AMR (obstruction detection)
- Sterilization / deodorization equipment (Hand detection)
- Body surface temperature measuring equipment (Human body detection)
- Amusement equipment (Hand detection)

### Sensor Evaluation Board  
**2JCIE-EV Series**

### Type

<table>
<thead>
<tr>
<th>Model</th>
<th>2JCIE-EV01-RP1</th>
<th>2JCIE-EV01-AR1</th>
<th>2JCIE-EV01-FT1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>RP type</td>
<td>AR type</td>
<td>FT type</td>
</tr>
</tbody>
</table>

### Features

Compatible with 3 major platforms. Allow various sensing functions to be easily evaluated.

OMRON sensor evaluation board

CAN be connected to OMRON sensors*

Six types of sensing functions

Temperature, humidity, light, barometric pressure, noise, acceleration

https://components.omron.com/sensor/evaluation-board/2jcie

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* For compatible models, see the list of "External Expansion Sensors".

**Platform**

Supports three platforms

- Raspberry Pi *
- Arduino *
- Feather *

Sample source code Now available

https://github.com/omron-devhub
### Type

<table>
<thead>
<tr>
<th>Sensing method</th>
<th>Appearance</th>
<th>Size</th>
<th>Connecting method</th>
<th>Output type</th>
<th>Sensing distance</th>
<th>Model</th>
<th>Minimum number of deliverable units (Unit: pieces)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reflective</td>
<td>Miniature</td>
<td>Connector</td>
<td>I2C</td>
<td>PC</td>
<td>40 mm</td>
<td>B5WC-VB2322-1</td>
<td>1</td>
</tr>
</tbody>
</table>

### Features

#### 1 Liquid condition monitoring

A color sensor monitors changes in the color of the liquid and contributes to more efficient equipment maintenance.

#### 2 Multi-functionalization of equipment

The operation according to the color information of the detected object can contribute to multi-functionalization of the equipment and automation of business operations.

#### 3 Stable operation of equipment

Detecting objects by color, rather than differences in the amount of reflected light as with conventional optical sensors, can contribute to stable operation of the equipment.

### Product / Technology Overview

By monitoring the color of the lubricating oil with a color sensor, the deterioration of the oil for each equipment can be quantitatively monitored by color, and the oil can be replaced at the optimum time without depending on personal criteria.

The presence or absence of an object to detect may be confirmed by using a signal output from a color sensor for each color of the detected object.

Example applications:
- Object detection on the production line

### Example Applications

#### Machine tool

Remote monitoring of lubricant color

#### Drink dispenser

Automatic supply of beverages according to the cup color

#### Object detection on the production line

Example applications:
- Object detection on the production line

### Color Sensor Principle

A color sensor uses a white LED as its light source to emit light and receive reflected light (the ratio of red, green, and blue is unique to each color) determined by the color of the detected object. The color sensor separates the reflected light received into red, green, and blue, and outputs the red, green, and blue data (RGB data) as voltage values using the I2C communication method. For example, in the case of red and yellow detected objects, the red, green, and blue output values from the color sensor are different for red and yellow reflected light by the white LED, allowing differentiation of red and yellow.
**Type**

<table>
<thead>
<tr>
<th>Type</th>
<th>Sensing type</th>
<th>Detection range (white paper)</th>
<th>NIR transmission filter</th>
<th>Model</th>
<th>Minimum number of deliverable units</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOF</td>
<td></td>
<td>0.5m to 4m</td>
<td>Available (Built-in)</td>
<td>B5L-A2S-U01-010</td>
<td>1 piece</td>
</tr>
</tbody>
</table>

**Features**

1. **Ambient light immunity**
   - Ambient light immunity equivalent to 100,000 lx!
   - Its powerful ambient light immunity ensures stable detection performance free from saturation even in bright places.

2. **High Precision**
   - ±2% (2m)
   - Achieves high output accuracy for compensated signals.

3. **Long Life**
   - Long life equivalent to 5 years under continuous driving.
   - According to OMRON's research in March, 2020.
   - Long life thanks to OMRON’s unique circuit design and heat emission design.

4. **Interference prevention**
   - With interference prevention function (up to 17 units)
   - According to OMRON’s research in March, 2020.
   - Ideal for applications that require the use of multiple devices such as robots at the same time.

Note: Functionality and performance may decrease under certain operating conditions. Refer to User’s Manual (manual number: E596-E1) for details.

*1. According to OMRON’s evaluation method (reliability acceleration test at the ambient temperature of 20°C and the humidity of 65%RH).
*2. However, product specifications are not guaranteed.

**Product / Technology Overview**

**What is a TOF Sensor?**
A TOF (Time of Flight) sensor uses the flight time of light to measure distances to objects. As well as being able to turn captured images into 3D images, it can also measure at a speed of 20 frames per second, allowing it to track the movement of objects three-dimensionally.

**Differences from a conventional camera sensor**
The use of extensive distance information enables the sensor to identify its peripheral environment.

**Example Applications**

- **AMR/service robots**
  - Drop detection / Environment recognition
  - Periphery recognition / Human recognition

- **Logistics and conveyance**
  - Volume and shape measurement
  - Empty space detection

- **Observation**
  - Behavioral understanding and observation of patients under long-term care

- **Automatic doors/elevators**
  - Counting people and tracking traffic flows

Watch a demonstration video here.

3D TOF Sensor Module  B5L Series  

Data-sheet  Video
## MEMS Flow Sensor  D6F Series

### Type

#### MEMS Flow Sensor (Flow Rate Type)

<table>
<thead>
<tr>
<th>Applicable fluid</th>
<th>Item Model</th>
<th>Air</th>
<th>Low flow</th>
<th>Analog</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>D6F-P001A1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>D6F-01A1-110</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>D6F-P0010A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>D6F-P0010AM2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>D6F-02A1-110</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Flow rate range (L/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0 to 0.1L/min</td>
</tr>
<tr>
<td></td>
<td>0 to 1L/min</td>
</tr>
<tr>
<td></td>
<td>0 to 2L/min</td>
</tr>
</tbody>
</table>

#### MEMS Gas Flow Sensor (Velocity Type)

<table>
<thead>
<tr>
<th>Applicable fluid</th>
<th>Item Model</th>
<th>Urban gas (13A)</th>
<th>LP gas</th>
<th>Urban gas (13A)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>D6F-01N2-000</td>
<td>D6F-02L2-000</td>
<td>D6F-05N2-000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>D6F-02L7-000</td>
<td></td>
<td>D6F-05N7-000</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Flow rate range (L/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0 to 0.1L/min</td>
</tr>
<tr>
<td></td>
<td>0 to 2L/min</td>
</tr>
<tr>
<td></td>
<td>0 to 5L/min</td>
</tr>
</tbody>
</table>

#### MEMS Medium to High Flow Sensor

<table>
<thead>
<tr>
<th>Applicable fluid</th>
<th>Item Model</th>
<th>Air</th>
<th>Medium to high flow</th>
<th>Analog</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>D6F-10A5-000</td>
<td>D6F-20A5-000</td>
<td>D6F-30A5-000</td>
<td>D6F-50A5-000</td>
</tr>
<tr>
<td></td>
<td>D6F-10A6-000</td>
<td>D6F-20A6-000</td>
<td>D6F-30A6-000</td>
<td>D6F-50A6-000</td>
</tr>
<tr>
<td></td>
<td>D6F-10A7-000</td>
<td>D6F-20A7-000</td>
<td>D6F-30A7-000</td>
<td>D6F-50A7-000</td>
</tr>
<tr>
<td></td>
<td>D6F-10A7D-000</td>
<td>D6F-20A7D-000</td>
<td>D6F-30A7D-000</td>
<td>D6F-50A7D-000</td>
</tr>
<tr>
<td></td>
<td>D6F-70AB71-000</td>
<td>D6F-70AB71D-000</td>
<td>D6F-70AB71-000</td>
<td>D6F-70AB71D-000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Flow rate range (L/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0 to 10L/min</td>
</tr>
<tr>
<td></td>
<td>0 to 20L/min</td>
</tr>
<tr>
<td></td>
<td>0 to 30L/min</td>
</tr>
<tr>
<td></td>
<td>0 to 50L/min</td>
</tr>
<tr>
<td></td>
<td>0 to 70L/min</td>
</tr>
</tbody>
</table>

### MEMS Air Flow Sensor (Velocity Type)

<table>
<thead>
<tr>
<th>Applicable fluid</th>
<th>Item Model</th>
<th>Air</th>
<th>Velocity</th>
<th>Analog</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>D6F-W01A1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>D6F-W03A1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>D6F-W04A1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>D6F-W10A1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Flow speed range (m/s)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0 to 1m/s</td>
</tr>
<tr>
<td></td>
<td>0 to 3m/s</td>
</tr>
<tr>
<td></td>
<td>0 to 4m/s</td>
</tr>
<tr>
<td></td>
<td>0 to 10m/s</td>
</tr>
</tbody>
</table>

### MEMS Differential Pressure Sensor

<table>
<thead>
<tr>
<th>Applicable fluid</th>
<th>Item Model</th>
<th>Air</th>
<th>Differential pressure</th>
<th>Digital</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>D6F-PH0505</td>
<td></td>
<td>-50 to 50Pa</td>
<td></td>
</tr>
<tr>
<td></td>
<td>D6F-PH0025</td>
<td></td>
<td>0 to 250Pa</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Differential pressure range (Pa)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-500 to 500Pa</td>
</tr>
</tbody>
</table>

- are the only digital types.
Features

1. **High Precision**
   ±3%RD (25-100%F.S.) is realized by linear temperature correction using ASIC technology.
   Ambient temperature = 25°C (Model: D6F-20A7D-000-0).

2. **High Sensitivity**
   Omron’s unique MEMS technology allows detection of very low air velocities.
   Example of D6F-01A1-110: Output corresponding to flow rate change below 1/1000 of full scale.

3. **Miniature**
   The product size is reduced by using the world-smallest class size MEMS sensor element.
   Dimension of D6F-V model: 24x8x14mm.

Product/Technology Overview

**What is MEMS flow sensor?**
A sensor that measures how much gas (how many liters) is flowing per minute.
The basic principle is the heat ray method where the temperature sensor captures the heat transfer generated by the movement of the air flow.

**Resistant to dust**
- Equipped with a dust segregation system (cylgonic) - D6F-W/-V/-P

- The sensor can be placed anywhere thanks to its dust-resistant structure.
- Omron’s unique design of 3D flow path provides a high level of reliability by separating dust particles to reduce its effect on the sensor chip. Additionally, Omron succeeded in reducing the sensor size, allowing it to be used in wider range of applications.

Example Applications

**Flow Measurement**
- Flow rate
- Velocity
- Differential pressure

```
Projector  PC  Server
Welder  Container manufacturing machine  Environmental analyzer  Mounting machine
```

**Combustion Control**
- Flow rate
- Differential pressure

```
Fuel cell  Water heater  Boiler
```

**Air Volume Detection**
- Velocity
- Differential pressure

```
Duct  Air flow measurement (environment)  Air conditioner
```
Seismic Sensor  D7S Series

**Type**

<table>
<thead>
<tr>
<th>Model</th>
<th>D7S-A0001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acceleration Detection Range</td>
<td>-2,000 to +2,000 gal</td>
</tr>
<tr>
<td>Shutoff Output</td>
<td>Output at seismic intensity level 5 or higher</td>
</tr>
</tbody>
</table>

**Features**

1. **Super miniature**
   - Ideal for embedded applications
2. **High Reliability**
   - Prevent false detection and non-detection
3. **IoT Link**
   - Allow secondary use of earthquake information

**Example Applications**

The world's smallest-class seismic sensor can be used in a wider range of applications. Also ideal for embedded applications.

**Industrial**

- Semiconductors/FPDs, machine tools, control panels, combustion furnaces, printers

**Residential**

- Distribution boards, disaster prevention systems, home appliances (heaters, gas stoves)

**Commercial**

- Electrical/gas meters, chemical plants, highways, bridges, tunnels, railroads

---

**Automatic Horizontal Vibration Sensor / Sealed Vibration Sensor / Fall Sensor**  D7A/D7E

**Type**

<table>
<thead>
<tr>
<th>Model</th>
<th>D7A-1</th>
<th>D7A-2</th>
<th>D7A-3-1</th>
<th>D7E-1</th>
<th>D7E-2</th>
<th>D7E-5</th>
<th>D7E-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>For horizontal boards</td>
<td>For vertical boards</td>
<td>Screw tightening</td>
<td>Vibration sensor</td>
<td>Fall sensor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appearance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating characteristics</td>
<td>Acceleration setting</td>
<td>90 to 170 gal</td>
<td>130 to 200 gal</td>
<td>100 to 170 gal</td>
<td>120 to 195 gal</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Operation angle</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>50 to 80°</td>
<td></td>
</tr>
<tr>
<td>Output configuration</td>
<td>Structure setting</td>
<td>1a</td>
<td></td>
<td></td>
<td></td>
<td>1b</td>
<td></td>
</tr>
</tbody>
</table>

**Example Applications**

- Fan heater
- IH / gas stove
- Gas meter
MEMS Non-Contact Thermal Sensor  D6T Series

**Type**

<table>
<thead>
<tr>
<th>Model</th>
<th>D6T-1A-01</th>
<th>D6T-1A-02</th>
<th>D6T-8L-09</th>
<th>D6T-8L-09H</th>
<th>D6T-44L-06</th>
<th>D6T-44L-06H</th>
<th>D6T-32L-01A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of elements</td>
<td>1(1x1)</td>
<td>8(1x8)</td>
<td>16(4x4)</td>
<td>1024(32x32)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appearance</td>
<td><img src="image1" alt="Image" /></td>
<td><img src="image2" alt="Image" /></td>
<td><img src="image3" alt="Image" /></td>
<td><img src="image4" alt="Image" /></td>
<td><img src="image5" alt="Image" /></td>
<td><img src="image6" alt="Image" /></td>
<td><img src="image7" alt="Image" /></td>
</tr>
<tr>
<td>Viewing angle</td>
<td><img src="image8" alt="Image" /></td>
<td><img src="image9" alt="Image" /></td>
<td><img src="image10" alt="Image" /></td>
<td><img src="image11" alt="Image" /></td>
<td><img src="image12" alt="Image" /></td>
<td><img src="image13" alt="Image" /></td>
<td><img src="image14" alt="Image" /></td>
</tr>
<tr>
<td>X-direction</td>
<td>X = 58.0°</td>
<td>X = 26.5°</td>
<td>X = 54.5°</td>
<td>X = 44.2°</td>
<td>X = 90.0°</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Y-direction</td>
<td>Y = 58.0°</td>
<td>Y = 26.5°</td>
<td>Y = 5.5°</td>
<td>Y = 45.7°</td>
<td>Y = 9.0°</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Object temperature detection range</td>
<td>5 to 50°C</td>
<td>-40 to 80°C</td>
<td>5 to 200°C</td>
<td>5 to 200°C</td>
<td>5 to 200°C</td>
<td>0 to 200°C</td>
<td></td>
</tr>
</tbody>
</table>

**Features**

1. **High Precision**
   World's highest-class stable temperature output

2. **Easy connection**
   Direct temperature value output allows easy software design

3. **Number of elements x temperature lineup**
   Variation of the number of elements (1 to 1024) x temperature range (-40 to 200°C)

*According to OMRON’s research as of February 2021, except for D6T-32L-01A

**Example Applications**

- **Refrigerator Interior & Room Temperature Detection**
  Home appliances (refrigerators & air conditioners)

- **Human Presence Detection**
  Air conditioners & lighting systems

- **Screening of Humans with Fever**
  Room-Entry Management Equipment

- **Abnormal High Temperature Monitoring**
  Transformers & distribution boards
## Type

<table>
<thead>
<tr>
<th>Item</th>
<th>Long-distance detection type B5T-007001-010</th>
<th>Wide-angle detection type B5T-007001-020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Horizontal detection range</td>
<td>Approx. 54°</td>
<td>Approx. 94°</td>
</tr>
<tr>
<td>(angle of view)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vertical detection range</td>
<td>Approx. 41°</td>
<td>Approx. 76°</td>
</tr>
<tr>
<td>(angle of view)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input resolution</td>
<td>1600x1200 pixels</td>
<td></td>
</tr>
<tr>
<td>Output resolution</td>
<td>Selectable (no image output, 160x120 pixels, 320x240 pixels)</td>
<td></td>
</tr>
<tr>
<td>Shooting in the dark</td>
<td>200lx max.</td>
<td></td>
</tr>
<tr>
<td>Power supply voltage</td>
<td>DC 5V±0.5V</td>
<td></td>
</tr>
<tr>
<td>Current consumption</td>
<td>0.4A max.</td>
<td></td>
</tr>
<tr>
<td>Power consumption</td>
<td>2W max.</td>
<td></td>
</tr>
<tr>
<td>Operating temperature</td>
<td>0°C to +50°C (with no condensation or icing)</td>
<td></td>
</tr>
<tr>
<td>Communication method</td>
<td>UART 3.3V</td>
<td>USB CDC-class devices</td>
</tr>
</tbody>
</table>

## Features

1. Choice of wide-angle type and long-distance type depending on detection distance or range needs

2. Can be used for apps that analyze customer base from attribute information (age, gender, etc.) and utilize the data for marketing

3. Evaluation software and development tool can be downloaded for free from the website

- Development tool
  - [Japanese] https://www.omron.co.jp/ecb/
  - [English] https://components.omron.com/
**Product / Technology Overview**

- Equipped with human recognition image sensing technology (cumulative shipments of over 1 billion licenses) supported by face information of more than 1 million people.

* Cumulative number of licenses shipped over the past 10 years, as of April 2018, according to our in-house research.

- The human recognition image sensing technology has been modularized by utilizing the algorithm's strengths of small size and high speed.
  - It can be easily installed in customer's equipment that lacks a camera.

**Example Applications**

**Beverage vending machines, ticket vending machines, POS, signage**
- It can be used for marketing upon analyzing the customer base from attribute information (age, gender, facial expression) and accumulating data.
- Enable effective advertising by switching and displaying advertisements according to attribute information.

Usage function example:
- Face detection, age / gender estimation, facial expression estimation, etc.

**Industrial equipment**
- Identifies the operator, permits use by a specific person, and records the operator along with the operation details.
- Identifies the operator and optimizes service content (such as display previous operation records).

Usage function example:
- Face detection, face recognition, etc.

**Modules tailored to specific applications**

- **Wide-angle detection type**  
  BST-007001-020  
  Suitable for detecting objects with a wide angle of view at a relatively short distance.

- **Long-distance detection type**  
  BST-007001-010  
  Suitable for detecting objects at a relatively long distance.
### Information of Related Products

<table>
<thead>
<tr>
<th>Product Type</th>
<th>Catalog No.</th>
<th>QR Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Photomicrosensors Selection Guide</td>
<td>Y211-E1</td>
<td><img src="#" alt="Photomicrosensors Selection Guide QR Code" /></td>
</tr>
<tr>
<td>Light Convergent Reflective Sensor</td>
<td>E589-E1</td>
<td><img src="#" alt="Light Convergent Reflective Sensor QR Code" /></td>
</tr>
<tr>
<td>MEMS Flow Sensor</td>
<td>X211-E1</td>
<td><img src="#" alt="MEMS Flow Sensor QR Code" /></td>
</tr>
<tr>
<td>MEMS Thermal Sensors</td>
<td>A274-E1</td>
<td><img src="#" alt="MEMS Thermal Sensors QR Code" /></td>
</tr>
<tr>
<td>Built-In Color Sensor</td>
<td>E614-E1</td>
<td><img src="#" alt="Built-In Color Sensor QR Code" /></td>
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</tbody>
</table>

### The SOLUTIONS: Optical Sensor

<table>
<thead>
<tr>
<th>Product</th>
<th>Catalog No.</th>
<th>QR Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optical Sensor</td>
<td>E614-E1</td>
<td><img src="#" alt="Optical Sensor QR Code" /></td>
</tr>
</tbody>
</table>

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Please check each region’s Terms & Conditions by region website.

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**OMRON Corporation**

**Device & Module Solutions Company**

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**Regional Contact**

- **Americas**
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  - https://components.omron.com/jp

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In the interest of product improvement, specifications are subject to change without notice.

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Cat. No. Y232-E1-05

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