Honeywell

# Temperature Sensors Line Guide



**Accuracy and flexibility. Stability and speed.** Honeywell Sensing and Control (S&C) offers an impressive array of temperature sensors, each designed to provide enhanced reliability, repeatability, precision, and responsiveness. These temperature sensors are designed to maximize your component and product performance for most any potential application.

That's why more customers worldwide call the industry's most trusted name for:

- Enhanced accuracy and stability
- Strong standard technology platforms
- A wide variety of housings and termination styles
- Easy-to-customize platforms
- High-temp product line expansion sensing capability
- Comprehensive technical support

## FEATURES

### PACKAGED TEMPERATURE PROBES

#### R300 Series.

**Features:** Wide temperature-range • Stainless steel construction • Enhanced response time • Enhanced accuracy • Enhanced reliability • Linear output • Extended life

**Benefits:** Robust, stainless steel closed-tip design for reliability in most aggressive environments, while still providing enhanced response time. One-piece sensor with integral connector for potential use in heavy duty vehicle engine exhaust gas recirculation systems, fluid or air temperature sensing within the engine environment or HVAC, or refrigeration compressor equipment.

#### 500 Series.

**Features:** Choice of custom or existing designs • Wide selection of housing, resistance, and termination options • Wide operating temperature range

**Benefits:** Housing material ranges from all plastic to all-metal, and accommodates air/gas, fluid immersion or surface sensing requirements. Full range of custom or off-the-shelf thermistor and RTD-based solutions for a wide variety of potential industrial, transportation, and aerospace applications.

#### ES110 Series.

**Features:** Exposed thermistor • Rugged design • Brass encapsulation • Plastic overmold • Enhanced response time • Wide operating temperature range

**Benefits:** Overmolded, hexagonal shape for easy installation. Two end configurations available, depending on response or degree of protection required. All-plastic design reduces heat loss through the sensor. Exposed thermistor offers fast response for air/gas sensing, especially for potential transportation engine management systems and industrial applications.

#### ES120 Series.

**Features:** Enclosed thermistor • Rugged design • Brass encapsulation • Plastic overmold • Wide operating temperature range

**Benefits:** Overmolded, hexagonal shape for easy installation. All-plastic design reduces heat loss through the sensor. Enclosed thermistor may potentially be used for liquid temperature sensing in engine management systems and industrial applications.

#### 6655 Series.

**Features:** Air/surface temperature sensing • NTC thermistor output • Low cost • Low, compact profile • Tight interchangeability • Enhanced accuracy • Enhanced response time • Wide operating temperature range • Variety of mounting brackets • Widely used sensor package footprint • Enhanced stability/ low drift

**Benefits:** Offers temperature measurements with enhanced response and accuracy on most flat surfaces and pipes in non-condensing applications. Allows greater flexibility in temperature monitoring and controlling. Tight interchangeability eliminates or reduces need for calibration. A wide operating temperature range allows application flexibility. Potential applications include water heaters and boilers, industrial ovens and ranges, copier diffuser rollers, and HVAC compressor or duct temperature sensing.

continued on page 9

# Temperature Sensors Line Guide

**Products for thousands of potential applications.** Honeywell S&C's temperature sensors provide multiple choices:

**Packaged Temperature Probes:** These enhanced and responsive sensors are often ideal for fluid, surface, and air/gas temperature sensing. Honeywell's temperature probes are offered in a variety of housing materials and styles, terminations and R-T curve types, depending on customers' application needs. Honeywell's packaged temperature probe assemblies incorporate either NTC (negative temperature coefficient) thermistors or RTD (resistance temperature detector) technology and operate under a wide range of environmental conditions. Whether it be an IP67 seal-rated oil temperature sensor used in the engine of a heavy duty vehicle, a surface temperature sensor used to monitor critical compressor temperatures in a transport refrigeration system, or an air temperature sensor rated to MIL-PRF-23648 used to measure aircraft engine – bleed air temperature inside the leading edge of an aircraft wing, Honeywell has the right technology, sensor packaging, testing, track record and application expertise to provide the right sensor solution for its customers. Customers trust and depend on Honeywell temperature sensors every day for their precision, stability, reliability and quality.





| Packaged Temperature Probes | R300 Series | 500 Series |
|---|---|---|
| **Temperature sensing type** | immersion | air/gas, immersion, surface, and liquid level |
| **Thermistor type** | RTD | NTC |
| **Nominal resistance at 25 °C [77 °F]** | 100 Ohm | 200 Ohm to 1,000,000 Ohm (inclusive) |
| **Operating temperature range** | -40 °C to 275 °C [-40 °F to 572 °F] continuous, excursion to 300 °C [572 °F] for 10 min. max. | -40 °C to 300 °C [-40 °F to 572 °F] (inclusive) |
| **Housing material** | stainless steel | plastic, aluminum, stainless steel, epoxy filled, tin- or nickel-plated copper, ceramic or kynar-filled tubing |
| **Electrical and mechanical interface** | overmolded connector with M14 x 1.50 thread | wide variety of connectors and lead types, materials and insulation |





| Packaged Temperature Probes | ES110 Series | ES120 Series |
|---|---|---|
| **Temperature sensing type** | air/gas | immersion |
| **Thermistor type** | NTC | NTC or KTY |
| **Nominal resistance at 25 °C [77 °F]** | 2000 Ohm | 2000 Ohm |
| **Operating temperature range** | -40 °C to 150 °C [-40 °F to 302 °F] | -40 °C to 150 °C [-40 °F to 302 °F] |
| **Housing material** | brass | brass |
| **Electrical and mechanical interface** | overmolded connector with M10x1.25 or M12 x 1.50 thread | overmolded connector with M10x1.25, M14 x 1.50 thread or 1/8 PTF |

**Discrete and Packaged RTD Sensors:** Our platinum-based RTDs are laser-trimmed for accuracy and flexibility — designed to offer stable and fast linear outputs, accurate and interchangeable, plus plastic and ceramic, miniaturized and surface mount housings (including printed circuit board termination). Potential applications include motor overload and semiconductor protection, electronic assembly thermal management and temperature compensation, as well as HVAC equipment.

**Discrete Thermistors:** These sensors don't amplify, rectify, polarize or generate a signal, but rather change resistance with any change in temperature. The change can occur in the surrounding temperature or by passing a current through the thermistor to self-heat.



## Packaged Temperature Probes

| | 6655 Series |
|---|---|
| **Temperature sensing type** | air/surface |
| **Thermistor type** | NTC |
| **Nominal resistance at 25 °C [77 °F]** | 10,000 Ohm, 12,000 Ohm |
| **Operating temperature range** | -20 °C to 110 °C [-4 °F to 230 °F] |
| **Housing material** | phenolic |
| **Electrical and mechanical interface** | quick connect terminal: (90°, 0.25 in), (0°, 0.25 in), (45°, 0.25 in), (90°, 0.1875 in) |



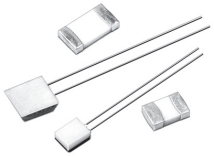


## Discrete RTD Sensors

| | HEL-705, 707, 710 Series | HEL-775 Series |
|---|---|---|
| **Sensor type** | 100 Ohm, 1000 Ohm platinum RTD | 100 Ohm, 1000 Ohm platinum RTD |
| **Temperature coeffiecient** | 0.00385 Ohm/Ohm/°C, 0.00375 Ohm/Ohm/°C | 0.00385 Ohm/Ohm/°C, 0.00375 Ohm/Ohm/°C |
| **Temperature sensing range** | TFE Teflon: -70° to +260°C (-94° to +500°F) Fiberglass: -75° to +500°C (-100° to +932°F) | -55 °C to 150 °C [-67 °F to 302 °F] |
| **Packaging type** | alumina tube | ceramic case |
| **Termination** | 28 ga. or 24 ga. leadwire | SIP |
| **Base resistance and interchangeability** | 100 Ohm ±1; 0.6 Ohm at 0 °C, 100 Ohm ±1; 1.2 Ohm at 0 °C, 1000 Ohm ±1; 0.6 Ohm at 0 °C, 1000 Ohm ±1; 1.2 Ohm at 0 °C | 100 Ohm ±1; 0.6 Ohm at 0 °C, 100 Ohm ±1; 1.2 Ohm at 0 °C, 1000 Ohm ±1; 0.6 Ohm at 0 °C, 1000 Ohm ±1; 1.2 Ohm at 0 °C |
| **Self-heating** | <15 mW/°C for 0.85 O.D. typ. | <6,8 mW/°C typ., 9,7 mW/°C typ. |

# Temperature Sensors Line Guide





| Discrete RTD Sensors | HEL-777/776 Series | 700 Series |
|---|---|---|
| **Sensor type** | 100 Ohm, 1000 Ohm platinum RTD | 100 Ohm, 1000 Ohm platinum RTD |
| **Temperature coeffiecient** | 0.00385 Ohm/Ohm/°C, 0.00375 Ohm/Ohm/°C | 0.00385 Ohm/Ohm/°C, 0.00375 Ohm/Ohm/°C |
| **Temperature sensing range** | -55 °C to 150 °C [-67 °F to 302 °F] | -70 °C to 500 °C [-94 °F to 932 °F]<br>lead version: -50 °C to 130 °C [-58 °F to 266 °F] |
| **Packaging type** | molded plastic | radial chip or surface mount axial flip chip |
| **Termination** | SIP | leadwires or solderpads |
| **Base resistance and interchangeability** | 100 Ohm ±1; 0.6 Ohm at 0 °C,<br>100 Ohm ±1; 1.2 Ohm at 0 °C,<br>1000 Ohm ±1; 0.6 Ohm at 0 °C,<br>1000 Ohm ±1; 1.2 Ohm at 0 °C | 100 Ohm ±1; 0.6 Ohm at 0 °C,<br>100 Ohm ±1; 1.2 Ohm at 0 °C,<br>1000 Ohm ±1; 0.6 Ohm at 0 °C,<br>1000 Ohm ±1; 1.2 Ohm at 0 °C |
| **Self-heating** | <15 mW/°C typ. | 0,4k /mW, 0.6k /mW or 0.8k/mW at 0 °C [32 °F] |





| Discrete and Packaged RTD Sensors | HRTS Series | TD Series |
|---|---|---|
| **Sensor type** | 100 Ohm, 1000 Ohm platinum RTD | 2000 Ohm silicon resistive element |
| **Temperature coeffiecient** | 0.00385 Ohm/Ohm/°C, 0.00375 Ohm/Ohm/°C | N/A |
| **Temperature sensing range** | -70 °C to 260 °C [-94 °F to 500 °F] | -40 °C to 150 °C [-40 °F to 302 °F] |
| **Packaging type** | ceramic case | plastic or threaded aluminum case |
| **Termination** | leadwires | SIP or leadwires |
| **Base resistance and interchangeability** | 100 Ohm ±1; 0.6 Ohm at 0 °C,<br>100 Ohm ±1; 1.2 Ohm at 0 °C,<br>1000 Ohm ±1; 0.6 Ohm at 0 °C,<br>1000 Ohm ±1; 1.2 Ohm at 0 °C | R2000 Ohm ±5 Ohm at 20 °C |
| **Self-heating** | <0,3 mW/°C typ. | N/A |





## Discrete Thermistors

| | 111 Series | 112 Series | 115 Series |
|---|---|---|---|
| **Description** | small, hermetically-sealed glass bead | large, hermetically-sealed glass bead | E-I tested and matched beads on header assembly |
| **Operating temperature range** | -60 °C to 300 °C [-76 °F to 572 °F] | -60 °C to 300 °C [-76 °F to 572 °F] | -60 °C to 300 °C [-76 °F to 572 °F] |
| **Dissipation constant in still air** | 0,1 mW/°C | 0,4 mW/°C | varies with assembly type |
| **Time constant in air** | 0.5 s | 4.0 s | 0.5 s |
| **Nominal resistance at [25 °F to 77 °F]** | 1,000 Ohm, 2,000 Ohm, 8,000 Ohm, 10,000 Ohm, 100,000 Ohm | 200 Ohm, 500 Ohm, 1,000 Ohm, 2,000 Ohm, 5,000 Ohm, 10,000 Ohm, 50,000 Ohm, 100,000 Ohm, 500,000 Ohm, 2,000,000 Ohm | 2,000 Ohm, 8,000 Ohm |
| **Maximum diameter** | 0,36 mm [0.014 in] | 1,14 mm [0.045 in] | 0,36 mm [0.014 in] |
| **Termination material** | platinum iridium | platinum iridium | glass to metal header |
| **Lead length** | 9,6 mm [0.375 in] | 9,6 mm [0.375 in] | 31,75 mm [1.25 in] |




## Discrete Thermistors

| | 120 Series | 121 Series |
|---|---|---|
| **Description** | mini glass probe | standard glass probe |
| **Operating temperature range** | -60 °C to 300 °C [-76 °F to 572 °F] | -60 °C to 300 °C [-76 °F to 572 °F] |
| **Dissipation constant in still air** | 0,7 mW/°C, 1,0 mW/°C | 1,0 mW/°C |
| **Time constant in air** | 10.0 s | 22.0 s |
| **Nominal resistance at [25 °F to 77 °F]** | 1,000 Ohm, 2,000 Ohm, 10,000 Ohm | 2,000 Ohm, 5,000 Ohm, 10,000 Ohm, 50,000 Ohm, 100,000 Ohm, 1,000,000 Ohm |
| **Maximum diameter** | 1,5 mm [0.060 in] | 2,54 mm [0.10 in] |
| **Termination material** | dumet | dumet |
| **Lead length** | 31,8 mm [1.25 in] | 50,8 mm [2.00 in] |

# Temperature Sensors Line Guide





**Discrete Thermistors**

| | 126 Series | 128 Series | 129 Series |
|---|---|---|---|
| **Description** | matched large glass bead | matched mini glass probe | matched large glass probe |
| **Operating temperature range** | -60 °C to 300 °C [-76 °F to 572 °F] | -60 °C to 300 °C [-76 °F to 572 °F] | -60 °C to 300 °C [-76 °F to 572 °F] |
| **Dissipation constant in still air** | 0,8 mW/°C | 2,1 mW/°C | 3,0 mW/°C |
| **Time constant in air** | 4.0 s | 10.0 s | 22.0 s |
| **Nominal resistance at [25 °F to 77 °F]** | 2,000 Ohm; 100,000 Ohm | 2,000 Ohm; 15,000 Ohm | 2,000 Ohm; 4,000 Ohm |
| **Maximum diameter** | 2,54 mm [0.10 in] | 3,05 mm [0.120 in] | 5,08 mm [0.20 in] |
| **Termination material** | platinum iridium | dumet | dumet |
| **Lead length** | 9,6 mm [0.375 in] | 31,8 mm [1.25 in] | 50,8 mm [2.00 in] |





**Discrete Thermistors**

| | 135 Series | 140 / 142 Series | 143 Series |
|---|---|---|---|
| **Description** | glass encapsulated chip, DO-35 type | disc | disc |
| **Operating temperature range** | -60 °C to 300 °C [-76 °F to 572 °F] | -60 °C to 150 °C [-76 °F to 302 °F] | -60 °C to 150 °C [-76 °F to 302 °F] |
| **Dissipation constant in still air** | 2,5 mW/°C | 3,0 mW/°C / 4,0 mW/°C | 5 to 7 mW/°C |
| **Time constant in air** | 4.0 s | 10.0 s | 16.0 s |
| **Nominal resistance at [25 °F to 77 °F]** | 1,000 Ohm; 2,000 Ohm; 5,000 Ohm; 10,000 Ohm; 20,000 Ohm; 25,000 Ohm; 30,000 Ohm; 47,000 Ohm; 50,000 Ohm; 100,000 Ohm; 200,000 Ohm; 230,000 Ohm; 500,000 Ohm; 1,000,000 Ohm; 5,000,000 Ohm | 500 Ohm; 1,000 Ohm; 3,000 Ohm; 5,000 Ohm; 8,000 Ohm; 10,000 Ohm; 25,000 Ohm; 100,000 Ohm | 100 Ohm; 200 Ohm; 1,000 Ohm; 3,000 Ohm; 5,000 Ohm; 30,000 Ohm |
| **Maximum diameter** | 2,0 mm [0.080 in] | 2,54 mm [0.10 in] | 5,08 mm [0.20 in] |
| **Termination material** | tinned copper-clad steel | tinned copper | tinned copper |
| **Lead length** | 28,6 mm [1.125 in] | 38,1 mm [1.50 in] | 38,1 mm [1.50 in] |

## Discrete Thermistors





| | 173 Series | 175 Series | 192 Series |
|---|---|---|---|
| **Description** | EIA 0805 surface mount, end-banded | EIA 1206 surface mount, end-banded | Uni-Curve with bare leads and epoxy |
| **Operating temperature range** | -60 °C to 125 °C [-76 °F to 257 °F] | -60 °C to 125 °C [-76 °F to 257 °F] | -60 °C to 150 °C [-76 °F to 302 °F] |
| **Dissipation constant in still air** | 3,5 mW/°C | 3,5 mW/°C | 0,75 mW/°C |
| **Time constant in air** | 10.0 s | 10.0 s | 15.0 s |
| **Nominal resistance at [25 °F to 77 °F]** | 500 Ohm, 5,000 Ohm, 10,000 Ohm, 22,000 Ohm, 33,000 Ohm, 47,000 Ohm, 50,000 Ohm, 100,000 Ohm | 5,000 Ohm, 10,000 Ohm, 50,000 Ohm, 100,000 Ohm, 440,000 Ohm | 500 Ohm, 1,000 Ohm, 2,252 Ohm, 3,000 Ohm, 5,000 Ohm, 10,000 Ohm, 30,000 Ohm, 50,000 Ohm, 100,000 Ohm |
| **Maximum diameter** | EIA 0805 SMD | EIA 1206 SMD | 2,413 mm [0.095 in] |
| **Termination material** | solder plated NI barrier | solder plated NI barrier | tinned copper, alloy 180 |
| **Lead length** | N/A | N/A | 38,1 mm [1.50 in] |

## Discrete Thermistors




| | 194 Series | 196 Series |
|---|---|---|
| **Description** | Uni-Curve with insulated leads and epoxy | chip with silver top and bottom surface electrode |
| **Operating temperature range** | -60 °C to 150 °C [-76 °F to 302 °F] | -60 °C to 150 °C [-76 °F to 302 °F] |
| **Dissipation constant in still air** | 0,75 mW/°C | 0,75 mW/°C |
| **Time constant in air** | 15.0 s | 10 .0 s |
| **Nominal resistance at [25 °F to 77 °F]** | 2,252 Ohm, 3,000 Ohm, 5,000 Ohm, 10,000 Ohm, 30,000 Ohm, 100,000 Ohm, 50,000 Ohm | 500 Ohm, 1,000 Ohm, 2,000 Ohm, 5,000 Ohm, 10,000 Ohm, 50,000 Ohm, 100,000 Ohm |
| **Maximum diameter** | 2,413 mm [0.095 in] | 2,413 mm [0.095 in] |
| **Termination material** | solid nickel, Teflon insulated | metalized silver |
| **Lead length** | 38,1 mm [1.50 in] | N/A |

# Temperature Sensors Line Guide





## Discrete Thermistors

| | 197 Series | ICL Series |
|---|---|---|
| **Description** | chip with bare leads and epoxy | inrush current limiter |
| **Operating temperature range** | -60 °C to 125 °C [-76 °F to 257 °F] | -40 °C to 185 °C [-40 °F to 365 °F] |
| **Dissipation constant in still air** | 0,75 mW/°C | 12.7 mW/°C to 23 mW/°C |
| **Time constant in air** | 15.0 s | 32 s to 93 s |
| **Nominal resistance at [25 °F to 77 °F]** | 300 Ohm, 1,000 Ohm, 3,000 Ohm, 5,000 Ohm, 10,000 Ohm, 50,000 Ohm, 100,000 Ohm | 0.5 Ohm to 220 Ohm +/- 20 % |
| **Maximum diameter** | 2,413 mm [0.095 in] | 9.5 mm [0.374 in] to 32 mm [1.26 in] |
| **Termination material** | tinned copper, alloy 180 | tinned copper |
| **Lead length** | 38,1 mm [1.50 in] | 1 in min. |

## DISCRETE RTD SENSORS

### HEL-700 Series.

**Features:** Linear resistance vs. temperature • Accurate and interchangeable • Enhanced stability • Teflon or fiberglass lead wires • Wide temperature range • Ceramic case material • Multiple sizes

**Benefits:** Fully assembled and ready to use without need for fragile splices to extension leads. Wide temperature range covers most potential applications such as HVAC, electronic assemblies and process control.

### HEL-775 Series.

**Features:** Linear resistance vs. temperature • Accurate and interchangeable • Enhanced stability • Thin film platinum • Ceramic SIP package • Solderable leads • Small size

**Benefits:** Ceramic SIP package with solderable leads provides strong connections for wires or printed circuits. Ideal for PCBs, temperature probes and other lower temperature applications including HVAC, electronic assemblies and process control applications.

### HEL-777/776 Series.

**Features:** Linear resistance vs. temperature • Accurate and interchangeable • Enhanced stability • Thin film platinum • Molded plastic SIP package • Solderable leads • Small size

**Benefits:** Molded plastic SIP package with solderable leads provides strong connections for wires or printed circuits. 1000 Ohm, 375 alpha version provides 10X greater sensitivity and signal to noise. Ideal for PCBs, temperature probes, or other potential applications including HVAC, electronic assemblies and process control.

### 700 Series.

**Features:** Linear resistance vs. temperature • Enhanced accuracy • Interchangeability • Surface mount versions • Enhanced stability • Enhanced time response • Wide temperature range • Cost effective

**Benefits:** Economical, miniature temperature sensors available in two sizes each of leaded and surface mount configurations. Surface mount in industry-standard 0805 and 1206 packages. 100 Ohm and 1000 Ohm base resistance in both 3850 ppm/K and 3750 ppm/K temperature coefficients (385 and 375 alphas). Tolerances meet DIN class A, DIN class B and DIN class 2B industry standards. Wide temperature range covers most potential applications. Including HVAC, electronic assemblies, thermal management and process control.

### HRTS Series.

**Features:** Linear resistance vs. temperature • Resistance interchangeable • Accurate • Fast • Laser trimmed • Wide temperature range

**Benefits:** Fully assembled and ready to use without need for fragile splices to extension leads. Wide temperature range covers most potential applications including HVAC, electronic assemblies and process control applications.

### TD Series.

**Features:** Linear resistance vs. temperature • Interchangeable without recalibration • Thin film • Laser trimmed • Long term stability • Air or liquid temperature sensing • Cost effective

**Benefits:** Provide 8 Ohm/°C sensitivity with inherently near linear output. Completely interchangeable without sensor-to-sensor recalibration. Silicon chip sensing element with proven thin film processing reliability. Individually laser trimmed. TD4A environmentally sealed liquid temperature sensors simple to install. TD5A miniature temperature sensors used where space is at a premium. Very small thermal mass for rapid response to temperature changes in potential industrial applications including HVAC, semiconductor protection, and process control.

## DISCRETE THERMISTORS

### 111 Series.

**Features:** Enhanced response time • Hermetically sealed in glass • Enhanced long-term stability • Micro size • Relatively uniform size • Weldable platinum iridium leads

**Benefits:** Highly sensitive to electric power. Potential for use in self-heat applications such as gas flow measurement and thermal conductivity analysis. Micro size for use in extremely small application spaces, such as medical assemblies.

### 112 Series.

**Features:** Enhanced response time • Hermetically sealed in glass • Enhanced long-term stability • Small size • Meets MIL-T-23648 • Weldable platinum iridium leads

**Benefits:** Small sensors designed to provide maximum stability for potential low cost, general purpose temperature measurement and control applications as well as most stringent military and aerospace applications.

### 115 Series.

**Features:** E-I matched in air or helium • Resistance matched at 25 °C [77 °F] • Interchangeable pairs • Extended life • Compression-type glass hermetic seal • High pressure solder seal

**Benefits:** Two beads, each bead mounted to a special hermetically-sealed header. Use higher resistance units at higher ambient temperatures for maximum sensitivity. Potential for use in gas chromatography, thermal conductivity gas analysis instruments, medical and military/aerospace applications.

### 120 Series.

**Features:** Hermetically sealed in glass • Enhanced reliability and stablility • Weldable/solderable dumet leads

**Benefits:** Shock resistant, rugged, glass encapsulated units often ideal for immersion in fluid and convenient for mounting in air sensing assemblies. Extremely reliable. Wide variety of potential military and aerospace applications.

### 121 Series.

**Features:** Hermetically sealed in glass • Enhanced reliability and stablility • Weldable/solderable dumet leads

**Benefits:** Shock resistant, rugged, glass encapsulated units often ideal for immersion in fluid and convenient for mounting in air sensor sensing assemblies. Enhanced reliability. Potential for use in a wide variety of military and aerospace applications.

### 126 Series.

**Features:** Hermetically sealed in glass • Interchangeability • Accuracy • Enhanced sensitivity • Enhanced stability • Enhanced reliability • Small size • Cost effective

**Benefits:** May be selected to tolerances only limited to the system's capability available to test them. Precision sensing elements used where curve-matched interchangeability is required for precise temperature control and precision temperature indication.

### 128 Series.

**Features:** Hermetically sealed in glass • Interchangeability • Accuracy • Enhanced sensitivity, stability and reliability • Miniature size • Cost effective

**Benefits:** Miniature size for applications where space is at a premium. May be selected to tolerances only limited to the system's capability available to test them. Precision sensing elements for where curve-matched interchangeability is required for precise temperature control and precision temperature indication such as military, aerospace, medical, and instrumentation test equipment.

### 129 Series.

**Features:** Interchangeability • Accuracy • Enhanced sensitivity, stability and reliability • Small size • Cost effective

**Benefits:** May be selected to tolerances only limited to the system's capability available to test them. Precision sensing elements for where curve-matched interchangeability is required for precise temperature control and precision temperature indication such as military, aerospace, medical and instrumentation test equipment.

### 135 Series.

**Features:** Rugged DO-35 glass encapsulation • Enhanced temperature capability • Enhanced reliability • Uniform dimensions • Tape and reel • Cost effective

**Benefits:** Uniform dimensions and tape and reel for automated assembly. Rugged sensor designed for potential high-volume, cost-sensitive applications that demand enhanced reliability.

### 140 Series.

**Features:** Cost effective • PC board mountable • Rugged design • Versatile • Solderable leads

**Benefits:** Broad range of custom resistance values and R/T curves. Potential applications include low-cost applications with a maximum temperature of 150 °C [302 °F].

### 143 Series.

**Features:** Rugged design • PC board mountable • Solderable leads • Cost effective

**Benefits:** Broad range of custom resistance values and R/T curves. Potentially for use in high-volume, cost-sensitive applications.

### 173 Series.

**Features:** Surface mount • Tape and reel • Glass-coated ceramic • Solder-plated Ni • 0805 EIA package • Cost effective

**Benefits:** Surface mount for automated pick and place. Tape and reel for high volume applications such as PC boards. Glass-coated ceramic designed for long term reliability. Solder-plated Ni-barrier terminations easy to solder. Potential for use in high-volume, cost-sensitive applications.

### 175 Series.

**Features:** Surface mount • Tape and reel • Glass-coated ceramic • Solder-plated Ni • 1206 EIA package • Cost effective

**Benefits:** Surface mount for automated pick and place. Tape and reel for high volume applications such as PC boards. Glass-coated ceramic design for long term reliability. Solder-plated Ni-barrier terminations easy to solder. Potential for use in high-volume, cost-sensitive applications.

### 192 Series.

**Features:** Resistance temperature curve interchangeability • Accuracy • Enhanced stability • Enhanced life • Cost effective • Small size • Epoxy coated

**Benefits:** Resistance temperature-matched interchangeable units designed to provide cost savings by eliminating need for individual resistance temperature calibration and standardization of circuit components. Designed to simplify design and replacement in temperature measurement, indication, control and compensation of ambient temperature effects on a variety of integrated circuits and other semiconductor devices.

### 194 Series.

**Features:** Resistance temperature curve interchangeability • Accuracy • Enhanced stability • Enhanced life • Cost effective • Small size • Epoxy coated • Teflon-coated leads

**Benefits:** Resistance temperature-matched interchangeable units designed to provide cost savings by eliminating need for individual resistance temperature calibration and standardization of circuit components. Simplifies design and replacement in temperature measurement, indication, control and compensation of ambient temperature effects on a variety of integrated circuits and other semiconductor devices.

### 196 Series.

**Features:** Rapid response times • Silver top and bottom surface electrode • Uniform size • Small size • Epoxy coated

**Benefits:** Uniform size for robotic assembly. Attach to hybrid or integrated circuits, and printed circuit boards by epoxy bonding or soldering. Provides over-temperature protection and temperature compensation in a variety of potential applications, including telecommunications and office automation.

### 197 Series.

**Features:** Rapid response times • Small size • Epoxy coated

**Benefits:** Broad range of custom resistance and R/T values for potential applications including communications, medical, office automation, instrumentation test equipment, and aerospace electronics.

### ICL Series.

**Features:** Cost effective • Enhanced reliability • Special high temp protective coating • Rugged design • PCB board mountable

**Benefits:** Designed to prevent damage to other electrical components. ICL absorbs electrical surge and the thermisotor's resistance decreases by a factor of 10 to 50; power drop across the ICL is reduced accordingly. For use in potential applications where the inrush of current can damage components in a switching power supply and other power devices when the equipment is turned on.

**Warranty.** Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Honeywell's standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgement or consult your local sales office for specific warranty details. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace, at its option, without charge those items it finds defective. **The foregoing is buyer's sole remedy and is in lieu of all warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall Honeywell be liable for consequential, special, or indirect damages.**

While we provide application assistance personally, through our literature and the Honeywell web site, it is up to the customer to determine the suitability of the product in the application.

Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this printing. However, we assume no responsibility for its use.

For more information about Sensing and Control products, visit www.honeywell.com/sensing or call +1-815-235-6847
Email inquiries to info.sc@honeywell.com

**⚠ WARNING**
**PERSONAL INJURY**

- DO NOT USE these products as safety or emergency stop devices or in any other application where failure of the product could result in personal injury.

**Failure to comply with these instructions could result in death or serious injury.**

**⚠ WARNING**
**MISUSE OF DOCUMENTATION**

- The information presented in this catalogue is for reference only. DO NOT USE this document as product installation information.
- Complete installation, operation and maintenance information is provided in the instructions supplied with each product.

**Failure to comply with these instructions could result in death or serious injury.**

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009033-2-EN IL50 GLO
July 2009
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Стандарт Электрон Связь

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Благодаря сотрудничеству с мировыми поставщиками мы осуществляем комплексные и плановые поставки широчайшего спектра электронных компонентов.

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