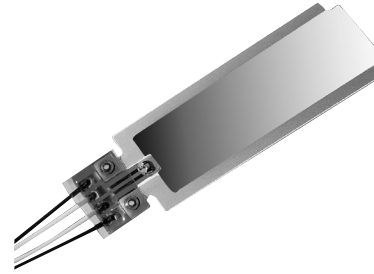


# Flexible Heaters Line Guide



**Performance and reliability. Trust and service.** These words aren't platitudes at Honeywell Sensing and Control (S&C), each is an attribute built into every part we forge. Our heater applications meet multiple needs in many industries — from medical electronics to burgeoning global telecommunication segments. Delivering all the benefits you'd expect: Flat, molded-to-shape, spiral wrap, transparent, composite and high-temperature configurations. Single, multiple or variable watt

densities designed to customize heat output to unique needs. A variety of manufacturing materials, including silicone and other flexible dielectric components. And each solution is designed to be bonded to other system parts or combined with Honeywell thermostats, thermistors, thermocouples, temperature sensors and thermal fuses to form custom-engineered heating systems.

## FEATURES

### FLEXIBLE HEATERS

#### 78000 Series.

**Features:** Truly transparent, no wires in clear view area • Optical grade, thin-film polyester • Low power consumption

**Benefits:** Electrically-conductive transparent film eliminates need for resistance wires or traces and also accommodates potential EMI/RFI shielding applications. Optical grade, thin-film polyester is designed to ensure clarity and optimum readability in extreme environments. Transparent PSA permits light transmission up to 93 % and allows heating element to be mounted in front of or behind LCD. Low power consumption for use with battery or line power. May be combined with other Honeywell thermal products to form custom-engineered heating solutions. Warms LCDs (liquid crystal displays) in cold, moist environments down to -40 °C [40 °F], including display systems, medical equipment, food service display cabinets and outdoor camera systems.

#### 3400 Series.

**Features:** Low out gassing • Variety of geometries such as flat, molded-to-shape and spiral wrap • High dielectric strength with minimum thickness • Standard designs UL, CSA and TUV approved

**Benefits:** Kapton is designed to provide thermal stability over a wide temperature range. PSA simplifies installation. May be bonded to other system parts or combined with other Honeywell thermal products to form custom-engineered heating solutions. Used where thin profile and/or low material outgassing are important considerations such as airborne valves, appliances, and medical electronics.

#### 3100 Series.

**Features:** Virtually any size and shape • Standard designs UL, CSA and TUV approved

**Benefits:** Multi-stranded resistance wires allow wire-wound heaters to conform to three dimensional shapes for potential airborne valve, appliance, and medical electronics applications. PSA simplifies installation.

#### 3200 Series.

**Features:** Multiple watt densities or varying trace geometries • Variety of geometries such as flat, molded-to-shape and spiral wrap • Standard designs UL, CSA and TUV approved

**Benefits:** Easily vulcanized to metal parts. PSA simplifies installation. May be bonded to other system parts or combined with other Honeywell thermal products to form custom-engineered heating solutions. Used where multiple watt densities or varying trace geometries are required such as airborne valves, appliances, and medical electronics.

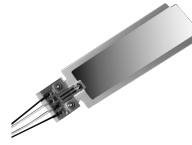
# Flexible Heaters Line Guide

## Everything you expect from the industry leader.

Whether we're warming fluids in medical applications or backing up power supplies for telecom base stations, Honeywell S&C flexible heaters are the gold standard. But enhanced performance and reliability are only the start:

**Customization:** it sets us apart from commodity suppliers. Honeywell S&C excels in tailored, value-added designs. Our modular components are assembled in-house according to your specifications.

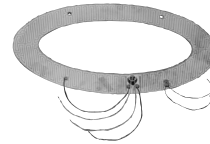
**Service:** as your true globally competitive answer. Local support. Distributor stocking. Even full-line, one-stop convenience. Whether you knew us as Elmwood Sensors or know us as Honeywell S&C, everyone knows we are the leader in superior service.



## Flexible Heaters

### 78000 Series

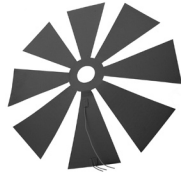
<b>Description</b>	transparent
<b>Maximum power</b>	0.155 W/cm <sup>2</sup> [5 W/in <sup>2</sup> ]
<b>Operating/storage temperature range</b>	-40 °C to 85 °C [-40 °F to 185 °F]
<b>Size constraints</b>	0,60 m x 0,43 m [22 in x 17 in]
<b>Geometry</b>	specific to customer requirements within size constraints
<b>Heater trace pattern</b>	continuous layer of ITO (Indium Tin Oxide) across entire surface
<b>Construction</b>	Very thin layer of ITO electrically sputtered on PET polyester film. Electrical connection made via silver ink or carbon bus bars laid on top of the ITO. Wire connections are made via ring terminals eyeleted to the silver or carbon bus bars or flexible tail/connector.
<b>Standard wire type</b>	<ul style="list-style-type: none"> <li>• UL 1180 Teflon</li> <li>• gauge per customer request</li> <li>• otherwise selected for max. heater current draw</li> </ul>
<b>PSA (Pressure Sensitive Adhesive)</b>	yes



## Flexible Heaters

### 3400 Series

<b>Description</b>	Kapton <sup>®</sup> insulated or Kapton <sup>®</sup> insulated high temperature
<b>Maximum power</b>	16 W/cm <sup>2</sup> [40 W/in <sup>2</sup> ]
<b>Operating/storage temperature range</b>	<ul style="list-style-type: none"> <li>• Kapton insulated: 177 °C [350 °F] max.</li> <li>• Kapton insulated high temperature: 260 °C [500 °F] max.</li> </ul>
<b>Size constraints</b>	0,61 m x 0,61 m [24 in x 24 in]
<b>Geometry</b>	specific to customer requirements within size constraints
<b>Heater trace pattern</b>	specific to customer requirements
<b>Construction</b>	Contain etched, resistive foil encased between two layers of Kapton. Kapton Insulated uses acrylic, thermoset bonding adhesive; Kapton Insulated High Temperature uses Teflon <sup>®</sup> bonding adhesive
<b>Standard wire type</b>	<ul style="list-style-type: none"> <li>• UL 1180 Teflon</li> <li>• gauge per customer request</li> <li>• otherwise selected for max. heater current draw</li> </ul>
<b>PSA (Pressure Sensitive Adhesive)</b>	yes



## Flexible Heaters

### 3100 Series

### 3200 Series

	3100 Series	3200 Series
<b>Description</b>	silicone wire-wound	silicone chemically-etched
<b>Maximum power</b>	16 W/cm <sup>2</sup> [40 W/in <sup>2</sup> ]	16 W/cm <sup>2</sup> [40 W/in <sup>2</sup> ]
<b>Operating/storage temperature range</b>	250 °C [482 °F] max. 200 °C [392 °F] max. (UL)	250 °C [482 °F] max. 200 °C [392 °F] max. (UL)
<b>Size constraints</b>	none, virtually any size and shape	0,61 m x 0,61 m [24 in x 24 in]
<b>Geometry</b>	specific to customer requirements	specific to customer requirements within size constraints
<b>Heater trace pattern</b>	specific to customer requirements	specific to customer requirements
<b>Construction</b>	Contains resistive wire encased between two layers of fiberglass-supported silicone rubber. All bonding adhesives are uncured silicone rubber. Cured under pressure and temperature during manufacturing.	Contains resistive foil traces encased between two layers of fiberglass-supported silicone rubber bonded together using temperature and pressure. Heater trace patterns generated similar to processes used in printed circuit board design and manufacture.
<b>Standard wire type</b>	<ul style="list-style-type: none"> <li>• UL 1180 Teflon</li> <li>• gauge per customer request</li> <li>• otherwise selected for max. heater current draw</li> </ul>	<ul style="list-style-type: none"> <li>• UL 1180 Teflon</li> <li>• gauge per customer request</li> <li>• otherwise selected for max. heater current draw</li> </ul>
<b>PSA (Pressure Sensitive Adhesive)</b>	yes	yes

**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](http://www.honeywell.com/sensing) or call +1-815-235-6847. Email inquiries to [info.sc@honeywell.com](mailto: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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