Hermetically Sealed, High Temperature Limit Switches
HR Series

DESCRIPTION
When the application requires a hermetically sealed switch with high temperature capability, Honeywell delivers the HR Series limit switches for the most severe of environments. The HR Series is well suited for commercial and military aircraft applications where high temperatures are encountered. The switch design incorporates a choice of an integral pin plunger or roller plunger with a 3/4 inch diameter threaded bushing for ease of installation into a panel. With stainless steel material construction for the external package and high temperature rated components, the HR Series switches are capable of withstanding continuous temperatures up to 315 °C [600 °F] and suitable where corrosive environments are present.

HR Series limit switches are designed to MIL-PRF-8805 standards with select catalog listings qualified to the MIL-PRF-8805 standards.

FEATURES
- Exceptional wide temperature range of -65 °C to 315 °C [-85 °F to 600 °F]
- Select HR Series catalog listings are qualified or compliant to MIL-PRF-8805
- Hermetically sealed to MIL-PRF-8805 symbol 5
- Stainless steel housing and threaded bushing
- Different styles of integral actuators: pin plungers and roller plungers
- Several different styles of electrical termination: 4-48 terminal screws, end or side exit #20 AWG wire leads

POTENTIAL APPLICATIONS
- Thrust reverser actuation system (TRAS) for jet engines
- Cowl-lock indication during thrust reverse actuation for jet engines

DIFFERENTIATION
- Only manufacturer with a bushing mount high-temperature hermetically sealed limit switch
- Threaded bushing facilitates ease of installation

PORTFOLIO
In addition to the HR Series hermetically sealed switches, Honeywell offers a complete range of sealed switches for aircraft and military systems. The sealed switches include the EN Series, HM Series, HE Series, HS Series, SE Series, and XE Series.

VALUE TO CUSTOMERS
- Honeywell HR Series hermetically sealed high-temperature switches drive solutions for precise position indication of critical applications on commercial/military aircraft and military systems
### Hermetically Sealed, High Temperature Limit Switches, HR Series

#### Table 1. Specifications

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>High temperature hermetically sealed limit switch with MIL-PRF-8805 standards</td>
</tr>
<tr>
<td>Standards</td>
<td>Design conforms to MIL-PRF-8805</td>
</tr>
<tr>
<td>Housing &amp; bushing material</td>
<td>300 Series stainless steel</td>
</tr>
<tr>
<td>Contacts</td>
<td>Silver alloy</td>
</tr>
<tr>
<td>Circuitry</td>
<td>1PDT or 2PDT [reference circuitry illustrations below]</td>
</tr>
<tr>
<td>Electrical rating</td>
<td>5 A resistive or 2 A inductive @ 28 Vdc</td>
</tr>
<tr>
<td>Mechanical endurance</td>
<td>25000 cycles min.</td>
</tr>
<tr>
<td>Electrical endurance</td>
<td>25000 cycles min. at full rated load</td>
</tr>
<tr>
<td>Dielectric strength (initial)</td>
<td>1000 VRMS; 500 μA. Max. leakage</td>
</tr>
<tr>
<td>Insulation resistance (initial)</td>
<td>500 Vdc; 1000 Megohms min.</td>
</tr>
<tr>
<td>Environmental sealing</td>
<td>Symbol 5, hermetic seal per MIL-PRF-8805</td>
</tr>
<tr>
<td>Temperature range</td>
<td>-65 °C to 315 °C [-85 °F to 600 °F]</td>
</tr>
<tr>
<td>Shock</td>
<td>Symbol M (100 g) per MIL-PRF-8805</td>
</tr>
<tr>
<td>Vibration</td>
<td>Symbol 1 (10 g peak) 10 Hz to 500 Hz sinusoidal per MIL-PRF-8805</td>
</tr>
</tbody>
</table>

#### HR SERIES SWITCHES

The HR Series high-temperature hermetically sealed switches are designed with a threaded bushing for panel mount applications. The HR Series has a threaded bushing which is 0.75 (3/4) in diameter.

The options for the electrical termination for the HR Series switches are generally end exit wire leads or screw terminals integral to the switch; however, military style connectors integral to the HR switch are also available.

#### MOUNTING

Plunger actuator switches bushing mount through 0.75 inch (19.1 mm) diameter holes. Lock washer, keying washer, and wire lock hexagon mounting nuts lock the switches in their mounting.

#### ACTUATORS

**Plunger**
For in-line actuation. An ice scraper ring clears the actuator with each operation. Material is stainless steel.

**Roller plunger**
For cam and slide actuation not to exceed 20° rise. Roller adjusts laterally in 45° increments. An ice scraper ring clears the actuator with each operation. Material is stainless steel.

#### TYPICAL CIRCUITRY

![TYPICAL CIRCUITRY Diagram](image)

1PDT

One Single-Pole Double-Throw Circuit

2PDT

Two Single-Pole Double-Throw Circuits

2PDT with connector

Two Single-Pole Double-Throw Circuits
ELECTROMECHANICAL SWITCHES

Definitions below explain the meaning of operating characteristics. Characteristics shown in tables were chosen as most significant. They are taken at normal room temperature and humidity. These may vary as temperature and humidity conditions differ. Sketches show how characteristics are measured for in-line plunger actuation.

Linear dimensions for in-line actuation are from top of plunger to a reference line.

Differential Travel (D.T.) – Plunger or actuator travel from point where contacts “snap-over” to point where they “snapback.”

Free Position (F.P.) – Position of switch plunger or actuator when no external force is applied (other than gravity).

Full Overtravel Force – Force required to attain full overtravel of actuator.

Operating Position (O.P.) – Position of switch plunger or actuator at which point contacts snap from normal to operated position. Note that in the case of flexible or adjustable actuators, the operating position is measured from the end of the lever or its maximum length. Location of operating position measurement shown on mounting dimension drawings.

Operating Force (O.F.) – Amount of force applied to switch plunger or actuator to cause contact “snap-over.” Note in the case of adjustable actuators, the force is measured from the maximum length position of the lever.

Overtravel (O.T.) – Plunger or actuator travel available beyond operating position.

Pretravel (P.T.) – Distance or angle traveled in moving plunger or actuator from free position to operating position.

Release Force (R.F.) – Amount of force still applied to switch plunger or actuator at moment contacts snap from operated position to unoperated position.

Total Travel (T.T.) – Distance from actuator free position to overtravel limit position.
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### Table 2. Order Guide

<table>
<thead>
<tr>
<th>Actuator</th>
<th>Circuitry</th>
<th>Catalog Listing</th>
<th>Military Number or Note</th>
<th>Electrical Termination</th>
<th>Switch Characteristics</th>
<th>Dimensional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin plunger</td>
<td>2PDT</td>
<td>12HR1-S</td>
<td>MS24594-1</td>
<td>Screws (6), #4-48</td>
<td>Operating Force N [lb]</td>
<td>26.7 to 53.4 [6 to 12]</td>
</tr>
<tr>
<td>Pin plunger</td>
<td>1PDT</td>
<td>12HR8-6</td>
<td>–</td>
<td>Leadwire #20 AWG (end exit) per MIL-C-25038</td>
<td>Release Force min. N [lb]</td>
<td>26.7 to 53.4 [6 to 12]</td>
</tr>
<tr>
<td>Roller plunger</td>
<td>2PDT</td>
<td>22HR1-S</td>
<td>–</td>
<td>Screws (6), #4-48</td>
<td>Free Position nom. mm [in]</td>
<td>26.7 to 53.4 [6 to 12]</td>
</tr>
<tr>
<td>Roller plunger</td>
<td>1PDT</td>
<td>22HR8-6</td>
<td>–</td>
<td>Leadwire #20 AWG (end exit) per MIL-C-25038</td>
<td>Pretravel max. mm [in]</td>
<td>26.7 to 53.4 [6 to 12]</td>
</tr>
<tr>
<td>Roller plunger</td>
<td>2PDT</td>
<td>22HR80-RB</td>
<td>-31 °C to 204 °C [-25 °F to 400 °F]</td>
<td>6-pin, end-exit connector</td>
<td>Overtravel min. mm [in]</td>
<td>26.7 to 53.4 [6 to 12]</td>
</tr>
</tbody>
</table>

### PRODUCT DIMENSIONS

#### Figure 1. 12HR1-S mm [in]

![Diagram showing product dimensions](image-url)
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Figure 2.12HE8-6 mm [in]

1.83 wide x 0.24 [0.072 wide x 0.049] keyway to within [0.25] of shoulder

(3) No. 20 wire lead per spec MIL-C-25038 marked, per spec MIL-W-5088 (1-20, 2-20, 3-20)

Figure 3. 22HR1-S mm [in]

Roller guide may be locked in increments of 45° azimuth.
Roller guide may be unscrewed and removed from bushing to facilitate installation.

4-48 NF-2A X 0.188 ref pan head terminal screws and washers (SEMS)
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Figure 4. 22HR8-6 mm [in]

Roller guide may be locked in increments of 45° azimuth. Roller guide may be unscrewed and removed from bushing to facilitate installation.

Figure 4. 22HR80-RB mm [in]

Roller guide may be locked in increments of 45° azimuth. Roller guide may be unscrewed and removed from bushing to facilitate installation.

Physical science connector HP02WS-14S-6P (Type) (or equiv)
Warranty/Remedy
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 other 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 Honeywell may 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.

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