# Type HOLCO Series

## Key Features

- Ultra Precision - Down To 0.05%
- Matched Sets Available To 2ppm/°C
- High Pulse Withstand
- Low Reactance
- Low TCR - Down To 5ppm/°C
- Long Term Stability
- Up To 1 Watt At 70°C
- Released To CECC 40101 004, 030 And 804



The Holco range of Precision Metal Film Resistors meets the requirement for economically priced components for industrial and military applications. The manufacturing facility utilises closely controlled production processes including the sputter coating of metal alloy films to ceramic substrates, and laser spiralling to achieve close tolerance and high stability resistors. An epoxy coating is applied for environmental and mechanical protection. Commercially the Series is available in two case sizes, from 1 ohm to 4M ohms, tolerances from 0.05% to 1% and TCR's from 5ppm/°C to 100ppm/°C. Offered with release to BS CECC 40101 004, 030 and 804 the H8 is available via distribution.

## Characteristics - Electrical

| | H4P | H4 | H8 | |
|---|---|---|---|---|
| **BS CECC 40101 004** | | | | |
| **Style:** | | K | H | J |
| **Power Rating at 70°C:** | | 0.25W | 0.063W | 0.125W |
| **Temperature Rise (max):** | | 32°C | 14°C | 28°C |
| **Limiting Element Voltage:** | | 250V | 200V | 200V |
| **BS CECC 40101 030** | | | | |
| **Style:** | | J | H | |
| **Power Rating at 125°C:** | | 0.125W | 0.1W | |
| **Temperature Rise (max):** | | 30°C | 30°C | |
| **Limiting Element Voltage:** | | 250V | 200V | |
| **BS CECC 40101 804** | | | | |
| **Style:** | | B | A | |
| **Power Rating at 125°C:** | | 0.25W | 0.125W | |
| **Limiting Element Voltage:** | | 250V | 200V | |
| **Commercial Ratings** | | | | |
| **Power Rating at 70°C:** | 1.0W | 0.5W | 0.25W | |
| **Temperature Rise:** | 70°C | 55°C | 40°C | |
| **Limiting Element Voltage:** | 500V | 350V | 350V | |

## General Data

| | |
|---|---|
| **Lead Material:** | Solderability to BS CECC 40101 004 Para 4.15.1 |
| **Encapsulation:** | Conformal Epoxy Coating |
| **Resistor Marking:** | Legend printed in accordance with CECC 40000 Para 2.4 |
| **Solvent Resistance:** | The epoxy coating and print will withstand the action of all commonly used industrial cleansing solvents |



Dimensions are in millimeters and inches unless otherwise specified. Values in brackets are standard equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

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## Temperature Coefficient / Tolerance Ranges

| TCR | H4P | | | H4 | | | H8 | | |
|---|---|---|---|---|---|---|---|---|---|
| ppm/°C | 0.05% | 0.1%-0.25% | 0.5%-1.0% | 0.05% | 0.1%-0.25% | 0.5%-1.0% | 0.05% | 0.1%-0.25% | 0.5%-1.0% |
| 5 | 10R-500K | 10R-500K | 10R-500K | 10R-500K | 10R-500K | 10R-500K | 10R-500K | 10R-500K | 10R-500K |
| 10 | 10R-1M0 | 10R-1M0 | 10R-1M0 | 10R-1M0 | 10R-1M0 | 10R-1M0 | 10R-1M0 | 10R-1M0 | 10R-1M0 |
| 15 | 10R-1M0 | 10R-1M0 | 10R-1M0 | 10R-1M0 | 10R-1M0 | 10R-1M0 | 10R-1M0 | 10R-1M0 | 10R-1M0 |
| 25 | 10R-1M0 | 10R-2M0 | 10R-2M0 | 10R-1M0 | 10R-2M0 | 10R-2M0 | 10R-1M0 | 10R-2M0 | 10R-2M0 |
| 50 | 10R-1M0 | 10R-2M0 | 10R-4M0 | 10R-1M0 | 10R-2M0 | 10R-4M0 | 10R-1M0 | 10R-2M0 | 10R-4M0 |
| 100 | 10R-1M0 | 1R0-2M0 | 1R0-4M0 | 10R-1M0 | 1R0-2M0 | 1R0-4M0 | 10R-1M0 | 1R0-2M0 | 1R0-4M0 |

## Approved Value Ranges 40101-004, 40101-030

| Type | Style 004 | Style 030 | Z 100ppm | C 50ppm | D 25ppm | Y 15ppm |
|---|---|---|---|---|---|---|
| H4 | K | J | 10R-1M0 | 49R9-1M0 | 49R9-1M0 | 49R9-1M0 |
| H8 | HJ | H | 10R-1M0 | 49R9-1M0 | 49R9-1M0 | 49R9-1M0 |

Tolerances 0.1%, 0.25%, 0.5%, 1%

## 40101-804

| Type | Style | C 50ppm | D 25ppm | T 15ppm |
|---|---|---|---|---|
| H4 | B | 49R9-1M0 | 49R9-1M0 | 49R9-1M0 |
| H8 | A | 49R9-1M0 | 49R9-1M0 | 49R9-1M0 |

Tolerances 0.1%, 0.25%, 0.5%, 1%

## Characteristics - Electrical

| | Typical Data | Reference |
|---|---|---|
| **Voltage Coefficient of Resistance (Between 10% and Full Rated Voltage)** | Less Than 5ppm/Volt Applied | n/a |
| **Insulation Resistance at 500 Volts** | Greater Than $10^{12}$ Ohms | n/a |
| **Resistance to Soldering Heat (260°C for 10 Secs.)** | Less Than 0.05% | BS CECC 40101 004 Para 4.15.2 |
| **Short Term Overload (6.25 Times Rated BS CECC Wattage for 5 Seconds)** | Less Than 0.06% | BS CECC 40101 004 Para 4.11 |
| **Ambient Temperature Range** | -55°C to +155°C | BS CECC 40101 004, BS CECC 40101 030 & Commercial |
| **Rapid Change of Temperature (-55°C to +155°C, 5 cycles)** | Less Than 0.04% | BS CECC 40101 004 Para 4.16 |
| **Shelf Life (at Normal Room Temp.)** | Less Than 0.05% Per Annum | n/a |
| **Vibration (10-500 HZ,Amplitude 0.75mm, or Acceleration 98m/s2 which is less severe, sweep duration 6 hours)** | Less Than 0.04% | BS CECC 40101 004 Para 4.19 |
| **Vibration (55-2000 Hz Simple Harmonic Motion, Max.Acceleration 98m/s2, Duration 35±5 Minutes)** | Less Than 0.04% | MIL STD 202 METHOD 204-C |
| **Bump (390m/s2, 4000 Bumps)** | Less Than 0.03% | BS 2011 Part 2.1 Eb 1977 (1984) |
| **Load Stability** | See Graphs | n/a |
| **Damp Heat Steady State** | See Graph | BS CECC 40101 004 Para 4.21 |



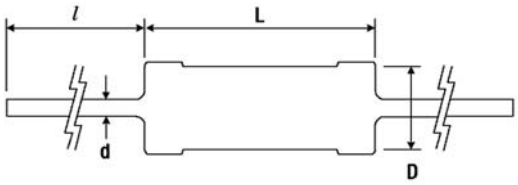
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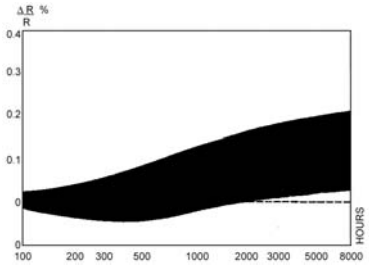
## Dimensions

To prevent damage to the components conformal coating, the leads should be adequately supported during the forming process

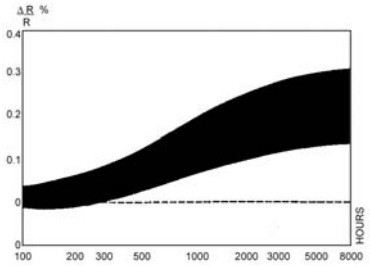



| | H4P | H4 | H8 |
|---|---|---|---|
| **Body Length (L) maximum:** | 10.0 mm | 10.0 mm | 7.20 mm |
| **Body Diameter (D) maximum:** | 3.70 mm | 3.70 mm | 2.50 mm |
| **Lead Diameter (d) maximum:** | 0.60 mm | 0.60 mm | 0.60 mm |
| **Lead Length (l) nominal:** | 30.0 mm | 30.0 mm | 30.0 mm |
| **Recommended Mounting Pitch:** | 12.7 mm | 12.7 mm | 10.2 mm |
| **Weight (g/100 resistors)** | 40 | 40 | 24 |

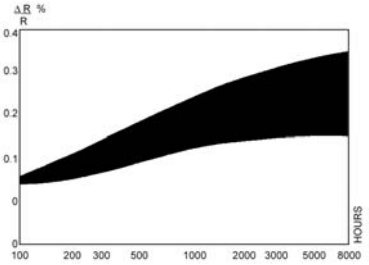
## Characteristics - Long Term Stability



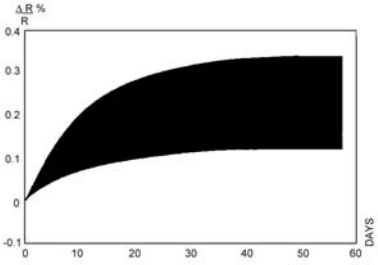

**Long Term Stability**
BS CECC 40101 004
Ratings at 70°C
H4 - 0.25 W
H8 - 0.125 W




**Long Term Stability**
BS CECC 40101 030
Ratings at 125°C
H4 - 0.125 W
H8 - 0.1 W




**Long Term Stability**
Commercial
Ratings at 125°C
H4P - 1W
H4 - 0.5 W
H8 - 0.25 W




**Damp Heat Steady State**
93% RH at 40°C

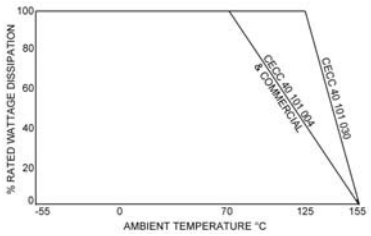


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## Derating Graph - Approved and Commercial Ratings




## How to Order

| H8 | 100R | B | Y | B |
|---|---|---|---|---|
| **Common Part** | **Resistance Value** | **Tolerance** | **T.C.R. Code** | **Release** |
| H4P<br>H4<br>H8 | 1.0 ohm (1000 milli ohms) 1R0<br>10 ohm (10 ohms) 10R<br>100 ohm (100 ohms) 100R<br>1K 0hm (1000 ohms) 1K0<br>10K ohm (10000 ohms) 10K<br>100K ohm (100000 ohms) 100K<br>1M ohm (1000000 ohms) 1M0 | A - 0.05%<br>B - 0.1%<br>C - 0.25%<br>D - 0.5%<br>F - 1.0% | A - 5ppm<br>B - 10ppm<br>Y - 15ppm<br>D - 25ppm<br>C - 50ppm<br>Z - 100ppm | A - Part can only be sold with Commercial or C of C release.<br>B - Part can be sold to BS CECC 40101 004, BS CECC 40101 030<br>D - Part can be sold to BS CECC 40101 804 |

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