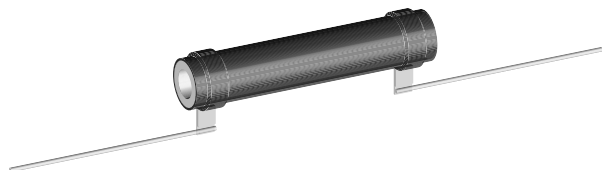


## Wirewound Resistors, Industrial Power, Tubular



### FEATURES

- High temperature silicon coating
- Complete welded construction
- Excellent for intermittent power and pulsing applications
- Available in non-inductive styles (model NHLW) with Aryton-Perry winding
- Axial or radial terminals for through hole or lead weld applications
- Excellent stability in operation (< 3 % change in resistance)
- Compliant to RoHS Directive 2002/95/EC



RoHS+  
COMPLIANT  
**GREEN**  
(5-2009)\*\*  
Available

### STANDARD ELECTRICAL SPECIFICATIONS

| GLOBAL MODEL    | HISTORICAL MODEL  | POWER RATING<br>$P_{25\text{ }^\circ\text{C}}$ W | RESISTANCE RANGE $\Omega$<br>$\pm 5\%$ | RESISTANCE RANGE $\Omega$<br>$\pm 10\%$ | WEIGHT (typical)<br>g |
|-----------------|-------------------|--|--|---|-----------------------|
| HLW03<br>NHLW03 | HLW-3<br>NHLW-3   | 3  | 1.0 to 6K<br>1.0 to 700                | 0.10 to 6K<br>1.0 to 700                | 1.16                  |
| HLW05<br>NHLW05 | HLW-5<br>NHLW-5   | 5.25   | 1.0 to 15K<br>1.0 to 1.9K              | 0.10 to 15K<br>1.0 to 1.9K              | 2.12                  |
| HLW06<br>NHLW06 | HLW-6<br>NHLW-6   | 8  | 1.0 to 20.5K<br>1.0 to 2.7K            | 0.10 to 20.5K<br>1.0 to 2.7K            | 4.60                  |
| HLW10<br>NHLW10 | HLW-10<br>NHLW-10 | 10   | 1.0 to 29K<br>1.0 to 3.7K              | 0.10 to 29K<br>1.0 to 3.7K              | 6.24                  |
| HLW12<br>NHLW12 | HLW-12<br>NHLW-12 | 12   | 1.0 to 58K<br>1.0 to 3.9K              | 0.10 to 58K<br>1.0 to 3.9K              | 6.60                  |
| HLW15<br>NHLW15 | HLW-15<br>NHLW-15 | 15   | 1.0 to 60K<br>1.0 to 4.3K              | 0.10 to 58K<br>1.0 to 4.3K              | 8.82                  |
| HLW20<br>NHLW20 | HLW-20<br>NHLW-20 | 20   | 1.0 to 95K<br>1.0 to 6.8K              | 0.10 to 95K<br>1.0 to 6.8K              | 11.36                 |

### TECHNICAL SPECIFICATIONS

| PARAMETER                       | UNIT                  | HLW RESISTOR CHARACTERISTICS   |
|---------------------------------|-----------------------|--|
| Temperature Coefficient         | ppm/ $^\circ\text{C}$ | $\pm 30$ for 10 $\Omega$ and above; $\pm 50$ for 1 $\Omega$ to 9.9 $\Omega$ ; $\pm 90$ for 0.1 $\Omega$ to 0.99 $\Omega$ |
| Short Time Overload             | -                     | 10 x rated power for 5 s   |
| Dielectric Withstanding Voltage | $V_{AC}$              | 1000, from terminal to mounting hardware   |
| Maximum Working Voltage         | V                     | $(P \times R)^{1/2}$   |
| Insulation Resistance           | $\Omega$              | 1000 M $\Omega$ minimum dry, 100 M $\Omega$ minimum after moisture test  |
| Operating Temperature Range     | $^\circ\text{C}$      | - 55 to + 350  |

### GLOBAL PART NUMBER INFORMATION

Global Part Numbering example: NHLW12A1Z10R00JF

|  |  |   |  |   |  |   |   |   |  |   |  |   |   |   |   |  |  |
|--|--|---|--|---|--|---|---|---|--|---|--|---|---|---|---|--|--|
| N  | H  | L | W  | 1 | 2  | A | 1   | Z | 1  | 0 | R  | 0 | 0 | J | F |  |  |
| GLOBAL MODEL   | TERMINAL DESIGNATION                             |   | TERMINAL FINISH                                  |   | RESISTANCE VALUE   |   | TOLERANCE   |   | PACKAGING CODE   |   | SPECIAL  |   |   |   |   |  |  |
| <b>NHLW12</b><br>(See "Standard Electrical Specifications" table above for additional P/N's) | <b>A1</b><br><b>A2</b><br><b>R1</b><br><b>R2</b> |   | <b>E</b> = Lead (Pb)-free<br><b>Z</b> = Tin/lead |   | <b>R</b> = Decimal<br><b>K</b> = Thousand<br><b>10R00</b> = 10.0 $\Omega$<br><b>1K000</b> = 1 k $\Omega$ |   | <b>J</b> = $\pm 5.0\%$<br><b>K</b> = $\pm 10.0\%$ |   | <b>E</b> = Lead (Pb)-free foam pack<br><b>F</b> = Tin/lead foam pack (F01) |   | (Dash Number)<br>(Up to 2 digits)<br>From <b>1</b> to <b>99</b><br>as applicable |   |   |   |   |  |  |

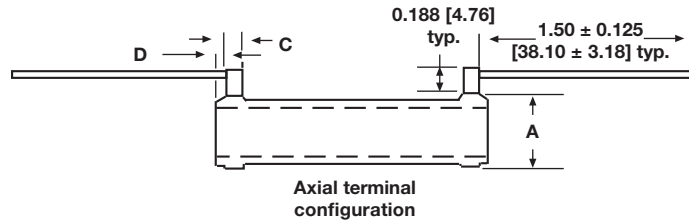
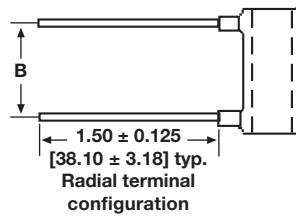
Historical Part Numbering example: NHLW-12-A1Z 10  $\Omega$  5 % F01

|                  |                 |                  |           |           |
|------------------|-----------------|------------------|-----------|-----------|
| NHLW-12          | A1Z             | 10 $\Omega$      | 5 %       | F01       |
| HISTORICAL MODEL | TERMINAL/FINISH | RESISTANCE VALUE | TOLERANCE | PACKAGING |

\* Pb containing terminations are not RoHS compliant, exemptions may apply

\*\* Please see document "Vishay Material Category Policy": [www.vishay.com/doc?99902](http://www.vishay.com/doc?99902)

**DIMENSIONS** in inches [millimeters]



| GLOBAL MODEL    | A (MAX.)         | B TYP.           | C ± 0.031 [0.79] | D TYP.          | CORE DIMENSIONS       |                  |                     | AXIAL TERMINAL DESIGNATION | RADIAL TERMINAL DESIGNATION | BRACKET TYPE <sup>(1)</sup> |
|-----------------|------------------|------------------|------------------|-----------------|-----------------------|------------------|---------------------|----------------------------|-----------------------------|-----------------------------|
|                 |                  |                  |                  |                 | LENGTH ± 0.063 [1.59] | O.D.             | I.D. ± 0.031 [0.79] |                            |                             |                             |
| HLW03<br>NHLW03 | 0.297<br>[7.54]  | 0.282<br>[7.16]  | 0.063<br>[1.59]  | 0.047<br>[1.19] | 0.438<br>[11.11]      | 0.203<br>[5.16]  | 0.125<br>[3.18]     | A2Z                        | R2Z                         | -                           |
| HLW05<br>NHLW05 | 0.344<br>[8.73]  | 0.469<br>[11.91] | 0.063<br>[1.59]  | 0.047<br>[1.19] | 0.625<br>[15.88]      | 0.250<br>[6.35]  | 0.125<br>[3.18]     | A2Z                        | R2Z                         | -                           |
| HLW06<br>NHLW06 | 0.406<br>[10.32] | 0.688<br>[17.48] | 0.125<br>[3.18]  | 0.094<br>[2.38] | 1.000<br>[25.40]      | 0.313<br>[7.94]  | 0.188<br>[4.76]     | A1Z                        | R1Z                         | 101, 204, 301               |
| HLW10<br>NHLW10 | 0.563<br>[14.28] | 0.688<br>[17.48] | 0.125<br>[3.18]  | 0.094<br>[2.38] | 1.000<br>[25.40]      | 0.438<br>[11.11] | 7.94<br>[0.313]     | A1Z                        | R1Z                         | 101, 203, 301               |
| HLW12<br>NHLW12 | 0.406<br>[10.32] | 1.438<br>[36.53] | 0.125<br>[3.18]  | 0.094<br>[2.38] | 1.750<br>[44.45]      | 0.313<br>[7.94]  | 4.76<br>[0.188]     | A1Z                        | R1Z                         | 101, 204, 301               |
| HLW15<br>NHLW15 | 0.563<br>[14.29] | 1.188<br>[30.18] | 0.125<br>[3.18]  | 0.094<br>[2.38] | 1.500<br>[38.10]      | 0.438<br>[11.11] | 7.94<br>[0.313]     | A1Z                        | R1Z                         | 101, 203, 301               |
| HLW20<br>NHLW20 | 0.563<br>[14.29] | 1.688<br>[42.88] | 0.125<br>[3.18]  | 0.094<br>[2.38] | 2.000<br>[50.80]      | 0.438<br>[11.11] | 7.94<br>[0.313]     | A1Z                        | R1Z                         | 101, 203, 301               |

**Note**

(1) Brackets are available for mounting HLW series resistors - see "Mounting Hardware" section.

**TERMINAL FINISH**

Terminals are 20 AWG for HLW03 and HLW05 size and 18 AWG for all other sizes. "E" Finish - 100 % Sn, coated Copperweld®. "Z" Finish - 60/40 Sn/Pb coated Copperweld®.

**MOUNTING HARDWARE**

Mounting hardware is available for HLW resistors, see "HL Brackets and Sliders" datasheet for more information: [www.vishay.com/doc?30279](http://www.vishay.com/doc?30279).

**MATERIAL SPECIFICATIONS**

**Element:** Copper-nickel alloy of nickel-chrome alloy, depending on resistance value

**Core:** Ceramic, steatite

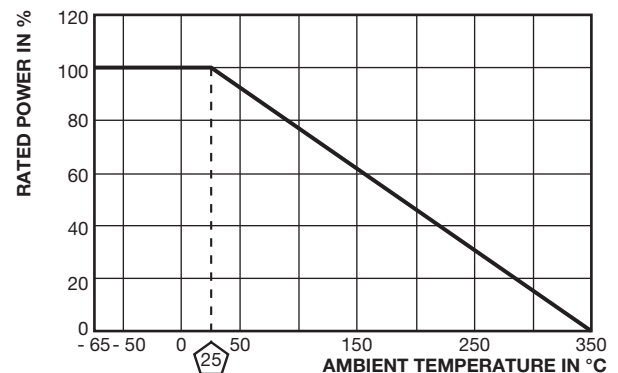
**Coating:** Special high temperature silicone

**Standard Terminals:** Model "E" terminals are tinned Copperweld®

**Terminal Bands:** Steel

**Part Marking:** Dale, model, wattage, value, tolerance, date code

**DERATING**





## Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk and agree to fully indemnify and hold Vishay and its distributors harmless from and against any and all claims, liabilities, expenses and damages arising or resulting in connection with such use or sale, including attorneys fees, even if such claim alleges that Vishay or its distributor was negligent regarding the design or manufacture of the part. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.