

# Wirewound Resistors, Industrial Power, Vitreous Coated, Adjustable Edgewound Tubular



## FEATURES

- High temperature vitreous coating
- Complete welded construction
- Tight tolerance of 5 % for values above 1  $\Omega$
- Excellent stability in operation (< 3 % change in resistance)
- Material categorization:  
for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**  
**GREEN**  
(5-2008)

## STANDARD ELECTRICAL SPECIFICATIONS

| GLOBAL MODEL | HISTORICAL MODEL | POWER RATING<br>$P_{25^\circ\text{C}}$<br>W | RESISTANCE RANGE<br>$\Omega$<br>$\pm 5\%$ | RESISTANCE RANGE<br>$\Omega$<br>$\pm 10\%$ | WEIGHT (typical)<br>g |
|--------------|------------------|---|---|--|-----------------------|
| AVE0050      | AVE-50           | 50  | 1.0 to 3.8                                | 1.0 to 3.8                                 | 18                    |
| AVE0090      | AVE-90           | 90  | 0.10 to 5.7                               | 0.10 to 5.7                                | 36                    |
| AVE0100      | AVE-100          | 100   | 1.0 to 6.1                                | 0.15 to 6.1                                | 41                    |
| AVE0110      | AVE-110          | 110   | 1.0 to 7.4                                | 0.20 to 7.4                                | 49                    |
| AVE0120      | AVE-120          | 120   | 1.0 to 8.6                                | 0.1 to 8.6                                 | 54                    |
| AVE0140      | HLZ-140          | 140   | 0.08 to 9.0                               | 0.08 to 9.0                                | 109                   |
| AVE0155      | AVE-155          | 155   | 1.0 to 12.5                               | 0.1 to 12.5                                | 129                   |
| AVE0165      | HLZ-165          | 165   | 0.35 to 13.0                              | 0.35 to 13.0                               | 91                    |
| AVE0180      | HLZ-165          | 165   | 0.35 to 13.0                              | 0.35 to 13.0                               | 91                    |
| AVE0240      | AVE-240          | 240   | 1.0 to 18                                 | 0.1 to 18                                  | 186                   |
| AVE0300      | AVE-300          | 300   | 1.0 to 25                                 | 0.15 to 25                                 | 236                   |
| AVE0375      | AVE-375          | 375   | 1.0 to 32                                 | 0.20 to 32                                 | 286                   |
| AVE0420      | AVE-420          | 420   | 1.0 to 35.8                               | 0.25 to 35.8                               | 320                   |

## GLOBAL PART NUMBER INFORMATION

Global Part Numbering example: AVE030020E15R0KE92 (visit [www.vishay.net](http://www.vishay.net) SAP parts manual for all options)

**A** **V** **E** **0** **3** **0** **0** **2** **0** **E** **1** **5** **R** **0** **K** **E** **9** **2**

| GLOBAL MODEL<br>(7 digits)   | TERMINAL DESIGNATION<br>(2 digits)  | TERMINAL FINISH<br>(1 digit) | VALUE<br>(4 digits)   | TOLERANCE<br>(1 digit)                        | PACKAGING CODE<br>(1 digit)                  | SPECIAL<br>(up to 2 digits)   |
|--|-------------------------------------|------------------------------|---|---|--|---|
| (see Standard Electrical Specifications Global Model column for options) | <b>06</b><br><b>15</b><br><b>20</b> | <b>E</b> = lead (Pb)-free    | <b>R</b> = decimal<br><b>K</b> = thousand<br><b>1R50</b> = 1.5 $\Omega$<br><b>1K50</b> = 1.5 k $\Omega$ | <b>J</b> = $\pm 5\%$<br><b>K</b> = $\pm 10\%$ | <b>E</b> = lead (Pb)-free cell and bulk pack | (dash number) from <b>1</b> to <b>99</b> as applicable<br><b>91</b> = 100 style horizontal thru-bolt bracket<br><b>92</b> = 200 style push-in bracket<br><b>93</b> = 300 style vertical thru-bolt bracket |

Historical Part Number example: AVE-300-15-10%-BKTS

|                  |                               |             |             |
|------------------|-------------------------------|-------------|-------------|
| <b>AVE-300</b>   | <b>15 <math>\Omega</math></b> | <b>10 %</b> | <b>BKTS</b> |
| HISTORICAL MODEL | RESISTANCE VALUE              | TOLERANCE   | SPECIAL     |

**DIMENSIONS** in inches [millimeters]


| MODEL              | CORE DIMENSIONS    |                             |                             | TERMINAL SETBACK | DISTANCE CENTER TO CENTER (REF.) | TERMINAL DESIGNATION |                          | SLIDER MODEL NUMBER |
|--------------------|--------------------|-----------------------------|-----------------------------|------------------|----------------------------------|----------------------|--------------------------|---------------------|
|                    | LENGTH             | O.D.<br>± 0.031<br>[± 0.79] | I.D.<br>± 0.031<br>[± 0.79] |                  |                                  | STANDARD             | OPTIONAL (QUICK CONNECT) |                     |
| AVE0050            | 2.000<br>[50.8]    | 0.750<br>[19.05]            | 0.500<br>[12.70]            | 0.094<br>[2.18]  | 1.562<br>[39.67]                 | 06                   | 15                       | 71                  |
| AVE0090            | 4.000<br>[101.6]   | 0.563<br>[14.30]            | 0.312<br>[7.95]             | 0.094<br>[2.39]  | 3.562<br>[90.47]                 | 06                   | 15                       | 71                  |
| AVE0100            | 3.500<br>[88.90]   | 0.750<br>[19.05]            | 0.500<br>[12.70]            | 0.079<br>[2.39]  | 3.092<br>[78.54]                 | 06                   | 15                       | 74                  |
| AVE0110            | 4.000<br>[101.6]   | 0.750<br>[19.05]            | 0.500<br>[12.70]            | 0.125<br>[2.01]  | 3.500<br>[88.90]                 | 06                   | 15                       | 74                  |
| AVE0120            | 4.500<br>[114.3]   | 0.750<br>[19.05]            | 0.547<br>[13.89]            | 0.125<br>[3.18]  | 3.400<br>[101.60]                | 06                   | 15                       | 74                  |
| AVE0140            | 4.000<br>[101.6]   | 1.125<br>[28.58]            | 0.750<br>[19.05]            | 0.219<br>[5.56]  | 2.812<br>[71.42]                 | 20                   | 15                       | 74                  |
| AVE0155            | 4.250<br>[107.95]  | 1.125<br>[28.58]            | 0.750<br>[19.05]            | 0.282<br>[7.16]  | 3.311<br>[84.10]                 | 20                   | 15                       | 74                  |
| AVE0165<br>AVE0180 | 6.500<br>[165.1]   | 0.750<br>[19.05]            | 0.750<br>[19.05]            | 0.125<br>[3.18]  | 5.75<br>[146.05]                 | 20                   | 15                       | 74                  |
| AVE0240            | 6.500<br>[165.1]   | 1.125<br>[28.58]            | 0.750<br>[19.05]            | 0.282<br>[7.16]  | 5.625<br>[142.88]                | 20                   | 15                       | 75                  |
| AVE0300            | 8.500<br>[215.9]   | 1.125<br>[28.58]            | 0.750<br>[19.05]            | 0.267<br>[6.78]  | 7.591<br>[192.81]                | 20                   | 15                       | 75                  |
| AVE0375            | 10.500<br>[266.7]  | 1.125<br>[28.58]            | 0.750<br>[19.05]            | 0.266<br>[6.76]  | 9.593<br>[243.66]                | 20                   | 15                       | 75                  |
| AVE0420            | 11.750<br>[298.45] | 1.125<br>[28.58]            | 0.750<br>[19.05]            | 0.266<br>[6.76]  | 10.843<br>[275.41]               | 20                   | 15                       | 76                  |

**TERMINAL DIMENSIONS** in inches [millimeters]

| DIMENSIONS        | TERMINAL STYLE   |                  |                   |
|-------------------|------------------|------------------|-------------------|
|                   | 06               | 15               | 20                |
| A                 | 0.250<br>[6.35]  | 0.250<br>[6.35]  | 0.375<br>[9.53]   |
| B                 | 0.500<br>[12.70] | 0.594<br>[15.08] | 0.5625<br>[14.28] |
| C (HOLE DIAMETER) | 0.173<br>[4.39]  | 0.065<br>[1.65]  | 0.204<br>[5.18]   |
| D                 | 0.020<br>[0.51]  | 0.031<br>[0.79]  | 0.032<br>[0.812]  |

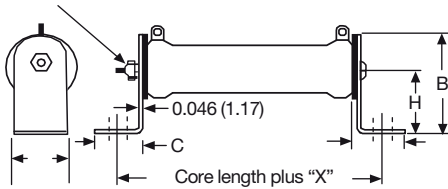

**AVE SLIDERS-DIMENSIONS** in inches [millimeters]

| Hole Dia. | WIDTH | HEIGHT | GLOBAL PART NUMBER <sup>(1)</sup><br>(RoHS COMPLIANT) | GLOBAL MODEL<br>(OF RESISTOR)         | SLIDER MODEL NUMBER | DIMENSIONS    |               |               |
|-----------|-------|--------|---|---------------------------------------|---------------------|---------------|---------------|---------------|
|           |       |        |   |                                       |                     | WIDTH         | HEIGHT        | HOLE DIAMETER |
|           |       |        | 75008603E29   | ASE0050, ASE0090                      | 71                  | 0.250 [6.35]  | 0.719 [18.26] | 0.141 [3.58]  |
|           |       |        | 75025201E29   | ASE0100, ASE0110,<br>ASE0120, ASE0155 | 74                  | 0.312 [7.92]  | 0.891 [22.63] | 0.196 [4.98]  |
|           |       |        | 75025203E29   | ASE0240, ASE0300,<br>ASE0375          | 75                  | 0.500 [12.70] | 0.891 [22.63] | 0.265 [6.73]  |
|           |       |        | 75025206E29   | ASE0420                               | 76                  | 0.312 [7.92]  | 0.891 [22.63] | 0.196 [4.98]  |

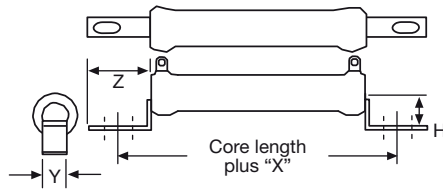
**Note**

<sup>(1)</sup> Order HEI slider with global part number.

**MOUNTING HARDWARE FOR AVE PRODUCTS** - Dimensions in inches (millimeters)

**91 = 100 Style Horizontal 1 High Bracket**


| BRACKET TYPE | X                | Y                | Z                | H                | MOUNTING SLOT                   | C                | B                |
|--------------|------------------|------------------|------------------|------------------|---------------------------------|------------------|------------------|
| 102          | 1.063<br>(26.99) | 0.750<br>(19.05) | 0.859<br>(21.83) | 1.250<br>(31.75) | 0.219 x 0.438<br>(5.56 x 11.11) | 0.750<br>(19.05) | 1.750<br>(44.75) |
| 103          | 1.063<br>(26.99) | 1.250<br>(31.75) | 1.000<br>(25.40) | 1.500<br>(38.10) | 0.281 x 0.563<br>(7.14 x 14.29) | 0.927<br>(23.55) | 2.125<br>(53.98) |

**92 = 200 Style Push-In Bracket**


| BRACKET TYPE | X                | H                | Y                | Z                | HOLE (DIA.)                    |
|--------------|------------------|------------------|------------------|------------------|--------------------------------|
| 204          | 0.700<br>(17.78) | 0.578<br>(14.68) | 0.250<br>(6.35)  | 0.500<br>(12.70) | 0.156<br>(3.96)                |
| 206          | 0.846<br>(21.49) | 0.800<br>(20.62) | 0.375<br>(9.53)  | 0.600<br>(15.24) | 0.343 x 0.213<br>(8.71 x 5.46) |
| 207          | 0.700<br>(17.78) | 1.125<br>(28.58) | 0.500<br>(12.70) | 0.687<br>(17.45) | 0.250 x 0.188<br>(6.35 x 4.78) |

**93 = 300 Style Thru-Bolt Bracket**

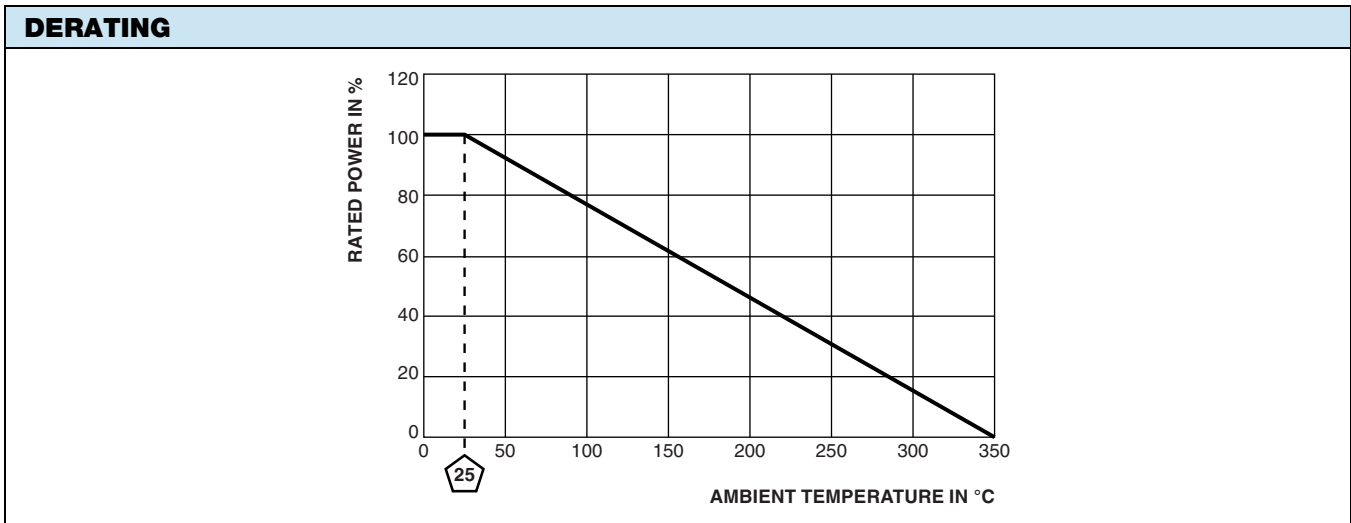

| BRACKET TYPE | X (APPROXIMATE) | THREAD |
|--------------|-----------------|--------|
| 302          | 0.271 (6.88)    | 10-32  |
| 303          | 0.463 (11.76)   | 1/4-20 |

| MOUNTING HARDWARE |  |                                |                                  |
|-------------------|--|--------------------------------|----------------------------------|
| GLOBAL MODEL      | AVAILABLE BRACKET TYPES BY MODEL         |                                |                                  |
|                   | 91 = 100 STYLE HORIZONTAL 1 HIGH BRACKET | 92 = 200 STYLE PUSH-IN BRACKET | 93 = 300 STYLE THRU-BOLT BRACKET |
| AVE0050           | 102                                      | 206                            | 302                              |
| AVE0090           | 102                                      | 204                            | 302                              |
| AVE0100           | 102                                      | 206                            | 302                              |
| AVE0110           | 102                                      | 206                            | 302                              |
| AVE0120           | 102                                      | 206                            | 302                              |
| AVE0140           | 103                                      | 205                            | 303                              |
| AVE0155           | 103                                      | 207                            | 302                              |
| AVE0165           | 102                                      | 206                            | 303                              |
| AVE0180           | 102                                      | 206                            | 303                              |
| AVE0240           | 103                                      | 207                            | 302                              |
| AVE0300           | 103                                      | 207                            | 303                              |
| AVE0375           | 103                                      | 207                            | 303                              |
| AVE0420           | 103                                      | 207                            | 303                              |
| AVE0500           | 103                                      | -                              | 302                              |



| TECHNICAL SPECIFICATIONS               |                   |   |
|--|-------------------|---|
| PARAMETER                              | UNIT              | RESISTOR CHARACTERISTICS  |
| Power Rating                           | W                 | 50 to 420   |
| Resistance Range                       | $\Omega$          | 0.10 to 35.8  |
| Resistance Tolerance                   | %                 | 10  |
| Temperature Coefficient                | ppm/ $^{\circ}$ C | $\pm 260$ for 20 $\Omega$ and above, $\pm 400$ for 1 $\Omega$ to 19.99 $\Omega$         |
| Operating Temperature                  | $^{\circ}$ C      | -55 $^{\circ}$ C to 350 $^{\circ}$ C  |
| Temperature Rise                       | $^{\circ}$ C      | 325 $^{\circ}$ C above an ambient of 25 $^{\circ}$ C                                    |
| Maximum Altitude                       | f.a.s.l.          | 10 000  |
| Short-Term Overload                    | -                 | 10x rated power for 5 s   |
| Surge Windings                         | -                 | Available   |
| Maximum Working Voltage                | -                 | $(P \times R)^{0.5}$  |
| Insulation Resistance                  | $\Omega$          | 1M  |
| Dielectric Voltage                     | V <sub>RMS</sub>  | 1000 V <sub>AC</sub>  |
| Creepage                               | -                 | Varies by wattage, see "Terminal Setback" in Dimensions table                           |
| Terminal Sleeves                       | -                 | n/a   |
| Inductance                             | $\mu$ H           | Varies by wattage and resistance  |
| Non-Inductive Winding                  | -                 | n/a   |
| Terminal Strength                      | lb                | 10 lbs  |
| Electrical or Mechanical Customization | -                 | Contact factory: <a href="mailto:ww2dresistors@vishay.com">ww2dresistors@vishay.com</a> |

| MATERIAL SPECIFICATIONS |   |
|-------------------------|---|
| Element                 | Copper-nickel alloy or nickel-chrome alloy, depending on resistance value |
| Core                    | Cordierite, steatite  |
| Coating                 | Special high temperature vitreous enamel                                  |
| Standard Terminals      | Tinned alloy 42   |
| Optional Terminals      | Alloy 42  |
| Terminal Bands          | Alloy 42  |
| Part Marking            | HEI, model, wattage, value, tolerance, date code                          |





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