

Wirewound Resistors, Industrial Power, Silicone Coated, Fixed Edgewound Tubular



LINKS TO ADDITIONAL RESOURCES



FEATURES

- High temperature silicone coating
- Complete welded construction
- Excellent stability in operation (< 3 % change in resistance)
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE
GREEN
(5-2008)

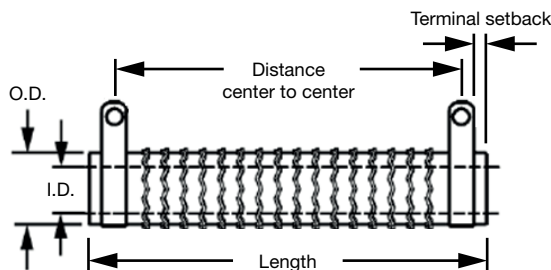
STANDARD ELECTRICAL SPECIFICATIONS

| GLOBAL MODEL | HISTORICAL MODEL | POWER RATING $P_{25^{\circ}\text{C}}$ W | RESISTANCE RANGE Ω $\pm 5\%$ | RESISTANCE RANGE Ω $\pm 10\%$ | WEIGHT (typical) g |
|--------------|------------------|---|---|--|--------------------------|
| FSE0050 | FSE-50 | 50 | 1.0 to 3.8 | 1.0 to 3.8 | 18 |
| FSE0090 | FSE-90 | 90 | 0.10 to 5.7 | 0.10 to 5.7 | 36 |
| FSE0100 | FSE-100 | 100 | 1.0 to 6.1 | 0.15 to 6.1 | 41 |
| FSE0110 | FSE-110 | 110 | 1.0 to 7.4 | 0.20 to 7.4 | 49 |
| FSE0120 | FSE-120 | 120 | 1.0 to 8.6 | 0.1 to 8.6 | 54 |
| FSE0140 | HLZ-140 | 140 | 0.08 to 9.0 | 0.08 to 9.0 | 109 |
| FSE0155 | FSE-155 | 155 | 1.0 to 12.5 | 0.1 to 12.5 | 129 |
| FSE0165 | HLZ-165 | 165 | 0.35 to 13.0 | 0.35 to 13.0 | 91 |
| FSE0180 | HLZ-165 | 165 | 0.35 to 13.0 | 0.35 to 13.0 | 91 |
| FSE0240 | FSE-240 | 240 | 1.0 to 18 | 0.1 to 18 | 186 |
| FSE0300 | FSE-300 | 300 | 1.0 to 25 | 0.15 to 25 | 236 |
| FSE0375 | FSE-375 | 375 | 1.0 to 32 | 0.20 to 32 | 286 |
| FSE0420 | FSE-420 | 420 | 1.0 to 35.8 | 0.25 to 35.8 | 320 |
| FSE0500 | FSE-500 | 500 | 1.0 to 46.2 | 0.30 to 46.2 | 381 |
| FSE0750 | FSE-750 | 750 | 1.0 to 81.3 | 0.35 to 81.3 | 654 |
| FSE1000 | FSE-1000 | 1000 | 1.0 to 101.6 | 0.40 to 101.6 | 817 |
| FSE1500 | FSE-1500 | 1500 | 1.0 to 135.5 | 0.25 to 135.5 | 1090 |

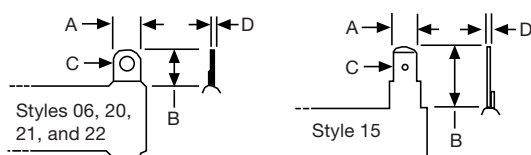
GLOBAL PART NUMBER INFORMATION

Global Part Numbering Example: FSE050021E15R0JE (visit www.vishay.net Vishay Dale parts numbering manual for all options)

| | | | | | | | | | | | | | | | | | |
|--|---|------------------------------------|---|------------------------------|-----------------------------|---|-------------------------|-----------|------------------------------|---|---|---------|---|---|---|--|--|
| F | S | E | 0 | 5 | 0 | 0 | 2 | 1 | E | 1 | 5 | R | 0 | J | E | | |
| GLOBAL MODEL (7 digits) | | TERMINAL DESIGNATION (2 digits) | | TERMINAL FINISH (1 digit) | VALUE (4 digits) | | TOLERANCE (1 digit) | | PACKAGING CODE (1 digit) | | SPECIAL (up to 2 digits) | | | | | | |
| (see Standard Electrical Specifications Global Model column for options) | | 06 15 20 21 22 | | E = lead (Pb)-free | R = decimal 1R50 = 1.5 Ω | | J = ± 5 % K = ± 10 % | | E = lead (Pb)-free bulk pack | | (dash number) from 1 to 99 as applicable 91 = 100 style BKT 92 = 200 style BKT 93 = 300 style BKT CT = center tap | | | | | | |
| Historical Part Number Example: FSE-500-15-5 % | | | | | | | | | | | | | | | | | |
| FSE-500 | | | | 15 Ω | | | | 5 % | | | | | | | | | |
| HISTORICAL MODEL | | | | RESISTANCE VALUE | | | | TOLERANCE | | | | SPECIAL | | | | | |

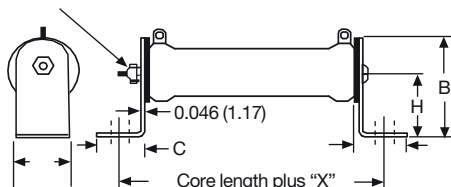
DIMENSIONS in inches (millimeters)


| MODEL | CORE DIMENSIONS | | | TERMINAL SETBACK | DISTANCE CENTER TO CENTER STANDARD TERMINAL (REF.) | DISTANCE CENTER TO CENTER QUICK CONNECT TERMINAL (REF.) | TERMINAL DESIGNATION | |
|--------------------|---|---------------------------------------|---------------------------------------|------------------|--|---|----------------------|--------------------------|
| | LENGTH ± 0.062 (± 1.57) | O.D. ± 0.031 (± 0.79) | I.D. ± 0.031 (± 0.79) | | | | STANDARD | OPTIONAL (QUICK CONNECT) |
| FSE0050 | 2.000 (50.8) | 0.750 (19.05) | 0.500 (12.7) | 0.094 (2.39) | 1.562 (39.67) | 1.500 (38.1) | 06 | 15 |
| FSE0090 | 4.000 (101.6) | 0.562 (14.27) | 0.312 (7.92) | 0.094 (2.39) | 3.562 (90.47) | 3.500 (88.9) | 06 | 15 |
| FSE0100 | 3.500 (88.9) | 0.750 (19.05) | 0.500 (12.7) | 0.079 (2.01) | 3.092 (78.54) | 3.030 (76.96) | 06 | 15 |
| FSE0110 | 4.000 (101.6) | 0.750 (19.05) | 0.500 (12.7) | 0.125 (3.18) | 3.500 (88.9) | 3.438 (87.33) | 06 | 15 |
| FSE0120 | 4.500 (114.3) | 0.750 (19.05) | 0.546 (13.87) | 0.125 (3.18) | 4.000 (101.6) | 3.938 (100.03) | 06 | 15 |
| FSE0140 | 4.000 (101.6) | 1.125 (28.58) | 0.750 (19.05) | 0.219 (5.56) | 3.187 (80.95) | 3.250 (82.55) | 20 | 15 |
| FSE0155 | 4.250 (107.95) | 1.125 (28.58) | 0.750 (19.05) | 0.282 (7.16) | 3.311 (84.1) | 3.374 (85.7) | 20 | 15 |
| FSE0165 ASE0180 | 6.500 (165.1) | 0.750 (19.05) | 0.500 (12.7) | 0.125 (3.18) | 5.875 (149.23) | 5.938 (150.83) | 20 | 15 |
| FSE0240 | 6.500 (165.1) | 1.125 (28.58) | 0.750 (19.05) | 0.250 (6.35) | 5.625 (142.88) | 5.688 (144.48) | 20 | 15 |
| FSE0300 | 8.500 (215.9) | 1.125 (28.58) | 0.750 (19.05) | 0.267 (6.78) | 7.591 (192.81) | 7.654 (194.41) | 20 | 15 |
| FSE0375 | 10.500 (266.7) | 1.125 (28.58) | 0.750 (19.05) | 0.267 (6.78) | 9.591 (243.61) | 9.654 (245.21) | 20 | 15 |
| FSE0420 | 11.750 (298.45) | 1.125 (28.58) | 0.750 (19.05) | 0.267 (6.78) | 10.841 (275.36) | 10.466 (265.84) | 20 | 15 |
| FSE0500 | 10.500 (266.7) | 1.625 (41.28) | 1.125 (28.58) | 0.267 (6.78) | 8.948 (227.28) | - | 21 | - |
| FSE0750 | 12.000 (304.8) | 2.500 (63.5) | 1.750 (44.45) | 0.508 (12.9) | 10.484 (266.29) | - | 22 | - |
| FSE1000 | 15.000 (381) | 2.500 (63.5) | 1.750 (44.45) | 0.508 (12.9) | 13.484 (342.49) | - | 22 | - |
| FSE1500 | 20.000 (508) | 2.500 (63.5) | 1.750 (44.45) | 0.508 (12.9) | 18.484 (469.49) | - | 22 | - |

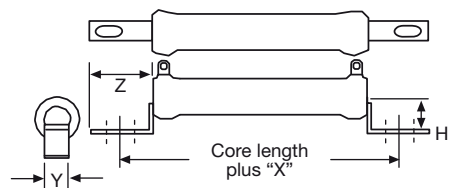
TERMINAL DIMENSIONS in inches (millimeters)


| DIMENSIONS | TERMINAL STYLE | | | | |
|----------------------|------------------|------------------|-------------------|------------------|------------------|
| | 06 | 15 | 20 | 21 | 22 |
| A | 0.250 (6.35) | 0.250 (6.35) | 0.375 (9.53) | 0.500 (12.70) | 0.500 (12.70) |
| B | 0.500 (12.70) | 0.594 (15.08) | 0.5625 (14.28) | 0.625 (15.87) | 0.925 (23.49) |
| C (HOLE DIAMETER) | 0.173 (4.39) | 0.065 (1.65) | 0.204 (5.18) | 0.264 (6.70) | 0.264 (6.70) |
| D | 0.020 (0.51) | 0.031 (0.79) | 0.032 (0.812) | 0.025 (0.64) | 0.025 (0.64) |

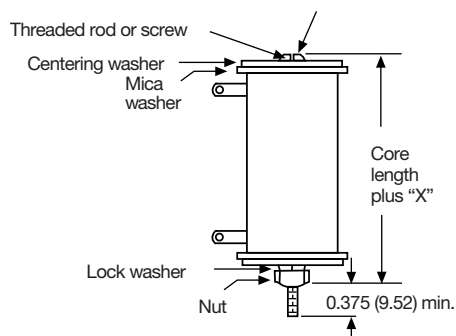
MOUNTING HARDWARE FOR FSE PRODUCTS - Dimensions in inches (millimeters)

91 = 100 Style Horizontal 1 High Bracket


| BRACKET TYPE | X | Y | Z | H | MOUNTING SLOT | C | B |
|--------------|------------------|------------------|------------------|------------------|---------------------------------|------------------|-------------------|
| 102 | 1.063 (27) | 0.750 (19.05) | 0.859 (21.82) | 1.250 (31.75) | 0.219 x 0.438 (5.56 x 11.13) | 0.750 (19.05) | 1.750 (44.45) |
| 103 | 1.063 (27) | 1.250 (31.75) | 1.000 (25.40) | 1.500 (38.10) | 0.281 x 0.563 (7.14 x 14.30) | 0.927 (23.55) | 2.125 (53.98) |
| 104 | 1.952 (49.58) | 2.500 (63.50) | 1.478 (37.54) | 3.000 (76.20) | Open slot x 0.406 (10.31) | 1.375 (34.93) | 4.250 (107.95) |

92 = 200 Style Push-In Bracket


| BRACKET TYPE | X | H | Y | Z | HOLE (DIA.) |
|--------------|------------------|------------------|------------------|------------------|--------------------------------|
| 204 | 0.700 (17.78) | 0.578 (14.68) | 0.250 (6.35) | 0.500 (12.70) | 0.156 (3.96) |
| 206 | 0.846 (21.49) | 0.800 (20.32) | 0.375 (9.53) | 0.600 (15.24) | 0.343 x 0.213 (8.71 x 5.41) |
| 207 | 0.700 (17.78) | 1.125 (28.58) | 0.500 (12.70) | 0.687 (17.45) | 0.250 x 0.188 (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

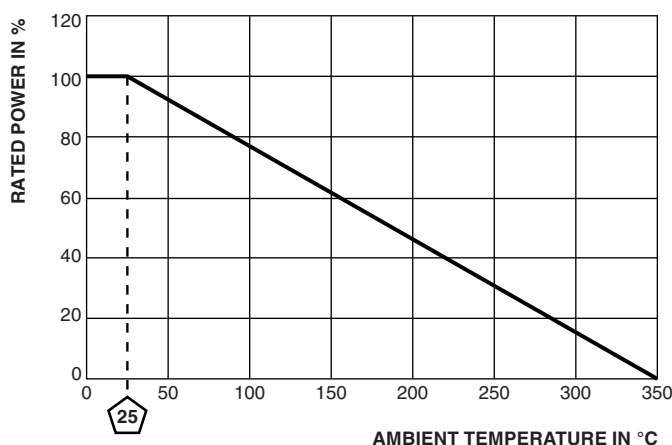
| GLOBAL MODEL | AVAILABLE BRACKET TYPES BY MODEL | | |
|--------------|--|--------------------------------|----------------------------------|
| | 91 = 100 STYLE HORIZONTAL 1 HIGH BRACKET | 92 = 200 STYLE PUSH-IN BRACKET | 93 = 300 STYLE THRU-BOLT BRACKET |
| FSE0050 | 102 | 206 | 302 |
| FSE0090 | 102 | 204 | 302 |
| FSE0100 | 102 | 206 | 302 |
| FSE0110 | 102 | 206 | 302 |
| FSE0120 | 102 | 206 | 302 |
| FSE0140 | 103 | 205 | 303 |
| FSE0155 | 103 | 207 | 302 |
| FSE0165 | 102 | 206 | 303 |
| FSE0180 | 102 | 206 | 303 |
| FSE0240 | 103 | 207 | 302 |
| FSE0300 | 103 | 207 | 303 |
| FSE0375 | 103 | 207 | 303 |
| FSE0420 | 103 | 207 | 303 |
| FSE0500 | 103 | - | 302 |
| FSE0750 | 104 | - | 303 |
| FSE1000 | 104 | - | 303 |
| FSE1500 | 104 | - | 303 |

**TECHNICAL SPECIFICATIONS**

| PARAMETER | UNIT | RESISTOR CHARACTERISTICS |
|--|------------------|---|
| Power Rating | W | 50 to 1500 |
| Resistance Range | Ω | 0.10 to 135.5 |
| Resistance Tolerance | % | 5, 10 |
| Temperature Coefficient | ppm/°C | ± 260 for 20 Ω and above, ± 400 for 1 Ω to 19.99 Ω |
| Operating Temperature | °C | -55 °C to 350 °C |
| Temperature Rise | °C | 325 °C above an ambient of 25 °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 | Ω | 1M |
| Dielectric Voltage | V _{RMS} | 1000 V _{AC} from terminal to mounting hardware |
| Creepage | - | Varies by wattage, see "Terminal Setback" in Dimensions table |
| Terminal Sleeves | - | n/a |
| Inductance | μ H | Varies by wattage and resistance |
| Non-Inductive Winding | - | n/a |
| Terminal Strength | lb | 10 lbs |
| Electrical or Mechanical Customization | - | Contact factory: ww2dresistors@vishay.com |

MATERIAL SPECIFICATIONS

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

DERATING



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