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DIRECT

Electronics Tech.

(DRE)

High current Round Edge wound Resistors

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► Product Introduction

Direct coiling customer special round edge wound resistors fit renewable energy, load banks, dynamic braking, and inverters design

Features :

- Power Current from 5.1(A) to 105(A)
- Resistance nominal tolerance $\pm 10\%$ (K)
- Resistance value range 0.08Ω to $42.1\#937$;
- suitable for high current applications

Applications :

- Power Industrial Machinery Resistors.
- Dynamic Braking Resistors, Load Banks, Motor Starting Resistor.
- Plugging Resistor, Electric Distribution Resistors.
- Wind Turbines, Harmonic Filters.

Direct (DRE) Round Edge wound Resistor is a versatile, heavy-duty unit with lightweight construction, consisting of a non-corrodible, high quality stainless steel alloy. This tough resistor is appropriate for the following applications: VFD braking, motor control, load banks and neutral grounding applications.



(DRE) resistor includes through-rods, through-bars, fixed terminals, hardware and stainless steel element. It is supported by a mounting bar which is slotted at both ends. Fixed terminations are made by welding stainless steel tabs to either end of the element, or at various points for multiple connections. The ribbon-like element is coiled on edge in the form of a helix, and then spun onto a porcelain core which a threaded rod passing through the center of the ceramic core.

Direct (DRE) series is also available in many mounting configurations such as stud mount version, universal edge wound, mounting bracket options of Vishay, or Ohmite. Many standard hardware options allow resistors to be purchased fully assembled, allowing easy integration into the final assembly. Assemblies are wired in parallel or in series to meet the needs of the application. Terminal blocks and thermal switches are also available.

Value-add wiring and connectors allow for a "plug-and-play" solution that easily integrates into the final assembly. Custom resistors are designed to order by our engineers and can be customized to fit unique electrical and mechanical constraints.

For more dynamic braking resistors, please link to Direct official website "[High Power Resistors](#)" to get more information. Or contact us with your specific needs.

Customer special design options:

- Mechanical: Overall dimensions, mounting type, and configuration, insulation.
- Connection: Wire leads, connectors, terminal type, size, set-in, and material.
- Electrical: Tolerance, wattage, resistance, dielectric withstanding voltage, surge ability, temperature coefficient.



DRE-P

Round Edge wound Standard Dimensions (DRE-P)

High power (DRE) series edge power resistors are constructed by coiling a resistance-alloy ribbon wire and winding it on edge over specially designed ceramic insulators. The porcelain insulators separate coils of the resistance elements from each other and the frame. The advantage is an open coil construction is to easily accommodate surges and overloads that allow efficient heat dissipation.

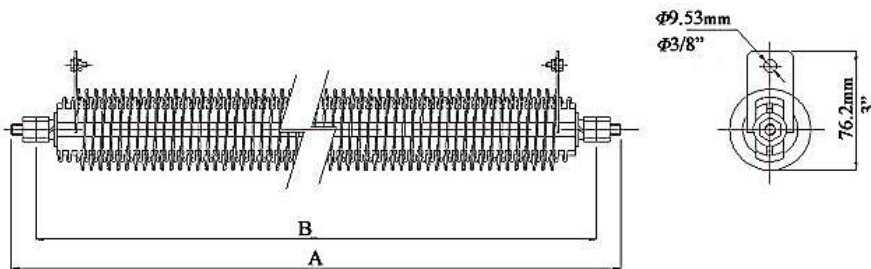
Round Edge wound Construction:

- Insulators provide insulation from threaded stud mount and proper turn-to-turn spacing.
- A sturdy welded steel frame supports the refractory insulators and finished with a zinc chromate conversion for corrosion resistance.
- The resistance element is a stainless steel strip with negligible temperature coefficient and anti-corrosion features, used for its current carrying capacity vs Ohms per length.
- The resistance element is designed by edgewinding a stainless strip into a continuous coil of the proper scaling length.
- Zinc plated terminals are welded to the resistive wire for a reliable electrical connection.

| Length Code | 2 | | 3 | | 4 | | 5 | | 6 | | 7 | | 8 | | 9 | |
|-------------|-------|------|--------|-------|-------|------|--------|-------|--------|-------|--------|-------|-----|------|-------|------|
| Dimensions | mm | inch | mm | inch | mm | inch | mm | inch | mm | inch | mm | inch | mm | inch | mm | inch |
| A | 228.6 | 9 | 285.75 | 11.25 | 381 | 15 | 438.15 | 17.25 | 615.95 | 24.25 | 615.95 | 24.25 | 762 | 30 | 838.2 | 33 |
| B | 177.8 | 7 | 254.0 | 10 | 330.2 | 13 | 406.4 | 16 | 457.2 | 18 | 558.8 | 22 | 635 | 25 | 711.2 | 28 |



Round Edgewound Resistor (DRE-P)



Round Edgewound Standard Dimensions (DRE-P)



Edge wound Electrical Ratings (DRE-P)

| Length Code | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|-----------------|---|------|------|------|------|------|------|------|
| Amps (A) | Resistance (Ω) at 25°C, Resistance Tolerance (10%) | | | | | | | |
| 11 | 2.3 | 3.7 | 5.1 | 6.5 | 7.9 | 9.3 | 10.7 | 12.0 |
| 12 | 1.9 | 3.1 | 4.3 | 5.4 | 6.6 | 7.8 | 8.9 | 10.0 |
| 18 | 1.1 | 1.7 | 2.4 | 3.0 | 3.6 | 4.3 | 4.9 | 5.5 |
| 21 | 0.79 | 1.26 | 1.73 | 2.2 | 2.67 | 3.14 | 3.6 | 4.1 |
| 24 | 0.62 | 1.0 | 1.4 | 1.75 | 2.1 | 2.5 | 2.87 | 3.2 |
| 27 | 0.50 | 0.80 | 1.1 | 1.4 | 1.7 | 2.0 | 2.3 | 2.6 |
| 29 | 0.44 | 0.70 | 0.96 | 1.2 | 1.5 | 1.7 | 1.95 | 2.2 |
| 35 | 0.31 | 0.50 | 0.69 | 0.88 | 1.1 | 1.3 | 1.5 | 1.7 |
| 40 | 0.24 | 0.39 | 0.54 | 0.68 | 0.83 | 0.97 | 1.12 | 1.3 |
| 45 | 0.22 | 0.35 | 0.46 | 0.61 | 0.74 | 0.87 | 1.0 | 1.1 |
| 50 | 0.17 | 0.27 | 0.37 | 0.47 | 0.57 | 0.67 | 0.77 | 0.87 |
| 60 | - | 0.20 | 0.27 | 0.33 | 0.40 | 0.47 | 0.58 | 0.65 |
| 70 | - | 0.15 | 0.20 | 0.25 | 0.30 | 0.35 | 0.40 | 0.45 |
| 85 | - | 0.12 | 0.15 | 0.18 | 0.23 | 0.27 | 0.31 | 0.35 |
| 105 | - | 0.09 | 0.12 | 0.15 | 0.18 | 0.21 | 0.24 | 0.27 |

- The continuous current ratings are based on a 375°C temperature rise.
- The resistance values are measured at 25°C and have a $\pm 10\%$ tolerance.



DRE-G

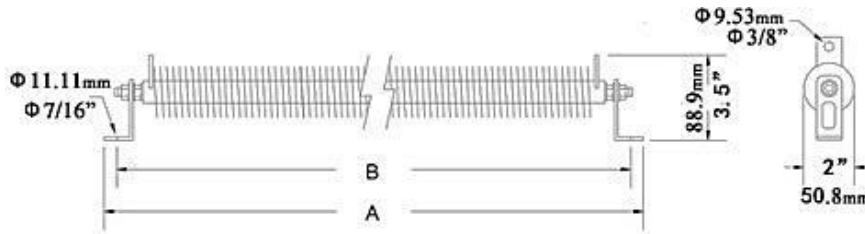
Round Edge wound Bracket Assembly Options Dimensions (DRE-G)

Fully assembled on open-style brackets are available in Direct (DRE-G) Edge wound Resistor series. Mill galvanized brackets complete with all hardware and stainless steel bus bars with this open-style construction consist of resistors installed.

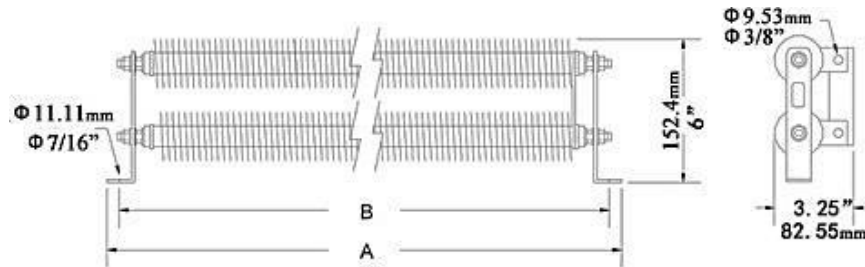
| Length Code | 2 | | 3 | | 4 | | 5 | | 6 | | 7 | | 8 | | 9 | |
|-------------|-------|------|-------|------|-------|------|-------|------|-------|------|-------|------|-------|------|-------|------|
| Dimensions | mm | inch | mm | inch | mm | inch | mm | inch | mm | inch | mm | inch | mm | inch | mm | inch |
| A | 228.6 | 9 | 304.8 | 12 | 381 | 15 | 457.2 | 18 | 508 | 20 | 609.6 | 24 | 685.8 | 27 | 762 | 30 |
| B | 203.2 | 8 | 579.4 | 11 | 355.6 | 14 | 431.8 | 17 | 482.6 | 19 | 584.2 | 23 | 660.4 | 26 | 736.6 | 29 |



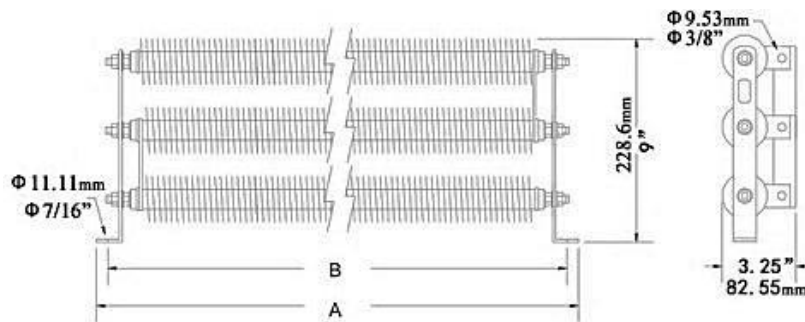
Round Edgewound Resistor (DRE-G)



Bracket Assembly Options Dimensions (DRE-G1)



Bracket Assembly Options Dimensions (DRE-G2)



Bracket Assembly Options Dimensions (DRE-G3)

● Standard assemblies of 2 or more coils include series jumpers. Add "-N" to eliminate jumpers and "-P" for parallel jumpers.



Edgewound Electrical Ratings (DRE-G)

| Length Code | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|-----------------|---|------|------|------|------|------|------|------|
| Amps (A) | Resistance (Ω) at 25°C, Resistance Tolerance (10%) | | | | | | | |
| 11 | 2.3 | 3.7 | 5.1 | 6.5 | 7.9 | 9.3 | 10.7 | 12.0 |
| 12 | 1.9 | 3.1 | 4.3 | 5.4 | 6.6 | 7.8 | 8.9 | 10.0 |
| 18 | 1.1 | 1.7 | 2.4 | 3.0 | 3.6 | 4.3 | 4.9 | 5.5 |
| 21 | 0.79 | 1.26 | 1.73 | 2.2 | 2.67 | 3.14 | 3.6 | 4.1 |
| 24 | 0.62 | 1.0 | 1.4 | 1.75 | 2.1 | 2.5 | 2.87 | 3.2 |
| 27 | 0.50 | 0.80 | 1.1 | 1.4 | 1.7 | 2.0 | 2.3 | 2.6 |
| 29 | 0.44 | 0.70 | 0.96 | 1.2 | 1.5 | 1.7 | 1.95 | 2.2 |
| 35 | 0.31 | 0.50 | 0.69 | 0.88 | 1.1 | 1.3 | 1.5 | 1.7 |
| 40 | 0.24 | 0.39 | 0.54 | 0.68 | 0.83 | 0.97 | 1.12 | 1.3 |
| 45 | 0.22 | 0.35 | 0.46 | 0.61 | 0.74 | 0.87 | 1.0 | 1.1 |
| 50 | 0.17 | 0.27 | 0.37 | 0.47 | 0.57 | 0.67 | 0.77 | 0.87 |
| 60 | - | 0.20 | 0.27 | 0.33 | 0.40 | 0.47 | 0.58 | 0.65 |
| 70 | - | 0.15 | 0.20 | 0.25 | 0.30 | 0.35 | 0.40 | 0.45 |
| 85 | - | 0.12 | 0.15 | 0.18 | 0.23 | 0.27 | 0.31 | 0.35 |
| 105 | - | 0.09 | 0.12 | 0.15 | 0.18 | 0.21 | 0.24 | 0.27 |

- The continuous current ratings are based on a 375°C temperature rise.
- Power: varies. •Tolerance: ± 10 %.



DRE-R

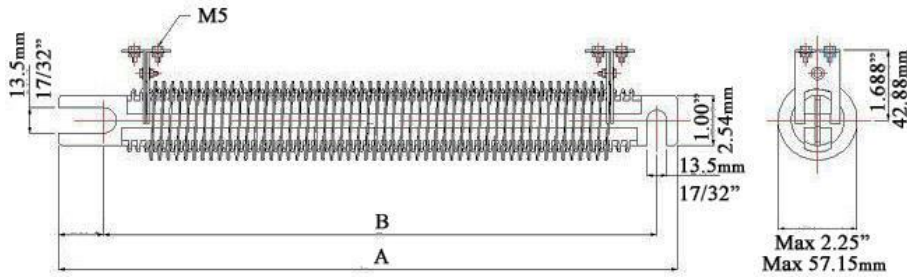
Bar-Mount Edge wound Dimensions (DRE-R)

Direct (DRE-R) bar-mounted edge wounds are existing with the same electrical ratings as the Type (DRE-G) edge wounds. All units have the same approximate diameter of 2 inches (50.8mm). Units are equipped with through-bar and terminal hardware.

| Length Code | 2 | | 3 | | 4 | | 5 | | 6 | | 7 | | 8 | |
|-------------|--------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Dimensions | mm | inch | mm | inch | mm | inch | mm | inch | mm | inch | mm | inch | mm | inch |
| A | 225.43 | 8.875 | 301.63 | 11.875 | 377.83 | 14.875 | 454.03 | 17.875 | 530.23 | 20.875 | 606.43 | 23.875 | 682.63 | 26.875 |
| B | 184.15 | 7.25 | 260.35 | 10.25 | 336.55 | 13.25 | 412.75 | 16.25 | 488.95 | 19.25 | 565.15 | 22.25 | 641.35 | 25.256 |



Bar-Mount Edgewound Resistor (DRE-R)



Bar-Mount Edgewound Dimensions (DRE-R)



Bar-Mount Edgewound Resistor Custom Type

Edgewound Electrical Ratings (DRE-R)

| Length Code | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-----------------|---|-------|------|------|------|------|------|
| Amps (A) | Resistance (Ω) at 25°C, Resistance Tolerance (10%) | | | | | | |
| 5.1 | 7.9 | 13.6 | 19.3 | 25.0 | 30.7 | 36.4 | 42.1 |
| 5.9 | 6.3 | 10.9 | 15.4 | 20.0 | 24.5 | 29.0 | 33.5 |
| 6.6 | 5.3 | 9.2 | 13.0 | 17.0 | 20.8 | 24.6 | 28.4 |
| 7.6 | 4.1 | 7.1 | 10.0 | 13.0 | 15.9 | 18.8 | 21.7 |
| 8.3 | 3.4 | 5.9 | 8.5 | 11.0 | 13.5 | 16.0 | 18.5 |
| 9.4 | 2.70 | 4.60 | 6.50 | 8.50 | 10.4 | 12.3 | 14.2 |
| 10.3 | 2.10 | 3.70 | 6.30 | 6.80 | 8.30 | 9.80 | 11.3 |
| 11.8 | 1.70 | 2.90 | 4.20 | 5.40 | 6.60 | 7.80 | 9.00 |
| 12.7 | 1.40 | 2.40 | 3.50 | 4.50 | 5.50 | 6.50 | 7.50 |
| 14.6 | 1.10 | 1.90 | 2.70 | 3.50 | 4.30 | 5.10 | 5.90 |
| 16.3 | 0.88 | 1.50 | 2.20 | 2.80 | 3.40 | 4.00 | 4.60 |
| 18.4 | 0.69 | 1.20 | 1.70 | 2.20 | 2.70 | 3.10 | 3.50 |
| 26 | 0.56 | 0.90 | 1.20 | 1.60 | 1.90 | 2.20 | 2.50 |
| 29 | 0.45 | 0.73 | 1.00 | 1.30 | 1.50 | 1.75 | 2.00 |
| 33 | 0.35 | 0.56 | 0.77 | 1.00 | 1.20 | 1.40 | 1.60 |
| 39 | 0.26 | 0.42 | 0.58 | 0.75 | 0.90 | 1.05 | 1.20 |
| 41 | 0.23 | 0.36 | 0.51 | 0.67 | 0.80 | 0.93 | 1.06 |
| 43 | 0.21 | 0.33 | 0.46 | 0.60 | 0.72 | 0.85 | 0.98 |
| 47 | 0.17 | 0.28 | 0.38 | 0.50 | 0.60 | 0.70 | 0.80 |
| 50 | 0.12 | 0.20 | 0.28 | 0.37 | 0.45 | 0.53 | 0.61 |
| 54 | 0.11 | 0.18 | 0.25 | 0.33 | 0.40 | 0.47 | 0.54 |
| 57 | 0.10 | 0.16 | 0.23 | 0.30 | 0.36 | 0.42 | 0.48 |
| 63 | 0.80 | 0.13 | 0.19 | 0.25 | 0.30 | 0.35 | 0.40 |
| 68 | 0.07 | 0.12 | 0.18 | 0.22 | 0.26 | 0.30 | 0.34 |
| 75 | 0.06 | 0.10 | 0.14 | 0.18 | 0.21 | 0.25 | 0.30 |
| 78 | 0.052 | 0.088 | 0.12 | 0.16 | 0.16 | 0.22 | 0.25 |
| 89 | 0.046 | 0.078 | 0.11 | 0.14 | 0.17 | 0.20 | 0.23 |
| 91 | 0.040 | 0.070 | 0.10 | 0.12 | 0.14 | 0.16 | 0.18 |
| 100 | 0.033 | 0.057 | 0.08 | 0.10 | 0.12 | 0.14 | 0.16 |

- The rating of continuous current (Amps) is based on a 375°C temperature rise.
- Power: varies. •Tolerance: $\pm 10\%$.



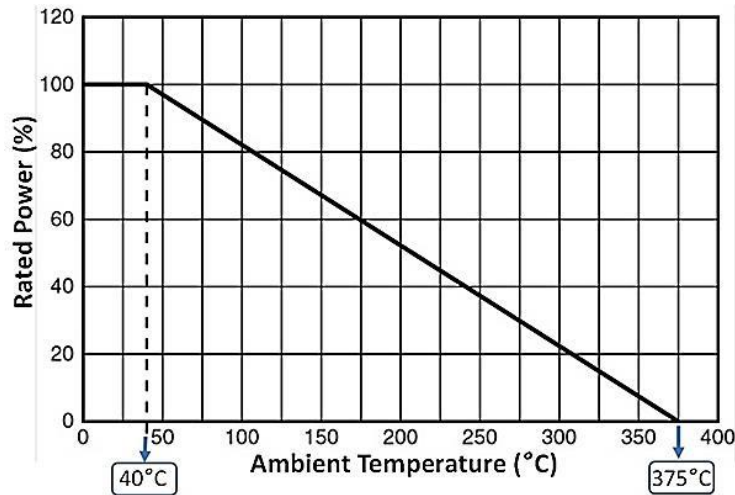
► Electrical Characteristics

Electrical Characteristics (DRE)

| Test Item | Specification | Test Methods |
|--|---|--|
| Ambient Temperatures | Ambient Temperature: -55°C ~350°C. Derated current rating: 95% for 50°C ambient, 90% for 75°C ambient, 85% for 100°C ambient, 10% for 350°C ambient. | Standard ratings are based on maximum ambient temperatures of 40°C. |
| Continuous current ratings and temperatures Rise | 375°C Max. | The rating of continuous current is based on a 375°C temperature rise at ambient temperatures of 40°C. |
| Resistance tolerance | Resistance Nominal Tolerance ±10%(K) for all units; as low as ±3% if required. | JIS-C-5202 5-1 |
| Thermal Shock | $\Delta \leq \pm(2\%R + 0.1\Omega)$ | JIS-C-5202 7.3, Room temp 30 minutes, -55°C 15 minutes. |
| Terminal strength | $\Delta \leq \pm(2\%R + 0.1\Omega)$ | JIS-C-5202 6.1, 45N, 30S |
| Short-term Overload | $\Delta \leq \pm(2\%R + 0.1\Omega)$ | JIS-C-5202 5.5, 10PR, 5S. |

- Resistance and resistance tolerance were tested in-house at room temperature (25°C) with micro resistance meter.
- Ambient Temperature: refers to the temperature inside the subject and around the specimen, not to the air-temperature outside the subject.

Edge wound Derating Curve (DRE)



Edge wound Derating Curve (DRE)



Order Codes

Order Codes (DRE)

| DRE | 2 | 11 | 2R3 | | K | | G | |
|-------------|-------------|----------|------------------|-------|--------------------------|------|------------------|--|
| Part Number | Length Code | Amps (A) | Resistance Value | | Resistance Tolerance (%) | | Mounting Options | |
| DRE | 2 | 11 | 2R3 | 2.3Ω | K | ±10% | P | Standard |
| | 3 | 12 | R62 | 0.62Ω | | | R | Bar-Mount |
| | 4 | 18 | R37 | 0.37Ω | | | G1 | Standard Bracket |
| | 5 | 21 | | | | | G2 | Bracket (Series Jumper included for 2 or more Standard Assembly) |
| | 6 | 24 | | | | | G3 | Bracket (Series Jumper included for 2 or more Standard Assembly) |
| | 7 | 27 | | | | | G2P | Parallel Jumper (2 or more Assembly) |
| | 8 | 29 | | | | | G3P | Parallel Jumper (2 or more Assembly) |
| | 9 | 35 | | | | | G2N | No Jumper (2 or more Assembly) |
| | ... | ... | | | | | G3N | No Jumper (2 or more Assembly) |

► General Information

Benefits & Features

Providing design engineers with an economical resistor with high quality performance, Direct Electronics offers industry grade power wire wound devices.

Direct provide terminal blocks, thermal switches, fusing, fans, junction boxes, screened or solid bottom plates, conduit knockouts, and customer specified requirements. For large applications a welded frame construction is utilized to provide a robust design for power resistor mounting in both indoor and outdoor environments.

Products range from large capacity metal clad, nonflammable fixed and adjustable, wave ribbon wire-wound, slide, starter, box type, to nonflammable flat type. Direct extends a complete line for both military and commercial applications.

Utilization Notes

1. Smoke emitted from non-flammable resistors on initial use in powered circuits is a normal phenomenon and the component can be safely utilized.
2. All resistors manufactured by Direct Electronics Industry Corporation comply with the U.S. UL-94 non- flammability test, Class V-0, a continuous combustion period of zero seconds.
3. Never use organic solvents to clean non-flammable resistors.
4. Non-flammable resistors cannot be utilized in oil.
5. Non-flammable resistors cannot be used in high frequency machinery because of the inductance produced by the windings. A suitable type of resistor must be selected. Contact us for details.
6. In applications where resistors are subject to intermittent current surges and spikes, be sure in advance that the components selected are capable of withstanding brief durations of increased load.
7. Do not exceed the recommended usable load. Resistors must use within the rated voltage range to prevent the shortening of service life and/or failure of the wound resistance elements.
8. Minimum load. Resistors must be utilized at 1/10 or more of the rated voltage to prevent poor conductance due to oxidation build-up.
9. Although the hardness exceeds that of a 3H pencil lead, do not nick the resistor coating with screw drivers or other pointed objects.
10. Avoid touching non-flammable resistors in operation; the surface temperature ranges from approximately 350°C ~ 400°C when utilized at the full rated value. Maintaining a surface temperature of 200°C or less will extend resistor service life.
11. Keep temperature from rising by choosing a resistor with a higher rated capacity; do not use a component having the exact load value required. For considerations of safety in extended period applications, the resistor rating should be more than four times higher than the actual wattage involved, but never use a resistor at less than 25% of its rated power.
12. Application and Placement: Wire-wound resistors use different gauges of wire as resistance elements. Sometimes the gauge is extremely thin (finer than a strand of human hair) and very susceptible to breakage in environments containing salts, ash, dust and corrosives. Avoid utilization in such environments. Do not install in dusty areas because the accumulation will cause shorts and poor conductance.

