

# Type VR Ventwound Resistors - 2.5 to 16.7 Amps

## APPLICATION

Powerohm's Type VR Ventwound Resistors can be used for any AC or DC power application. Units are most commonly used for braking of variable frequency drives, motor control, load banks and neutral grounding applications.

The Type VR resistors are suitable for continuous duty applications where low current and relatively high resistance are required. These units are designed to withstand continuous current ratings between 2.5 and 16.7 amps, and resistance values ranging between 170.0 and 1.0 ohms, respectively. Units have a rated temperature rise of 375°C above ambient temperature, which is in accordance with NEMA standards.

## BASIC CONSTRUCTION

Powerohm's Type VR resistors are lightweight, durable units consisting of a high quality stainless steel alloy wound around a toothed ceramic insulator. The element is attached at either end of the core by stainless steel terminals, or at various points for multiple connections. All resistors are supported by a threaded rod passing through the center of the ceramic core. These units include a ceramic insulator, fixed terminals, through rods, hardware and stainless steel element.

The Type VR resistor is an open-type design, which allows the element to come into direct contact with ambient air. This unique design allows for rapid, efficient cooling of the resistor element.

Our ceramic insulating cores are manufactured in-house to maintain total control over production and quality standards. Powerohm is the only domestic resistor manufacturer with this added advantage.

## OPTIONS

**COIL SIZES:** Type VR resistors are available in (6) standard lengths, all having the same approximate 2 inch diameter. Wattage values vary from 250 to 1100 watts per coil. These units are available in (17) different current ratings.

**ADJUSTABLE TERMINALS:** Adjustable terminals, which can be clamped to the element, are available for all units; add "-A" to the part number.

**ENCLOSURES:** Powerohm Type VR resistors can be packaged in our wide selection of enclosures. See the Enclosure Section of our catalog for details.

Type VR Ventwound Resistor



## ELECTRICAL CHARACTERISTICS

**VOLTAGE INSULATION:** A standard Type VR resistor is insulated for 1000 volts. Our standard bracket and enclosure assemblies are also insulated for 1000 volts. Also, with special precautions and additional insulation, units can be used for applications exceeding 15 kV.

**RESISTANCE TOLERANCE:** + 10% for all units; as low as + 3% if required.

**COEFFICIENT OF RESISTIVITY:** Resistance values will increase as the element temperature rises. Expect an approximate increase of 5% in resistance after the unit reaches an operating temperature of 375°C above ambient. Contact the factory for more specific information if needed.

**AMBIENT TEMPERATURE:** Standard ratings are based on maximum ambient temperatures of 40°C. Derate current rating 95% for 50°C ambient, 90% for 75°C ambient, and 85% for 100°C ambient.

**EFFECTS OF ALTITUDE:** The published electrical ratings are applicable for altitudes of 6000 feet or less. Contact the factory for deration factors above 6000 feet.

## CUSTOM DESIGNS

Powerohm offers a complete selection of standard size coils on the following page. These coils cover a wide range of resistance and current values. Numerous variations are available for special applications or replacement of other manufacturers. Powerohm can match the electrical ratings of any ventwound style product available. Please contact the factory for assistance.

# Type VR Electrical Ratings of Standard Size Coils

**SPECIFY PART NUMBERS AS FOLLOWS:** VR - .

Length ————

Amp Rating ————

For example, the part number of a 9.4 amp, 8.7 ohm coil is VR5-9.4.

**RATINGS:** The continuous current ratings are based on a 375°C temperature rise. The resistance values are measured at 25°C and have a + 10% tolerance.

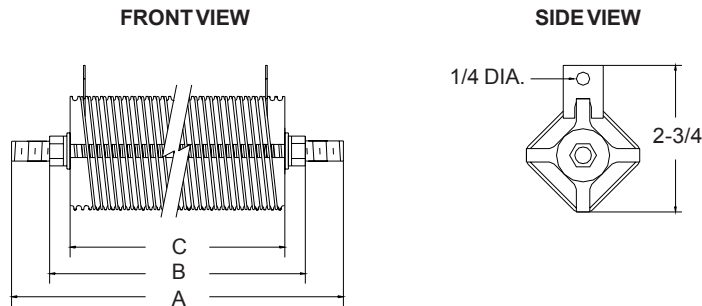
## ELECTRICAL RATINGS OF STANDARD SIZE COILS

| CONTINUOUS AMP RATING | RESISTANCE IN OHMS |          |          |          |          |          |
|-----------------------|--------------------|----------|----------|----------|----------|----------|
|                       | LENGTH 2           | LENGTH 3 | LENGTH 4 | LENGTH 5 | LENGTH 6 | LENGTH 7 |
| 16.7                  | 1.0                | 1.6      | 2.2      | 2.7      | 3.3      | 3.9      |
| 14.9                  | 1.2                | 2.0      | 2.7      | 3.4      | 4.2      | 4.9      |
| 13.3                  | 1.6                | 2.5      | 3.4      | 4.3      | 5.3      | 6.2      |
| 11.9                  | 2.0                | 3.1      | 4.3      | 5.5      | 6.7      | 7.9      |
| 10.6                  | 2.5                | 4.0      | 5.5      | 7.0      | 8.5      | 9.9      |
| 9.4                   | 3.1                | 5.0      | 6.9      | 8.7      | 10.6     | 12.5     |
| 8.4                   | 3.9                | 6.3      | 8.6      | 11.0     | 13.3     | 15.7     |
| 7.3                   | 5.0                | 8.0      | 11.1     | 14.1     | 17.1     | 20.1     |
| 6.5                   | 6.4                | 10.2     | 14.0     | 17.8     | 21.6     | 25.5     |
| 5.9                   | 7.9                | 12.6     | 17.3     | 22.0     | 26.7     | 31.4     |
| 5.2                   | 9.9                | 15.9     | 21.9     | 27.8     | 34.0     | 40.0     |
| 4.5                   | 13.3               | 21.2     | 29.2     | 37.0     | 45.0     | 53.0     |
| 4.1                   | 16.7               | 26.7     | 37.0     | 47.0     | 57.0     | 67.0     |
| 3.6                   | 21.2               | 34.0     | 47.0     | 60.0     | 72.0     | 85.0     |
| 3.2                   | 26.6               | 42.0     | 59.0     | 75.0     | 90.0     | 107.0    |
| 2.8                   | 34.0               | 54.0     | 74.0     | 94.0     | 114.0    | 135.0    |
| 2.5                   | 43.0               | 68.0     | 93.0     | 120.0    | 144.0    | 170.0    |

# Type VR Coil Dimensions & Tap Options

## TYPE VR VENTWOUND DIMENSIONS

**COIL DIMENSIONS:** The coil dimensions are for standard size units. Coil and threaded rod length can be varied per customer request. All units have the same approximate diameter of 2 inches. Units are furnished with 5/16" through rods and #10 terminal hardware.



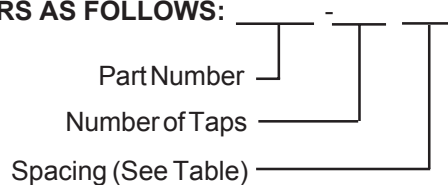
## STANDARD COIL DIMENSIONS

| LENGTH | A      | B  | C      |
|--------|--------|----|--------|
| 2      | 9-3/8  | 7  | 6-1/8  |
| 3      | 12-3/8 | 10 | 9-1/8  |
| 4      | 15-3/8 | 13 | 12-1/8 |
| 5      | 18-3/8 | 16 | 15-1/8 |
| 6      | 21-3/8 | 19 | 18-1/8 |
| 7      | 24-3/8 | 21 | 20-1/8 |

## ADDITIONAL TAPS

Type VR resistors are furnished with two stainless steel terminals at either end of the ceramic core. Additional fixed taps, welded in place at various intervals, are available for coils rated 7.3 amps and higher. Numerous tap configurations are available, but limited to a spacing no closer than 1 inch.

**SPECIFY PART NUMBERS AS FOLLOWS:**

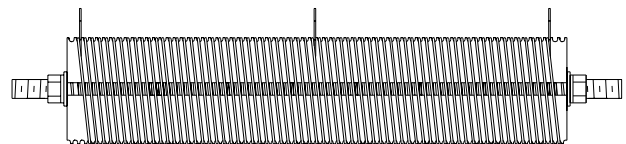


For example, the part number of a 9.4 amp, 8.7 ohm coil with 2 taps at 1/3 spacing is VR5-9.4-2C. See below for additional part number examples.

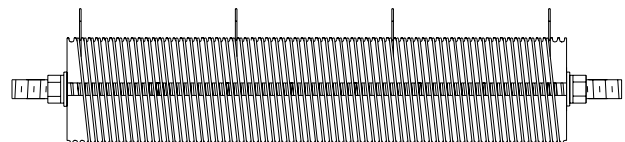
## ADDITIONAL TAPS & SPACING CHART

| FRACTIONAL SPACING | SUFFIX LETTER |
|--------------------|---------------|
| 1/2                | B             |
| 1/3                | C             |
| 1/4                | D             |
| 1/5                | E             |
| 1/6                | F             |
| 1/7                | G             |
| 1/8                | H             |
| 1/9                | J             |
| 1/10               | K             |
| 1/11               | L             |
| 1/12               | M             |
| 1/13               | N             |
| 1/14               | P             |
| 1/15               | R             |
| 1/16               | S             |
| 1/17               | T             |
| 1/18               | V             |
| 1/19               | W             |
| 1/20               | X             |
| 1/21               | Z             |

Other part number examples of Type VR Ventwound Resistors with additional taps.



VR3-16.7-1B  
(1 TAP @ 1/2 SPACING)

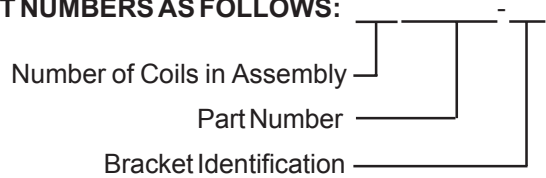


VR3-16.7-2C  
(2 TAP @ 1/3 SPACING)

# Type VR Mounting Bracket Options & Dimensions

Type VR Ventwound Resistors are available fully assembled on open-style brackets. This open-style construction consists of resistors installed on mill galvanized brackets complete with all stainless steel bus bars.

## SPECIFY PART NUMBERS AS FOLLOWS:

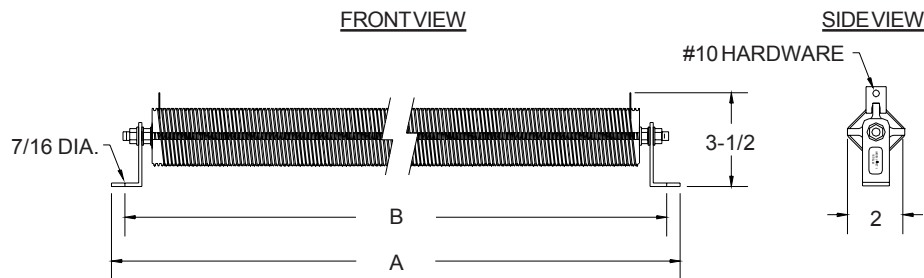


For example, the part number of a 9.4 amp, 8.7 ohm coil mounted on B1 Brackets is 1VR5-9.4-B1. Bracket assemblies consisting of 2 or more coils include series jumpers. Add "-N" to eliminate jumpers and "-P" for parallel jumpers.

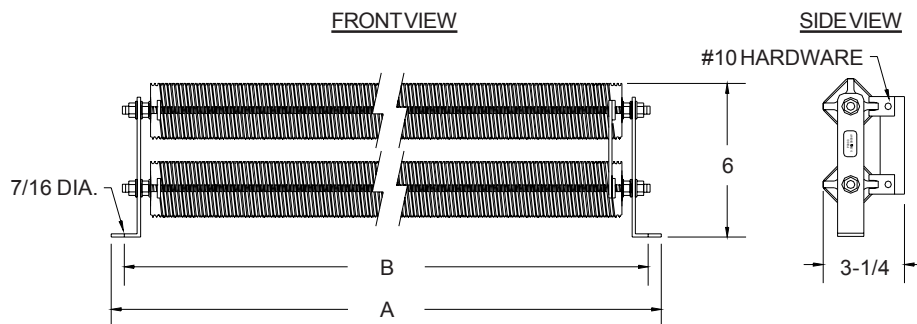
## STANDARD BRACKET DIMENSIONS

| DIMENSION | SIZE 2 | SIZE 3 | SIZE 4 | SIZE 5 | SIZE 6 | SIZE 7 |
|-----------|--------|--------|--------|--------|--------|--------|
| A         | 9      | 12     | 15     | 18     | 21     | 24     |
| B         | 8      | 11     | 14     | 17     | 20     | 23     |

## B1 BRACKET ASSEMBLY OPTIONS & DIMENSIONS



## B2 BRACKET ASSEMBLY OPTIONS & DIMENSIONS



## B3 BRACKET ASSEMBLY OPTIONS & DIMENSIONS

