

Series 800 and 1000 Tubular Resistors Product Information



Tubular Resistors – Series 800 and 1000

Series 800 and 1000 Tubular Non-Inductive Bulk Ceramic Resistors provide excellent performance for high peak power or high-energy pulses. Bulk construction advantageously produces an inherently non-inductive resistor; and it allows energy and power to be uniformly distributed through the

entire ceramic resistor body – there is no film or wire to fail. We offer a full line of rugged, reliable ceramic resistors.

We offer three distinctly different ceramic materials to afford the designer with unique components to meet the most demanding requirements:

Type SP resistors are composed of materials that withstand high operating temperatures resulting in high power dissipation. Maximum continuous operating temperature is specified at 350°C. This type is suitable for use in oil without an oil-resistant coating.

Type AS resistors are best suited for high energy and voltage pulse applications. Maximum continuous operating temperature is specified at 230°C. The standard dielectric coating is recommended for use in air, and the oil-resistant coating is recommended for use in oil.

Type A is a high-power non-inductive resistor used when high resistance is required.

Global bulk ceramic resistors are problem solvers for:

Type SP

- Motor drive circuits
- Snubber circuits
- High-frequency circuits
- RF dummy loads
- Dynamic braking
- Transformer protection
- Harmonic filter

Type AS

- Impulse generators
- High-voltage circuits
- X-ray equipment
- High voltage power supplies
- Laser/Imaging equipment
- Capacitor charge/discharge

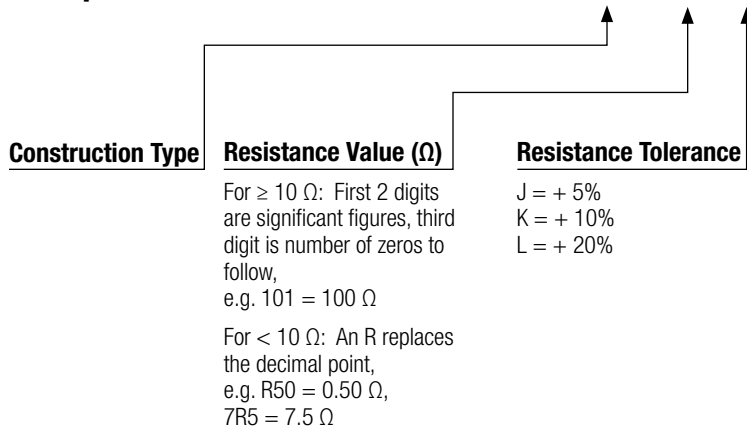
Type A

- Bleeder
- Capacitor charge/discharge
- ... just to name a few uses.

Ordering Information

Part Numbering System

Example Part Number: 890AS101KDS **890AS** **101** **K** **DS** ← **Terminal End Options**



| | |
|--|--|
| SP | No Suffix = Standard aluminum metalized ends |
| | No-arc terminal not available on SP products |
| | G = Radial tab, riveted and soldered |
| | G1 = Radial tab, riveted and <u>no</u> solder |
| AS | DS = Standard dielectric coating and silver metalized ends |
| | N = No-arc terminal and dielectric coating |
| | NO = No-arc terminal with oil resistant coating |
| | DG = Radial tab, riveted and soldered with dielectric coating |
| | DG1 = Radial tab, riveted and <u>no</u> solder with dielectric coating |
| GO = Radial tab, riveted and soldered with oil resistant coating | |
| TO = Soldered end and oil resistant coating | |
| A | No Suffix = Standard nickel metalized ends |
| | D = Dielectric coating |
| | DG = Radial tab, riveted and soldered with dielectric coating |
| | N = No-arc terminal and dielectric coating |
| | NO = No-arc terminal with oil resistant coating |
| | DG = Radial tab, riveted and soldered with dielectric coating |
| DG1 = Radial tab, riveted and <u>no</u> solder with dielectric coating | |
| GO = Radial tab with oil resistant coating | |
| TO = Soldered end and oil resistant coating | |

Contact Information

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High Voltage Resistors – High Power Resistors – High Energy Resistors

Series 800 and 1000 Tubular Resistors are available in a wide variety of sizes and terminations from 2" to 24" in length and 1/2" to 2" in diameter. These resistors can handle up to 1000 watts, 165 kJ and 165 kV in resistance values from 1 ohm to 1 megohm.

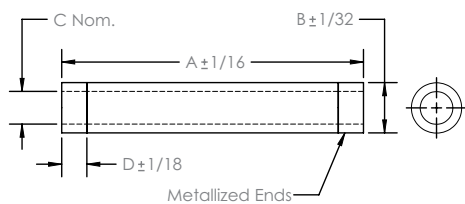
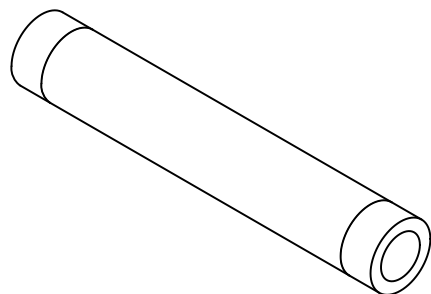
Electrical Specifications

| Length and Diameter | Type | Resistance Available (ohms) Min. to Max. | | Average Power @ 40°C (watts) | Peak* Energy (joules) | Peak* Voltage** (volts) |
|---------------------|--------|--|------|------------------------------|-----------------------|-------------------------|
| 2" x 1/2" | 884SP | 1.0 | 200 | 22.5 | 250 | 1,000 |
| 2 1/2" x 3/4" | 885SP | 1.0 | 130 | 45 | 250 | 1,000 |
| | 885AS | 6.0 | 1200 | 15 | 2,800 | 8,000 |
| | 885A | 1500 | 220K | 15 | 750 | 3,750 |
| 5" x 3/4" | 886SP | 1.0 | 330 | 90 | 500 | 4,000 |
| | 886AS | 15.0 | 3300 | 30 | 7,000 | 20,000 |
| | 886A | 3900 | 390K | 30 | 1,500 | 10,000 |
| 6" x 1" | 887SP | 1.0 | 330 | 150 | 1,600 | 4,000 |
| | 887AS | 12.0 | 3300 | 50 | 13,000 | 30,000 |
| | 887A | 3900 | 390K | 50 | 6,000 | 12,000 |
| 6" x 1 1/2" | 1026AS | 5.0 | 1200 | 70 | 30,000 | 30,000 |
| 8" x 1" | 888SP | 1.0 | 390 | 190 | 2,100 | 6,000 |
| | 888AS | 15.0 | 3900 | 75 | 16,500 | 45,000 |
| | 888A | 4700 | 470K | 60 | 7,500 | 15,000 |
| 8" x 1 1/2" | 1028AS | 6.5 | 1875 | 100 | 46,000 | 45,000 |
| 12" x 1" | 889SP | 1.0 | 680 | 275 | 3,200 | 10,000 |
| | 889AS | 25.0 | 6800 | 100 | 27,000 | 75,000 |
| | 889A | 8200 | 680K | 90 | 12,500 | 25,000 |
| 12" x 1 1/2" | 1032AS | 9.0 | 2500 | 150 | 75,000 | 75,000 |
| 18" x 1" | 890SP | 1.0 | 1000 | 375 | 4,200 | 16,000 |
| | 890AS | 40.0 | 10K | 150 | 43,000 | 120,000 |
| | 890A | 12K | 1M | 125 | 20,000 | 40,000 |
| 18" x 1 1/2" | 1038AS | 15.0 | 3800 | 225 | 119,000 | 120,000 |
| 18" x 2" | 891SP | 1.0 | 450 | 750 | 15,000 | 16,000 |
| 24" x 2" | 892SP | 1.0 | 600 | 1000 | 17,500 | 22,000 |
| 24" x 1 1/2" | 1044AS | 20.0 | 4800 | 300 | 164,000 | 165,000 |

* Allowable peak energy/voltage will depend on the resistance value. Consult factory.

** Derate by 50% with oil resistant coating on Type AS resistors. Energy ratings are based on pulses <10 milliseconds. Type SP ratings can be substantially greater for longer pulses. Consult factory.

Dimensions – Inches



| Type | A | B | C (SP & AS) | C (A) | D |
|-----------------|------|------|-------------|-------|------|
| 884 SP | 2.0 | 0.50 | 0.22 | – | 0.25 |
| 885 SP, AS, & A | 2.5 | 0.75 | 0.50 | 0 | 0.50 |
| 886 SP, AS, & A | 5.0 | 0.75 | 0.50 | 0 | 0.62 |
| 887 SP, AS, & A | 6.0 | 1.00 | 0.75 | 0.5 | 0.50 |
| 888 SP, AS, & A | 8.0 | 1.00 | 0.75 | 0.5 | 0.88 |
| 889 SP, AS, & A | 12.0 | 1.00 | 0.75 | 0.5 | 0.88 |
| 890 SP, AS & A | 18.0 | 1.00 | 0.75 | 0.5 | 0.88 |
| 891 SP | 18.0 | 2.00 | 1.50 | – | 1.00 |
| 892 SP | 24.0 | 2.00 | 1.50 | – | 1.00 |
| 1026 AS | 6.0 | 1.50 | 1.00 | – | 0.50 |
| 1028 AS | 8.0 | 1.50 | 1.00 | – | 0.88 |
| 1032 AS | 12.0 | 1.50 | 1.00 | – | 0.88 |
| 1038 AS | 18.0 | 1.50 | 1.00 | – | 0.88 |
| 1044 AS | 24.0 | 1.50 | 1.00 | – | 0.88 |

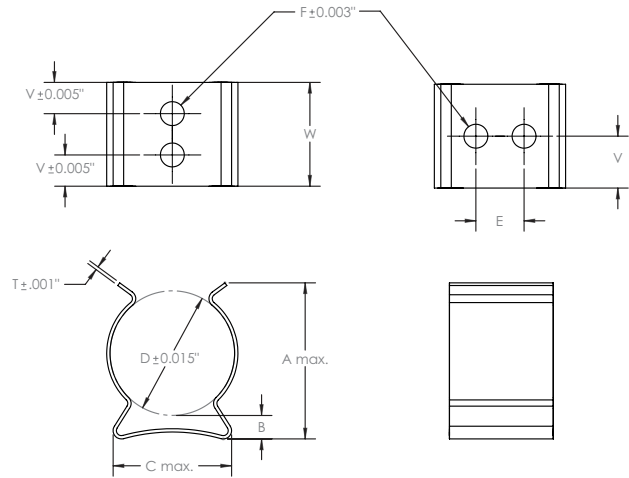
Special sizes are available. Consult factory.

Termination Metals

Electrical connection to the resistive bodies of resistors is made by metal end bands. The standard metal is aluminum for Type SP, silver for Type AS and nickel for Type A. Special terminations of brass, copper or soldered ends are also available.

Mounting Clips

In most cases, connections to the resistors may be made by using these stock clips.

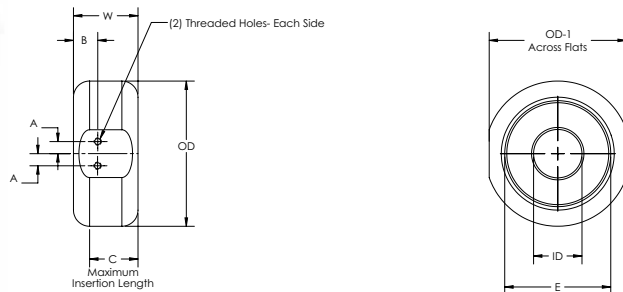
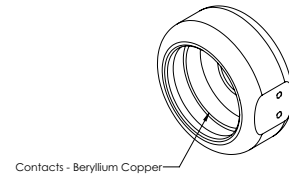


Dimensions — Inches

| Part No. | Resistor OD | Holes | A | B | C | D | E | F | T | V | W |
|----------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 35370 | 1/2 | 1 | 0.620 | 0.090 | 0.560 | 0.500 | N/A | 0.093 | 0.020 | 0.188 | 0.375 |
| 35267 | 3/4 | 1 | 0.940 | 0.155 | 0.830 | 0.750 | N/A | 0.144 | 0.020 | 0.312 | 0.625 |
| 35268 | 1 | 2 | 1.230 | 0.170 | 1.070 | 1.000 | N/A | 0.128 | 0.024 | 0.156 | 0.625 |
| 35371 | 1 1/2 | 2 | 1.650 | 0.100 | 1.650 | 1.500 | 0.925 | 0.103 | 0.032 | 0.250 | 0.500 |
| 35269 | 2 | 2 | 2.375 | 0.544 | 1.080 | 2.000 | 0.375 | 0.125 | 0.043 | 0.375 | 0.750 |

Material: Beryllium Copper Finish: Electro Tin Plate

Aluminum Connector Caps



Dimensions — Inches

| Part No. | Resistor Diameter | OD | OD-1 | W | E | ID | A | B | C | Threaded Holes |
|----------|-------------------|-------|-------|-------|-------|-----|------|------|-----|---------------------|
| 36075 | 3/4 | 1 1/2 | 1 3/8 | 3/4 | 0.830 | 3/8 | 3/16 | 3/16 | .50 | M3 x .5P x 3/16" DP |
| 36100 | 1 | 1 3/4 | 1 5/8 | 1 | 1.080 | 1/2 | 3/16 | 3/8 | .75 | M3 x .5P x 3/16" DP |
| 36150 | 1 1/2 | 2 1/4 | 2 1/8 | 1 | 1.580 | 3/4 | 3/16 | 3/8 | .75 | M4 x .7P x 3/16" DP |
| 36200 | 2 | 3 | 2 3/4 | 1 1/8 | 2.080 | 1 | 5/16 | 7/16 | .88 | M5 x .8P x 1/4" DP |

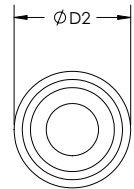
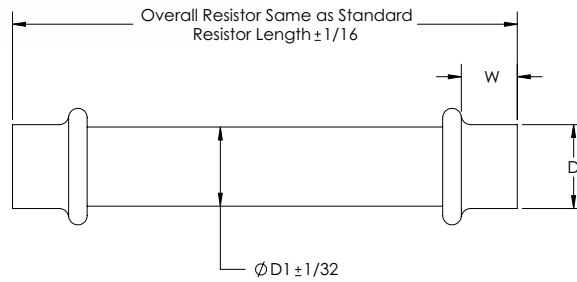
Optional No-Arc Termination

“N” Suffix



Dimensions — Inches

| D1 | D2 | D | W |
|-------|------|---|-----|
| 1 | 1.56 | 1 | 3/4 |
| 1 1/2 | 1.84 | 1 | 3/4 |



Optional Radial Tab Termination

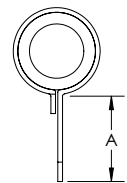
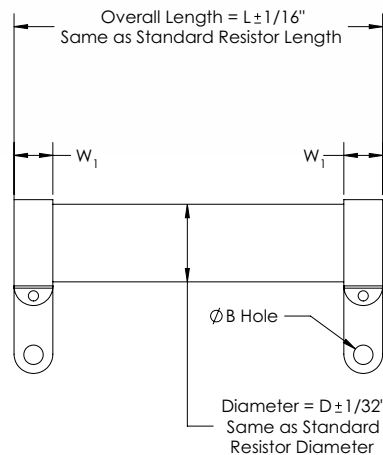
“G1” suffix - riveted only

“G” suffix - riveted with solder



Dimensions — Inches

| D | W1 | A | B |
|-------|------|-------|-------|
| 1/2 | 3/16 | 17/32 | 0.062 |
| 3/4 | 3/8 | 25/32 | 0.156 |
| 1 | 3/8 | 25/32 | 0.156 |
| 1 1/2 | 3/8 | 25/32 | 0.156 |
| 2 | 5/8 | 1.25 | 0.281 |



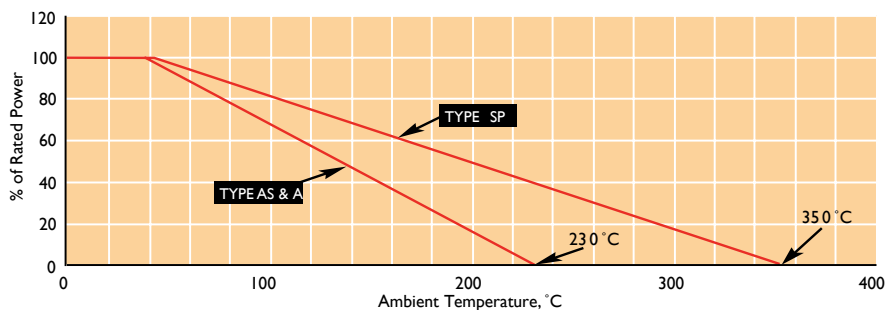
| Characteristics | Type SP | Type AS | Type A |
|---|--------------------|--------------------|--------------------|
| Operating Temperature (I) | -55°C to +350°C | -55°C to +230°C | -55°C to +230°C |
| Resistance Temperature Coefficient | +0.2 to -0.08 %/°C | +0.0 to -0.08 %/°C | +0.0 to -0.02 %/°C |
| Voltage Coefficient Max. % per kilovolt per inch active length | -1.0% | -1.0% | — |
| Short Time Overload Max. % change after 10 cycles of 1000% rated power 5 sec. On, 90 sec. Off | ± 5% | ± 2% | — |
| Load Life Max. % change after 1,000 hours at rated power | ± 5% | ± 5% | — |
| Thermal Shock Max. % change after 10 cycles -55°C to +125°C | ± 3% | ± 3% | — |
| Moisture Resistance Max. % change when tested per MIL-STD-202, Method 103 | ± 5% | ± 5% | ± 5% |

(I) Note: When required, Type SP material can withstand short periods of use at red-heat conditions, i.e. up to 550°C to 600°C

| Typical Physical Properties | SP Resistors | AS Resistors | A Resistors |
|-----------------------------|-----------------------------|-------------------------------|-------------------------------|
| Density | 2.2 - 2.4 gm/cc | 2.2 - 2.6 gm/cc | 2.2 - 2.6 gm/cc |
| Specific Heat | 0.24 - 0.26 cal/gm · °C | 0.23 - 0.25 cal/gm · °C | 0.23 - 0.25 cal/gm · °C |
| Thermal Conductivity | 0.14 - 0.16 cal/cm · °C/sec | 0.003 - 0.006 cal/cm · °C/sec | 0.003 - 0.006 cal/cm · °C/sec |

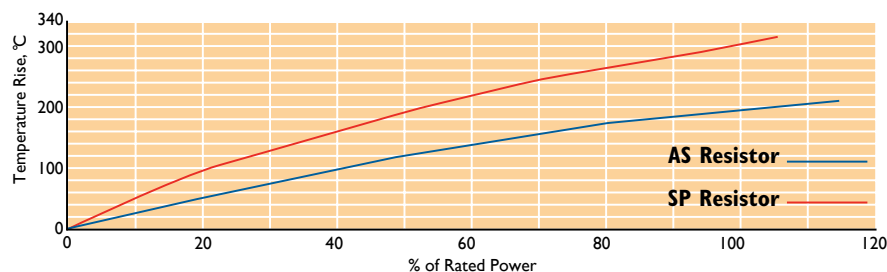
Power Rating Curves

Power ratings are based on maximum allowable surface temperature in still air at 40°C ambient temperature.



Resistor Surface Temperature Rise Versus Power

(Curve is Typical for Resistor Midpoint with Horizontal Orientation in Still Air)



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