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(DRS)
Smooth Wound
Adjustable Resistor

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▶ Product Introduction

Choose Token's smooth-wound adjustable power resistor (DRS) for applications requiring settings at different resistance values.

These high energy wire wounds are equipped with an adjustable lug, making them ideal for adjusting circuits, obtaining unique resistance values and setting equipment to meet various line voltages.

DRS resistors feature a hollow core to permit secure fastening with thru bolts with washers or spring-type clips. They also offer the durability of lead free vitreous enamel, or silicone coating and all-welded construction.

The Power (DRS) Adjustable Resistor is RoHS compliant and lead free. For non-standard technical requirements and custom special applications, please contact us. Or link to Token official website "[High Power Resistors](http://www.token.com.tw)" to get more information.



To Calculate Max. Amperes:

- Voltage = (Watts × Ohms)^{1/2}

Power Rating:

- Based on 25°C free air rating. The stated wattage rating applies only when the entire resistance is in the circuit.
- Setting the lug at an intermediate point reduces the wattage rating by approximately the same proportion.
- Example: If the lug is set at half resistance, the wattage is reduced by approximately one-half.
- Wattage is proportional to this adjusted resistance value.
- Adjustability is 10% to 90% of full resistance value.

Features:

- Adjustable lug supplied.
- High wattage applications.
- Flame resistant and rugged lead coating.
- Terminals suitable for soldering or bolt connection.
- Resistance Tolerance: J(±5%), K(±10%).

Options:

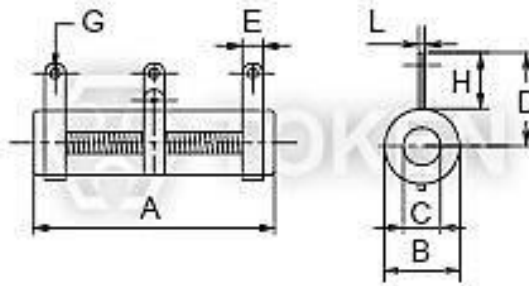
- Adjustable, fixed, or tapped styles are available.
- Special terminals available for non-standard applications.
- Single and double quick connect terminals can be specified.
- Standard lug terminals available with or without terminal hardware.
- Non-inductive Ayrton Perry windings can be specified.
- Special temperature coefficients, tolerances



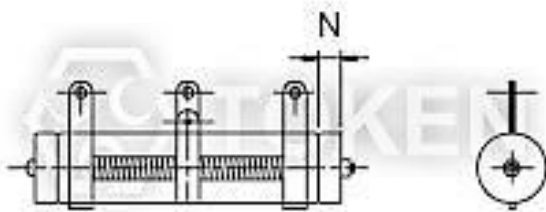
► **DRSA Dimensions**

Dimensions (DRS-A 20W ~ 1300W)

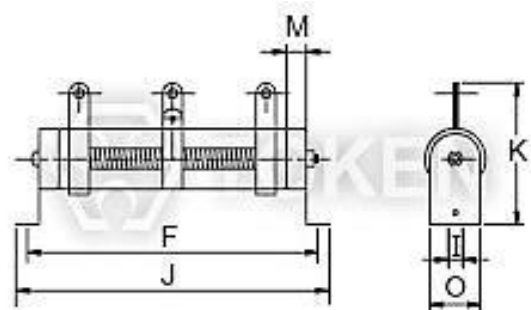
| Wattage Rating | Dimensions (Unit: mm) | | | | | | | | | | | | | | | Max. Pickable Resistance Value (Ω) |
|----------------|-----------------------|----|----|----|----|-----|---|----|----|-----|-----|-----|----|---|----|---|
| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | |
| 20W | 60 | 17 | 8 | 22 | 5 | 78 | 2 | 12 | 4 | 90 | 36 | 1.0 | - | 6 | 16 | 1~150 Ω |
| 30W | 80 | 17 | 8 | 22 | 5 | 100 | 2 | 12 | 4 | 112 | 36 | 1.0 | - | 6 | 16 | 1~250 Ω |
| 40W | 110 | 17 | 8 | 22 | 5 | 128 | 2 | 12 | 4 | 140 | 36 | 1.0 | - | 6 | 16 | 1~400 Ω |
| 50W | 110 | 25 | 16 | 30 | 8 | 150 | 5 | 18 | 6 | 166 | 58 | 1.2 | 6 | - | 27 | 1.5~500 Ω |
| 60W | 90 | 28 | 18 | 32 | 8 | 130 | 5 | 19 | 6 | 146 | 60 | 1.2 | 6 | - | 27 | 1.5~550 Ω |
| 80W | 110 | 28 | 18 | 32 | 8 | 150 | 5 | 19 | 6 | 166 | 60 | 1.2 | 6 | - | 27 | 2~650 Ω |
| 100W | 140 | 28 | 18 | 32 | 8 | 180 | 5 | 19 | 6 | 196 | 60 | 1.2 | 6 | - | 27 | 2~750 Ω |
| 120W | 160 | 28 | 18 | 32 | 8 | 200 | 5 | 19 | 6 | 216 | 60 | 1.2 | 6 | - | 27 | 3~850 Ω |
| 150W | 195 | 28 | 18 | 32 | 8 | 235 | 5 | 19 | 6 | 251 | 60 | 1.2 | 6 | - | 27 | 3~1.2K Ω |
| 160W | 185 | 35 | 24 | 36 | 10 | 225 | 5 | 19 | 8 | 245 | 76 | 1.6 | 6 | - | 34 | 5~1.3K Ω |
| 200W | 210 | 35 | 24 | 36 | 10 | 250 | 5 | 19 | 8 | 274 | 76 | 1.6 | 6 | - | 34 | 6~1.5K Ω |
| 250W | 210 | 40 | 25 | 38 | 12 | 250 | 5 | 20 | 8 | 274 | 78 | 1.6 | 6 | - | 34 | 6~2K Ω |
| 300W | 260 | 40 | 25 | 38 | 12 | 300 | 5 | 20 | 8 | 320 | 78 | 1.6 | 6 | - | 34 | 7~2.5K Ω |
| 400W | 330 | 40 | 25 | 38 | 12 | 370 | 5 | 20 | 8 | 395 | 78 | 1.6 | 6 | - | 34 | 8~3.5K Ω |
| 500W | 330 | 50 | 35 | 50 | 12 | 380 | 6 | 25 | 9 | 400 | 100 | 1.6 | 8 | - | 40 | 8~4.5K Ω |
| 600W | 400 | 50 | 35 | 50 | 12 | 450 | 6 | 25 | 9 | 470 | 100 | 1.6 | 8 | - | 40 | 8~5.5K Ω |
| 700W | 460 | 50 | 35 | 50 | 12 | 510 | 6 | 25 | 9 | 530 | 100 | 1.6 | 8 | - | 40 | 12~7K Ω |
| 800W | 460 | 60 | 40 | 55 | 15 | 515 | 6 | 30 | 10 | 535 | 110 | 1.6 | 10 | - | 50 | 12~8K Ω |
| 1000W | 540 | 60 | 40 | 55 | 15 | 595 | 6 | 30 | 10 | 615 | 110 | 1.6 | 10 | - | 50 | 15~9K Ω |
| 1300W | 650 | 65 | 42 | 62 | 15 | 702 | 6 | 30 | 10 | 722 | 115 | 1.6 | 10 | - | 50 | 15~11K Ω |



(DRSA) N - No Mount



(DRSA) Z - Vertical Mount

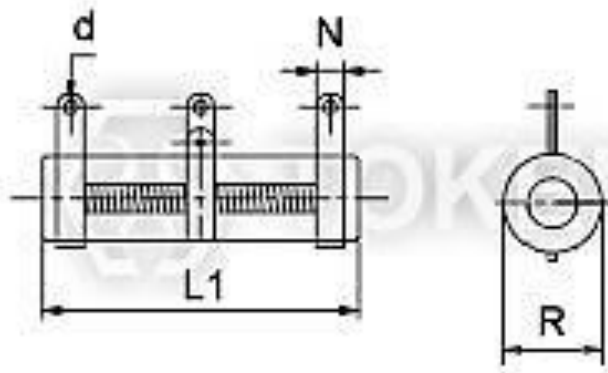


(DRSA) G - Horizontal Mount

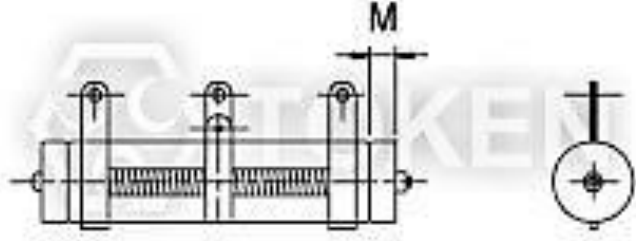
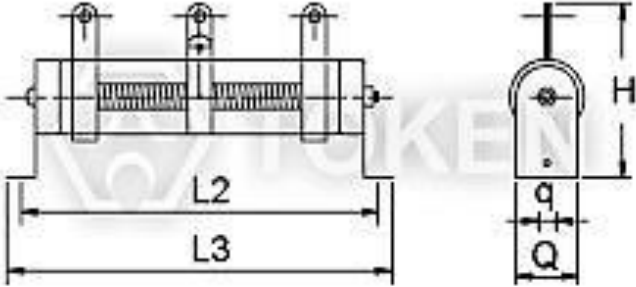
► **DRSB Dimensions**

Dimensions (DRSB 15W ~ 20000W)

| Wattage Rating | Dimensions (Unit: mm) | | | | | | | | | | Max. Pickable Resistance Value (Ω) |
|----------------|-----------------------|------|------|------|-----|----|-----|-----|-----|-----|---|
| | R | L1 | L2 | L3 | H | N | d | M | q | Q | |
| 15W | 15 | 45 | 65 | 85 | 40 | 6 | 3.5 | 3.5 | 4.5 | 15 | 1~1K Ω |
| 20W | 15 | 50 | 70 | 90 | 40 | 6 | 3.5 | 3.5 | 4.5 | 15 | 1~1K Ω |
| 25W | 20 | 50 | 80 | 100 | 50 | 6 | 3.5 | 5 | 5 | 20 | 2~1K Ω |
| 30W | 20 | 70 | 100 | 120 | 50 | 6 | 3.5 | 5 | 5 | 20 | 2~1K Ω |
| 40W | 20 | 87 | 115 | 137 | 50 | 6 | 3.5 | 5 | 5 | 20 | 2~1K Ω |
| 50W | 28 | 90 | 115 | 143 | 68 | 9 | 4.5 | 5.5 | 6 | 27 | 5~1K Ω |
| 80W | 28 | 90 | 115 | 143 | 68 | 9 | 4.5 | 5.5 | 6 | 27 | 5~2K Ω |
| 100W | 28 | 170 | 195 | 223 | 68 | 9 | 4.5 | 5.5 | 6 | 27 | 10~3K Ω |
| 150W | 28 | 215 | 240 | 268 | 68 | 9 | 4.5 | 5.5 | 6 | 27 | 10~3K Ω |
| 200W | 28 | 267 | 292 | 320 | 68 | 9 | 4.5 | 5.5 | 6 | 27 | 10~5K Ω |
| 250W | 28 | 267 | 292 | 320 | 68 | 9 | 4.5 | 5.5 | 6 | 27 | 10~5K Ω |
| 300W | 40 | 267 | 300 | 343 | 90 | 10 | 4.5 | 6 | 6 | 39 | 20~5K Ω |
| 400W | 40 | 330 | 365 | 406 | 90 | 10 | 4.5 | 6 | 6 | 39 | 20~5K Ω |
| 500W | 50 | 330 | 365 | 415 | 98 | 10 | 6 | 8.5 | 8 | 49 | 20~5K Ω |
| 600W | 50 | 330 | 365 | 415 | 98 | 10 | 6 | 8.5 | 8 | 49 | 20~5K Ω |
| 700W | 50 | 400 | 435 | 485 | 95 | 10 | 6 | 8.5 | 8 | 49 | 20~5K Ω |
| 800W | 70 | 300 | 320 | 362 | 138 | 15 | 8 | - | 8 | 69 | 40~500 Ω |
| 1000W | 70 | 300 | 320 | 362 | 138 | 15 | 8 | - | 8 | 69 | 40~500 Ω |
| 1500W | 70 | 415 | 435 | 477 | 138 | 15 | 8 | - | 8 | 69 | 40~500 Ω |
| 2000W | 70 | 510 | 530 | 572 | 138 | 15 | 8 | - | 8 | 69 | 40~500 Ω |
| 2500W | 70 | 600 | 620 | 662 | 138 | 15 | 8 | - | 8 | 69 | 40~500 Ω |
| 3000W | 70 | 600 | 620 | 662 | 138 | 15 | 8 | - | 8 | 69 | 40~500 Ω |
| 4000W | 100 | 430 | 450 | 521 | 155 | 15 | 8 | - | 8 | 99 | 40~500 Ω |
| 5000W | 100 | 500 | 620 | 691 | 155 | 15 | 8 | - | 8 | 99 | 40~500 Ω |
| 6000W | 100 | 600 | 720 | 791 | 155 | 15 | 8 | - | 8 | 99 | 40~500 Ω |
| 10000W | 150 | 600 | 625 | 720 | 350 | 30 | 8 | - | 10 | 150 | 40~500 Ω |
| 12000W | 150 | 660 | 685 | 780 | 350 | 30 | 8 | - | 10 | 150 | 40~500 Ω |
| 15000W | 150 | 660 | 685 | 780 | 350 | 30 | 8 | - | 10 | 150 | 40~500 Ω |
| 20000W | 150 | 1000 | 1030 | 1120 | 350 | 30 | 8 | - | 10 | 150 | 40~500 Ω |



(DRSB) N - No Mount

| Wattage Rating | Dimensions (Unit: mm) | | | | | | | | | | Max. Pickable Resistance Value (Ω) |
|---|-----------------------|----|----|----|---|---|---|---|---|---|---|
| | R | L1 | L2 | L3 | H | N | d | M | q | Q | |
|  | | | | | | | | | | | |
| (DRSB) Z - Vertical Mount | | | | | | | | | | | |
|  | | | | | | | | | | | |
| (DRSB) G - Horizontal Mount | | | | | | | | | | | |

► Specification

Specification (DRS)

| Test Item | Test Methods | Characteristics |
|---------------------------------|--|--|
| Load life | JIS-C-5202 7-10 90 minutes ON - 30 minutes OFF 500 hours | Free of appearance or structural irregularity Surface coating crack $\Delta R/R \leq \pm(1\%+0.05\Omega)$ |
| Load rating | JIS-C-5202 5-4 | $\Delta R/R \leq \pm(0.5\%+0.1\Omega)$ Surface temperature up 350°C MAX |
| Humidity | JIS-C-5202 7-5 40°C 90%RH 240 hours | Free of appearance or structural irregularity Surface coating crack $\Delta R/R \leq \pm(3\%+0.1\Omega)$ |
| Vibration | JIS-C-5202 6-3 1.5m/m 10 ~ 50 ~ 10 Hz/min X-Y-Z 2 hours each | Free of appearance or structural irregularity Surface coating crack $\Delta R/R \leq \pm(1\%+0.05\Omega)$ |
| Thermal shock | JIS-C-5202 7-3 Room temp 30 minutes ON-55°C 15 minutes OFF | Free of structural irregularity $\Delta R/R \leq \pm(2\%+0.1\Omega)$ |
| Terminal strength | JIS-C-5202 6-1 8kg 30 seconds | Free of appearance or structural irregularity |
| Flame retardation | JIS-C-5202 7-13-3-2 100% - 600% rated wattage load | US UL-94 flame retardation test V-0 grade noncombustible |
| Resistance tolerance | JIS-C-5202 5-1 | Resistance Nominal Tolerance $1 \leq R$ $1 > R$ $\pm 5\%(J) \pm 10\%(K)$ |
| Short-term overload | JIS-C-5202 5-5 1000% rated wattage 5 seconds | Free of appearance or structural irregularity $\Delta R/R \leq \pm(2\%+0.1\Omega)$ |
| Insulation resistance | JIS-C-5202 5-6 500VDC | 100MΩ min |
| Temperature coefficient | JIS-C-5202 5-2 | $\pm 200\text{PPM}/^\circ\text{C}$ MAX |
| Dielectric withstanding voltage | JIS-C-5202 5-7 1000VDC 1 minute Between terminal and anchor stand | Free of appearance or structural irregularity $\Delta R/R \leq \pm(0.1\%+0.05\Omega)$ |
| REMARKS: | 1. Resistance and resistance tolerance were tested in-house with micro resistance meter. 2. Coating refers to UL-certified data provided by supplier. | |

▶ Application Notes

Application Notes of Adjustable Wire wound (DQS)

Determination of End Resistance Value of FVR, DQS, DSRA, DSRB, BSR, BSQ:

- Resistance Range means you can choose one maximum resistance value (Max. Pickable Resistance / End resistance value) at one of FVR, DQS, DSRA, DSRB, BSR, BSQ VR (Variable Resistor) type.
- After End Resistance Value confirmed, the minimum resistance (start resistance value) will be determined by depending on resistance of wire and wirewound type.

Power Rating of Variable Resistor:

The part Number formation of FVR, DQS, DSRA, DSRB, BSR and BSQ:

Product type - Rated Wattage - Max. Pickable Resistance (Ω) - Resistance Tolerance

Product type means one of FVR, DQS, DSRA, DSRB, BSR, BSQ.

Rated Wattage means power rating at End Resistance Value.

Resistance Value (Ω) means maximum resistance value (End Resistance Value).

Resistance Tolerance means precision range of End Resistance Value.

1. Power Rating of VR (Variable Resistor) is determined by the maximum resistance value (End Resistance Value).
2. Resistance and Power Rating should be decreased while you are adjusting the screw.

Power Rating:

- Based on 25°C free air rating. The stated wattage rating applies only when the entire resistance is in the circuit.
- Setting the lug at an intermediate point reduces the wattage rating by approximately the same proportion.
- Example: If the lug is set at half resistance, the wattage is reduced by approximately one-half.
- Adjustability is 10% to 90% of full resistance value.
- Wattage is proportional to this adjusted resistance value.

If you need current constant type or special specifications, please feel free to contact us.

▶ Order Codes

Order Codes (DRS)

| DRSA | 600W | 250R | J | G |
|-------------|-----------------|--------------------|--------------------------|---------------------|
| Part Number | Rated Power (W) | Resistance Value | Resistance Tolerance (%) | Assembly Method |
| DRSA | 20W~1300W | 0R1 0.1 Ω | J $\pm 5\%$ | N No mount. |
| DRSB | 15W~20000W | 1R 1 Ω | K $\pm 10\%$ | C Clip mount. |
| | | 10R 10 Ω | | G Horizontal mount. |
| | | 100R 100 Ω | | Z Vertical mount. |
| | | 1K 1K Ω | | |
| | | 10K 10K Ω | | |
| | | 100K 100K Ω | | |

► General Information

Benefits & Features

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

Token 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. Token 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 Token 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.

