

Version:  
January 17, 2018



# TOKEN

## **(DR) Smooth Wound Tubular Power Resistor**

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**► Product Introduction**

**Token's (DR) series is the best cost-effective smooth-wound tubular power resistors for high energy applications.**

**Features :**

- Fixed, adjustable, or tapped styles are available.
- Special terminals are available for unusual applications.
- Special temperature coefficients, tolerances, and resistance value can be specified.
- Ayrton Perry type non-inductive winding formats are available. See DRS Series when required.
- Standard resistance tolerance is  $\pm 5\%$  and  $\pm 10\%$ . Closer tolerances are available upon request.
- Standard lug terminals available with or without terminal hardware.
- Single and double quick connect terminals can be specified.
- The wire is spot welded to the terminal bands and then "fastened" onto the core with a silicone, cement, or vitreous enamel coating.

**Applications :**

- Ideal for educational modeling applications, load testing, industrial machinery, electric power distribution, instruments, automation control installations, etc.
- Typical applications for roundwire (DR) series in motor/motion control include areas such as dynamic braking, motor starting, speed/torque control, industrial machinery, electric power distribution, and plugging.
- Other applications include load dumping, current limiting, elevators, UPS systems, lift trucks, and voltage dropping.

A tubular ceramic has two terminals and is wound with copper round wire or chromium alloy round wire to provide the resistance. Coated with non-flammable resin in high temperature. Insulation is applied through a high-temperature process and the mounts are attached. Due to Token excellent winding technology applied, many taps can be added, impedance is low and the shape can be altered to produce many types.

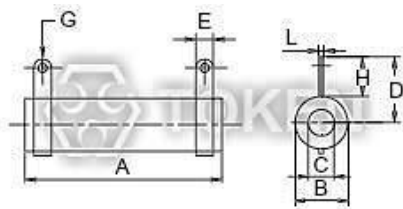
The (DR) Series is RoHS compliant and lead free. Order individual replacement units, or entire grids with various mounting configurations, or custom specifications, contact us to discuss the details. Or link to Token official website "[High Power Resistors](http://www.token.com.tw)" to get more information.



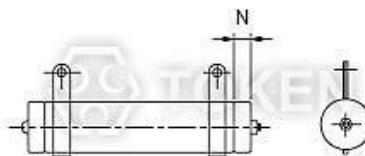
► **DR-A Dimensions**

**Dimensions (DR-A 10W ~ 1300W)**

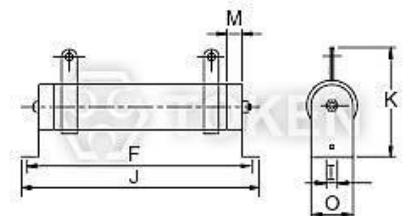
Wattage Rating	Dimensions (Unit: mm)															Resistance Range
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	
10W	45	12	6	15	4	54	2	9	3	62	28	1.0	-	6	10	1~1KΩ
20W	60	17	8	22	5	78	2	12	4	90	36	1.0	-	6	16	1~2KΩ
30W	80	17	8	22	5	100	2	12	4	112	36	1.0	-	6	16	1~3KΩ
40W	110	17	8	22	5	128	2	12	4	140	36	1.0	-	6	16	1~4KΩ
50W	110	25	16	30	8	150	5	18	6	166	58	1.2	6	-	27	1.5~5KΩ
60W	90	28	18	32	8	130	5	19	6	146	60	1.2	6	-	27	1.5~6KΩ
80W	110	28	18	32	8	150	5	19	6	166	60	1.2	6	-	27	2~8KΩ
100W	140	28	18	32	8	180	5	19	6	196	60	1.2	6	-	27	2~10KΩ
120W	160	28	18	32	8	200	5	19	6	216	60	1.2	6	-	27	3~12KΩ
150W	195	28	18	32	8	235	5	19	6	251	60	1.2	6	-	27	3~15KΩ
160W	185	35	24	36	10	225	5	19	8	245	76	1.6	6	-	34	5~16KΩ
200W	210	35	24	36	10	250	5	19	8	274	76	1.6	6	-	34	6~20KΩ
250W	210	40	25	38	12	250	5	20	8	274	78	1.6	6	-	34	6~25KΩ
300W	260	40	25	38	12	300	5	20	8	320	78	1.6	6	-	34	7~30KΩ
400W	330	40	25	38	12	370	5	20	8	395	78	1.6	6	-	34	8~40KΩ
500W	330	50	35	50	12	380	6	25	9	400	100	1.6	8	-	40	8~50KΩ
600W	400	50	35	50	12	450	6	25	9	470	100	1.6	8	-	40	8~60KΩ
700W	460	50	35	50	12	510	6	25	9	530	100	1.6	8	-	40	12~70KΩ
800W	460	60	40	55	15	515	6	30	10	535	110	1.6	10	-	50	12~80KΩ
1000W	540	60	40	55	15	595	6	30	10	615	110	1.6	10	-	50	15~100KΩ
1300W	650	65	42	62	15	702	6	30	10	722	115	1.6	10	-	50	15~130KΩ



(DR-A) **N** - No Mount



(DR-A) **Z** - Vertical Mount

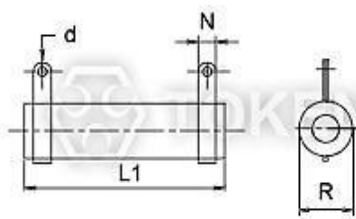


(DR-A) **G** - Horizontal Mount

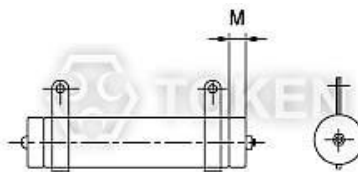
► DR-B Dimensions

Dimensions (DR-B 15W ~ 20000W)

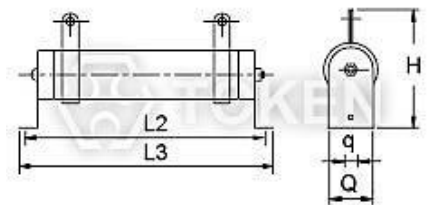
Wattage Rating	Dimensions (Unit: mm)										Resistance Range
	R	L1	L2	L3	H	N	d	M	q	Q	
15W	15	45	65	85	40	6	3.5	3.5	4.5	15	1~1KΩ
20W	15	50	70	90	40	6	3.5	3.5	4.5	15	1~1KΩ
25W	20	50	80	100	50	6	3.5	5	5	20	2~1KΩ
30W	20	70	100	120	50	6	3.5	5	5	20	2~1KΩ
40W	20	87	115	137	50	6	3.5	5	5	20	2~1KΩ
50W	28	90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



(DR-B) N - No Mount



(DR-B) Z - Vertical Mount



(DR-B) G - Horizontal Mount

## ► Introduction

### Introduction (DR\*N)

The **Nonflammable Round-Wound Non-Inductive Resistor (DR\*N)** Series is lead-free and RoHS compliant.

Please contact us for details with your specific needs.

DR\*N round-wire resistor applies Ayrton Perry non-inductive winding method to compensate residual inductance and to allow for efficient heat dissipation at higher temperature ranges.

#### Non-Inductance :

- Ayrton Perry type non-inductive winding is applied. When required add "N" to the part number.

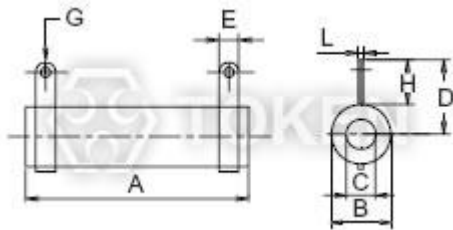
#### Resistance Tolerance :

- K( $\pm 10\%$ ), J( $\pm 5\%$ )

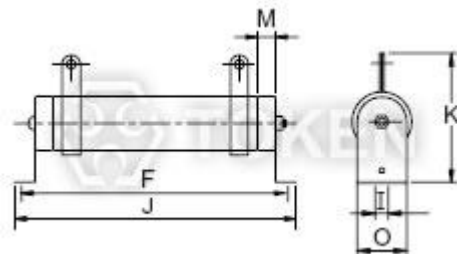
## ► DRAN Dimensions

### Dimensions (DRAN 50W ~ 1300W)

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



(DRAN) N - No Mount

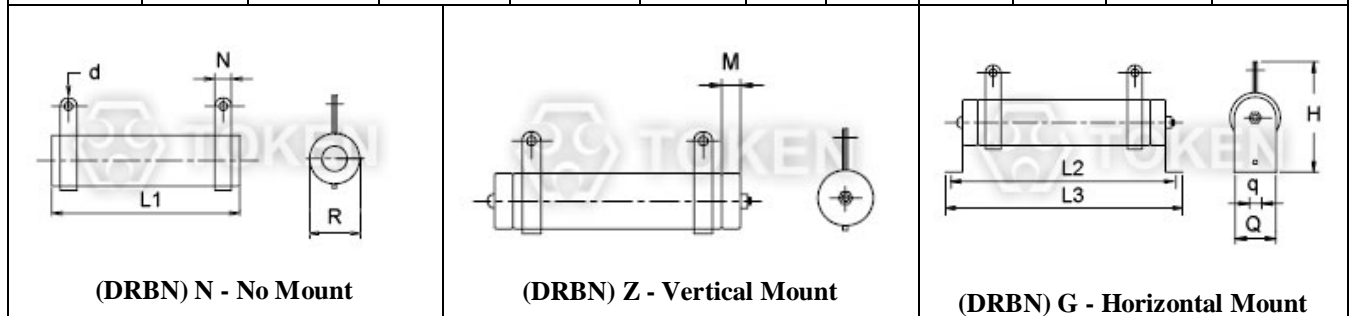


(DRAN) G - Horizontal Mount

**DRBN Dimensions**

**Dimensions (DRBN 15W ~ 20000W)**

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



## Specifications

### Specifications (DR)

Test Item	Test Methods	Characteristics
Load life	JIS-C-5202 7-10 90 minutes ON - 30 minutes OFF500 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 Tolerance 1≤R 1>R ±5%(J) ±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	±200PPM/°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.	

## Order Codes

### Order Codes (DR)

DRA	600W	100R	J	G
Part Number	Rated Power (W)	Resistance Value (Ω)		Assembly Method
DRA	10W~1300W	0R1	0.1Ω	N No mount.
DRB	15W~20000W	1R	1Ω	C Clip mount.
DRAN	50W~1300W	10R	10Ω	G Horizontal mount.
DRBN	15W~20000W	100R	100Ω	Z Vertical mount.
		1K	1KΩ	
		10K	10KΩ	
		100K	100KΩ	
			J ±5%	
			K ±10%	

## ► 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.

