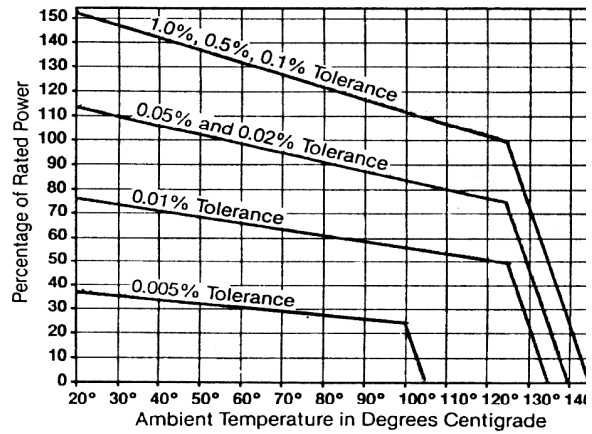




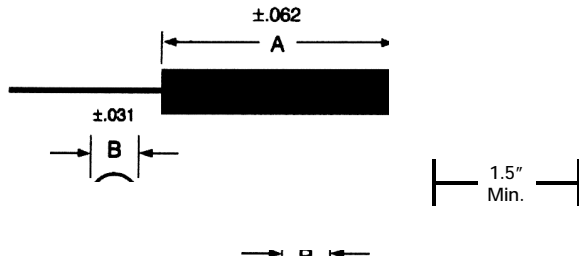
Wattage Ratings

The wattage ratings listed for ultra-precision wirewound resistors are maximum wattage ratings. They are based upon an ambient temperature of 125°C. Ultra-precision wirewound resistors should not be used at a combination of full wattage and maximum ambient temperature where reliability is an important factor. When high reliability is required, a multiplication factor of 0.6 should be applied to the wattage listed. Also as tolerances get tighter, the resistor can only operate at a fraction of its rated power (see derating chart).



Resistor Tolerance

RGA Resistors use a calibration bridge which is annually calibrated to NIST traceable standards to verify the resistance during the manufacturing process. A final resistance check is performed immediately before shipping. Standard available tolerances are 1%, 0.5%, 0.25%, 0.1%, 0.05% and 0.01%. In some cases accuracies of .00% and tighter are available; contact the factory.



Stability

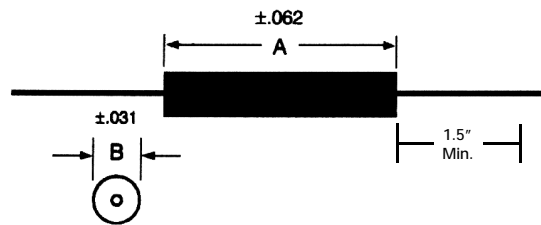


Ultra Precision Wirewound Resistors

UPR100 Series

This is our standard line of ultra precision resistors. The sizes below should handle most of your needs; however we can provide other sizes and custom configurations should they be required. Just call the factory and describe your needs.

PART NO	A	B	WATTAGE	MAX VOLTAGE	MAX Ω	LEADS
UPR101	0.250	0.187	0.120	100	500 K	.025
UPR102	0.375	0.187	0.150	125	1.5 M	.025
UPR103	0.500	0.187	0.200	175	1.8 M	.025
UPR104	0.250	0.250	0.150	125	1.2 M	.025
UPR105	0.344	0.250	0.200	175	2.0 M	.025
UPR106	0.500	0.250	0.250	250	3.0 M	.025
UPR107	0.750	0.250	0.375	500	3.5 M	.025
UPR108	0.500	0.375	0.375	600	9.0 M	.032
UPR109	0.625	0.375	0.400	600	9.0 M	.032
UPR110	0.750	0.375	0.500	800	14.0 M	.032
UPR111	0.828	0.375	0.500	800	14.0 M	.032
UPR112	1.000	0.375	0.750	800	20.0 M	.032
UPR113	0.500	0.500	0.500	500	18.0 M	.032
UPR114	1.000	0.500	1.000	1000	35.0 M	.032
UPR115	1.500	0.500	1.500	1000	50.0 M	.032
UPR116	2.000	0.500	2.000	1200	75.0 M	.032



Part Numbering System

UPR101W1R00BT

Part No.	TC (ppm/°C)	Config	Ohms	Tolerance	Leads	Packaging
UPR101	W - 10 (Std) M - 4500 Q - 3900 N - 6000 G - 5 J - 2	R - Radial	1R02 = 1.02 1001 = 1k ~	T - .01 Q - .02 X - .025 A - .05	B - .10 C - .25 D - .50 F - 1.0	U = .020 TC S = .025 TC M = .032 TC B = Bulk T = T & R

The standard UPR series resistor is axial leaded, so no designator is required for this specification. Include a lead designator only if special construction is required. Lead sizes are standard in the above chart, should you require a different size or type of lead material please affix the appropriate suffix.

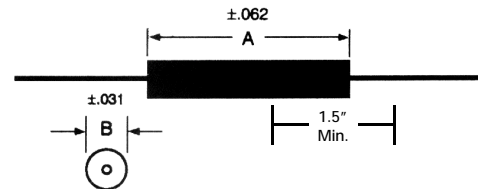


UPR300 Series

These resistors, although dimensionally the same as the UPR100 series resistors, offer much greater stability over the lifetime of the resistor. Maximum drift of .002% per year is available in most cases. Order these resistors for applications in which it is important that the resistance repeat every time.

RGA takes special care in winding these resistors. These resistors undergo tensionless winding and the windings are then specially treated for physical stability. Our proprietary aging process completes the manufacture, insuring great stability and reliability.

PART NO	A	B	WATTAGE	MAX VOLTAGE	MAX Ω	LEADS
UPR301	0.250	0.187	0.120	100	500 K	.025
UPR302	0.375	0.187	0.150	125	1.5 M	.025
UPR303	0.500	0.187	0.200	175	1.8 M	.025
UPR304	0.250	0.250	0.150	125	1.2 M	.025
UPR305	0.344	0.250	0.200	175	2.0 M	.025
UPR306	0.500	0.250	0.250	250	3.0 M	.025
UPR307	0.750	0.250	0.375	500	3.5 M	.025
UPR308	0.500	0.375	0.375	600	9.0 M	.032
UPR309	0.625	0.375	0.400	600	9.0 M	.032
UPR310	0.750	0.375	0.500	800	14.0 M	.032
UPR311	0.828	0.375	0.500	800	14.0 M	.032
UPR312	1.000	0.375	0.750	800	20.0 M	.032
UPR313	0.500	0.500	0.500	500	18.0 M	.032
UPR314	1.000	0.500	1.000	1000	35.0 M	.032
UPR315	1.500	0.500	1.500	1000	50.0 M	.032
UPR316	2.000	0.500	2.000	1200	75.0 M	.032



These resistors are ordered and designated just like the UPR100 series. (See Page K3)

A word about tolerance and TCR

Measurements are made on equipment calibrated to NIST standards. Limitations do exist in measuring two-leaded resistors, so there are minimum practical tolerance limits depending upon the resistance required. The following tables show these.

Tolerance	Min
0 ± .005%	1K and over
0 ± .01%	50 and over
0 ± .05%	5 and over
0 ± .10%	1 and over
0 ± .25%	.05 and over

ppm/°C	Resistance Range
0 ± 10	100 and over
0 ± 15	10 to 100
0 ± 30	1 to 10
0 ± 90	less than 1

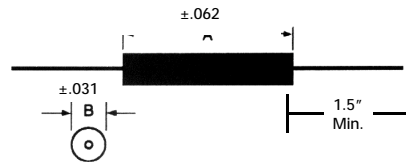


Ultra Precision Wirewound Resistors

UPR500 Series

This series offers the same reliability and quality as our UPR100 series resistor, only in a smaller package. Designed for tight places, the many different sizes shown here should provide the design engineer with enough flexibility. However, we will be happy to design a resistor to meet your exact specifications.

P/N	A	B	WATTAGE	MAX VOLTAGE	MAX Ω	LEADS
UPR501	0.15	0.08	0.025	10	30 K Ω	.0126
UPR502	0.21	0.08	0.030	10	30 K Ω	.0126
UPR503	0.20	0.10	0.040	20	70 K Ω	.0126
UPR504	0.25	0.10	0.050	30	150	.0126
UPR505	0.31	0.10	0.060	30	75 K Ω	.020
UPR506	0.18	0.12	0.050	30	100	.020
UPR507	0.20	0.12	0.050	30	100	.0126
UPR508	0.25	0.12	0.060	50	250	.020
UPR509	0.31	0.12	0.060	50	250	.020
UPR510	0.37	0.12	0.100	75	400	.025
UPR511	0.50	0.12	0.125	80	400	.025
UPR512	0.31	0.15	0.100	85	600	.0126



Leads smaller than 0.020 are tinned Grade A Nickel. Leads of 0.020 diameter and larger are tinned copper. Other lead materials and diameters are available, please call the factory.

Wattage rating is for full power dissipation at 125°C continuous operation.

Part Numbering System

UPR501W1R00BT

Part No.	TC (ppm/°C)	Ohms	Tolerance	Leads	Packaging	
UPR501	W - 10 (Std) M - 4500 Q - 3900 N - 6000 G - 5 J - 2	1R02 = 1.02 1001 = 1k ~	T - .01 Q - .02 X - .025 A - .05	B - .10 C - .25 D - .50 F - 1.0	U=.020 TC S=.025 TC M=.032 TC N= #28 TN X=Special	B = Bulk T = T & R

Lead sizes are standard in the above chart, should you require a different size or type of lead material please affix the appropriate suffix.