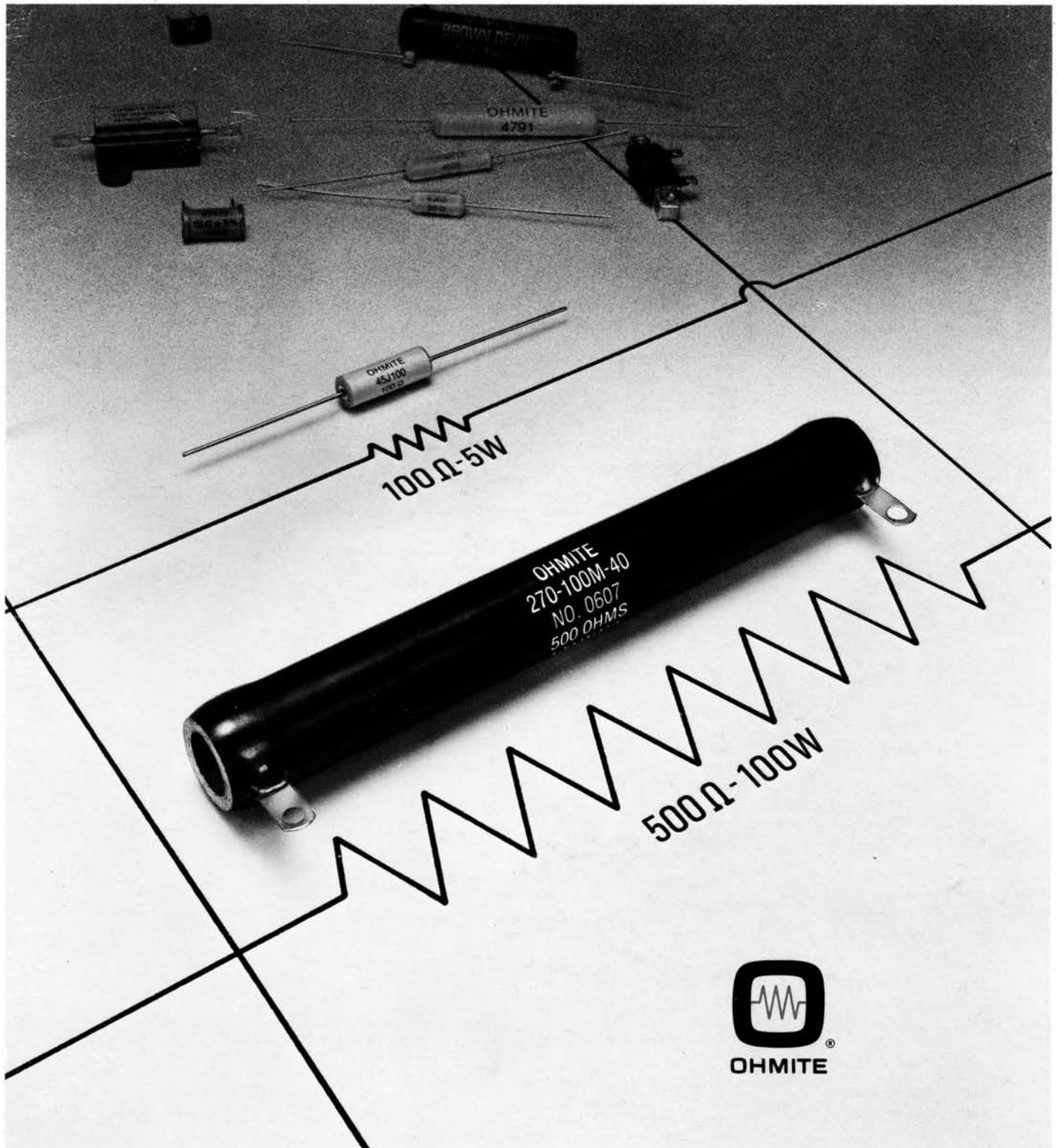


OHMITE®

Resistors

Catalog No. 101
INDUSTRIAL CATALOG



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270 Type	Fixed Tubular Resistors	20-21	43JR10-43J10K	3 watt Axial Lead Resistor	9
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280 Type	Corrib Fixed Resistors	30-31	45FR10-45F30K	5 watt Axial Lead Resistor	9
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0769-0796	75 watt Adjustable Resistor	23	63/12-63/18	"Live" mounting brackets	41
0900-0925	225 watt Fixed Resistor	21	7PA5-7PA200	Perpendicular Thru bolts	42
0956-0973	100 watt Adjustable Resistor	23	80013-85260	3-5-10 watt Axial Lead Resistor	13
1001-1040	12 watt Adjustable Resistor	23	805F1R0-		
1156-1173	175 watt Adjustable Resistor	23	805F25K	5 watt Metal Mite Resistor	15
1356-1373	225 watt Adjustable Resistor	23	810F1R0-		
1500-1557	8W Brown Devil Resistor	19	810F50K	10 watt Metal Mite Resistor	15
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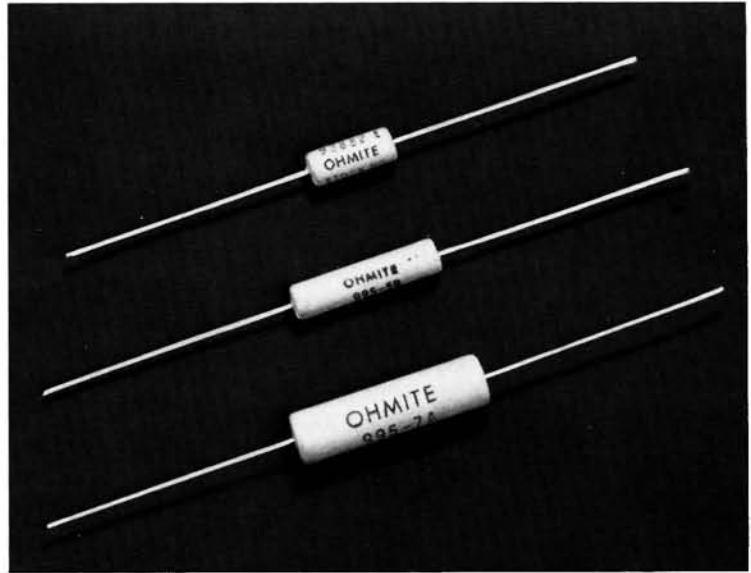
Series 99

Molded Vitreous Enamel Axial Lead Wirewound Resistors

Features

- Unique Molded Construction Provides Consistent Shape & Size
- Exceeds MIL-R-26 Moisture Requirements
- Endures Heat Up to 1500 F
- All Welded Construction
- Ideal for Machine Insertion and High Density Circuits

Series 99 molded vitreous wirewound resistors are high performance components designed for precision instrumentation, medical equipment and other applications demanding high reliability and stable operation. MIL-R-26 approved units are available for Military Application.



Specifications

Tolerance $\pm 5\%$ std. $\pm .25\%$ to $\pm 10\%$ available. 2 ohm minimum for tolerances closer than $\pm 1\%$.

Temperature Coefficient

$0 \pm 30\text{ppm}/^\circ\text{C}$ 10 ohms and above.

$0 \pm 100\text{ppm}/^\circ\text{C}$ 1 to 10 ohms.

$0 \pm 200\text{ppm}/^\circ\text{C}$ below 1 ohm.

Dielectric Withstanding Voltage 1000 VAC. 500 VAC for 1 watt size.

Overload 10X rated wattage for 5 sec. for 5 watt size and larger. 5X rated wattage for 5 sec. under 5 watt size.

Wattage Rating may be increased by using metal mounting clips as a heat sink. See page 41 for clips.

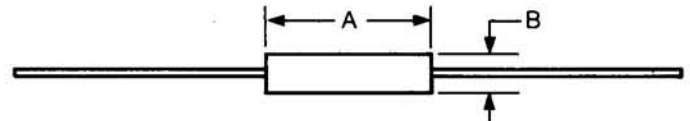
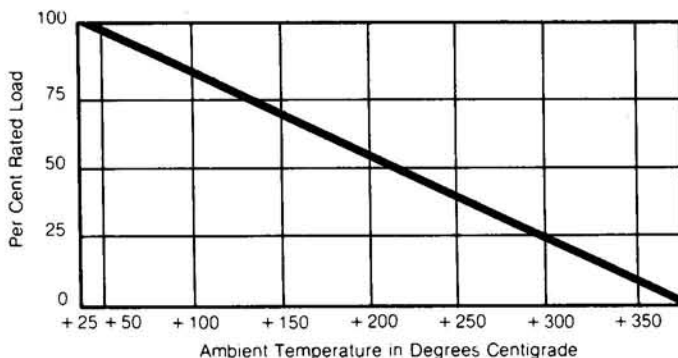
Inductance Standard units have single layer inductive winding. Non-inductive (Aryton Perry or limited inductance) windings available.

Core Steatite ceramic.

Coating Molded vitreous enamel.

Derating

Wattage rating is based on 25°C Free Air Rating. For higher ambient temperatures, use derating chart.



Watts	Type	Resistance Range Min.-Max.	Body Dimensions				Leads 1.5" (38.1 mm) Ga.	Heat Sink Clip No.
			Max. Lgth.—A		Max. Dia.—B			
			In.	MM	In.	MM		
1.5	995-1A	.1—6.65K	.437	11.1	.140	3.6	24	5900
2.25	995-2A	.1—6.49K	.390	9.9	.219	5.6	20	5902
3.25	995-3A	.1—22.1K	.562	14.3	.234	5.9	20	5904
5	995-5B	.1—53.6K	.953	24.2	.234	5.9	20	5906
6.5	995-5A	.1—80.6K	.937	23.8	.343	8.7	20	5905
9	995-7A	.1—118K	1.233	31.3	.343	8.7	20	5907
11	995-10A	.1—187K	1.796	45.6	.343	8.7	20	5908
15	995-15A	.1—243K	2.015	51.2	.425	10.8	20	—

Ordering Data

To specify non-standard resistors.

Typical No. **995 - 3A - 500R0 - J**

OHMITE TYPE NO.
Identifies basic resistor construction.

WATTAGE

1A = 1.5W
2A = 2.25W
3A = 3.25W
5B = 5W
5A = 6.5W
7A = 9W
10A = 11W
15A = 15W

TOLERANCE

C = +.25%
D = +.5%
F = +1%
G = +2%
H = +3%
J = +5% std.
K = +10%

RESISTANCE VALUE

R = Decimal Pt.
K = Decimal Pt. and X1000

Examples

R5000 = .5 ohms
1R000 = 1 ohms
25R00 = 25 ohms
1K000 = 1000 ohms
25K00 = 25000 ohms

Popular values are available from Ohmite stock or from your local authorized Ohmite stocking distributor. Refer to next page.

Series 99

Catalog Numbers for Standard Resistance Values in Stock*



Ohms	1 1/2 Watts	2 1/4 Watts	3 1/4 Watts	5 Watts	11 Watts
1.0	4030	3860	4330	4530	4730
1.1	4031	3861	4331	4531	4731
1.2	4032	3862	4332	4532	4732
1.3	4033	3863	4333	4533	4733
1.5	4034	3864	4334	4534	4734
1.6	4035	3865	4335	4535	4735
1.8	4036	3866	4336	4536	4736
2.0	4037	3867	4337	4537	4737
2.2	4038	3868	4338	4538	4738
2.4	4039	3869	4339	4539	4739
2.7	4041	3871	4341	4541	4741
3.0	4042	3872	4342	4542	4742
3.3	4043	3873	4343	4543	4743
3.6	4044	3874	4344	4544	4744
3.9	4045	3875	4345	4545	4745
4.0	4046	3876	4346	4546	4746
4.3	4047	3877	4347	4547	4747
4.7	4048	3878	4348	4548	4748
5.0	4049	3879	4349	4549	4749
5.1	4050	3880	4350	4550	4750
5.6	4051	3881	4351	4551	4751
6.2	4053	3883	4353	4553	4753
6.8	4054	3884	4354	4554	4754
7.5	4056	3886	4356	4556	4756
8.2	4058	3888	4358	4558	4758
9.1	4060	3890	4360	4560	4760
10	4061	3891	4361	4561	4761
11	4062	3892	4362	4562	4762
12	4063	3893	4363	4563	4763
13	4064	3894	4364	4564	4764
15	4065	3895	4365	4565	4765
16	4066	3896	4366	4566	4766
18	4067	3897	4367	4567	4767
20	4068	3898	4368	4568	4768
22	4069	3899	4369	4569	4769
24	4070	3900	4370	4570	4770
25	4071	3901	4371	4571	4771
27	4072	3902	4372	4572	4772
30	4073	3903	4373	4573	4773
33	4074	3904	4374	4574	4774
35	4074A	3905	4374A	4574A	4774A
36	4075	3906	4375	4575	4775
39	4076	3907	4376	4576	4776
40	4077	3908	4377	4577	4777
43	4078	3909	4378	4578	4778
47	4079	3910	4379	4579	4779
50	4080	3911	4380	4580	4780
51	4081	3912	4381	4581	4781
56	4082	3913	4382	4582	4782
62	4084	3915	4384	4584	4784
68	4085	3916	4385	4585	4785
75	4087	3918	4387	4587	4787
82	4089	3920	4389	4589	4789
91	4091	3922	4391	4591	4791
100	4092	3923	4392	4592	4792
110	4093	3924	4393	4593	4793
120	4094	3925	4394	4594	4794
130	4095	3926	4395	4595	4795
150	4096	3927	4396	4596	4796
160	4097	3928	4397	4597	4797
180	4098	3929	4398	4598	4798
200	4099	3930	4399	4599	4799
220	4100	3931	4400	4600	4800
240	4101	3932	4401	4601	4801
250	4102	3933	4402	4602	4802
270	4103	3934	4403	4603	4803
300	4104	3935	4404	4604	4804
330	4105	3936	4405	4605	4805
350	4105A	3937	4405A	4605A	4805A
360	4106	3938	4406	4606	4806
390	4107	3939	4407	4607	4807
400	4108	3940	4408	4608	4808
430	4109	3941	4409	4609	4809

Ohms	1 1/2 Watts	2 1/4 Watts	3 1/4 Watts	5 Watts	11 Watts
450	4109A	3942	4409A	4609A	4809A
470	4110	3943	4410	4610	4810
500	4111	3944	4411	4611	4811
510	4112	3945	4412	4612	4812
560	4113	3946	4413	4613	4813
600	4114	3947	4414	4614	4814
620	4115	3948	4415	4615	4815
680	4116	3949	4416	4616	4816
700	4117	3950	4417	4617	4817
750	4118	3951	4418	4618	4818
800	4119	3952	4419	4619	4819
820	4120	3953	4420	4620	4820
900	4121	3954	4421	4621	4821
910	4122	3955	4422	4622	4822
1000	4123	3956	4423	4623	4823
1100	4124	3957	4424	4624	4824
1200	4125	3958	4425	4625	4825
1300	4126	3959	4426	4626	4826
1400	4126A	3960	4426A	4626A	4826A
1500	4127	3961	4427	4627	4827
1600	4128	3962	4428	4628	4828
1800	4129	3963	4429	4629	4829
2000	4130	3964	4430	4630	4830
2200	4131	3965	4431	4631	4831
2400	4132	3966	4432	4632	4832
2500	4133	3967	4433	4633	4833
2700	4134	3968	4434	4634	4834
3000	4135	3969	4435	4635	4835
3300			4436	4636	4836
3500			4436A	4636A	4836A
3600			4437	4637	4837
3900			4438	4638	4838
4000			4439	4639	4839
4300			4440	4640	4840
4500			4440A	4640A	4840A
4700			4441	4641	4841
5000			4442	4642	4842
5100			4443	4643	4843
5600			4444	4644	4844
6000			4445	4645	4845
6200			4446	4646	4846
6800			4447	4647	4847
7000			4448	4648	4848
7500			4449	4649	4849
8000			4450	4650	4850
8200			4451	4651	4851
9000			4452	4652	4852
9100			4453	4653	4853
10000			4454	4654	4854
11000				4655	4855
12000				4656	4856
13000				4657	4857
14000				4657A	4857B
15000				4658	4858
16000				4659	4859A
17000				4659B	4859C
18000				4660	4860
20000				4661	4861
22000				4662	4862
24000				4663	4863
25000				4664	4864
27000					4865
30000					4866
33000					4867
35000					4867A
36000					4868
39000					4869
40000					4870
43000					4871
45000					4871A
47000					4872
50000					4873
51000					4874

*Some resistance values may not be carried in stock at all times. See the current OHMITE Component Selector for these non-stock standard items.

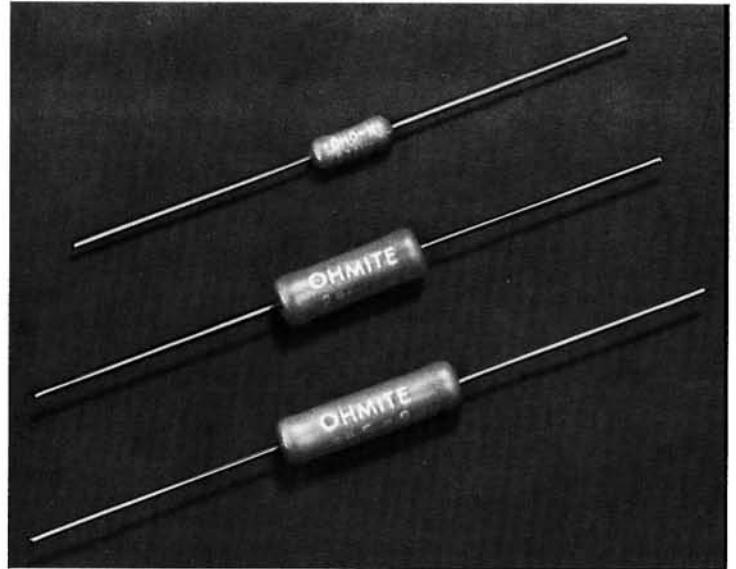
Series 22

Conformal Vitreous Enamel Axial Lead Wirewound Resistors

Features

- Rugged Vitreous Enamel Coating Withstands Severe Humidity and Temperature Cycling
- Economical
- All Welded Construction
- Ideal for Machine Insertion

Advanced conformal vitreous enamel coating protects resistors, even in environments of high heat. These rugged, economical wirewound resistors are recommended for industrial applications where quality construction and reliable operation are prime specifying parameters. MIL-R-26 approved units are available.



Specifications

Tolerance $\pm 5\%$ std. $\pm 1\%$ to $\pm 10\%$ available.

Temperature Coefficient

0 ± 30 ppm/ $^{\circ}\text{C}$ 10 ohms and above.

0 ± 50 ppm/ $^{\circ}\text{C}$ 1 to 9.99 ohms.

0 ± 90 ppm/ $^{\circ}\text{C}$ below 1 ohm.

Dielectric Withstanding Voltage

1000 VAC. (500 VAC for 1 watt type.)

Overload 10X rated wattage for 5 sec. for 5 watt size and larger. 5X rated wattage for 5 sec. under 5 watt size.

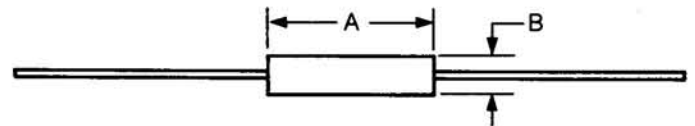
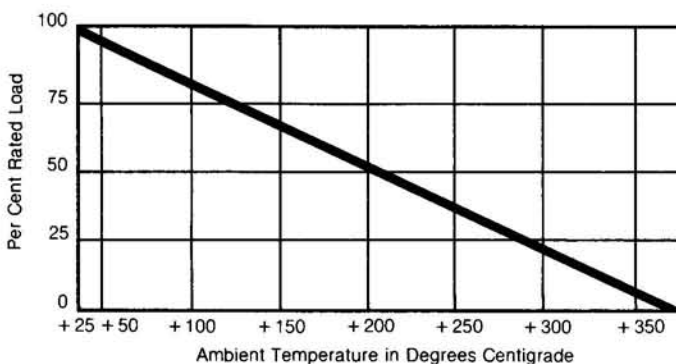
Inductance Standard units have single layer inductive winding. Low inductance windings available.

Core Steatite ceramic.

Coating Conformal vitreous enamel.

Deratings

Wattage ratings are based on 25°C Free Air Rating. For higher ambient temperatures, use derating chart.



Watts	Type	Resistance Range	Body Dimensions				Leads 1.5" (38.1mm) Ga.
			Max. Lgth.—A		Max. Dia.—B		
		Min.-Max.	In.	MM	In.	MM	
1	221	.1—6.1K	.406	10.3	.156	4.0	22
2	222	.1—8.7K	.406	10.3	.219	5.6	20
3	223	.1—22K	.562	14.3	.250	6.4	20
5	225	.1—54K	1.000	25.4	.250	6.4	20
6	226	.1—89K	1.031	26.2	.343	8.7	20
7	227	.1—118K	1.250	31.8	.343	8.7	20
10	220	.1—190K	1.797	45.6	.343	8.7	20
12.5	220P	.1—21K	1.812	46.0	.406	10.3	18

Ordering Data

To specify non-standard resistors

Typical No.

22-1-S-R5000-J

OHMITE SERIES NO.
Identifies basic resistor construction.

WATTAGE

- 1 = 1 W
- 2 = 2 W
- 3 = 3 W
- 5 = 5 W
- 6 = 6 W
- 7 = 7 W
- 0 = 10 W
- OP = 12.5W

MISCELLANEOUS SPECIFICATIONS
S = Standard winding.

TOLERANCE

- F = $\pm 1\%$
- G = $\pm 2\%$
- H = $\pm 3\%$
- J = $\pm 5\%$ std.
- K = $\pm 10\%$

RESISTANCE VALUE

R = Decimal Pt.
K = Decimal Pt. and X1000

Examples:

- R5000 = .5 ohm
- 1R000 = 1 ohm
- 250R0 = 250 ohms
- 1K000 = 1000 ohms
- 25K00 = 25,000 ohms
- 25K50 = 25,500 ohms

For standard resistance values carried in stock see next page.

Series 22

Catalog Number for Standard Resistance Values in Stock*



Ohms	1 Watt	2 Watts	3 Watts	5 Watts	10 Watts	Ohms	1 Watt	2 Watts	3 Watts	5 Watts	10 Watts
1.0	21J1R0	22J1R0	23J1R0	25J1R0	20J1R0	560	21J560	22J560	23J560	25J560	20J560
1.5	21J1R5	22J1R5	23J1R5	25J1R5	20J1R5	600	21J600	22J600	23J600	25J600	20J600
2.0	21J2R0	22J2R0	23J2R0	25J2R0	20J2R0	680	21J680	22J680	23J680	25J680	20J680
2.2	21J2R2	22J2R2	23J2R2	25J2R2	20J2R2	750	21J750	22J750	23J750	25J750	20J750
3.0	21J3R0	22J3R0	23J3R0	25J3R0	20J3R0	800	21J800	22J800	23J800	25J800	20J800
4.0	21J4R0	22J4R0	23J4R0	25J4R0	20J4R0	820	21J820	22J820	23J820	25J820	20J820
5.0	21J5R0	22J5R0	23J5R0	25J5R0	20J5R0	900	21J900	22J900	23J900	25J900	20J900
7.5	21J7R5	22J7R5	23J7R5	25J7R5	20J7R5	1000	21J1K0	22J1K0	23J1K0	25J1K0	20J1K0
10.0	21J10R	22J10R	23J10R	25J10R	20J10R	1100	21J1K1	22J1K1	23J1K1	25J1K1	20J1K1
12.0	21J12R	22J12R	23J12R	25J12R	20J12R	1200	21J1K2	22J1K2	23J1K2	25J1K2	20J1K2
15.0	21J15R	22J15R	23J15R	25J15R	20J15R	1500	21J1K5	22J1K5	23J1K5	25J1K5	20J1K5
18.0	21J18R	22J18R	23J18R	25J18R	20J18R	1800	21J1K8	22J1K8	23J1K8	25J1K8	20J1K8
20.0	21J20R	22J20R	23J20R	25J20R	20J20R	2000	21J2K0	22J2K0	23J2K0	25J2K0	20J2K0
22.0	21J22R	22J22R	23J22R	25J22R	20J22R	2200	21J2K2	22J2K2	23J2K2	25J2K2	20J2K2
25.0	21J25R	22J25R	23J25R	25J25R	20J25R	2500	21J2K5	22J2K5	23J2K5	25J2K5	20J2K5
27.0	21J27R	22J27R	23J27R	25J27R	20J27R	2700	21J2K7	22J2K7	23J2K7	25J2K7	20J2K7
30.0	21J30R	22J30R	23J30R	25J30R	20J30R	3000	21J3K0	22J3K0	23J3K0	25J3K0	20J3K0
33.0	21J33R	22J33R	23J33R	25J33R	20J33R	3300			23J3K3	25J3K3	20J3K3
35.0	21J35R	22J35R	23J35R	25J35R	20J35R	3500			23J3K5	25J3K5	20J3K5
39.0	21J39R	22J39R	23J39R	25J39R	20J39R	3900			23J3K9	25J3K9	20J3K9
40.0	21J40R	22J40R	23J40R	25J40R	20J40R	4000			23J4K0	25J4K0	20J4K0
47.0	21J47R	22J47R	23J47R	25J47R	20J47R	4500			23J4K5	25J4K5	20J4K5
50.0	21J50R	22J50R	23J50R	25J50R	20J50R	4700			23J4K7	25J4K7	20J4K7
56.0	21J56R	22J56R	23J56R	25J56R	20J56R	5000			23J5K0	25J5K0	20J5K0
62.0	21J62R	22J62R	23J62R	35J62R	20J62R	6000			23J6K0	25J6K0	20J6K0
68.0	21J68R	22J68R	23J68R	25J68R	20J68R	6800			23J6K8	25J6K8	20J6K8
75.0	21J75R	22J75R	23J75R	25J75R	20J75R	7000			23J7K0	25J7K0	20J7K0
82.0	21J82R	22J82R	23J82R	25J82R	20J82R	7500			23J7K5	25J7K5	20J7K5
100	21J100	22J100	23J100	25J100	20J100	8000			23J8K0	25J8K0	20J8K0
120	21J120	22J120	23J120	25J120	20J120	9000			23J9K0	25J9K0	20J9K0
125	21J125	22J125	23J125	25J125	20J125	10,000			23J10K	25J10K	20J10K
150	21J150	22J150	23J150	25J150	20J150	12,000				25J12K	20J12K
180	21J180	22J180	23J180	25J180	20J180	13,000					20J13K
200	21J200	22J200	23J200	25J200	20J200	15,000				25J15K	20J15K
220	21J220	22J220	23J220	25J220	20J220	17,000					20J17K
225	21J225	22J225	23J225	25J225	20J225	20,000				25J20K	20J20K
250	21J250	22J250	23J250	25J250	20J250	22,000				25J22K	20J22K
270	21J270	22J270	23J270	25J270	20J270	25,000				25J25K	20J25K
300	21J300	22J300	23J300	25J300	20J300	30,000					20J30K
330	21J330	22J330	23J330	25J330	20J330	33,000					20J33K
390	21J390	22J390	23J390	25J390	20J390	35,000					20J35K
400	21J400	22J400	23J400	25J400	20J400	40,000					20J40K
450	21J450	22J450	23J450	25J450	20J450	50,000					20J50K
470	21J470	22J470	23J470	25J470	20J470						
500	21J500	22J500	23J500	25J500	20J500						

*Some resistance values may not be carried in stock at all times. See the current OHMITE Component Selector for these non-stock standard items.

Note: The above catalog numbers are used for standard stock items only. Do not use this numbering system to order non-standard resistors. See Ordering Data on previous page.

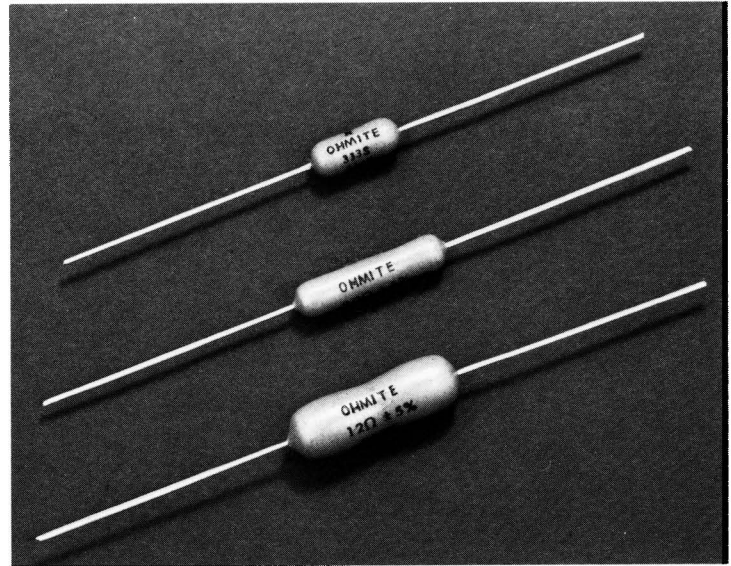
Series 33 Blue Jacket®

Conformal Vitreous Enamel Axial Lead Wirewound Resistors

Features

- Vitreous Enamel Coating Withstands High Humidity Environments.
- Welded Construction
- Ideal for Printed Circuit Boards

This quality wirewound resistor is used where reliability and good performance are required. Used in business machines, medical electronic equipment, telephone and radio communications equipment.



Specifications

Tolerance $\pm 5\%$ std. $\pm 1\%$ to $\pm 10\%$ available.

Temperature Coefficient

- $0 \pm 30\text{ppm} / ^\circ\text{C}$ 10 ohms and above.
- $0 \pm 50\text{ppm} / ^\circ\text{C}$ 1 ohm to 9.99 ohms.
- $0 \pm 90\text{ppm} / ^\circ\text{C}$ below 1 ohm.

Dielectric Withstanding Voltage

1000 VAC. (500 VAC for 1 watt type.)

Overload 10X rated wattage for 5 sec. for 5 watt size and larger. 5X rated wattage for 5 sec. under 5 watt size.

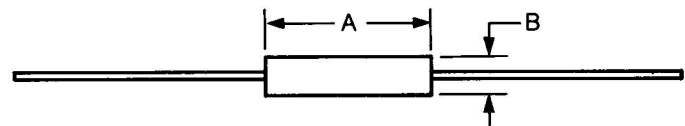
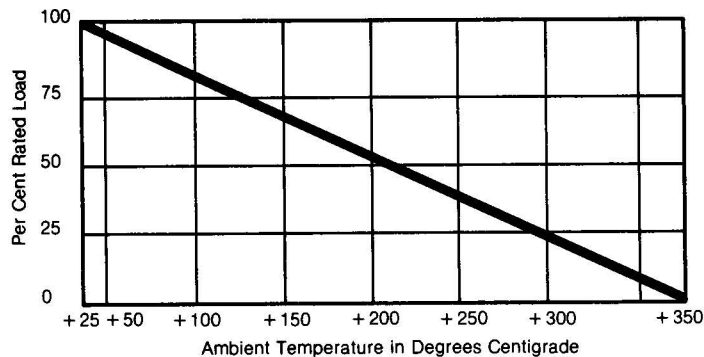
Inductance Standard units have single layer inductive windings.

Core Steatite ceramic.

Coating Conformal vitreous enamel.

Deratings

Wattage ratings are based on 25°C Free Air Rating. For higher ambient temperatures, use derating chart.



Watts	Type	Resistance Range	Body Dimensions				Leads 1.5" (38.1mm) Ga.
			Max. Lgth.—A		Max. Dia.—B		
			In.	MM	In.	MM	
1	331	.1—6.1K	.406	10.3	.156	4.0	22
2	332	.1—8.7K	.406	10.3	.219	5.6	20
3	333	.1—22K	.562	14.3	.250	6.4	20
5	335	.1—54K	1.000	25.4	.250	6.4	20
6	336	.1—80K	1.031	26.2	.343	8.7	20
7	337	.1—118K	1.250	31.8	.343	8.7	20
10	330	.1—190K	1.797	45.6	.343	8.7	20

*Blue Jacket is a registered trade name of Ohmite Mfg. Co.

Ordering Data

To specify resistors see below. Available only as "made to order" items

Typical No.

33-1-S-R5000-J

OHMITE SERIES NO.
Identifies basic resistor construction.

WATTAGE

- 1 = 1 W
- 2 = 2 W
- 3 = 3 W
- 5 = 5 W
- 6 = 6 W
- 7 = 7 W
- 0 = 10 W

MISCELLANEOUS SPECIFICATIONS

S = Standard winding.

TOLERANCE

- F = $\pm 1\%$
- G = $\pm 2\%$
- H = $\pm 3\%$
- J = $\pm 5\%$ std.
- K = $\pm 10\%$

RESISTANCE VALUE

R = Decimal Pt.
K = Decimal Pt. and X1000

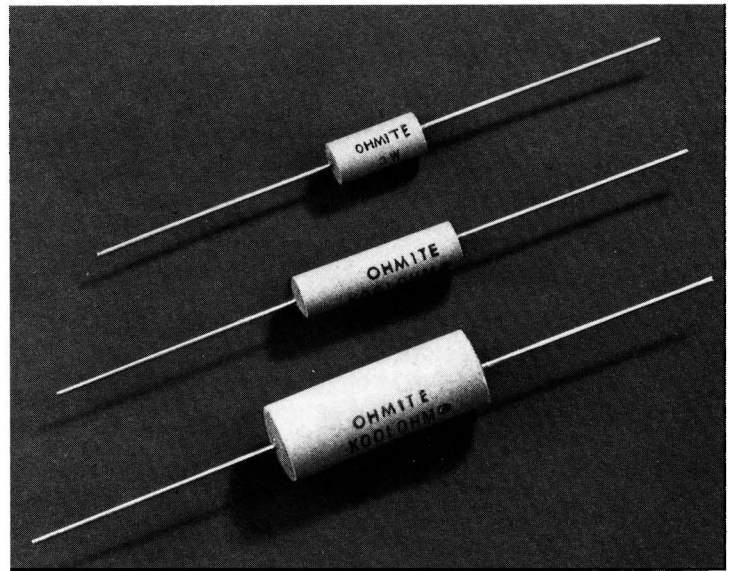
Examples:

- R5000 = .5 ohm
- 1R000 = 1 ohm
- 250R0 = 250 ohms
- 1K000 = 1000 ohms
- 25K00 = 25,000 ohms
- 25K50 = 25,500 ohms



Features

- Moisture-proof Construction
- All Welded Construction
- Tubular Ceramic Outer Shell For High Voltage Insulation and Excellent Mechanical Protection.

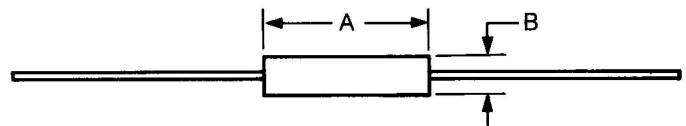
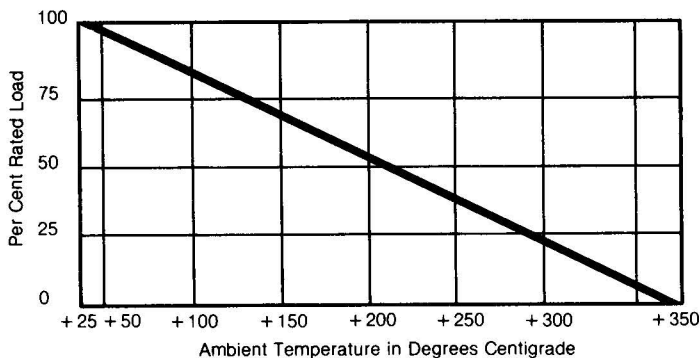


Specifications

Tolerance $\pm 5\%$ std. $\pm 10\%$ also available.
 Temperature Coefficient 0 ± 260 ppm per degree centigrade.
 Dielectric Withstanding Voltage 1000 volts AC.
 Overload 10X rated wattage for 5 seconds.
 Inductance Standard units have single layer inductive winding. Non-inductive (Aryton Perry or limited inductance) windings available.
 Core Steatite ceramic
 Protective Cover Tubular ceramic housing with silicone cement end seals.

Deratings

Wattage ratings are based on 25°C Free Air Rating. For higher ambient temperatures, use derating chart.



Watts	Type	Resistance Range Min.-Max.	Body Dimensions				Leads 1.5" (38.1mm) Ga.
			Max. Lgth.—A		Max. Dia.—B		
			In.	MM	In.	MM	
2	77A	1.0—3K	.468	11.9	.249	6.3	20
3	77B	1.0—10K	.624	15.8	.280	7.1	20
5	77C	1.0—20K	1.062	27.0	.280	7.1	20
7	77D	1.0—40K	1.374	34.9	.499	12.7	20
10	77E	1.0—70K	2.093	53.2	.499	12.7	20
14	77F	1.0—20K	2.093	53.2	.499	12.7	20

*KOOLOHM is a registered trade name of Ohmite Mfg. Co.

Ordering Data

To specify resistors see below. Available only as "made to order" items.

Typical No. **77-A-S-R5000-J**

OHMITE SERIES NO. Identifies basic resistor construction.	WATTAGE A = 2 W B = 3 W C = 5 W D = 7 W E = 10 W F = 14 W	TOLERANCE J = $\pm 5\%$ std. K = $\pm 10\%$
MISCELLANEOUS SPECIFICATIONS S = Standard winding. N = Non-inductive winding.	RESISTANCE VALUE R = Decimal Pt. K = Decimal Pt. and X1000 Examples: R5000 = .5 ohm 1R000 = 1 ohm 250R0 = 250 ohms 1K000 = 1000 ohms 25K00 = 25,000 ohms 25K50 = 25,500 ohms	

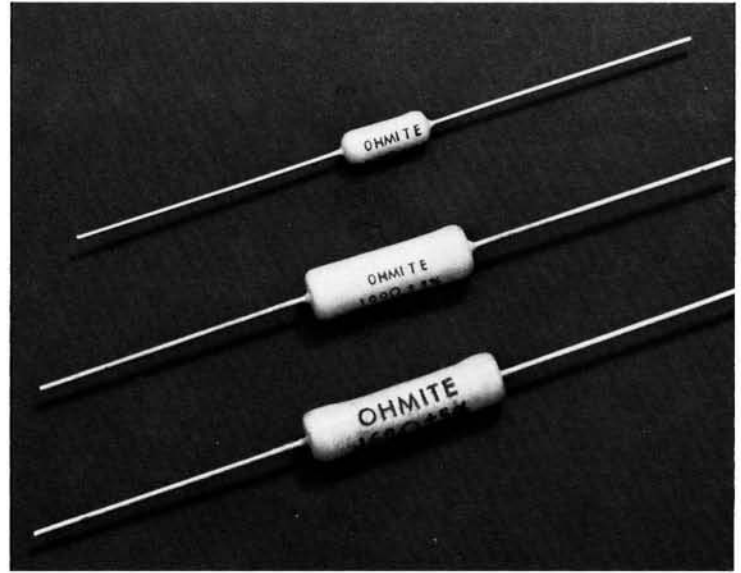
Series 44 OHMICONE®

Conformal Silicone Ceramic Axial Lead Wirewound Resistors

Features

- Economically Priced
- Ohmicone Silicone-Ceramic Coated
- MIL-R-26 Approved Units Available
- Low Temperature Coefficient
- All Welded Construction
- Ideal for Machine Insertion

Series 44 Ohmicone conformal silicone ceramic power resistors are designed for a wide range of commercial, industrial, and communications equipment. Primary specifying features are excellent economy and low T.C.



Specifications

Tolerance $\pm 1\%$ and $\pm 5\%$ std. $\pm .05\%$ to $\pm 10\%$ available.

Temperature Coefficient

$0 \pm 20\text{ppm}/^\circ\text{C}$ 10 ohms and above.

$0 \pm 50\text{ppm}/^\circ\text{C}$ 1 to 10 ohms.

$0 \pm 90\text{ppm}/^\circ\text{C}$ below 1 ohm.

Dielectric Withstanding Voltage 500 V. (250 V for 1 watt size.) 1000 V available.

Overload 10X rated wattage for 5 sec. for 5 watt size and larger. 5X rated wattage for 5 sec. under 5 watt size.

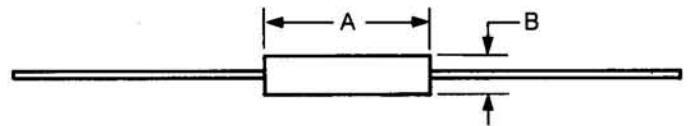
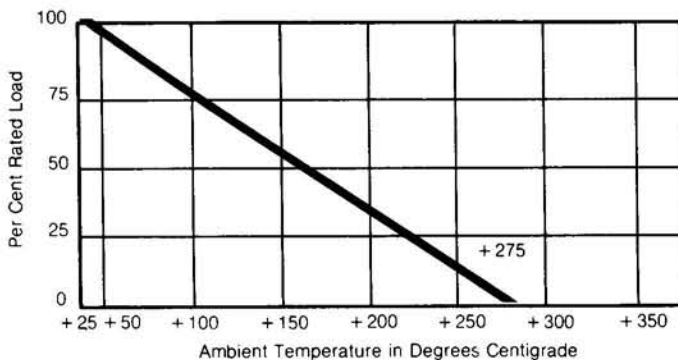
Inductance Standard units have single layer inductive winding. Non-inductive (Aryton Perry or limited inductance) windings available.

Core Steatite ceramic.

Coating Conformal silicone ceramic.

Deratings

Wattage ratings are based on 25°C Free Air Rating. For higher ambient temperatures, use derating chart.



Watts	Type	Resistance Range	Body Dimensions				Leads 1.5" (38.1mm) Ga.
			Max. Lgth.—A		Max. Dia.—B		
		Min.-Max.	In.	MM	In.	MM	
1	441	.5—6.7K	.437	9.4	.125	3.2	22
2	442	.1—8.7K	.406	10.3	.219	5.6	20
3	443	.1—22.1K	.563	14.3	.250	6.4	20
5	445	.1—81.4K	.937	23.8	.343	8.7	18
7	447	.1—119K	1.250	31.8	.343	8.7	18
10	440	.1—223K	1.843	46.8	.406	10.3	18

*OHMICONE is a registered trade mark of Ohmite Mfg. Co.

Ordering Data

To specify non-standard resistors

Typical No.

44-1-S-R5000-J

OHMITE SERIES NO.
Identifies basic resistor construction.

WATTAGE

- 1 = 1 W
- 2 = 2 W
- 3 = 3 W
- 5 = 5 W
- 7 = 7 W
- 0 = 10 W

MISCELLANEOUS SPECIFICATIONS

- S = Standard winding.
- N = Non-inductive winding.

TOLERANCE

- A = $\pm .05\%$
- B = $\pm .1\%$
- W = $\pm .125\%$
- C = $\pm .25\%$
- D = $\pm .5\%$
- F = $\pm 1\%$ std.
- G = $\pm 2\%$
- H = $\pm 3\%$
- J = $\pm 5\%$ std.
- K = $\pm 10\%$

Not available for non-inductive type

RESISTANCE VALUE

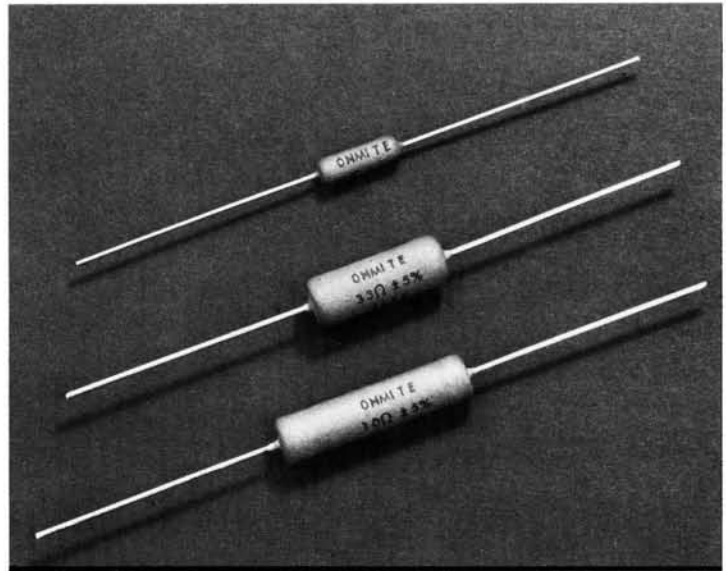
- R = Decimal Pt.
- K = Decimal Pt. and X1000

Examples:

- R5000 = .5 ohm
- 1R000 = 1 ohm
- 250R0 = 250 ohms
- 1K000 = 1000 ohms
- 25K00 = 25,000 ohms
- 25K50 = 25,500 ohms

Features

- Low Temperature Coefficient
- High Dielectric Strength
- MIL-R-26 Approved Units Available
- All Welded Construction
- Ideal for Machine Insertion
- High Reliability



Specifications

Tolerance $\pm 1\%$ std. $\pm .05\%$ to $\pm 10\%$ available.

Temperature Coefficient

- $\pm 20\text{ppm}/^\circ\text{C}$ 10 ohms and above.
- $\pm 50\text{ppm}/^\circ\text{C}$ 1 to 9.99 ohms.
- $\pm 90\text{ppm}/^\circ\text{C}$ less than 1 ohm.

Dielectric Withstanding Voltage 1000 VAC. (500 VAC for 1 watt size.)

Overload 10X rated wattage for 5 seconds for 5 watt size and larger. 5X rated wattage for under 5 watt size.

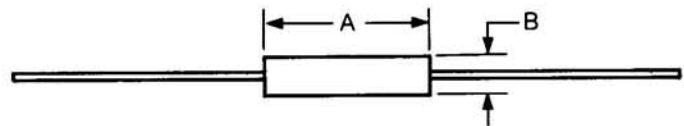
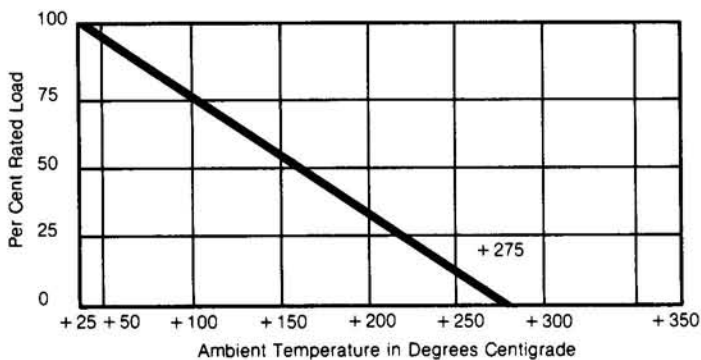
Inductance Standard units have single layer inductive winding. Non-inductive (Aryton Perry or limited inductance) windings available.

Core Steatite ceramic

Coating Conformal silicone

Deratings

Wattage ratings are based on 25°C Free Air Rating. For higher ambient temperatures, use derating chart.



Watts	Type	Resistance Range	Body Dimensions				Leads 1.5" (38.1mm) Ga.
			Min.-Max.	Max. Lgth.—A In.	Max. Lgth.—A MM	Max. Dia.—B In.	
1.25	551P	.5—6.7K	.437	.94	.125	3.2	24
2	552	.1—8.7K	.406	10.3	.219	5.6	20
3	553	.1—22.1K	.563	14.3	.250	6.4	20
5	555	1.0—7.5 K	.937	23.8	.343	8.7	18
7	557	1.0—119K	1.280	32.5	.343	8.7	18
10	550	1.0—223K	1.843	46.8	.406	10.3	18

*ACRASIL is a registered trade mark of Ohmite Mfg. Co.

Ordering Data

To specify resistors see below. Available only as "made to order" items.

Typical No. **55-1-S-R5000-J**

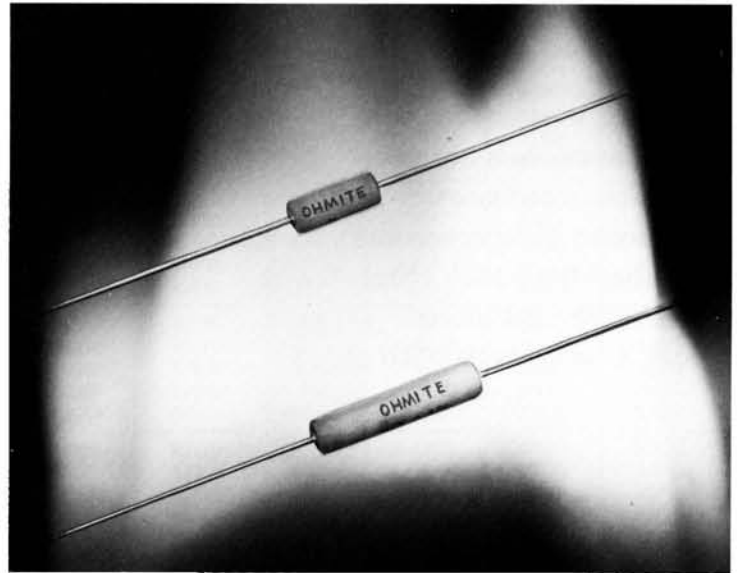
OHMITE SERIES NO. Identifies basic resistor construction.	WATTAGE 1P = 1.25W 2 = 2 W 3 = 3 W 5 = 5 W 7 = 7 W 0 = 10 W	TOLERANCE A = $\pm .05\%$ B = $\pm .1\%$ W = $\pm .125\%$ C = $\pm .25\%$ D = $\pm .5\%$ F = $\pm 1\%$ G = $\pm 2\%$ H = $\pm 3\%$ J = $\pm 5\%$ std. Not available for non-inductive type
MISCELLANEOUS SPECIFICATIONS S = Standard winding. N = Non-inductive winding.	RESISTANCE VALUE R = Decimal Pt. K = Decimal Pt. and X1000 Examples: R5000 = .5 ohm 1R000 = 1 ohm 250R0 = 250 ohms 1K000 = 1000 ohms 25K00 = 25,000 ohms 25K50 = 25,500 ohms	



Features

- Flameproof—WILL NOT IGNITE from any Overload or Exposure to Open Flame
- Ideal for Applications Where High Overloads Could Result in Flaming or Body Deterioration
- All Welded Construction
- Ideal for Machine Insertion

A unique coating on a rugged power wirewound resistor for a spectrum of applications where non-flamability is absolutely essential. Designed for use in data processing equipment, communications equipment, electrically controlled apparatus, medical and home entertainment equipment . . . and similar demanding applications.



Specifications

Tolerance $\pm 5\%$ std. $\pm 1\%$ to $\pm 10\%$ available.

Temperature Coefficient

- $0 \pm 30\text{ppm} / ^\circ\text{C}$ 10 ohms and above.
- $0 \pm 50\text{ppm} / ^\circ\text{C}$ 1 ohm to 9.99 ohms.
- $0 \pm 90\text{ppm} / ^\circ\text{C}$ below 1 ohm.

Dielectric Withstanding Voltage 500 VAC. (250 VAC for 1 and 2 watt sizes.) 1000 VAC available for 3 thru 10 watt sizes.

Overload 5X rated wattage for 3 sec.

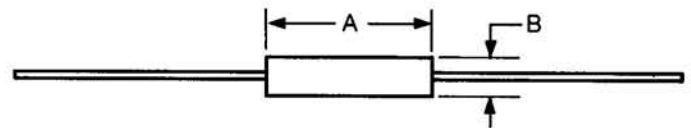
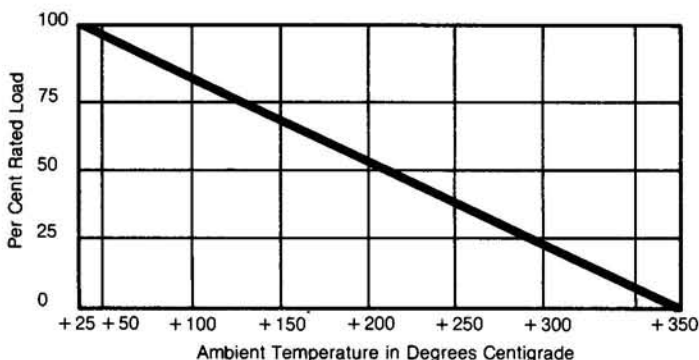
Inductance Standard units have single layer inductive winding. Non-inductive (Aryton Perry or limited inductance) windings available.

Core Steatite Ceramic

Coating Flameproof conformal ceramic

Deratings

Wattage ratings are based on 25°C Free Air Rating. For higher ambient temperatures, use derating chart.



Watts	Type	Resistance Range Min.-Max.	Body Dimensions				Leads 1.5" (38.1mm) Ga.
			Max. Lgth.—A		Max. Dia.—B		
			In.	MM	In.	MM	
1	571	1.0—3K	.406	10.3	.156	4.0	22
2	572	1.0—4K	.406	10.3	.219	5.6	20
3	573	1.0—12K	.562	14.3	.234	5.9	20
5	575	1.0—30K	1.000	25.4	.234	5.9	20
7	577	1.0—50K	1.094	27.8	.343	8.7	20
10	570	1.0—60K	1.813	46.1	.343	8.7	20

*CERON is a registered trade name of Ohmite Mfg. Co.

Ordering Data

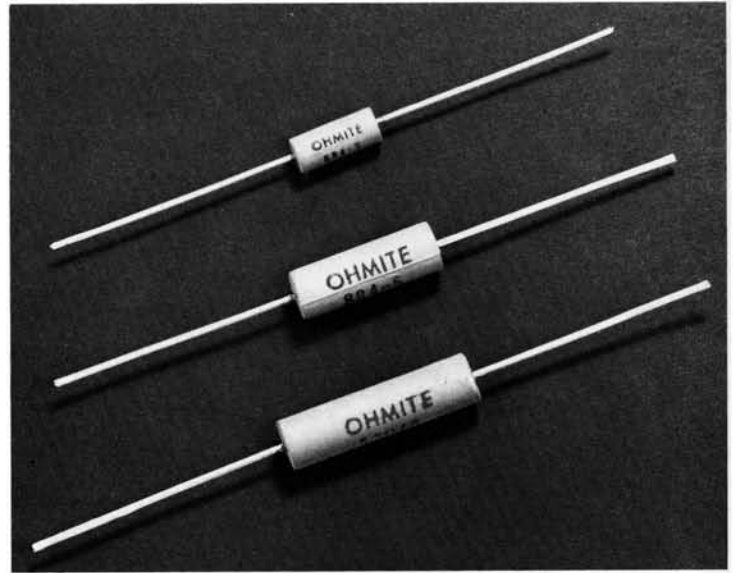
To specify resistors see below. Available only as "made to order" items

Typical No. **57-1-S-R5000-J**

OHMITE SERIES NO. Identifies basic resistor construction.	WATTAGE 1 = 1 W 2 = 2 W 3 = 3 W 5 = 5 W 7 = 7 W 0 = 10 W	TOLERANCE F = $\pm 1\%$ G = $\pm 2\%$ H = $\pm 3\%$ J = $\pm 5\%$ std. K = $\pm 10\%$
MISCELLANEOUS SPECIFICATIONS S = Standard winding. N = Non-inductive winding.	RESISTANCE VALUE R = Decimal Pt. K = Decimal Pt. and X1000 Examples: R5000 = .5 ohms 1R000 = 1 ohm 250R0 = 250 ohms 1K000 = 1000 ohms 25K00 = 25,000 ohms 25K50 = 25,500 ohms	

Features

- Molded Construction—Designed for High Stability, Precision Power Applications
- Low Temperature Coefficient
- 1% Tolerance Standard
- All Molded Construction for Uniform Sizes
- Excellent Breakdown Voltage Rating
- All Welded Construction
- Ideal for Machine Insertion



Specifications

Tolerance $\pm 1\%$ std. $\pm .05\%$ to $\pm 10\%$ available.

Temperature Coefficient
 $\pm 20\text{ppm}/^\circ\text{C}$ 10 ohms and above
 $\pm 50\text{ppm}/^\circ\text{C}$ 1 to 9.99 ohms
 $\pm 90\text{ppm}/^\circ\text{C}$ below 1 ohm

Dielectric Withstanding Voltage 1000 VAC. (500 VAC for 1 watt type.)

Overload 10X rated wattage for 5 sec. for 5 watt size and larger. 5X rated wattage for 5 sec. under 5 watt size.

Wattage See table. Wattage may be increased by using metal mounting clips as a heat sink. See page 41 for clips.

Stability Load life delta R of 0.5% for 2000 hours.

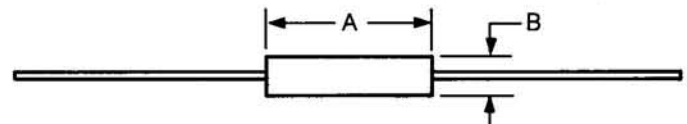
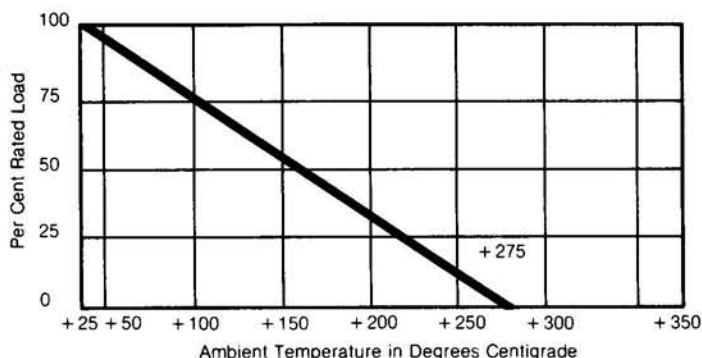
Inductance Standard units have single layer inductive winding. Non-inductive (Aryton Perry or limited inductance) windings available.

Core Steatite Ceramic

Coating Molded Silicone ceramic

Deratings

Wattage ratings are based on 25°C Free Air Rating. For higher ambient temperatures, use derating chart.



Watts	Type	Resistance Range Min.-Max.	Body Dimensions				Leads 1.5" (38.1 mm) Ga.	Heat Sink Clip No.
			Max. Lgth.—A		Max. Dia.—B			
			In.	MM	In.	MM		
1	884-1A	.1—10.8K	.437	11.1	.125	3.2	24	5900
2	884-2	.1—10.6K	.395	10.0	.208	5.3	20	5902
3	884-3	.1—35.6K	.562	14.3	.250	6.4	20	5904
5	884-5	.1—129K	.937	23.8	.343	8.7	18	5905
7	884-7	.1—188K	1.238	31.4	.343	8.7	18	5907
10	884-10	.1—319K	1.843	46.8	.363	9.2	18	5909

*RITEOHM is a registered trade name of Ohmite Mfg. Co.

Ordering Data

To specify resistors, see below for non-standard resistor values.

Typical No. **884-1-S-R5000-F**

OHMITE TYPE NO. Identifies basic resistor construction.	WATTAGE 1A = 1 W 2 = 2 W 3 = 3 W 5 = 5 W 7 = 7 W 10 = 10 W	TOLERANCE F = $\pm 1\%$ G = $\pm 2\%$ H = $\pm 3\%$ J = $\pm 5\%$ std. K = $\pm 10\%$
MISCELLANEOUS SPECIFICATIONS S = Standard winding. N = Non-inductive winding.	RESISTANCE VALUE R = Decimal Pt. K = Decimal Pt. and X1000 Examples: R5000 = .5 ohm 1R000 = 1 ohm 250R0 = 250 ohms 1K000 = 1000 ohms 25K00 = 25,000 ohms 25K50 = 25,500 ohms	

For standard resistor values carried in stock see next page.

Series 88 RITEOHM®

Catalog Numbers for Standard Resistance Values.



Ohms	3 Watts	5 Watts	10 Watts	Ohms	3 Watts	5 Watts	10 Watts	Ohms	3 Watts	5 Watts	10 Watts
.100	80013	80015	80010	56.2	81853	81855	81850	2000	83343	83345	83340
.121	80023	80025	80020	59.0	81873	81875	81870	2150	83373	83375	83370
.150	80033	80035	80030	60.4	81883	81885	81880	2210	83383	83385	83380
.200	80053	80055	80050	61.9	81893	81895	81890	2260	83393	83395	83390
.221	80063	80065	80060	68.1	81933	81935	81930	2430	83423	83425	83420
.249	80073	80075	80070	75.0	81973	81975	81970	2490	83433	83435	83430
.274	80083	80085	80080	82.5	82013	82015	82010	2740	83473	83475	83470
.392	80103	80105	80100	88.7	82043	82045	82040	2940	83503	83505	83500
.475	80113	80115	80110	90.9	82053	82055	82050	3010	83513	83515	83510
.499	80123	80125	80120	100	82093	82095	82090	3090	83523	83525	83520
.681	80143	80145	80140	115	82153	82155	82150	3160	83533	83535	83530
.750	80153	80155	80150	121	82173	82175	82170	3240	83543	83545	83540
.825	80163	80165	80160	130	82203	82205	82200	3320	83553	83555	83550
1.00	80173	80175	80170	150	82263	82265	82260	3480	83573	83575	83570
1.10	80213	80215	80210	162	82293	82295	82290	3920	83623	83625	83620
1.21	80253	80255	80250	169	82313	82315	82310	4020	83633	83635	83630
1.43	80323	80325	80320	174	82323	82325	82320	4750	83703	83705	83700
1.50	80343	80345	80340	178	82333	82335	82330	4870	83713	83715	83710
1.58	80363	80365	80360	182	82343	82345	82340	4990	83723	83725	83720
1.82	80423	80425	80420	200	82383	82385	82380	5110	83733	83735	83730
2.00	80463	80465	80460	205	82393	82395	82390	5490	83763	83765	83760
2.21	80503	80505	80500	215	82413	82415	82410	5620	83773	83775	83770
2.49	80553	80555	80550	221	82423	82425	82420	6040	83803	83805	83800
2.74	80593	80595	80590	249	82473	82475	82470	6190	83813	83815	83810
3.01	80633	80635	80630	255	82483	82485	82480	6650	83843	83845	83840
3.32	80673	80675	80670	274	82513	82515	82510	6810	83853	83855	83850
4.02	80753	80755	80750	301	82553	82555	82550	6980	83863	83865	83860
4.42	80793	80795	80790	332	82593	82595	82590	7500	83893	83895	83890
4.53	80803	80805	80800	340	82603	82605	82600	8060	83923	83925	83920
4.99	80843	80845	80840	365	82633	82635	82630	8250	83933	83935	83930
5.11	80853	80855	80850	374	82643	82645	82640	8870	83963	83965	83960
6.19	80933	80935	80930	383	82653	82655	82650	10,000	84013	84015	84010
6.81	80973	80975	80970	392	82663	82665	82660	15,000	84183 †	84185	84180
7.50	81013	81015	81010	402	82673	82675	82670	20,000	84303 †	84305	84300
8.06	81043	81045	81040	432	82703	82705	82700	20,500	84313 †	84315	84310
9.09	81093	81095	81090	453	82723	82725	82720	22,100	84343 †	84345	84340
10.0	81133	81135	81130	475	82743	82745	82740	23,700		84375	84370
11.0	81173	81175	81170	499	82763	82765	82760	24,900		84395	84390
12.1	81213	81215	81210	511	82773	82775	82770	25,500		84405	84400
13.0	81243	81245	81240	562	82813	82815	82810	27,400		84435	84430
14.0	81273	81275	81270	604	82843	82845	82840	30,100		84475	84470
15.0	81303	81305	81300	619	82853	82855	82850	34,000		84525	84520
18.2	81383	81385	81380	681	82893	82895	82890	36,500		84555	84550
20.0	81423	81425	81420	715	82913	82915	82910	40,200		84595	84590
22.1	81463	81465	81460	750	82933	82935	82930	43,200		84625 †	84620
24.3	81503	81505	81500	806	82963	82965	82960	45,300		84645 †	84640
24.9	81513	81515	81510	825	82973	82975	82970	47,500		84665 †	84660
27.4	81553	81555	81550	909	83013	83015	83010	49,900		84685 †	84680
30.1	81593	81595	81590	953	83033	83035	83030	51,500		84695 †	84690
33.2	81633	81635	81630	1000	83053	83055	83050	80,600		84885 †	84880
34.8	81653	81655	81650	1100	83093	83095	83090	82,500			84890
38.3	81693	81695	81690	1180	83123	83125	83120	90,900			84930
39.2	81703	81705	81700	1300	83163	83165	83160	100,000			84970
40.2	81713	81715	81710	1470	83213	83215	83210	150,000			85140 †
43.2	81743	81745	81740	1500	83223	83225	83220	174,000			85200 †
47.5	81783	81785	81780	1620	83253	83255	83250	200,000			85260 †
49.9	81803	81805	81800	1780	83293	83295	83290				
51.1	81813	81815	81810	1820	83303	83305	83300				

† These values correspond to limiting maximum voltages of 200, 460, and 1100 for the 3, 5 and 10W sizes respectively.



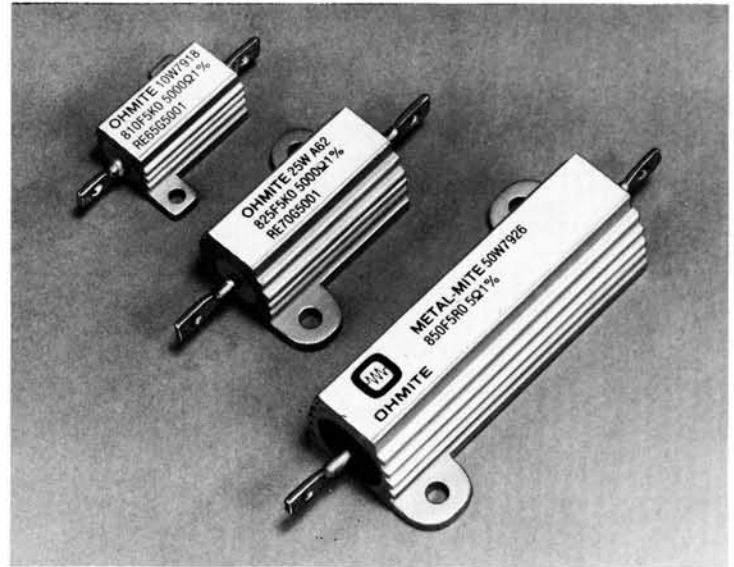
Uniform shape of Riteohms permits clip mounting for extra heat dissipation. The wattage capability can be increased by as much as 100% when clip is mounted to a metal surface. See page 41 for clip ordering information.

*Some resistance values may not be carried in stock at all times. See the current OHMITE Component Selector for these non-stock standard items.

Series 89 METAL-MITE®

Features

- Molded Construction Provides Protection from Humidity.
- High Stability.
- Small Size for Power Rating.
- Aluminum Housing Provides for Chassis Mounting and Heat Sink Capability.
- Withstands Vibration and Shock.
- MIL-R-18546 Approved Units Available.



Specifications

Tolerance $\pm 1\%$ std. $\pm 0.05\%$ to $\pm 10\%$ available.

Temperature Coefficient

0 ± 20 ppm/ $^{\circ}\text{C}$ 10 ohms and over

0 ± 50 ppm/ $^{\circ}\text{C}$ 1 to 10 ohms

0 ± 90 ppm/ $^{\circ}\text{C}$ under 1 ohm.

Dielectric Withstanding Voltage

1000 VAC 5 and 10 watt sizes.

2000 VAC 25 and 50 watt sizes.

Overload 10X rated wattage for 5 seconds.

Stability $\pm 1\% + .05$ ohm Delta R max in 1000 hours.

Inductance Standard units have single layer inductive winding. Non-inductive (Aryton Perry or limited inductance) windings available.

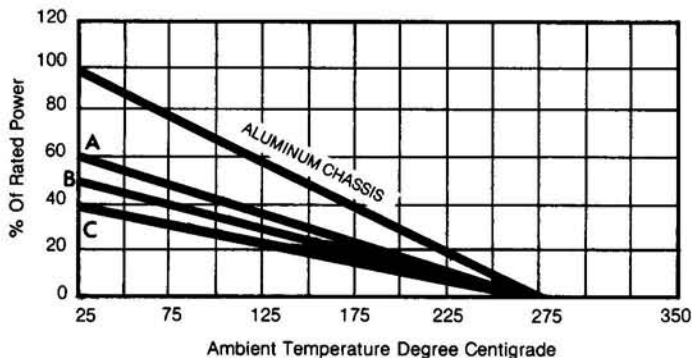
Core Steatite ceramic.

Housing Anodized aluminum.

Derating

Series 89 resistors have an operating temperature range of -55°C . to $+275^{\circ}\text{C}$. Derating is required for reduced chassis mounting area and high ambient temperatures. The following curves apply to operation of unmounted resistors.

A = 5 and 10 watt units B = 25 watt units C = 50 watt units



Power Rating

Power rating is based on chassis mounting area and stability. Proper Heat Sink:

4" x 6" x 2" x .040" aluminum chassis for 5 and 10 watt units.

5" x 7" x 2" x 0.40" aluminum chassis for 25 watt units.

12" x 12" x .059" aluminum panel for 50 watt units.

Ordering Data

To specify resistors, see below for non-standard resistance values.

Typical No.

89-05-S-R5000-B

OHMITE SERIES NO.
Identifies basic resistor construction.

WATTAGE

05 = 5 watts
10 = 10 watts
25 = 25 watts
50 = 50 watts

MISCELLANEOUS SPECIFICATIONS

S = Standard winding.
N = Non-inductive winding.

TOLERANCE

A = $\pm .05\%$
B = $\pm .1\%$
W = $\pm .125\%$
C = $\pm .25\%$
D = $\pm .5\%$
F = $\pm 1\%$ std.
G = $\pm 2\%$
H = $\pm 3\%$
J = $\pm 5\%$

Not available for non-inductive types

RESISTANCE VALUE

R = Decimal Pt.
K = Decimal Pt. and X1000

Examples:

R5000 = .5 ohms
1R000 = 1 ohms
250R0 = 250 ohms
1K000 = 1000 ohms
25K00 = 25,000 ohms
25K50 = 25,500 ohms

Series 89 METAL-MITE

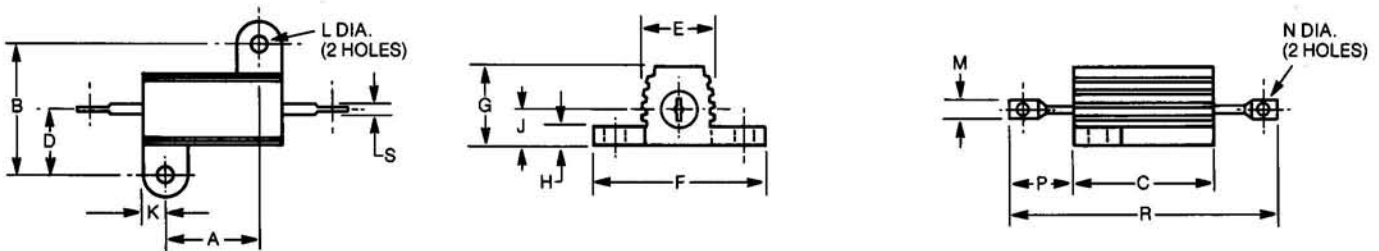
Catalog Numbers for Standard Resistance Values* 1% Tolerance



Ohms	5 Watts	10 Watts	25 Watts	50 Watts	Ohms	5 Watts	10 Watts	25 Watts	50 Watts
1	805F1R0	810F1R0	825F1R0	850F1R0	500	805F500	810F500	825F500	850F500
1.5	805F1R5	810F1R5			750	805F750	810F750	825F750	850F750
2.0	805F2R0	810F2R0	825F2R0	850F2R0	1000	805F1K0	810F1K0	825F1K0	850F1K0
3.0	805F3R0	810F3R0	825F3R0	850F3R0	1500	805F1K5	810F1K5	825F1K5	850F1K5
4.0	805F4R0	810F4R0			2000	805F2K0	810F2K0	825F2K0	850F2K0
5.0	805F5R0	810F5R0	825F5R0	850F5R0	2500	805F2K5	810F2K5		
10.0	805F10R	810F10R	825F10R	850F10R	3000	805F3K0	810F3K0	825F3K0	850F3K0
15.0	805F15R	810F15R	825F15R	850F15R	3500	805F3K5	810F3K5		
20.0	805F20R	810F20R			4000	805F4K0	810F4K0		
25.0	805F25R	810F25R	825F25R	850F25R	4500	805F4K5	810F4K5		
30.0	805F30R	810F30R			5000	805F5K0	810F5K0	825F5K0	850F5K0
40.0	805F40R	810F40R			6000	805F6K0	810F6K0		
50.0	805F50R	810F50R	825F50R	850F50R	10,000	805F10K	810F10K	825F10K	850F10K
75.0	805F75R	810F75R	825F75R	850F75R	15,000	805F15K	810F15K	825F15K	850F15K
100	805F100	810F100	825F100	850F100	20,000	805F20K	810F20K		
150	805F150	810F150	825F150	850F150	25,000	805F25K	810F25K	825F25K	850F25K
200	805F200	810F200	825F200	850F200	50,000		810F50K		
250	805F250	810F250	825F250	850F250	75,000			825F75K	
300	805F300	810F300			100,000				850F100K
400	805F400	810F400							

*Some resistance values may not be carried in stock at all times. See the current OHMITE Component Selector for these non-stock standard items.

Dimensions



Dimensions (Inches)

Wattage Size	Ohms Range	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	
		±.005	±.005	±.031	±.0025	±.015	±.015	±.015	±.010	±.015	±.010	±.005	Min.	±.005	±.062	±.062	Min. AWG	
RE60G	5†	0.1—29.5K	.444	.490	.600	.245	.334	.646	.320	.060	.156	.078	.093	.085	.050	.266	1.125	16
RE65G	10†	0.1—66.2K	.562	.625	.750	.312	.420	.800	.390	.075	.183	.093	.093	.140	.086	.312	1.375	12
RE70G	20††	0.1—145K	.719	.781	1.062	.391	.550	1.080	.546	.088	.231	.172	.125	.140	.086	.438	1.938	12
RE75G	30††	0.1—407K	1.563	.844	1.968	.422	.630	1.140	.610	.088	.260	.196	.125	.140	.086	.438	2.781	12

Dimensions (Metric)

Wattage Size	Ohms Range	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	
		±.127	±.127	±.787	±.064	±.381	±.381	±.381	±.254	±.381	±.254	±.127	Min.	±.127	±.158	±.158	Diam	
RE60G	5†	0.1—29.5K	11.28	12.45	15.24	6.22	8.48	16.41	8.13	1.52	3.90	1.98	2.36	2.16	1.27	6.76	28.58	1.29
RE65G	10†	0.1—66.2K	14.27	15.88	19.05	7.93	10.67	20.32	9.91	1.90	4.65	2.36	3.56	2.18	7.92	34.93	2.05	
RE70G	20††	0.1—145K	18.26	19.84	26.97	9.93	13.97	27.43	13.87	2.24	2.54	4.37	3.18	3.56	2.18	11.13	49.23	2.05
RE75G	30††	0.1—407K	39.70	21.44	49.99	10.72	16.00	28.96	15.49	2.24	2.54	4.98	3.18	3.56	2.18	11.13	70.64	2.05

For additional information on Mil-R-Type resistors, consult factory.

†Can be rated 7.5 and 12.5 watts respectively.
 ††Rated 25 and 50 watts, respectively, by Ohmite.

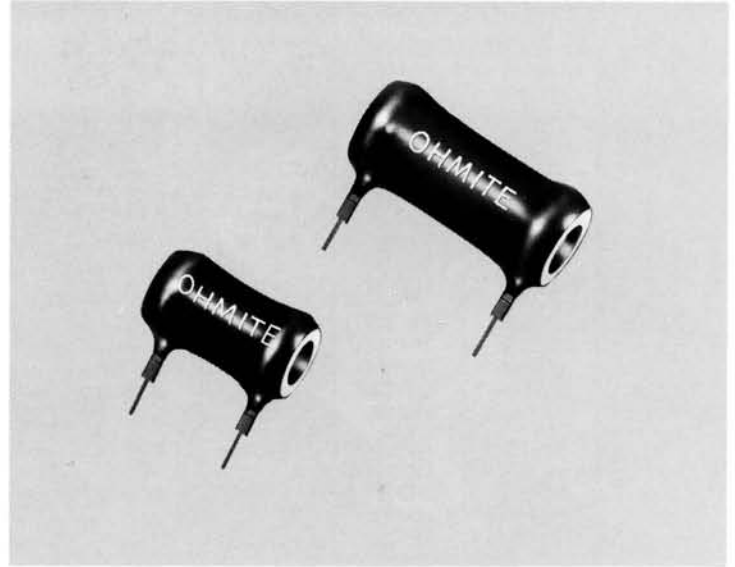
Note: The above catalog numbers are used for standard stock items only. Do not use this numbering system to order non-standard resistors. See Ordering Data on previous page.

Type 270

FIXED RESISTORS Radial Lead Resistors for Printed Circuit Boards

Features

- Reduces Labor Cost by Increased Productivity.
- Positive Positioning Above P.C. Board by Built-in Stand-off.
- Radial Terminals Fit Standard P.C. Hole Spacing and Hole Diameter.
- Marking always visible on top of the Resistor When Mounted.



Specifications

Tolerance $\pm 5\%$ for values 1 ohm and above. $\pm 10\%$ for values below 1 ohm.

Temperature Coefficient 0 ± 260 PPM/ $^{\circ}\text{C}$.

Overload 3 watt size, 5 times rated wattage for 5 seconds.
5 1/4 watt size, 10 times rated wattage for 5 seconds.

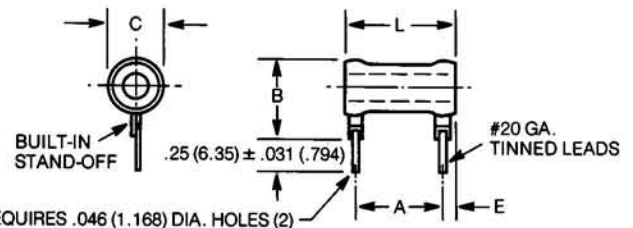
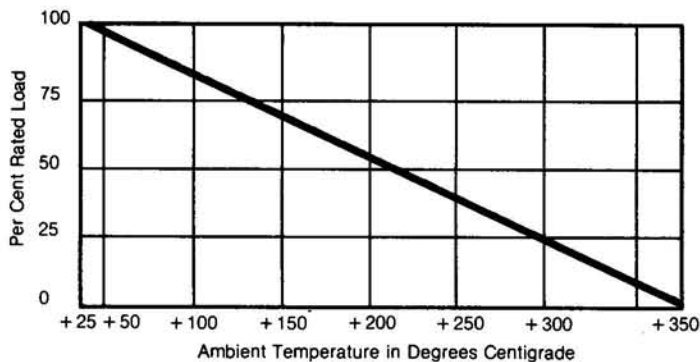
Inductance Standard units have single layer inductive winding. Non-inductive (Aryton Perry or limited inductance) windings available.

Core Steatite Ceramic.

Coating Conformal vitreous enamel or silicone ceramic.

Derating

Wattage rating is based on 25 $^{\circ}\text{C}$ Free Air Rating. For higher ambient temperatures, use derating chart.



Rated Watts @25 $^{\circ}\text{C}$	Dimensions									
	A $\pm .010$ (.25)		B $\pm .031$ (.79)		C Max.		E. Min.		L $\pm .016$ (.40)	
	In.	MM	In.	MM	In.	MM	In.	MM	In.	MM
3	.300	7.62	.469	11.91	.313	7.94	.031	.79	.438	11.11
5 1/4	.500	12.70	.516	13.11	.344	8.73	.031	.79	.625	15.88

Ordering Data

For non-standard resistance values.

Typical No.	270-3AA-58-500R0-J			
OHMITE TYPE NO. Identifies basic resistor construction.	WATTAGE 3 5 1/4		TOLERANCE F = $\pm 1\%$ H = $\pm 3\%$ J = $\pm 5\%$ K = $\pm 10\%$	
CORE DIAMETER CODE AA = .313(7.950) CA = .344(8.737)	RESISTANCE VALUE R = Decimal Pt. K = Decimal Pt. and x 1000 Examples: R1000 = 0.1 ohm 1R000 = 1 ohm 10R00 = 10 ohms 250R0 = 250 ohms 1K000 = 1000 ohms 20K50 = 20,500 ohms			

Popular resistance values available from stock. See next page.

Type 270

Catalog Numbers for Standard Resistance Values in Stock*

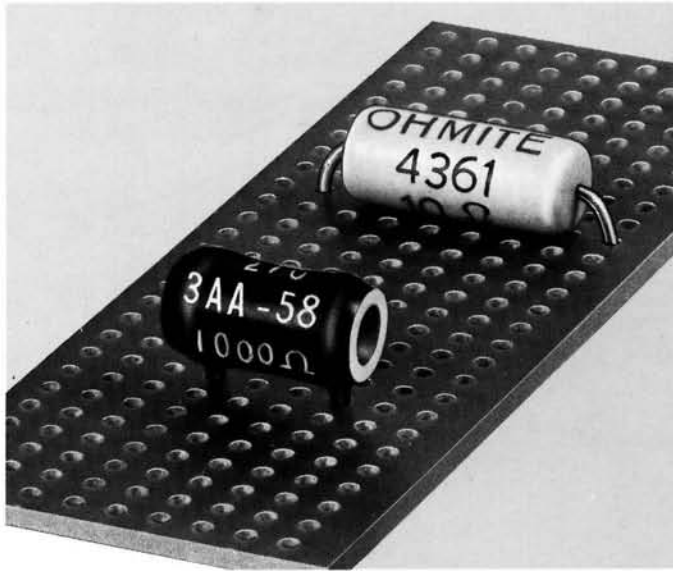


Illustration showing overall width savings and built-in stand-off provided by Radial Lead vs. a typical axial lead resistor.

3-Watts

Free air rating thru 10K ohms.

Ohms	Catalog No.	Max. Amps	Ohms	Catalog No.	Max. Amps
1.0	5800	1.73	450	5825	.0816
1.5	5801	1.41	500	5826	.0775
2.0	5802	1.22	560	5827	.0732
2.4	5803	1.12	600	5828	.0707
3.0	5804	1.00	620	5829	.0696
4.0	5805	.866	750	5830	.0632
5.0	5806	.774	800	5831	.0612
7.5	5807	.632	900	5832	.0577
10.0	5808	.548	1000	5833	.0548
15	5809	.447	1200	5834	.0500
20	5810	.387	1500	5835	.0447
30	5811	.316	1800	5836	.0408
50	5812	.245	2000	5837	.0387
56	5813	.231	2500	5838	.0346
68	5814	.210	2700	5839	.0133
82	5815	.191	3000	5840	.0316
100	5816	.173	4000	5841†	.0274
120	5817	.158	4700	5842†	.0253
150	5818	.141	5000	5843†	.0245
200	5819	.122	5600	5844†	.0231
250	5820	.110	6200	5845†	.0220
270	5821	.105	7000	5846†	.0209
300	5822	.100	7500	5847†	.0200
330	5823	.0953	9000	5848†	.0182
400	5824	.0866	10000	5849†	.0173

5¼ Watts

Free air rating thru 15K ohms.

Ohms	Catalog No.	Max. Amps	Ohms	Catalog No.	Max. Amps
1.0	5850	2.29	350	5873	.122
1.5	5850A	1.87	400	5874	.115
2.0	5851	1.62	500	5875	.102
3.0	5851A	1.32	510	5875A	.101
4.0	5851B	1.15	560	5875B	.0968
5.0	5852	1.02	600	5876	.0935
5.6	5852A	.968	750	5877	.0837
10.0	5853	.725	800	5878	.0310
15	5854	.592	1000	5879	.0725
18	5855	.540	1200	5880	.0661
20	5856	.512	1300	5881	.0635
22	5856A	.489	1800	5882	.0540
25	5857	.458	2000	5883	.0512
30	5858	.418	2200	5883A	.0488
40	5859	.362	2500	5884	.0458
50	5860	.324	3000	5885	.0418
51	5860A	.321	3300	5885A	.0399
56	5860B	.306	3900	5885B	.0367
68	5861	.278	4000	5886	.0362
75	5862	.265	4500	5887	.0341
82	5863	.253	5000	5888	.0324
100	5864	.229	5600	5889	.0306
120	5865	.209	6000	5890	.0296
150	5866	.187	7500	5891†	.0265
160	5867	.181	8200	5892†	.0253
200	5868	.162	9000	5893†	.0241
220	5869	.154	9100	5893A†	.0240
250	5870	.145	10000	5894†	.0229
270	5870A	.139	12000	5895†	.0209
300	5871	.132	15000	5896†	.0187
330	5872	.126	20000	5897†	.0152

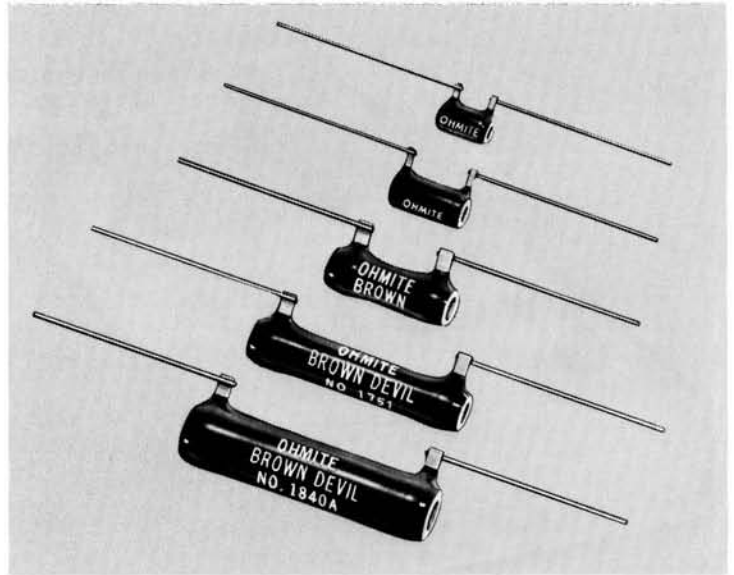
†NOTE: These resistors are Ohmicone® (Silicon ceramic) coated.

*Some resistance values may not be carried in stock at all times. See the current OHMITE Component Selector for these non-stock standard items.

Type 200 FIXED RESISTORS "BROWN DEVIL"®

Features

- Rugged Vitreous Enamel Coating
- Higher Wattage Ratings
- Self-supporting By-Leads
- All Welded Construction



Specifications

Tolerance $\pm 5\%$ standard $\pm 1\%$ to $\pm 10\%$ available.
 $\pm 10\%$ below 1 ohm.

Temperature Coefficient 400 ppm/°C 5 ohms and below.
 260 ppm/°C above 5 ohms.

Dielectric Withstanding Voltage 1000 volts AC, Terminals to mounting brackets.

Overload 5 times rated wattage for 5 seconds, 3 watt size.
 10 times rated wattage for 5 seconds, 5¼ watt and larger sizes.

Inductance Standard units have single layer inductive winding. Non-inductive (Aryton Perry or limited inductance) windings available.

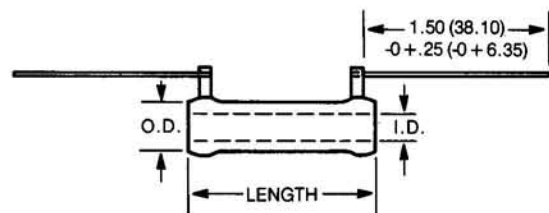
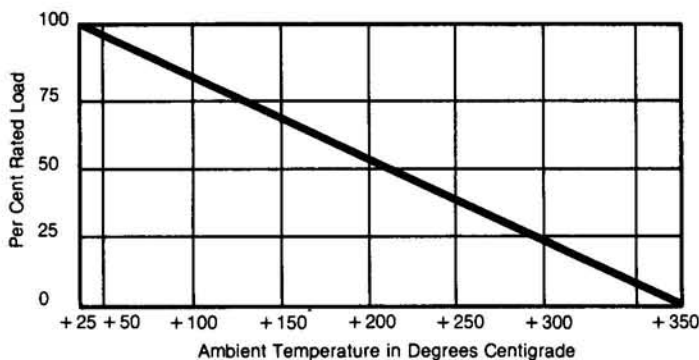
Core Steatite ceramic.

Coating Conformal vitreous enamel.

Mounting By solderable leads or through-bolt or spring clip brackets. See page 39.

Derating

Wattage rating is based on 25°C Free Air Rating. For higher ambient temperatures, use derating chart.



Watts	Resistance Range	Core Dimensions Only						Lead AWG.
		Length		O.D.		I.D.		
		In.	MM	In.	MM	In.	MM	
3	0.1—10K	.438	11.11	0.210	5.33	0.130	3.30	20
5¼	0.1—20K	.625	15.88	0.250	6.35	0.135	3.43	20
8	0.03—25K	1.000	25.40	0.313	7.94	0.188	4.76	18
12	0.08—51K	1.750	44.45	0.313	7.94	0.188	4.76	18
20	0.1—100K	2.000	50.80	0.438	11.11	0.250	6.35	18

Ordering Data

For non-standard resistance values.

Typical No.

200-8-D-5R000 - J

Identifies basic resistor construction.

3

5¼

8

12

20

F = $\pm 1\%$
 H = $\pm 3\%$
 J = $\pm 5\%$ std.
 K = $\pm 10\%$

R = Decimal Pt.
 K = Decimal Pt. and X1000

Examples:

R5000 = 0.5 ohm

1R000 = 1 ohm

250R0 = 250 ohms

1K000 = 1000 ohms

25K00 = 25,000 ohms

25K50 = 25,500 ohms

AA = 0.21 (5.33mm)
 CA = 0.25 (6.35mm)
 D = .313 (7.94mm)
 H = .438 (11.11mm)

Popular resistance values available from stock. See next page.

Type 270 FIXED RESISTORS

Conformal Vitreous Enamel Radial Lugs

Features

- Rugged Vitreous Enamel Coating
- Welded Construction
- Terminals Suitable for Soldering or Bolt Connections
- Wide Choice of Physical Size and Wattage Combinations



Specifications

Tolerance $\pm 5\%$ std. $\pm 1\%$ to $\pm 10\%$ available.

Temperature Coefficient
 0 ± 400 ppm/ $^{\circ}\text{C}$ 1 ohm to 20 ohms.
 0 ± 260 ppm/ $^{\circ}\text{C}$ above 20 ohms.

Dielectric Withstanding Voltage
 Measured from terminal to mounting bracket
 12 to 100 watts size, 1000 volts AC.
 175 and 225 watts size, 3000 volts AC.
 Higher voltage available on special order.

Overload 10 times rated wattage for 5 sec.

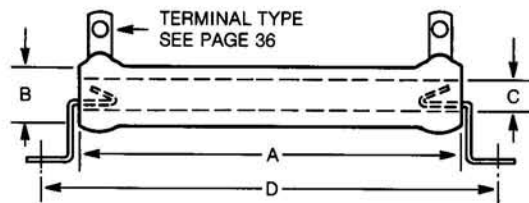
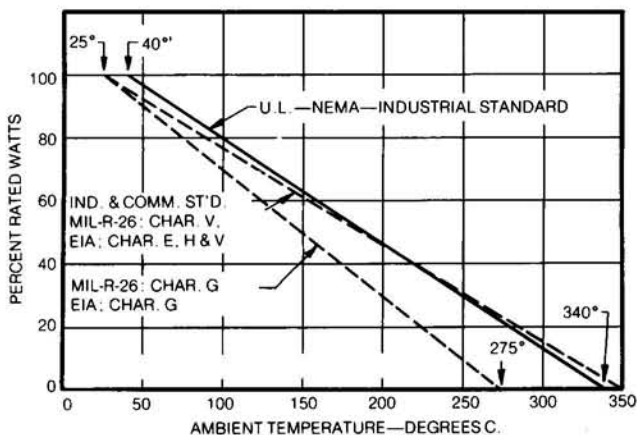
Inductance Standard units wound with single layer inductive winding. Non-inductive (Ayrton-Perry) winding available. See Type 270N.

Core Tubular ceramic.

Coating Vitreous Enamel. Silicone ceramic available. See Type 470.

Mounting "Z" push-in bracket std. Horizontal or vertical through-bolts available with mica or porcelain plug supplemental insulation for high voltage applications. See pages 39 to 43 for details.

Derating



Watts	Resistance Range	Body Dimensions								Lug Type
		A		B		C		D		
	Min.—Max.	In.	MM	In.	MM	In.	MM	In.	MM	
12	.1—51.6K	1.75	44.4	.313	7.94	.188	4.76	2.19	55.6	57
25	.15—100K	2.0	50.8	.562	14.3	.313	7.94	2.75	69.9	40
50	.38—260K	4.0	101.6	.562	14.3	.313	7.94	4.75	120.7	40
100	.23—101K	6.5	165.1	.75	19.1	.50	12.7	7.38	187.3	40
175	.13—101K	8.5	215.9	1.125	28.6	.75	19.1	9.38	238.1	46
225	.16—129K	10.5	266.7	1.125	28.6	.75	19.1	11.38	288.9	46

For other wattage ratings and physical sizes see page 34. Other terminals available including solder lug, bolt-on and quick-connect. See page 36 for selection.

Ordering Data

Typical No. **270-50-K-40-R5000-J**

OHMITE TYPE NO. Identifies basic resistor construction	TOLERANCE F = $\pm 1\%$ H = $\pm 3\%$ J = $\pm 5\%$ std. K = $\pm 10\%$
WATTAGE @25 C Ambient	
CORE DIAMETER See Page 34.	
TERMINAL TYPE. See Page 36.	
RESISTANCE VALUES R = Decimal Pt. K = Decimal Pt. and X1000 Examples: R5000 = 0.5 ohm 1R000 = 1 ohm 250R0 = 250 ohms 1K000 = 1000 ohms 25K00 = 25,000 ohms 25K50 = 25,500 ohms	

Popular resistance values available from stock see next page. For other wattage ratings available on special order see page 34.

Type 270 FIXED RESISTORS

Catalog Numbers for Standard Resistance Values in Stock*



12 Watts Core: 1.75 x .31 (44.45 x 7.94) Mntg. Ctr. 2.19 (55.55) Av. Wt. .02 lb. (.009 kg.) Std. Mntg. Brkt.: Cat. No. 5			25 Watts Core: 2.00 x .56 (50.80 x 14.29) Mntg. Ctr. 2.75 (69.85) Av. Wt. .05 lb. (.023 kg.) Std. Mntg. Brkt.: Cat. No. 9			50 Watts Core: 4.00 x .56 (101.60 x 14.29) Mntg. Ctr. 4.75 (120.65) Av. Wt. .09 lb. (.041 kg.) Std. Mntg. Brkt.: Cat. No. 9			100 Watts Core: 6.50 x .75 (165.10 x 19.05) Mntg. Ctr. 7.38 (187.33) Av. Wt. .20 lb. (.091 kg.) Std. Mntg. Brkt.: Cat. No. 12			175 Watts Core: 8.50 x 1.13 (215.90 x 28.58) Mntg. Ctr. 9.38 (238.13) Av. Wt. .50 lb. (.227 kg.) Std. Mntg. Brkt.: Cat. No. 18			225 Watts Core: 10.50 x 1.13 (266.70 x 28.58) Mntg. Ctr. 11.38 (288.93) Av. Wt. .62 lb. (.281 kg.) Std. Mntg. Brkt.: Cat. No. 18		
Ohms	Cat. No.	Max. Amps.	Ohms	Catalog No.	Max. Amps.	Ohms	Catalog No.	Max. Amps.	Ohms	Catalog No.	Max. Amps.	Ohms	Catalog No.	Max. Amps.	Ohms	Catalog No.	Max. Amps.
.51	3723	4.86	1	0200J	5.00	0400J	7.07	0600C	10.00	0700C	13.2	0900C	15.00				
1.0	3730	3.46	2	0200K	3.54	0400K	5.00	0600D	7.07	0700D	9.35	0900D	10.60				
1.5	3734	2.83	3	0200L	2.88	0400L	4.07	0600E	5.77	0700E	7.63	0900E	8.67				
2.2	3738	2.34	4	0200N	2.50	0400N	3.53	0600F	5.00	0700F	6.6	0900F	7.50				
3.3	3742	1.91	5	0200A	2.24	0400A	3.16	0600A	4.47	0700A	5.92	0900A	6.72				
4.7	3746	1.60	10	0200B	1.58	0400B	2.23	0600B	3.16	0700B	4.18	0900B	4.74				
6.8	3750	1.33	15	0200R	1.29												
10	3754	1.10	25	0200C	1.00	0400C	1.41	0601	2.00	0701	2.64	0901	3.00				
12	3756	1.00	50	0200D	.71	0400D	1.00	0602	1.41	0702	1.87	0902	2.12				
15	3758	.89	75	0200E	.58	0400E	.82	0603	1.15	0703	1.52	0903	1.73				
18	3760	.82	100	0200F	.50	0400F	.71	0604	1.00	0704	1.32	0904	1.50				
22	3762	.74	125					0604B	.90	0704B	1.18						
27	3764	.67	150	0200G	.41	0400G	.58	0605	.82	0705	1.08	0905	1.25				
33	3766	.60	200	0200H	.35	0400H	.50										
39	3768	.55	250	0201	.32	0401	.45	0606	.63	0706	.84	0906	.95				
47	3770	.53	500	0202	.22	0402	.32	0607	.45	0707	.59	0907	.67				
56	3772	.46	750	0203	.18	0403	.26	0608	.37	0708	.48	0908	.55				
68	3774	.42	800	0204	.17	0404	.25										
82	3776	.38	1,000	0205	.16	0405	.22	0609	.32	0709	.42	0909	.47				
100	3778	.35	1,500	0206	.13	0406	.18	0610	.26	0710	.34	0910	.39				
120	3780	.32	2,000	0207	.12	0407	.16	0611	.22	0711	.30	0911	.34				
150	3782	.28	2,500	0208	.10	0408	.14	0612	.20	0712	.26	0912	.30				
180	3784	.26	3,000	0209	.091	0409	.13	0613	.18	0713	.24	0913	.27				
220	3786	.23	3,500	0210	.084												
270	3788	.21	4,000	0211	.079	0410	.11										
330	3790	.19	5,000	0212	.070	0411	.10	0614	.14	0714	.19	0914	.21				
390	3792	.18	6,000	0213	.064												
470	3794	.16	7,500	0214	.057	0412	.081	0615	.12	0715	.15	0915	.17				
560	3796	.15	8,000			0413	.079										
680	3798	.13	10,000	0215	.050	0414	.071	0616	.10	0716	.13	0916	.15				
820	3800	.12	12,000	0216	.045	0415	.064										
1,000	3802	.11	15,000	0217	.036	0416	.057	0617	.081	0717	.11	0917	.13				
1,200	3804	.10	20,000	0218	.031	0417	.050	0618	.071	0718	.094	0918	.11				
1,500	3806	.089	25,000	0219	.025	0418	.045	0619	.063	0719	.083	0919	.095				
1,800	3808	.082	30,000	0220	.021			0620	.058	0720	.076	0920	.087				
2,200	3810	.074	35,000	0221	.018	0419	.033										
2,700	3812	.067	40,000	0222	.016			0621	.050	0721	.066	0921	.075				
3,300	3814	.060	50,000	0224	.013	0420	.028	0622	.045	0722	.059	0922	.067				
3,900	3816	.055	60,000	0225	.010			0623	.041	0723	.054	0923	.061				
4,700	3818	.051	70,000	0226	.0089												
5,600	3820	.046	75,000			0421	.022	0624	.037	0724	.048	0924	.055				
6,800	3822	.038	80,000	0227	.0078												
8,200	3824	.035	100,000	0229	.0063	0422	.016	0625	.028	0725	.036	0925	.046				
10,000	3826	.032	125,000			0423	.013										
12,000	3828	.029	150,000			0424	.011										
15,000	3830	.026	175,000			0425	.0093										
18,000	3832	.024	200,000			0426	.0081										
22,000	3834	.021	250,000			0428	.0065										
27,000	3836	.019															
33,000	3838	.017															
39,000	3840	.014															
47,000	3842	.012															
51,000	3843	.011															

NOTE:
The above ohms column to be used for ordering 12 watt resistors.

NOTE:
The above ohms column to be used for ordering 25 through 225 watt resistors.

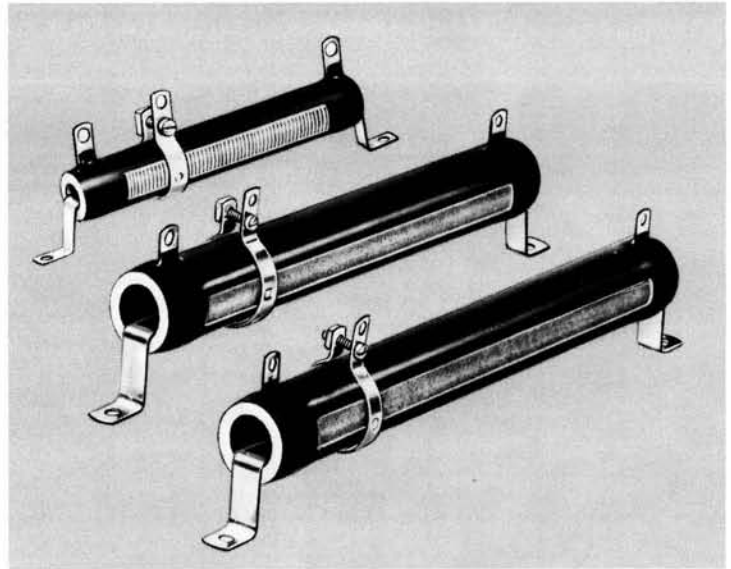
*Some resistance values may not be carried in stock at all times. See the current OHMITE Component Selector for these non-stock standard items.

Type 210

ADJUSTABLE RESISTORS—DIVIDOHM®
Conformal Vitreous Enamel Coating

Features

- Rugged Vitreous Enamel Coating
- Welded Construction
- Terminals Suitable for Soldering or Bolt Connections
- Wide Choice of Physical Size and Wattage Combinations



Specifications

Tolerance $\pm 10\%$ std. $\pm 1\%$ to $\pm 10\%$ available.

Temperature Coefficient
 0 ± 260 ppm/°C

Dielectric Withstanding Voltage
measured from terminal to mounting brackets.
12 to 100 watt size, 1000 volts AC.
175 and 225 watts size, 3000 volts AC.
Higher voltage available on special order.

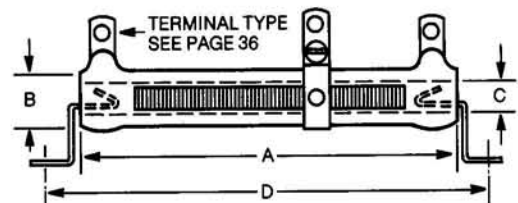
Wattage Rating Stated wattage applies when the entire resistance is used. Derate proportionally to the percentage of total resistance used.

Inductance Resistance element is single layer inductive winding.

Core Tubular Ceramic.

Coating Vitreous enamel. Silicone ceramic available.

Mounting "Z" push-in brackets std. Horizontal or vertical through-bolts available with mica or porcelain plug supplemental insulation for high voltage applications. See pages 39 to 43 for details.



Watts	Resistance Range	Body Dimensions								Lug Type
		A		B		C		D		
	Min.—Max.	In.	MM	In.	MM	In.	MM	In.	MM	
12	1.0—30K	1.75	44.4	.313	7.94	.188	4.76	2.19	55.6	57
25	.25—67K	2.0	50.8	.562	14.3	.313	7.94	2.75	69.9	40
50	.62—176K	4.0	101.6	.562	14.3	.313	7.94	4.75	120.7	40
75	1.0—284K	6.0	152.4	.562	14.3	.313	7.94	6.75	171.5	40
100	1.0—101K	6.5	165.1	.75	19.1	.50	12.7	7.38	187.3	40
175	.7—101K	8.5	215.9	1.125	28.6	.75	19.1	9.38	238.1	46
225	.86—129K	10.5	266.7	1.125	28.6	.75	19.1	11.38	288.9	46

Other terminals available including solder lugs, bolt-on and quick connect. See page 36 for selection.

Ordering Data

Typical No. **210-50-K-40-5R000-J**

OHMITE TYPE NO.
Identifies basic resistor construction.

WATTAGE
@25°C
Ambient

CORE DIAMETER
See Page 34

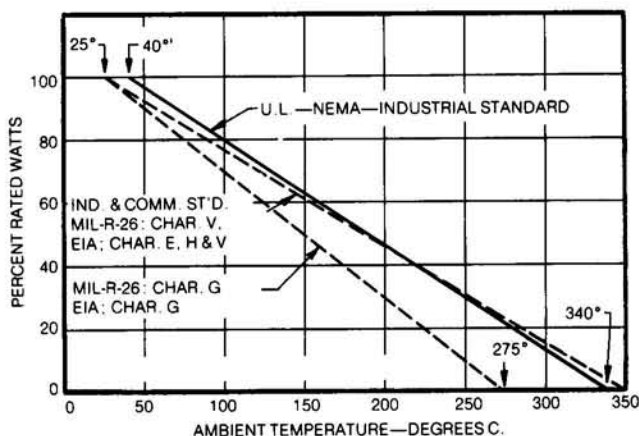
TERMINAL TYPE
See page 36

TOLERANCE
F = $\pm 1\%$
H = $\pm 3\%$
J = $\pm 5\%$
K = $\pm 10\%$ std.

RESISTANCE VALUE
R = Decimal Pt.
K = Decimal Pt. and X1000

Examples:
R5000 = .5 ohm
1R000 = 1 ohm
250R0 = 250 ohms
1K000 = 1000 ohms
25K00 = 25,000 ohms
25K50 = 25,500 ohms

Derating



Popular resistance values available from stock, see next page. For other wattage ratings available on special order see page 35.

Type 210 DIVIDOHM®

Catalog Numbers for Standard Resistance Values in Stock*



Ohms	12 Watts		25 Watts		50 Watts		75 Watts		100 Watts		175 Watts		225 Watts	
	Cat. No.	Max. Amps.	Cat. No.	Max. Amps.	Cat. No.	Max. Amps.	Cat. No.	Max. Amps.	Cat. No.	Max. Amps.	Cat. No.	Max. Amps.	Cat. No.	Max. Amps.
1	1001	3.46	0360	5.00	0560A	7.07	0769A	8.66	0956A	10.0	1156A	13.2	1356A	15.00
2	1002	2.45	0360B	3.54	0560B	5.00	0769B	6.12	0956B	7.07	1156B	9.35	1356B	10.60
3	1003	2.00	0361	2.88	0560C	4.07	0769C	5.00	0956C	5.77	1156C	7.63	1356C	8.67
4					0560D	3.53	0769D	4.33	0956D	5.00	1156D	6.60	1356D	7.50
5	1004	1.54	0362	2.24	0560	3.16	0769	3.87	0956	4.47	1156	5.92	1356	6.72
7.5	1005	1.26	0362B	1.82										
10	1006	1.09	0363	1.58	0561	2.23	0770	2.74	0957	3.16	1157	4.18	1357	4.74
15	1007	.89	0364	1.29			0771	2.24						
20	1008	.77	0364B	1.12										
25	1009	.69	0365	1.00	0562	1.41	0772	1.73	0958	2.00	1158	2.64	1358	3.00
50	1010	.49	0366	.71	0563	1.00	0773	1.22	0959	1.41	1159	1.87	1359	2.12
75	1011	.40	0367	.58	0564	.82								
100	1012	.34	0368	.50	0565	.71	0774	.86	0960	1.00	1160	1.32	1360	1.50
150	1013	.28	0369	.41	0566	.58								
200	1014	.24	0370	.35	0567	.50	0774B	.61						
250	1015	.22	0371	.32	0568	.45	0775	.55	0960B	.63	1160B	.84	1360B	.95
300	1016	.20	0371B	.29	0568B	.41	0775B	.50						
350	1017	.18												
400	1018	.17	0371C	.25	0568C	.35	0775C	.43						
500	1019	.15	0372	.22	0569	.32	0776	.39	0961	.45	1161	.59	1361	.67
600	1020	.14												
750	1021	.13	0373	.18	0570	.26	0777	.32						
800	1022	.12	0374	.17	0571	.25	0777B	.30						
1000	1023	.11	0375	.16	0572	.22	0778	.27	0962	.32	1162	.42	1362	.47
1250	1024	.098	0375B	.14	0572B	.20	0778B	.24						
1500	1025	.089	0376	.13	0573	.18	0779	.22	0962B	.26	1162B	.34	1362B	.39
2000	1026	.077	0377	.12	0574	.16	0780	.19						
2250	1027	.073	0377B	.11	0574B	.15	0780B	.18						
2500	1028	.069	0378	.10	0575	.14	0781	.17	0963	.20	1163	.26	1363	.30
3000	1029	.063	0379	.091	0576	.13	0781B	.16						
3500	1030	.058	0380	.084	0576B	.12	0782	.15						
4000	1031	.055	0381	.079	0577	.11	0782B	.14						
4500	1032	.047	0381B	.074	0577B	.10	0782C	.13						
5000	1033	.045	0382	.070	0578	.10	0783	.12	0964	.14	1164	.19	1364	.21
6000	1034	.041	0383	.064	0578B	.091	0783B	.11						
7000	1035	.038	0383B	.060	0578C	.084	0783C	.10						
7500	1036	.037	0384	.057	0579	.081	0784	.10						
8000	1037	.035	0384B	.055	0580	.079	0784B	.096						
8500	1038	.034												
9000	1039	.033	0384C	.047	0580B	.074	0784C	.091						
10000	1040	.032	0385	.045	0581	.071	0785	.086	0965	.10	1165	.13	1365	.15
12000			0386	.041	0582	.064	0785B	.079						
15000			0387	.037	0583	.057	0786	.070	0966	.081	1166	.11	1366	.13
20000			0388	.031	0584	.050	0787	.061	0967	.071	1167	.094	1367	.11
25000			0389	.025	0585	.039	0788	.054	0968	.063	1168	.083	1368	.095
30000					0586	.036	0789	.050	0969	.058	1169	.076	1369	.087
35000							0790	.046						
40000					0587	.031	0791	.038	0970	.050	1170	.066	1370	.075
45000							0792	.036						
50000					0588	.028	0793	.034	0971	.045	1171	.059	1371	.067
60000														
75000					0589	.025	0794	.031	0972†	.032	1172	.048	1372	.055
80000														
80000					0590	.020	0795	.027						
100000					0591	.016	0796	.024	0973†	.028	1173	.036	1373	.046

Adjustable Lugs

One "Screw Driver Type Adjustable Lug" is supplied with each unit. Lugs with a silver contact button can be ordered from the table shown below.

Core Diam.	MM	Standard		With Silver Contact Buttons	
		Screw Driver Type	Bakelite Knob Type	Screw Driver Type	Bakelite Knob Type
		Cat. No.	Cat. No.	Cat. No.	Cat. No.
.313	7.94	2115	—	2116	—
.563	14.29	2121	2122	2123	2124
.750	19.05	2125	2126	2127	2128
1.125	28.58	2133	2134	2135	2136



Double Thumb Screw Adjustable Lug

This adjustable lug, which is illustrated at left, features two advantages—ease of adjustment and less chance of damaging the resistance wire while moving lugs. Available for 1.125 (28.58mm) cores. Catalog No. 2160

MOVING THE LUGS: Lugs always should be loosened completely before moving and not moved except while the current is off, in order to protect the exposed wire from mechanical or electrical injury and to protect the operator from dangerous voltages.

*Some resistance values may not be carried in stock at all times. See the current OHMITE Component Selector for these non-stock standard items.

Type 270N NON-INDUCTIVE FIXED RESISTORS

Conformal Vitreous Enamel Radial Lug Wirewound Resistors

Features

- Rugged Vitreous Enamel Coating
- All Welded Construction
- Terminals Suitable for Soldering or Bolt Connections
- Wide Choice of Physical Size and Wattage Combinations
- Inductance Is Less Than 1% of the Inductance of a Standard Single Winding Resistor



Specifications

Tolerance $\pm 5\%$ std. $\pm 1\%$ to $\pm 10\%$ available.

Temperature Coefficient

0 ± 400 ppm/ $^{\circ}\text{C}$ 1 ohm to 20 ohms.

0 ± 260 ppm/ $^{\circ}\text{C}$ above 20 ohms.

Dielectric Withstanding Voltage Measured from lug to mounting bracket 12 to 100 watts size, 1000 volts AC. 175 and 225 watts size, 3000 volts AC. Higher voltage available on special order.

Overload 10 times rated watts for 5 sec.

Inductance Residual Inductance reduced by dual windings (Ayrton Perry) wound in opposite directions to cancel the inductance. See listing on next page for typical residual inductance or capacitance. Limited inductance resistors available by reducing the number of turns in a single layer winding.

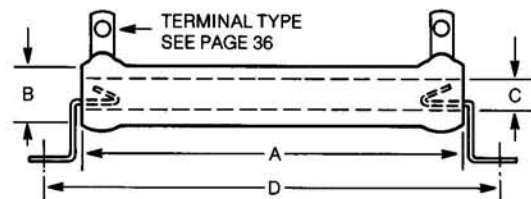
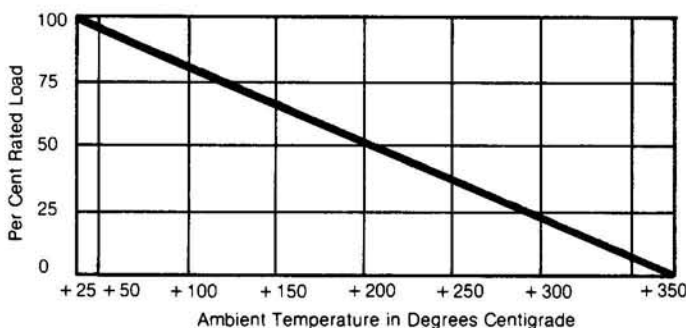
Core Tubular Ceramic.

Coating Vitreous Enamel. Silicone Ceramic available.

Mounting Spring-grip brackets are standard. Through-bolt mountings not recommended.

Deratings

Wattage ratings are based on 25°C Free Air Rating. For higher ambient temperatures, use derating chart.



Watts	Resistance Range	Body Dimensions								Term. Type
		A		B		C		D		
	Min.—Max.	In.	MM	In.	MM	In.	MM	In.	MM	
12	5.0—10K	1.75	44.4	.313	7.94	.188	4.75	2.19	55.6	57
50	5.0—5K	4.0	101.6	.562	14.3	.313	7.94	4.75	120.7	40
100	5.0—5K	6.5	165.1	.75	19.1	.50	12.7	7.38	187.3	40
175	5.0—5K	8.5	215.9	1.125	28.6	.75	19.1	9.38	238.1	46

Other terminals available including solder lug, bolt-on, and quick connect. See page 36 for selection.

Ordering Data

Typical No. **270N-50-K-40-5R000-J**

OHMITE TYPE NO. Identifies basic resistor construction.		TOLERANCE F = $\pm 1\%$ H = $\pm 3\%$ J = $\pm 5\%$ std. K = $\pm 10\%$
WATTAGE @ 25°C Ambient		RESISTANCE VALUE R = Decimal Pt. K = Decimal Pt. and X1000 Examples: 5R000 = 5 ohms 250R0 = 250 ohms 1K000 = 1000 ohms 25K00 = 25,000 ohms 25K50 = 25,500 ohms
CORE DIAMETER See page 34.		
TERMINAL TYPE See page 36.		

Popular resistance values available from stock. See next page. For other wattage ratings available or special order, see page 34.

Type 270N

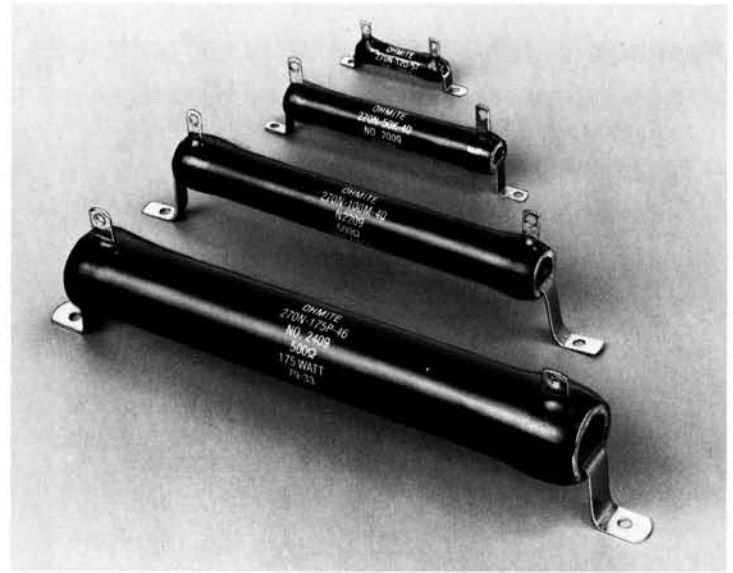
Catalog Numbers for Standard Resistance Values in Stock*



Application

These resistors are suitable for radio frequencies extending into the megacycle range depending on resistance and permissible deviation. Non-inductive resistors are used as dummy antennas for radio transmitters, as load resistors in high frequency circuits and as terminating resistors for radio antennas. They are also used in various circuits subject to steep wave-front surges or pulses.

See page 57 for Dummy Antennas designed for commonly used R.F. transmission line impedance.



12 Watts

Core: 1.75 x .31 (44.45 x 7.94) Mntg. Cntr. 2.19 (55.55) Av. Wt. .02 lb. (.009 kg.) Mntg. Brkt.: Cat. No. 5

Cat. No.	Ohms	Max. Milli-amps.	Approx. † Induc. (Ls) or Capac. (Cp)	Cat. No.	Ohms	Max. Milli-amps.	Approx. † Induc. (Ls) or Capac. (Cp)	Cat. No.	Ohms	Max. Milli-amps.	Approx. † Induc. (Ls) or Capac. (Cp)
2050	5	1,540	.1 μh	2061	200	240	.2 μh	2072	2,000	77	.75 pf
2051	10	1,090	.1 μh	2062	250	220	.2 μh	2073	2,500	69	.75 pf
2052	15	890	.1 μh	2063	300	200	.1 μh	2074	3,000	63	1.2 pf
2053	20	770	.1 μh	2064	400	170	.1 μh	2075	4,000	54	1.2 pf
2054	25	690	.1 μh	2065	500	150	.2 pf	2076	5,000	49	1.2 pf
2055	30	630	.1 μh	2066	600	140	.2 pf	2077	6,000	44	1.2 pf
2056	40	550	.1 μh	2067	700	130	.5 pf	2078	7,500	40	1.2 pf
2057	50	490	.15 μh	2068	800	120	.5 pf	2079	8,000	38	1.2 pf
2058	75	400	.15 μh	2069	900	110	.75 pf	2080	9,000	36	1.2 pf
2059	100	340	.15 μh	2070	1,000	110	.75 pf	2081	10,000	35	1.2 pf
2060	150	280	.2 μh	2071	1,500	89	.75 pf				

50 Watts

Core: 4.00 x .56 (101.60 x 14.29) Av. Wt. .09 lb. (.041 kg.) Mntg. Cntr. 4.75 (120.65) Mntg. Brkt.: Cat. No. 9

Cat. No.	Ohms	Max. Milli-amps.	Approx. † Induc. (Ls) or Capac. (Cp)
2001	5	3,160	.2 μh
2002	10	2,230	.2 μh
2003	25	1,410	.35 μh
2004	50	1,000	.35 μh
2005	100	710	.55 μh
2006	150	580	.55 μh
2007	200	500	.55 μh
2008	250	450	.55 μh
2009	500	320	.05 μh
2010	750	260	.1 pf
2011	1,000	220	.75 pf
2012	1,500	180	.75 pf
2013	2,000	160	.75 pf
2014	2,500	140	.75 pf
2015	3,000	130	1.2 pf
2016	3,500	120	1.2 pf
2017	4,000	110	1.2 pf
2018	5,000	100	1.2 pf

100 Watts

Core: 6.50 x .75 (165.10 x 19.05) Av. Wt. .20 lb. (.091 kg.) Mntg. Cntr. 7.38 (187.33) Mntg. Brkt.: Cat. No. 12

Cat. No.	Ohms	Max. Milli-amps.	Approx. † Induc. (Ls) or Capac. (Cp)
2201	5	4,470	.4 μh
2202	10	3,160	.4 μh
2203	25	2,000	.6 μh
2204	50	1,410	.6 μh
2205	100	1,000	.9 μh
2206	150	816	.9 μh
2207	200	707	.9 μh
2208	250	630	.9 μh
2209	500	450	.7 μh
2210	750	365	.15 μh
2211	1,000	320	.8 pf
2212	1,500	260	1.7 pf
2213	2,000	220	1.7 pf
2214	2,500	200	1.7 pf
2215	3,000	180	1.7 pf
2216	3,500	170	2.3 pf
2217	4,000	160	2.3 pf
2218	5,000	140	2.3 pf

175 Watts

Core: 8.50 x 1.13 (215.90 x 28.58) Av. Wt. 50 lb. (.227 kg.) Mntg. Cntr. 9.38 (238.13) Mntg. Brkt.: Cat. No. 18

Cat. No.	Ohms	Max. Milli-amps.	Approx. † Induc. (Ls) or Capac. (Cp)
2401	5	5,920	.65 μh
2402	10	4,180	.65 μh
2403	25	2,640	.9 μh
2404	50	1,870	1.4 μh
2405	100	1,320	1.4 μh
2406	150	1,090	1.4 μh
2407	200	935	1.4 μh
2408	250	840	1.4 μh
2409	500	590	.75 μh
2410	750	480	.15 μh
2411	1,000	420	2.2 pf
2412	1,500	340	3.3 pf
2413	2,000	290	3.3 pf
2414	2,500	260	3.3 pf
2415	3,000	240	3.7 pf
2416	3,500	222	3.7 pf
2417	4,000	208	3.7 pf
2418	5,000	190	3.7 pf

†Effective series inductance (Ls) or effective parallel capacitance (Cp) when measured at 5 megacycles. Capacitance in "picofarads;" 1 pf = 1 μμf

*Some resistance values may not be carried in stock at all times. See the current OHMITE Component Selector for these non-stock standard items.

Type 250 FIXED/260 ADJUSTABLE

"Thin" Vitreous Enamelled Resistors

Features

- Smaller size per watt due to heat sinking mounting.
- Space saving possible by stacking resistors
- Rugged vitreous enamel coating
- All welded construction. These resistors are most frequently used where space is limited. Their over-all height above the mounting surface is low and they can be compactly stacked.

Specifications

Tolerance Fixed resistors $\pm 5\%$ 1 ohm and above. Adjustable resistors and fixed below 1 ohm $\pm 10\%$ is std. $\pm 1\%$ to $\pm 10\%$ available.

Temperature Coefficient

0 ± 400 ppm/ $^{\circ}\text{C}$ 1 ohm to 20 ohms.
 0 ± 260 ppm/ $^{\circ}\text{C}$ 20 ohm and above.

Dielectric Withstanding Voltage Measured from lug to mounting bracket. 10 to 20 watts size, 500 volts AC. 21 and 25 watts size, 1000 volts AC. 30 to 95 watts size, 1000 volts AC.

Overload Ten times rated wattage for 5 seconds.

Inductance Resistance element is single layer inductive winding.

Core Steatite ceramic.

Coating Vitreous enamel. Silicone ceramic available as Type 450 and 460.

Wattage rating is based on mounting a single resistor on a steel mounting surface of 10" (254mm) square by .040" (1.016mm) thick or equivalent. See derating chart for stacked resistors.

450 = 250 series in silicone

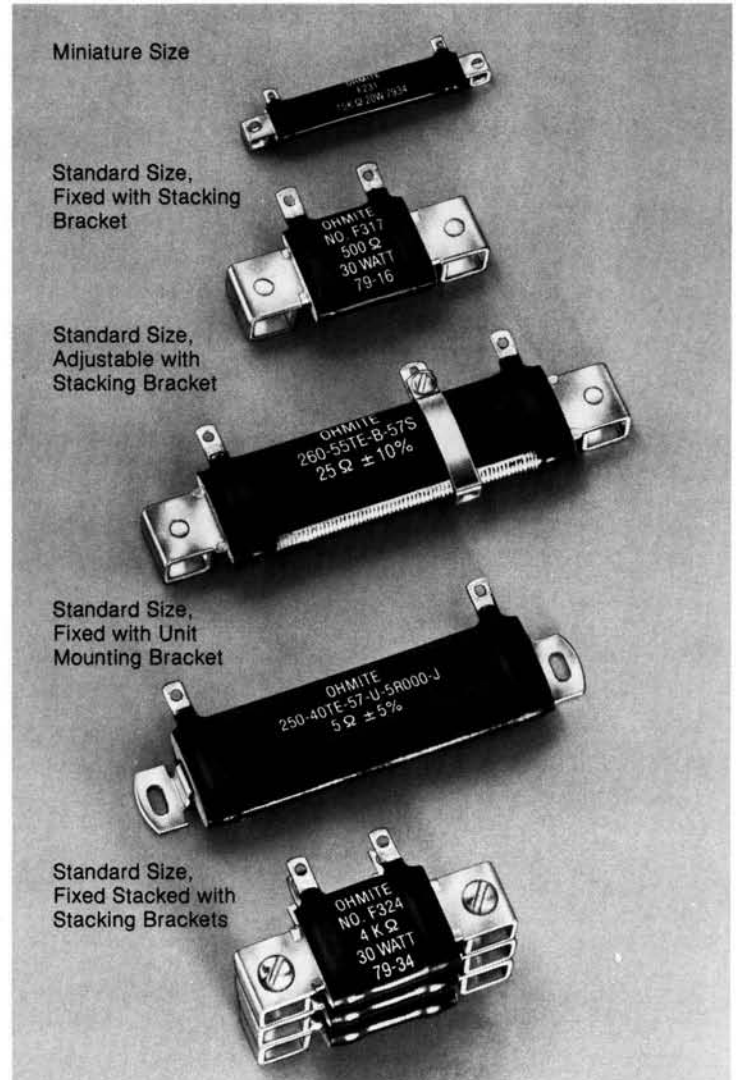
Ordering Data

A coded specification number can be written as shown by the example below:

Typical No. **250-30TE-B-57-SB-1R000-J**

OHMITE TYPE NO. 250—Fixed 260—Adjustable	TOLERANCE F $\pm 1\%$ H $\pm 3\%$ J $\pm 5\%$ Std. for fixed K $\pm 10\%$ Std. for adjust.
WATTS AND CORE CODE 10-15-20-TA 12-TB 21-25-TD 30-40-55-70*-95*-TE	RESISTANCE VALUE R = Decimal Pt. K = Decimal Pt. and X1000 Examples: 1R000 = 1 ohm 250R0 = 250 ohms 1K000 = 1000 ohms 25K00 = 25,000 ohms 25K50 = 25,500 ohms
POSITION OF CONTACT AREA TYPE 260 ADJUSTABLE ONLY Lug edge—L Back edge—B Top side miniature core TA only—T	MOUNTING BRACKETS Stacking box type—SB Stacking Stud Std. height.—SS Stacking Stud high—SSH Unit type—U Note: User supplies brackets for core code TB
TERMINAL TYPE #51, #57 See pages 36 and 37	

*Core Code TE in the 70 and 95 watt size coated only in OHMICONE® (silicone ceramic) as Type 450 and 460. See page 38. Vitreous enamel coating not available.



Type 260 Adjustable Resistors

Standard Thin Adjustable Resistors have a strip of winding exposed on either the lug edge (L) or the opposite or back edge (B). On Miniature resistors, the exposed strip may be on either edge or on the top (T). The 1" long core is the shortest practicable for Adjustable Resistor use.

Adjustable Lugs (For Standard & Miniature Sizes)



With "screw at 90°," the screw is perpendicular to the resistor mounting surface. With the screw "parallel" to the mounting surface, it may be adjusted more easily where several Dividohms are stacked.

For Resistor Size	For Contact Area	Screw Location	Cat. No.
Standard	L or B	at 90°	1978
Standard	L or B	parallel	1979
Miniature	T	at 90°	1980
Miniature	L or B	parallel	1981

Type 250 FIXED/260 ADJUSTABLE

"Thin" Resistors



Mountings In addition to the standard box bracket, stud type brackets are available for stacking the standard size resistors. Stud type brackets are available in two heights: Standard height (SS) of .437" (11.113mm), and High (SSH) of .531" (13.494mm).

The (SSH) stud is recommended when stacking the adjustable Type 260 as it assures clearance for the adjustable lugs to pass each other. A spacer washer No. 6027 .219" (5.556mm) OD x .125" (3.175mm) ID and .094" (2.381mm) thick is recommended for use with the miniature adjustable and fixed resistors to provide clearance, as explained above, or increased wattage. See derating table.

Derating for stacked mounting

Stacked resistors should be derated to prevent excessive temperatures due to proximity. Approximate ratings are given in the table.

No. of Resistors	Percent of Single Unit Rating		
	Std. or Inter.	Miniature	Miniature with .094" (2.381mm) Spacer Washer
2	70	70	75
3	60	60	69
4	50	50	60

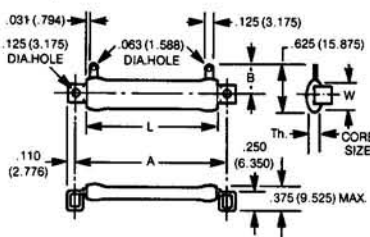


Fig. 1: Miniature Thin resistor with stacking-type box bracket.

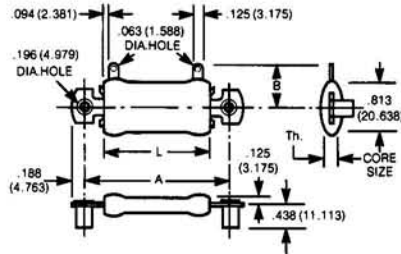


Fig. 2: Intermediate Thin resistor with stacking-type stud bracket.

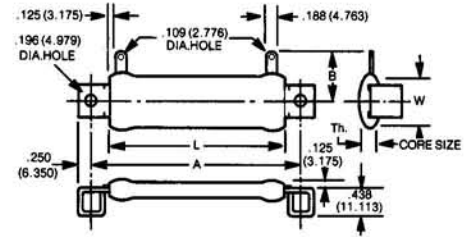


Fig. 3: Standard resistor with stacking-type box bracket.

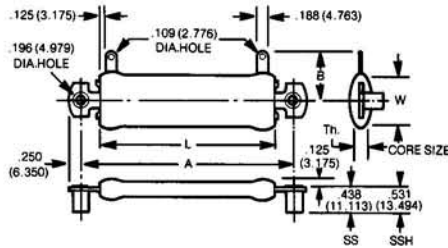


Fig. 4: Standard resistor with stacking-type stud bracket.

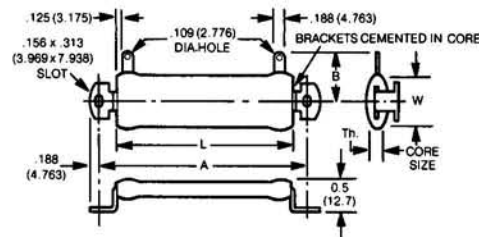


Fig. 5: Standard resistor with unit-type mounting bracket.

250 "Thin" Resistors, Made-To-Order

*Free Air Watts	†Core Dimensions						Min. Ohms	Practical Resistance Limits for Vitreous Enamel Ohms	Core Code	Fig. No.	A		B		Std. Term
	Length In.	Length MM	Width In.	Width MM	Thickness In.	Thickness MM					In.	MM	In.	MM	
Miniature															
10	.750	19.050	.375	9.525	.125	3.175	1	15,000	TA	1	1.000	25.400	.375	9.525	51
15	1.000	25.400	.375	9.525	.125	3.175	1	25,000	TA	1	1.250	31.750	.375	9.525	51
20	2.000	50.800	.375	9.525	.125	3.175	1	50,000	TA	1	2.313	58.750	.375	9.525	51
12	.688	17.463	.594	15.081	.234	5.953	1	20,000	TB	**	—	—	—	—	51
Intermediate															
21	1.000	25.400	.813	20.638	.250	6.350	1	8,000	TD	2	1.313	33.350	.594	15.081	51
25	1.500	38.100	.813	20.638	.250	6.350	1	15,000	TD	2	1.813	46.050	.594	15.081	51
Standard															
30	1.250	31.750	1.000	25.400	.250	6.350	1	10,000	TE	5 3-4	1.750 2.000	44.450 50.800	.938	23.813	57
40	2.000	50.800	1.000	25.400	.250	6.350	1	25,000	TE	5 3-4	2.500 2.750	63.500 69.850	.938	23.813	57
55	3.500	88.900	1.000	25.400	.250	6.350	1	30,000	TE	5 3-4	4.000 4.250	101.600 107.950	.938	23.813	57
70‡	4.750	120.650	1.000	25.400	.250	6.350	1	120,000 ‡	TE	5 3-4	5.250 5.500	133.350 139.700	.938	23.813	57
95‡	6.000	152.400	1.000	25.400	.250	6.350	1	150,000 ‡	TE	5 3-4	6.500 6.750	165.100 171.450	.938	23.813	57

*Based on mounting on steel panel 10" (254mm) x 10" (254mm) x .040" (1.016mm).

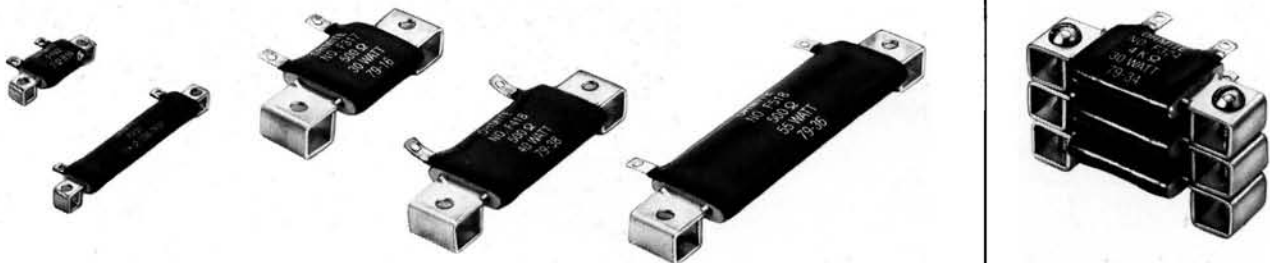
†Inside dimensions of core are: .250" (6.350mm) x .047" (1.191mm) for TA, .406" (10.319mm) x .047" (1.191mm) for TB, .438" (11.113mm) x .063" (1.588mm) for TD, .672" (17.066mm) x .063" (1.588mm) for TE.

‡These sizes are Ohmite (silicone-ceramic) coated —Type 450-460

**User supplies brackets.

Type 250 THIN RESISTORS

Catalog Numbers for Standard Resistance Values*



Miniature Sizes

Resist. Ohms	10 Watt Core: .750 x .375 x .125 (19.050 x 9.525 x 3.175) Mtg. Ctr. 1.000 (25.400) Mtg. Hole .125 (3.175) Av. Wt. .007 lb.			20 Watt Core: 2.000 x .375 x .125 (50.800 x 9.525 x 3.175) Mtg. Ctr. 2.313 (58.750) Mtg. Hole .125 (3.175) Av. Wt. .015 lb.		
	Cat. No.	Max. Volts	Max. Amps	Cat. No.	Max. Volts	Max. Amps
1	F101	3.16	3.16	F201	4.47	4.47
1.5						
2	F102	4.47	2.24	F202	6.32	3.16
3						
4						
5	F103	7.07	1.41	F203	10.0	2.00
7.5	F104	8.66	1.15			
10	F105	10.0	1.00	F204	14.1	1.41
15	F106	12.2	0.82	F205	17.3	1.16
20	F107	14.1	0.71			
25	F108	15.8	0.63	F206	22.3	0.89
30	F109	17.3	0.58			
40	F110	20.0	0.50	F207	28.3	0.71
50	F111	22.3	0.45	F208	31.6	0.63
75	F112	27.4	0.36	F209	38.7	0.52
100	F113	31.6	0.32	F210	44.7	0.45
125	F114	35.3	0.28			
150	F115	38.7	0.26	F211	54.8	0.36
200	F116	44.7	0.22	F212	63.2	0.32
250	F117	50.0	0.20	F213	70.7	0.28
300	F118	54.8	0.18	F214	77.4	0.26
400	F119	63.2	0.16	F215	89.4	0.22
500	F120	70.7	0.14	F216	100.0	0.20
600	F121	77.4	0.13			
750	F122	86.6	0.12			
800				F217	126.0	0.16
1000	F123	100.0	0.10	F218	141.0	0.14
1250	F124	111.0	0.089	F219	158.0	0.12
1500	F125	122.0	0.081	F220	173.0	0.12
1750	F126	132.0	0.075			
2000	F127	141.0	0.071	F221	200.0	0.10
2500	F128	158.0	0.063	F222	223.0	0.089
3000	F129	173.0	0.057	F223	245.0	0.081
3500				F224	264.0	0.075
4000	F130	200.0	0.050	F225	283.0	0.070
5000				F226	316.0	0.063
6000	F131	223.0	0.045	F227	346.0	0.058
7500				F228	387.0	0.052
10000				F229	445.0	0.045
12500				F230	500.0	0.040
15000				F231	555.0	0.036
20000				F232	625.0	0.032
25000				F233	715.0	0.028
30000				F234	770.0	0.026
35000				F235	835.0	0.024
40000				F236	910.0	0.022
50000				F237	990.0	0.020

Standard Sizes

Resist. Ohms	30 Watt Core: 1.250 x 1.000 x .250 31.750 x 25.400 x 6.350 Mtg. Ctr. 2.000 (50.800) Mtg. Hole .196 (4.979) Av. Wt. .037 lb.			40 Watt Core: 2.000 x 1.000 x .250 (50.800 x 25.400 x 6.350) Mtg. Ctr. 2.750 (69.850) Mtg. Hole .196 (4.979) Av. Wt. .052 lb.			55 Watt Core: 3.500 x 1.000 x .250 (88.900 x 25.400 x 6.350) Mtg. Ctr. 4.250 (107.95) Mtg. Hole .196 (4.979) Av. Wt. .096 lb.		
	Cat. No.	Max. Volts	Max. Amps	Cat. No.	Max. Volts	Max. Amps	Cat. No.	Max. Volts	Max. Amps
	F301	5.47	5.47	F401	6.32	6.32	F501	7.42	7.42
	F302	6.70	4.47	F402	7.74	5.16	F502	8.25	6.05
	F303	7.74	3.88	F403	8.94	4.47	F503	10.4	5.24
	F304	9.45	3.17	F404	10.9	3.65	F504	12.8	4.28
				F405	12.6	3.16	F505	14.8	3.70
	F305	12.2	2.46	F406	14.1	2.83	F506	16.6	3.32
	F306	17.3	1.73	F407	17.3	2.31	F507	20.6	2.72
	F307	21.2	1.42	F408	20.0	2.00	F508	23.4	2.34
	F308	27.4	1.10	F409	31.6	1.26	F509	37.1	1.48
	F309	34.6	0.87	F410	40.0	1.00	F510	46.9	1.17
	F310	38.7	0.77	F411	44.7	0.89	F511	52.4	1.05
	F311	47.4	0.63	F412	54.8	0.73	F512	64.2	0.86
	F312	54.8	0.55	F413	63.2	0.63	F513	74.1	0.74
	F313	67.0	0.45	F414	77.4	0.52	F514	82.5	0.61
	F314	77.4	0.39	F415	89.4	0.45	F515	104.0	0.52
	F315	86.6	0.35	F416	100.0	0.40	F516	117.0	0.47
	F316	108.0	0.28	F417	126.0	0.32	F517	148.0	0.37
	F317	122.0	0.25	F418	141.0	0.28	F518	166.0	0.33
	F318	150.0	0.20	F419	173.0	0.23	F519	206.0	0.27
	F319	173.0	0.17	F420	200.0	0.20	F520	234.0	0.23
	F320	212.0	0.14	F421	245.0	0.16	F521	287.0	0.19
	F321	245.0	0.12	F422	283.0	0.14	F522	332.0	0.17
	F322	274.0	0.11	F423	316.0	0.13	F523	371.0	0.15
	F323	300.0	0.10	F424	345.0	0.12	F524	406.0	0.14
	F324	346.0	0.087	F425	400.0	0.10	F525	469.0	0.12
	F325	387.0	0.076	F426	447.0	0.089	F526	524.0	0.10
	F326	424.0	0.057	F427	548.0	0.073	F527	642.0	0.086
	F327	490.0	0.049	F428	632.0	0.063	F528	741.0	0.074
				F429	670.0	0.045	F529	825.0	0.061
				F430	774.0	0.039	F530	1040.0	0.052
				F431	866.0	0.035	F531	1170.0	0.047
							F532	1210.0	0.040

*Some resistance values may not be carried in stock at all times. See the current OHMITE Component Selector for these non-stock standard items.

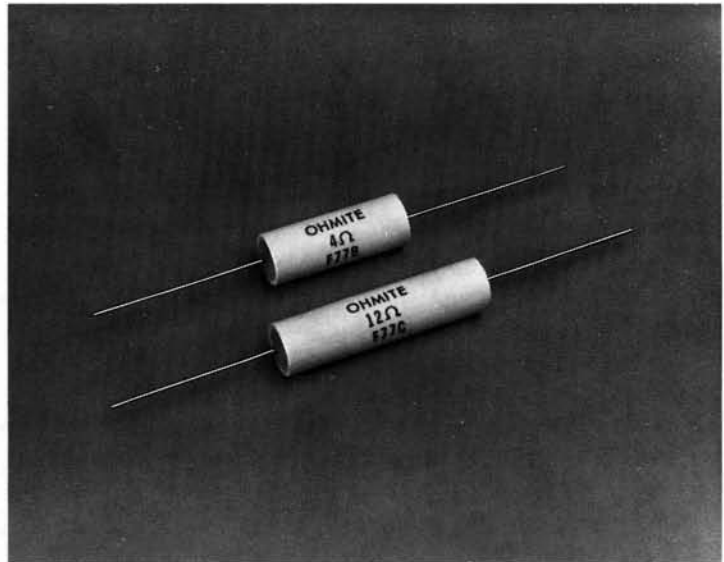
Series F77

Fuse Resistor



Features

- Tubular Ceramic Outer Shell;
Provides moisture-proof construction.
High dielectric voltage breakdown
Confines sparking during fusing.
- Combines Resistor and Fuse Functions
- Saves Space and Cost
- Axial Lead Construction for Printed Circuit Boards or Terminal to Terminal Wiring
- Wirewound Element Combines Best Features of Resistor and Fuse Construction.
- Custom Designed for Each Application



Specifications

Tolerance $\pm 5\%$ std. 1 ohm and above. $\pm 10\%$ std. below 1 ohm. $\pm 1\%$ to $\pm 10\%$ available.

Stability $\Delta R \pm 10\%$ for 1000 Hours.

Dielectric Withstanding Voltage 1000 volts A.C.

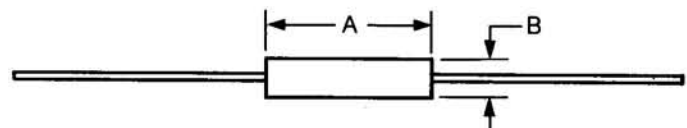
Inductance Standard resistors have single layer inductive windings.

Core Steatite ceramic.

Protective Cover Tubular ceramic housing with silicone cement end seals.

Derating

Wattage rating is based on 25°C Free Air Rating. Derate to zero watts at 275°C. For other ambient temperatures see derating chart page 50.



Leads 1.5 (38.1mm) long. 20 ga. tinned.

Watts	Type	Resistance Range		Body Dimensions			
		Ohms		Max. Lgth.—A		Max. Dia.—B	
		Min.—Max.	In.	MM	In.	MM	
3	F77B	.075 — 300	.624	15.80	.280	7.11	
5	F77C	.100 — 750	1.062	26.97	.280	7.11	

Ordering Data

To specify resistors, furnish the following information.

- Operating current or wattage.
- Fusing current or wattage.
- Fusing time, maximum and/or minimum
- Resistance and tolerance.
- Voltage to be interrupted.
- D.C. or A.C., frequency if A.C.
- Brief circuit description.

Typical values for 3 watt fuse resistor based on 1 second maximum fusing time

Ohms	Cont. Amps	Fuse Amps	Ohms	Cont. Amps	Fuse Amps
.075	6.40	20.0	6.00	0.71	2.24
.100	5.55	17.3	8.00	0.62	1.94
.200	4.00	12.3	15.0	0.45	1.41
.250	3.54	11.0	20.0	0.39	1.23
.350	3.00	9.26	25.0	0.35	1.10
.500	2.50	7.75	40.0	0.27	.866
.750	2.05	6.33	60.0	0.23	.707
1.00	1.75	5.48	80.0	0.19	.612
1.50	1.43	4.47	100.	0.17	.548
2.00	1.25	3.87	120.	0.16	.500
3.00	1.00	3.16	150.	0.14	.447
4.00	0.87	2.74	200.	0.12	.387
			300.	0.1	.316

Typical values for 5 watt fuse resistor based on 1 second maximum fusing time

Ohms	Cont. Amps	Fuse Amps	Ohms	Cont. Amps	Fuse Amps
.100	7.20	22.4	15.0	.580	1.83
.220	4.90	15.1	22.0	.480	1.51
.250	4.60	14.2	30.0	.410	1.29
.400	3.60	11.2	45.0	.330	1.05
.500	3.20	10.0	60.0	.290	.913
1.00	2.30	7.07	90.0	.240	.745
1.50	1.85	5.77	120.	.205	.645
2.00	1.60	5.00	150.	.183	.577
3.00	1.30	4.08	225.	.150	.471
5.00	1.00	3.16	300.	.130	.408
7.00	.850	2.67	400.	.112	.354
12.00	.650	2.04	500.	.100	.316
			750.	.080	.258

Type 280

FIXED CORRIB® RESISTORS

Type 230

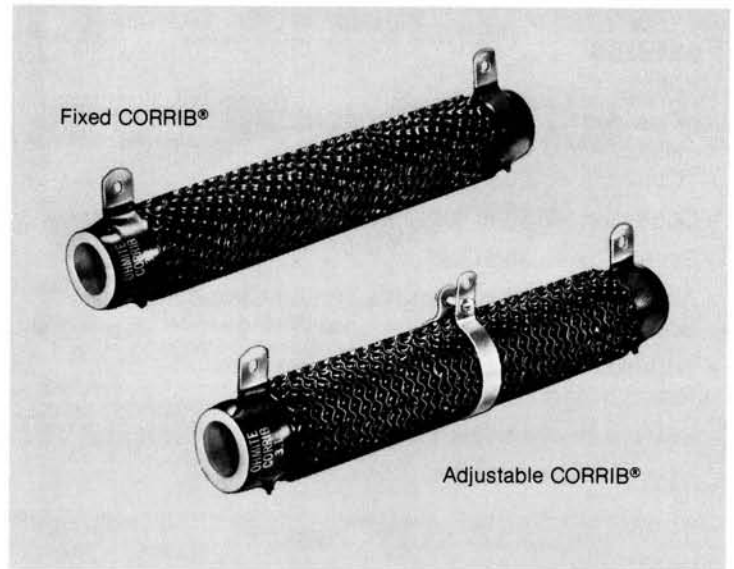
ADJUSTABLE CORRIB® RESISTORS

High Current—
Low Resistance Resistors

Features

- High Wattage Dissipation up to 1500 Watts
- Very Low Resistance Values
- Large Selection of Physical Sizes for any Wattage
- Ribbed Construction Aids in Rapid Cooling

Used for controlling DC motors in cranes, hoists, elevators, machine tools, printing presses and other equipment generally requiring low resistance load banks of low ohmic value and high current capacity.



Specifications

Tolerance $\pm 10\%$ standard, down to $\pm 1\%$ for most sizes.

Temperature Coefficient

0 ± 260 ppm/°C

Dielectric Withstanding Voltage Measured from terminal to mounting bracket. 1000 volts AC. Higher voltages available on special order.

Overload 10 times rated wattage for 5 seconds.

Inductance ALL CORRIBS are single layer inductively wound.

Non-inductive winding not available.

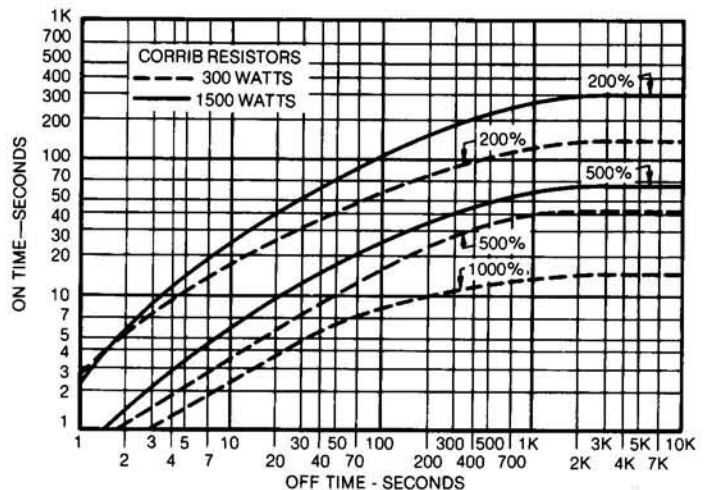
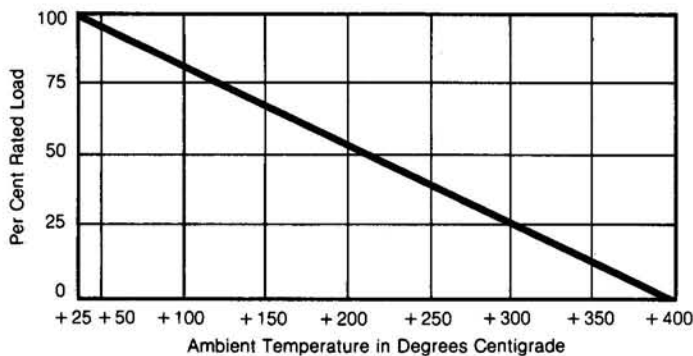
Core Tubular ceramic

Coating Vitreous enamel

Mounting Spring-grip brackets available for cores with O.D. .563 (14.288) to 1.125 (28.575). Horizontal or vertical thru bolt mountings available with mica or porcelain plug supplemental insulation for high voltage applications. See pages 39 to 43 for details.

Derating

Wattage rating is based on 25°C free air ratio. For higher ambient temp. Use derate chart.



Percent of Continuous Duty Rating for Pulse Operation of CORRIB, Corrugated Ribbon Resistors.

Ordering Data

Typical No. **280-300P-45-12R00-K**

OHMITE TYPE NO. 280 Fixed 230 Adjustable	WATTAGE AND CORE CODE LETTER See chart next page	TERMINAL See chart next page	TOLERANCE K = $\pm 10\%$ std. J = $\pm 5\%$ H = $\pm 3\%$ F = $\pm 1\%$
RESISTANCE VALUE R = Decimal Pt. K = Decimal Pt. and X1000			Examples: R0200 = .02 ohm R2000 = .2 ohm 2R500 = 2.5 ohms 10R00 = 10 ohms 110R0 = 110 ohms See chart next page for min.-max. ohms

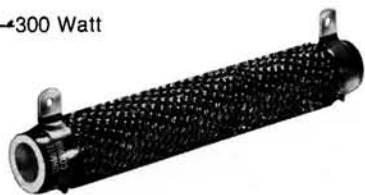
Type 280 / Type 230

FIXED CORRIB® / ADJUSTABLE CORRIB®

Catalog Numbers for Standard Resistance Values in Stock*



Fixed—300 Watt



Dividohm® Adjustable—300 Watt



Fixed—35 Watt



Stock CORRIBS®

Core: 8.5 x 1.125 (215.90 x 28.58) 300 Watt Fixed or Adjustable (DIVIDOHM) Avg. Weight (Fixed) .61 lb.; (Dividohm) .64 lb.

Ohms*	Amps.	Fixed Catalog No.	Dividohm† Catalog No.
0.10	54.7	2501	2601
0.12	50.0	2502	2602
0.16	43.3	2503	2603
0.20	38.7	2504	2604
0.25	34.6	2505	2605
0.31	31.1	2506	2606
0.40	27.4	2507	2607
0.50	24.5	2508	2608
0.63	21.8	2509	2609
0.80	19.3	2510	2610
1.0	17.3	2511	2611
1.2	15.8	2512	2612
1.6	13.7	2513	2613
2.0	12.2	2514	2614
2.5	10.9	2515	2615
3.1	9.8	2516	2616
4.0	8.6	2517	2617
5.0	7.7	2518	2618
6.3	6.9	2519	2619
8.0	6.1	2520	2620
10.0	5.5	2521	2621
12.0	5.0	2522	2622
16.0	4.3	2523	2623
20.0	3.8	2524	2624

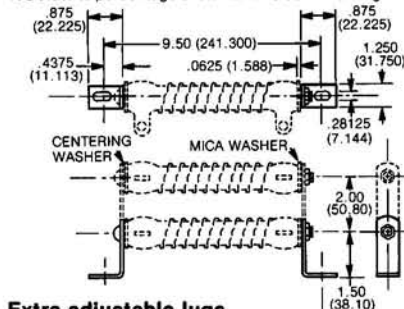
† Adjustable Lug Stk. No. 1974 supplied with Dividohm.

Stock thru bolt mounting brackets for 300 Watt CORRIBS

Includes 2 brackets; bolt; centering, mica, and lock washers; nuts. Diagram below.

No. of Resistors	Catalog No.	Derate %
1	6126P8 1/2	100%
2	6127P8 1/2 ††	83%
3	6128P8 1/2 ††	80%
4	6129P8 1/2 ††	77%

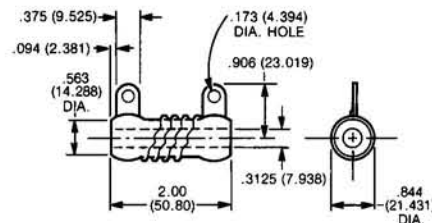
†† Derate to percentage shown when stack mounting



Extra adjustable lugs for 300 Watt CORRIBS

For Dividohm	Lug Catalog No.
2601-2606	1974-B
2610; 2619	
2607-2609	1974-A
2611-2618	
2620-2624	

Stock CORRIBS®



Ohms*	Current (Max. Amps.)	Catalog Number
0.02	41.8	2530
0.04	29.6	2531
0.06	24.2	2532
0.08	20.9	2533
0.10	18.7	2534
0.15	15.3	2535
0.20	13.2	2536
0.25	11.8	2537
0.30	10.8	2538
0.40	9.4	2539
0.50	8.4	2540
0.60	7.6	2541
0.80	6.6	2542
1.00	5.9	2543
1.25	5.3	2544

*Some resistance values may not be carried in stock at all times. See the current OHMITE Component Selector for these non-stock standard items.

Made to Order CORRIBS®

Vitreous enamel coated except for some of the very low resistance values which may be OHMICONE® (silicone ceramic) coated.

Watts	Core Size						Core Code	Resistance Range		Term. Type
	O.D.		I.D.		Length			Min. Ohms	Max. Ohms	
	In.	MM	In.	MM	In.	MM				
1500	2.50	63.5	1.75	44.45	20.0	508.00	S	0.56	358	45
1000					15.0	381.00	S	0.41	258	
750					12.0	304.80	S	0.31	198	
380					6.0	152.40	S	0.13	78	
550	1.625	41.28	1.125	28.58	11.75	298.45	R	0.21	133	
500					10.50	266.70	R	0.19	117	
400					8.5	215.90	R	0.14	91	
270	1.50	38.10	1.125	28.58	5.0	127.00	Q	0.065	41	
395	1.125	28.58	0.75	19.05	11.25	285.75	P	0.14	87	
375					10.5	266.70	P	0.13	80	
300					8.5	215.90	P	0.099	63	
220					6.0	152.40	P	0.063	39	
185					5.0	127.00	P	0.05	30	
155					4.25	107.95	P	0.038	25	
315					1.00	25.40	0.625	15.88	10.0	254.00
215	7.0	177.80	N	0.068					43	
190	6.0	152.40	N	0.056					35	
150	5.0	127.00	N	0.043					27	
125	4.0	101.60	N	0.031					19	
180	0.75	19.05	0.50	12.70	6.5	165.10	M	0.031	29	
160					6.0	152.40	M	0.038	26	
140					5.0	127.00	M	0.028	20	
105					4.0	101.60	M	0.020	14	
100					3.5	88.90	M	0.021	11	
135					0.563	14.30	0.313	7.95	6.0	152.40
110	5.0	127.00	K	0.029					16	
90	4.0	101.60	K	0.021					12	
35	2.0	50.80	K	0.0097					0.11	
35	0.563	14.30	0.313	7.95	2.0	50.80	K	0.12	5.6	40

Type 080 FIXED/030 ADJUSTABLE Type 082 FIXED/032 ADJUSTABLE

Powr-Rib® Resistors

Features

- High Wattage Capability
- Rugged Construction Withstands Shock and Vibration
- Handles Severe Overloads
- All Metal and Porcelain Construction

Specifications

Tolerance $\pm 10\%$ standard, $\pm 5\%$ available.

Temperature Coefficient

500 ppm/°C For resistors 50 amps and more.

300 ppm/°C For resistors 47 amps and less.

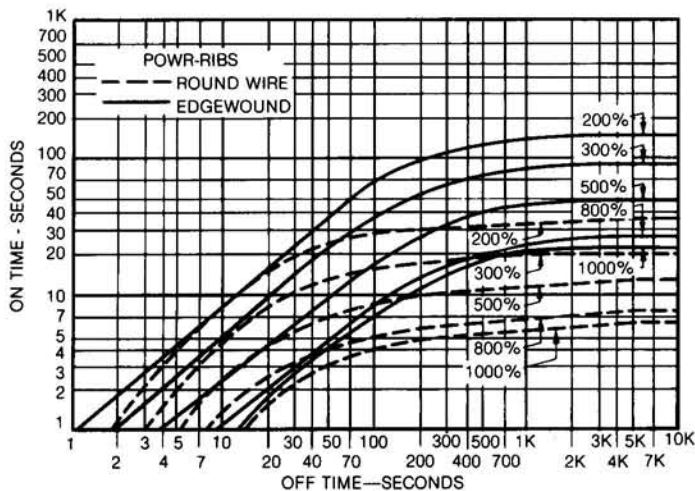
Overload 10 times rated watts for 5 seconds for round wire and ribbon wire units.

Inductance Single layer winding inductively wound.

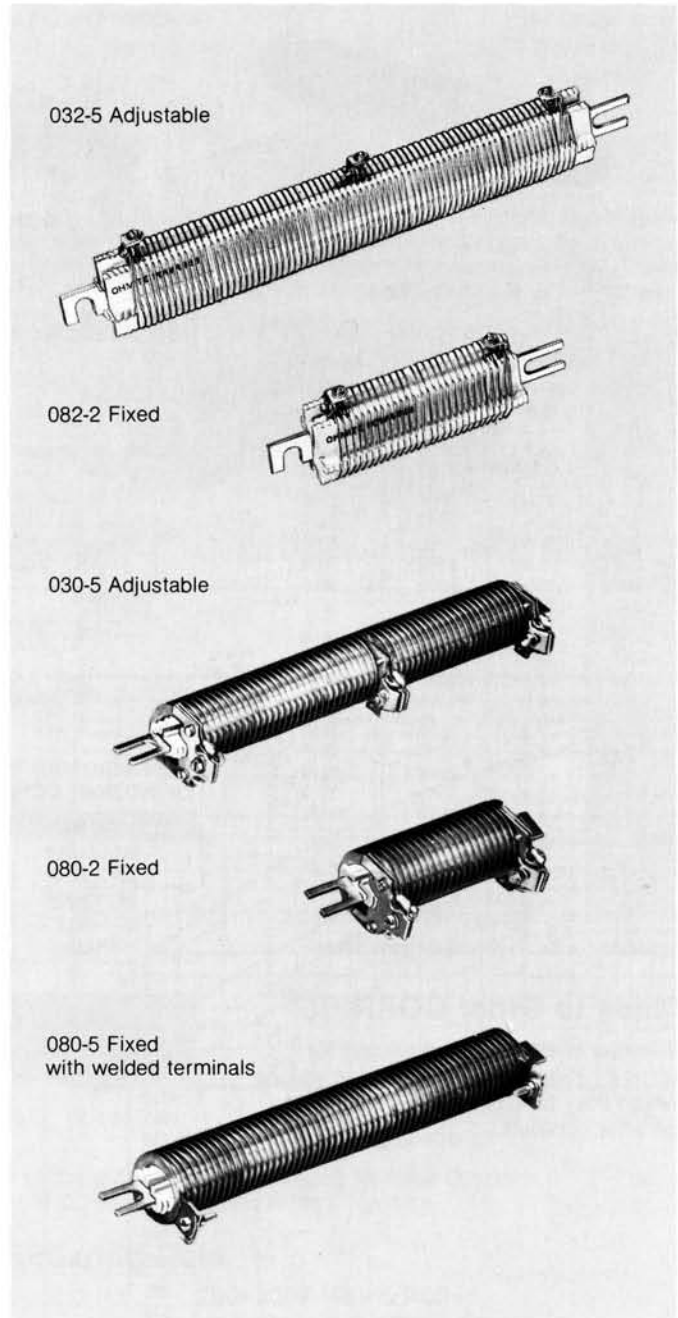
Construction Heavy resistance alloy mounted on ceramic insulators which are supported by a metal bar mounting bracket. Metal parts except for the resistance element are heavily plated to prevent oxidation at high operating temperatures and to prevent corrosion.

Mounting A heavy metal bar with slots on each end provide easy secure mounting.

Pulse and Intermittant Duty Operation



Percent of Continuous Duty Rating for Pulse Operation of POWR-RIB, Bare Resistors.



Ordering Data

Typical No.

080-7-72B-1.40

OHMITE TYPE NO.

080 Fixed

Ribbon Wound

030 Adjustable

Ribbon Wound

082 Fixed

Round Wire Wound

032 Adjustable

Round Wire Wound

NUMBER OF INSULATOR SEGMENTS

OHMS

Select from table on page 33

TERMINAL

72B = 2172-B

72G = 2172-G

72F = 2172-F

75 = 2175

76 = 2176

39 = Welded Tab

Type 080 FIXED/030 ADJUSTABLE Type 082 FIXED/032 ADJUSTABLE



080 and 030 Types Edge-wound "POWR-RIB" Resistors Size* (Number of Insulator-Segments Long)

2	3	4	5 In Stock	6	7	8		
8.875 (225.425) A	11.875 (30.163) A	14.875 (377.825) A	17.875 (454.025) A	20.875 (530.225) A	23.875 (606.425) A	26.875 (682.625) A		
7.250 (184.150) B	10.250 (31.750) B	13.250 (336.550) B	16.250 (412.75) B	19.250 (488.950) B	22.250 (565.150) B	25.250 (641.350) B		
Ohms	Ohms	Ohms	Ohms	Cat.* No.	Ohms	Ohms	Ohms	Max. Amps.
.033	.057	.08	.10	2301	.12	.14	.16	100
.040	.070	.10	.12	2302	.14	.16	.18	91
.046	.078	.11	.14	2303A	.17	.20	.23	89
.052	.088	.12	.16	2304A	.19	.22	.25	78
.06	.10	.14	.18	2305A	.21	.25	.30	75
.07	.12	.18	.22	2306A	.26	.30	.34	68
.08	.13	.19	.25	2306	.30	.35	.40	63
.10	.16	.23	.30	2308A	.36	.42	.48	57
.11	.18	.25	.33	2308	.40	.47	.54	54
.12	.20	.28	.37	2309A	.45	.53	.61	50
.17	.28	.38	.50	2310	.60	.70	.80	47
.21	.33	.46	.60	2317	.72	.85	.98	43
.23	.36	.51	.67	2318	.80	.93	1.06	41
.26	.42	.58	.75	2311	.90	1.05	1.2	39
.35	.56	.77	1.00	2312	1.20	1.40	1.6	33
.45	.73	1.00	1.30	2319	1.50	1.75	2.0	29
.56	.90	1.20	1.60	2313	1.90	2.2	2.5	26
.69	1.20	1.70	2.20	2331A	2.70	3.1	3.5	18.4
.88	1.50	2.20	2.80	2332A	3.40	4.0	4.6	16.3
1.10	1.90	2.70	3.50	2333A	4.30	5.1	5.9	14.6
1.40	2.40	3.50	4.50	2334A	5.50	6.5	7.5	12.7
1.70	2.90	4.20	5.40	2335A	6.60	7.8	9.0	11.8
2.10	3.70	5.30	6.80	2336A	8.30	9.8	11.3	10.3
2.70	4.60	6.50	8.50	2337A	10.40	12.3	14.2	9.4

082 and 032 Types Round-Wire "POWR-RIB" Resistors

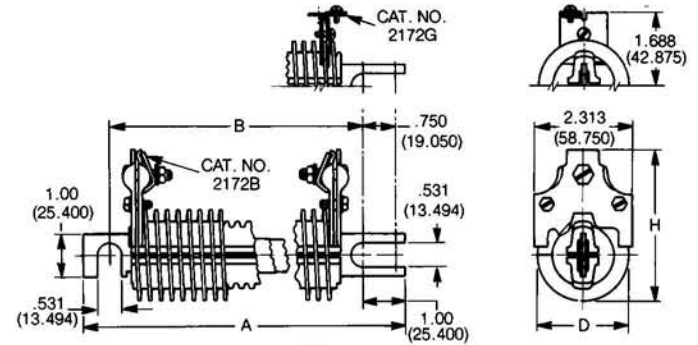
3.4	5.9	8.5	11.0	2338	13.5	16.0	18.5	8.3
4.1	7.1	10.0	13.0	2339	15.9	18.8	21.7	7.6
5.3	9.2	13.0	17.0	2340	20.8	24.6	28.4	6.6
6.3	10.9	15.4	20.0	2341	24.5	29.0	33.5	5.9
7.9	13.6	19.3	25.0	2342	30.7	36.4	42.1	5.1

*5-section units are stocked and are ordered by catalog number.

Order other sizes, or variations, by length, and ohms. Two terminals supplied as standard unless otherwise specified.

"POWR-RIB" resistors are rated at 375°C (675°F) temperature rise, measured on the resistance element (NEMA standard). They are made in seven standard lengths, which are 2, 3, 4, 5, 6, 7 or 8 insulator segments long. Available resistance values and current ratings are shown in the table. Intermediate resistance values can be obtained by relocating the terminal clamps. Terminals can be clamped in line with the mounting or at 90° to it. Any combination of clamps can be ordered.

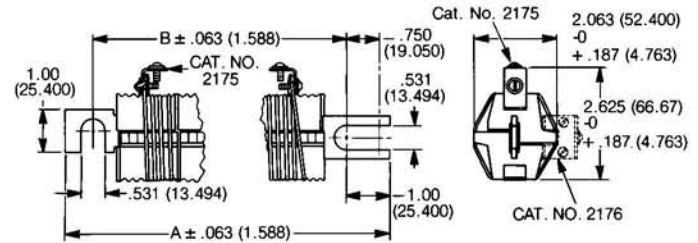
Dimensions—Edge-Wound POWR-RIB Resistors



Amps*	H + .125 (3.175)		D + .125 (3.175)-0	
	In.	MM	In.	MM
100-68	3.313	84.150	2.125	53.975
63-33	3.125	79.375	1.875	47.625
29-26	2.563	65.100	1.875	47.625
18.4, 16.3, 12.7, 11.8	2.500	63.500	1.750	44.450
14.6, 10.3, 9.4	2.438	61.925	1.625	41.275

*100 to 33 amp rating with terminal No. 2172B
29 to 8.5 amp rating with terminal No. 2172G

Dimensions—Round-Wire POWR-RIB



- Adjustable Terminal **Cat. No. 2172-B**
(For 30 amps. or more)
- Adjustable Terminal **Cat. No. 2172-G**
(For 29 amps. or less)
- Adjustable Terminal **Cat. No. 2172-F**
(For parallel wound units)
- Adjustable Terminal (in line mtg.) **Cat. No. 2175**
(For 8.3 amps. or less)
- Adjustable Terminal (90° mtg.) **Cat. No. 2176**
(For 8.3 amps. or less)
- Welded Terminal with .250 (6.350) dia. hole **Type 39**
(Cannot be supplied unmounted. Must be specified on resistor order)
- Clamp, with screw, nut and lockwasher **Cat. No. 2173**
(For use on welded terminal Type 39)

Welded or brazed terminal Type 39 can be supplied only for edge-wound resistors of 26 ampere rating or greater.

An optional slotted sleeve, **Cat. No. 2174** .750 (19.050) O.D. x .500 (12.700) I.D. x .375 (9.525) lg. is available, which permits the mounting bar to expand with complete freedom and without buckling, when the resistor operates at very high temperatures.

Made To Order Tubular Core Resistors

Fixed Resistors TYPE 200, TYPE 270

Free Air Wattage Rating	Nominal Core Dimensions						Code for Core Dia.	Vitreous Enamel Coated, Type 200, Type 270				Standard Terminal See Page 36 For Other Terminals	
	Length		Outside Dia.		Inside Dia.			Critical Resistance Limiting Factors					
	In.	MM	In.	MM	In.	MM		Minimum Ohms	For Ohms Over	Limit Watts and Working Voltage to	Maximum Possible Ohms		
*3	.438	11.1	.210	5.25	.130	3.17	AA	0.13	Limits controlled by free air watts and max. possible ohms		3.48K	48, 58	
*5¼	.625	15.9	.250	6.35	.135	3.43	CA	0.19	Limits controlled by free air watts and max. possible ohms		7.06K	48, 58	
6½	1.0	25.4	.250	6.35	.125	3.18	CA	0.10			2.30K	27.3K	57
*8	1.0	25.4	.313	7.95	.188	4.76	D	0.10	2.16K	Limit wattage to 78% of free air watts and working volts to 500 volts per inch of winding space between terminal edges		17.1K	48, 57
*12	1.75	44.5	.313	7.95	.188	4.76	D	0.10	6.52K			51.6K	48, 57
11	1.0	25.4					H	0.10	3.02K	Limit wattage to 78% of free air watts and working volts to 500 volts per inch of winding space between terminal edges		28.2K	57
15	1.5	38.1	.438	11.1	.250	6.35	H	0.10	6.03K			56.4K	40
*20	2.0	50.8					H	0.11	10.1K	Limit wattage to 78% of free air watts and working volts to 500 volts per inch of winding space between terminal edges		94.0K	48-40
26	3.0	76.2					H	0.21	18.1K			169.0K	40
*25	2.0	50.8					K	0.15	12.9K	Limit wattage to 78% of free air watts and working volts to 500 volts per inch of winding space between terminal edges		100.0K	40
35	3.0	76.2					K	0.26	23.2K			180.0K	
*50	4.0	101.6	.563	14.3	.313	7.95	K	0.38	33.5K	Limit wattage to 78% of free air watts and working volts to 500 volts per inch of winding space between terminal edges		260.0K	40
60	5.0	127.0					K	0.50	43.8K			340.0K	
*75	6.0	152.4					K	0.61	54.1K	Limit wattage to 78% of free air watts and working volts to 500 volts per inch of winding space between terminal edges		420.0K	40
24	1.5	38.1					M	0.10	9.49K			12.2K	
30	2.0	50.8					M	0.10	16.4K	Limit wattage to 78% of free air watts and working volts to 500 volts per inch of winding space between terminal edges		21.1K	40
45	3.0	76.2					M	0.10	30.2K			38.8K	
51	3.5	88.9					M	0.11	37.1K	Limit wattage to 78% of free air watts and working volts to 500 volts per inch of winding space between terminal edges		47.6K	40
61	4.0	101.6	.750	19.1	.50	12.7	M	0.13	44.0K			56.5K	
65	4.5	114.3					M	0.15	50.9K	Limit wattage to 78% of free air watts and working volts to 500 volts per inch of winding space between terminal edges		65.3K	40
76	5.0	127.0					M	0.17	57.8K			74.2K	
90	6.0	152.4					M	0.21	71.6K	Limit wattage to 78% of free air watts and working volts to 500 volts per inch of winding space between terminal edges		91.9K	40
*100	6.5	165.1					M	0.23	78.5K			101.0K	
52	3.0	76.2					N	0.11	Limits controlled by free air watts and working volts to 500 volts per inch of winding space between terminal edges		25.3K	40	
70	4.0	101.6	1.0	25.4	.625	15.9	N	0.17			37.2K		
85	5.0	127.0					N	0.22	Limits controlled by free air watts and working volts to 500 volts per inch of winding space between terminal edges		49.1K	40	
105	6.0	152.4					N	0.27			61.0K		
112	6.5	165.1					N	0.30	Limits controlled by free air watts and working volts to 500 volts per inch of winding space between terminal edges		67.1K	40	
120	7.0	177.8					N	0.33			72.9K		
140	8.0	203.2					N	0.38	Limits controlled by free air watts and working volts to 500 volts per inch of winding space between terminal edges		84.8K	40	
176	10.0	254.0					N	0.49			109.0K		
40	2.0	50.8					P	0.10	Limits controlled by free air watts and working volts to 500 volts per inch of winding space between terminal edges		9.63K	46	
80	4.0	101.6					P	0.10			37.7K		
95	5.0	127.0					P	0.10	Limits controlled by free air watts and working volts to 500 volts per inch of winding space between terminal edges		51.7K	46	
121	6.0	152.4					P	0.10			65.7K		
130	6.5	165.1	1.125	28.6	.75	19.1	P	0.10	Limits controlled by free air watts and working volts to 500 volts per inch of winding space between terminal edges		72.7K	46	
160	8.0	203.2					P	0.12			93.7K		
*175	8.5	215.9					P	0.13	Limits controlled by free air watts and working volts to 500 volts per inch of winding space between terminal edges		101.0K	46	
*225	10.5	266.7					P	0.16			129.0K		
235	11.25	285.8					P	0.18	Limits controlled by free air watts and working volts to 500 volts per inch of winding space between terminal edges		139.0K	46	
251	12.0	304.8					P	0.19			150.0K		
150	5.0	127.0	1.5	38.1	1.125	28.6	Q	0.10	Limits controlled by free air watts and working volts to 500 volts per inch of winding space between terminal edges		34.2K	45	
220	8.5	215.9					R	0.18			75.0K		
275	10.5	266.7					R	0.23	Limits controlled by free air watts and working volts to 500 volts per inch of winding space between terminal edges		96.6K	45	
300	11.75	298.5	1.625	41.3	1.125	28.6	R	0.26			110.0K		
250	6.0	152.4					S	0.15	Limits controlled by free air watts and working volts to 500 volts per inch of winding space between terminal edges		6.11K	45	
500	12.0	304.8	2.5	63.5	1.75	44.5	S	0.38			15.4K		
750	15.0	381.0					S	0.50	Limits controlled by free air watts and working volts to 500 volts per inch of winding space between terminal edges		20.0K	45	
1000	20.0	508.0					S	0.69			27.7K		

Tolerance on Nominal Core Dimensions

Length	Tolerance
.438 (11.113mm) to 4.00 (101.60mm)	± .031 (.794mm)
Over 4.00 (101.60mm) to 6.50 (165.10mm)	± .047 (1.191mm)
Over 6.50 (165.10mm) to 11.25 (285.575mm)	+ .063 (1.588mm) - .094 (2.381mm)
Over 11.25 (285.575mm) to 20.0 (508.0mm)	± .125 (3.175mm)

Tolerances do not include effect of longitudinal camber.

I.D.	Tolerance
To .500 (12.700mm)	± .016 (.397mm)
Over .500 (12.700mm) to 1.125 (28.575mm)	± .031 (.794mm)
Over 1.125 (28.575mm) to 1.750 (44.450mm)	± .063 (1.588mm)

*These core sizes are used for the standard stock items. See the listing of the resistance values under Types 200, 210, 270.

Maximum Diameter Over Coating: The overall diameter of a finished resistor includes the build-up due to wire diameter, coating and terminal material. This results in a possible maximum increase in diameter of .188 (4.763mm) for low resistance, 1.125 (28.575mm) O.D. core resistors and larger; .156 (3.969mm) for resistors with smaller diameter cores. On all high resistance units the increase is generally less than .125 (3.175mm).

Other Core Sizes: Many other specials are available including cores with special inside diameter listed below.

Cores with Non-Standard I.D. (or O.D.)

O.D.		I.D.		Code	O.D.		I.D.		Code
In.	MM	In.	MM		In.	MM	In.	MM	
.313	7.938	.219	5.556	DA	.750	19.050	.547	13.891	MA
.438	11.113	.313	7.938	HA	.938	23.813	.563	14.288	UA
.563	14.288	.391	9.922	KA	1.125	28.575	.875	22.225	PA
.625	15.875	.453	11.509	LA					

Fixed Resistors
TYPE 400, TYPE 470

Dividohm® Adjustable Resistors
TYPE 210, TYPE 410



Ohmicone® Coated Type 400, Type 470				Type 210 or 410 Minimum Ohms	Vitreous Enamel Coated Type 210		Ohmicone® Coated Type 410		Type 210 or 410 Maximum Possible Ohms	Free Air Wattage Rating	
Minimum Ohms	Critical Resistance Limits				Critical Resistance Limiting Factors						
	For Ohms Over	Limit Work Volts to	Maximum Ohms		For Ohms Over	Limit Watts and Working Volts to	Limit Watts and Working Volts to				
0.1	8.0K	155	15.8K						*3		
0.1	15.0K 21.6K	281 375	34.0K 45.4K	These core sizes not available as adjustable resistors						*5¼ 6½	
0.1	9.87K 50.0K	281 775	42.8K 50.4K	0.95	4.47K	10 Watts—316 Volts	12 Watts—345 Volts	10.0K	*8 12		
	7.18K 21.1K 44.0K	281 563 938	35.3K 70.5K 118.0K	This core size not available as adjustable resistor						11 15 *20	
0.1	110.0K	1690	212.0K	0.44 0.73 1.30	4.14K 6.90K 12.4K	Limit wattage to 78% of free air watts and working volts to 500 volts per inch of wind- ing space between terminal edges	Limits controlled by free air watts and working volts to 500 volts per inch of wind- ing space between terminal edges.	11.8K 19.7K 35.5K	26		
	35.2K 81.6K 119.0K 170.0K 207.0K	938 1690 2440 3190 3940	151.0K 272.0K 393.0K 340.0K 420.0K	0.24 0.43 0.62 0.81 1.00	8.88K 16.0K 23.1K 30.2K 37.3K			25.0K 45.6K 100.0K 86.2K 100.0K	*25 35 *50 60 *75		
0.1	11.1K 26.6K 59.8K 80.0K 93.6K 118.0K 130.0K 168.0K 182.0K	516 893 1640 2020 2390 2770 3140 3890 4270	73.6K 127.0K 234.0K 288.0K 341.0K 395.0K 448.0K 555.0K 609.0K	0.24 0.42 0.77 0.95 1.10 1.30 1.50 1.80 1.00	6.16K 10.7K 19.6K 24.1K 28.6K 33.0K 37.5K 46.5K 50.9K			8.73K 15.1K 27.8K 34.1K 40.5K 46.8K 53.2K 65.9K 100.0K	24 30 45 51 61 65 76 90 *100		
0.1	49.2K 78.9K 113.0K 141.0K 159.0K 176.0K 204.0K 267.0K	1600 2350 3100 3850 4220 4600 5350 6850	305.0K 448.0K 591.0K 734.0K 805.0K 877.0K 1.02M 1.31M	0.18 0.26 0.34 0.42 0.47 0.51 0.59 0.75				25.3K 37.2K 49.1K 61.0K 67.0K 72.9K 84.8K 109.0K	52 70 85 105 112 120 140 176		
0.1	6.66K 51.0K 80.8K 102.0K 116.0K 158.0K 166.0K 211.0K 237.0K 257.0K	516 2020 2770 3520 3890 5020 5390 6890 7460 8030	83.9K 328.0K 450.0K 572.0K 633.0K 816.0K 877.0K 1.12M 1.21M 1.31M	0.10 0.25 0.34 0.44 0.48 0.62 0.67 0.86 0.93 1.00				9.57K 37.4K 51.3K 65.2K 72.2K 93.0K 100.0K 100.0K 138.0K 148.0K	40 80 95 121 130 160 *175 *225 235 251		
0.1	44.4K	2580	433.0K	0.41				Limits controlled by free air watts and working volts to 500 volts per inch of winding space between terminal edges		29.4K	150
0.1	123.0K 164.0K 195.0K	5210 6710 7650	351.0K 452.0K 516.0K	0.91 1.20 1.30						64.6K 83.2K 94.8K	220 275 300
0.1	35.0K 111.0K 125.0K 180.0K	2960 7460 9680 13400	86.3K 218.0K 283.0K 392.0K	0.61 1.50 2.00 2.80						6.11K 15.4K 20.0K 27.7K	250 500 750 1000

Resistor Type Numbers

Coating	Fixed Resistors	Adjustable Resistors
Vitreous Enamel	200	210
	270	
Silicone Ceramic Ohmicone®	400	410
	470	

Note: Type 200 and Type 400 are wire lead terminal fixed resistors.

Ordering Data

Typical No. **270-61-M-40-100R0-J**

OHMITE TYPE NO.
See chart at left

FREE AIR WATTS
See chart above
and previous page

CORE DIAMETER
Code Letter
See previous page

TERMINAL LUG NO.
See Pages 36 and 37
For Type numbers

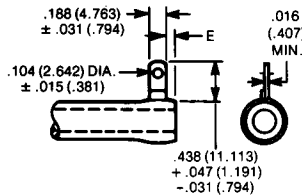
RESISTANCE TOLERANCE LETTER,
see Individual Series
Number page for
tolerance available.

RESISTANCE IN OHMS
See previous page for limits.
See individual Series Num-
ber page for instructions on
writing code

Resistor Terminals for Tubular Cores

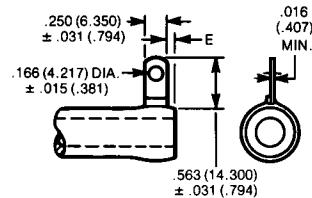
Type 57

Std. on .313 (7.950mm) O.D. cores. Also used on cores from .250 (6.350mm) to .750 (19.050mm) O.D. Solder coated. Terminal bolts not available.



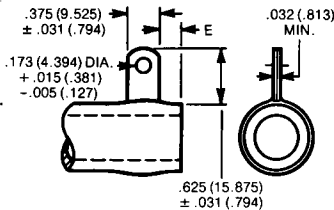
Type 40 and 40A

Std. on .563 (14.300mm), .750 (19.05mm) and 1.000 (25.40mm) O.D. cores. Also used on cores from .313 (7.950mm) to 1.125 (28.575mm) O.D. Solder coated. Type 40A has screw #6-32 x .5 (12.70mm) with 2 nuts and 2 washers.



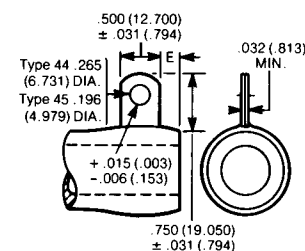
Type 46 and 46A

Std. on 1.125 (28.575mm) O.D. cores. Also used on cores .563 (14.300mm) to 1.50 (38.10mm) O.D. Solder coated. Type 46A has screw #8-32 x .625 (15.875mm) with 2 nuts and 2 washers.



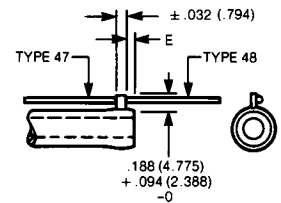
Type 44—44A—45—45A—45B

Type 44 std. on 1.50 (38.10mm) to 2.50 (63.50mm) cores. Also used on cores from .75 (19.05mm) to 1.125 (28.575mm) O.D. Solder coated. Type 44A has screw 1/4-20 x .625 (15.875mm) with 2 nuts and 2 washers. Type 45A has screw #8-32 x .625 (15.875mm) with 2 nuts and 2 washers. Type 45B has screw #10-32 x .625 (15.875mm) with 2 nuts and 2 washers.



Type 47 and 48

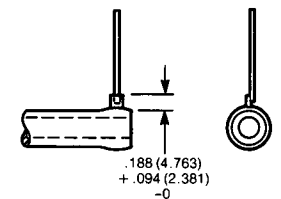
.125 (3.175mm) on .313 (7.950mm) O.D. cores and larger with #18 ga. leads .0625 (1.588mm) on .250 (6.35mm) O.D. cores and smaller, #20 ga. leads. Type 47 leads 2.00 (50.80mm) long. Type 48 leads 1.500 (38.10) long. Leads solder coated. Used on cores .210 (5.25) to .563 (14.3) O.D.



E = .016 (.407mm) on cores less than 1.00 (25.40mm) long. .031 (.788mm) on cores 1.00 (25.40mm) and longer.

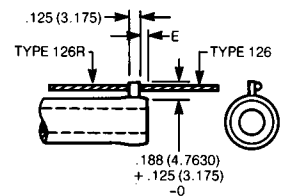
Type 48R

Dimensions and lead gauge same as Type 48.



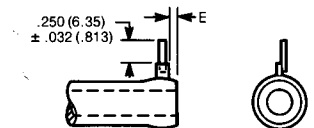
Type 126 and 126R

Used on cores .313 (7.950mm) to 1.125 (28.575mm) O.D. Leads #18 ga. stranded bare phosphor bronze. Specify length.



Type 58

Designed for printed circuit board use. Used on cores .210 (5.334mm) O.D. to .562 (14.275mm) O.D. Leads #20 ga. solder coated.



E = .016 (.407mm) on cores less than 1.00 (25.40mm) .031 (.788mm) on cores 1.00 (25.40mm) thru 2.00 (50.80).

Edge Distance—Dimension "E"

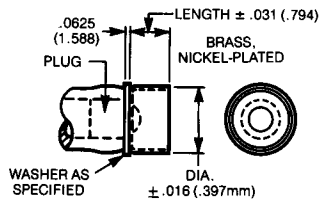
Terminals	Core O.D.																			
	In.	MM	In.	MM	In.	MM	In.	MM	In.	MM	In.	MM	In.	MM	In.	MM	In.	MM	In.	MM
	.250	6.350	.313	7.938	.438	11.113	.563	14.288	.750	19.050	1.00	25.40	1.125	28.575	1.500	38.100	1.625	41.275	2.500	63.500
40-40A-49-50-57-68-69-126-126R-532	.031	.794	.094	2.381	.094	2.381	.094	2.381	.125	3.175	.156	3.969	.219	5.556	—	—	—	—	—	—
44-44A-45-45A-45B-46-46A	—	—	—	—	—	—	.250	6.350	.250	6.350	.250	6.350	.250	6.350	—	—	—	—	—	—
535-538	—	—	.125	3.175	.125	3.175	.125	3.175	.125	3.175	.156	3.969	.219	5.556	.250	6.350	.250	6.350	.500	12.700

Dimension "E" can be varied and is often reduced for cores 2.00 (50.80mm) or less in length or sometimes increased for greater lead-

age distance to ground. Tolerance on "E" is ± .016 (.397mm) up to .125 (3.175mm) and ± .063 (1.588) above.

Type 140

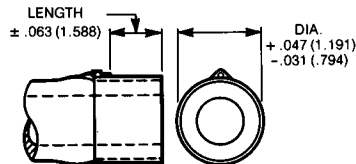
For Cores .438 (11.113mm) to 1.125 (28.575mm) O.D.



Ferrule				Catalog No.	
Diameter		Length		No Washer	With Washer
In.	MM	In.	MM		
.563	14.288	.500	12.700	140/9*	140/19
.688	17.463	.563	14.288	140/11*	140/01
.813	20.638	.500	12.700	140/13†	140/03
1.125	28.575	.500	12.700		140/18

*Up thru .563 (14.288mm) D. core. †Up thru .750 (19.050mm)

Type 141

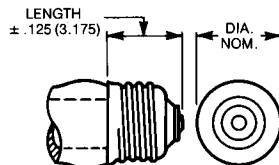


Ferrule				Cat. No.	Core O.D.	
Diameter		Length			In.	MM
In.	MM	In.	MM			
.625	15.875	.625	15.875	141/10	.563	14.288
.813	20.638	.688	17.463	141/13	.750	19.050
1.062	26.988	.688	17.463	141/17	1.000	25.400
1.188	30.163	.688	17.463	141/19	1.125	28.575

Ferrules are brass, natural finish.

Type 146

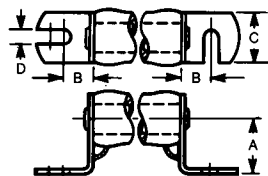
For Cores as Required.



Cat. No.	Size	Diameter		Length	
		In.	MM	In.	MM
146/I	Intermediate	.656	16.669	.813	20.638
146/M	Medium	1.031	26.194	1.000	25.400

Miniature and Candelabra bases also available.

Type 63

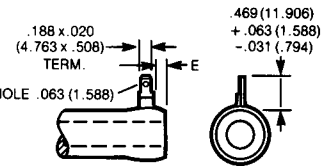


Cores .563 (14.288mm) to .750 (19.050mm) O.D. **Cat. No. 63/12**
 Cores 1.000 (25.400mm) to 1.125 (28.575mm) O.D. . . . **Cat. No. 63/18**

Cat. No.	A ± .031 (.794)		B ± .031 (.794)		C ± .031 (.794)		D (Min.)	
	In.	MM	In.	MM	In.	MM	In.	MM
63/12	.781	19.844	.438	11.113	.750	19.050	.250	6.350
63/18	.875	22.225	.813	20.638	1.125	28.575	.313	7.938

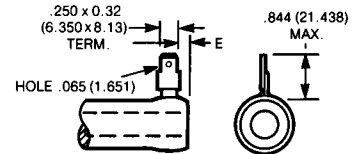
Type 532

Quick connect terminal used on .313 (7.950mm) thru 1.125 (28.575mm) O.D.



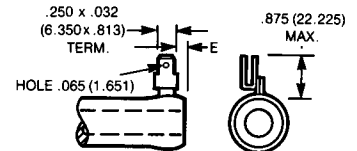
Type 538

Quick connect terminal used on .313 (7.950mm) thru 2.50 (63.50mm).



Type 535

Dual quick connect terminal used on .313 (7.950mm) thru 2.50 (63.50mm).



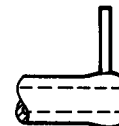
DBL. AMP TERMINAL

Other Terminals

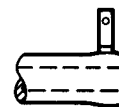
Type 49 .250 (6.35mm) wide x .313 (7.950mm) .166 (4.217mm) dia. hole. Solder coated.



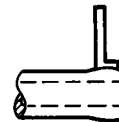
Type 50 Untinned lug intended for welded connection. .063 (1.600mm) x height as specified.



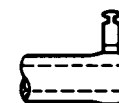
Type 51 .125 (3.175mm) wide x height as specified. .072 (1.829mm) hole. Solder coated.



Type 52 For "wire wrap" (Keller, Gardner-Denver T.M.)



Type 68 .188 (4.775mm) wide x .531 (13.488mm) high. Solder coated.



Type 69 .125 (3.175mm) wide x .375 (9.525mm) high. Solder coated.



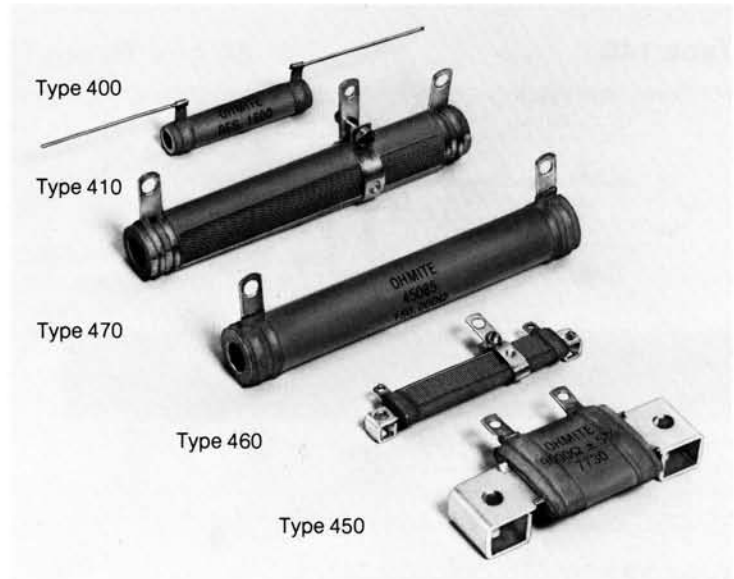
Type 400-450-470 FIXED RESISTORS

Type 410-460 ADJUSTABLE RESISTORS

OHMICONE®
Silicone Ceramic Coating

Features

- No Noise All Welded Construction
- Rugged Silicone Coating
- Full Wattage Range Available
- High Resistance Values



Specifications

Tolerance $\pm 5\%$ 1 ohm and above $\pm 10\%$ below 1 ohm. $\pm 1\%$ to $\pm 0.05\%$ available.

Temperature Coefficient 0 ± 400 PPM/ $^{\circ}\text{C}$ 1 ohm to 20 ohms. 0 ± 260 PPM/ $^{\circ}\text{C}$ above 20 ohms.

Dielectric Withstanding Voltage Measured from terminals to mounting bracket, 1000 volts AC up to 1 inch diameters. 3000 volts AC 1.125 inches diameter and larger.

Overload 10 times rated wattage for 5 seconds for 5 watts and greater sizes.

Inductance Standard resistors wound with a single layer inductive winding. Non-inductive and reduced inductance windings available for fixed resistors.

Core Ceramic, Tubular or oval

Coating Silicone ceramic

Mounting Type 400 may be mounted by the wire leads. Type 400 and Type 470 may be mounted by "push-in" brackets or through bolts. See pages 39 and 40 for details. Type 450-460 have integral brackets for individual or stack mounting. See Type 250 for bracket details and spacer washers.

Dimensions

Type 400 same as Type 200. See page 18.

Type 410 same as Type 210. See pages 22 and 35.

Type 450-460 same as Type 250-260. See page 26.

Type 470 same as Type 270. See pages 20 and 35.

Electrical Limiting Factors

Type 400, Type 410, Type 470. See page 35.

Type 450-460. See page 26.

Ordering Data

To specify resistors, see below.

Typical No.	450	30TE	57S	1K000	J
OHMITE TYPE NO.	400	410	450	460	470
WATTAGE at 25 C Ambient					
CORE CODE See page 35 for tubular. See page 27 for thin type.					
TERMINALS See page 36-37					
USED FOR TYPE 450-460 ONLY S = Stacking bracket U = Unit mounting bracket					
TOLERANCE	F = +1% G = +2% H = +3% J = +5% K = +10%				
RESISTANCE VALUE R = Decimal Pt. K = Decimal Pt. and X1000	Examples R5000 = .5 ohm 1R000 = 1 ohm 250R0 = 250 ohms 1K000 = 1000 ohms 25K00 = 25,000 ohms 25K50 = 25,500 ohms				

Spring Grip Mounting Brackets Non-Turn Features for Tubular Core Resistors



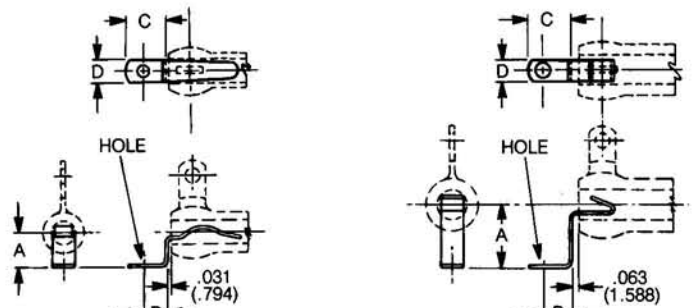
Spring-Grip Type Mounting Brackets

These are the standard type of brackets for mounting stock resistors. They will be supplied on bulk shipments to manufacturers only when specifically ordered. They are automatically included with unit boxed stock resistors sold

through distributors. The standard brackets are made of plated steel. Spring-steel brackets, of greater holding power, can be ordered for increased resistance to vibration and shock.



Spring-grip mounting brackets.



(1) FOR CAT. NO. 5 & 7

(2) FOR CAT. NO. 9 TO 18

Mounting bracket dimensions.

Std.	Catalog No.		For Core				Dimensions								Size of Hole		Max. Screw Size
	Spring Steel	Brass	O.D.		I.D.		A		B		C		D		In.	MM	
			In.	MM	In.	MM	In.	MM	In.	MM	In.	MM	In.	MM			
5	5S	5B	.313	7.938	.188	4.763	.281	7.144	.188	4.763	.375	9.525	.250	6.350	.144	3.658	# 6
7	7S	7B	.438	11.113	.250	6.350	.375	9.525	.250	6.350	.500	12.700	.250	6.350	.147	3.734	# 6
9	9S	9B	.563	14.288	.313	7.938	.688	17.463	.313	7.938	.469	11.913	.250	6.350	.161	4.089	# 6
12	12S	12B	.750	19.050	.500	12.700	1.188	30.163	.375	9.525	.750	19.050	.375	9.525	.196	4.978	#10
16	16S	16B	1.000	25.400	.625	15.875	1.188	30.163	.375	9.525	.750	19.050	.500	12.700	.196	4.978	#10
18	18S	18B	1.125	28.575	.750	19.050	1.188	30.163	.375	9.525	.750	19.050	.500	12.700	.196	4.978	#10

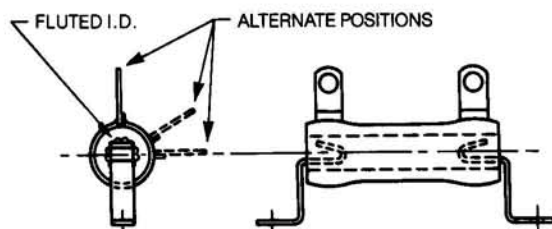
Non-Turn Features for Brackets

When a positive means (not dependent on friction) for preventing the resistor from turning on the bracket is required, resistors can be ordered with special cores which engage the bracket as shown.

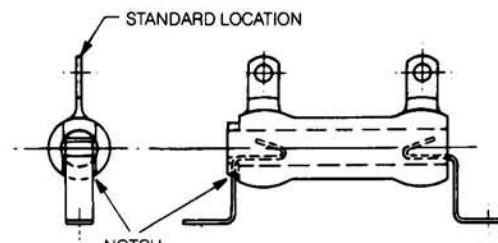
The code word "NOTCA 1" feature has a notch at one end of the core in line with the terminal and requires the terminal to be set in farther than standard from the end of the core. Special angles can be specified. Code word "NOTCA 2" feature has a patented fluted inside diameter core. The mounting bracket engages the flutes. The resistor may be positioned with the terminals in line with the brackets at 90°, or at an intermediate angle. "NOTCA 2" is available in certain sizes only, where tube wall thickness permits. When ordering add the complete code word to the resistor designation.



Resistors with Non-Turn features.



Fluted I.D. core Notca 2 feature.

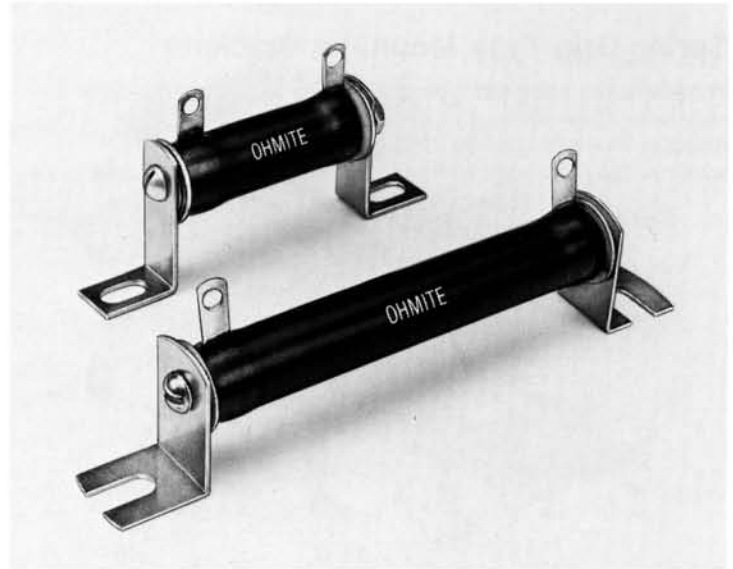


Notched Core for Notca 1 feature.

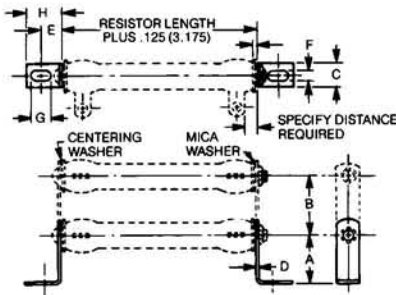
Through-Bolt Type "Dead" Mounting Brackets

Through-bolt mounting brackets are recommended for mounting applications where a sturdier type of mounting is required instead of the standard spring grip mounting brackets. Two types of brackets are available; the "end-slot and side slot" pair for quick mounting and the elongated hole type. Resistors are mounted on the brackets by means of through-bolts, centering washers and mica washers. Special brackets are available to meet military standards MS75009 and High Shock specification MIL-R-15109.

Resistors must be derated when two or more resistors are stack mounted. See page 50 for derating factors.

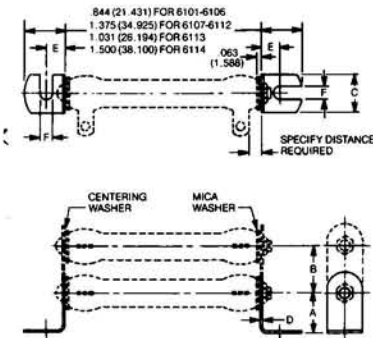


Through-bolt Type Mounting Brackets—Elongated Holes



Cat. No. Pair of Brackets Only	Cat. No. Brackets and Bolts	No. of Resistors	Resistor Core O.D. & Core Code		Dimensions				Standard Core Lengths	
			In.	MM	In.	MM	In.	MM		
6120	Add Core Dia. Letter and Resistor Length (Standard or Special) to Cat. No. as a Suffix. Example: Cat. No. 6121-K4.	1	D: .313	7.938	A: 1.000	25.400	B: 1.125	3.175	1.75", 2", 4"	
6121		2	H: .438	11.113	C: .500	12.700	D: .031	.794	6"	
				K: .563	14.288	E: .422	10.716	F: .219	5.556	
						G: .438	11.113	H: .750	19.050	
6122		1	M: .750	19.050	A: 1.250	31.750	B: 1.625	41.275	2", 4", 6.5"	
6123		2	N: 1.000	25.400	C: .750	19.050	D: .031	.794		
6124		3			E: .422	10.716	F: .219	5.556		
6125		4			G: .438	11.113	H: .750	19.050		
6126		1	P: 1.125	3.175	A: 1.500	38.100	B: 2.000	50.800	2", 6", 6.5"	
6127		2			C: 1.250	31.750	D: .063	1.588	8.5", 10.5"	
6128		3			E: .438	11.113	F: .281	7.144		
6129		4			G: .563	14.288	H: .875	22.225		

Through-bolt Type Mounting Brackets—Slotted



Cat. No. Pair of Brackets Only	Cat. No. Brackets and Bolts	No. of Resistors	Resistor Core O.D. & Core Code		Dimensions				Standard Core Lengths
			In.	MM	In.	MM	In.	MM	
6101	Add Core Dia. Letter and Resistor Length (Standard or Special) to Cat. No. as a Suffix. Example: Cat. No. 6105-M6.5	1	K: .563	14.288	A: .781	19.844	B: .938	23.813	2", 4", 6"
6102		2			C: .750	19.050	D: .031*	.794	
6103		3			E: .438	11.113	F: .250	6.350	
6104		1	M: .750	19.050	A: .781	19.844	B: 1.125	28.573	2", 4", 6.5"
6105		2			C: .750	19.050	D: .031*	.794	
6106		3			E: .438	11.113	F: .250	6.350	
6110A		1	N: 1.000	25.400	A: 1.000	25.400	B: 1.750	44.450	4", 6"
6111A		2			C: 1.125	28.575	D: .063	1.588	
6112A		3			E: .813	20.241	F: .313	7.938	
6110		1	P: 1.125	28.575	A: 1.000	25.400	B: 1.750	44.450	2", 6", 6.5"
6111		2			C: 1.125	28.575	D: .063	1.588	8.5", 10.5"
6112		3			E: .813	20.241	F: .313	7.938	
6113		1	P: 1.125	28.575	A: 1.562	34.688	B: . . .		2", 6", 6.5"
6113A		1	Q: 1.500	38.100	C: 1.250	31.750	D: .063	1.588	8.5", 10.5"
6113B		1	R: 1.625	41.275	E: .438	11.113	E: .375	9.525	
†6114		1	S: 2.500	63.500	A: 2.750	69.850	B: . . .		6", 12", 15"
					C: 2.500	63.500	D: .063	1.588	20"
					E: 1.000	25.400	F: .375	9.525	

*D = .047 (1.191) on brackets for 2 or 3 resistors.

†Both brackets have end slots and integral centering device, consisting of 3 projections.

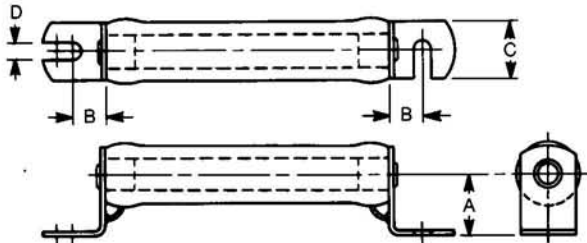
"Live" Mounting Brackets For Tubular Resistors Clip Mountings For Molded Axial Lead Resistors



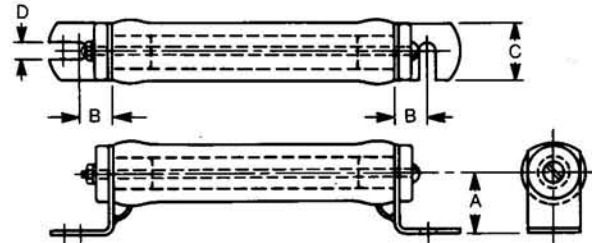
Live Bracket Mounted Resistors

Live Bracket Resistors use the brackets as the electrical terminals as well as a means of mounting. They are popular for railway signal work and locomotive circuits. The resistors are made with wire leads which are connected to the plated

brass brackets after the brackets are fastened to the core. One type has the brackets cemented to the core. The other type is assembled by a through-bolt, which is insulated from the brackets by porcelain plugs.



Type 63 Live Brackets (Cemented in Place)



Type 63A Through-bolt Type Live Brackets

Type 63 Live Brackets (Cemented in Place)

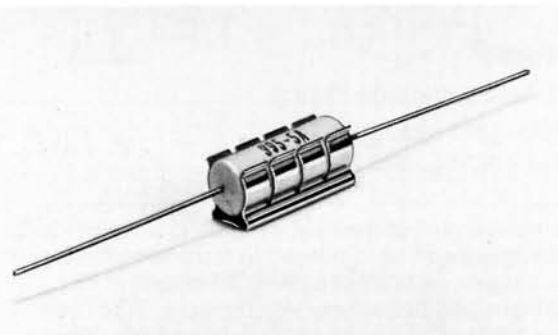
Cat. No.	For Core Diameters				Dimensions							
	In.		MM		A		B		C		D	
	In.	MM	In.	MM	In.	MM	In.	MM	In.	MM	In.	MM
63/12	.563	14.29	.750	19.05	.781	19.84	.438	11.11	.750	19.05	.250	6.35
63/18	1.00	25.4	1.125	28.57	.875	22.22	.813	20.64	1.125	28.57	.313	7.93

Type 63A Through-bolt Type Live Brackets

Cat. No.	For Core Diameters				Dimensions							
	In.		MM		A		B		C		D	
	In.	MM	In.	MM	In.	MM	In.	MM	In.	MM	In.	MM
63A/18	1.00	25.4	1.125	28.57	.875	22.22	1.062	26.99	1.125	28.58	.375	9.525

Mounting Clips for Molded Axial Lead Resistors

Molded axial lead resistors (Series 88, "Ohmicone" silicone-ceramic and Series 99, vitreous enamel) are distinguished for their consistent form and dimensions. This characteristic facilitates mounting of such resistors in clips. Thus, while these resistors are conventionally lead mounted, clip mounting may be desirable where immunity to severe vibration or mechanical shock is required. Clip mounting confers another advantage in the form of heat sink benefits. With the clip mounted on a metal surface*, up to a 100% increase in wattage rating is possible. Holes in the base of the clips permit fastening to chassis surface by means of machine screws, eyelets or rivets.



*Equivalent to a minimum of 1 1/2 sq. inches of .040" aluminum per watt dissipated.

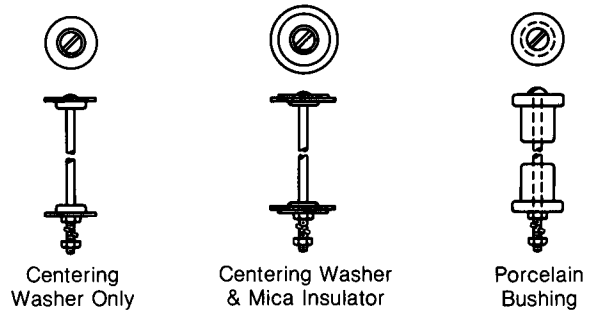
Stock Clips

Series 88 (type 884)	Series 99 (type 995)	Cat. No.	Clip Stock No. and Dimensions										
			Clip Length		Clip Width		Clip Height		No. of Holes	Hole Ctrs.		Hole Ctrs.	
			In.	MM	In.	MM	In.	MM		In.	MM	In.	MM
-1A	-1A	5900	.40	10.319	.150	3.810	.250	6.350	1			.071	1.803
-2	-2A	5902	.35	8.890	.217	5.500	.275	6.980	2	.156	3.969	.071	1.803
-3	-3A	5904	.50	12.700	.257	6.500	.319	8.103	2	.250	6.350	.093	2.362
-5, -6.5	-5A	5905	.90	22.860	.333	8.458	.377	9.576	2	.500	12.700	.093	2.362
---	-5B	5906	.90	22.860	.237	6.019	.284	7.214	2	.400	10.160	.103	2.616
-7, -8	-7A	5907	1.20	30.480	.333	8.458	.375	9.525	2	.600	15.240	.103	2.616
---	-10A	5908	1.75	44.450	.333	8.458	.377	9.576	2	.800	20.320	.103	2.616
-10, -11	---	5909	1.75	44.450	.360	9.128	.385	9.779	2	.800	20.320	.103	2.616

Perpendicular Through-Bolts, Heat Conducting Stud Mountings

Perpendicular Through-Bolts

Through-bolts, with centering washers, nuts and washers, or with additional mica washers or ceramic bushings can be ordered to mount resistors of various diameters and lengths. Unless otherwise specified, the bolts are long enough to mount the resistor on a 1/4" thick panel, maximum. The length of the resistor to be used must be given on the order.



Through-bolts For Made-to-order Size Resistors

Resistor Core Size		Bolt Size	With Centering Washers	With Centering Washers & Mica Washers	With Porcelain Bushings
In.	MM				
.313	7.938	No. 8	*6150	‡6160	—
.438	11.113	No. 8	6151	6161	—
.562	14.288	No. 10	6152	6162	§6172
.750	19.050	No. 10	6153	6163	6173
1.000	25.400	No. 10#	6154	6164	6174
1.125	28.575	1/4"	6155	6165	6175
1.500	38.100	1/4"	6156	6166	—
1.625	41.275	1/4"	6157	6167	—
2.500	63.500	1/4"	6158	6168	—

*Flat washers used.
 ‡Flat washers are used and mica washers Cat. No. 6010.
 #No. 10 used for 7" long max. resistors; 1/4" for longer sizes.
 §No. 8 bolt size used.

Through-bolts For Stock Resistors

Watts	Size		Bolt Size	Cat. No. with Mica and Centering Washers
	In.	MM		
5	.313 x .188 x 1.00	7.938 x 4.763 x 25.40	No. 8 x 1 3/4"	7PA5
12	.313 x .188 x 1.75	7.938 x 4.763 x 77.79	No. 8 x 2 1/2"	7PA10
20	.438 x .250 x 2.00	11.113 x 6.350 x 50.80	No. 8 x 2 3/4"	7PA20
25	.563 x .313 x 2.00	14.288 x 7.938 x 50.80	No. 10 x 2 3/4"	7PA25
50	.563 x .313 x 4.00	14.288 x 7.938 x 101.60	No. 10 x 4 3/4"	7PA50
75	.563 x .313 x 6.00	14.288 x 7.938 x 152.40	No. 10 x 6 3/4"	7PA75
100	.750 x .500 x 6.50	19.050 x 12.700 x 165.10	No. 10 x 7 5/8"	7PA100
175	1.125 x .750 x 8.50	28.575 x 19.050 x 215.90	1/4" x 9 1/2"	7PA160
225	1.125 x .750 x 10.50	28.575 x 19.050 x 266.70	1/4" x 11 1/2"	7PA200

Heat-Conducting Stud Mountings

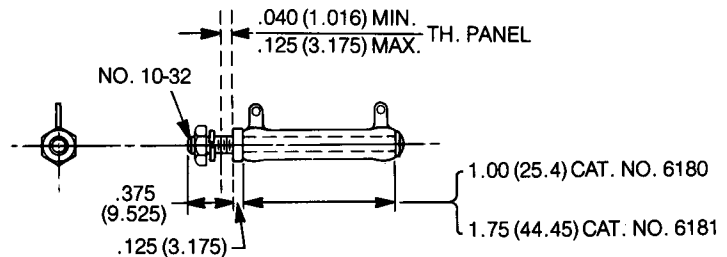
Features

- Increased Wattage Rating
- Convenient Mounting
- Minimum Space

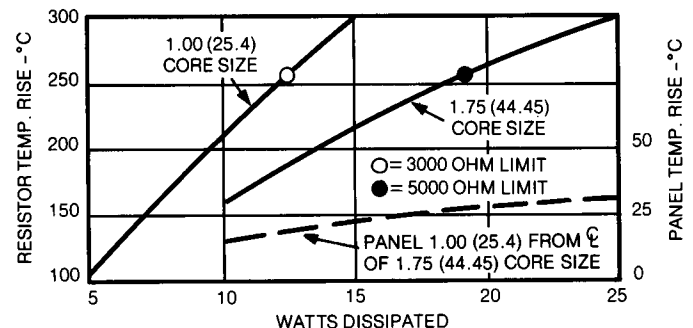
A substantial part of the heat generated in small tubular type resistors can be conveyed to a metal mountings surface under certain conditions, by means of an aluminum stud fitted snugly into the core. This transfer of heat tends to lower the temperature of the resistor. The size and nature of the mounting panel or chassis, and the permissible panel temperature rise therefore sets limits to the wattage that can be dissipated.

If the temperature rise of the resistor is maintained at 300° centigrade, the wattage can be more than doubled for small resistors mounted on a chassis of at least 100 square inches area. Ohmite provides special aluminum studs which are supplied riveted into special keyed cores.

Terminals for these resistors can be selected from pages 36 and 37.



Cat. No. Mtg. Stud	Core Size	
	In.	MM
6180	.313 x .188 x 1.00	7.94 x 4.77 x 25.40
6181	.313 x .188 x 1.75	7.94 x 4.77 x 77.79



Wattage dissipation versus temperature rise for stud-mounted resistor.

Resistor Mounting Washers and Porcelain Bushings



Metal Centering Washers



When resistors are to be mounted by through-bolts, "centering washers" are used with all resistors having an inside diameter larger than .250 (6.350mm), so as to keep the resistor centered on the bolt. The standard washers are made of steel, plated to resist corrosion.

Cat. No.	O.D. of Core		I.D. of Core		Dia. of Washer		Dia. of Hole		For Max. Screw Size
	In.	MM	In.	MM	In.	MM	In.	MM	
6007	.438	11.113	.250	6.350	.438	11.113	.173	4.394	#8
6000	.563	14.288	.313	7.938	.563	14.288	.190	4.826	#10
6006	.625	15.875	.438	11.113	.625	15.875	.190	4.826	#10
6001	.750	19.050	.500	12.700	.750	19.050	.190	4.826	#10
6002	1.000	25.400	.625	15.875	1.000	25.400	.250	6.350	1/4"
6003	1.125	28.575	.750	19.050	1.125	28.575	.250	6.350	1/4"
6004	1.500	38.100	1.125	28.575	1.625	41.275	.250	6.350	1/4"
6005	2.500	63.500	1.750	44.450	2.500	63.500	.250	6.350	1/4"

Mica Washers



Mica washers are used on through-bolt mounted resistors when a larger insulation leakage distance to ground is wanted than that provided by the normal lug edge distance alone. The mica washer fits between the core and the centering washer and the mica washer then requires the same I.D. as the resistor tube. The mica washers are made of "built-up mica" nominally .031 (.794mm) thick. As there is often some tendency for the laminations to separate during shipping and handling, it is the usual practice to use one or more laminations together, to obtain .031 (.794mm) minimum, when assembling.

Flexibility of mica washers allows No. 10 and 1/4" diameter bolts to pass through nominal 3/16" diameter holes.

Cat. No.	Core				Washer			
	O.D.		I.D.		O.D.		I.D.	
	In.	MM	In.	MM	In.	MM	In.	MM
*6029	.438	11.113	.250	6.350	.750	19.050	.250	6.350
6010	.563	14.288	.313	7.938	.750	19.050	.188	4.763
*6011	.563	14.288	.313	7.938	.750	19.050	.313	7.938
*6026	.563	14.288	.313	7.938	1.000	25.400	.313	7.938
6012	.750	19.050	.500	12.700	1.000	25.400	.188	4.763
*6013	.750	19.050	.500	12.700	1.000	25.400	.500	12.700
6014	1.000	25.400	.625	15.875	1.250	31.750	.188	4.763
*6015	1.000	25.400	.625	15.875	1.250	31.750	.625	15.875
6016	1.125	28.575	.750	19.050	1.500	38.100	.188	4.763
*6017	1.125	28.575	.750	19.050	1.500	38.100	.750	19.050
*6019	1.500	38.100	1.125	28.575	2.000	50.800	1.125	28.575
*6018	2.500	63.500	1.750	44.450	3.000	76.200	1.750	44.450

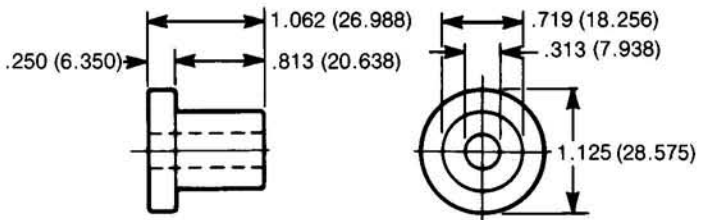
*To be used with centering washers.

Porcelain Bushings for Through-Bolt Mounting

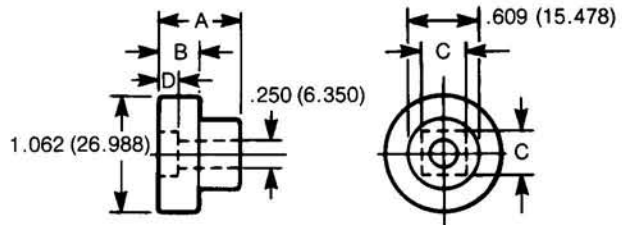
Porcelain bushings, which act as centering washers and additional end insulation, are available, as listed in the table, for resistors which are to be mounted by through-bolts. The bushings are a convenient means for increasing the leakage distance from the lugs to ground without the necessity of mounting the lugs farther in on the core. The bushings can be furnished cemented into resistors, when so ordered.

Cat. No.	For Core Size		Recess For Nut Size
	In.	MM	
6020	1.125 O.D. x .750 I.D.	28.575 O.D. x 19.050 I.D.	—
6022	*1.000 O.D. x .625 I.D.	25.400 O.D. x 15.875 I.D.	#10
6023	*1.000 O.D. x .625 I.D.	25.400 O.D. x 15.875 I.D.	1/4"
6024	.563 O.D. x .313 I.D.	14.288 O.D. x 7.938 I.D.	#8
6025	.750 O.D. x .500 I.D.	19.050 O.D. x 12.700 I.D.	#10

*Also used with 1.125 (28.575mm) O.D. core and special brackets.



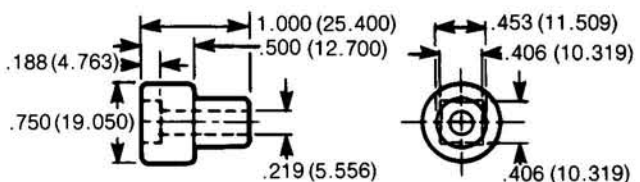
Cat. No. 6020 for 1.125 (28.575mm) O.D. Resistor



Cat. No.	For O.D.		A		B		C		D	
	In.	MM	In.	MM	In.	MM	In.	MM	In.	MM
6022	1.000	25.400	.750	19.050	.375	9.525	.406	10.319	.188	4.763
6023	1.000	25.400	.875	22.225	.500	12.700	.516	13.106	.313	7.938



Cat. No. 6024 for .563 (14.288mm) O.D. Resistor

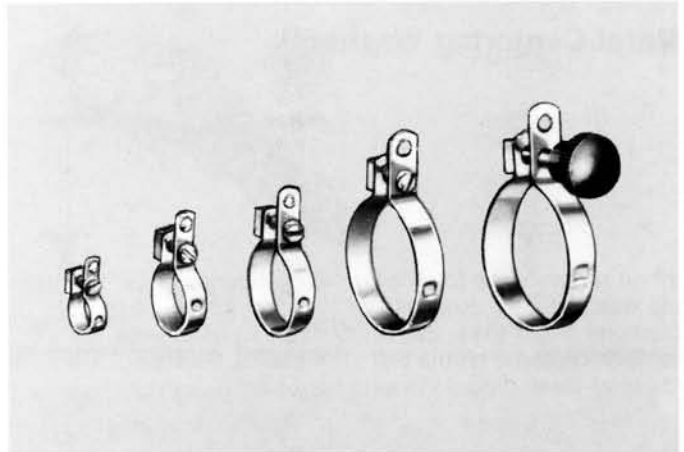


Cat. No. 6025 for .750 (19.050) O.D. Resistor

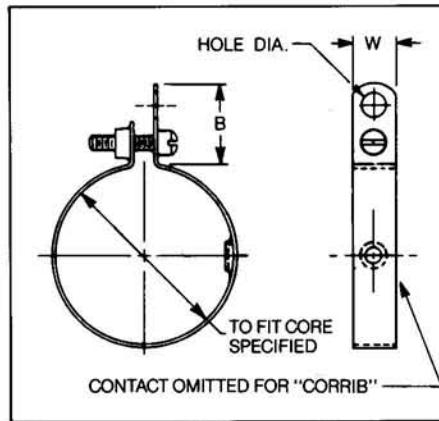
Adjustable Lugs

Adjustable Lugs for DIVIDOHM® Resistors

Adjustable lugs are clamp terminals used on resistors which have been provided with a bared side or track of exposed wire so the terminal can be located at any desired point and make contact with the wire. The standard lugs are made of plated steel. A small embossing provides the contact area. A unique Ohmite feature is the *flat* contact area of the embossing, as contrasted with the conventional ball shape. The flat distributes the pressure and prevents damage to the wire. A silver contact can be provided instead of the embossing. Lugs fasten by means of a screw.



Adjustable Lugs for Wirewound Resistors



Core Dia.		Dimensions						Screw Driver Type Cat. No.		Bakelite Knob Type Cat. No.	
		W Width		B Proj.		Hole D		Standard	Silver Contact	Standard	Silver Contact
In.	MM	In.	MM	In.	MM	In.	MM				
.313	7.950	.188	4.775	.406	10.312	.125	3.175	2115*	2161	—	—
.438	11.125	.250	6.350	.594	15.088	.152	3.861	0356	2162	0357	2163
.563	14.300	.250	6.350	.594	15.088	.170	4.318	2121*	2164	2122*	2165
.750	19.050	.250	6.350	.625	15.875	.170	4.318	2125*	2166	2126*	2167
1.000	25.400	.313	7.950	.688	17.475	.173	4.394	1956	2168	1957	2169
1.125	28.575	.313	7.950	.688	17.475	.173	4.394	2133*	2170	2134*	2171
1.500	38.100	.313	7.950	.688	17.475	.169	4.293	2180	2182	2181	2183
1.625	41.275	.375	9.525	.688	17.475	.169	4.293	2184	2186	2185	2187
2.500	63.500	.500	12.700	.969	24.613	.193	4.902	2188	2190	2189	2191

*Extruded Thread Style

Adjustable Lugs for "CORRIBS"

Adjustable lugs for use on the corrugated ribbon exposed winding "Corrib" resistors are similar to the regular adjustable lugs except for the omission of the embossing.

Corrib Adjustable Lugs

Core Dia.		*Cat. No.	Dimensions					
			Width W		Proj. B		Hole D.	
In.	MM		In.	MM	In.	MM	In.	MM
.563	14.300	1971	.313	7.950	.688	17.475	.175	4.445
.750	19.050	1972	.313	7.950	.688	17.475	.175	4.445
1.000	25.400	1973	.375	9.525	.688	17.475	.175	4.445
1.125	28.575	1974	.375	9.525	.688	17.475	.175	4.445
1.500	38.100	1975	.375	9.525	.688	17.475	.175	4.445
1.625	41.275	1976	.375	9.525	.688	17.475	.175	4.445
2.500	63.500	1977	.500	12.700	.906	23.012	.188	4.775

*When ordering Adjustable Lugs separately for "Corrib" resistors, add suffix A to Cat. No. for resistors using .063 (1.600mm) ribbon; add B to Cat. No. for resistors using .125 (3.175mm) ribbon. (Consult factory if in doubt.)

Double Thumb Screw Adjustable Lugs

This type of lug has one thumb-nut for fastening the connecting wire and a thumb-screw which presses a phosphor-bronze contact spring against the winding. As the thumb-screw must be loosened before the lug can be moved, this automatically protects the wire against possible damage.

These lugs are available only for 1.125 (28.575mm) diameter cores.

Catalog No. 2160



Resistor Cages

Type RC Cages—Individual Terminals



These are sturdy perforated metal cages with gray wrinkle enamel finish and porcelain "feed-through" type terminals for each resistor. Mounting slots are .313 (7.938mm) wide.

Specify cage style number and resistance. Cages with a removable panel for one or two adjustable resistors can be supplied. Consult factory for size.

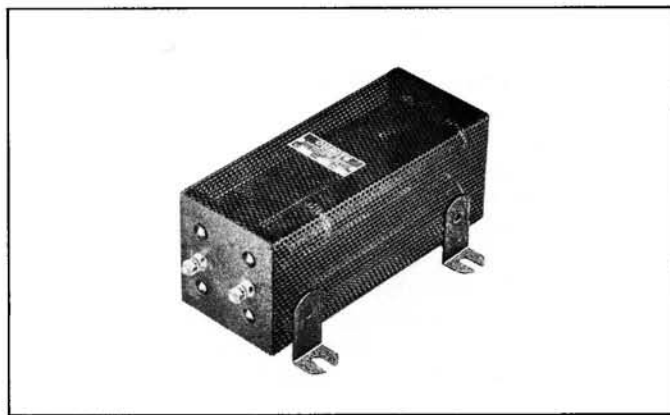
Number of Resistors	Resistor Size		Overall Dimensions						Mounting Centers		Watts each Unit††	Cage Style No.	*General Electric Equivalent
			Length		Height		Width						
	In.	MM	In.	MM	In.	MM	In.	MM	In.	MM			
1	1.000 x 6.500	25.400 x 165.10	10.50	266.70	2.375	60.325	1.938	49.225	8.375	212.73	112	RC1	IC 9006 C101A ()
	1.125 x 8.500	28.575 x 215.90	12.50	317.50	2.375	60.325	1.938	49.225	10.375	263.53	175	RC1A	
	1.125 x 10.50	28.575 x 266.70	14.50	368.30	2.375	60.325	1.938	49.225	12.375	314.33	225	RC1B	
2	1.000 x 6.500	25.400 x 165.10	10.50	266.70	3.938	100.025	2.313	58.750	8.375	212.73	74	RC2	IC 9006 C102A ()
	1.125 x 8.500	28.575 x 215.90	12.50	317.50	3.938	100.025	2.313	58.750	10.375	263.53	116	RC2A	
	1.125 x 10.50	28.575 x 266.70	14.50	368.30	3.938	100.025	2.313	58.750	12.375	314.33	149	RC2B	
4	1.100 x 6.500	25.400 x 165.10	10.50	266.70	3.875	98.425	3.625	92.075	8.375	212.73	65	RC4	IC 9006 C104A ()
	1.125 x 8.500	28.575 x 215.90	12.50	317.50	3.875	98.425	3.625	92.075	10.375	263.53	102	RC4A	
	1.125 x 10.50	28.575 x 266.70	14.50	368.30	3.875	98.425	3.625	92.075	12.375	314.33	130	RC4B	

†Length includes terminals.
††For continuous duty.

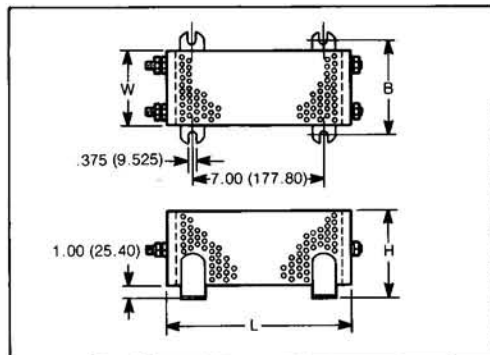
* The above cages are directly interchangeable with General Electric cages Type IC 9006 C. See the General Electric numbers above. For G.E. Type IC 9006 C103A () and slide wire types, contact your Ohmite representative.

Type RCM Cages Internally connected—Group Terminal

These cages can be made for any required number of resistors which are to be connected together inside the cage with one (or more) pair of terminals brought out. The ends are of heavy transite and the sides of gray wrinkle enameled perforated sheet metal. Terminal bolts are supplied as standard, but binding posts, conduit connection, or other type of terminal can be supplied. Cages for resistors of other length than those listed below are 1.375 (34.925mm) longer than the resistor length; mounting bracket centers are 2.875 (73.025mm) less than the cage length.



Typical RCM cage assembly



Style No.	Resistors 1.125 x 8.50 (28.575mm x 215.90mm)	Overall Dimension Length L is 9.875 (250.825mm)				B Mounting Hole Centers		Watts Each Unit††
		Height H		Width W		In.	MM	
		In.	MM	In.	MM			
RCM-1	1	4.00	101.60	3.00	76.20	4.00	101.60	175
RCM-2	2	4.00	101.60	5.50	139.70	6.50	165.10	135
RCM-3	3	4.00	101.60	8.00	203.20	9.00	228.60	120
RCM-4	4	6.50	165.10	5.50	139.70	6.50	165.10	115
RCM-6	6	6.50	165.10	8.00	203.20	9.00	228.60	110
RCM-8	8	6.50	165.10	10.50	266.70	11.50	292.10	105
RCM-9	9	6.50	165.10	13.00	330.20	14.00	355.60	104
RCM-10	10	6.50	165.10	13.00	330.20	14.00	355.60	103
RCM-12	12	6.50	165.10	15.50	393.70	16.50	419.10	100

††For continuous duty.

Resistor Selection

Resistor Facts and Factors

A resistor is a device connected into an electrical circuit to introduce a specified resistance. The resistance is measured in ohms. As stated by Ohm's Law, the current through the resistor will be directly proportional to the voltage across it and inversely proportional to the resistance.

The passage of current through the resistance produces heat. The heat produces a rise in temperature of the resistor above the ambient temperature. The physical ability of the resistor to withstand, without deterioration,

the temperature attained, limits the operating temperature which can be permitted. Resistors are rated to dissipate a given wattage without exceeding a specified standard "hot spot" temperature and the physical size is made large enough to accomplish this.

Deviations from the standard conditions ("Free Air Watt Rating") affect the temperature rise and therefore affect the wattage at which the resistor may be used in a specific application.

Selection Requires 3 Steps

Simple short-cut graphs and charts in this catalog permit rapid determination of electrical parameters. Calculation of each parameter is also explained. To select a resistor for a specific application, the following steps are recommended:

- 1 (a) Determine the Resistance.
(b) Determine the Watts to be dissipated by the Resistor.
- 2 Determine the proper "Watt Size" (physical size) as controlled by watts, volts, permissible temperatures, mounting conditions and circuit conditions.
- 3 Choose the most suitable kind of unit, including type, terminals and mounting.

Step 1 Determine Resistance and Watts

Ohm's Law

$$(a) \quad R = \frac{E}{I} \quad \text{or} \quad I = \frac{E}{R} \quad \text{or} \quad E = IR$$

Ohm's Law, shown in formula form above, enables determination of the resistance when the required voltage and current are known. When the current and voltage are unknown, or the best values not decided on, at least two of the three terms in Ohm's Law must be measured in a trial circuit.

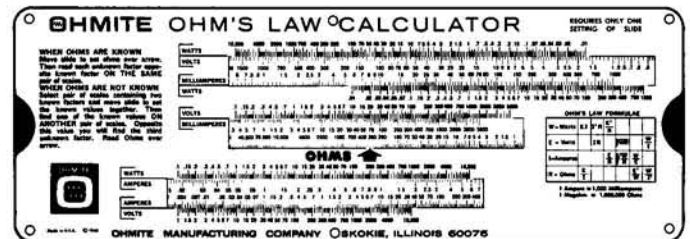
$$(b) \quad W = I^2R \quad \text{or} \quad W = EI \quad \text{or} \quad W = \frac{E^2}{R}$$

Power in watts, can be determined from the formulas above, which stem from Ohm's Law. R is measured in ohms, E in volts, I in amperes and W in watts.

Short-Cut Method

Use an Ohmite Ohm's Law Calculator (convenient slide-chart).

Set known values as explained on the Calculator and read the sought for OHMS and WATTS.



9" x 3" Calculator solves Ohm's Law problems with one setting of slide. Two types (1) heavy varnished cardboard and (2) deluxe Vinylite. Has parallel resistance computing scales. Ohm's Law resistance scale ranges from 0.01 ohms to 100 megohms. Current scales provided both in amperes and milliamperes. Also includes A, B, C and D slide rule scales.

Cardboard **Stock No. 5180**
Plastic **Stock No. 5182**

Why Watts Must Be Accurately Known

Stated non-technically, any change in current or voltage produces a much larger change in the wattage (heat to be dissipated by the resistor). Therefore, the effect of apparently small increases in current or voltage must be investigated because the increase in wattage may be large enough to be significant.

Mathematically, the wattage varies as the square of the current, or voltage, as stated in the formulas (b). For example, an increase of 20% in current or voltage will increase the wattage 44%. Fig. 1 graphically illustrates the square law relation. Hence, the actual current must be used in figuring the wattage and the increase in wattage due to apparently small changes, then determined in order to select the proper size resistor. Allowance should be made for maximum possible line voltage.

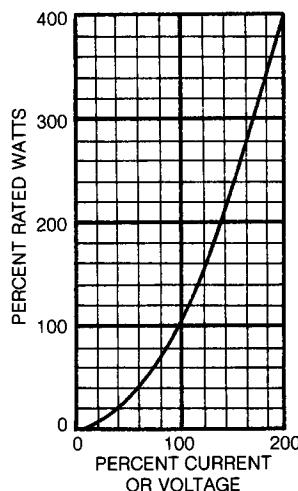


Fig. 1: Rapid increase of wattage with current or voltage

Step 2 Power Rating or Physical Size of Resistor

A resistor operated at a constant wattage will attain a steady temperature which is determined largely by the ratio between the size (surface area) and the wattage dissipated. The temperature stabilizes when the sum of the heat loss rates (by radiation, convection and conduction) equals the heat input rate (proportional to wattage). The greater the resistor area per watt to be dissipated, the greater the heat loss rate and therefore the lower the temperature rise. The relation between the losses varies for different resistors.

Free Air Watt Rating

The wattage rating of resistors, as established under specified standard conditions, is defined as the "Free Air Rating" ("Full Rating" or "Maximum Power Rating"). Several standard methods of rating are in use based on different service conditions. The method of both the "National Electrical Manufacturers Association" (NEMA) and the "Underwriters' Laboratories, Inc." (UL) can be described as follows:

The relation of the "Free Air Watt Rating" of tubular type, vitreous enameled resistors to the physical size, is to be set at such a figure that when operated at their rated watts, the temperature rise of the hottest spot shall not exceed 300°C (540°F) as measured by a thermocouple when the temperature of the surrounding air does not exceed 40°C (104°F). The temperature is to be measured at the hottest point of a two-terminal resistor suspended in free still air space with at least one foot of clearance to the nearest object, and with unrestricted circulation of air.

A slightly different definition of temperature limit used as a basis for wattage rating, and which results in a

slightly higher attained temperature, was originally established in military specification MIL-R-26 for wire-wound resistors.

Characteristic V resistors are required to dissipate rated wattage in an ambient of 25°C without exceeding a maximum operating temperature of 350°C at the hottest spot. This corresponds to a temperature rise of 325°C in a 25°C ambient. Although MIL-R-26 permits a 25°C greater temperature rise than NEMA or UL, the reference ambient for the latter two is 15° higher. Consequently, the difference in attained temperature between the two systems is only 10°C. The curves in Fig. 2 show the relation between temperature rise and wattage for various specifications. Note the differences in the permissible rise for each specification.

The absolute temperature rise for a specific resistor is roughly related to the area of its radiating surface. It is also dependent upon a number of other factors, however, such as thermal conductivity of the core and coating materials, emissivity factor of the outer surfaces, ratio of length to diameter, heat-sink effect of mountings, and other minor factors.

The maximum permissible operating temperature for a given resistor is basically determined by the temperature limitations imposed by the materials used in its construction. Generally speaking, these limits cannot be sharply defined in terms of temperature alone. Other factors such as resistance stability versus time, deterioration rates of insulation and moisture-resistance characteristics, type and size of resistance wire, all enter into consideration of "acceptable service life."

(Step 2 continued on next page)

Resistor Selection

Step 2 Power Rating or Physical Size of Resistor (continued)

For these reasons, the precise temperature limits corresponding to 100% rated wattage are somewhat arbitrary and serve primarily as design targets. In the last analysis, once a wattage rating has been assigned on the basis of an empirical hot spot limit, the verification of its correctness must be established through long term load-life tests based on performance and stability standards rather than the measurement of hot spot temperature. Maximum limits are stipulated for parameter changes as a result of various tests, including a 2000 hour load-life test.

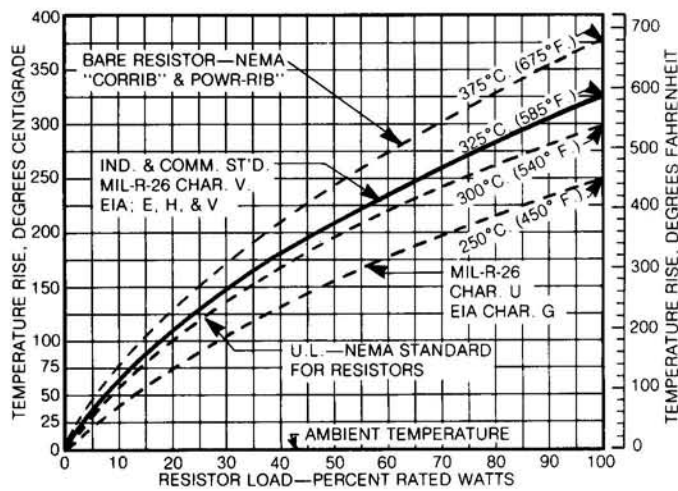


Fig. 2: Approximate hot spot temperature rise of a resistor in free air for various specifications.

It is also assumed that the temperature rise at a given wattage is independent of the ambient temperature in which this wattage is being dissipated. Therefore, for high ambient temperatures, the operating wattage should be limited in accordance with the curves of Fig. 3. Although the assumption that temperature rise is independent of ambient is not exactly true, the approximation is sufficiently close for all practical purposes and, therefore, has been adopted for derating purposes.

Despite the above variables, figures may be cited in terms of "watts dissipated per square inch of winding surface" for a given temperature rise. For power type resistors operating at 300°C rise above ambient, this figure varies between approximately 6.3 watts per square inch for large resistors (175 watt) to about 9

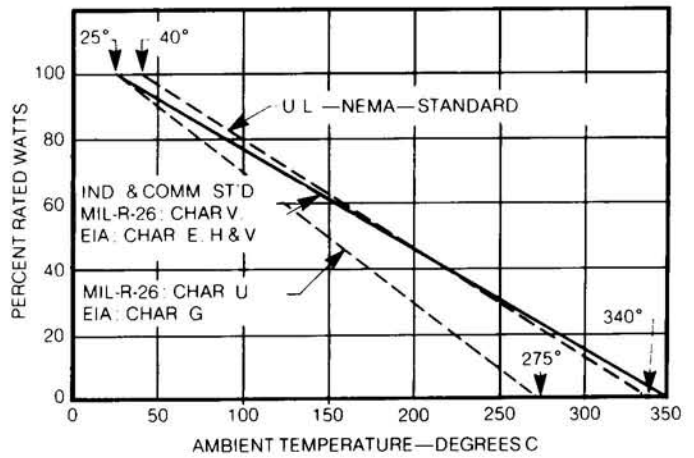


Fig. 3: Derating for ambient temperature.

watts per square inch for smaller resistors (12 watt). It should also be observed from Fig. 2 that temperature rise is not directly proportional to wattage dissipated. Note, for example, that at 50% rated wattage, the temperature rise still remains about 70% of that at full rating.

The wattage ratings used in this catalog, unless otherwise stated for certain types, are on the basis of a nominal operating temperature of 350°C at full rating. There are two general categories of power resistors for which the 350°C nominal temperature limit does not apply. One is that class of power-precision resistors where high stability is a salient feature, in which case the operating temperature is nominally limited to 275°C. The other category includes all exposed ribbon wire resistors (see description of CORRIB and POWR-RIB) which are rated for 375°C (675°F) maximum temperature rise when measured on the wire per NEMA standards.

Temperature Distribution on a Resistor

The temperature rise varies (following a curve) along the length of the resistor with the hot spot at the center-top (of a horizontal tube) and the ends at approximately 60% of the maximum temperature rise. The terminals themselves are still cooler. When the resistor is vertical, the hot spot shifts upwards a little and the top end is hotter than the bottom. The standard "Free Air Watt Rating," however, is used regardless of position.

Step 3 Select a Resistor

Choose the most suitable resistor meeting the requirements of the application. Standard resistors carried in stock should be considered first. If a suitable resistor

cannot be found in the standard sizes then select a non-standard resistor using the charts on page 34.



Application Watt Rating

To allow for the differences between the actual service conditions and the "Free Air Watt Rating" it is a general engineering practice to operate resistors at more or less than the nominal rating. The details by which such ratings can be estimated are given in the following pages. Most thermal calculations, however, involve so many factors which are usually not accurately known, that at best they are only approximations. The most accurate method of determining or checking

the rating is to measure the temperature rise in a trial installation. A thermocouple (made of #30 B & S gage wire) is recommended for the measuring element. Even measurements made with a thermocouple will vary slightly with different samples and techniques. On small resistors an infra-red optical pyrometer is recommended.

The factors which affect the temperature rise act independently of each other and are summarized as follows:

1. Ambient Temperature

As the maximum permissible operating temperature is a set amount, any increase in the ambient temperature subtracts from the permissible temperature rise and therefore reduces the permissible watt load.

2. Enclosure

Enclosure limits the removal of heat by convection currents in the air and by radiation. The walls of the enclosure also introduce a thermal barrier between the air contacting the resistor and the outside cooling air. Hence, size, shape, orientation, amount of ventilating openings, wall thickness, material and finish all affect the temperature rise of the enclosed resistor.

3. Grouping

When resistors are close to each other they will show an increased hot spot temperature rise for a given wattage because of the heat received by radiation from each other and the increased heat per unit volume of air available for convection cooling.

4. Altitude

The amount of heat which air will absorb varies with the density, and therefore with the altitude above sea level. At altitudes above 100,000 feet, the air is so rare that the resistor loses heat practically only by radiation.

5. Pulse Operation

This is not an environmental condition but a circuit condition. As a pulse of power, when averaged over the total on and off time, results in less heat per unit time than for continuous duty, the temperature rise is affected. This may permit higher power during the pulses. The conditions must be expertly considered for conservative rating. The open-wound "Powr-Rib" resistor construction is most suitable.

6. Cooling Air

Forced circulation of air over a resistor removes more heat per unit time than natural convection does and therefore permits an increased watt dissipation. Liquid cooling and special conduction mountings also can increase the rating.

7. Limited Temperature Rise

It is sometimes desirable to operate a resistor at a fraction of the Free Air Watt Rating in order to keep the temperature rise low. This may be to protect adjacent heat sensitive apparatus, to hold the resistance value very precisely both with changing load and over long periods of time and to insure maximum life. Refer to paragraph on Temperature Coefficient of Resistance for additional information.

8. Other Considerations

High Resistance. High resistance units, which require the use of very small diameter wire, generally should operate at reduced temperature for maximum reliability.

High Voltage. A maximum voltage gradient of 500 volts R.M.S. (705 volts peak) per inch of winding length is recommended under normal conditions. For higher gradients in pulse applications or for other special conditions such as oil immersion, consult factory.

High Frequency. Non-inductively wound resistors are generally required for use at radio and supersonic frequencies.

Military and Other Specifications. The special physical operating and test requirements of the applicable industrial or military specification must be considered. Military specification resistors should be ordered by their MIL numbers.

Resistor Selection

Environmental Factors—effect on the power rating of components

All the components of an electrical apparatus—resistors, rheostats, capacitors, transformers, chokes, wiring, terminal boards, rectifiers, transistors, electronic tubes, etc.—have their own limitations as to the maximum temperature at which they can reliably operate. The attained temperature in service is the sum of the ambient temperature plus the temperature rise due to the heat dissipated in the apparatus. The temperature rise of a component is affected by a number of factors.

The graphs and discussions which follow, amplify and supplement the factors on the previous page.

Note that the Multiplying Factors given on the Short Cut Chart, on page 53 are the reciprocals of the "Percent Load Ratings" shown on the graphs in this section. The percent figures are, of course, expressed as decimals before finding the reciprocals.

Ambient Temperature Derating

Fig. 4 shows the percent of full load which power resistors can dissipate for various high ambient temperatures.

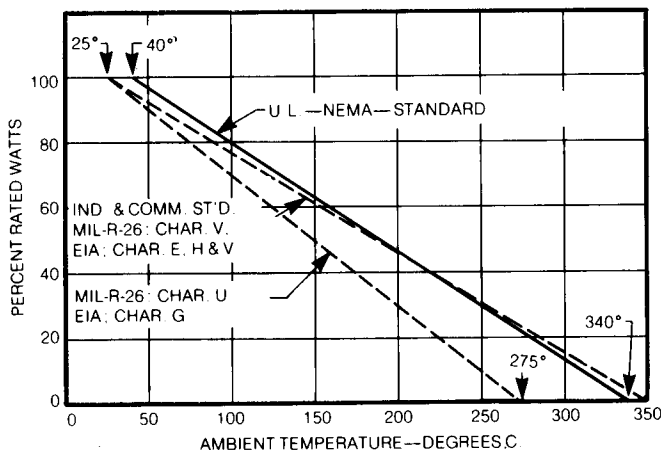


Fig. 4 Derating of Resistors for High Ambient Temperatures.

Derating Due to Enclosure

The amount of derating required, if any, because of enclosure is affected by a number of factors, most of which are hard to determine accurately. The watts per square inch of surface, size, shape, orientation, wall thickness, material, finish and amount and location of ventilating openings all play a part. Fig. 5 serves to indicate for a particular set of conditions how the temperatures varied with the size of enclosure for a moderate size power resistor.

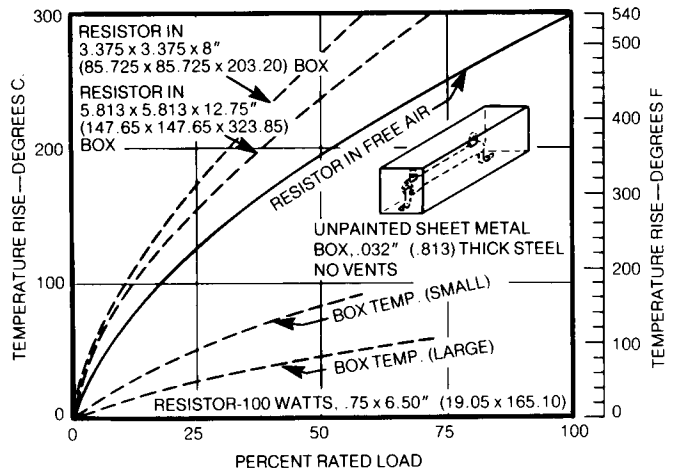


Fig. 5 Example of Effect of Size of Enclosure on Temperature Rise of An Enclosed Resistor.

Derating Due to Grouping

The temperature rise of a component is affected by the nearby presence of other heat-producing units, such as resistors, electronic tubes, etc. The curves in Fig. 6 show the power rating for groups of resistors with various spacings between the closest points of the resistors, assuming operation at maximum permissible hot spot temperature. If resistors are to be operated at lower hot spot temperatures, the amount of derating for grouping can be reduced.

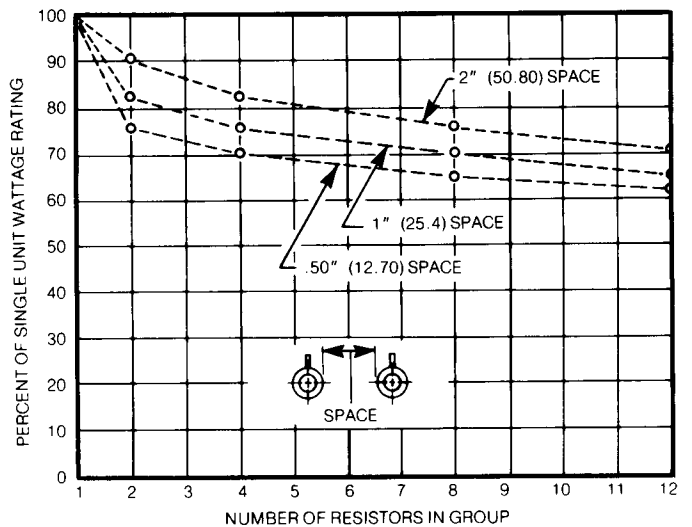


Fig. 6 Derating of Resistors to Allow for Grouping.

Derating for Altitude

The curve in Fig. 7 shows the proportional watts for various altitudes, assuming standard atmospheric conditions.

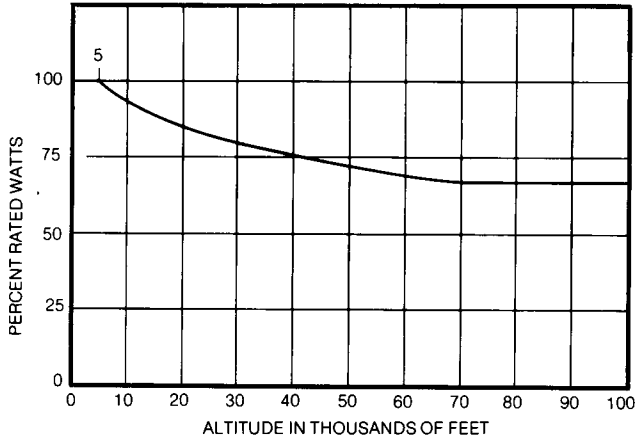


Fig. 7 Derating for Altitude.

Pulse Operation

Unlike the environmental factors, which result in reduction of the watt rating, pulse operation may permit higher power in the pulses than the continuous duty rating.

The NEMA has set up certain standard duty cycles for motor control resistors and the resistor ratings for some of these conditions are shown in Fig. 8.

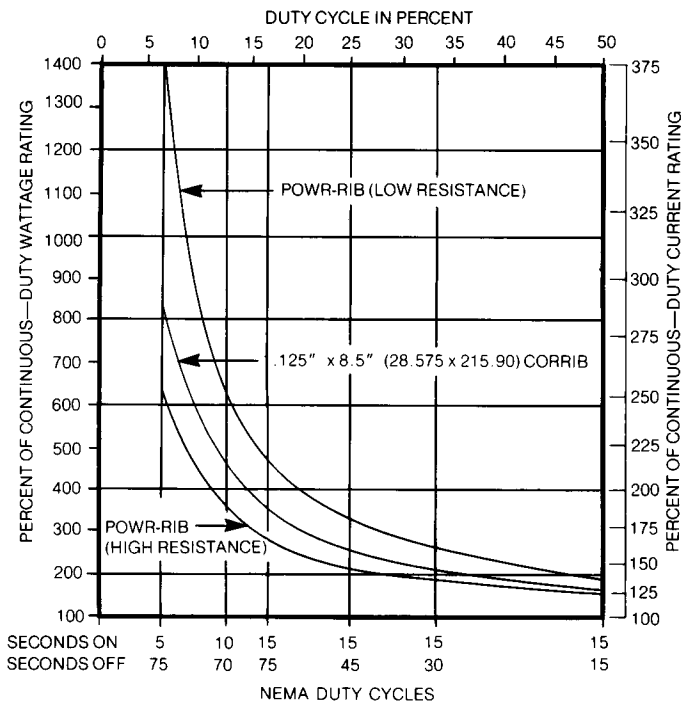


Fig. 8 Percent of Continuous Duty Rating for Resistors for Typical NEMA Duty Cycles.

The curves in Figures 10, 11, 12 and 13 illustrate the more general case of various combinations of on and off time for specified loads up to 1000% for a continuous series of pulses. Intermediate loads can be approximated by interpolation. The "on-time" at which each curve flattens out also indicates the maximum on-time for single pulses (with enough off-time for cooling to ambient). Additional data on single pulses is given by Fig. 9. Resistors will reach about 75% of the rated maximum temperature rise in approximately 5 to 8 pulses and level off at maximum rise in another 10 to 20 cycles, depending on percent load, size, type, etc. Any curve passing above the intersection of the designated on and off-times indicates a percent load which can be used. A resistor operated at the rating of an interpolated curve through the point of intersection would operate at maximum rated temperature rise.

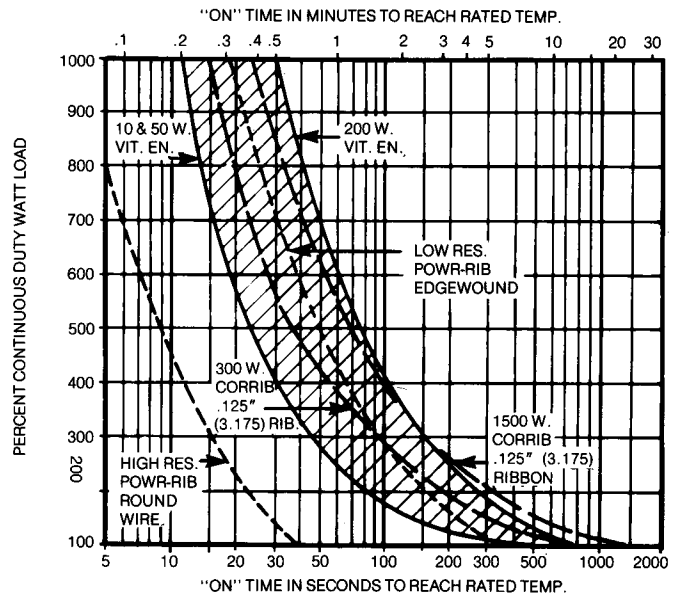


Fig. 9 Time Required for Typical Resistors to Reach Rated Operating Temperature at Various Watt Loads.

The exact temperature rise, of course, varies with each resistor, depending on size, ohms winding, etc. The curves shown indicate the approximate rise for typical units only, as a band or range of values actually exists for each percent load.

Ratings at over 1000% are not recommended except for POWR-RIB® resistors. Curves for intermediate size resistors can be roughly estimated by comparison with the sizes given.

Ratings for single pulses in the milli-second range (and up to 1 to 2 seconds) require individual calculation. This is because the ratings vary greatly with the resistance, or more specifically with the actual weight and specific heat of the resistance alloy used. Calculation is based on the assumption that all of the heat generated in the pulse goes to raise the temperature of the resistance wire.

Resistor Selection

Pulse operation—Cooling—Limited temperatures

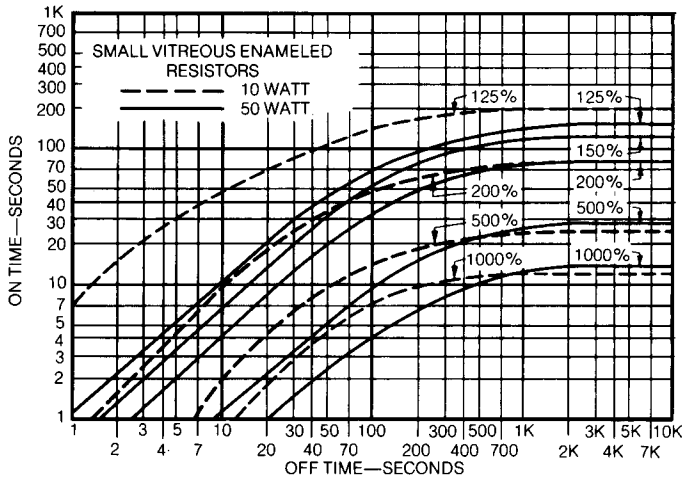


Fig. 10 Percent of Continuous Duty Rating for Pulse Operation of Small to Medium Size Vitreous Enameled Resistors.

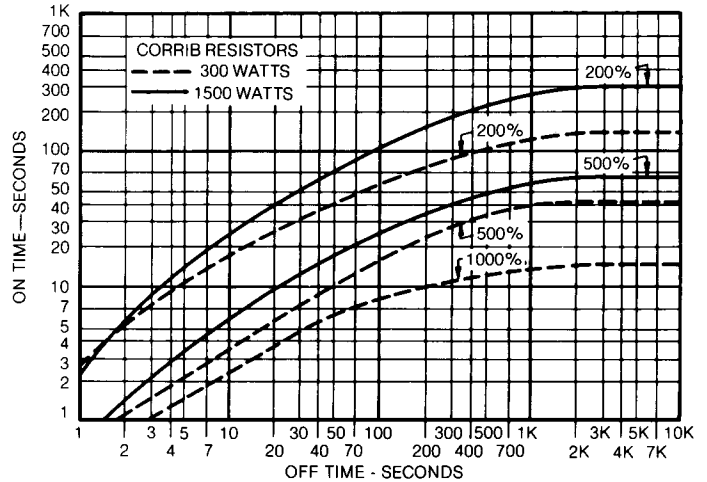


Fig. 12 Percent of Continuous Duty Rating for Pulse Operation of CORRIB, Corrugated Ribbon Resistors.

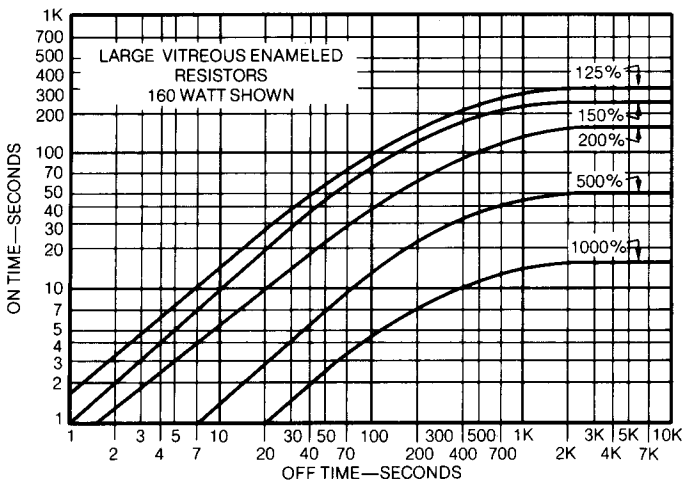


Fig. 11 Percent of Continuous Duty Rating for Pulse Operation of Large Vitreous Enameled Resistors.

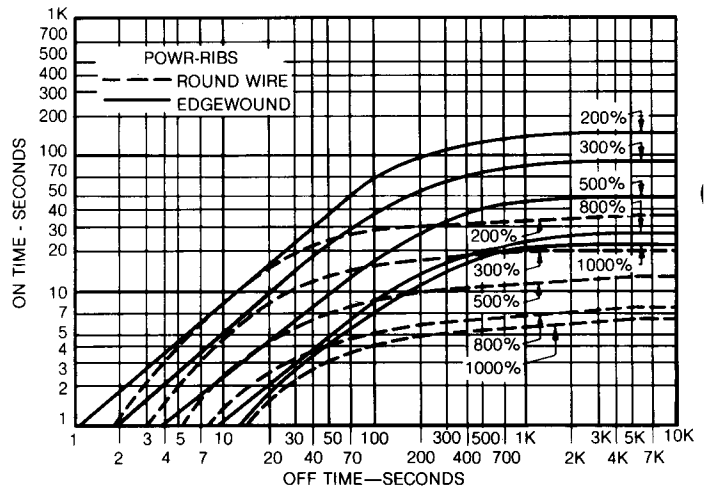


Fig. 13 Percent of Continuous Duty Rating for Pulse Operation of POWR-RIB, Bare Resistors.

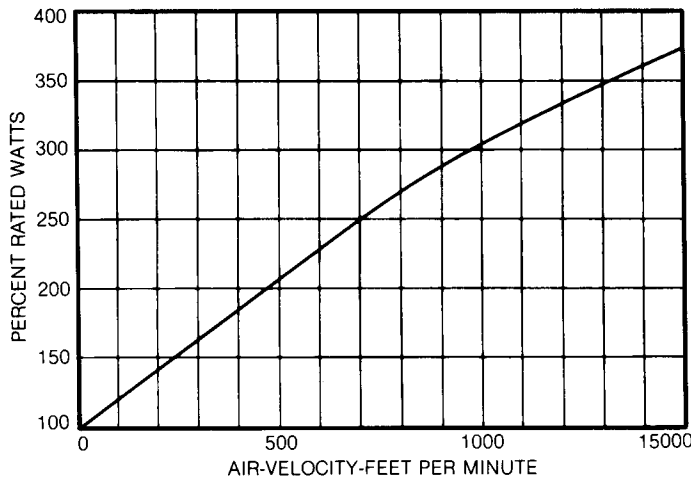


Fig. 14 Percent of Free Air Rating for Typical Resistor Cooled by Forced Air Circulation.

Cooling Air

Resistors can be operated at higher than rated wattage when cooled by forced circulation of air. A typical curve is illustrated in Fig. 14. The curve tends to level off at higher velocities as excessive hot spots develop where the air flow does not reach all parts uniformly.

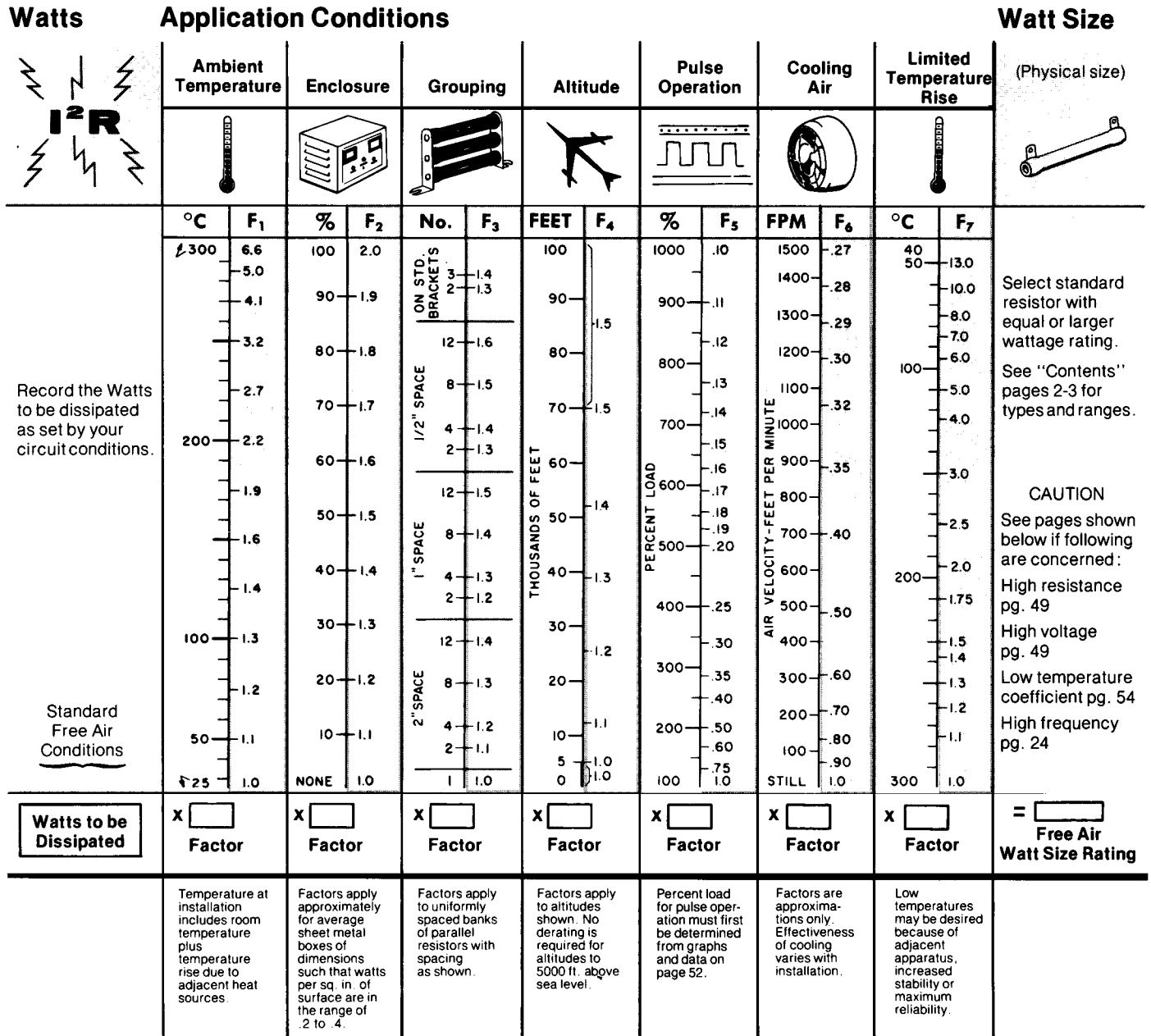
Limited Temperature Rise

When it is desired to operate a resistor at less than maximum temperature rise, the percent watts for a given rise can be read from "Temperature Rise vs. Resistor Load" Fig. 2. graphs on page 48.

Short-Cut Chart Method To Find Required Size

(As affected by application conditions)

- For each Condition locate the relevant value on the scales below and record the corresponding Factor (F_1 to F_7).
Note: The Standard Free Air Condition Factor is always 1.
- Multiply the Factors together.
- Multiply the Watts by the product obtained from 2 above.



EXAMPLE: Four resistors, each dissipating 115 watts, are to be mounted in a group. Spacing is to be 2" surface to surface. Ambient to be 50°C (122°F). Enclosure to be total. Other factors standard. Determine Watt Size required.

Operation (1) On Ambient Temperature scale locate 50°C. Note and record $F_1 = 1.1$ as shown. Locate and record the other factors.

F_1	F_2	F_3	F_4	F_5	F_6	F_7
50°	100%	4@2"	Standard Conditions			
1.1	x 2.0	x 1.2	x 1	x 1	x 1	x 1

Operation (2) Multiply the factors together = 2.64

Operation (3) 115 watts x 2.64 = 304 Watts Free Air Watt Size Rating required for each resistor.

Resistor Selection

Temperature Coefficient of Resistance

The resistance alloys used for all except the lowest ohmic values show such little change with temperature that in most power circuits the resistance is considered constant. Actually there may be changes at full load of -4% to +8% of the initial resistance. The change is attributed in most part to the "temperature coefficient of resistance" (TCR) which is the change in resistance expressed as "parts per million per degree centigrade of temperature" (ppm/°C).

For special applications which require very constant resistance, it may be necessary to specify the maximum permissible TCR for the range of temperature involved. This would limit the choice of wire to only certain types of resistance alloys. The commonly known low TCR alloys in the 800 ohms per circular-mil-foot class consist largely of nickel and chromium alloyed with small amounts of aluminum and either copper or iron. Other low resistivity alloys, 294 ohms per circular-mil-foot, consist primarily of nickel and copper with only traces of other metals.

Both of these wire classes are rated by the wire manufacturers as having a TCR of $0 \pm 20\text{ppm}/^\circ\text{C}$. The expression " $0 \pm 20\text{ppm}/^\circ\text{C}$ " implies that, although the nominal value of the TCR is zero, the actual value may lie anywhere within the tolerance range of $-20\text{ppm}/^\circ\text{C}$ to $+20\text{ppm}/^\circ\text{C}$.

For other resistance wires such as the widely used nickel-chromium-iron, for example, a nominal value of $+140\text{ppm}/^\circ\text{C}$ is given. Actually, however, a tolerance of $\pm 30\text{ppm}$ is applicable so that the TCR may range between the limits of $+110$ to $+170\text{ppm}/^\circ\text{C}$.

Unfortunately, the TCR of a completed power resistor is generally somewhat different from that of the original wire. This is because the TCR may be affected by such factors as heat treatment during processing, and materials and methods of construction. Without special controls and precautions, the TCR over the range of 25°C to 300°C rise may increase to as much as $0 \pm 80\text{ppm}$ from the original $0 \pm 20\text{ppm}$ for certain

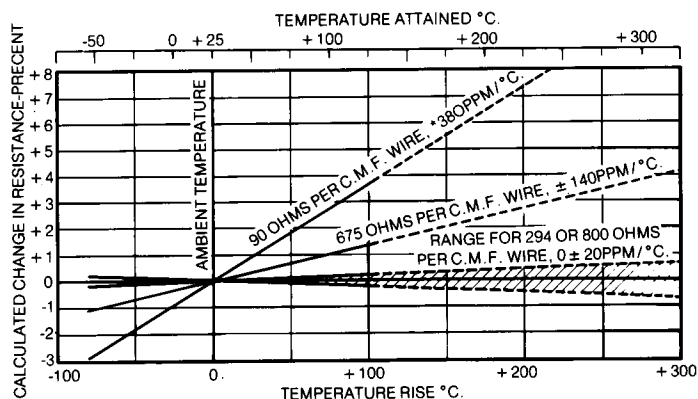


Fig. 15 Calculated change in resistance with nominal TC assumed constant.

types of wire on vitreous enameled resistors. Theoretical changes in resistance with temperature are shown in Fig. 15.

The circuit designer should carefully consider the actual needs of the circuit before specifying limits on the TCR of a desired resistor. Wherever possible it is best to select a resistor for a critical application so that it operates at a low temperature rise. This will also provide the maximum stability over a long period. For low TCR (and other) applications, Ohmite can provide resistors with an "Ohmicone" (silicone-ceramic) coating. "Ohmicone" is processed at much lower temperatures than vitreous enamel and therefore makes control of TCR and tolerance easier. Data on the TCR and other properties of various alloys is given on page 55.

Ballast Resistors: A very high TCR is required in resistors used to stabilize a circuit against the effects of varying input voltage. To design such "ballast resistors" the following data must be known: Resistance value at a specified reference temperature, change in resistance for a stated temperature or current change, time factors, current and voltage.

Resistance Alloys and Uses

A number of different resistance alloys are used in winding resistors and rheostats as shown in Fig. 16. The general use for each alloy is indicated by the column headed, "Resistance Range for Which Used." Whether a particular alloy can be used on a specific resistor can be estimated by dividing the given resistance by the area of the given winding space and determining whether the quotient falls within the limits given hereafter. The "high resistance" alloys cover the range from approximately 10 to 25,000 ohms per square inch of winding area, the "low to medium" type from 5 to 400 ohms and the "very low resistance" alloys from less than an ohm to 250 ohms. It should be noted that the "Ohms per Square Inch" ranges overlap considerably, indicating that in many instances a given resistor could use any of several alloys. Both the upper and lower limits of the ranges are only approximate and in general can be extended somewhat when necessary. The actual temperature coefficient of a complete resistor is generally greater than the nominal for the

wire alone. The approximate change in overall resistance at full load is shown in the table.

Other Alloys: In addition to the alloys tabulated which show small changes in resistance with temperature, there are others which sometimes have to be used for very low resistance units. These alloys have higher temperature coefficients, which limit their use to applications where the change in resistance with load is not important. An example is No. 60 alloy, which has a resistance of 60 ohms per circular-mil-foot and a temperature coefficient of +700ppm/°C.

Ballast Wire: There are other alloys which are selected especially for their high temperature coefficient of resistance. These are used for so-called "ballast" resistors where a large change in resistance is desired with a change in load. A typical ballast wire is Nickel, which has 58 ohms/cm² and a temperature coefficient of +4800ppm/°C. Others are "Hytemco" and "Balco" at 120 ohms/cm² and a TC of +4500ppm/°C.

ASTM Alloy Class*	Alloy Composition (Approximate)	Ohms per CMF	Trade Names	Mean Temperature Coeff. of Res. ppm/°C	Temperature Range for TCR °C	Resistance Range for Which Used	†Average Resistance Change at Full Load
1a	Nickel base, non-magnetic Ni 75%, Cr 20% plus Al, Cu, Fe, etc.	800	Evanohm Karma Moleculoy Nikrothal L	0 ± 20	-65 to +250	Very high, medium and up, for low temp. coeff.	Under ± 1% to ± 2%
1b		800		0 ± 10	-65 to +150		
2a	Iron base, magnetic Fe 73%, Cr 22.5%, Al 4.5% (plus Co in one alloy)	800	Alloy 815-R Kanthal DR Mesaloy	0 ± 20	-65 to +200	Alternate sometimes for Class 1	Under ± 1% to ± 2%
2b		800		0 ± 10	0 to +150		
3a	Nickel-Chromium 80%—20%	650	Chromel A Nichrome V Nikrothal B Protoloy A Tophet C	+ 80 ± 20	-65 to +250	High and medium	+ 4 to +6%
3b		675		+ 60 ± 20			
4	Nickel—Chromium—Iron 60%—16%—24%	675	Chromel C Electroloy Nichrome Nikrothal 6 Tophet C	+ 140 ± 30	-65 to +200	High and medium	+ 5 to +8%
5a	Copper-Nickel 55%—45%	300	Advance Copel Cupron Cuprothal 294 Neutroloy	0 ± 20	-65 to +150	Low and low to medium for low temp. coeff.	Under ± 1% to ± 2%
5b				0 ± 40			
6	Manganin 13% Mn, 87% Cu	290	Manganin	0 ± 15	+ 15 to +35	Low and low to medium for low TC near 25°C	Under ± 1% to ± 2% †
7	Copper-Nickel 77%—23%	180	180 Alloy Cuprothal 180 Midohm	+ 180 ± 30	-65 to +150	Very low	+ 5% to +8%
9	Copper-Nickel 90%—10%	90	90 Alloy 95 Alloy Cuprothal 90	+ 450 ± 50	-65 to +150	Very low	+ 5% to +10%

*American Society for Testing Materials, Tentative Specification B267-68. †—For resistor with 300°C hot spot rise from 25°C ambient except 54°C rise for Manganin.

Fig. 16 Table of Resistance Alloys Generally Used for Resistors and Rheostats.

Other Ohmite Resistance Products

Military Specification Resistors

OHMITE has been manufacturing resistors meeting the stringent requirements of military applications for over 40 years. The unusual and severe environmental conditions encountered by military equipment often make standard commercial resistors unsuitable for the application.

The various "MIL SPECS" developed over many years of field experience set the pattern for military resistors. OHMITE has the capability of developing and testing resistors designed to meet the requirements of high humidity, salt spray, over load, long life stability and high shock that set these resistors apart from the usual commercial standards.

OHMITE is on the "Qualified Products List" (QPL) for the following military specifications for wirewound resistors.

MIL-R-26 Fixed Resistors

OHMITE can furnish the following types; RW20 through RW24, RW29 through RW47, RW55 through RW59 and RW67V through RW69V, RW70U through 79U.

MIL-R-19365 Adjustable Resistors

OHMITE can furnish types RX29 through RW47 in characteristic V.

MIL-R-15109 Class Hi Shockproof Resistors

OHMITE can furnish type IW, EW, fixed or tapped, multi-section or adjustable resistors. 5 watts to 550 watts mounted on shock proof through-bolt mounting brackets.

MIL-R-18546 Aluminum Housed Precision Resistors

OHMITE can furnish type RE60 through RE70 fixed precision resistors $\pm 1\%$ tolerance. Aluminum housing permits heat sinking when mounted on metal panels.

0.1% Precision Determ-Ohm® Resistance Box

The new Ohmite Precision Determ-ohm® is a resistance decade box with an accuracy of $\pm 0.1\%$. Four models cover the resistance range from 1 ohm to 1 megohm in a choice of three-4 decade and one-6 decade models.

Simplified selection of resistance values is accomplished by operation of thumb-wheel switches. Resistance setting is indicated by a direct in-line numeric readout. Unique switch feature allows advancing or decreasing of values directly from 9 thru 0 to 1 or vice versa, without retracting all other values.

The housing is a case equipped with universal binding posts.

Selection

Resistance Range (Ohms)	Ohms per Step	Number of Decades	Catalog Number
1 to 9.999K	1	4	3405
1 to 99.99K	10	4	3406
1 to 999.9K	100	4	3407
1 to 999.999K	1	6	3410

Specifications

Accuracy: 0.1% (plus .01 Ω max. contact and circuit resistance per decade).

Selection: Thumbwheel switches, continuous rotation in either direction.

Switch life: In excess of 50,000 operations.

Power: ¼ Watt per resistor.

Operating Temperature: +15 +35°C.

T.C. of Resistors: ± 10 ppm/°C max. 20ppm/°C.

Maximum Current Ratings

(Do not exceed 500 Volts.)

Resistance Range (Ohms)	Maximum Current (Milliamps)
1-9	710
10-99	220
100-999	71
1000-9999	22
10,000-99,999	7.1
100,000-999,999	1.1

Ohm-Ranger®

- Over 11 million ohms in one-ohm increments
- 1% accuracy*
- Easy slide switch operation
- Handy slimline size
- Rugged metal construction

1 to 11,111, 110 ohms, in one-ohm steps—with accuracy assured by half-watt 1% tolerance resistors! Has three binding posts, one to ground case. Small enough to take anywhere in your pocket, the handy easy-to-use OHM-RANGER is ideal for lab use, schools and service technicians. Dimensions 4.00 (101.60mm) x 6.00 (152.40mm) x 1.00 (25.40mm)

*10 ohms and above.

Catalog No. 3420

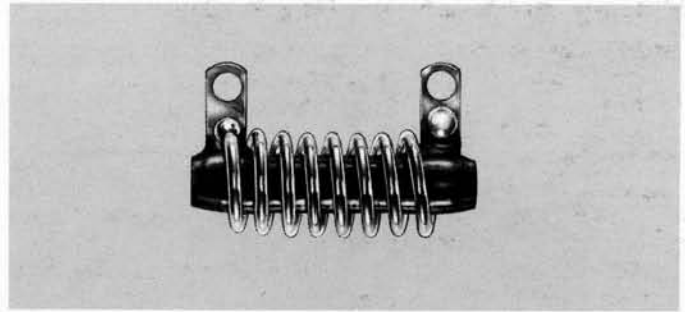


**economical,
portable resistance
selector**

Parasitic Suppressor

The P-300 Suppressor is designed to prevent unwanted ultra-high-frequency parasitic oscillations which occur in the plate and grid leads of push-pull and parallel tube circuits. The P-300 is a non-inductive, 50 ohm, vitreous enameled resistor combined with a choke (in parallel) of 3 microhenries inductance and .003 ohms D.C. resistance. The two form a small integral unit only 1.750 (44.450mm) long overall and .656 (16.669mm) diameter. The unit may be mounted directly in the grid lead without extra support.

Catalog No. P-300 Wt. .04 lb.

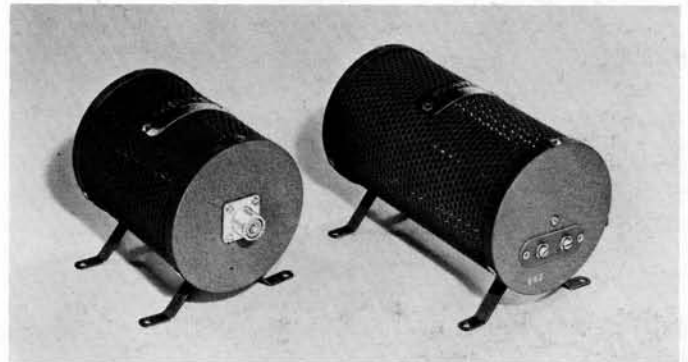
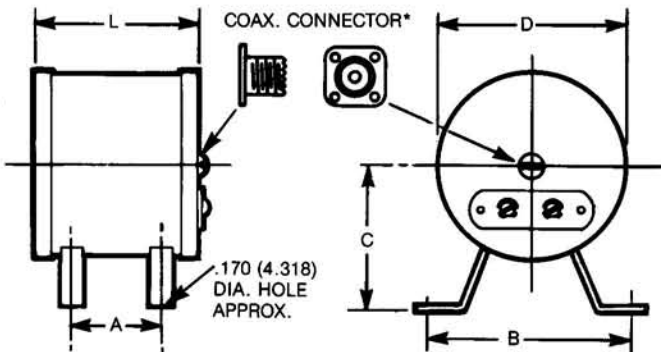


Dummy-Antenna Resistors

NON-INDUCTIVE

Ohmite Models D-101 and D-251 Dummy Antenna Resistors provide a simple, accurate, and direct means of measuring R.F. power for the radio amateur, experimenter and manufacturer and for operators of aviation, police and broadcast stations. The dummy antenna resistors feature constant R.F. resistance (within their recommended frequency range), low reactance, high wattage dissipation, and compactness. Actual D.C. resistance tolerance is $\pm 5\%$.

The residual inductance and distributed capacitance have been kept to a minimum, thereby making the natural resonant frequency as high as possible. These factors and the D.C. resistance have been proportioned in such a manner as to give the best possible response characteristics. This resistor may be considered practically a "Non-Reactive Resistor."



Dimensions

Catalog Number	A		B		C		D		L	
	In.	MM	In.	MM	In.	MM	In.	MM	In.	MM
D-101-52*, D-101-73*	1.500	38.100	3.500	88.900	2.375	60.325	3.156	80.163	2.719	69.063
D-101-300, D-101-600	2.750	69.85	3.500	88.900	2.375	60.325	3.156	80.163	4.219	107.163
D-251-52*, D-251-73*	3.125	79.375	3.875	98.425	2.50	63.500	3.719	94.463	4.594	116.688
D-251-300, D-251-600	5.125	130.175	3.875	98.425	2.50	63.500	3.719	94.463	6.813	173.050

*Employs coax Connector.

Frequency Characteristics of Ohmite Dummy Antennas

Type Resistance	D-101				D-251				Cat. No. †	Watts	$\pm 5\%$ Ohms	Net Lbs.
	52 Ohms	73 Ohms	300 Ohms	600 Ohms	52 Ohms	73 Ohms	300 Ohms	600 Ohms				
Maximum frequency at which $R_s = R_{dc} \pm 10\%$	22 mc	38 mc	22 mc	31 mc	19 mc	21 mc	15 mc	19 mc	D-101-52	100	52	.60
R_s at this frequency	1.10 R dc	1.10 R dc	1.10 R dc	.90 R dc	1.10 R dc	1.10 R dc	1.10 R dc	.90 R dc	D-101-73	100	73	.60
Z at this frequency	1.18 R dc	1.14 R dc	1.10 R dc	.99 R dc	1.25 R dc	1.13 R dc	1.15 R dc	1.00 R dc	D-101-300	100	300	.65
									D-101-600	100	600	.65
Maximum frequency at which $Z = R_{dc} \pm 10\%$	18 mc	32 mc	22 mc	60 mc	13 mc	19 mc	13 mc	30 mc	D-251-52	250	52	1.25
R_s at this frequency	1.06 R dc	1.07 R dc	1.10 R dc	.60 R dc	1.03 R dc	1.07 R dc	1.08 R dc	.64 R dc	D-251-73	250	73	1.25
Z at this frequency	1.10 R dc	1.10 R dc	1.10 R dc	.90 R dc	1.10 R dc	1.10 R dc	1.10 R dc	.90 R dc	D-251-300	250	300	1.50
									D-251-600	250	600	1.50

Rdc D.C. Resistance of Dummy Antenna

R_s Effective Series Resistance of Dummy Antenna

Z Scalar Value of Impedance of Dummy Antenna

†Some resistance values may not be carried in stock at all times. See the current OHMITE Component Selector for these non-stock standard items.

OHMITE

Ohmite Quality Products

- | | |
|--|---|
| Resistors | Wire wound resistors in a wide range of physical shapes and wattage sizes to satisfy every requirement for resistors. Coatings to meet all mechanical, electrical and environmental requirements. |
| Rheostats | Wire wound potentiometer-rheostats for every control requirement. Used extensively for controlling electric generators, motors, heaters, lamps, electric brakes and clutches. Largest choice of wattage sizes offered by any manufacturer, from 7½ watts to 1000 watts in single units. |
| Rotary Tap Switches | Heavy duty power switches ranging from 7 to 100 amperes. Single pole 2 to 12 positions, to three pole 2 to 12 positions. These heavy duty electrical power switches are Ohmite's answer to controlling those high power level electrical machines. |
| Variable Transformers | Auto transformers providing continuously variable voltage output from zero to 16% over the input voltage. Single phase and three phase transformers available. 1.5 to 25 amperes models. |
| Relays | General purpose relays, latching relays, sensitive plate circuit relays for most used A.C. and D.C. coil voltages. Contact ratings from 10 to 20 amperes. |
| Solid State Power Controls | Component-type power controls, 120 and 240 volts A.C. inputs, A.C. or D.C. outputs capable of handling from 0 to 2000 watt loads. Ideal for heater, lamp and motor controls. |
| Radio Frequency and Power Line Chokes | R.F. plate chokes for frequencies from 3 megahertz to 520 megahertz, at currents up to 4 amperes. Power line chokes to suppress radio frequency interference in current ratings up to 30 amperes. |



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