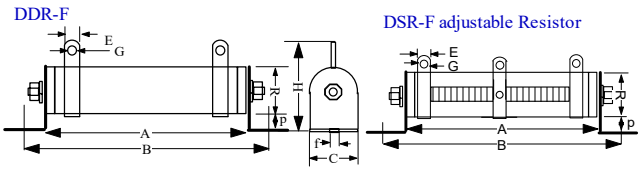
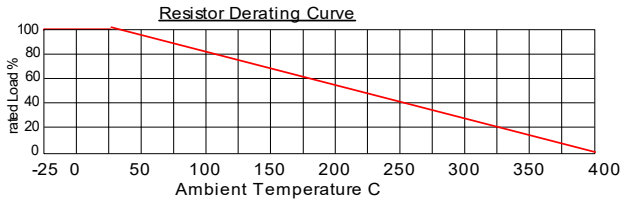
Silicon Coated Wire-Wound Power Resistors with mounting fixture

- These resistors are suitable as loading resistor, braking resistor, capacitor discharge, Resistive Load simulation, Machinery, Machinery and Equipment higher power application.
- Good for Continuous Load and Short Time Over Load application
- Mounting fixture is available
- Resistance Adjustable version is available : DSR-F series
- Resistance Box and Load Bank available with power up to 2000kW.
- Support Precision Resistance Tolerance requirement
- Support Vitreous Enamel coating for harsh environment applications.





DDR-F / DSR-F Type – Wire Wound Resistors

Dimension in mm :	**R**	**A**	**B**	**C**	**H**	**p**	**E**	**G**	**f**
Tolerance : +/- mm	1	5	5	1	3	3	1	1	1
15W	15	45	66	15	40	13	6	3.5	4.5
20W	15	50	71	15	40	13	6	3.5	4.5
25W	20	50	80	20	50	15	6	3.5	5
30W	20	70	100	20	50	15	6	3.5	5
40W	20	87	115	20	50	15	6	3.5	5
50W	28	90	122	28	68	20	9	4.5	6
80W	28	90	122	28	68	20	9	4.5	6
100W	28	170	202	28	68	20	9	4.5	6
150W	28	215	247	28	68	20	9	4.5	6
200W	28	267	299	28	68	20	9	4.5	6
250W	28	267	299	28	68	20	9	4.5	6
300W	40	267	305	40	90	20	10	4.5	6
400W	40	330	367	40	90	20	10	4.5	6
500W	50	330	370	50	98	20	10	6	8
600W	50 / 60	330	370	50	98	20	10	6	8
700W	50	400	440	50	95	20	10	6	8
800W	70	300	331	70	135	30	15	8	8
1000W	70	300	331	70	135	30	15	8	8
1500W	70	415	446	70	135	30	15	8	8
2000W	70	510	541	70	135	30	15	8	8
2500W	70	600	631	70	135	30	15	8	8
3000W	70	600	631	70	135	30	15	8	8
4000W	100	430	468	100	185	35	15	8	8
5000W	100	500	538	100	185	35	15	8	8
6000W	100	600	638	100	185	35	15	8	8
10,000W	150	600	640	152	260	43	30	8	10
12,000W	150	660	700	152	260	43	30	8	10
15,000W	150	660 / 750	700 / 850	152	260	43	30	8	10
20,000W	150	1000	1040	152	260	43	30	8	10

DNR–F Type – Low Inductance Wire Wound Resistors

Dimension in mm :	**R**	**A**	**B**	**C**	**H**	**p**	**E**	**G**	**f**
Tolerance : +/- mm	1	5	5	1	3	3	1	1	1
15W	15	45	66	15	40	13	6	3.5	4.5
20W	15	50	71	15	40	13	6	3.5	4.5
25W	20	50	80	20	50	15	6	3.5	5
30W	20	70	100	20	50	15	6	3.5	5
40W	20	87	115	20	50	15	6	3.5	5
50W	28	90	122	28	68	20	9	4.5	6
80W	28	90	122	28	68	20	9	4.5	6
100W	28	170	202	28	68	20	9	4.5	6
150W	28	215	247	28	68	20	9	4.5	6
200W	28	267	299	28	68	20	9	4.5	6
250W	28	267	299	28	68	20	9	4.5	6
300W	40	267	305	40	90	20	10	4.5	6
400W	40	330	367	40	90	20	10	4.5	6
500W	50	330	370	50	98	20	10	6	8
600W	50 / 60	330	370	50	98	20	10	6	8
700W	50	400	440	50	95	20	10	6	8
800W	70	300	331	70	135	30	15	8	8
1000W	70	300	331	70	135	30	15	8	8
1500W	70	415	446	70	135	30	15	8	8
2000W	70	510	541	70	135	30	15	8	8
2500W	70	600	631	70	135	30	15	8	8
3000W	70	600	631	70	135	30	15	8	8
4000W	100	430	468	100	185	35	15	8	8
5000W	100	500	538	100	185	35	15	8	8
6000W	100	600	638	100	185	35	15	8	8
10,000W	150	600	640	152	260	43	30	8	10
12,000W	150	660	700	152	260	43	30	8	10
15,000W	150	660 / 750	700 850	152	260	43	30	8	10
20,000W	150	1000	1040	152	260	43	30	8	10

Electrical Characteristics :

Testings	Testing Conditions	Testing Results
Resistance Tolerance	JIS-C-5202 5-1 testing voltage<3V 25C	Standard +/-5%
Temperature Coefficient	JIS-C-5202 5-2	+/- 200 - 400ppm/C max.
Rated Load	JIS-C-5202 5-4 40C at rated voltage 1hour	△R<=+/-(1%+0.1ohm) surface temperature <=400C
Insulation Resistance	JIS-C-5202 5-6 500Vdc	100M ohm min.
Dielectric Withstand voltage	JIS-C-5202 5-7 1000Vdc 1min. between Terminal and body	△R<=+/- (0.1%+0.05ohm)
Short Time Overload	JIS-C-5202 5-5 DDR/DSR/DNR : 5*rated power in 5 sec DDVR : 5*rated power in 10 sec	△R <= +/-(2%Ro + 0.1ohm)
Flammability	1 - 6 times rated power 5min.	without combustion
Load Life	JIS-C-5202 7-10 90min.-ON 30min.-OFF 500hours	Free of appearance or structural irregularity, Surface coating crack △R/R<=+/-(5%+0.1ohm)

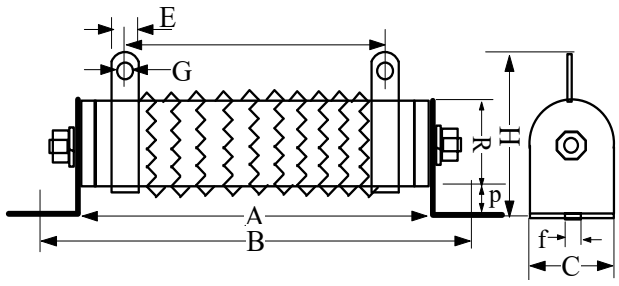
Part Number :

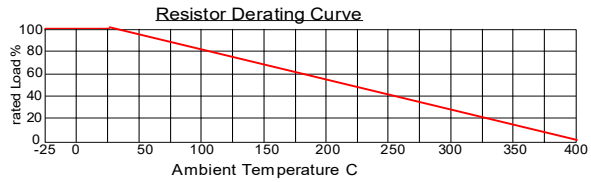
Series + Rated Power + Resistance Value (ohm) + Resistance Tolerance + Drawing Number + Multi-Terminals (DDR & DNR)

DDR	15 – 20,000W	0.1 ohm = R1	B= +/-0.1%	F : mounting fixture	2 Terminals : NA
DSR	15 – 20,000W	1 ohm = 1R	D= +/-0.5%	W : with handwheel	3 Terminals : 3MT
DNR		15 ohm = 15R	F = +/-1%		4 Terminals : 4MT
		150 ohm = 150R	G = +/-2%		
		1k ohm = 1kR	H=+/-3%		
			J = +/-5%		
			K= +/-10%		
			M= +/-20%		
			R= -0/+5%		
			T= -0/+10%		

Silicon Coated Wave Ribbon Wire-Wound Power Resistors

- These resistors are suitable as Resistive Load simulation, Electric power distribution, Machinery, Power / Industrial Machinery, Instrument and Equipment higher power application; Automation control, particularly useful where high energy is to be dissipated in the lower ohmic ranges.
- Good for Continuous load and Short Time Over Load application
- Higher Current and better heat convection
- Resistance Adjustable version is available – DQS-F series
- Resistance Box and Load Bank available with power up to 2000KW.
- Support Precision Resistance Tolerance requirement
- Support Vitreous Enamel coating for harsh environment applications.





DQR-F Type – Wave Ribbon Wire Wound Resistors

Dimension in mm :	**R**	**A**	**B**	**C**	**H**	**p**	**E**	**G**	**f**
Tolerance : +/- mm	1	5	5	1	3	3	1	1	1
30W	20	70	100	20	50	15	6	3.5	5
40W	20	87	115	20	50	15	6	3.5	5
50W	28	90	122	28	68	20	9	4.5	6
80W	28	90	122	28	68	20	9	4.5	6
100W	28	170	202	28	68	20	9	4.5	6
150W	28	215	247	28	68	20	9	4.5	6
200W	28	267	300	28	68	20	9	4.5	6
250W	28	267	300	28	68	20	9	4.5	6
300W	40	267	305	40	90	20	10	4.5	6
400W	40	330	367	40	90	20	10	4.5	6
500W	50	330	370	50	98	20	10	6	8
600W	50 / 60	330	370	50	98	20	10	6	8
700W	50	400	440	50	95	20	10	6	8
800W	70	300	331	70	135	30	15	8	8
1000W	70	300	331	70	135	30	15	8	8
1500W	70	415	446	70	135	30	15	8	8
2000W	70	510	541	70	135	30	15	8	8
2500W	70	600	631	70	135	30	15	8	8
3000W	70	600	631	70	135	30	15	8	8
4000W	100	430	468	100	185	35	15	8	8
5000W	100	500	538	100	185	35	15	8	8
6000W	100	600	638	100	185	35	15	8	8
10,000W	150	600	640	152	260	43	30	8	10
12,000W	150	660	700	152	260	43	30	8	10
15,000W	150	660 / 750	700 / 850	152	260	43	30	8	10
20,000W	150	1000	1040	152	260	43	30	8	10

DQN-F Type – Wave-Shape Low Inductance Wire Wound Resistors

Dimension in mm :	**R**	**A**	**B**	**C**	**H**	**p**	**E**	**G**	**f**
Tolerance : +/- mm	1	5	5	1	3	3	1	1	1
30W	20	70	100	20	50	15	6	3.5	5
40W	20	87	115	20	50	15	6	3.5	5
50W	28	90	122	28	68	20	9	4.5	6
80W	28	90	122	28	68	20	9	4.5	6
100W	28	170	202	28	68	20	9	4.5	6
150W	28	215	247	28	68	20	9	4.5	6
200W	28	267	300	28	68	20	9	4.5	6
250W	28	267	300	28	68	20	9	4.5	6
300W	40	267	305	40	90	20	10	4.5	6
400W	40	330	367	40	90	20	10	4.5	6
500W	50	330	370	50	98	20	10	6	8
600W	50 / 60	330	370	50	98	20	10	6	8
700W	50	400	440	50	95	20	10	6	8
800W	70	300	331	70	135	30	15	8	8
1000W	70	300	331	70	135	30	15	8	8
1500W	70	415	446	70	135	30	15	8	8
2000W	70	510	541	70	135	30	15	8	8
2500W	70	600	631	70	135	30	15	8	8
3000W	70	600	631	70	135	30	15	8	8
4000W	100	430	468	100	185	35	15	8	8
5000W	100	500	538	100	185	35	15	8	8
6000W	100	600	638	100	185	35	15	8	8
10,000W	150	600	640	152	260	43	30	8	10
12,000W	150	660	700	152	260	43	30	8	10
15,000W	150	660 / 750	700 / 850	152	260	43	30	8	10
20,000W	150	1000	1040	152	260	43	30	8	10

Electrical Characteristics :

Testing	Testing Conditions	Testing Results
Resistance Tolerance	JIS-C-5202 5-1 testing voltage<3V 25C	+/-5%
Temperature Coefficient	JIS-C-5202 5-2	+/- 200 - 350ppm/C max.
Rated Load	JIS-C-5202 5-4 40C at rated voltage 1hour	△R<=+/-(1%+0.1ohm) surface temperature < 400C
Insulation Resistance	JIS-C-5202 5-6 500Vdc	100M ohm min.
Dielectric Withstand voltage	JIS-C-5202 5-7 1000Vdc 1min.	△R<=+/- (0.1%+0.05ohm)
Short Time Overload	JIS-C-5202 5-5 DQR/DQN : 5*rated power in 5 sec DDVR : 5*rated power in 10 sec	△R <= +/-(2%Ro + 0.1ohm)
Flammability	1 - 6 times rated power 5min.	without combustion

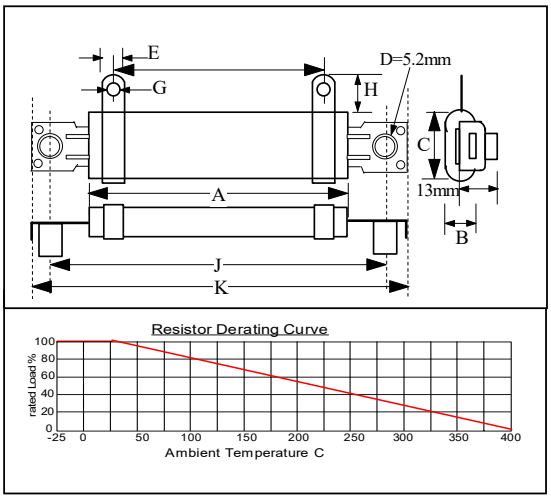
Part Number :

Series + Rated Power + Resistance Value (ohm) + Resistance Tolerance + Drawing Number

DQR 30 - 20000W 0.1 ohm = R1 F = +/-1% / G = +/-2% F : mounting fixture
DQN 30 - 20000W 1 ohm = 1R H= +/-3%
DQS 15 ohm = 15R J = +/-5%
150 ohm = 150R K= +/-10%
1000 ohm = 1kR R= -0/+5%
T= -0/+10%

Silicon Coated Oval / Flat Type Wire-Wound Power Resistors

- These resistors are suitable as loading resistor, braking resistor, capacitor discharge, Resistive Load simulation, Machinery, Machinery and Equipment higher power application.
- Space saving
- Low Inductance and Waved Ribbon type available
- support Precision Resistance Tolerance requirement
- mounting fixture is available, allow stacking into compact unit
- Electrical Tab Terminal can be customized according to customer's need.
- With power up to 500W



ZZR-F : Oval / Flat Wire Wound Resistors

Power Rating	Dimensions in mm +/-1mm								Resistance Range ohm
	A	B	C	E	G	H	J	K	
40W	50	9	27	6.5	4.1	12	70	103	0.1 – 4k
50W	90	9	27	6.5	4.1	12	110	123	0.1 – 4k
60W	90	9	27	6.5	4.1	12	110	123	0.1 – 4k
80W	120	9	27	6.5	4.1	12	140	153	0.1 – 4k
100W	150	9	27	6.5	4.1	12	170	183	0.1 – 4k
120W	160	9	27	6.5	4.1	12	180	193	0.1 – 4k
150W	185	11	27	6.5	4.1	12	205	218	0.1 – 4k
200W	210	11	27 / 35	9	5.2	13	230	243	0.1 – 4k
250W	254	11	35	9	5.2	13	274	287	0.1 – 4k
300W	300	11	35	9	5.2	13	320	333	0.1 – 4k

Electrical Characteristics :

Testings	Testing Conditions	Testing Results
Resistance Tolerance	JIS-C-5202 5-1 testing voltage<3V 25C	+/-5%
Temperature Coefficient	+/- 400ppm/C max.	
Rated Load	JIS-C-5202 5-4 40C at rated voltage 1hour	△R<=+/-(1%+0.1ohm) surface temperature < 400C
Insulation Resistance	JIS-C-5202 5-6 500Vdc	100M ohm min.
Dielectric Withstand voltage	JIS-C-5202 5-7 1000Vdc 1min.	△R<=+/- (0.1%+0.05ohm)
Short Time Overload	JIS-C-5202 5-5 5*rated power in 5 seconds	△R <= +/-(2%Ro + 0.1ohm)
Flammability	1 - 6 times rated power 5min.	without combustion

Part Number :

Series + Rated Power + Resistance Value (ohm) + Resistance Tolerance + Drawing Number

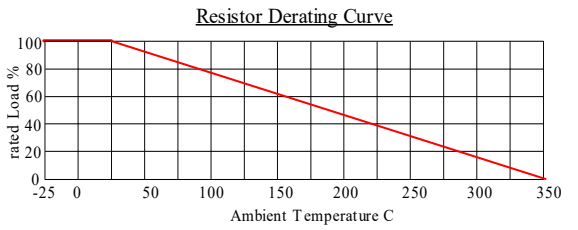
ZZR	40 - 300W	0.1 ohm = R1	F = +/-1%	F : mounting fixture
ZNR	40 - 300W	1 ohm = 1R	G = +/-2%	
		15 ohm = 15R	J = +/-5%	
		150 ohm = 150R	K= +/-10%	
		1k ohm = 1kR	R= -0/+5%	
			T= -0/+10%	

Vitreous Enamel Power Resistors - DVR

This series of resistors is suitable as loading application, more stable, withstand humidity and higher temperature

- low Inductance version is available
- small resistor body size
- withstand harsh working conditions
- mounting fixture is available like DDR-F series
- adjustable version is available **DVSR**
- support multi tab terminals

We support other resistance value that not listed above.



DVR- Vitreous Enamel Power Resistors

Rated Power	Dimensions in mm		Resistance Range ohm	
	Length	Diameter	DVR	Resistance adjustable DVSR
8W	35 +/- 1.5	14 +/- 2	5.1 - 3.3k	-
10W	41 +/- 1.5		5.1 – 3.3k	5.1 - 200
16W	51 +/- 2	17 +/- 2	5.1 – 3.3k	5.1 - 220
20W	51 +/- 2		5.1 – 4k	10 - 430
25W	51 +/- 2	21 +/- 2.5	10 – 4k	10 - 510
30W	71 +/- 2.5		10 – 5k	10 - 1k
40W	87 +/- 2.5		20 – 7.5k	20 - 1.2k
50W	91 +/- 2.5	29 +/- 3	20 - 10k	20 - 1.5k
80W	140 +/- 3.5		24 – 12k	24 - 2k
100W	170 +/- 3.5		24 – 15k	24 - 2.7k
150W	215 +/- 4		20 - 30k	20 - 4.3k
200W	215 +/- 4	38 +/- 3	4.7 - 12k	5.1 - 3k
300W	266 +/- 4	36 +/- 2	4.7 - 12k	5.1 - 3k
400W	250 +/- 4	54 +/- 2	5.1 - 10k	6.2 - 3k
500W	300 +/- 4		5.1 - 10k	6.2 - 3k

Electrical Characteristics :

Testing	Testing Conditions	Testing Results
Resistance Tolerance	JIS-C-5202 5-1 testing voltage<3V 25C	+/-5%, +/-10%
Temperature Coefficient	+/- 250ppm/C max.	
Short Time Overload	10*rated power in 5 seconds	△R <= +/-(2%Ro + 0.05 ohm)
Surface temperature	<= 350C	At maximum rated power

Part Number :

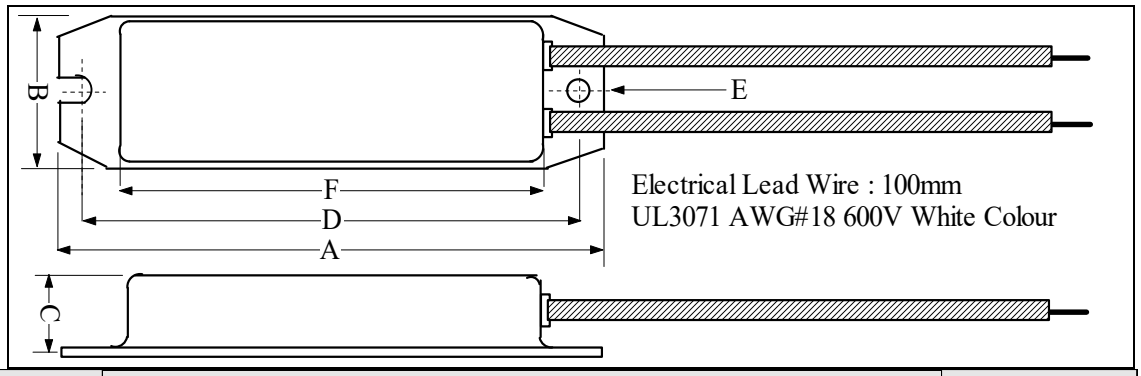
Series

DVR : normal
DVR-F : with mounting fixture
DVSR : resistance adjustable
DVSR-F : resistance adjustable with mounting fixture
DVRN : low inductance
DVRN-F : low inductance with mounting fixture
DQVR : Waved Ribbon Power Resistor : up to 1000W : resistor size refer to DQR-F series
DDVR : Wire Wound Power Resistor : up to 1000W : resistor size refer to DDR-F series

Aluminum Housing Wire Wound Power Resistors / Braking Resistors

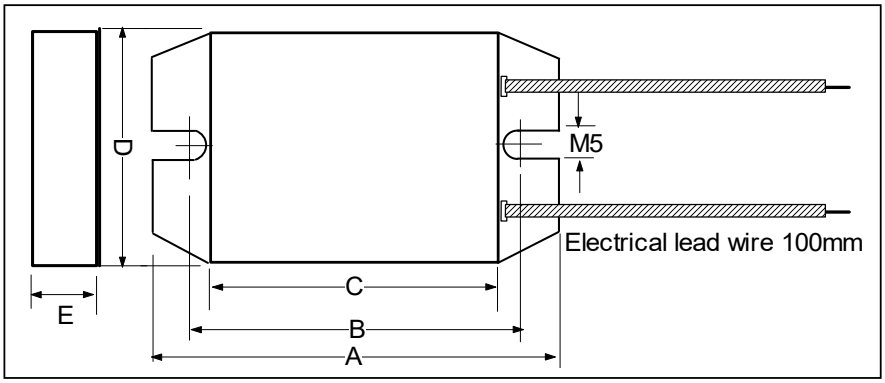
- Internal wire wound resistor is protected by external Aluminum Case from external mechanical force, humidity and dusty.
- Suitable for industrial machinery and equipment, Variable Frequency Drives, Snubber circuits, heating resistors and Braking resistors
- Excellent Short Time Over Load capacity.
- Durable and can withstand stronger vibration.
- Low temperature coefficient and better heat conduction.
- Options : Water Resistance up to IP65
- With built-in Thermocouple or Thermal Switch
- Low Inductance requirement
- Braking Resistor with protective enclosure, cooling system and thermal switch
- Precision Resistance Tolerance +/-0.1% +/-0.5% +/-1% +/-5% +/-10% -0/+5% -0/+10%
- support Low Ohmic Resistance and high Resistance value
- support Resistor size other than listed below

ASQ type :



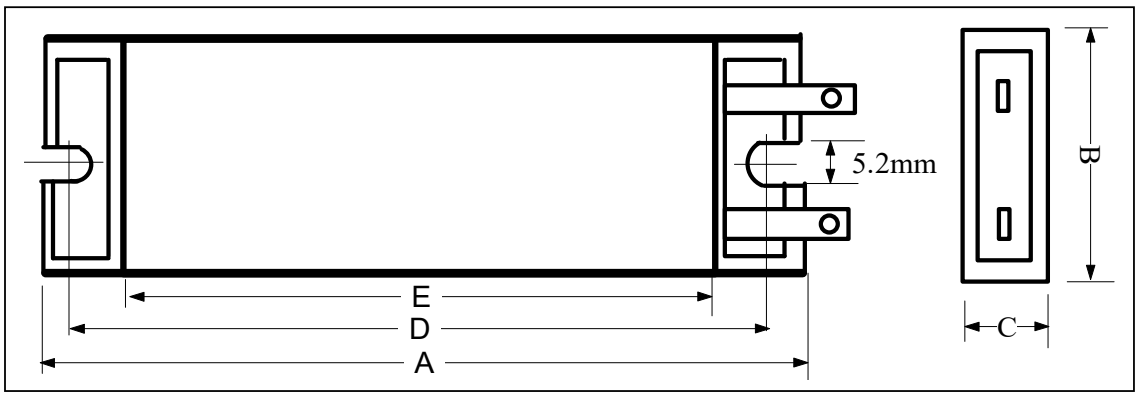
Power Rating	Dimensions in mm +/-1mm						Resistance Range ohm
	A	B	C	D	E	F	
60W	100	30	13	90	4.5	75	0.01 – 100k
80W	130	42	19	116	5	103	0.01 – 100k
100W	130	42	19	116	5	103	0.01 – 100k
120W	182	42	19	172	6	152	0.01 – 100k

ASQM type : Low Profile Metal Clad Resistors – the resistor thickness can even as thin as 5mm. For more details, e-mail us.



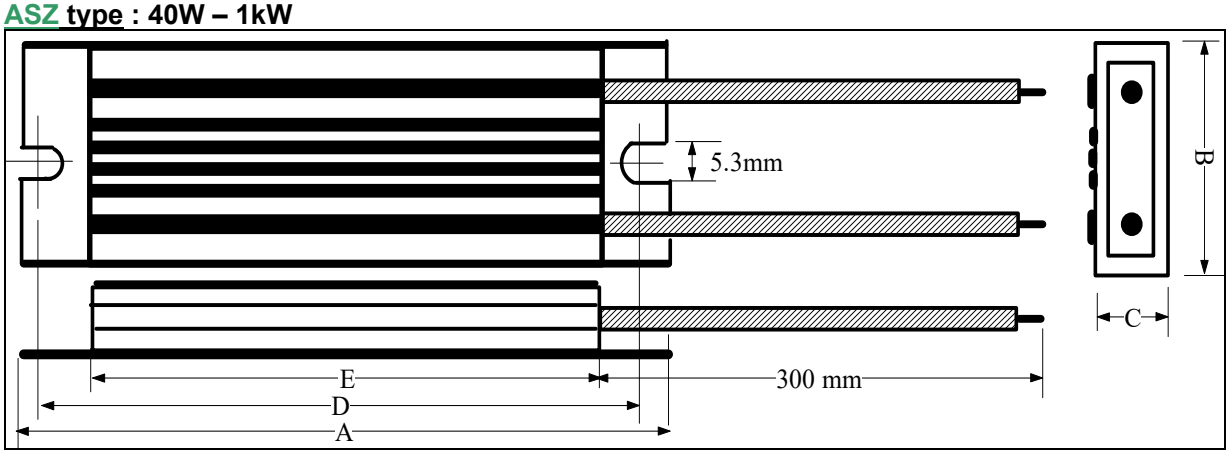
Power Rating	Dimensions in mm and Resistance Range in ohm					
	A	B	C	D	E	Resistance range ohm
60W	100	86	70	45	8	0.1 – 10k
80W	120	106	95	45	8	0.1 – 10k
100W	120	106	95	45	8	0.1 – 10k
120W	150	135	125	45	8	0.1 – 10k
150W	216	200	190	45	8	0.1 – 10k
200W	265	250	240	45	12 / 15 / 20	0.1 – 10k

ASZ type : 1kW – 8kW Power can be customized up to 10kW



Power Rating	Dimensions in mm +/-1mm					Resistance Range ohm
	A +/-2	B +/-1	C +/-1	D +/-2	E +/-2	
1000 W	335 / 380	70 / 60	45 / 30	320	300	0.01 – 20k
1200 W	350 / 400	107 / 70	50 / 45	385	365	0.01 – 20k
1500 W	350 / 450	107 / 70	50 / 45	335 / 435	315 / 415	0.01 – 20k
2k W	400 / 500	107 / 70	50 / 45	385 / 485	365 / 465	0.01 – 20k
2500 W	450 / 550	107 / 70	50 / 45	435 / 535	415 / 515	0.01 – 20k
3k W	450 / 600	107 / 70	50 / 45	435 / 585	415 / 565	0.01 – 20k
4k W	500 / 525 / 550	128 / 129 / 107	41 / 41 / 50	-	-	Customize
5k W	550	175 / 107	65 / 50	-	-	Customize
8k W	850	107	50	-	-	Customize
15k W	650	175	65	-	-	Customize

ASZ type : 40W – 1kW

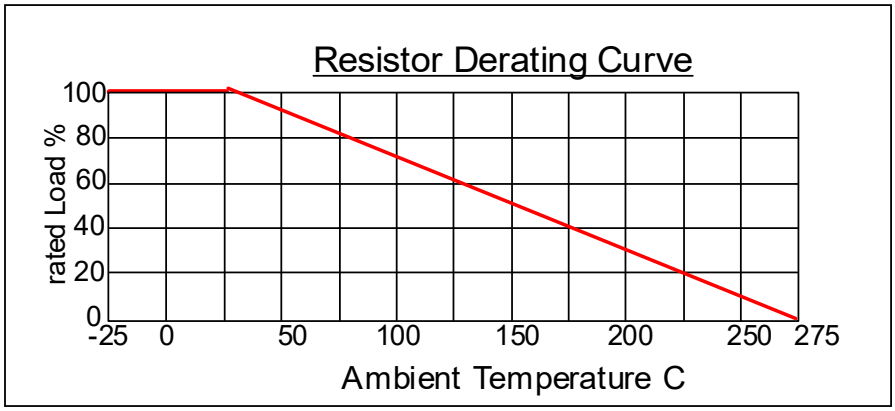


Power Rating	Dimensions in mm +/-1mm					Resistance Range ohm
	A +/-2	B +/-1	C +/-1	D +/-2	E +/-2	
40W	90	40	20	75	60	0.01 – 100k
60W	100 / 115	40	20	100	85	0.01 – 100k
80W	130 / 140	40	20	125	115	0.01 – 100k
100W	140	40	20	125	115	0.01 – 100k
120W	165 / 185	40	20	170	155	0.01 – 100k
150W	185	40	20	170	155	0.01 – 100k
200W	165	60	30	150	130	0.01 – 100k
250W	165	60	30	150	130	0.01 – 100k
300W	215	60	30	200	180	0.01 – 100k
400W	245 / 265	60	30	250	230	0.01 – 100k
500W	285 / 335	60	30	320	300	0.01 – 100k
600W	300 / 335	60	30	320	300	0.01 – 100k
800W	335 / 365	60	30	350	330	0.01 – 100k
1kW	335 / 380	70 / 60	45 / 30	320	300	0.01 – 20k

We support other resistance value that not listed above.

Electrical Characteristics :

Testing	Testing Conditions	Testing Results
Resistance Tolerance	JIS-C-5202 5-1 testing voltage<3V 25C	+/-5%
Temperature Coefficient	+/- 400ppm/C max.	
Rated Load	JIS-C-5202 5-4 40C at rated voltage 1hour	△R<=+/-(1%+0.1ohm) surface temperature <= 400C
Insulation Resistance	JIS-C-5202 5-6 1000Vdc	100M ohm min.
Dielectric Withstand voltage	JIS-C-5202 5-7 2000Vdc 1min.	△R<=+/- (0.1%+0.05ohm)
Short Time Overload	JIS-C-5202 5-5 5*rated power in 5 seconds (can be customized according to customer's application need)	△R <= +/-(2% + 0.1ohm)
Operating Temperature range	- 55C - +275C	
Power Derate to Zero	At 275C	

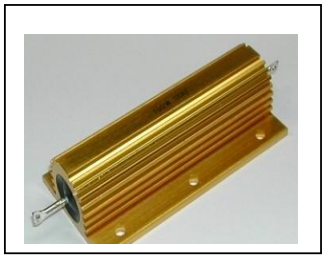


Part Number :

Series	+ Rated Power	+ Resistance Value (ohm)	+ Resistance Tolerance	+ Drawing Number
ASQ	60 - 120W	0.01 ohm = R01	B= +/-0.1% D=+/-0.5%	
ASQM	60 - 200W	0.1 ohm = R1	F = +/-1% J = +/-5%	
ASZ	40 - 8000W	1 ohm = 1R	K= +/-10%	
		15 ohm = 15R	R= -0/+5%	
		150 ohm = 150R	T = -0/+10%	

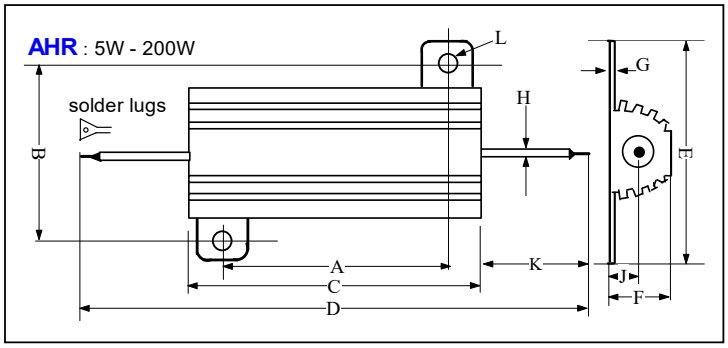
AHR type :

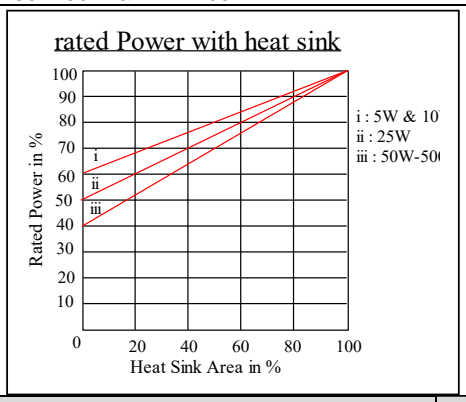
- **Application** : Braking Resistor, Dumping Resistor for Motor Control, Rush Current protection, Gate Resistor, Snubber Resistors
- Aluminium housed Resistors are wound with Nickel Copper or Nickel Chromium wire on ceramic core fitted with end caps.
  The winded assembly is then encapsulated in a anodized Heat sink using high temperature moulding compound.
- Low Inductance type is available
- Resistance range : 0.01 ohm – 100k ohm
- It is low cost, light weight and compact



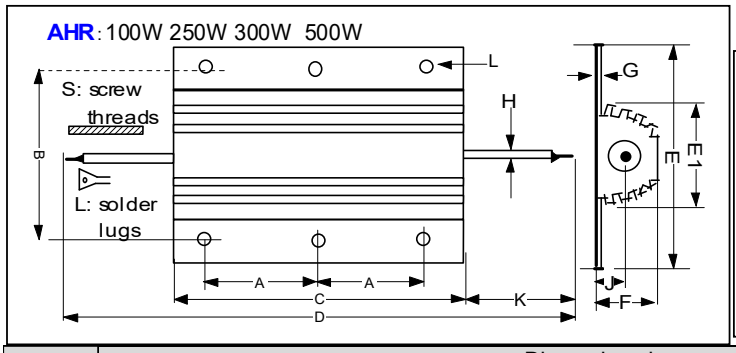
Electrical Specifications :

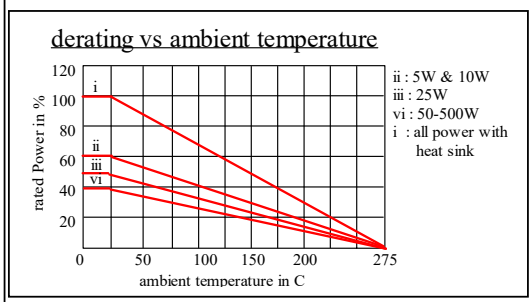
Rated Power	5Watts to 500Watts
Terminals	Soldering Lugs : 5 – 50W; Screw Threads : 75 – 500W
Temperature Coefficient	+/-20ppm/C, +/-50ppm/C, +/-100ppm/C, +/-200ppm/C, +/-250ppm/C,
Tolerance	+/-0.1%, +/-0.5%, +/-1%, +/-5%, +/-10%, -0/+5%, -0/+10%
Dielectric Voltage	1000Vac : 5 – 25W, 1500Vac : 50 – 500W
Operating Temperature	-55 to 250C
Overload – short time	5 time of rated power in 5 seconds
Derating	Deratings is needed to reduce chassis mounted area and for high ambient temperatures. Derate to zero Power Linearly at 250C ambient. Derating necessary for unmounted resistors at ambient temperatures of 25C, 5W & 10W - 40%, 25W-50% 50W & above 60%.





Rated Power	Dimensions in mm											Weight gram
	A +/-0.2	B +/-0.2	C +/-0.2	D+/-4	E +/-0.5	F +/-0.4	G +/-0.2	H +/-0.1	J +/-0.5	K +/-2	L +/-0.2	
5W	11.2	12.5	15.2	28.5	16.5	8.0	1.7	1.2	3.8	7.0	2.2	3
10W	14.3	15.8	19.5	35.0	20.3	10.0	1.9	2.0	4.2	8.0	2.2	11
25W	18.3	19.8	27.5	49.0	27.4	14.0	2.2	2.0	6.0	11.0	3.2	18
50W	40.0	21.5	50.0	72.0	29.2	15.5	2.2	2.0	6.6	13.0	3.2	30





Rated Power	Dimensions in mm												Weight gram
	A +/-0.5	B +/-0.5	C +/-1	D+/-4	E +/-1	E1 +/-0.5	F +/-0.5	G +/-0.2	H +/-0.2	J +/-0.3	K +/-2	L +/-0.3	
75W	23.5	38.0	65.5	105	48	27	26	3.3	2.8	11.5	20	4.2	90
100W	35.5	38.0	98.0	138	48	27	26	3.3	2.8	11.5	20	4.2	160
150W	52.0	38.0	135.0	175	48	27	26	3.3	2.8	11.5	20	4.2	240
200W	70.0	38.0	165.0	205	48	27	26	3.3	2.8	11.5	20	4.2	420
250W	45.5	58.0	112.0	152	73	46.5	45	5.0	6.0	21.0	20	5.3	480
300W	51.5	58.0	130.0	170	73	46.5	45	5.0	6.0	21.0	20	5.3	580
500W	87.0	58.0	204.0	244	73	46.5	45	5.0	6.0	21.0	20	5.3	970

Part Number :

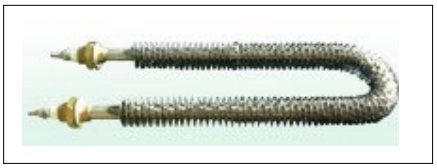
Series + Rated Power + Resistance Value (ohm) + Resistance Tolerance + Terminals + Drawing Number

AHR	5 - 50W	0.1 ohm	= R1	F = +/-1% G= +/-2%
	75 - 500W	1 ohm	= 1R	J = +/-5% K= +/-10%
		15 ohm	= 1R5	R= -0/+5% T= -0/+10%

S : screw threads
L : solder lugs
W : electrical wires

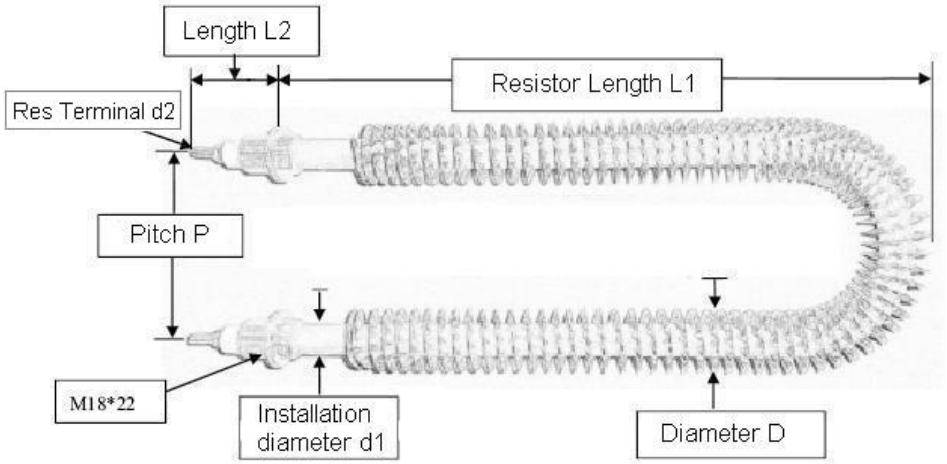
Thermal Power Resistors

- Applications : Load Banks, Variable Frequency Drives, Dynamic Braking, Heating Resistors, Snubber circuits
- Excellent for both Continuous Energy Dissipation and Pulse Energy dissipation applications
- The Resistive element is protected by external Stainless Steel Tube with fins. The pins increase the resistor surface area.
- This design is good for thermal energy dissipation and heat convection
- Robust Stainless Steel Resistor body provides good resistance to mechanical vibration, humidity and increases the resistor reliability.
- Resistor body is water resistance. However, the resistor terminals cannot contact with water
- Power range : 200W to 6000W
- Low temperature coefficient and better heat conduction.
- Precision Resistance Tolerance +/-1% +/-5% +/-10% -0/+5% -0/+10%
- Resistance is made according to customer's application
- max. current up to 30A per resistor



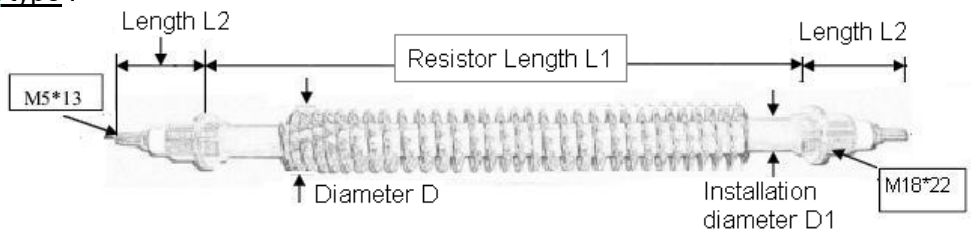
- The Resistor size might be changed according to different resistance value and load current requirement.
- Support with Enclosure, Cooling Fan and Thermal Switch requirement

HER-U type :



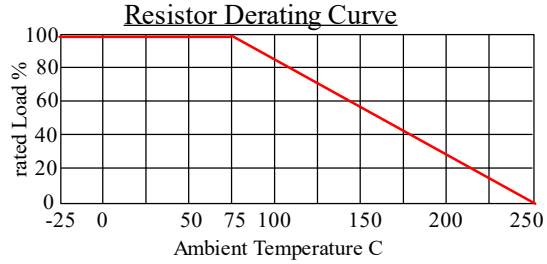
Power Rating	D +/-1mm	d1 +/-1mm	d2 +/-1mm	L1 +/-3mm #	L2 +/-2mm	P +/-3mm	Resistance range
500W	29	14	M5*13	380	40 / 50	70	0.1 – 1k
1000W	29	14	M5*13	600	40	85	0.1 – 1k
1500W	29	14	M6*13	800	40	85	0.1 – 1k
2000W	29	14	M6*13	1200	40	85	0.1 – 1k

HER type :



Power Rating	D +/-1mm	d1 +/-1mm	L1 +/-3mm #	L2 +/-2mm	Resistance range
500W	29	14	700	40	0.1 – 1k
1000W	29	14	1200	40	0.1 – 1k

HER-U and HER type :



Part Number :

Series + Rated Power + Resistance Value (ohm) + Resistance Tolerance + Drawing Number

HER-U	200 - 6000W	0.1 ohm = R1	F = +/-1% J = +/-5%
HER	200 - 500W	1 ohm = 1R	K= +/-10%
		15 ohm = 15R	R= -0/+5%
		150 ohm = 150R	T = -0/+10%

Actual Resistor length might vary due to the resistance value and load current.

Edge Wound Power Resistors – EWR series

Applications :

Variable Frequency Drive, Frequency Converter Drives, Server, Motion Control
High Pulse Energy absorption
Overhead Crane, hoist forklifts, Electric Lift Trucks
Mine locomotive
Neutral Grounding of Transformers and generators
Elevator control
Continuous High Current duty applications
Pulse Current / Energy dissipations
Dynamic Brakings
Discharge Resistors

Characteristics :

This series Edge Wound Resistor has fins like high quality Resistive Alloy resistive element and winds around the ceramic substrate.
The design increases the overall surface area, which is good for thermal energy dissipation and increase resistor reliability.

- Power range : 500W to 3000W
- Suitable for both High Current Continuous Duty and Short Pulse Energy dissipation applications
- Withstand Severe short-time overload : 10 x rated Wattage 5 seconds
- Support low resistance and high current requirement
- Support multi-Resistances per resistor
- Support adjustable resistance requirement with an adjustable ring Terminal
- Support Screw Bolt Terminals and Quick Fit Tab Terminal
- Support mounting fixture, enclosure, cooling fan and Thermal Switch requirement

The Resistor size might be changed according to different resistance value and load current requirement.
We manufacture Edge Wound Resistors for a wide variety of industrial applications.
Different applications can have very different resistor electrical and mechanical profile requirements.
Please feel free to send your application details; we might have a solution for your need.
Production Lead Time will be about 7 - 15 days, depending on order quantity, material and production status.

Part Number :

Series	+ Rated Power	+ Resistance (ohm)	+ Resistance Tolerance	+ Terminals
EWR	500 – 3kW	0.1 ohm = R1	J = +/5%	S : Screw Bolt
		1 ohm = 1R	K = +/-10%	T : Tab Terminal
		10 ohm = 10R		

Open Helical Coil Wound Resistors / Spring Coil Wound Resistors – FDL series

Applications :

Variable Frequency Drive, Frequency Converter Drives, Server, Motion Control
High Pulse Energy absorption
Load Banks
Overhead Crane, hoist forklifts Control Systems
Electric Lift Trucks
Mine locomotive
Neutral Grounding of Transformers and generators
Elevator control
High Current and Current Limiting
Dynamic Braking
Crowbar Circuits
Discharge Resistors
Heaters

Characteristics :

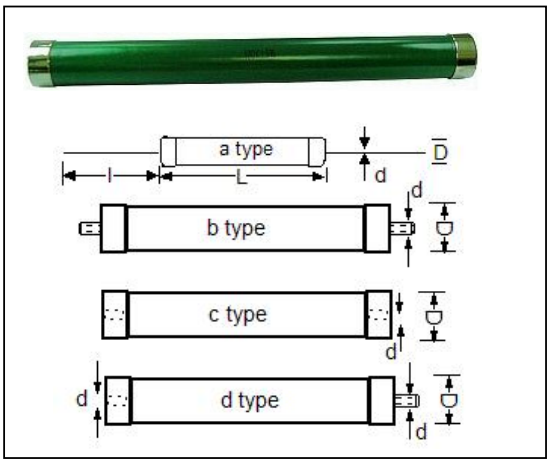
This series Open Helical Coil Wound Resistors has coiled resistance material and winds around the ceramic substrate.
The design increases the airflow across the coiled resistance material, stabilize resistive Coil temperature and increase the rate of energy dissipation.
- Power range : 500W to 4000W
- Suitable for both Continuous Duty and Short Pulse Energy dissipation applications
- Withstand Severe short-time overload : 5 x rated Wattage 5 seconds
- Support multi-Resistances per resistor
- Support adjustable resistance requirement with an adjustable ring Terminal
- Support mounting fixture, enclosure, cooling system and thermal switch requirement

The Resistor size might be changed according to different resistance value and load current requirement.
We manufacture Open Helical Coil Wound Resistors for a wide variety of industrial applications.
Different applications can have very different resistor electrical and mechanical profile requirements.
Please feel free to send your application details; we might have a solution for your need.
Production Lead Time will be about 10 - 20 days, depending on order quantity, material and production status.

Part Number :

Series	+ Rated Power	+ Resistance (ohm)	+ Resistance Tolerance	+ Terminals
FDL	500 – 4kW	1 ohm = 1R	J = +/5%	
		10 ohm = 10R	K = +/-10%	

High Voltage Resistors DHVR – Non-Inductive



- it is vitreous Enamel coating for better resistor protection
- Can withstand 3-5 times the rated power for short time
- Standard resistor rated power : 0.5W - 500W
- Standard resistance range : 10k ohm - 100G ohm
- Surge voltage up to 200kV
- Support High Pulse Current requirement
- Rated temperature range : -55C - 70C
- If Resistor will be immersed in high voltage insulation oil or SF6, please let us know. We support this requirement.

Applications :

High Voltage divider / Measuring resistor / Electrostatics / Over voltage protection / Capacitor Discharge

Please provide following working condition for quotation and delivery lead time :

- Resistance value and Resistor Power
- AC or DC voltage, if there is Surge Voltage, please tell the peak to peak voltage range, duty cycle and repetition rate.
- Surge Voltage, if it is larger than the rated voltage according to resistor rated Power and Resistance condition.
- for AC and Surge Voltage, can you tell the estimated duty cycle, repetition rate or frequency

The above condition can help us offer suitable High Voltage Resistor for your application.

DHVR type : For Resistor power that not listed above, please contact us for details.

Rated Power Wattage 70C	Resistor package type	Dimensions in mm *				Resistance range ohm	Temperature Coefficient ppm/C	Resistance Tolerance	Max. Pulse Voltage KV ###
		Length L	Diameter D	Lead length	Lead diameter				
0.5W	a	7	2.5	30+/-1	0.6	10k~50M	<= 400	+/-1% +/-2% +/-5% +/-10%	0.35
1W	a	13+/-1	4.5		0.8	10k~100M			2.5
2W	a	17+/-1	6.5		0.8	10k~100M			4.0
3W	a	25+/-1	8		0.8	10k~500M			4.8
4W	a	35	8		0.8	10k~500M			10
5W	a	37 / 42 +/-1	11		1	100k~3G			8 / 10
10W	a	71 / 84 +/-2	11 / 12		1	5k~10G			25 / 32
20W	a	103 / 114 +/-2	11 / 12		1	5k~20G			40 / 45
25W	a	126 / 138 +/-2	11 / 12		1	5k~40G			50 / 55
30W	b c d	90+/-2	16	-	M5	5k~5G	+/-150		25
40W		100+/-2	27	-	M5 / 6	5k~10G			30
50W		133+/-2	27			10k~40G			45
60W		160+/-2	27			20k~60G			58
70W		180+/-2	27			20k~60G			62
80W		200+/-2	27			50k~60G			68
90W		210+/-2	27			50k~75G			82
100W		260 / 150 +/-2	27 / 35			50k~85G	+/-150		100
150W		310/ 210+/-2 / 154+/-2	27 / 28 / 60	-	M5 / 6 / 8	50k~100G	+/-250		130 / 55
200W		260+/-2 / 210+/-2	28 / 42	-	M8		+/-400		82
250W		270+/-2 / 180+/-2	42 / 60	-	M8				110 / 62
300W		310+/-2	37	-	M8				130
400W		420 +/-2	42	-	M8				180
500W		540 / 360 +/-2	42 / 62	-	M8 / 10	50k~100G			240

* Resistor sizes might be vary depend on pulse voltage, load current, pulse rate and ambient temperature etc.

** We support lower Temperature Coefficient requirement

For a given rated power resistor, the actual max. pulse voltage will depend on the rated resistance value, pulse width, duty cycle, number of pulses per second/minute, ambient temperature, humidity and resistor surface cleanness.

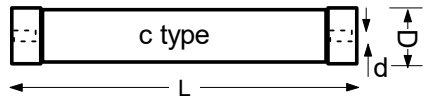
For a given rated power Resistor, the actual max. pulse voltage is depended on the rated resistance value.
Support lower Temperature Coefficient requirement.

Part Number :

Series	+ type	+ Rated Power	+ Resistance Value (ohm)	+ Resistance Tolerance
DHVR	a	1 - 500W	10k ohm= 10KR	J = +/-5%
	b		100k ohm= 100kR	K= +/-10%
	c		1M ohm = 1MR	
	d		100G ohm = 100GR	

High Voltage Pulse Power Resistors DHVRC – Non-Inductive

This series is for High Voltage, High Frequency, Pulse Energy and Pulse Current applications.
Resistance range : 1 ohm to 5k ohm
Tolerance : +/-5% and +/-10%
Temperature coefficient : <=400 ppm/k (25C to +125C)
Support lower Temperature Coefficient requirement.
Resistor package type : c
The max. Voltage depends on the rated resistance value.
For a given rated power, the actual max. pulse voltage is depended on the rated resistance value.



DHVRC type :

Rated Power Wattage 70C	Maximum Pulse Voltage kV #	Dimensions D x L in mm *
20W	0.5	25 x 50
30W	25	25 x 70
50W	40	25 x 125
60W	52	25 x 150
70W	60	25 x 172
80W	78	25 x 200
100W	100	25 x 250
150W	125	25 x 300
170W	55	60 x 154
200W	82	60 x 180
250W	180	42 x 270
300W	125	form by two 150W resistors
500W	200	form by two 250W resistors

* Resistor sizes might be vary depend on pulse voltage, load current, pulse rate and ambient temperature etc.
# For a given rated power resistor, the actual max. pulse voltage will depend on the rated resistance value, pulse width, duty cycle, number of pulses per second/minute and ambient temperature, humidity and resistor surface cleanness.
For Resistor power that not listed above, please contact us for details.

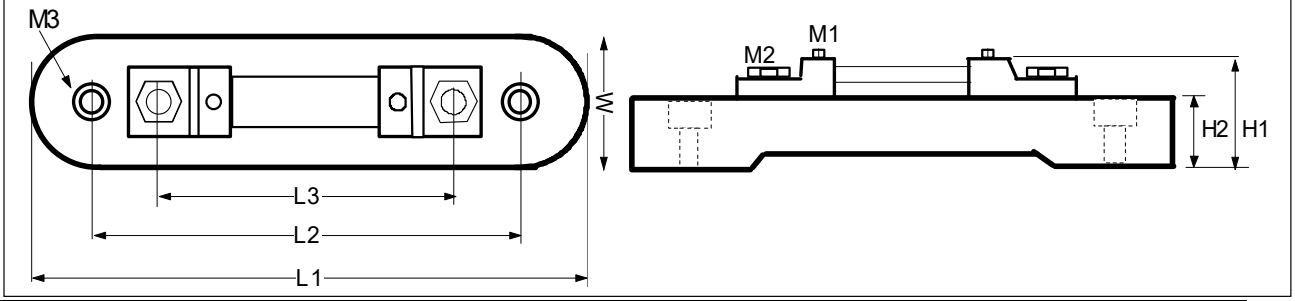
Part Number :

Series	+ Rated Power	+ Resistance Value (ohm)	+ Resistance Tolerance
DHVRC	1 - 500W	5 ohm = 5R	J = +/-5%
		10 ohm = 10R	K= +/-10%
		100 ohm = 100R	
		1k ohm = 1kR	

Shunt Resistors - SR

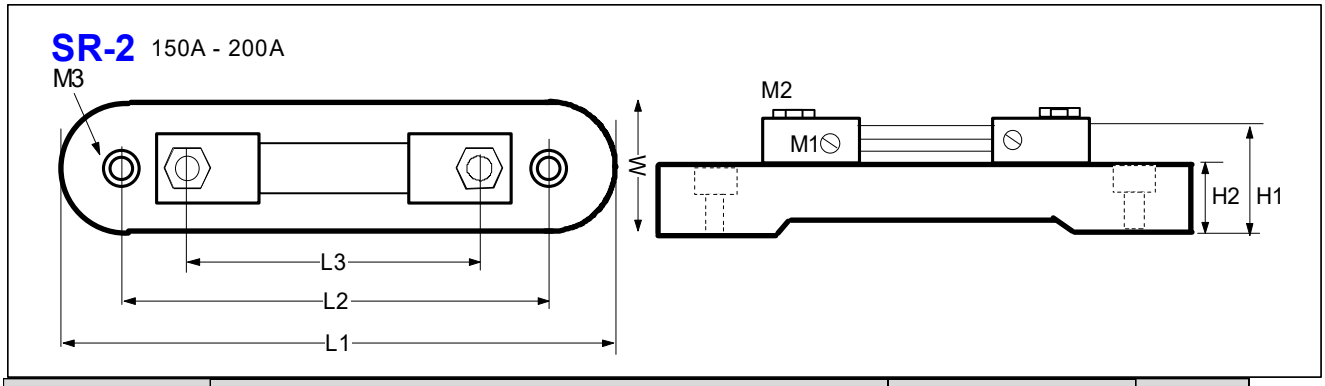
By measuring the Voltage drop across the Resistor with the knew resistance, you can calculate the needed Current.
We do our best to support customised Resistance values to meet customer's application needs.
Current range : 1A to 6000A
Support High Current requirement
Voltage : 50mV, 60mV, 75mV, 100mV and 150mV
We suggest to add about 40% load current capacity on top of the actual load current for continuous application. This can increase the resistor long run stability.

SR-1 1A - 125A



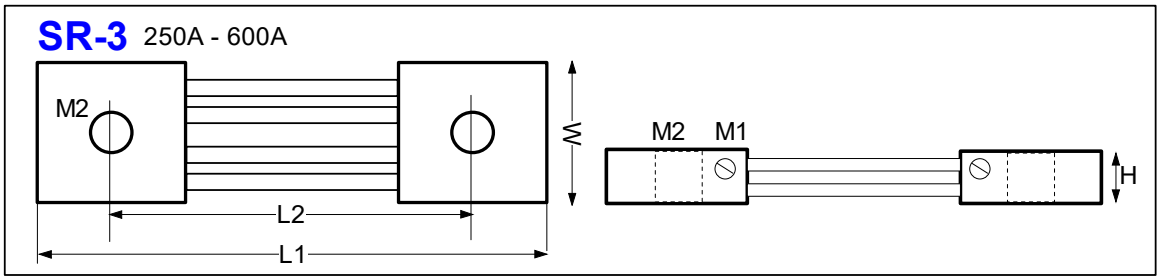
Voltage / Current	Dimensions in mm						Screw size in mm			Weight in g
	L1 +/-1.0	L2 +/-1.0	L3 +/-1.0	W +/-1.0	H1 +/-0.5	H2 +/-0.5	M1	M2	M3	
50mV : 1A to 125A	135	110	72	30	24	10	3	6	6	140
60mV : 1A to 125A	150	125	84	30	30	16	3	6	6	140
75mV : 1A to 125A	150	125	88	30	30	16	3	6	6	140

SR-2 150A - 200A



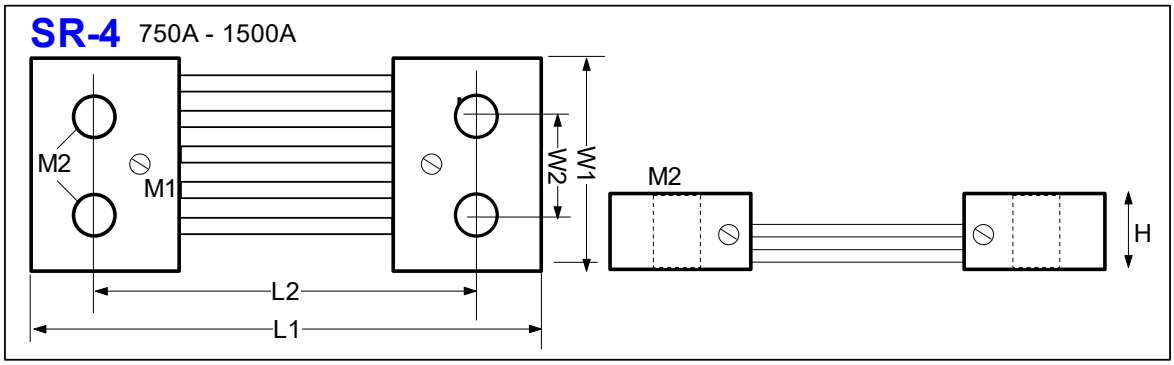
Voltage/ Current	Dimensions in mm						Screw size in mm			Weight in g
	L1 +/-1.0	L2 +/-1.0	L3 +/-1.0	W +/-1.0	H1 +/-0.5	H2 +/-0.5	M1	M2	M3	
50mV : 150A to 200A	135	110	68	30	25	10	3	8	6	245
60mV : 150A to 200A	150	125	80	30	31	16	3	8	6	260
75mV : 150A to 200A	150	125	84	30	31	16	3	8	6	265
100mV : 150A to 200A	170	150	105	30	31	16	3	8	6	270

SR-3 250A - 600A



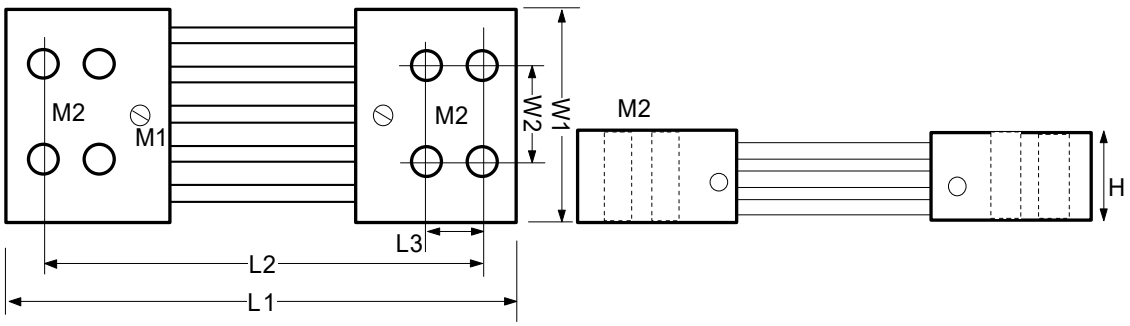
Voltage	Current	Dimensions in mm				Screw size in mm		Weight in g
		L1 +/-1.0	L2 +/-1.0	W +/-1.0	H +/-0.5	M1	M2	
50mV	250 - 300A	117	86	35	18.5	4	13	430
	400A	117	86	44	18.5	4	13	530
	500A	117	86	55	18.5	4	13	640
	600A	123	90	55	21	4	13	830
60mV	250 - 300A	126	96	35	18.5	4	13	430
	400A	126	96	44	18.5	4	13	530
	500A	126	96	55	18.5	4	13	650
	600A	132	98	55	21	4	13	830
75mV :	250 - 300A	138	107	35	18.5	4	13	430
	400A	138	107	44	18.5	4	13	530
	500A	138	107	55	18.5	4	13	650
	600A	144	111	55	21	4	13	840

SR-4 750A - 1500A



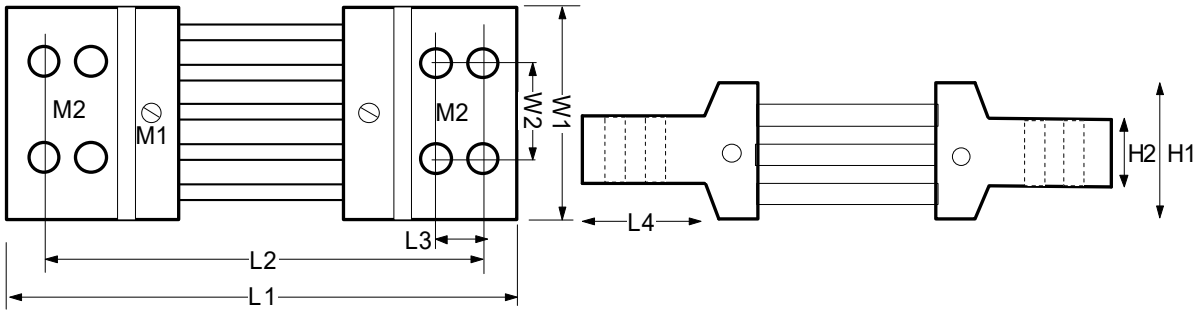
Voltage	Current	Dimensions in mm				Screw size in mm		Weight in kg
		L1 +/-1.0	L2 +/-1.0	W1 +/-1.0	W2 +/-1.0	M1	M2	
50mV	750A - 800A	123	90	70	35	21	4	13
	1000A	163	122	70	35	21	4	13
	1200A	165	124	85	45	21	4	13
	1500A	163	122	100	49	21	4	13
60mV	750A - 800A	132	98	70	35	21	4	13
	1000A	172	131	70	35	21	4	13
	1200A	174	133	85	45	21	4	13
	1500A	172	131	100	49	21	4	13
75mV:	750A - 800A	144	111	70	35	21	4	13
	1000A	185	145	70	35	21	4	13
	1200A	187	148	85	45	21	4	13
	1500A	185	145	100	49	21	4	13

SR-5 2000A - 2500A



Voltage	Current	Dimensions in mm						Screw size in mm		Weight in kg
		L1 +/-1.0	L2 +/-1.0	L3 +/-1.0	W1 +/-1.0	W2 +/-1.0	H +/-0.5	M1	M2	
50mV	2000A	190	162	37	100	50	39	4	13	4.7
	2500A	190	162	37	110	55	39	4	13	5.1
60mV	2000A	199	170	37	100	50	39	4	13	4.7
	2500A	199	170	37	110	55	39	4	13	5.2
75mV	2000A	212	184	37	100	50	39	4	13	4.8
	2500A	212	184	37	110	55	39	4	13	5.3

SR-6 3000A - 6000A



Voltage	Current	Dimensions in mm								Screw size in mm		Weight in kg
		L1 +/-1.0	L2 +/-1.0	L3 +/-1.0	L4 +/-1.0	W1 +/-1.0	W2 +/-1.0	H1 +/-0.5	H2 +/-0.5	M1	M2	
50mV	3000A	273	232	45	90	105	55	63	26	4	13	7.6
	4000A	273	232	45	90	125	76	63	26	4	13	9.0
	5000A	289	294	50	98	126	70	100	37	4	16.5	12.5
	6000A	289	294	50	98	135	80	100	37	4	16.5	14.5
60mV	3000A	281	241	45	90	105	55	63	26	4	13	7.7
	4000A	281	241	45	90	125	76	63	26	4	13	9.1
	5000A	298	258	50	98	126	70	100	37	4	16.5	12.5
	6000A	298	258	50	98	135	80	100	37	4	16.5	14.5
75mV	3000A	298	255	45	90	105	55	63	26	4	13	7.8
	4000A	298	255	45	90	125	76	63	26	4	13	9.2
	5000A	313	273	50	98	126	70	100	37	4	16.5	12.5
	6000A	313	273	50	98	135	80	100	37	4	16.5	14.5

Electrical Specifications :

Testing	Specifications
Rated Voltage Drop	50mV, 60mV, 75mV, 100mV and 150mV
Accuracy Class	0.5% : for 1A to 4000A; 1% : for 5000 to 6000A
Continuous Loading Current	2/3 x rated current
Short Time Overload Capacity	120% rated Current for 2 hours
Ambient Conditions	Temperature : -40C to +60C Relative Humidity : <= 95% at 35C
Resistor Surface Temperature increase	Load Current <= 50A : 80C Load Current > 50A : 120C
Temperature Coefficient	+/-25ppm/C, +/-50ppm/C and +/-100ppm/C
Capacity to Withstand External Mechanical Force	Shock frequency 80 to 120Hz 5 hours with acceleration less than $70m/s^2$

Force Cooling can be very useful, especially for high current, cannot vertical mount an in closed enclosure.

Part Number :

Series	+ Rated Current	+ Rated Voltage Drop	+ Tolerance
SR-1	1A to 6000A	50mV	D = +/-0.5%
SR-2		75mV	F= +/-1%
SR-3		100mV	
SR-4		150mV	
SR-5			
SR-6			

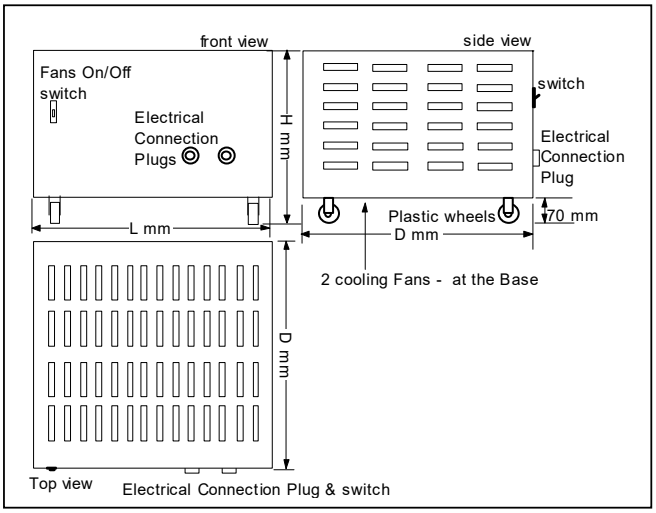
Load Boxes / Load Banks

- Support both AC Load Banks and DC Load Banks
- Resistive Load Boxes / Portable Resistance Load Banks : RB series up to 1KW - 30KW
- 3 phase Adjustable Power Resistor Load Banks RB3A : up to 2000KW
- 3 phase Resistive-Inductive Load Bank RLB3A series up to 600KVA
- High Load Current Load Banks : support up to thousands Amperes
- Adjustable Power Load Banks RBA : up to 2000kW
- Cost Saving design
- Protection Design options :
- Over-heating Warning
- over-heating Warning with Load Power Cut automatically
- Over-Current protection
- Cooling System Air Flow monitor with Load Power Cut automatically
- support both indoor and outdoor application
- Size can be made according to customer's requirement

Resistor Boxes - RB

Dimensions :

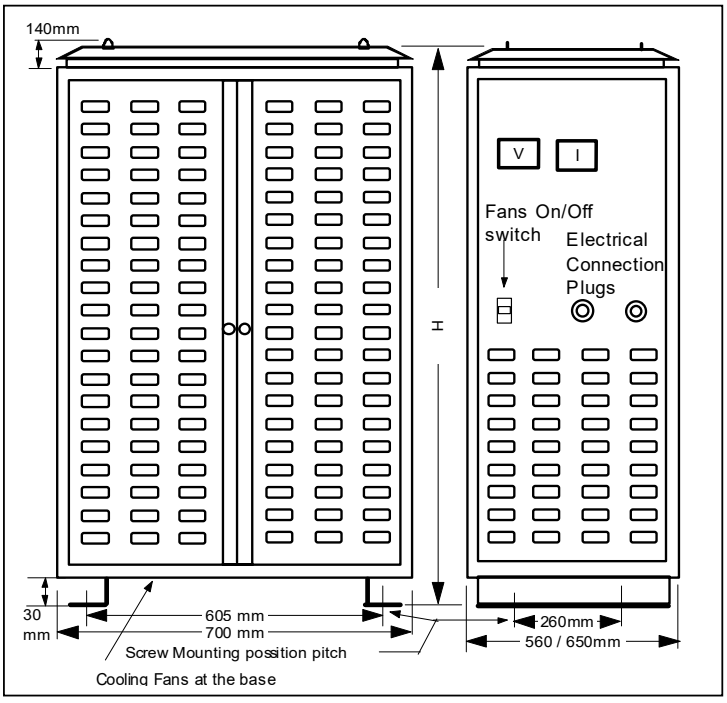
Rated Power	L +/-5mm	D +/-5mm	H +/15mm
2KW	380	200	210
5KW	500	290	210
6KW	590	290	210
8KW	590	400	210
10KW	680	400	210
12KW	680	400	210
15KW	680	500	210



Resistor Load Banks - RC

Dimensions :

Rated Power	High H mm	Weight
25KW	850	60kg
37KW	1100	70kg
50KW	1350	80kg
60KW	1600	90kg
70KW	1600	100kg
100KW	1820	110kg

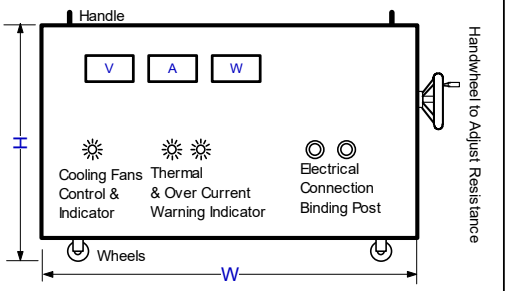


High Power Slide Rheostat Load Banks – DSR-WB

High Power Slide Rheostat with external metal enclosure.

With load power up to 50kW and load current up to 100A

Resistance value is adjustable by hand wheel
With build in Voltmeter, Ammeter, Wattmeter and Cooling system
Options : Thermal protection, Over Current protection, Ohmmeter and Main control Switch
Please tell following parameters :
i) maximum Resistance and minimum Current
ii) minimum Resistance and maximum Current
iii) voltage at minimum and maximum resistance
Please tell the best suitable resistance ranges that suitable for your application. There is no standard resistance value suitable for all applications. All rheostats are made according to customer's application need.



Rated Power	Max. Width in mm	Max. Depth in mm	Max. Height in mm
1kW	430	210	320
2kW	610	210	320
3kW	710	210	320
4kW	530	260	370
5kW	610	310	370
6kW	710	310	370
10kW	780	410	370

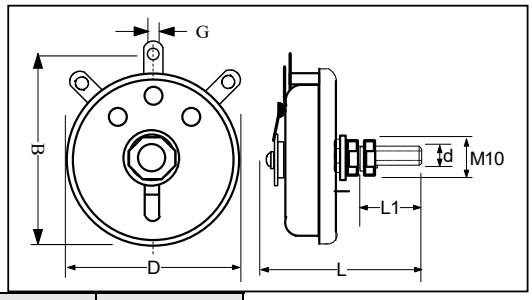
Load Bank sizes might be vary depend on resistance and load current.

3-Phase Power Slide Rheostats Load Banks – DSR3-WB

Three Phase asynchronous design
For some cases, can support Power up to 54kW and load Current up to 100A
Please tell following parameters.
i) maximum Resistance at minimum Phase Current
ii) minimum Resistance at maximum Phase Current
iii) voltage (L-N or L-L) at minimum and maximum phase resistance
Resistance and load current will be made according to customer's application need.
Options : Main Control Switch, Over Current protection, Thermal protection, Voltmeter, Ammeter, Power Meter and Ohmmeter.

Rheostat / Rotary Variable Power Wire Wound Resistors

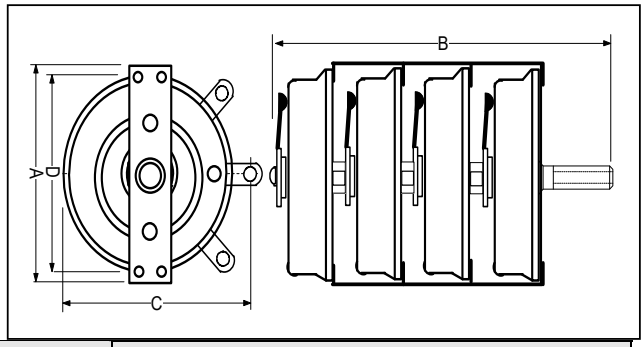
- Application : Resistive Load simulation, Heavy Duty application Machinery, Voltage and Current adjustment for Machinery & Equipment.
- Resistance range is made according to customer application need.
- When the resistance value is decreased, the workable Rheostat power is also decreased. The workable power at the adjusted resistance value is the ratio of adjusted resistance value to the rated maximum value of the rheostat or adjustable power resistor.
- rated Power = (max. load Current)^2 x rated resistance
- for more details, before refer to the application note on next page.



FVR : Rheostats / Rotary Power Wire Wound Resistors

Rated Power W	D mm	B mm	L mm	L1 mm	d mm	G mm
25	<44	<50	<60	<25	6	2
50	<64	<70	<64	<25	6	2
100	<84	<93	<66	<35	6	4
150	<104	<120	<73	<33	6	4
300	<156	<170	<115	<55	10	4
500	<206	<215	<122	<65	10	4

Tandem Mounted Rheostats



Part Number	Rated Power W	Max. Temperature	Dimensions in mm			
			A	D	C	B
FVR-500W/2	1000	350C	<215	<195	<218	<200
FVR-500W/3	1500	350C	<215	<195	<218	<300
FVR-500W/4	2000	350C	<215	<195	<218	<400
FVR-500W/5	2500	350C	<215	<195	<218	<500
FVR-500W/6	3000	350C	<215	<195	<218	<600

Part Number :

Series + Rated Power + Resistance Value (ohm) + Resistance Tolerance + No of Rheostat + Parallel/Serial connection

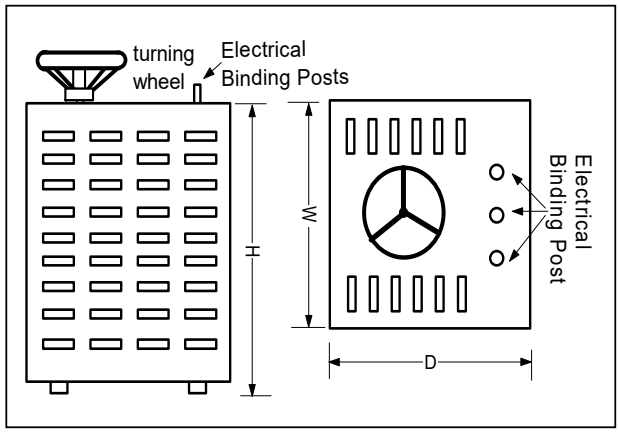
FVR	25W - 500W	0.1 ohm = R1	J= +/-5%	Tandem mount	P = parallel
		1 ohm = 1R	K= +/-10%	1 - 5	S = Serial
		15 ohm = 15R	R= -0/+5%		
		1k ohm = 1kR	T= -0/+10%		

For example : Tandem Mounted Rheostat 2500W 100R : FVR-500W500RJ/5P

FVRB : Rheostat Load Boxes : up to 4000W

for some applications, power range can be up to 20kW

Power	W / mm	D / mm	H / mm
300W	220	240	150
500W	260	280	150
1000W	260	280	280
1500W	260	280	320
2000W	260	280	450
2500W	260	280	530
3000W	260	280	610
3500W	260	280	690
4000W	260	280	770



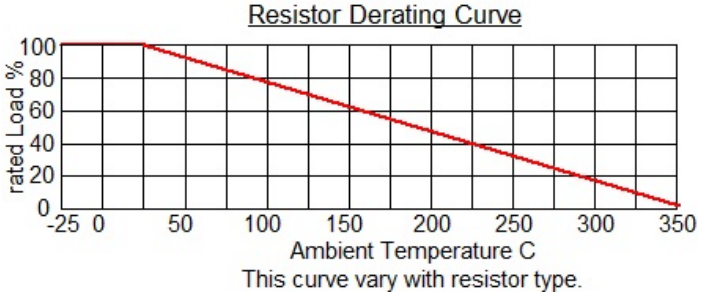
Application Note for Power Wire Wound Resistors :

A. Choosing Power Wire Wound Resistors and determine Resistor Power :

1. resistor power is calculated by Power $W=I^2R$ where :
   W = Resistor Power I = maximum loading current
   R = rated resistance value or maximum resistance of Power Resistor
2. Never over load the resistor beyond the specified voltage, rated power and loading current.
3. We recommend choosing a resistor with a rated power of at least 1.2-4 times higher than the actual required loading power if your application requires the resistor to run continuously for 100% duty cycle. This can extend the resistor's service life and lower it's surface temperature.
4. If the maximum or surge power larger than the rated resistor power, please tell the actual working condition like peak / surge voltage, resistance value, duty cycle, loading time and repetition rate.
5. For Surge Voltage application, if loading Voltage is larger than the rated Voltage according to resistor rated Power and Resistance value, please tell us the Peak to Peak Voltage range, Duty Cycle, Repetition Rate per unit time or Frequency and loading time.
6. Our resistor can withstand 5-10 times of the rated power for 5 seconds, depending on the current pulse width, resistor series and cooling system.
7. For very low ohmic Power Resistor, it is better to tell the working Voltage, Loading Time and Duty Cycle of your application. As different Voltage can induce different resistor current. In turn different raw materials and production process is needed to withstand the generated high current and temperature.
8. Different Resistance values for a given rated resistor power can have very different load current capacities, in turn different resistance material and even production processing will be needed.
   For example, load Current for 1 ohm and 1k ohm for a 1kW Power resistor is 31A and 1A respectively.
   Please feel free to tell the best suitable resistance for your application.
9. Maximum working voltage for a Resistor is limited by Ohm's Law, rated resistance, power, resistor dielectric and insulation.
10. We recommend choosing Low-Inductive Resistors for high frequency application.
11. We can make Power Resistors according to customer's application need like Resistance, Rated Power, Resistor Size, Mounting Fixture and Inductive / Low Inductive, Pulse Voltage condition etc...
12. Do not touch the Resistor when it is connected to a power source due to high resistor surface temperature and chance of ELECTRIC SHOCK.
13. Salty, dusty and corrosive environment can affect the wire wound resistors performance.

B. Other Application note :

1. The surface temperature of resistors can reach as high as 200°C to 600°C while at full load, depending on resistor series, resistor rated power, resistance value and working conditions. Keeping the temperature below 150°C to 200°C will extend it's service life.
2. Use guards and warning labels where necessary for the hot resistors.
3. Adding a cooling system such as external forced cooling fans can lower resistors' surface temperature and do not cover the resistors.
4. We recommend keeping all temperature sensitive components away from the resistor.
5. Do not touch the Resistor when it is connected to a power source due to high resistor surface temperature and chance of ELECTRIC SHOCK.
6. Below is one of the Derating Curves for Power Resistors in general, for an individual resistor's derating curve, please contact us.



7. We recommend cleaning the Resistor Tab Terminals before use. Do not clean Resistor surface with organic solvents.
8. Do not scratch surface of Resistor with any hard or pointed object.
9. DDR-F and DQR-F series Power Resistors are coated with UL 94V-0 class silicon coating. The Resistors should be installed away from any flammable materials.
10. Silicon coated resistors might emit smoke during initial power loading. It is a normal phenomenon. No smoke will be emitted after loading it 100% for 1-3 hours.

C. Other Application note :

All our Load banks RB3A, RLB3A, RB, DB, RBA, DSR-WB, DSR3-WB, FVRB and RBC series, should be **Ground** connected below connecting the Load Source and loading the load bank.

D. Adjustable Wire Wound Resistors DSR-F / Rheostats FVR / Rheostat Boxes FVRB and DSR-WB series application note :

1. Rheostat and Adjustable Wire Wound Resistor is a kind of wire wound resistor.
2. It's performance is bounded by both Ohm's Law and resistance wire Current carrying capacity.
3. The function of a rheostat is to adjust the circuit current between the maximum current at the rheostat minimum resistance value and the minimum current at the rheostat rated resistance.

Di. Parameters determination :

1. Rated Power = (maximum load Current)^2 x rated Resistance
2. The maximum load current is determined by the current of an existing application before the adjustable Power Resistor or Rheostat is inserted. This consideration is for Circuit Current adjustment.
3. The maximum loading current is limited by the resistance wire's current carrying capacity and Ohm's Law. Loading Current beyond this can damage the adjustable resistor / rheostat.
4. In terms of Rated Power, a smaller Rated Resistance value means the rheostat can have a larger Rated maximum Current capacity.
   It is not necessary to buy the standard resistance value.
   Most of the times, ordering Customized Resistance rheostat will not affect the cost and lead time.
5. Rheostat minimum resistance value can be calculated with the maximum current and voltage.
6. Rheostat maximum resistance value can be calculated with an acceptable minimum current and the voltage.
7. The workable Power will decrease as the resistance is adjusted to a smaller value.
   The workable power at the adjusted resistance is about the ratio of (adjusted resistance) to (the rated maximum resistance of that rheostat) x (rated rheostat power) or
   i.e. in material point of view : **Power per Unit Resistance**

Dii. Other Application Note :

1. Load Current at the adjusted resistance value =< Rheostat rated Current
2. Load Power at the adjusted resistance value =< Rheostat rated Power
3. Rated resistance value is not the same as an adjusted resistance value.
4. The voltage across Rheostat might need to decrease to avoid over loading the rheostat when reducing the resistance value.
5. A fixed power resistor can be connected in series with the rheostat to protect it from over current damage.
   The resistor resistance value is determined by the rheostat maximum load current.
   The Resistor power = (maximum load Current)^2 x rated Resistance.
6. The main role of Adjustable Power Wire Wound Resistor DSR-F, Rheostat FVR, Rheostat Box FVRB and DSR-WB is to decrease, not increase, the electrical current in the circuit.
7. The above is for **continuous load current - <u>Continuous resistance range</u>** design.
8. For some situations, we will suggest RBA series Adjustable Load Bank.
   The **Load Power / Current adjustment by preseting steps - <u>discrete resistance values</u>**.
   Load current is achieved via circuit breakers or power switches at control panel.
   Each switch can control a preset resistance value ON/OFF.
   With different ON/OFF combination, different load current can be achieved.
   For example : 250Vdc with max. current 150A.
   The setting can be :
   10A, 20A x 2, 50A x 2 = 150A in 5 steps with resolution 10A or
   1A, 2A x 2, 5A, 10A x 2, 20A, 50A x 2 = 150A in 9 steps with resolution 1A or
   If necessary, we can support some other precision resolution like 0.5A, 0.2A and 0.1A.
   The load Current is achieved by load Step adjustment.
   e.g. 97A is needed, switch : 2A, 5A, 10A, 10A, 50A is ON
   This load bank rated power is 250V x 150A = 37.5kW only.
   When compare with rheostat, RBA series load banks, this can be a cost saving option.

Diii. Other application note :

1. For Rheostats, the resistance adjustment is achieved by sliding the metal brusher across the metal resistance material.

In high current, voltage and power condition, there is chance to have flashover between these 2 metal parts.

We suggest power OFF the load source across the Rheostat before adjusting the resistance value for High Voltage or High Current situation.

2. Do not touch the Adjustable Resistor / Rheostat surface when it is connected to a power source due to **High Resistor Surface Temperature** and avoid **ELECTRIC SHOCK**.

3. We recommend choosing a resistor with a rated power of at least 1.2-4 times higher than the actual required loading power if your application requires the resistor to run continuously for 100% duty cycle. This can extend the resistor's service life and lower it's surface temperature.

4. There are metal movable parts within the Rheostat.

Due to high power application, we suggest the rheostat has to install in a fixed and level bench to avoid vibration.

5. Salty, dusty, humid, high temperature, vibration and corrosive environment can affect the Rheostat performance.

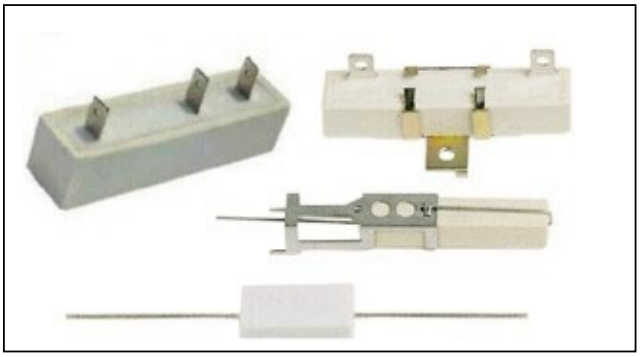
6. Both above Section A and B application notes are true for adjustable wire wound resistors.

Dvi. Rheostat Bank FVRB / Adjustable Load Bank DSR-WB options :

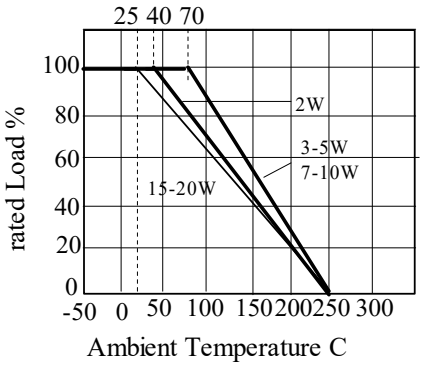
Ammeter, Voltmeter, Wattmeter, Ohm meter; OverCurrent protection; Thermal protection; Cooling Fans system and Main Switch.

Ceramic Encased Resistors – SQ series

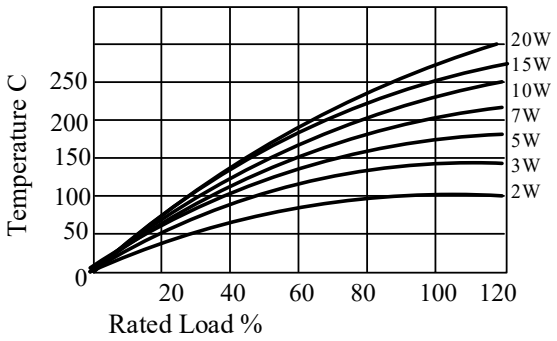
- excellent stability in high temperature, resistant to humidity and shock with economic price
- best suitable for heat dissipation; small linear temperature coefficient
- Instant overload capability; low noise figure
- Non Flammable Construction
- Low Inductance type available
- High Surge type available
- High Insulation Resistance
- Can be PCB mounted



Derating Curve



Temperature Rise



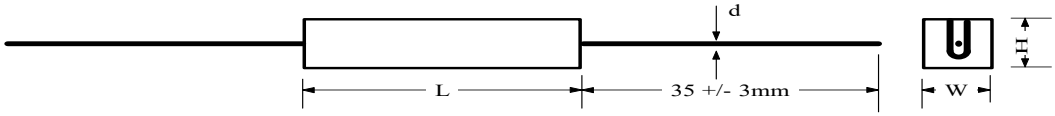
Test	Characteristics	
Resistance Temperature Coefficients	-55C - 155C	+/- 300ppm / C
Short Time Over Load	10 time of rated power 5seconds	+/-2%
Voltage withstanding	1000Vac 1min.	No change
Insulation Resistance	500V	1000M ohm
Temperature Cycle	-30 - 85C for 5 cycle	+/- 1%
Load Life	70C on / off cycle 1000 hours	+/- 5%
Moisture – proof Load Life	40C 95% RH on / off cycle 1000 hours	+/- 5%
Incombustibility	16 times of rated Power 5 minutes	No flamed
Rated Power	Rated Power 30 minutes	+/- 1%

Part Number :

Series	Rated Power	Resistance Value (ohm) + Resistance Tolerance + Drawing Number
SQP	2 - 50W	0.1 ohm = R1
SQT	5 - 10W	1 ohm = 1R
SQM	5 - 10W	10 ohm = 10R
SQH/SQH-G	10 - 40W	150 ohm = 150R
SQZ	5 - 50W	1k ohm = 1kR
		10k ohm = 10kR

B=+/-0.1% D= +/-0.5%
F=+/-1% J=+/-5%
K=+/-10%

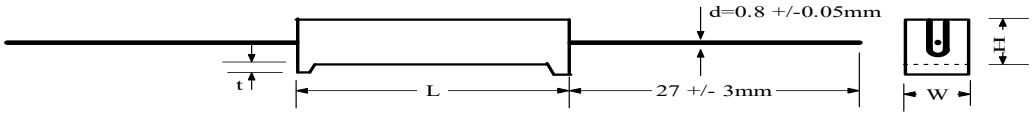
SQP type



Rated Power	Dimensions in mm				Resistance ohm	
	L +/-1.5mm	W+/-1mm	H+/-3mm	D+/-0.05mm	SQP	MO+SQP
2W	18.0	7.0	7.0	0.65	0.1 - 50	50 - 20k
3W	22.0	8.0	8.0	0.80	0.1 - 50	50 - 33k
5W	22.0	10.0	9.0	0.80	0.1 - 50	50 - 50k
7W	35.0	10.0	9.0	0.80	0.1 - 500	500 - 50k
10W	48.0	10.0	9.0	0.80	0.1 - 500	500 - 50k
15W	48.0	12.0	12.0	0.90	0.5 - 500	500 - 150k
20W / 25W	60.0	13.0	13.0	0.90	0.5 - 1k	1.1k - 150k
30W	75.0	19.0	19.0	0.90		
40W	90.0	19.0	19.0	0.90		
50W	90.0	19.0	19.0	0.90		

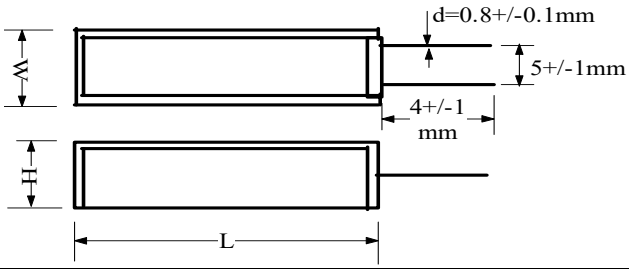
Support up to 100W, contact us for more details.

SQT type



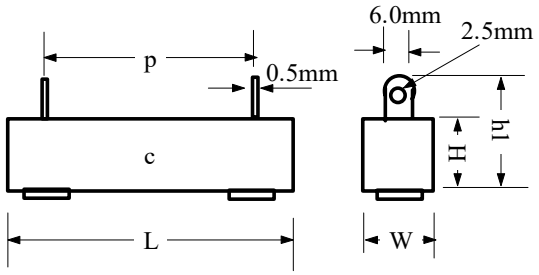
Rated Power	Dimensions in mm				Resistance ohm	
	L +/-1.5mm	W+/-1mm	H+/-3mm	t+/-1mm	SQT	MO+SQT
5W	22.0	10.0	9.0	1.5	0.1 - 50	50 - 50k
7W	35.0	10.0	9.0	3.0	0.1 - 500	500 - 50k
10W	48.0	10.0	9.0	3.0	0.1 - 500	500 - 50k
20W / 25W	59.0	17.0	14.5	3.5	0.1 - 500	500 - 50k

SQM type

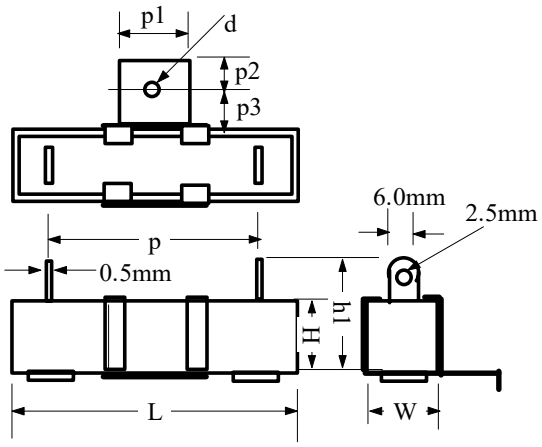


Rated Power	Dimensions in mm				Resistance ohm	
	L +/-1.5mm	W+/-1mm	H+/-3mm	d+/-0.1mm	SQM	MO+SQM
5W	25.0	13.0	9.0	0.8	0.1 - 50	50 - 50k
7W	39.0	13.0	9.0	0.8	0.1 - 500	500 - 47k
10W	51.0	13.0	9.0	0.8	0.1 - 500	500 - 47k

SQH type



SQH-G type

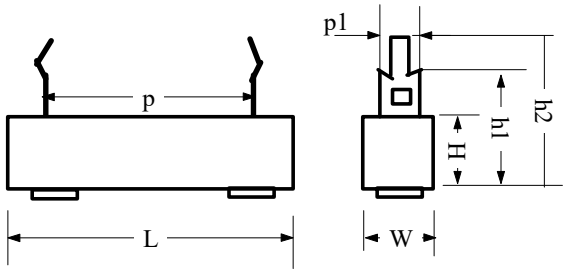


SQH / SQH-G type

Rated Power	Resistance Range ohm		Dimensions in mm								
	SQH	MO+SQH	L +/-2	H+/-2	W+/-2	P+/-2	h1+/-2	p1	p2	P3	D
10W	0.5 - 500	500 - 50K	48.0	10.0	10.0	32	21	12	6	8.0	4
15W	1 - 500	500 - 150K	48.0	12.0	12.0	32	21	12	6	8.0	4
20W	1 - 500	500 - 150K	63.5	12.0	12.0	42	24	12	6	8.0	4
30W	1 - 500		75.0	19.0	18.0	55	30	17	8	10.0	4
40W	1 - 50		90.0	19.0	18.0	68	30	17	8	10.0	4

Support up to 100W, contact us for more details.

SQZ type



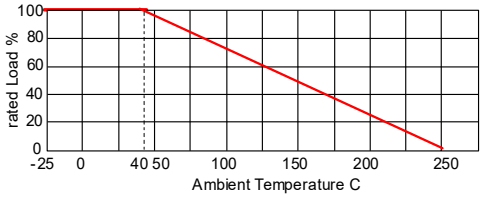
Rated Power	Resistance Range ohm		Dimensions in mm						
	SQZ	MO+SQZ	L+/-1	H+/-1	W+/-1	P+/-1	h1+/-1	h2+/-1	p1+/-1
5W	0.1 - 100	100 - 50k	27.0	9.5	9.5	15.0	21	24.0	5.0
7W	0.1 - 500	500 - 50k	35.0	9.5	9.5	22.5	21	24.0	5.0
10W	0.2 - 500	500 - 50k	48.0	9.5	9.5	35.0	21	24.0	5.0
15W	0.5 - 500	500 - 150k	48.0	12.5	12.5	32.5	23	36.5	5.0
20W / 25W	1 - 1k	1.1 - 150k	63.50	15	15	42 / 45.0	30	36.5	7.0
30W / 40W	1 - 1k		75	19	19	57	34	38	7.0
50W	1 - 1k		90	19	19	67	34	60	7.0

Support up to 100W, contact us for more details.

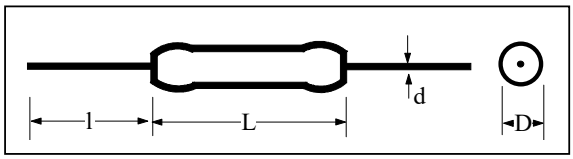
Wire Wound Resistors – KNP series

- excellent stability in high temperature, resistant to humidity and shock with economic price
- Instant overload capability; low noise figure
- Non Flammable Construction
- Non Inductance type available – NKNP and NKNT
- High Surge type available
- with Power up to 30W
- Resistance range : 0.01 ohm – 100k ohm
- Precision tolerance : +/-0.1%, +/-0.5%, +/-1%, +/-5%, +/-10%
- Resistor Colour support : Green, Gray and Black
- Marking for 1/2W to 5W : standard colour code ring
- Marking for 5W to 30W : resistance value and power marking
- support non-standard resistance value

KNP & NKNP Derating Curve



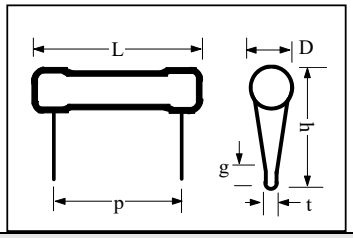
KNP series



KNP and NKNP type

Power range	KNP & NKNP dimension				Resistance range in ohm		Dielectric Voltage
	D + /-0.5mm	L+/-1mm	lead length (l) in mm +/-3mm	Lead wire diameter d / mm	KNP	NKNP	
1/2W	3.5	9	25	0.65	0.1 – 82	0.05 - 41	300V
1W	4.5	10.5	25	0.65	0.1 - 100	0.05 - 50	300V
1Ws	3.5	9	25	0.65	0.1 – 82	0.05 - 41	300V
2W	5	15	25	0.78	0.1 - 220	0.05 - 110	350V
2Ws	4.5	10.5	25	0.78	0.1 - 100	0.05 - 50	300V
3W	6	17	25	0.78	0.1 - 510	0.05 - 255	400V
3Ws	5	15	25	0.78	0.1 - 220	0.05 - 110	350V
5W	8	24	25	0.78	0.1 - 1.5K	0.05 - 750	500V
5Ws	6	17	25	0.78	0.1 - 510	0.05 - 255	400V
7W	8	31	25	0.78	0.1 - 3K	0.05 - 1.5K	500V
7Ws	8	24	25	0.78	0.1 - 1.5K	0.05 - 750	500V
8W	8	31	25	0.78	0.1 - 3K	0.05 - 1.5K	500V
8Ws	8	24	25	0.78	0.1 - 1.5k	0.05 - 750	500V
10W	8	41	25	0.78	0.1 - 8k	0.05 - 4K	500V
10Ws	8	31	25	0.78	0.1 - 3k	0.05 - 1.5K	500V
15W	8	52	25	0.78	0.1 - 10k	0.05 - 5K	500V
20W	8	61	25	0.78	0.1 - 12k	0.05 - 6K	500V
25W	8	61	25	0.78	0.1 - 12k	0.05 - 6K	500V
30W	8	70	25	0.78	0.1 - 15k	0.05 - 7.5K	500V

KNT series



KNT and NKNT type

	D + /-0.5mm	L+/-1mm	Height h in mm	Pitch p in mm	g in mm	t in mm	KNT	NKNT	
2.5W	5	19	10	10	4	1	0.1 - 220	0.05 - 110	300V
4W	5	24	10	15	4	1	0.1 - 220	0.05 - 110	400V
5W	8	24	23	14	4.5	3	0.1 - 1.5K	0.05 - 750	500V
6W	8	24	23	14	4.5	3	0.1 - 1.5K	0.05 - 750	500V
7W	8	31	23	22	4.5	3	0.1 - 3K	0.05 - 1.5K	500V
8W	8	31	23	22	4.5	3	0.1 - 3K	0.05 - 1.5K	500V
10W	8	41	23	32	4.5	3	0.1 - 8K	0.05 - 4K	500V
15W	8	52	23	42	4.5	3	0.1 - 10K	0.05 - 5K	500V
20W	8	61	23	52	4.5	3	0.1 - 12K	0.05 - 6K	500V
25W	8	61	23	52	4.5	3	0.1 - 12K	0.05 - 6K	500V
30W	8	70	23	62	4.5	3	0.1 - 15K	0.05 - 7.5K	500V

Electrical Characteristics :

Testing	Test conditions	Specifications
Resistance tolerance	JIS-C-5202 5-1	Resistance Nominal Tolerance 1 ≤R 1>R +/-5% (J), +/-10% (10)
Temperature coefficient	JIS-C-5202 5-2, –55C - 155C	+/-350 PPM/C Max
Short Time over load	JIS-C-5202 5-5 1000% rated power 5s for KN, 250% rate voltage 5s for MO	△R≤ +/- (2% + 0.05Ω)
Rated Load	Rated wattage 30 min	△R≤ +/- (2% + 0.05Ω)
Soldering	JIS-C-5202 6-4 235C 3s	△R≤ +/- (0.2% + 0.05Ω)
Insulation Resistance	JIS-C-5202 5-6	Over 1000MΩ
Moisture Resistance	JIS-C-5202 7-9 1000hr	△R≤ +/- (2%Ro + 0.05Ω)
Moisture-Proof Load Life	JIS-C-5202 7-10 40C 95% RH on - off cycle 1000hrs.	△R≤ +/- (5%Ro + 0.01Ω)
Flammability	500%, 1000%, 1600% power rating 5min	Not flamed

Part Number :

Series	Rated Power	Resistance Value (ohm)	Resistance Tolerance	Packaging
KNP	60 - 120W	0.01 ohm = R01	B=+/-0.1% D=+/-0.5%	T = tape
NKNP	60 - 200W	0.1 ohm = R1	F = +/-1% J = +/-5%	B = bulk
KNT	60 - 3000W	15 ohm = 15R	K= +/-10%	
NKNT		10k ohm = 10kR		

We reserve the right to make changes without further notice to any products herein to improve reliability, function, or design.