

# Fixed power wirewound resistors



# WIREWOUND RESISTORS - SILICONE

# COATED SERIE CS

## FEATURES

Easy replacement of vitreous enamel resistors with no cost increase and no performance loss. The whole assembly is coated with multi-layer silicone coating to give maximum wire protection from -55°C to +350°C. Performance improvement is obtained by close tolerance, very low temperature coefficient and excellent stability in operation under severe environmental conditions. High level reliability due to ceramic core chemically inert and centerless ground for uniformity, selected wire element and completely welded construction terminal to terminal.

## SPECIFICATIONS

These resistors meet or exceed the requirements of MIL-R-26E specification.

## ELECTRICAL

- Resistance range**  
See table. Consult factory for values lower (up to R01) and higher than indicated.
- Tolerance**  
standard 5% . Available on request up to 1%
- Temperature coefficient**  
Typical values; 30 to 100 ppm/°C from R10 to Rmax. Consult factory for special applications.
- Dielectric strenght**  
1.000 Vac for all types.
- Insulation resistance**  
1.000 MOhms minimum dry  
100 MOhms after moisture test.
- Overload**  
5 sec. at 10 times rated power  
5 sec. at 5 times rated power 2CS and 3CS
- Non inductive**  
Models of equivalent physical and electrical specifications are available with non inductive Ayrton-Perry winding.

## MECHANICAL

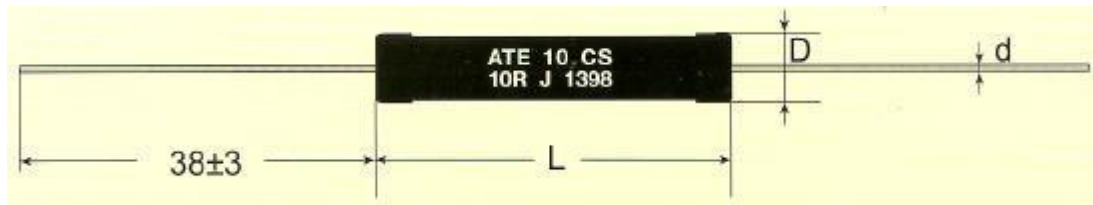
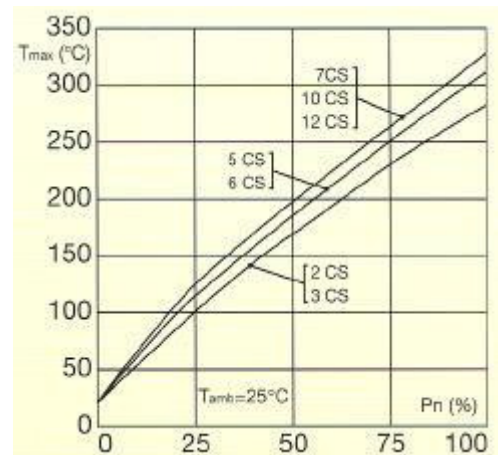
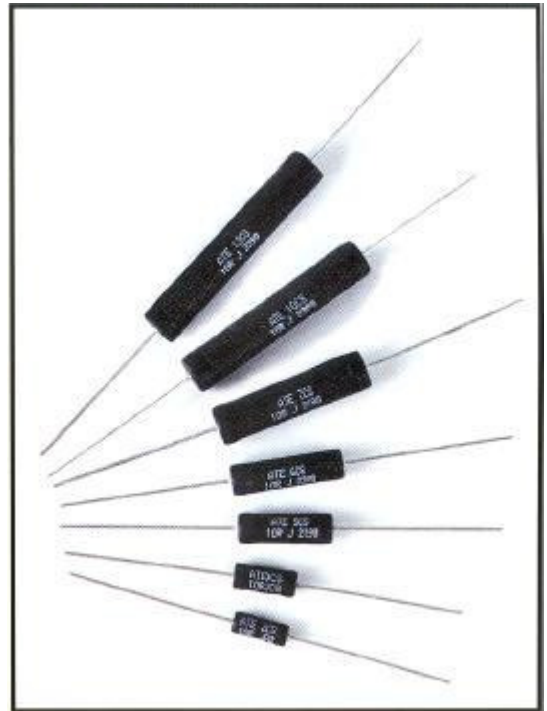
- Terminal strenght**  
10 lb. pull test
- Solderability**  
Continuous, satisfactory coverage when tested in accordance to MIL-R-26E.

## MATERIAL

- Core**  
Ceramic steatite or alumina centerless ground.
- Resistive element**  
Copper-nickel alloy or nickel-chrome alloy at specified temperature coefficient.
- End caps**  
Stainless steel.
- Coating** - Special high temperature silicone.
- Standard terminals** - Tinned copper or tinned copperweld.

## DERATING

These resistors could be used in a temperature range from -55°C to +350°C. To use these components in settings with base temperature upper to +25°C you have to made a power reduction with linear derating from nominal power to 0 at +350°C.



ATE type	Type Mil-R-26E	Rated power (W)	Resistance range (Ohm)	Max volt. working(V)	Temperature rise (°C/W)	Weight (Gr)	Dimensions		
							D (mm)	L (mm)	d (mm)
<b>2CS</b>	RW69V	3	0.01-5K6	130	91	1.2	5.2±0.5	12±0.8	0.8
<b>3CS</b>		4	0.01-10K	200	74	1.8	6±0.5	13.5±0.8	0.8
<b>5CS</b>	RW74U	6	0.01-24K	380	52	3.2	8±0.5	22±1.6	0.8
<b>6CS</b>	RW67V	7	0.01-27K	435	45	3.8	8±0.5	25±1.6	0.8
<b>7CS</b>	RW55V	10	0.01-47K	685	30	7	9.5±0.5	35±1.6	0.9
<b>10GS</b>	RW68V	13	0.01-68K	940	24	9	9.5±0.5	46±1.6	0.9
<b>12CS</b>	RW56V	15	0.01-82K	1.100	21	10	9.5±0.5	51±1.6	0.9

## SERIES SR



### SPECIFICATION

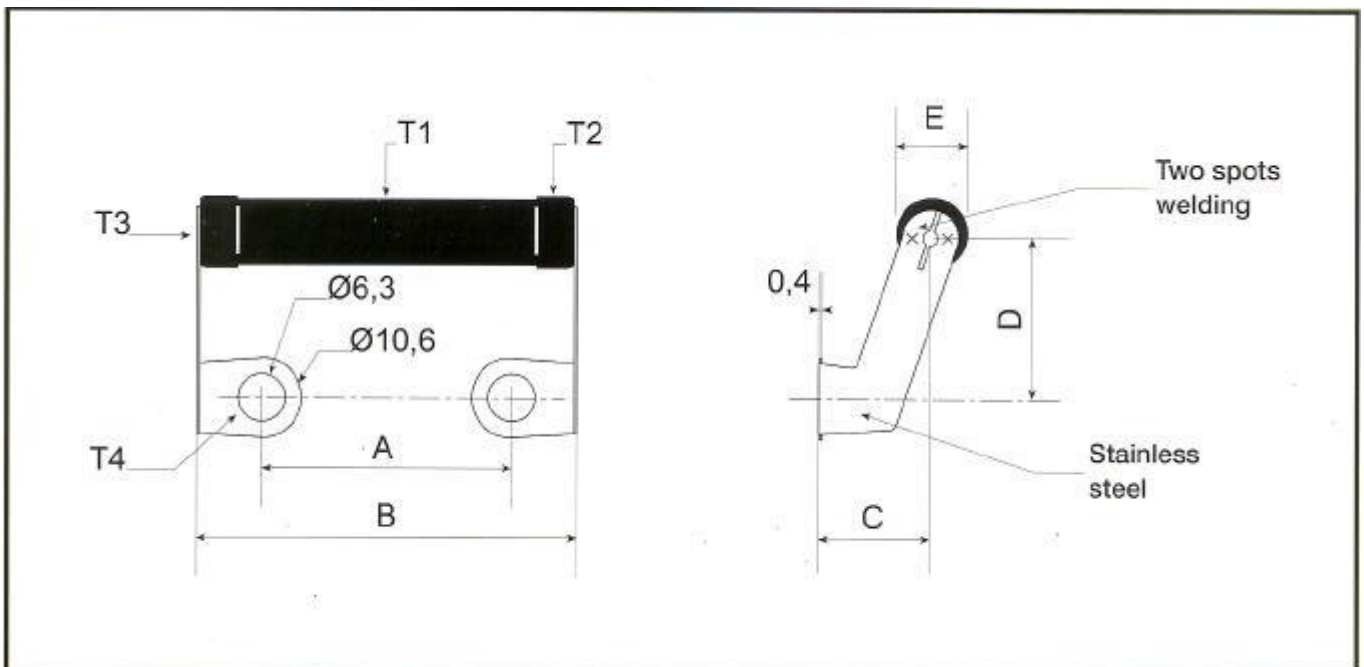
**Standard tolerance:** 5% ( $\pm 1\%$  on request)  
**Ohmic values:** Serie E12  
**TC:** From 30 to 100 ppm  
**Dielectric strenght:** 1.000 Vac  
**Packing:** Strip of 10 pcs.  
**Vibrations test:** According 1EC571  
 More technical data as 7CS and IOGS standard types.

Test point	Temp. Rise at Rated Power 7SR-7SR/B	Temp. Rise at Rated Power 10SR - 10SR/B
T1	$\Delta T = 26^\circ\text{C/W}$	$\Delta T = 21.5^\circ\text{C/W}$
T2	$\Delta T = 16^\circ\text{C/W}$	$\Delta T = 12.3^\circ\text{C/W}$
T3	$\Delta T = 15^\circ\text{C/W}$	$\Delta T = 11.5^\circ\text{C/W}$
T4*	$\Delta T = 1.2^\circ\text{C/W}$	$\Delta T = 1^\circ\text{C/W}$

\*Capacitor mounted - Depending on the shape and dimension of the capacitor connecting nut/cable system.

ATE type	MIL-R-26E	Power (W)	Resistance range (Ohm)	V limit (Vrms)
7SR	RW55	10	01-47K/82K	685
10SR	RW68	13	01-68K/120k	940

ATE type	Resistor type	A (mm) tol.: $\pm 1$	B (mm) tol.: max	C (mm) tol.: $\pm 1$	D (mm) tol.: $\pm 1$	E (mm) tol.: $\pm 1$	Weight (Gr)
7SR	7CS	22.2	40	15	21	9.5	9
7SR/B	7CS	22.2	40	10	16	9.5	9
10SR	10CS	31.8	50	15	21	9.5	11
10SR/B	10CS	31.8	50	10	16	9.5	11





## FEATURES

Extruded aluminium housing provides superior heat conduction.  
Housing deep finned for maximum heat dissipation at natural or forced air convection.  
Gold anodized finish for maximum resistance to environmental conditions.  
Special molding compound with high thermal conductivity  
Winding designed to give maximum core coverage and uniformity for even heat dissipation.  
Core centerless ground for maximum winding uniformity.  
Marking at top surface for easy identification after mounting.  
Complete welded construction terminal to terminal.

## SPECIFICATION

These resistors meet or exceed the requirements of MIL-R-18546 E specification.

## ELECTRICAL

For Power ratings and Resistance values: see table.

Tolerance: the following tolerances are available:

1%, 3%, 5%

Temperature coefficient

30 ppm R > 20 Ohm

50 ppm 1 Ohm < R < 20 Ohm

100ppm 0.1 Ohm < R < 1 Ohm.

Dielectric strength

1.500 Vac for RB5 / RB10

2.500 Vac for RB25 / RB50

3.500 Vac for RB75 / RB101 / RB150

4.500 Vac for RB100 / RB 250.

Insulation resistance

10.000 MOhms minimum

1.000 MOhms after moisture test.

Overload 5 sec. at 5 times rated power.

Non inductive

Models of equivalent physical and electrical specifications are available

## MECHANICAL

Terminal strength

10 lb, pull test.

Solderability

Satisfactory when tested in accordance with method 208 of MLSTD-202

The use of high temperature solder is recommended when resistors are operated near the maximum specified ratings.

## MATERIAL

Core

Ceramic steatite or alumina centerless ground.

Element

Copper-nickel alloy or nickel-chrome alloy of determined temperature coefficient.

End caps

Stainless steel.

Encapsulant

High temperature silicone transfer molding compound.

Housing

Aluminium with hard anodic coating

Standard terminals

Copperweld RB5 to RB150.

Stainless steel for RB100 and RB250.

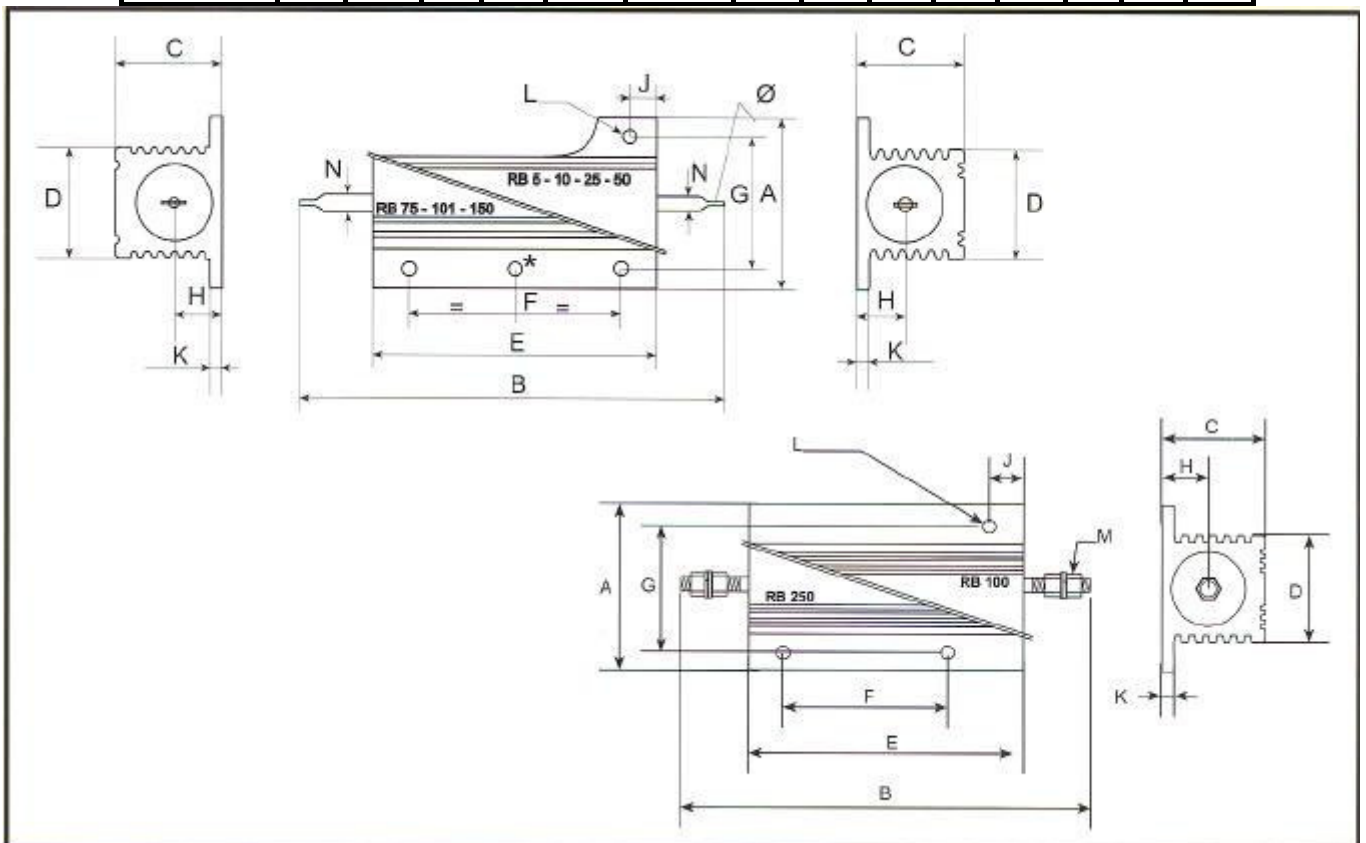
## DERATING

ATE RB resistors have an operative temperature range of -55 °C to +250 °C.

Derating is required for reduced chassis area and for high ambient temperature.

ATE type	Type MIL-R-18546E	Nominal power (W)	Max power no heatsink (W)	Res. range (Ohm)	V limit (V)	Temp. rise with heatsink(°C/W)	Weight (Gr)	Heatsink dim. (cm <sup>2</sup> x mm)
RB5	RE 60	7.5	4	0.01/68K	160	4,5	3.5	415x1
RB10	RE 65	12	6	0.01/10K	265	5,1	6	415x1
RB25	RE 70	25	12,5	0.01/18K	550	3	14	535x1
RB50	RE75	50	20	0.01/68K	1250	1,9	35	930x1.5
RB75	-	75	35	0.1/50K	1400	1,1	85	995x3
RB101	-	100	40	0.1/70K	1900	1	115	995x3
RB150	-	150	55	0.1/100K	2500	1	165	995x3
RB100	RE77	150	75	0.1/100K	1900	0,84	500	930x3
RB250	RE80	250	100	0.1/120K	2300	0,66	900	930x3

ATE type	DIMENSIONS (mm)													
	A	B	C	D	E	F	G	H	J	K	L	M	N	O
RB5	16.5	28.6	8.2	8.5	15.3	11.3	12.4	4	2	1.6	2.4		1.5	1.3
RB10	20.4	35	10	11	19	14.3	15.9	5	2.4	2	2.4		2	2.2
RB25	27.2	49	14	14	27	18.3	19.8	6.5	4.4	2	3.2		2	2.2
RB50	29.2	71	16	16	50	39.7	21.5	7	5.2	2	3.2		2	2.2
RB75	47.5	73	24	27	48	29	37	11.5	9.5	3.5	4.4		3	3.2
RB101	47.5	89	24	27	64	35	37	11.5	14.5	3.5	4.4		3	3.2
RB150	47.5	122	24	27	97	58	37	11.5	19.5	3.5	4.4		3	3.2
RB100	71.5	139	44. 5	46	89	69.8	57.1	20	10.4	5	4.8	M5		
RB250	76	178	55. 6	54	114	98.4	63.5	25.5	10.4	6.3	4.8	M6		
Toll.	±0.2	±1	±0. 2	±0.2	±0.5	±0.2	±0.2	±0.2	±0.5	±0.2	±0.2		±0.2	±0.2



**FIXED POWER WIREWOUND RESISTORS RB25/4-RB50/4  
ALUMINIUM HOUSED WITH KELVIN LEAD**

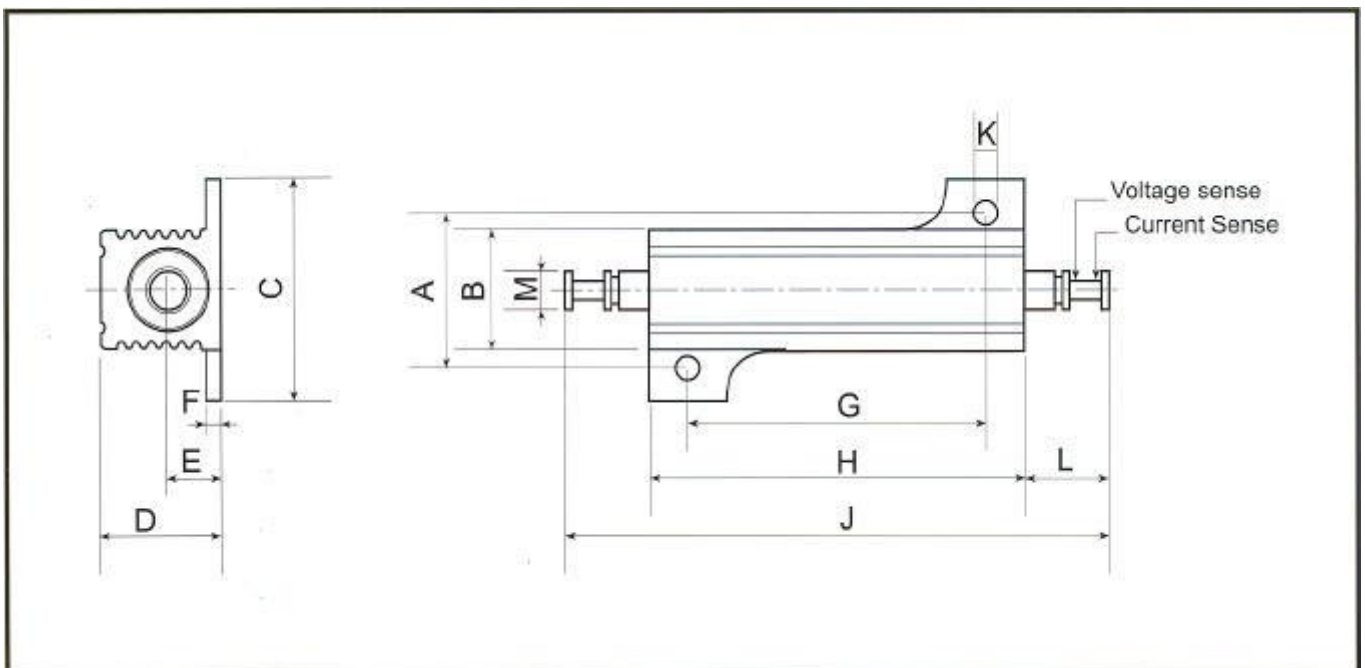


**SPECIFICATIONS**

Standard tolerance: 5% ( $\pm 1\%$  on request)  
 Ohmic Values: Serie E12  
 Temperature Coefficient: From 100 to 200 ppm  
 Insulation resistance: 10.000 MOhm minimum  
 1.000 MOhm after moisture test  
 Dielectric Strength: 2.000 Vac / 2.800 Vac peak  
 Max terminal current: RB25/4 50 A  
 RB50/4 70 A

ATE type	Type MIL-R-18546E	Nominal power (W)	Res. range (Ohm)	V limit (V)	Weight (Gr)	Haetsink dim. (cm <sup>2</sup> x mm)
RB25/4	RE70	25	0.01/0.10	550	16	535x1
RB50/4	RE75	50	0.01/0.10	1250	35	930x1.5

ATE type	DIMENSIONS (mm)												
	A	B	C	D	E	F	G	H	J	K	L	M	
RB25/4	19.8	14	27.7	14	6.5	2	18.3	27	49	3.2	10.5	4	
RB50/4	21.5	16	29.2	16	7	2	39.7	50	75	3.2	10.5	5	
Tol.	$\pm 0.2$	$\pm 0.2$	$\pm 0.2$	$\pm 0.2$	$\pm 0.2$	$\pm 0.2$	$\pm 0.2$	$\pm 0.2$	$\pm 0.5$	$\pm 1$	$\pm 0.1$	$\pm 1$	$\pm 0.2$



FIXED POWER WIREWOUND R HOUSED WITH LARGE CREEP

## ESISTORS ALUMINIUM RB25/6-RB50/6 DISTANCE



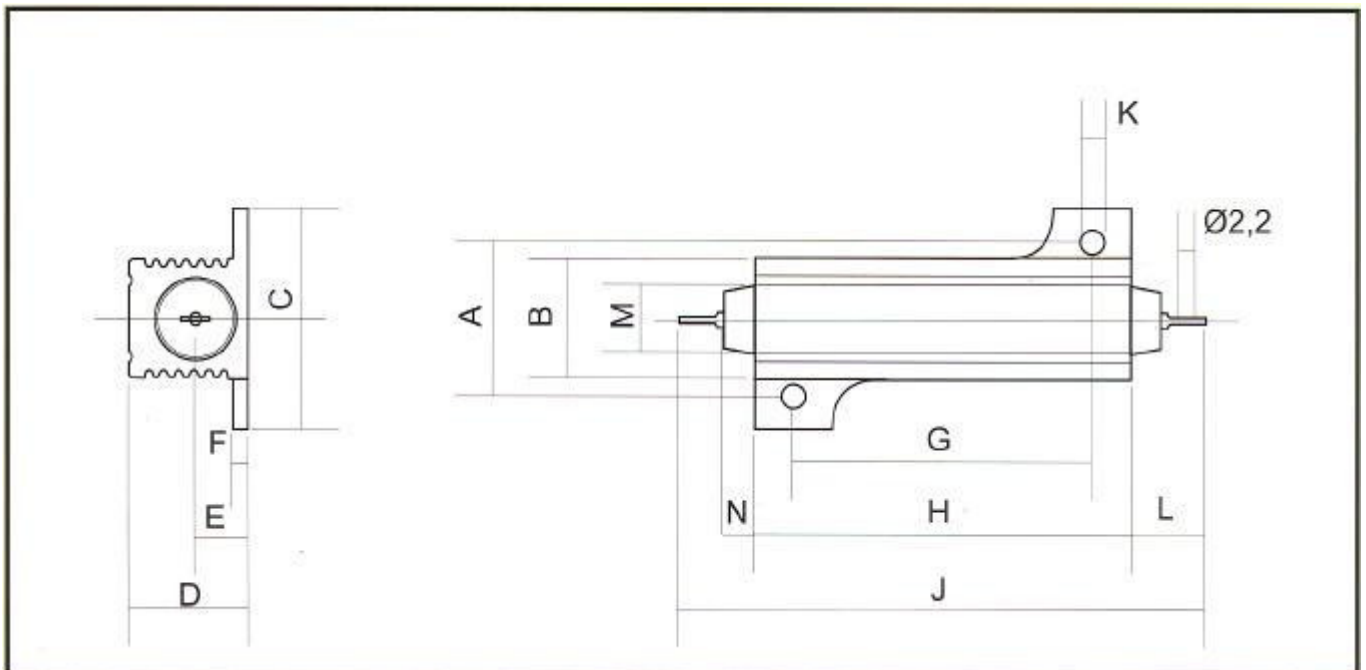
### SPECIFICATIONS

Standard Tolerance: 5% ( $\pm 1\%$  on request)  
 Ohmic Values: Serie E12  
 Temperature Coefficient: From 30 to 100 ppm  
 Insulation resistance: 10.000 MOhm minimum  
 1.000 MOhm after moisture test  
 Dielectric Strength: 3.000 Vac / 4.200 Vac peak  
 Large creep distance: RB2516 >6.5 mm

More technical data as RB25/RB50 standard type

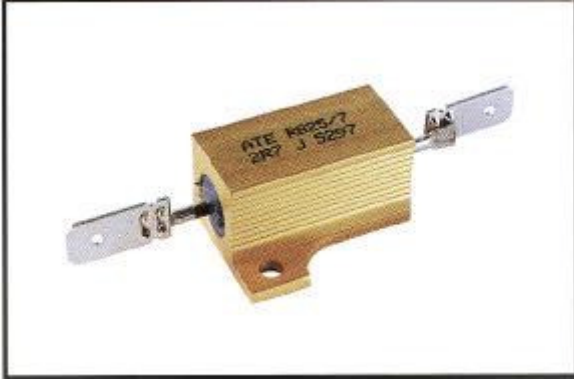
ATE type	Type MIL R 18546 D	Nominal power (W)	Res. range (Ohm)	V limit (V)	Weight (Gr)	Heatsink dim. (Cm <sup>2</sup> x mm)
RB25/6	RE70	25	0.01-18K/33K	550	13	535x1
RB50/6	RE75	50	0.01-68K/100K	1250	32	930x1.5

ATE type	DIMENSIONS (mm)													
	A	B	C	Ø	E	F	G	H	J	K	L	M	N	
RB2516	19.8	14	27.7	14	6.5	2	18.3	24	49	3.2	12.5	8	4	
RB50/6	21.5	16	29.2	16	7	2	39.7	46	75	3.2	14.5	10	6.5	
Tol.	$\pm 0.2$	$\pm 0.2$	$\pm 0.2$	$\pm 0.2$	$\pm 0.2$	$\pm 0.2$	$\pm 0.2$	$\pm 0.2$	$\pm 0.5$	$\pm 1$	$\pm 0.1$	$\pm 1$	$\pm 0.5$	$\pm 0.5$



FIXED POWER WIREWOUND RESISTORS  
ALUMINIUM HOUSED WITH FASTON LEADS

RB25/7-RB50/7



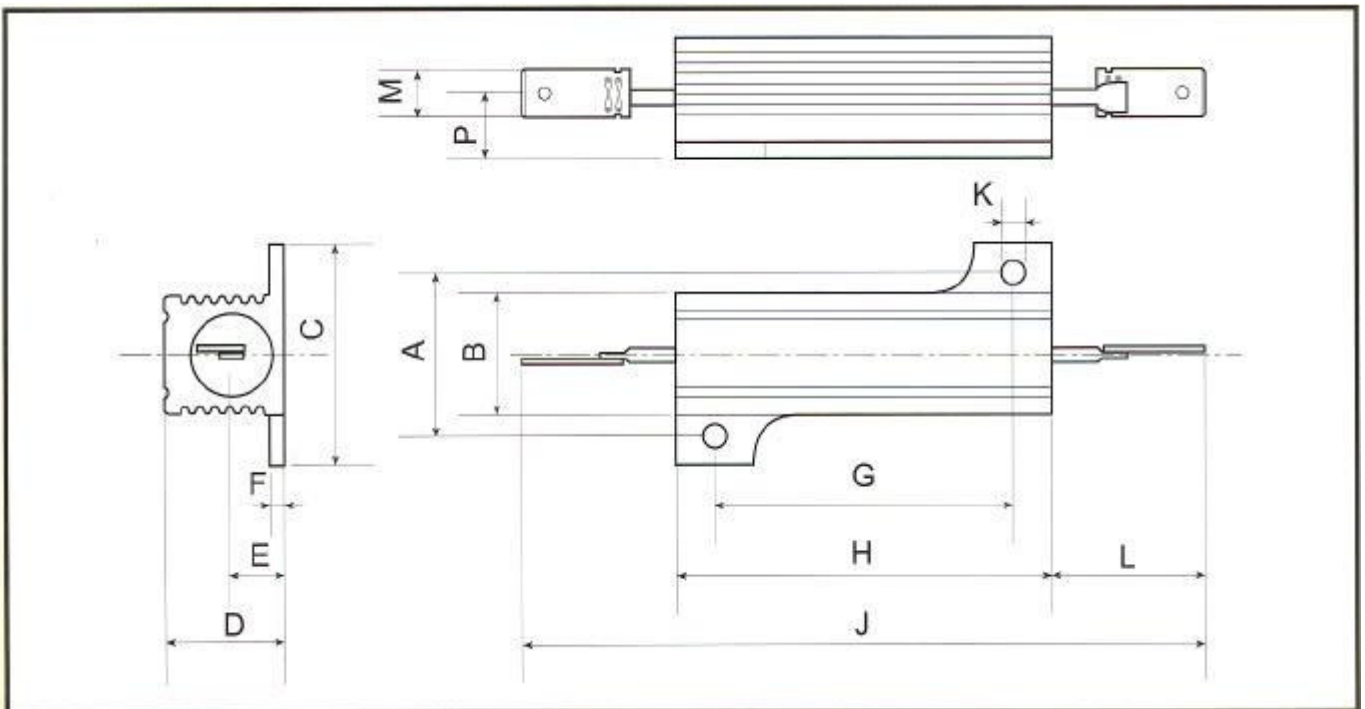
**SPECIFICATIONS**

Standard Tolerance: 5% ( $\pm 1\%$  on request)  
 Ohmic values: Serie E12  
 Temperature Coefficient: From 30 to 100 ppm  
 Insulation resistance: 10.000 MOhm minimum  
 1.000 MOhm after moisture test  
 Dielectric Strength: 2.500 Vac / 3.500 Vac peak  
 Lead: 6.35 mm Faston nickel plated steel. Spot welding.

More technical data as RB25/RB50 standard type

ATE type	Type MIL-R-18546E	Nominal power (W)	Res. range (Ohm)	V limit (.1)	Weight (Gr)	Heatsink dim. (cm <sup>2</sup> x mm)
RB25/7	RE70	25	0.1-18K133K	550	13	535x1
RB50/7	RE75	50	0.1-68K/100K	1250	32	930x1.5

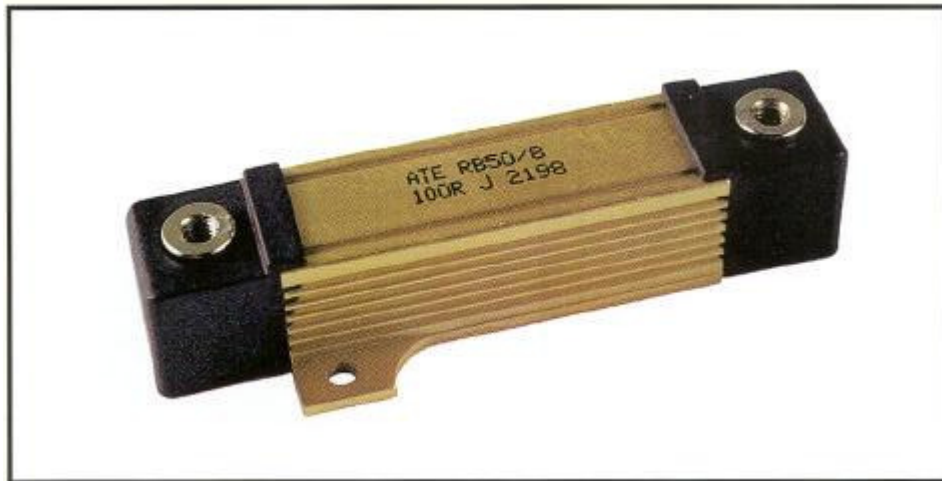
ATE type	DIMENSIONS (mm)												
	A	B	C	D	E	F	G	H	J	K	L	M	P
RB25/7	19.8	14	27.7	14	6.5	2	18.3	27	69	3.2	21	6.35	7.7
RB50/7	21.5	16	29.2	16	7	2	39.7	50	91	3.2	20.5	6.35	8.2
Tol.	$\pm 0.2$	$\pm 0.2$	$\pm 0.2$	$\pm 0.2$	$\pm 0.2$	$\pm 0.2$	$\pm 0.2$	$\pm 0.5$	$\pm 2$	$\pm 0.1$	$\pm 2$	-	$\pm 1$





FIXED POWER WIREWOUND RESISTORS ALUMINIUM  
HOUSED WITH SCREW LEADS(TOP)

RB 50/8

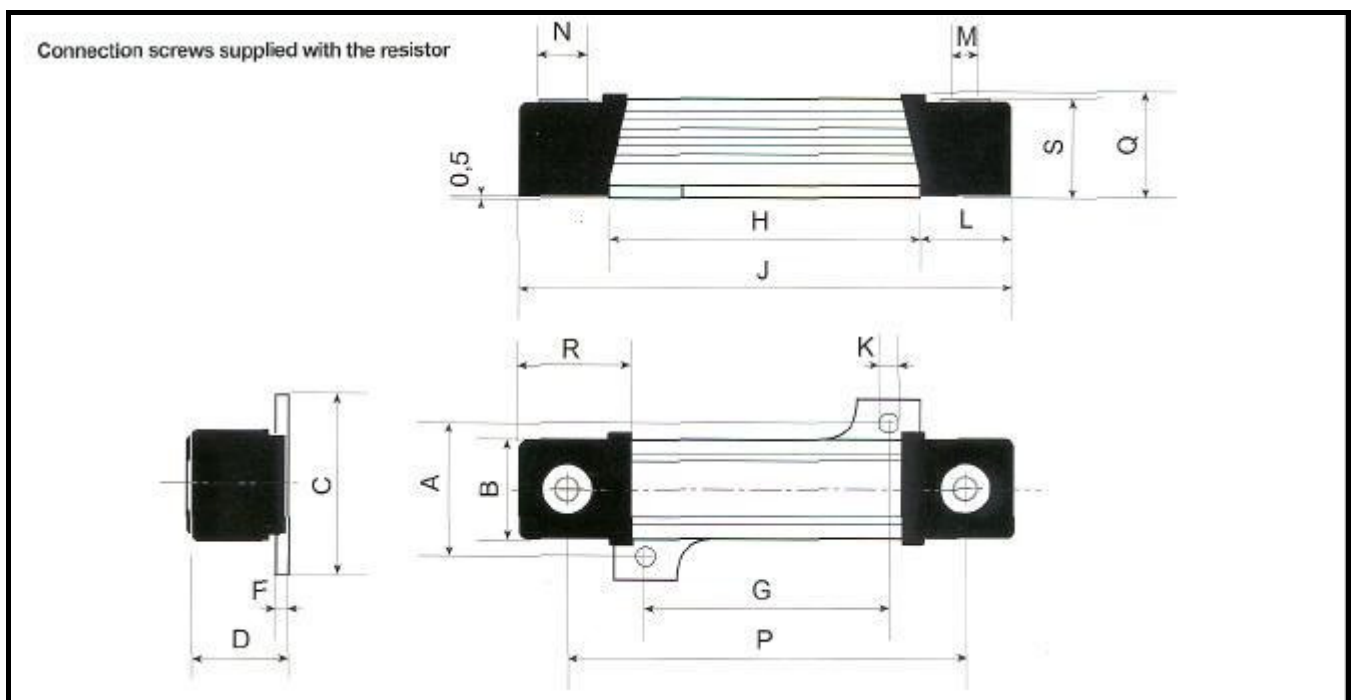


SPECIFICATIONS

Standard Tolerance: 5% ( $\pm 1\%$  on request)  
 Ohmic values: Serie E12  
 Temperature Coefficient: from 30 to 100 ppm  
 Insulation resistance: 10.000 MOhm minimum  
 1.000 MOhm after moisture test  
 Dielectric Strength: 2.500 Vac / 3.500 Vac peak  
 Max torque for contacts: 1.5 Nm (static)  
 Max torque for mounting: 1.5 Nm (static)

ATE type	Type	Nominal Power (W)	Res. Range (Ohm)	V limit (V)	Weight (Gr)	Heatsink dim. (cm <sup>2</sup> x mm)
RB50/8	MIL-R-1 8546D RE75	50	0.1-68K/100K	1250	52	930x1.5

ATE type RB50/8 Tol.	DIMENSIONS (mm)																	
	A	B	C	D	F	G	H	J	K	L	M4	8	M	N	P	Q	R	S
	21.5	16	29.2	16	2	39.7	50	79.5	3.2	14.5	-	-	8	65	17.5	18.5	16.5	
	$\pm 0.2$	$\pm 0.2$	$\pm 0.2$	$\pm 0.2$	$\pm 0.2$	$\pm 0.2$	$\pm 0.5$	$\pm 2$	$\pm 0.1$	$\pm 0.5$	-	-	$\pm 1$	$\pm 0.5$	$\pm 0.5$	$\pm 0.5$		



**FIXED WITH POWER WIREWOUND RESISTORS ALUMINIUM HOUSED  
WITH LARGE CREEP DISTANCE**

**RB106 - RB256**

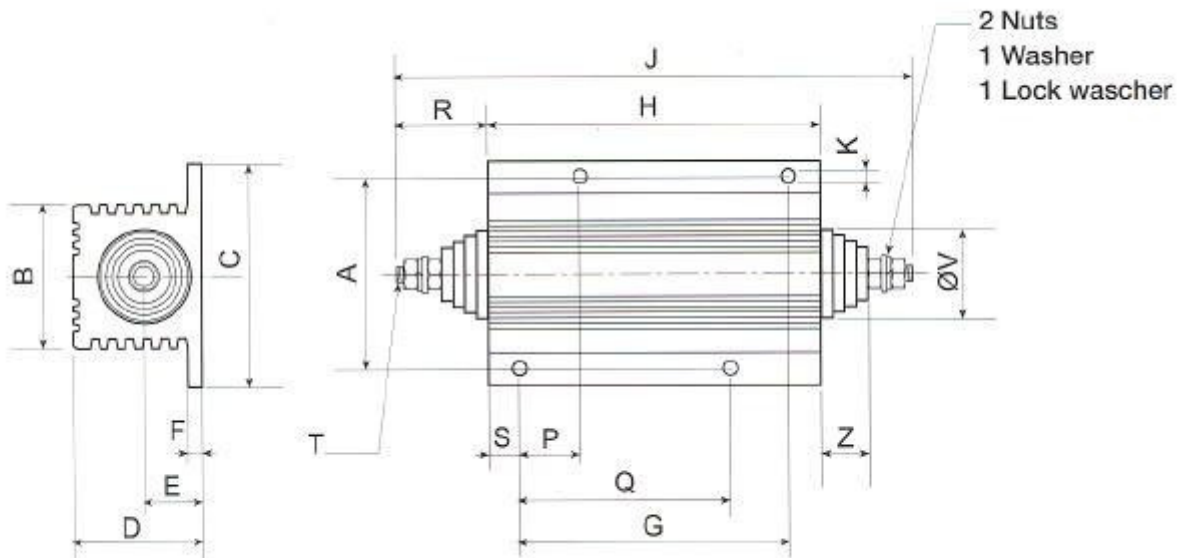


**SPECIFICATIONS**

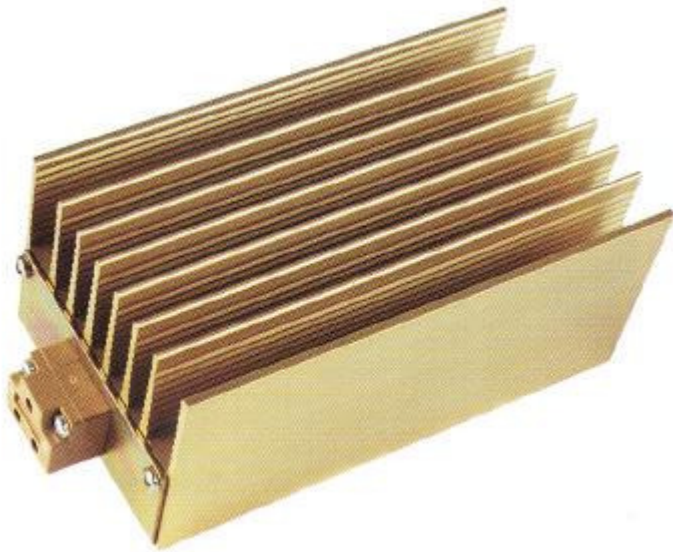
Standard tolerance: 5% ( $\pm 1\%$  on request)  
 Ohmic Values: Serie E12  
 Temperature Coefficient: From 30 to 100 ppm io.000 MOhm minimum.  
 Insulation resistance: 1.000 MOhm after moisture test  
 Dielectric Strength: 5.000 Vac / 7.000 Vac peak  
 Max terminal current: RB106 >22 mm  
 RB256 >25 mm

More technical data as RB100/RB250 standard tvDe.

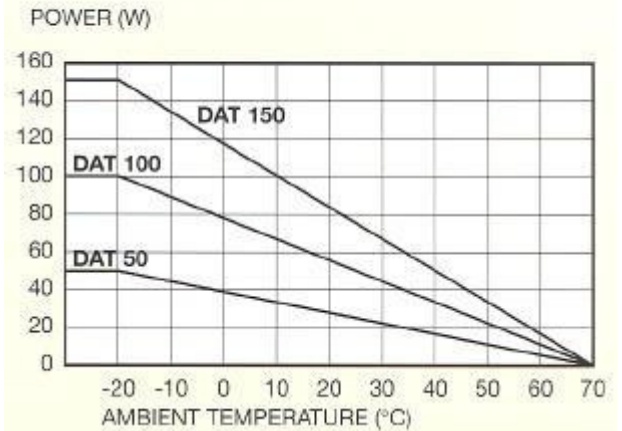
ATE type	Type MIL-R-1 8546E	Nominal power (W)	Res. range (Ohm)	V limit (V)	Weight (Gr)	Heatsink dim. (Cm <sup>2</sup> x mm)											
RB 106	RE77	150	0.1-100K	1900	500	930x3											
RB 256	RE80	250	0.1-120K	2300	900	930x3											
ATE type	DIMENSIONS (mm)																
RB 106	A	B	C	D	E	F	G	H	J	K	P	Q	R	S	T	V	Z
RB 256	57.1	46	71.5	44.5	20	5	69.8	89	139	4.8	-	-	25	9.6	M5	32	12
Tol.	63.5	54	76	55.6	25.5	6.3	98.4	114	178	4.8	22.2	76.2	32	7.8	M6	32	
	16																



# ANTI MOISTURE DEVICES DAT 50 DAT 100 DAT 150 TYPES **SERIE DAT**



**POWER DISSIPATED IN FUNCTION OF THE EXTERNAL TEMPERATURE**



## CHARACTERISTICS

One of the main causes for electrical troubles on electrical and electronic sets is due to the moisture which is formed on components during variation of the ambient temperature.

A simple and economic way to avoid any trouble of this kind, consists on application of anti-condensation devices (Heaters) which maintain the temperature inside the enclosure some degrees higher than the ambient temperature in order to prevent moisture condensation.

The Heater DAT 50, DAT 100 and DAT 150 have been developed for this specific use.

Their main features are as follow:

Surface temperature limited to 70°C allows assembling without problems. A thermoswitch permits maximum power a very low temperatures, then reduces the power dissipated till turn off the devices at +55°C.

The DAT models are provided with simple clip mounting for 35mm DIN rail. Use of power wirewound resistors, under MIL-R-1 8546 D specs., increase reliability and suitable supply voltage.

## ELECTRICAL CHARACTERISTICS:

<b>Max power ratings:</b>	DAT 50 = 50 W DAT100 =100W DAT150 =150W
<b>Voltage supplied:</b>	Standard 220 Vca ±20%. on request any voltage supplied from 24 to 220 Vca
<b>Dielectric strenght:</b>	2.000 Vca for any type
<b>Insulation resistance:</b>	1.000 MOhm minimum at 500 ...

**P = A x ΔT x K**

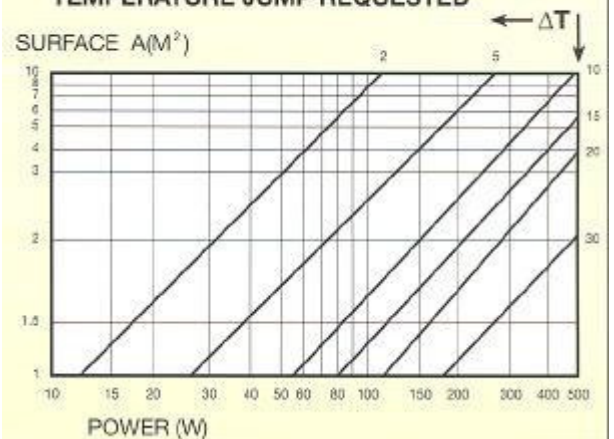
A = Console external surface (m<sup>2</sup>)

ΔT = temperature difference (°C)

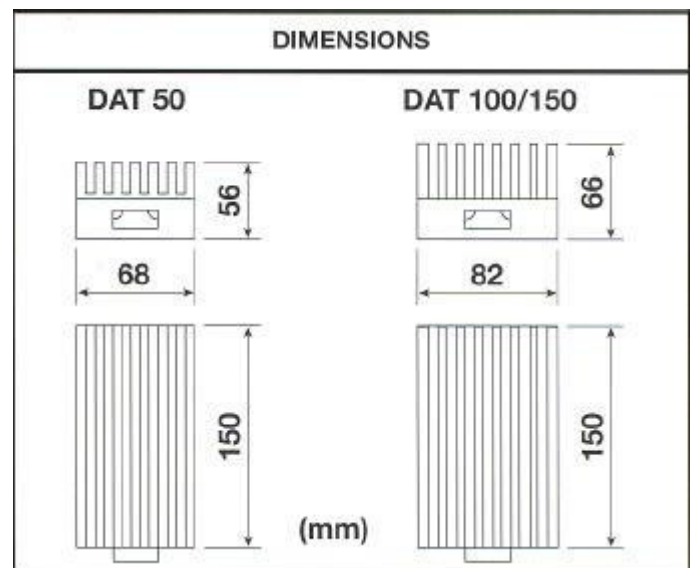
K = 3.5 W/m<sup>2</sup> for plastic console

K = 5.5 W/m<sup>2</sup> for iron platre (closed room)

**POWER OF THE ANTI-MOISTURE DEVICES IN FUNCTION OF EXTERNAL SURFACE AND TEMPERATURE JUMP REQUESTED**



## DIMENSIONS



# THICK FILM POWER RESISTORS      SERIE PRI 00

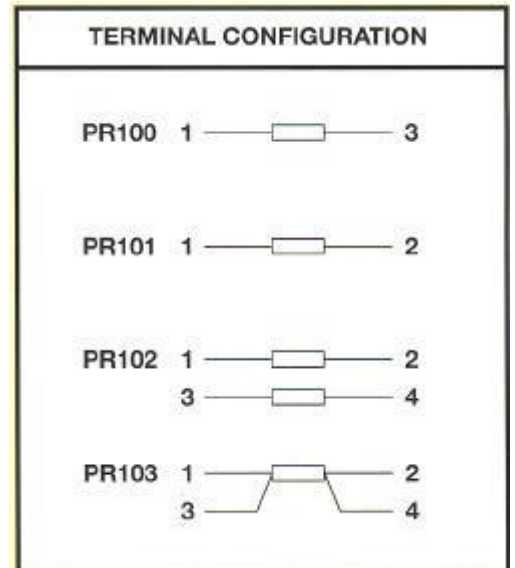
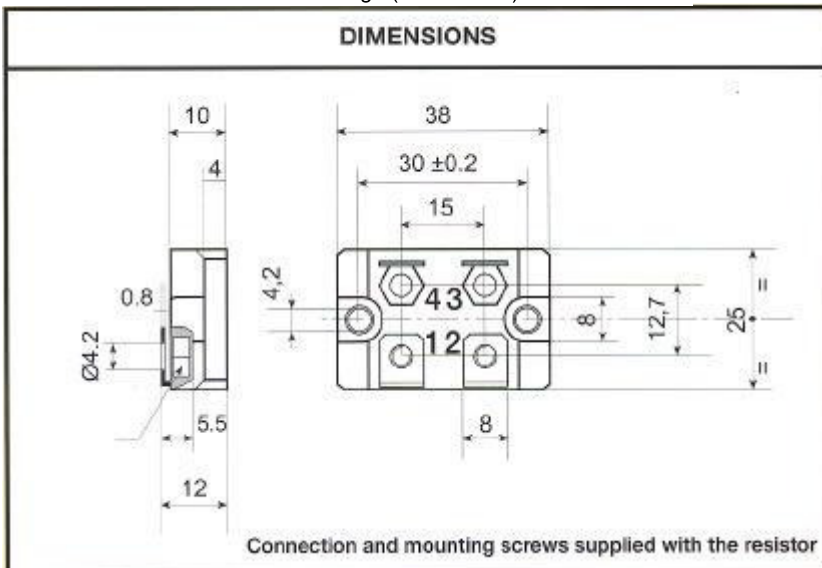
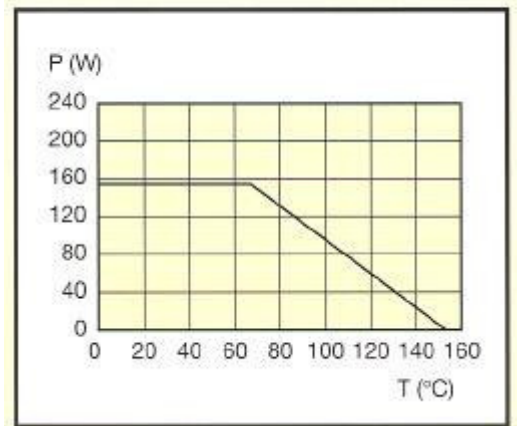


## FEATURES

- Very good ratio Power/Volume.
- Easy mounting and wiring with significant cost advantages.
- Non inductive performance for high frequency applications.
- One model for power from 20W to 200W.
- Suited to UL94-VO application.
- SOT227 configuration.

Power rating:	100 W
Max power not trimmed:	150 W (heatsink at 70 00)
Resistance range:	From 1R0 to 100K serie E6
Tolerance:	Standard $\pm 10\%$ up to 1% on request
Temperature coefficient:	100 ppm/ $^{\circ}\text{C}$
Max Work. Voltage:	500 Vac
Work Temp. Range:	55 00 to +155 $^{\circ}\text{C}$
Dielectric Strenght:	2.500 Vac
Insulation resistance:	$> 10^5$ MOhm at 500V
Partial discharge:	$< 80$ pC/2.000 Vac (only on request)
Self inductance:	40 nH
Capacitance/Mass:	$< 45$ pF
Overload:	2 Pn x 10 sec.
Thermal resistance:	0.5 $^{\circ}\text{C}/\text{W}$
Heatsink flatness:	0.05 mm Max
Heatsink surface finish:	6.3 $\mu\text{m}$ Max
Thermal grease:	Required
Max torque for contact:	1.2 Nm (static)
Max torque for mounting:	1.5 Nm (static)
Weight:	18 gr. (PR1 00/1 01) 24 gr. (PR1 02/103)

## PERMISSIBLE POWER VERSUS HEATSINK TEMPERATURE



# THICK FILM POWER RESISTORS

# SERIE PR250

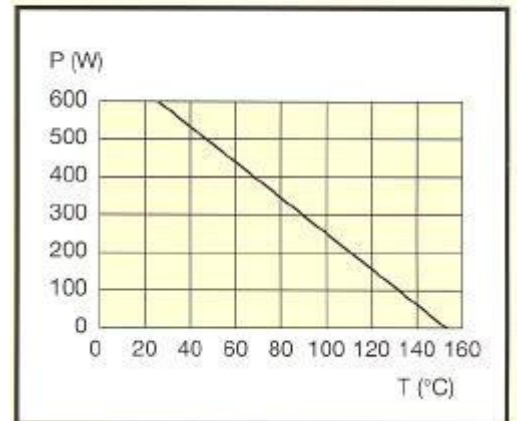


## FEATURES

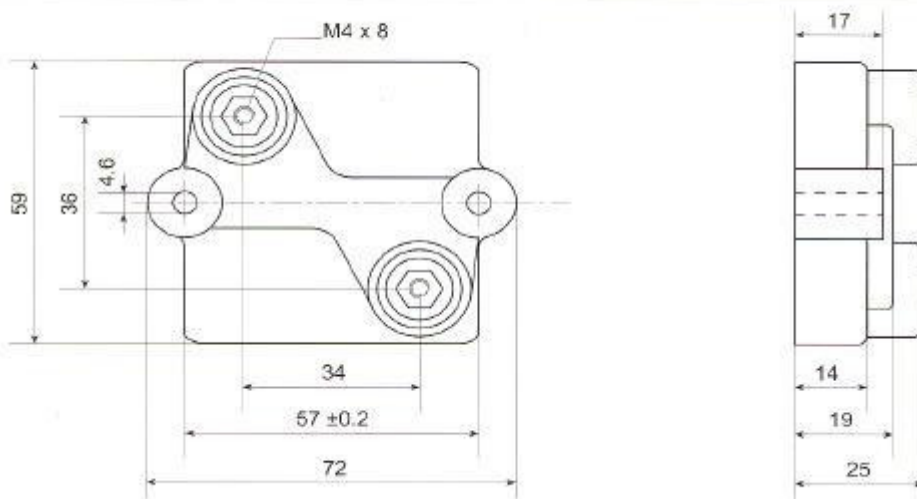
- Very good ratio PowerNolume
- Easy mounting and wiring with significant cost advantages
- Non inductive performance for high frequency applications
- One models for power applications from 100W to 500W
- Suited to ULV94-VO application

Power rating:	250W (heatsink at 100 °C)
Resistance Range:	from 1R0 to 1 MOhm serie E6
Tolerance:	Standard ±10% up to 1% on request
Temperature Coefficient:	100 ppm/°C
Max Work. Voltage:	5.000 Vac
Work Temp. Range:	-55°C to + 155°C
Dielectric Strength:	7.000 Vac
Insulation resistance:	> 10 <sup>5</sup> MOhm at 500V
Creep distance:	40 mm
Air gap distance:	14 mm
Partial discharge:	<10 pC/5.000 Vac
Self Inductance:	40 nH
Parallel capacitance:	40 pF
Capacitance/Mass:	<120 pF
Overload (not trimmed):	4 Pn x 10 sec.
Thermal resistance:	0.15 °C/W
Heatsink flatness:	0.05 mm Max
Heatsink surface finish:	6.3 µm Max
Thermal grease:	required
Max torque for contacts:	2 Nm (static)
Max torque for mounting:	2 Nm (static)
Weight:	110 gr.

## PERMISSIBLE POWER VERSUS HEATSINK TEMPERATURE



## DIMENSIONS



Connection and mounting screws supplied with the resistor

For more information, contact UPE Inc.



*Setting the Industry Standard*

UPE, Inc. was founded in 1990 to serve the power electronics industry in the United States and Canada with electrical products that represent the latest technology.

With headquarters in Richfield, Ohio, UPE maintains and ships product from this location. UPE, Inc. is the exclusive agent for BHC/EVOX-RIFA power electrolytic capacitors, Arcotronics film capacitors, Electronicon film capacitors, and ATE resistors.

UPE is also the exclusive agent for the High Power Circuit Board Technology worldwide.

**With State-of-the-Art Power Components**

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