

Enamelled wirewound resistors

WR0617E; WR0842E
WR0825E; WR0865E

QUICK REFERENCE DATA

Resistance ranges		4,7 Ω to 100 k Ω , E24 or E12 series
Resistance tolerance		$\pm 5\%$ or $\pm 10\%$
Max. body temperature (hot spot)		400 $^{\circ}\text{C}$
Rated dissipation at $T_{\text{amb}} = 70^{\circ}\text{C}$	WR0617E	4 W
	WR0825E	7 W
	WR0842E	11 W
	WR0865E	17 W
Basic specification		IEC publication 266, type 2
Climatic category (IEC 68)		55/200/56
Stability after:		
1000 h max. load		$\Delta R/R$ max. 5%
climatic tests		$\Delta R/R$ max. 1%
dip-soldering test		$\Delta R/R$ max. 0,5%
short time overload		$\Delta R/R$ max. 2%

APPLICATION

As power resistors in electrical and electronic circuitry.

DESCRIPTION

These resistors have a single layer of resistance wire wound on a ceramic body. Leads of solder-coated copper-clad wire are secured to caps which are force-fitted on to the ends of the ceramic body. The resistor is coated with brown enamel.

MECHANICAL DATA

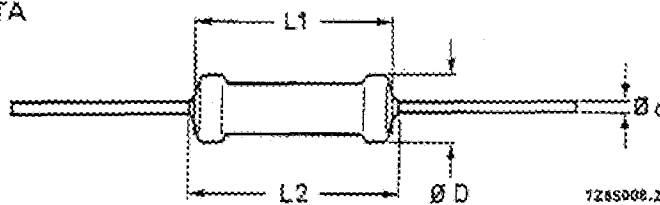


Fig. 1.

Table 1

type	D_{max}	L1 max	L2 max	d_{max}
WR0617E	6	17	23	0.7
WR0825E	8	26	32	0.8
WR0842E	8	44	50	0.8
WR0865E	8	67	73	0.8

Enamelled wirewound resistors

WR0617E; WR0842E
WR0825E; WR0865E

The length of the resistor body is measured by inserting the leads into the holes of two identical gauge plates and by moving these plates parallel to each other until the resistor body is clamped without deformation (see IEC publication 294). The diameter of the holes in the gauge plate is 1,0 mm.

Mass (per 100 pieces)

WR0617E	116 g
WR0825E	210 g
WR0842E	335 g
WR0865E	450 g

Mounting

The resistors must be mounted in such a way that:

- no stress is exerted on the leads so as to allow thermal expansion over the wide temperature range.
- nearby components and materials are not affected by the dissipated heat.

Marking

Each resistor is marked with:

- resistance value (R for Ω , K for $k\Omega$)
e.g. 27 Ω = 27R
27 $k\Omega$ = 27K

- tolerance on resistance in %

- rated dissipation at $T_{amb} = 70^\circ\text{C}$

Example: 27R 5%
4W

ELECTRICAL DATA

Table 2

type	rated dissipation at $T_{amb} = 70^\circ\text{C}$ W	resistance range Ω	tol. $\pm\%$	series *	catalogue number
WR0617E	4	4,7 — 4700	5	E24	2322 330 22 ...
WR0825E	7	6,8 — 27 000	5	E24	2322 330 32 ...
WR0842E	11	10 — 56 000	5	E24	2322 330 42 ...
WR0865E	17	15 — 100 000	5	E24	2322 330 52 ...

Maximum body temperature (hot spot)

400 $^\circ\text{C}$

Ambient temperature range

-55 to +200 $^\circ\text{C}$

Temperature coefficient

-80 to +140 $\cdot 10^{-6}/\text{K}$

Climatic category (IEC 68)

55/200/56

* See the table "Standard series of values in a decade" at the back of this book.

Enamelled wirewound resistors

WR0617E; WR0842E
WR0825E; WR0865E

COMPOSITION OF THE CATALOGUE NUMBER

The catalogue number in Table 2 is completed by inserting the resistance code: the first two significant figures of the resistance value (in Ω) followed by:

- 8 for R of 4,7 to 9,1 Ω
- 9 for R of 10 to 91 Ω
- 1 for R of 100 to 910 Ω
- 2 for R of 1 to 9,1 k Ω
- 3 for R of 10 to 91 k Ω
- 4 for R of 100 k Ω

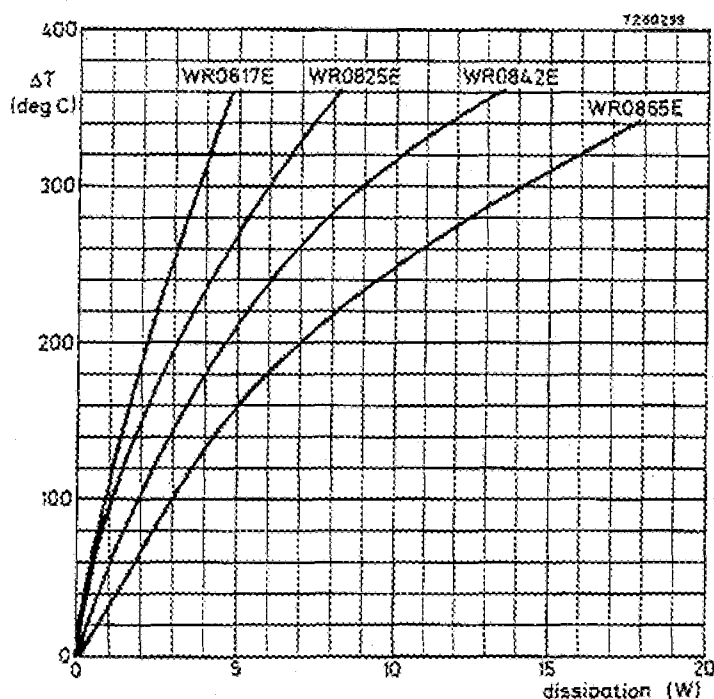


Fig. 2 Temperature rise (ΔT) of the resistor body as a function of the dissipation. Distance between cap and solder joint is 10 mm.

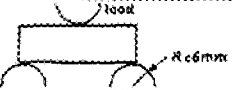
Enamelled wirewound resistors

WR0617E; WR0842E
WR0825E; WR0865E

TESTS AND REQUIREMENTS

Essentially all tests are carried out according to the schedule of IEC publications 266 and 266A, category 55/200/56 (rated temperature range -55°C to $+200^{\circ}\text{C}$; damp heat, long term, 56 days) and along the lines of IEC publication 68, "Recommended basic climatic and mechanical robustness testing procedure for electronic components". In the following table the tests are listed with reference to the relevant clauses of IEC publications 266, 266A and 68; a short description is also given of the test procedure and requirements. In some instances deviations from the IEC recommendation were necessary for our method of specifying.

Table 3

IEC 266 clause	IEC 68 test method	test	procedure	requirements
14		Robustness of resistor body	 load 200 ± 10 N	no visible damage $\Delta R \leq 0,5\%$ or $0,05 \Omega$
15	U	Robustness of terminations		
	Ua	Tensile all samples	load 10N; 10 s	
	Ub	Bending half number of samples	load 5N; 4 x 90°	
	Uc	Torsion other half number of samples	2 x 180° in opposite directions	no visible damage ΔR max. $0,5\% + 0,05 \Omega$
16	T	Soldering	2 s, 230°C , flux 600 thermal shock: 3 s 350°C , 6 mm from body	good tinning, no damage ΔR max. $0,5\% + 0,05 \Omega$
17	Na	Rapid change of temperature	$\frac{1}{2}$ h -55°C / $\frac{1}{2}$ h $+200^{\circ}\text{C}$, 5 cycles	no visible damage ΔR max. $1\% + 0,05 \Omega$
18	Fc	Vibration	frequency 10-500 Hz, displacement 0,75 mm or acceleration 10g, three directions; total 8 h (3 x 2 h)	no visible damage ΔR max. $0,5\% + 0,05 \Omega$
19	Eb	Bump	4000 ± 10 bumps 390 m/s ²	no visible damage ΔR max. $0,5\% + 0,05 \Omega$

Enamelled wirewound resistors

WR0617E; WR0842E
WR0825E; WR0865E

IEC 266 clause	IEC 68 test method	test	procedure	requirements
20		Climatic sequence		
20.2	Ba	Dry heat	16 h, 200 °C	
20.3	D	Damp heat (accel) 1st cycle	24 h; 55 °C; 95-100% R.H.	
20.4	Aa	Cold	2 h; -55 °C	
20.5	M	Low air pressure	1 h; 8,5 kPa; 15-35 °C	
20.6	D	Damp heat (accel) remaining cycles	5 days; 55 °C; 95-100% R.H.	after 24 h at P_n ΔR max. 5% + 0.1 Ω
21	Ca	Damp heat steady state	56 days; 40 °C; 90-95% R.H. dissipation $\leq 0,01 P_n$	after 24 h at P_n ΔR max. 1% + 0.05 Ω
22	—	Endurance	1000 h at 70 °C	ΔR max. 5% + 0.1 Ω
23	—		1000 h at 200 °C	ΔR max. 5% + 0.1 Ω
13.6	—	Overload	$10 \times P_n$, 5 s $2 \times P_n$, 10 min.	ΔR max. 2% + 0.1 Ω

Enamelled wirewound resistors

WR0617E; WR0842E
WR0825E; WR0865E

STANDARD PACKING

The resistors are supplied on bandolier in ammpack. For details see General section.

type	number per box
	bandolier
WR0617E	500
WR0825E	500
WR0842E	100
WR0865E	100

Dimensions of bandolier

type	a ± 0,5	A ± 1,6	B1 - B2 ± max.	S (spacing)	T (max. deviation of spacing)
WR0617E	5	66,7	1,2	10	} 1 mm per 10 spacings 0,5 mm per 5 spacings
WR0825E	6	74	1,2	10	
WR0842E	6	88	1,2	10	
WR0865E	6	110	1,2	10	

Dimensions of ammpack

type	M	N	P
WR0617E	85	77	259
WR0825E	93	115	259
WR0842E	132	56	160
WR0865E	132	56	160

The dimensions in above tables are in mm.