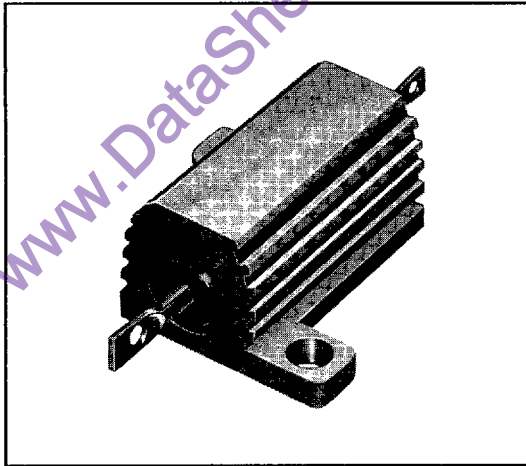


MODELS ERH and ENH Wirewound Resistors

Military/Established Reliability
MIL-R-39009 Qualified, Type RER, R Level



FEATURES

- Aluminum housed
- Standard (ERH) or non-inductive (ENH) winding
- Molded construction gives complete environmental protection
- Complete welded construction
- Mounts on chassis to utilize heat sink effect
- High stability at conventional power ratings
- Flat marking surface for easy identification
- Covered by U.S. Patents 201,884, 3,201,855 and 3,206,704
- 100% power stabilization and screening tests

STANDARD ELECTRICAL SPECIFICATIONS

DALE MODEL	MIL-R-39009 TYPE	POWER RATING (Watts)		MILITARY RESISTANCE RANGE (Ohms) $\pm 1\%$	MAX. WORKING VOLTAGE	MAX. WEIGHT (Grams)	MIL-R-39009 STANDARD TEMPERATURE COEFFICIENT VALUE RANGES (Ohms)		
		MOUNTED	FREE AIR				$\pm 100\text{PPM}/^\circ\text{C}$	$\pm 50\text{PPM}/^\circ\text{C}$	$\pm 30\text{PPM}/^\circ\text{C}$
ENH-5	RER40	5	3	1 - 1.65k	128.9	3.3	—	1 - 19.9	20 - 1.65k
ENH-10	RER45	10	6	1 - 2.8k	190.0	8.8	—	1 - 19.9	20 - 2.8k
ENH-25	RER50	20	8	1 - 6.04k	390.0	16.5	—	1 - 19.9	20 - 6.04k
ENH-50	RER55	30	10	1 - 19.6k	890.0	35.0	—	1 - 19.9	20 - 19.6k
ERH-5	RER60	5	3	0.10 - 3.32k	160.0	3.0	.1 - .99	1 - 19.9	20 - 3.32k
ERH-10	RER65	10	6	0.10 - 5.62k	265.0	6.0	.1 - .99	1 - 19.9	20 - 5.62k
ERH-25	RER70	20	8	0.10 - 12.1k	550.0	13.0	.1 - .99	1 - 19.9	20 - 12.1k
ERH-50	RER75	30	10	0.10 - 39.2k	1250.0	28.0	.1 - .99	1 - 19.9	20 - 39.2k

Note: All resistance ranges shown conform to military specifications unless otherwise indicated.

ELECTRICAL SPECIFICATIONS

Tolerance: Only military specification tolerance available is $\pm 1\%$.

Dielectric Strength: 1000 VAC on 5, 10 and 25 watt units.
2,000 VAC on 30 watt units.

Insulation Resistance: 10,000 Megohm minimum dry,
1,000 Megohm minimum after moisture test.

MECHANICAL SPECIFICATIONS

Terminal Strength: 5 pound pull test on 5 and 10 watt units.
10 pound pull test on 20 and 30 watt units.

Solderability: Satisfactory when tested in accordance with MIL-STD-202, Method 208.

MATERIAL SPECIFICATIONS

Core: Ceramic: Steatite or alumina, depending on physical size.

Element: Copper-nickel alloy or nickel-chrome alloy, depending on resistance value.

End Caps: Stainless steel.

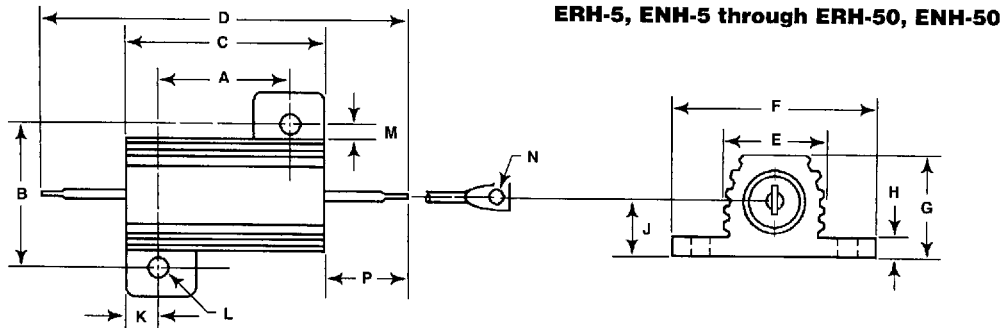
Encapsulant: Molded construction.

Housing: Aluminum with hard anodic coating.

Terminals: Tinned Copperweld[®].

MODELS ERH and ENH

DIMENSIONAL CONFIGURATIONS [Numbers in brackets indicate millimeters]



MODEL	A	B	C	D	E	F	G	H	J	K	L	M	N	P
ERH-5 ENH-5	.444 ±.005 [11.28 ±.127]	.490 ±.005 [12.45 ±.127]	.600 ±.031 [15.24 ±.787]	1.125 ±.062 [28.58 ±.157]	.334 ±.015 [8.48 ±.381]	.646 ±.015 [16.41 ±.381]	.320 ±.015 [8.13 ±.381]	.065 ±.010 [1.65 ±.254]	.133 ±.010 [3.38 ±.254]	.078 ±.010 [1.98 ±.254]	.093 ±.005 [2.36 ±.127]	.078 ±.015 [1.98 ±.381]	.050 ±.005 [1.27 ±.127]	.266 ±.062 [6.76 ±.157]
ERH-10 ENH-10	.562 ±.005 [14.27 ±.127]	.625 ±.005 [15.88 ±.127]	.750 ±.031 [19.05 ±.787]	1.375 ±.062 [34.93 ±.157]	.420 ±.015 [10.67 ±.381]	.800 ±.015 [20.32 ±.381]	.390 ±.015 [9.91 ±.381]	.075 ±.010 [1.90 ±.254]	.165 ±.010 [4.19 ±.254]	.093 ±.010 [2.36 ±.254]	.094 ±.005 [2.39 ±.127]	.102 ±.015 [2.59 ±.381]	.085 ±.005 [2.16 ±.127]	.312 ±.062 [7.92 ±.157]
ERH-25 ENH-25	.719 ±.005 [18.26 ±.127]	.781 ±.005 [19.84 ±.127]	1.062 ±.031 [26.97 ±.787]	1.938 ±.062 [49.23 ±.157]	.550 ±.015 [13.97 ±.381]	1.080 ±.015 [27.43 ±.381]	.546 ±.015 [13.87 ±.381]	.075 ±.010 [1.90 ±.254]	.231 ±.010 [5.87 ±.254]	.172 ±.010 [4.37 ±.254]	.125 ±.005 [3.18 ±.127]	.115 ±.015 [2.92 ±.381]	.085 ±.005 [2.16 ±.127]	.438 ±.062 [11.13 ±.157]
ERH-50 ENH-50	1.562 ±.005 [39.67 ±.127]	.844 ±.005 [21.44 ±.127]	1.968 ±.031 [49.99 ±.787]	2.781 ±.062 [70.64 ±.157]	.630 ±.015 [16.00 ±.381]	1.140 ±.015 [28.96 ±.381]	.610 ±.015 [15.49 ±.381]	.088 ±.010 [2.24 ±.254]	.260 ±.010 [6.60 ±.254]	.196 ±.010 [4.98 ±.254]	.125 ±.005 [3.18 ±.127]	.107 ±.015 [2.72 ±.381]	.085 ±.005 [2.16 ±.127]	.438 ±.062 [11.13 ±.157]

Note: All resistance ranges shown conform to military specifications unless otherwise indicated.

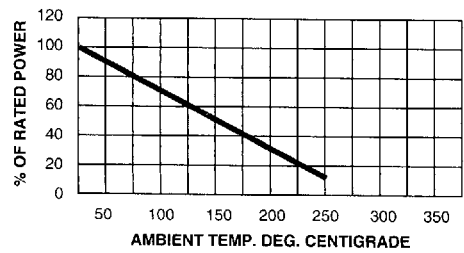
ENVIRONMENTAL PERFORMANCE

GENERAL: Testing of ERH and ENH resistors is done according to the procedures and test methods described in MIL-R-39009. The table below shows the military requirements and the Dale® performance.

TEST	MIL-R-39009	DALE TYPICAL
Temperature Coefficient	± 30PPM/°C 20Ω and up ± 50PPM/°C 1Ω to 19.60Ω ± 100PPM/°C below 1Ω	See Table
Thermal Shock	± (.3% + 0.01Ω) ΔR	± (.2% + 0.01Ω) ΔR
Short Time Overload	± (.3% + 0.01Ω) ΔR	± (.15% + 0.01Ω) ΔR
Dielectric	± (.2% + 0.01Ω) ΔR	± (.2% + 0.01Ω) ΔR
High Temperature Storage (2 hours)	± (.5% + 0.01Ω) ΔR	± (.25% + 0.01Ω) ΔR
High Temperature Exposure (2,000 hours)	± (1% + 0.01Ω) ΔR	± (.75% + 0.01Ω) ΔR
Moisture Resistance	± (.5% + 0.01Ω) ΔR	± (.25% + 0.01Ω) ΔR
Shock	± (.2% + 0.01Ω) ΔR	± (.1% + 0.01Ω) ΔR
Vibration	± (.2% + 0.01Ω) ΔR	± (.1% + 0.01Ω) ΔR
Load Life (2,000 hours)	± (1% + 0.01Ω) ΔR	± (.5% + 0.01Ω) ΔR
Terminal Strength	± (.2% + 0.01Ω) ΔR	± (.1% + 0.01Ω) ΔR

DERATING

ERH and ENH resistors have an operating temperature range of -55°C to +250°C. Derating is required for reduced chassis mounting area and for high ambient temperatures. The following curves apply to operation of unmounted resistors:
All types mounted to aluminum chassis.



POWER RATING

Dale® ERH and ENH resistor ratings are based on the following requirements:

- + 275°C maximum internal hotspot temperature.
- 1% maximum ΔR in 2000 hour load life.
- Proper heat sink:
4 x 6 x 2 x .040 aluminum chassis for ERH-5, ENH-5, ERH-10 and ENH-10.
5 x 7 x 2 x .040 aluminum chassis for ERH-25, ENH-25, ERH-50 and ENH-50.

PART MARKING

— JAN
— 91637
— Value and tolerance

— MIL mark
— Date/lot code

Note: For additional information on military marking see "Military Product Identification" page at back of catalog.

