

## Wirewound Resistors, Military/Established Reliability MIL-PRF-39009 Qualified, Type RER, R Level



### FEATURES

- Aluminum heat sink housing
- Molded construction for total environmental protection
- Qualified to MIL-PRF-39009
- Complete welded construction
- Available in non-inductive styles (type ENH) with Aryton-Perry winding for lowest reactive components
- Mounts on chassis to utilize heat-sink effect

### STANDARD ELECTRICAL SPECIFICATIONS

MODEL	MIL-PRF-39009 TYPE	POWER RATING $P_{25\text{ }^\circ\text{C}}$ W		MILITARY RESISTANCE RANGE $\pm 1\%$ $\Omega$	WEIGHT (typical) g
		MOUNTED	FREE AIR		
ENH-5	RER40	5	3	1 - 1.65K	3.3
ENH-10	RER45	10	6	1 - 2.8K	8.8
ENH-25	RER50	20	8	1 - 6.04K	16.5
ENH-50	RER55	30	10	1 - 4.99K	35
ERH-5	RER60	5	3	0.10 - 3.32K	3
ERH-10	RER65	10	6	0.10 - 5.62K	6
ERH-25	RER70	20	8	0.10 - 12.1K	13
ERH-50	RER75	30	10	0.10 - 39.2K	28

### TECHNICAL SPECIFICATIONS

PARAMETER	UNIT	ERH, ENH RESISTOR CHARACTERISTICS
Temperature Coefficient	ppm/ $^\circ\text{C}$	$\pm 100$ for $0.1\ \Omega$ to $0.99\ \Omega$ , $\pm 50$ for $1\ \Omega$ to $19.9\ \Omega$ , $\pm 20$ for $20\ \Omega$ and above
Dielectric Withstanding Voltage	$V_{AC}$	1000 for ERH-5, ERH-10 and ERH-25, 2000 for ERH-50
Short Time Overload	-	5 x rated power for 5 s
Maximum Working Voltage	V	$(P \times R)^{1/2}$
Insulation Resistance	$\Omega$	10 000 M $\Omega$ minimum dry, 1000 M $\Omega$ minimum after moisture test
Terminal Strength	lb	5 pull for ERH-5 and ERH-10, 10 pull for ERH-25 and ERH-50
Solderability	-	Meets requirements of ANSI J-STD-002
Operating Temperature Range	$^\circ\text{C}$	- 55 to + 250

### GLOBAL PART NUMBER INFORMATION

Global/Military Part Numbering: RER65F1001RC02

R   E   R   6   5   F   1   0   0   1   R   C   0   2

MIL TYPE
RER40
RER45
RER50
RER55
RER60
RER65
RER70
RER75

TOLERANCE CODE
F = $\pm 1.0\%$

RESISTANCE VALUE
3 digit significant figure, followed by a multiplier
49R9 = 49.9 $\Omega$
1000 = 100 $\Omega$
1001 = 1000 $\Omega$

FAILURE RATE
M = 1.0 %/1000 h
P = 0.1 %/1000 h
R = 0.01 %/1000 h

PACKAGING CODE
C02 = Tin/lead, card pack
CSL = Tin/lead, card pack, single lot date code

**DIMENSIONS**


MODEL	DIMENSIONS in inches [millimeters]													
	A	B	C	D	E	F	G	H	J	K	L	M	N	P
ERH-5 ENH-5	0.444 ± 0.005 [11.280 ± 0.127]	0.490 ± 0.005 [12.450 ± 0.127]	0.600 ± 0.031 [15.240 ± 0.787]	1.125 ± 0.062 [28.580 ± 1.570]	0.334 ± 0.015 [8.480 ± 0.381]	0.646 ± 0.015 [16.410 ± 0.381]	0.320 ± 0.015 [8.130 ± 0.381]	0.065 ± 0.010 [1.650 ± 0.254]	0.133 ± 0.010 [3.380 ± 0.254]	0.078 ± 0.010 [1.980 ± 0.254]	0.093 ± 0.005 [2.360 ± 0.127]	0.078 ± 0.015 [1.980 ± 0.381]	0.050 ± 0.005 [1.270 ± 0.127]	0.266 ± 0.062 [6.760 ± 1.570]
ERH-10 ENH-10	0.562 ± 0.005 [14.270 ± 0.127]	0.625 ± 0.005 [15.880 ± 0.127]	0.750 ± 0.031 [19.050 ± 0.787]	1.375 ± 0.062 [34.930 ± 1.570]	0.420 ± 0.015 [10.670 ± 0.381]	0.800 ± 0.015 [20.320 ± 0.381]	0.390 ± 0.015 [9.910 ± 0.381]	0.075 ± 0.010 [1.900 ± 0.254]	0.165 ± 0.010 [4.190 ± 0.254]	0.093 ± 0.010 [2.360 ± 0.254]	0.094 ± 0.005 [2.390 ± 0.127]	0.102 ± 0.015 [2.590 ± 0.381]	0.085 ± 0.005 [2.160 ± 0.127]	0.312 ± 0.062 [7.920 ± 1.570]
ERH-25 ENH-25	0.719 ± 0.005 [18.260 ± 0.127]	0.781 ± 0.005 [19.840 ± 0.127]	1.062 ± 0.031 [26.970 ± 0.787]	1.938 ± 0.062 [49.230 ± 1.570]	0.550 ± 0.015 [13.970 ± 0.381]	1.080 ± 0.015 [27.430 ± 0.381]	0.546 ± 0.015 [13.870 ± 0.381]	0.075 ± 0.010 [1.900 ± 0.254]	0.231 ± 0.010 [5.870 ± 0.254]	0.172 ± 0.010 [4.370 ± 0.254]	0.125 ± 0.005 [3.180 ± 0.127]	0.115 ± 0.015 [2.920 ± 0.381]	0.085 ± 0.005 [2.160 ± 0.127]	0.438 ± 0.062 [11.130 ± 1.570]
ERH-50 ENH-50	1.562 ± 0.005 [39.670 ± 0.127]	0.844 ± 0.005 [21.440 ± 0.127]	1.968 ± 0.031 [49.990 ± 0.787]	2.781 ± 0.062 [70.640 ± 1.570]	0.630 ± 0.015 [16.000 ± 0.381]	1.140 ± 0.015 [28.960 ± 0.381]	0.610 ± 0.015 [15.490 ± 0.381]	0.088 ± 0.010 [2.240 ± 0.254]	0.260 ± 0.010 [6.600 ± 0.254]	0.196 ± 0.010 [4.980 ± 0.254]	0.125 ± 0.005 [3.180 ± 0.127]	0.107 ± 0.015 [2.720 ± 0.381]	0.085 ± 0.005 [2.160 ± 0.127]	0.438 ± 0.062 [11.130 ± 1.570]

**MATERIAL SPECIFICATIONS**

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

**Core:** Ceramic, steatite or alumina, depending on physical size

**Encapsulant:** Silicone molded construction

**Housing:** Aluminum with hard anodic coating

**End Caps:** Stainless steel

**Standard Terminals:** Tinned Copperweld®

**Part Marking:** Source code, JAN, military PIN, date/lot code

**POWER RATING**

Vishay ERH and ENH resistor wattage ratings are based on mounting to the proper heat sink.

ERH-5 and ERH-10: 4" x 6" x 2" x 0.040" thick aluminum chassis

ERH-25 and ERH-50: 5" x 7" x 2" x 0.040" thick aluminum chassis


**APPLICABLE MIL SPECIFICATION**

**MIL-PRF-39009:** This is the military specification covering housed chassis mount established reliability power wirewound resistors. Vishay ERH and ENH resistors are listed as qualified on the MIL-PRF-39009 QPL.

PERFORMANCE		
TEST	CONDITIONS OF TEST	TEST LIMITS
Low Temperature Operation	Apply rated power until thermal stability, remove power subject to air temperature of - 55 °C for 15 to 30 min	± (0.5 % + 0.01 Ω) ΔR
Short Time Overload	5 x rated power for 5 s	± (0.3 % + 0.01 Ω) ΔR
Dielectric Withstanding Voltage	1000 V <sub>rms</sub> (RER 40, 45, 50, 60, 65, 70), 2000 V <sub>rms</sub> (RER55 and 75), 1 min duration	± (0.2 % + 0.01 Ω) ΔR
Low Temperature Storage	- 55 °C for 24 h	± (0.3 % + 0.01 Ω) ΔR
High Temperature Exposure	250 °C for 2000 h	± (1.0 % + 0.01 Ω) ΔR
Moisture Resistance	MIL-STD-202, Method 106	± (0.5 % + 0.01 Ω) ΔR
Shock, Specified Pulse	MIL-STD-202, Method 213, condition 1	± (0.2 % + 0.01 Ω) ΔR
Vibration, High Frequency	MIL-STD-202, Method 204, condition D	± (0.2 % + 0.01 Ω) ΔR
Load Life	2000 h at rated power, + 25 °C, 1.5 h "ON", 0.5 h "OFF"	± (1.0 % + 0.01 Ω) ΔR
Extended Life	10 000 h at rated power, + 25 °C, 1.5 h "ON", 0.5 h "OFF"	± (2.0 % + 0.01 Ω) ΔR
Terminal Strength	MIL-STD-202, Method 211, condition A 5 pound (RER40, 45, 60, 65), 10 pound (RER50, 55, 70, 75)	± (0.2 % + 0.01 Ω) ΔR



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