

## 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
<b>RER40</b> <b>RER45</b> <b>RER50</b> <b>RER55</b> <b>RER60</b> <b>RER65</b> <b>RER70</b> <b>RER75</b>

TOLERANCE CODE
<b>F</b> = $\pm 1.0\%$

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

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

PACKAGING CODE
<b>C02</b> = Tin/lead, card pack
<b>CSL</b> = 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



## Disclaimer

All product specifications and data are subject to change without notice.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.