

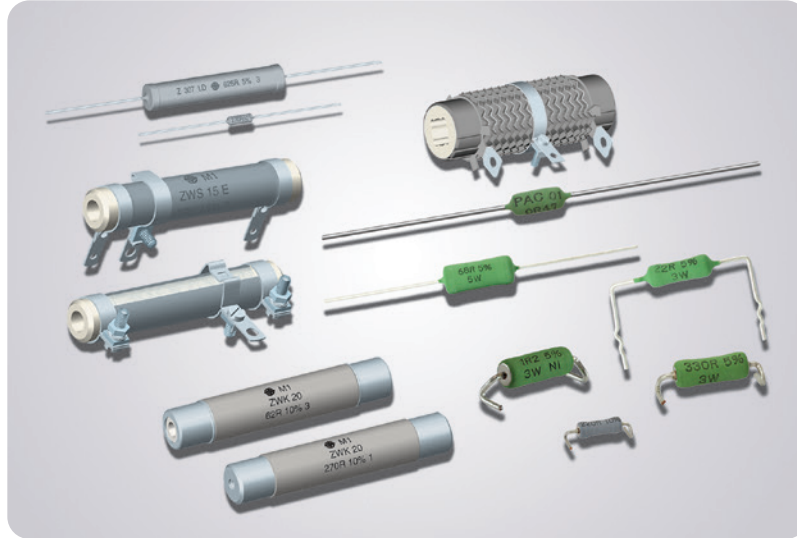


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# INDUSTRIAL WIREWOUND RESISTORS

Cement Coated

## Cement-Coated Wirewound Resistors



### FEATURES

- Power range of 1 W to 500 W
- Resistance range of 0.056  $\Omega$  to 620 k $\Omega$
- Temperature range: -55  $^{\circ}\text{C}$  to +250  $^{\circ}\text{C}$
- Flameproof construction according to UL94-V0
- Lead (Pb)-free
- High quality ceramic core
- Outstanding endurance
- Adjustable and non-inductive styles available
- RoHS-compliant
- High voltage surge (up to 12 kV) for specially designed components
- Fusing time < 30 s for 45 W overload for safety versions
- Special cement coating for immediate interruption without flame and explosion when mains voltage (220 V<sub>RMS</sub>) is applied

### RESOURCES





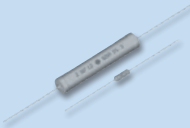
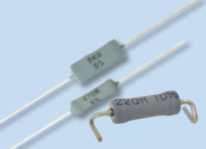
- For application of Vishay resistors in energy meters, please check <http://www.vishay.com/docs/28777/enrgymet.pdf>



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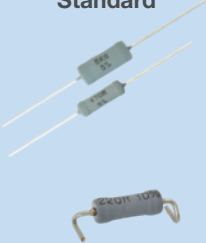
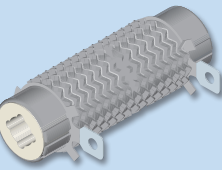
Model	Product	Wattage	Resistance Range	Tolerance (± %)*	TCR (ppm/K)*	Applications
 <p>AEC-Q200</p>	AC 01, AC01-AT	1 W	0.10 Ω – 2.4 kΩ	5	-10...-80/ 100...180	<ul style="list-style-type: none"> <li>Filters</li> <li>Capacitor discharge</li> <li>Brake resistors</li> <li>Power supplies</li> <li>Welding equipment</li> <li>Rail systems</li> <li>Voltage dividers</li> <li>Converters</li> <li>Automotive</li> <li>Energy meters</li> </ul>
	AC 03, AC03-AT	3 W	0.10 Ω – 5.1 kΩ			
	AC 04, AC04-AT	4 W	0.10 Ω – 6.8 kΩ			
	AC 05, AC05-AT	5 W	0.10 Ω – 10 kΩ			
	AC 07, AC07-AT	7 W	0.10 Ω – 15 kΩ			
	AC 10, AC10-AT	10 W	0.22 Ω – 27 kΩ			
	AC03-NI	3 W	0.10 Ω to 69 Ω			
	AC04-NI	4 W	0.10 Ω to 68 Ω			
	AC05-NI	5 W	0.18 Ω to 56 Ω			
<p><b>Safety Resistor</b> <b>AC01-CS,</b> <b>AC03-CS, AC05-CS</b></p>  <p>UL1412 recognized; UL file no. E362452</p>	AC01-CS AC03-CS AC05-CS	1 W 3 W 5 W	1 Ω - 100 Ω 1 Ω - 100 Ω 1 Ω - 100 Ω	5	200	<ul style="list-style-type: none"> <li>Washing machines</li> <li>Chargers</li> <li>Energy meters</li> </ul>
<p><b>PAC</b></p> 	PAC 01	1 W	0.10 Ω - 2.2 kΩ	1	± 100	<ul style="list-style-type: none"> <li>Power meters</li> <li>Smart grid solutions</li> <li>Inverter</li> <li>Energy storage</li> <li>Electronic motor starting</li> <li>AC/DC power supply</li> <li>UPS</li> <li>Domestic appliances</li> <li>Home automation - lighting</li> </ul>
	PAC 02	2 W	0.10 Ω - 3.6 kΩ			
	PAC 03	3 W	0.10 Ω - 4.7 kΩ			
	PAC 04	4 W	0.10 Ω - 8.2 kΩ			
	PAC 05	5 W	0.10 Ω - 12 kΩ			
	PAC 06	6 W	0.10 Ω - 12 kΩ			
	WSZ 6720	1.8 W	1 Ω - 510 Ω 0.22 Ω to 510 Ω 0.10 Ω to 3.3 kΩ 0.10 Ω to 3.3 kΩ	1 2 5 10	-10...-80 100...180	
<p><b>Z300</b></p> 	Z 301	1 W	.30 Ω - 2.0 kΩ	5 / 10	-10...-80/ 100...180	<ul style="list-style-type: none"> <li>Domestic appliances</li> <li>Power supplies</li> </ul>
	ZDA 0411	2 W	0.47 Ω - 4.3 kΩ on request	5 / 10 1 / 2		
	Z 302	3 W	0.10 Ω to 3.3 kΩ 0.22 Ω - 510 Ω	5 / 10 1 / 2		
	Z 303	4 W	0.10 Ω - 3.9 kΩ 0.1 Ω - 1.0 kΩ	5 / 10 1 / 2		
	Z 305	6 W	0.1 Ω - 10.0 kΩ 0.62 Ω - 2.4 kΩ	5 / 10 1 / 2		
	Z 306	8 W	0.13 Ω - 16 kΩ 1.0 Ω - 4.7 kΩ	5 / 10 1 / 2		
	Z 307	10 W	0.20 Ω - 30 kΩ 1.8 Ω - 8.2 kΩ	5 / 10 1 / 2		
<p><b>High Voltage Surge</b> <b>Z300-CXX</b></p> 	Z301-C	1 W	430 Ω - 2 kΩ	10 / 5	200	<p>High voltage surge (up to 12 kV) according to IEC 61000-4-5, for usage in:</p> <ul style="list-style-type: none"> <li>Energy meters</li> <li>Appliances</li> <li>Industrial electronics</li> <li>Radial and Z-bend termination</li> </ul>
	ZDA0411-C	2 W	180 Ω - 4.3 kΩ			
	Z302-C	3 W	62 Ω - 3.3 kΩ			
	Z303-C	4 W	27 Ω - 3.9 kΩ			
	Z304-C	5 W	15 Ω - 5.6 kΩ			
	Z305-C	6 W	4.7 Ω to 10 kΩ			
	Z306M-C	7W	10.0 Ω to 3.9 kΩ			



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<b>Z300-C00 Standard</b> 	Z301-C00	1 W	0.30 Ω to 2 kΩ	200	± 10 / ± 5	<ul style="list-style-type: none"> <li>• Non-flammable cement coating</li> <li>• High power dissipation in small size</li> <li>• Radial and Z-bend termination</li> </ul>
	ZDA0411-C00	2 W	0.10 Ω to 4.3 kΩ			
	Z302-C00	3 W	0.10 Ω to 3.3 kΩ			
	Z303-C00	4 W	0.47 Ω to 3.9 kΩ			
	Z304-C00	5 W	0.62 Ω to 5.6 kΩ			
	Z305-C00	6 W	0.15 Ω to 10 kΩ			
	Z306M-C00	7 W	10.0 Ω to 3.9 kΩ			
<b>ZWK</b> 	ZWK 10 ZWK 10 Ni	10 W	0.47 Ω - 22 kΩ 0.24 Ω - 3.9 kΩ	2 / 5 / 10 5 / 10	650...750/ -10...-80/ 100...180	<ul style="list-style-type: none"> <li>• Filters</li> <li>• Capacitor discharge</li> <li>• Brake resistors</li> <li>• Power supplies</li> <li>• Welding equipment</li> <li>• Rail systems</li> <li>• Voltage dividers</li> <li>• Converters</li> <li>• Automotive</li> </ul>
	ZWK 15 ZWK 15 Ni	15 W	0.47 Ω - 33 kΩ 0.36 Ω - 5.6 kΩ	2 / 5 / 10 5 / 10		
	ZWK 20 ZWK 20 Ni	20 W	0.75 Ω - 51 kΩ 0.56 Ω - 9.1 kΩ	2 / 5 / 10 5 / 10		
	ZWK 40 ZWK 40 Ni	40 W	1.5 Ω - 100 kΩ 1.1 Ω - 18 kΩ	2 / 5 / 10 5 / 10		
	ZWK 60 ZWK 60 Ni	60 W	1.8 Ω - 130 kΩ 1.5 Ω - 24 kΩ	2 / 5 / 10 5 / 10		
	ZWK 90 ZWK 90 Ni	90 W	2.7 Ω - 200 kΩ 2.2 Ω - 36 kΩ	2 / 5 / 10 5 / 10		
	ZWK 150 ZWK 150 Ni	150 W	4.7 Ω - 360 kΩ 3.9 Ω - 62 kΩ	2 / 5 / 10 5 / 10		
<b>ZBS</b> 	ZBS 20/100 ZBS 20/100 E	50 W	0.13 Ω - 6.2 Ω	10 / 5	650...750/ -10...-80/ 100...180	<ul style="list-style-type: none"> <li>• Filters</li> <li>• Capacitor discharge</li> <li>• Brake resistors</li> <li>• Power supplies</li> <li>• Welding equipment</li> <li>• Rail systems</li> <li>• Voltage dividers</li> <li>• Converters</li> <li>• Automotive</li> </ul>
	ZBS 20/165 ZBS 20/165 E	100 W	0.27 Ω - 12 Ω			
	ZBS 20/265 ZBS 20/265 E	150 W	0.47 Ω - 22 Ω			
	ZBS 30/100 ZBS 30/100 E	75 W	0.10 Ω - 8.2 Ω			
	ZBS 30/133 ZBS 30/133 E	110 W	0.15 Ω - 12 Ω			
	ZBS 30/165 ZBS 30/165 E	150 W	0.20 Ω - 16 Ω			
	ZBS 30/215 ZBS 30/215 E	200 W	0.27 Ω - 24 Ω			
	ZBS 30/265 ZBS 30/265 E	250 W	0.30 Ω - 27 Ω			
	ZBS 30/330 ZBS 30/330 E	300 W	0.39 Ω - 36 Ω			
	ZBS 45/370 ZBS 45/370 E	375 W	0.75 Ω - 56 Ω			
	ZBS 60/370 ZBS 60/370 E	500 W	0.91 Ω - 75 Ω			

Note: E = adjustable — Ni = non-inductive

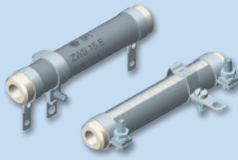
\* Ohmic values are not available in all tolerances and TC values. For more details, refer to datasheets at [www.vishay.com](http://www.vishay.com) or contact your local sales office.



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Model	Product	Wattage	Resistance Range	Tolerance ± %*	TCR (ppm/K)*	Applications
<b>ZWS</b> 	ZWS 6 ZWS 6 E ZWS 6 Ni	6 W	0.82 Ω - 13 kΩ 0.82 Ω - 4.7 kΩ 0.15 Ω - 2.4 kΩ	2 / 5 / 10 5 / 10 5 / 10		<ul style="list-style-type: none"> <li>• Filters</li> <li>• Capacitor discharge</li> <li>• Brake resistors</li> <li>• Power supplies</li> <li>• Welding equipment</li> <li>• Rail systems</li> <li>• Voltage dividers</li> <li>• Converters</li> <li>• Automotive</li> </ul>
	ZWS 8 ZWS 8 E ZWS 8 Ni	8 W	0.68 Ω - 20 kΩ 0.62 Ω - 6.8 kΩ 0.24 Ω - 3.6 kΩ	2 / 5 / 10 5 / 10 5 / 10		
	ZWS 12 ZWS 12 E ZWS 12 Ni	12 W	0.62 Ω - 27 kΩ 0.56 Ω - 9.1 kΩ 0.33 Ω - 5.1 kΩ	2 / 5 / 10 5 / 10 5 / 10		
	ZWS 15 ZWS 15 E ZWS 15 Ni	15 W	0.68 Ω - 33 kΩ 0.68 Ω - 11 kΩ 0.39 Ω - 6.2 kΩ	2 / 5 / 10 5 / 10 5 / 10		
	ZWS 20 ZWS 20 E ZWS 20 Ni	20 W	0.62 Ω - 43 kΩ 0.62 Ω - 15 kΩ 0.47 Ω - 8.2 kΩ	2 / 5 / 10 5 / 10 5 / 10		
	ZWS 35 ZWS 35 E ZWS 35 Ni	35 W	1.1 Ω - 82 kΩ 1.1 Ω - 27 kΩ 0.91 Ω - 15 kΩ	2 / 5 / 10 5 / 10 5 / 10		
	ZWS 50 ZWS 50 E ZWS 50 Ni	50 W	1.3 Ω - 91 kΩ 1.3 Ω - 33 kΩ 1.1 Ω - 16 kΩ	2 / 5 / 10 5 / 10 5 / 10		
	ZWS 100 ZWS 100 E ZWS 100 Ni	100 W	2.7 Ω - 200 kΩ 2.7 Ω - 68 kΩ 2.2 Ω - 33 kΩ	2 / 5 / 10 5 / 10 5 / 10		
	ZWS 30/100 ZWS 30/100 E ZWS 30/100 Ni	75 W	2.4 Ω - 180 kΩ 2.4 Ω - 56 kΩ 2.0 Ω - 30 kΩ	2 / 5 / 10 5 / 10 5 / 10		
	ZWS 30/133 ZWS 30/133 E ZWS 30/133 Ni	110 W	3.3 Ω - 240 kΩ 3.3 Ω - 82 kΩ 2.7 Ω - 43 kΩ	2 / 5 / 10 5 / 10 5 / 10		
	ZWS 150 ZWS 150 E ZWS 150 Ni	150 W	4.7 Ω - 360 kΩ 4.7 Ω - 120 kΩ 3.9 Ω - 62 kΩ	2 / 5 / 10 5 / 10 5 / 10		
	ZWS 250 ZWS 250 E ZWS 250 Ni	250 W	8.2 Ω - 620 kΩ 8.2 Ω - 220 kΩ 6.8 Ω - 110 kΩ	2 / 5 / 10 5 / 10 5 / 10		

Note: E = adjustable — Ni = non-inductive

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