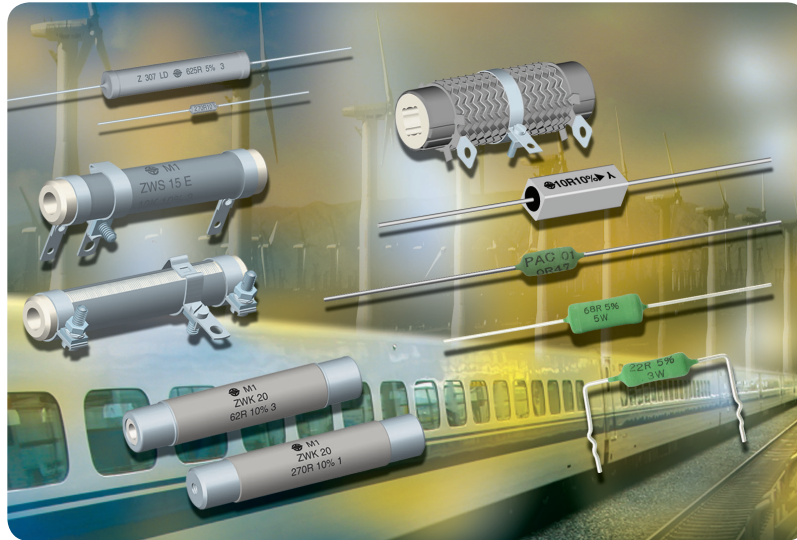


INDUSTRIAL WIREWOUND RESISTORS

Cement Coated

Cement-Coated Wirewound Resistors



FEATURES

- Power range of 1 W to 500 W
- Resistance range of 0.056 Ω to 620 k Ω
- Temperature range: -55 $^{\circ}\text{C}$ to +250 $^{\circ}\text{C}$
- Fire-proof 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 VRMS) is applied

RESOURCES



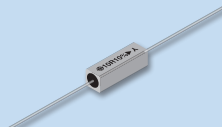

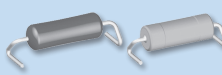
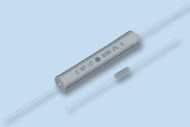
- For application of Vishay resistors in energy meters, please check <http://www.vishay.com/docs/28777/engrymet.pdf>.
- For application of Vishay resistors in electronic ballasts, please check <http://www.vishay.com/docs/28776/appvr25.pdf>.

A WORLD OF
SOLUTIONS



INDUSTRIAL WIREWOUND RESISTORS


Cement Coated

Model	Product	Wattage	Resistance Range	Tolerance (± %)*	TCR (ppm/K)*	Applications
AC 	AC 01	1 W	0.10 Ω - 2.4 kΩ	5	-10...-80/ 100...180	<ul style="list-style-type: none"> Filters Capacitor discharge Brake resistors Power supplies Welding equipment Rail systems Voltage dividers Converters Automotive Energy meters
	AC 03	3 W	0.10 Ω - 5.1 kΩ			
	AC 04	4 W	0.10 Ω - 6.8 kΩ			
	AC 05	5 W	0.10 Ω - 10 kΩ			
	AC 07	7 W	0.10 Ω - 15 kΩ			
	AC 10	10 W	0.68 Ω - 27 kΩ			
Safety Resistor AC01..CS, AC03..CS, AC05..CS 	AC01..CS	1 W	3 Ω - 100 Ω	5	200	<ul style="list-style-type: none"> Washing machines Chargers Energy meters
	AC03..CS	3 W	4.7 Ω - 100 Ω			
	AC05..CS	5 W	10 Ω - 100 Ω			
KKA, KKE 	KKA 4	4 W	0.056 Ω - 9.1 kΩ	5 / 10	400 ± 50 0 ± 40, 0 ± 10	<ul style="list-style-type: none"> Filters Capacitor discharge Brake resistors Power supplies Welding equipment Rail systems Voltage dividers Converters Automotive Energy meters
	KKE 4		0.075 Ω - 15 kΩ			
	KKA 5	5 W	0.075 Ω - 15 kΩ			
	KKA 7	7 W	0.11 Ω - 33 kΩ			
	KKE 7	7 W	0.075 Ω - 15 kΩ			
	KKE 7Si	4 W	0.075 Ω - 12 kΩ			
	KKA 9	9 W	0.11 Ω - 33 kΩ			
	KKE 9	9 W	0.11 Ω - 33 kΩ			
	KKE 9Si	5.5 W	0.11 Ω - 33 kΩ			
	KKA 11	11 W	0.15 Ω - 47 kΩ			
	KKE 11	11 W	0.15 Ω - 47 kΩ			
	KKE 11 Si	7 W	0.28 Ω - 47 kΩ			
PAC 	PAC 01	1 W	0.10 Ω - 2.2 kΩ	1	±100	<ul style="list-style-type: none"> Filters Capacitor discharge Brake resistors Power supplies Welding equipment Rail systems Voltage dividers Converters Automotive Energy meters
	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 - 10 kΩ			
	PAC 06	6 W	0.10 Ω - 12 kΩ			
WSZ 	WSZ 6720	1.8 W	1 Ω - 510 Ω	1	-10...-80 100...180	<ul style="list-style-type: none"> Filters Capacitor discharge Brake resistors Power supplies Welding equipment Rail systems Voltage dividers Converters Automotive Energy meters
			0.22 Ω to 510 Ω	2		
Z300 	Z 301	1 W	.30 Ω - 2.0 kΩ	5 / 10	-10...-80/ 100...180	<ul style="list-style-type: none"> Filters Capacitor discharge Brake resistors Power supplies Welding equipment Rail systems Voltage dividers Converters Automotive Energy meters
	ZDA 0411	2 W	0.47 Ω - 4.3 kΩ	5 / 10		
			on request	1 / 2		
	Z 302	3 W	0.10 Ω to 3.3 kΩ	5 / 10		
			0.22 Ω - 510 Ω	1 / 2		
	Z 303	4 W	0.10 Ω - 3.9 kΩ	5 / 10		
			1.0 Ω - 1.0 kΩ	1 / 2		
	Z 305	6 W	1.0 Ω - 2.4 kΩ	5 / 10		
		1.2 Ω - 2.4 kΩ	1 / 2			
Z 306	8 W	0.10 Ω - 16 kΩ	5 / 10			
		1.0 Ω - 4.7 kΩ	1 / 2			
Z 307	10 W	0.20 Ω - 30 kΩ	5 / 10			
		1.0 Ω - 8.2 kΩ	1 / 2			



INDUSTRIAL WIREWOUND RESISTORS

Cement Coated

Model	Product	Wattage	Resistance Range	Tolerance ± %*	TCR (ppm/K)*	Applications
High Voltage Surge Z300-C 	Z301-C	1 W	0.30 Ω – 2 kΩ	10/5	200	High voltage surge (up to 12 kV) according to IEC 61000-4-5, for usage in: <ul style="list-style-type: none"> • Energy meters • Appliances • Industrial electronics
	ZDA0411-C	2 W	0.47 Ω – 4.3 kΩ			
	Z302-C	3 W	0.22 Ω – 3.3 kΩ			
	Z303-C	4 W	0.47 Ω – 3.9 kΩ			
	Z304-C	5 W	0.62 Ω – 5.6 kΩ			
	Z304-5	6 W	0.15 Ω – 10 kΩ			
ZWK 	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"> • Filters • Capacitor discharge • Brake resistors • Power supplies • Welding equipment • Rail systems • Voltage dividers • Converters • Automotive
	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		
ZBS 	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"> • Filters • Capacitor discharge • Brake resistors • Power supplies • Welding equipment • Rail systems • Voltage dividers • Converters • Automotive
	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			

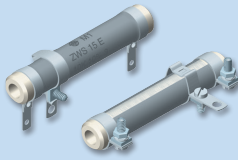
Note: E = adjustable — Ni = non-inductive

* Ohmic values are not available in all tolerances and TC values. For more details, refer to datasheets at www.vishay.com or contact your local sales office.



INDUSTRIAL WIREWOUND RESISTORS

Cement Coated

Model	Product	Wattage	Resistance Range	Tolerance ± %*	TCR (ppm/K)*	Applications
ZWS 	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"> • Filters • Capacitor discharge • Brake resistors • Power supplies • Welding equipment • Rail systems • Voltage dividers • Converters • Automotive
	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

* Ohmic values are not available in all tolerances and TC values. For more details, refer to datasheets at www.vishay.com or contact your local sales office.