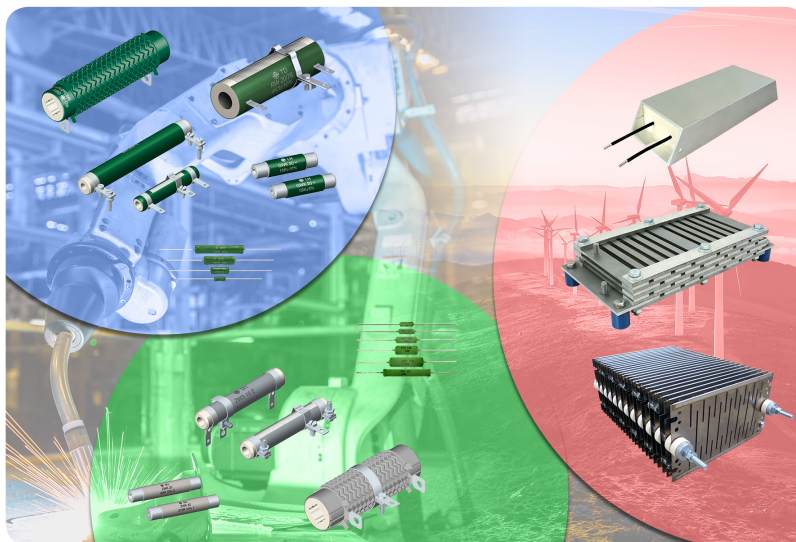


POWER RESISTORS

Vishay Draloric / Beyschlag

Vishay Draloric / Beyschlag Power Resistor Solutions for all Types of Applications



KEY BENEFITS

- Broad portfolio
- High performing products
- Standard, adjustable, and non-inductive types

FEATURES

- Resistor solutions for application-specific requirements, such as:
 - Very high power (up to 20 kW)
 - Very high pulse load (up to 3.5 MJ)
 - Very high temperature range (-55 °C to +450 °C)
 - High voltage
 - High reliability
 - Low ohmic (< 1 Ω)
 - Perfect humidity protection
 - Non-flammable
 - Fully green
 - AEC-Q200
 - MIL-PRF-26
 - Adjustable (E)
 - Non-inductive (Ni)
 - Fully welded construction

RESOURCES

- For technical questions contact: ww1resistors@vishay.com, powresistor@vishay.com

**POWER RESISTORS**

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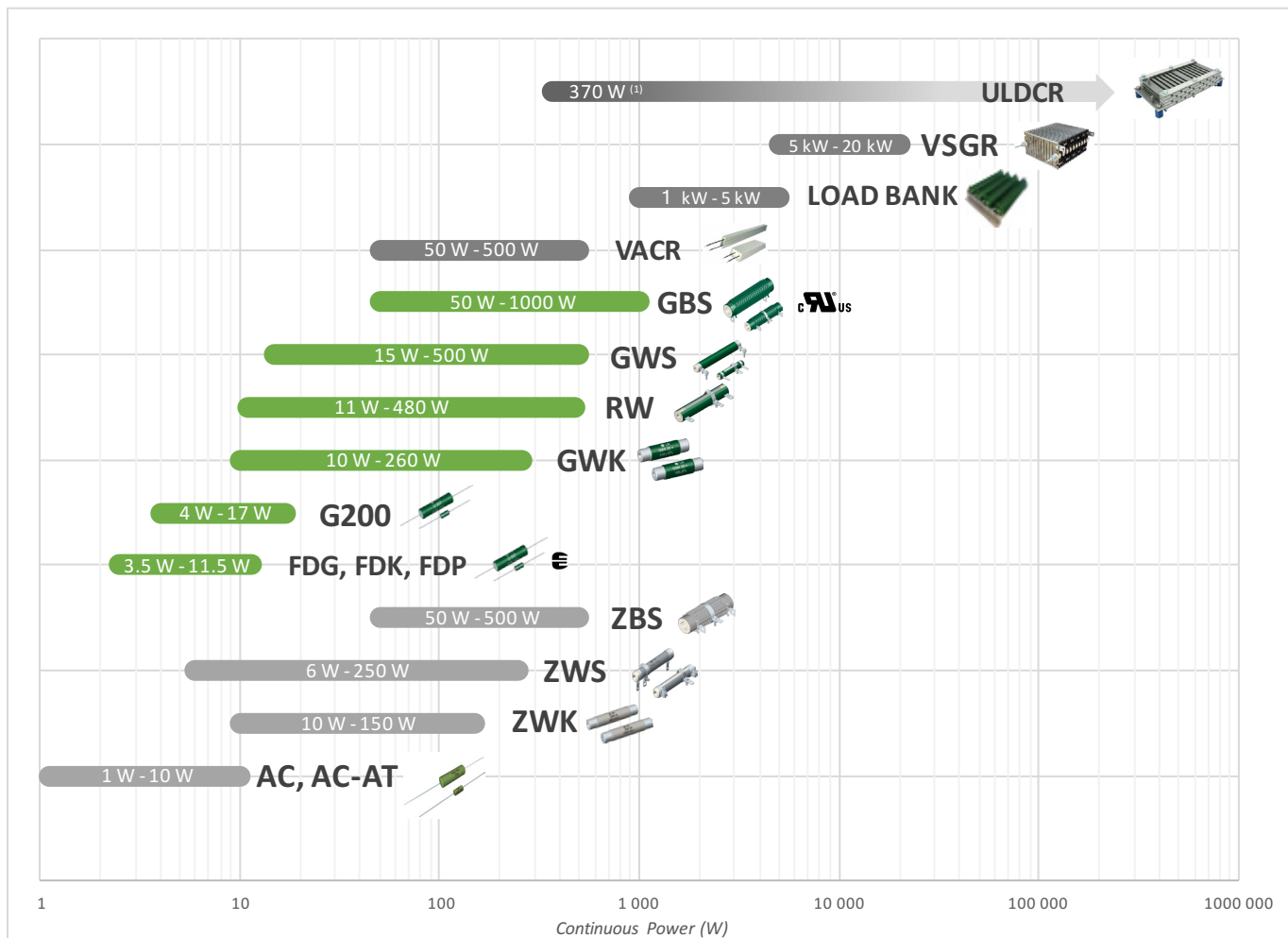
RESISTOR SOLUTIONS FOR SPECIFIC APPLICATION REQUIREMENTS

	Vitreous	Cemented	Aluminum Housed	Stainless Steel Grid
High Pulse Load	GBS GWS RW GWK G200	ZBS ZWS ZWK AC AC-AT	VACR	ULDCR
High Power	GBS GWS RW GWK G200	ZBS ZWS ZWK AC AC-AT	VACR	VSGR
High Voltage	RW GWK	ZWK		ULDCR
High Temperature	GBS GWS RW GWK G200	ZBS ZWS ZWK AC AC-AT	VACR	VSGR ULDCR
High Reliability	FDG FDK FDP			
Low Ohmic 0.1 Ω to < 1 Ω	GBS G200 RW	ZBS ZWS ZWK AC AC-AT		VSGR ULDCR
AEC-Q200		AC-AT		
Green		ZBS ZWS ZWK AC AC-AT	VACR	VSGR ULDCR
MIL-PRF-26	RW			
Adjustable (E)	GBS E GWS E RW E	ZBS E ZWS E		
Non-Inductive (Ni)	GWS Ni RW Ni GWK Ni	ZWS Ni ZWK Ni AC Ni AC-AT Ni		ULDCR

POWER RESISTORS

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POWER RATING FOR STANDARD TYPES



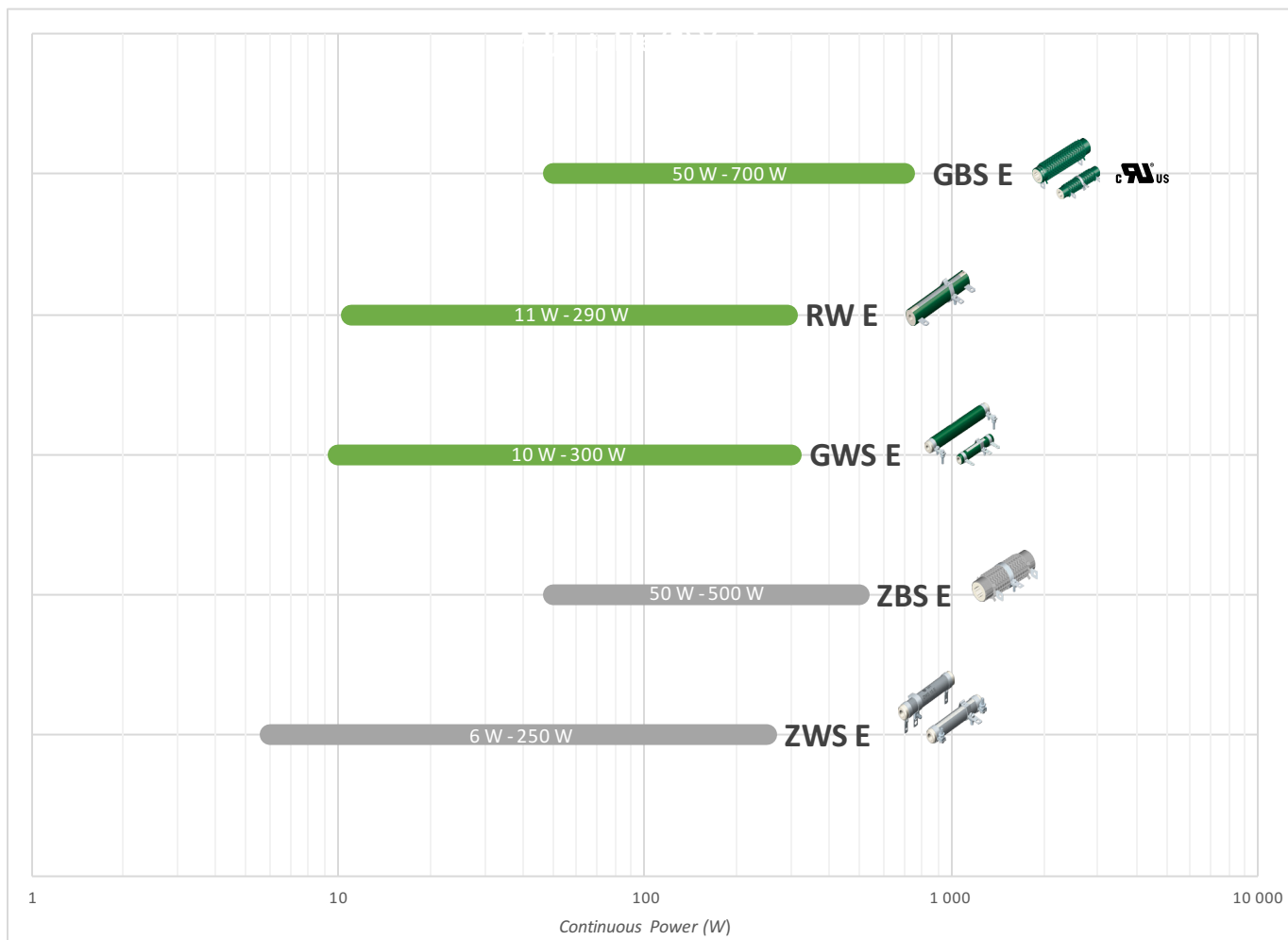
⁽¹⁾ High pulse load capability up to 3.5 MJ, designed to absorb and withstand short pulses of enormous loads



POWER RESISTORS

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POWER RATING FOR ADJUSTABLE (E) TYPES

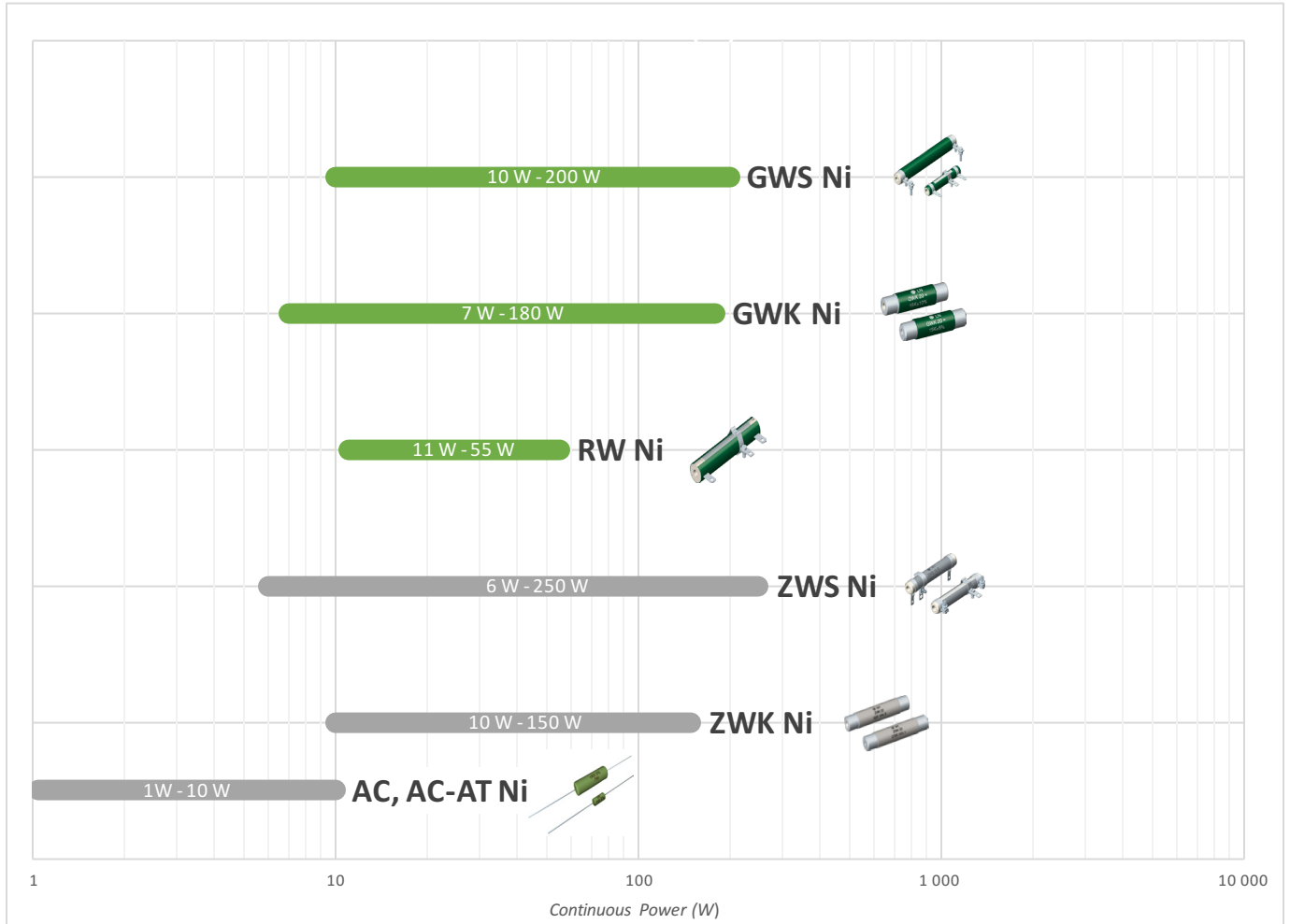




POWER RESISTORS

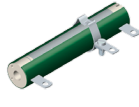
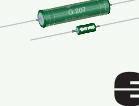
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POWER RATING FOR NON-INDUCTIVE (Ni) TYPES



POWER RESISTORS OVERVIEW

VITREOUS WIREWOUND RESISTORS

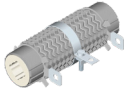
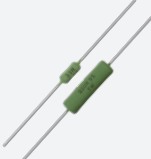
Series	Description	Features	Applications
GBS 	- Vitreous wirewound resistors corrugated ribbon - Power rating: 50 W - 1000 W - Resistance range: 0.10 Ω - 75 Ω - Tolerance: $\pm 5\%$ - $\pm 10\%$	- High power rating up to 1000 W - Excellent pulse load capability - Low ohmic values - Adjustable type (E) available - Corrugated ribbon construction for rapid cooling - Non-flammable / enhanced humidity protection	- Inrush current limiter - Capacitor charge / discharge - Snubber resistor - Brake resistor - Filter resistor
GWS 	- Vitreous wirewound resistors with lugs - Power rating: 10 W - 500 W - Resistance range: 3.3 Ω - 300 kΩ - Tolerance: $\pm 2\%$ - $\pm 10\%$ - Operating voltage Umax.: 250 V - 3000 V	- Lugs with various termination styles - Excellent pulse load capability - Adjustable type (E) available - Non-inductive type (Ni) available - Non-flammable / enhanced humidity protection	- Inrush current limiter - Capacitor charge / discharge - Snubber resistor - Brake resistor - Filter resistor
RW 	- Vitreous wirewound resistors acc. MIL-PRF-26 - Power rating: 11 W - 480 W - Resistance range: 0.39 Ω - 390 kΩ - Tolerance: $\pm 5\%$ - $\pm 10\%$ - Operating voltage Umax.: 120 V - 6000 V	- Very high operating voltage - Excellent pulse load capability - Models acc. to MIL-PRF-26 available - Adjustable type (E) available - Non-inductive type (Ni) available - Non-flammable / enhanced humidity protection	- Inrush current limiter - Capacitor charge / discharge - Snubber resistor - Brake resistor - Filter resistor - HVDC
GWK 	- Vitreous wirewound resistors with ferrules - Power rating: 7 W - 260 W - Resistance range: 1.8 Ω - 330 kΩ - Tolerance: $\pm 2\%$ - $\pm 10\%$ - Operating voltage Umax.: 280 V - 4000 V	- Excellent pulse load capability - Non-inductive type (Ni) available - Different caps options - Easy to change - Non-flammable / enhanced humidity protection	- Inrush current limiter - Capacitor charge / discharge - Snubber resistor - Brake resistor - Filter resistor - HVDC
G200 	- Axial vitreous leaded wirewound resistors - Power rating: 4 W - 17 W - Resistance range: 0.1 Ω - 120 kΩ - Tolerance: $\pm 2\%$ - $\pm 10\%$ - Operating voltage Umax.: 200 V - 650 V	- High power dissipation in a small design - Excellent pulse load capability - Completely welded construction - Vitreous coating - Non-flammable / enhanced humidity protection	- Inrush current limiter - Power supplies - Snubber resistor - Filter resistor
FDG, FDK, FDP 	- Axial vitreous leaded wirewound resistors - Power rating: 3.5 W - 11.5 W - Resistance range: 0.1 Ω - 68 kΩ - Tolerance: $\pm 2\%$ - $\pm 5\%$ - Operating voltage Umax.: 100 V - 350 V	- IECQ-CECC approved to CECC 40 201-801 - Established reliability, FRL E7 available - Excellent pulse load capability - Completely welded construction - Vitreous coating - Non-flammable / enhanced humidity protection	- Inrush current limiter - Power supplies - Snubber resistor - Filter resistor

POWER RESISTORS

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POWER RESISTORS OVERVIEW

CEMENTED WIREWOUND RESISTORS

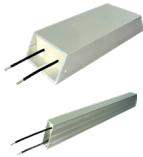
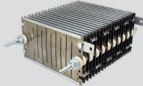
Series	Description	Features	Applications
ZBS 	- Cemented wirewound resistors corrugated ribbon - Power rating: 50 W - 500 W - Resistance range: 0.13 Ω - 75 Ω - Tolerance: $\pm 5\%$ - $\pm 10\%$	- All-welded construction - Power rating up to 500 W - Corrugated ribbon construction for rapid cooling - Adjustable type (E) available	- Inrush current limiter - Capacitor charge / discharge - Snubber resistor - Brake resistor - Filter resistor
ZWS 	- Cemented wirewound resistors with lugs - Power rating: 6 W - 250 W - Resistance range: 0.15 Ω - 620 kΩ - Tolerance: $\pm 2\%$ - $\pm 10\%$ - Operating voltage U_{max}: 100 V - 12 400 V	- Lugs with various termination styles - Excellent pulse load capability - Adjustable type (E) available - Non-inductive type (Ni) available - Non-flammable coating according to UL94 V-0	- Inrush current limiter - Capacitor charge / discharge - Snubber resistor - Brake resistor - Filter resistor
ZWK 	- Cemented wirewound resistors with ferrules - Power rating: 10 W - 150 W - Resistance range: 0.24 Ω - 360 kΩ - Tolerance: $\pm 2\%$ - $\pm 10\%$ - Operating voltage U_{max}: 470 V - 7400 V	- Excellent pulse load capability - High operating voltage up to 7350 V - Non-inductive type (Ni) available - Different caps options - Easy to change when mounted with spring clips - Non-flammable coating according to UL94 V-0	- Inrush current limiter - Capacitor charge / discharge - Snubber resistor - Brake resistor - Filter resistor - HVDC
AC, AC-AT 	- Cemented leaded wirewound resistors - Power rating: 1 W - 10 W - Resistance range: 0.1 Ω - 27 kΩ - Tolerance: $\pm 5\%$ - Operating voltage U_{max}: 50 V - 520 V	- AEC-Q200 qualified AC-AT series - High power dissipation in small design - Non-flammable coating according to UL94 V-0 - Excellent pulse load capability - Non-inductive type (Ni) available - WSZ-form for SMD Mounting	- Automotive electronics - Industrial electronics - Power supplies - White goods - Pre-charged / discharged applications

POWER RESISTORS

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POWER RESISTORS OVERVIEW

ALUMINIUM HOUSED & STAINLESS STEEL RESISTORS

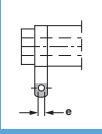
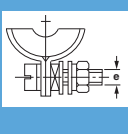
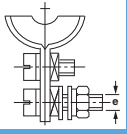
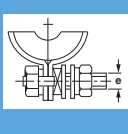
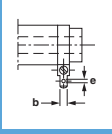
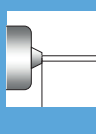
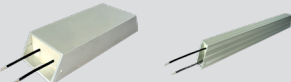
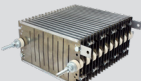
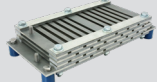
Series	Description	Features	Applications
VACR 	- Aluminum housed compact wirewound resistor - Power rating: 50 W - 500 W - Resistance range: 2.7 Ω - 1.8 kΩ - Tolerance $\pm$ 10 % - Operating voltage U_{max}: - UL 600 V / UL 1000 V - EN 1000 VDC	- Power rating up to 500 W - High overload capacity - Protection IP20 or IP65 - Enhanced humidity protection - Complete housed construction - Multiple construction for higher power rating - Heatsink mounting	- Drive controllers - Railway - Frequency inverter - Renewable energy - Brake resistor
VSGR 	- Stainless steel grid resistor - Power rating: 5000 W - 20 000 W - Resistance range: 0.1 Ω - 75 Ω - Tolerance: $\pm$ 10 % - Operating voltage U_{max}: - UL 600 V / UL 1000 V - EN 1000 VDC	- High power capability up to 20 kW at 40 °C - Operating temperature range: -25 °C to +250 °C - Protection IP00 to IP23	- Brake resistor - Filter resistor - Chopper resistor
ULDCR 	- Compact metal plate power resistor - Energy capability: up to 3.5 MJ - Resistance range: up to several Ω - Tolerance $\pm$ 5 %, $\pm$ 10 %	- Typical temperature rise below 350 K for single pulse at specified pulse current - Extremely robust and compact design - Salt Water resistant - No magnetic deformation - Customized design - Non-Inductive type (Ni) available	- Industrial - Alternative energy - Load dump resistor in wind turbines - Discharge resistor for bulk capacitors - Brake resistor - HVDC



POWER RESISTORS

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ELECTRICAL TERMINALS

	SL	SS	SB	SSB	FST	GDK	GZK	AXIAL
								
GBS	X							
GWS	X	X	X	X	X			
RW	X				X			
GWK						X	X	
G200								X ⁽¹⁾
FDG, FDK, FDP								X
ZBS	X							
ZWS	X	X	X	X	X			
ZWK						X	X	
AC, AC-AT								X ⁽¹⁾
VACR	 Crimped wires							
VSGR	 Customized electrical mounting (Standard M6 / M8 / M10)							
ULDCR	 Customized electrical mounting (Standard M10)							

Different mechanical mounting accessories are available, see the datasheet:

www.vishay.com/doc?21015

3D-Models are available on request, please inquire at

ww1resistors@vishay.com

⁽¹⁾ Various lead forms available:

- EK (single kink)



- DK (double kink)



- RT (radial taped)



- WSZ (Z-form)

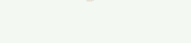
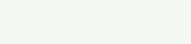
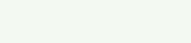
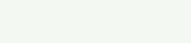
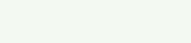
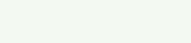
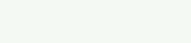




POWER RESISTORS

Vishay Draloric / Beyschlag

STANDARD TYPE - VITREOUS WIREWOUND RESISTORS

Series	Type	Rated Dissipation	Resistance Range	Operating Voltage U_{max}
GBS        	GBS 20 / 100	80 W	0.13 Ω to 6.2 Ω	22 V
	GBS 20 / 165	160 W	0.27 Ω to 12 Ω	44 V
	GBS 20 / 265	300 W	0.47 Ω to 22 Ω	81 V
	GBS 30 / 100	150 W	0.10 Ω to 8.2 Ω	35 V
	GBS 30 / 133	200 W	0.15 Ω to 12 Ω	49 V
	GBS 30 / 165	250 W	0.20 Ω to 16 Ω	63 V
	GBS 30 / 215	300 W	0.27 Ω to 24 Ω	85 V
	GBS 30 / 265	375 W	0.30 Ω to 27 Ω	101 V
	GBS 30 / 330	450 W	0.39 Ω to 36 Ω	125 V
	GBS 45 / 370	750 W	0.75 Ω to 56 Ω	205 V
	GBS 60 / 370	1000 W	0.91 Ω to 75 Ω	274 V
GWS            	GWS 15	15 W	4.3 Ω to 20 k Ω	250 V
	GWS 20	20 W	3.6 Ω to 30 k Ω	300 V
	GWS 25	25 W	3.6 Ω to 39 k Ω	300 V
	GWS 35	30 W	5.1 Ω to 47 k Ω	400 V
	GWS 50	40 W	3.3 Ω to 62 k Ω	400 V
	GWS 75	65 W	7.5 Ω to 130 k Ω	800 V
	GWS 100	80 W	6.8 Ω to 110 k Ω	600 V
	GWS 220	160 W	13 Ω to 160 k Ω	1250 V
	GWS 300	300 W	24 Ω to 300 k Ω	2500 V
	GWS 500	500 W	39 Ω to 270 k Ω	3000 V
	GWS 30 / 100	150 W	9.1 Ω to 100 k Ω	1600 V
	GWS 30 / 133	200 W	13 Ω to 160 k Ω	2300 V
GWK        	GWK 10	10 W	1.8 Ω to 16 k Ω	280 V
	GWK 20	20 W	2.2 Ω to 27 k Ω	400 V
	GWK 40	30 W	3.3 Ω to 43 k Ω	580 V
	GWK 60	40 W	6.2 Ω to 82 k Ω	850 V
	GWK 100	80 W	8.2 Ω to 82 k Ω	1200 V
	GWK 150	100 W	12 Ω to 110 k Ω	1600 V
	GWK 200	160 W	20 Ω to 180 k Ω	2300 V
	GWK 300	260 W	36 Ω to 330 k Ω	4000 V



POWER RESISTORS

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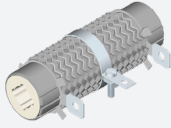
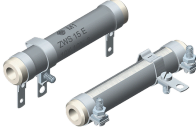
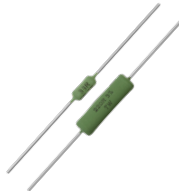
Series	Type	Rated Dissipation	Resistance Range	Operating Voltage U_{max}
RW 	RW 10 / 44	18 W	1.0 Ω to 36 k Ω	400 V
	RW 12 / 25	11 W	0.39 Ω to 13 k Ω	120 V
	RW 12 / 38	15 W	1.0 Ω to 33 k Ω	350 V
	RW 12 / 51	25 W	1.0 Ω to 56 k Ω	600 V
	RW 12 / 76	45 W	2.0 Ω to 91 k Ω	1000 V
	RW 20 / 76	70 W	1.0 Ω to 75 k Ω	1000 V
	RW 20 / 102	90 W	3.0 Ω to 110 k Ω	1400 V
	RW 30 / 102	130 W	2.7 Ω to 160 k Ω	1600 V
	RW 30 / 152	220 W	4.7 Ω to 200 k Ω	2500 V
	RW 30 / 203	300 W	6.8 Ω to 270 k Ω	3600 V
	RW 30 / 267	400 W	8.2 Ω to 390 k Ω	5000 V
	RW 30 / 305	480 W	10 Ω to 300 k Ω	6000 V
	RW 29	11 W	4.3 Ω to 5.6 k Ω	400 V
	RW 30	11 W	3.6 Ω to 2.7 k Ω	120 V
	RW 31	14 W	3.9 Ω to 6.8 k Ω	350 V
	RW 32	17 W	4.3 Ω to 10 k Ω	600 V
	RW 33	26 W	8.2 Ω to 18 k Ω	1000 V
	RW 35	55 W	18 Ω to 43 k Ω	1400 V
	RW 36	78 W	24 Ω to 56 k Ω	1600 V
	RW 37	113 W	33 Ω to 91 k Ω	2500 V
	RW 38	159 W	47 Ω to 150 k Ω	3600 V
	RW 47	210 W	75 Ω to 180 k Ω	5000 V
G200 	G202	4 W	0.10 Ω to 10 k Ω	200 V
	G204	7 W	0.10 Ω to 39 k Ω	350 V
	G206	13 W	0.15 Ω to 68 k Ω	500 V
	G207	17 W	0.20 Ω to 120 k Ω	650 V
FDG, FDK, FDP 	FDG	3.5 W	0.10 Ω to 10 k Ω	100 V
	FDK	6.5 W	0.10 Ω to 39 k Ω	200 V
	FDP	11.5 W	0.15 Ω to 68 k Ω	350 V



POWER RESISTORS

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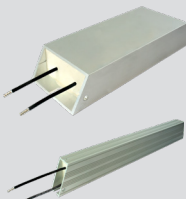
STANDARD TYPE - CEMENTED WIREWOUND RESISTOR

Series	Type	Rated Dissipation	Resistance Range	Operating Voltage U_{max}
ZBS 	ZBS 20 / 100	50 W	0.13 Ω to 6.2 Ω	18 V
	ZBS 20 / 165	100 W	0.27 Ω to 12 Ω	35 V
	ZBS 20 / 265	150 W	0.47 Ω to 22 Ω	57 V
	ZBS 30 / 100	75 W	0.1 Ω to 8.2 Ω	25 V
	ZBS 30 / 133	110 W	0.15 Ω to 12 Ω	36 V
	ZBS 30 / 165	150 W	0.20 Ω to 16 Ω	49 V
	ZBS 30 / 215	200 W	0.27 Ω to 24 Ω	69 V
	ZBS 30 / 265	250 W	0.30 Ω to 27 Ω	82 V
	ZBS 30 / 330	300 W	0.39 Ω to 36 Ω	104 V
	ZBS 45 / 370	375 W	0.75 Ω to 56 Ω	145 V
	ZBS 60 / 370	500 W	0.91 Ω to 75 Ω	194 V
ZWS 	ZWS 6	6 W	0.82 Ω to 13 k Ω	250 V
	ZWS 8	8 W	0.68 Ω to 20 k Ω	400 V
	ZWS 12	12 W	0.62 Ω to 27 k Ω	550 V
	ZWS 15	15 W	0.68 Ω to 33 k Ω	700 V
	ZWS 20	20 W	0.62 Ω to 43 k Ω	900 V
	ZWS 35	35 W	1.1 Ω to 82 k Ω	1500 V
	ZWS 50	50 W	1.3 Ω to 91 k Ω	2100 V
	ZWS 100	100 W	2.7 Ω to 200 k Ω	4450 V
	ZWS 150	150 W	4.7 Ω to 360 k Ω	7300 V
	ZWS 250	250 W	8.2 Ω to 620 k Ω	12400 V
	ZWS 30 / 100	75 W	2.4 Ω to 180 k Ω	3650 V
	ZWS 30 / 133	110 W	3.3 Ω to 240 k Ω	5100 V
ZWK 	ZWK 10	10 W	0.47 Ω to 22 k Ω	470 V
	ZWK 15	15 W	0.47 Ω to 33 k Ω	705 V
	ZWK 20	20 W	0.75 Ω to 51 k Ω	1010 V
	ZWK 40	40 W	1.5 Ω to 100 k Ω	2000 V
	ZWK 60	60 W	1.8 Ω to 130 k Ω	2800 V
	ZWK 90	90 W	2.7 Ω to 200 k Ω	4300 V
	ZWK 150	150 W	4.7 Ω to 360 k Ω	7400 V
AC, AC-AT 	AC01, AC01-AT	1 W	0.10 Ω to 2.4 k Ω	50 V
	AC03, AC03-AT	3 W	0.10 Ω to 5.1 k Ω	130 V
	AC04, AC04-AT	4 W	0.10 Ω to 6.8 k Ω	170 V
	AC05, AC05-AT	5 W	0.10 Ω to 10 k Ω	230 V
	AC07, AC07-AT	7 W	0.10 Ω to 15 k Ω	330 V
	AC10, AC10-AT	10 W	0.22 Ω to 27 k Ω	520 V

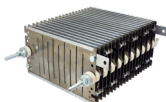
POWER RESISTORS

Vishay Draloric / Beyschlag

ALUMINIUM HOUSED COMPACT WIREWOUND RESISTOR

Series	Type	Rated Dissipation	Resistance Range	Protection	Permissible Operating Voltage U_{max}
VACR 	VACR0500	50 W	3.0 Ω to 560 Ω	IP65	UL 600 V / UL 1000 V
	VACR1000	100 W	3.0 Ω to 560 Ω	IP65	EN 1000 V DC
	VACR1001	100 W	2.7 Ω to 910 Ω	IP65	UL 600 V / UL 1000 V
	VACR1003	100 W	6.2 Ω to 1.2k Ω	IP65	UL 600 V / UL 1000 V
	VACR1202	120 W	4.7 Ω to 1.0k Ω	IP65	UL 600 V / UL 1000 V
	VACR1301	130 W	2.7 Ω to 910 Ω	IP65	EN 1000 V DC
	VACR1501	150 W	2.7 Ω to 910 Ω	IP20	UL 600 V / UL 1000 V
	VACR1502	150 W	4.7 Ω to 1.0 k Ω	IP65	EN 1000 V DC
	VACR1503	150 W	6.2 Ω to 1.2k Ω	IP65	EN 1000 V DC
	VACR1504	150 W	6.2 Ω to 1.2k Ω	IP65	UL 600 V / UL 1000 V
	VACR1505	150 W	9.1 Ω to 1.5 k Ω	IP65	UL 600 V / UL 1000 V
	VACR1804	180 W	6.2 Ω to 1.2 k Ω	IP65	EN 1000 V DC
	VACR1806	180 W	8.2 Ω to 1.8 k Ω	IP65	UL 600 V / UL 1000 V
	VACR2001	200 W	3.3 Ω to 910 Ω	IP20	EN 1000 V DC
	VACR2005	200 W	9.1 Ω to 1.5 k Ω	IP65	EN 1000 V DC
	VACR2502	250 W	4.7 Ω to 1.0 k Ω	IP20	UL 600 V / UL 1000 V
	VACR2506	250 W	8.2 Ω to 1.8 k Ω	IP65	EN 1000 V DC
	VACR3002	300 W	4.7 Ω to 1.0 k Ω	IP20	EN 1000 V DC
	VACR3004	300 W	6.2 Ω to 1.2 k Ω	IP20	UL 600 V / UL 1000 V
	VACR4004	400 W	6.2 Ω to 1.2 k Ω	IP20	EN 1000 V DC
	VACR4006	400 W	8.2 Ω to 1.8 k Ω	IP20	UL 600 V / UL 1000 V
	VACR5006	500 W	8.2 Ω to 1.8 k Ω	IP20	EN 1000 V DC

STAINLESS STEEL GRID RESISTOR

Series	Type	Rated Dissipation	Resistance Range	Protection	Permissible Operating Voltage U_{max}
VSGR 	VSGR050	5000 W	0.1 Ω to 54 Ω	IP00 to IP23	UL 600 V / 1000 V DC
	VSGR100	10000 W	0.2 Ω to 75 Ω	IP00 to IP23	UL 600 V / 1000 V DC
	VSGR150	15000 W	0.2 Ω to 51 Ω	IP00 to IP23	UL 600 V / 1000 V DC
	VSGR200	20000 W	0.3 Ω to 36 Ω	IP00 to IP23	UL 600 V / 1000 V DC

COMPACT METAL PLATE POWER RESISTOR

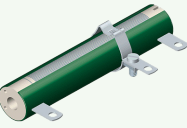
Series	Type	Pulse Energy E_p	Pulse Current I_p	Resistance	Temperature Coefficient	Inductance
ULDCR 	ULDCR00	1.35 MJ	9500 A	0.075 Ω	+1030 ppm/K	< 10 μ H
	ULDCR11	0.61 MJ	1300 A	0.090 Ω	+1030 ppm/K	< 10 μ H
	ULDCR12	0.76 MJ	1260 A	0.080 Ω	+1030 ppm/K	< 10 μ H
	ULDCR23	2.00 MJ	1000 A	0.500 Ω	+1030 ppm/K	< 15 μ H
	ULDCR25	2.00 MJ	1000 A	0.800 Ω	+1030 ppm/K	< 15 μ H



POWER RESISTORS

Vishay Draloric / Beyschlag

ADJUSTABLE TYPE - VITREOUS WIREWOUND RESISTORS

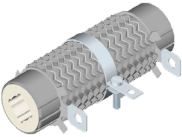
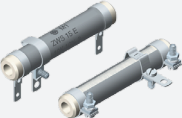
Series	Type	Rated Dissipation	Resistance Range	Operating Voltage U _{max.}
GBS E  	GBS 20 / 100 E	50 W	0.13 Ω to 6.2 Ω	18 V
	GBS 20 / 165 E	100 W	0.27 Ω to 12 Ω	35 V
	GBS 20 / 265 E	180 W	0.47 Ω to 22 Ω	63V
	GBS 30 / 100 E	90 W	0.10 Ω to 8.2 Ω	27 V
	GBS 30 / 133 E	120 W	0.15 Ω to 12 Ω	38 V
	GBS 30 / 165 E	150 W	0.20 Ω to 16 Ω	49 V
	GBS 30 / 215 E	200 W	0.27 Ω to 24 Ω	69 V
	GBS 30 / 265 E	250 W	0.30 Ω to 27 Ω	82 V
	GBS 30 / 330 E	350 W	0.39 Ω to 36 Ω	112 V
	GBS 45 / 370 E	550 W	0.75 Ω to 56 Ω	175 V
	GBS 60 / 370 E	700 W	0.91 Ω to 75 Ω	229 V
GWS E 	GWS 15 E	10 W	4.3 Ω to 620 Ω	250 V
	GWS 20 E	15 W	4.3 Ω to 1.0 k Ω	300 V
	GWS 25 E	18 W	5.1 Ω to 1.3 k Ω	300 V
	GWS 35 E	22 W	6.8 Ω to 1.6 k Ω	400 V
	GWS 50 E	30 W	8.2 Ω to 2.0 k Ω	400 V
	GWS 75 E	45 W	18 Ω to 3.9 k Ω	800 V
	GWS 100 E	60 W	13 Ω to 5.1 k Ω	600 V
	GWS 220 E	120 W	30 Ω to 10 k Ω	1250 V
	GWS 300 E	200 W	56 Ω to 20 k Ω	2500 V
	GWS 500 E	300 W	100 Ω to 36 k Ω	3000 V
	GWS 30 / 100 E	110 W	22 Ω to 8.2 k Ω	1600 V
	GWS 30 / 133 E	130 W	36 Ω to 13 k Ω	2300 V
RW E 	RW 10 / 44 E	11 W	1.0 Ω to 1.6 k Ω	400 V
	RW 12 / 38 E	14 W	4.3 Ω to 1.5 k Ω	350 V
	RW 12 / 51 E	17 W	1.0 Ω to 2.4 k Ω	600 V
	RW 12 / 76 E	27 W	2.0 Ω to 4.3 k Ω	1000 V
	RW 20 / 76 E	42 W	1.0 Ω to 6.8 k Ω	1000 V
	RW 20 / 102 E	55 W	3.0 Ω to 10 k Ω	1400 V
	RW 30 / 102 E	80 W	2.7 Ω to 15 k Ω	1600 V
	RW 30 / 152 E	130 W	4.7 Ω to 24 k Ω	2500 V
	RW 30 / 203 E	180 W	6.8 Ω to 36 k Ω	3600 V
	RW 30 / 267 E	240 W	8.2 Ω to 47 k Ω	5000 V
	RW 30 / 305 E	290 W	10 Ω to 56 k Ω	6000 V



POWER RESISTORS

Vishay Draloric / Beyschlag

ADJUSTABLE TYPE - CEMENTED WIREWOUND RESISTORS

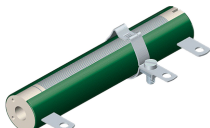
Series	Type	Rated Dissipation	Resistance Range	Operating Voltage U _{max.}
ZBS E 	ZBS 20 / 100 E	50 W	0.13 Ω to 6.2 Ω	18 V
	ZBS 20 / 165 E	100 W	0.27 Ω to 12 Ω	35 V
	ZBS 20 / 265 E	150 W	0.47 Ω to 22 Ω	57 V
	ZBS 30 / 100 E	75 W	0.10 Ω to 8.2 Ω	25 V
	ZBS 30 / 133 E	110 W	0.15 Ω to 12 Ω	36 V
	ZBS 30 / 165 E	150 W	0.20 Ω to 16 Ω	49 V
	ZBS 30 / 215 E	200 W	0.27 Ω to 24 Ω	69 V
	ZBS 30 / 265 E	250 W	0.30 Ω to 27 Ω	82 V
	ZBS 30 / 330 E	300 W	0.39 Ω to 36 Ω	104 V
	ZBS 45 / 370 E	375 W	0.75 Ω to 56 Ω	145 V
	ZBS 60 / 370 E	500 W	0.91 Ω to 75 Ω	194 V
ZWS E 	ZWS 6 E	6 W	0.82 Ω to 4.7 k Ω	150 V
	ZWS 8 E	8 W	0.62 Ω to 6.8 k Ω	200 V
	ZWS 12 E	12 W	0.56 Ω to 9.1 k Ω	300 V
	ZWS 15 E	15 W	0.68 Ω to 11 k Ω	400 V
	ZWS 20 E	20 W	0.62 Ω to 15 k Ω	500 V
	ZWS 35 E	35 W	1.1 Ω to 27 k Ω	950 V
	ZWS 50 E	50 W	1.3 Ω to 33 k Ω	1250 V
	ZWS 100 E	100 W	2.7 Ω to 68 k Ω	2600 V
	ZWS 150 E	150 W	4.7 Ω to 120 k Ω	4200 V
	ZWS 250 E	250 W	8.2 Ω to 220 k Ω	7400 V
	ZWS 30 / 100 E	75 W	2.4 Ω to 56 k Ω	2000 V
	ZWS 30 / 133 E	110 W	3.3 Ω to 82 k Ω	3000 V



POWER RESISTORS

Vishay Draloric / Beyschlag

NON-INDUCTIVE TYPE - VITREOUS WIREWOUND RESISTORS

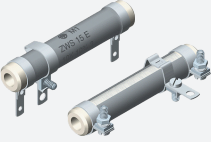
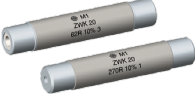
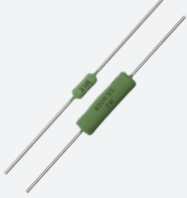
Series	Type	Rated Dissipation	Resistance Range	Operating Voltage U _{max.}
GWS Ni 	GWS 15 Ni	10 W	5.1 Ω to 910 Ω	250 V
	GWS 20 Ni	15 W	5.1 Ω to 1.3 kΩ	300 V
	GWS 25 Ni	18 W	6.8 Ω to 1.8 kΩ	300 V
	GWS 35 Ni	22 W	8.2 Ω to 2.4 kΩ	400 V
	GWS 50 Ni	30 W	10 Ω to 3.0 kΩ	400 V
	GWS 75 Ni	45 W	22 Ω to 6.2 kΩ	800 V
	GWS 100 Ni	60 W	24 Ω to 6.8 kΩ	600 V
	GWS 220 Ni	120 W	51 Ω to 16 kΩ	1250 V
	GWS 300 Ni	200 W	100 Ω to 30 kΩ	2500 V
RW Ni 	RW 10 / 44 Ni	11 W	6.2 Ω to 2.4 kΩ	400 V
	RW 12 / 38 Ni	14 W	5.6 Ω to 2.2 kΩ	350 V
	RW 12 / 51 Ni	17 W	9.1 Ω to 3.6 kΩ	600 V
	RW 12 / 76 Ni	27 W	16 Ω to 6.2 kΩ	1000 V
	RW 20 / 76 Ni	42 W	24 Ω to 10 kΩ	1000 V
	RW 20 / 102 Ni	55 W	36 Ω to 15 kΩ	1400 V
GWK Ni 	GWK 10 Ni	7 W	2.4 Ω to 1.0 kΩ	280 V
	GWK 20 Ni	13 W	4.7 Ω to 1.8 kΩ	400 V
	GWK 40 Ni	20 W	6.8 Ω to 2.7 kΩ	580 V
	GWK 60 Ni	25 W	13 Ω to 5.1 kΩ	850 V
	GWK 100 Ni	50 W	27 Ω to 10 kΩ	1200 V
	GWK 150 Ni	60 W	36 Ω to 15 kΩ	1600 V
	GWK 200 Ni	100 W	56 Ω to 22 kΩ	2300 V
	GWK 300 Ni	180 W	100 Ω to 43 kΩ	4000 V



POWER RESISTORS

Vishay Draloric / Beyschlag

NON-INDUCTIVE TYPE - CEMENTED WIREWOUND RESISTORS

Series	Type	Rated Dissipation	Resistance Range	Operating Voltage U _{max.}
ZWS Ni 	ZWS 6 Ni	6 W	0.15 Ω to 2.4 k Ω	100 V
	ZWS 8 Ni	8 W	0.24 Ω to 3.6 k Ω	150 V
	ZWS 12 Ni	12 W	0.33 Ω to 5.1 k Ω	200 V
	ZWS 15 Ni	15 W	0.39 Ω to 6.2 k Ω	300 V
	ZWS 20 Ni	20 W	0.47 Ω to 8.2 k Ω	400 V
	ZWS 35 Ni	35 W	0.91 Ω to 15 k Ω	700 V
	ZWS 50 Ni	50 W	1.1 Ω to 16 k Ω	850 V
	ZWS 100 Ni	100 W	2.2 Ω to 33 k Ω	1800 V
	ZWS 150 Ni	150 W	3.9 Ω to 62 k Ω	3000 V
	ZWS 250 Ni	250 W	6.8 Ω to 110 k Ω	5200 V
	ZWS 30 / 100 Ni	75 W	2.0 Ω to 30 k Ω	1500 V
	ZWS 30 / 133 Ni	110 W	2.7 Ω to 43 k Ω	2150 V
ZWK Ni 	ZWK 10 Ni	10 W	0.24 Ω to 3.9 k Ω	200 V
	ZWK 15 Ni	15 W	0.36 Ω to 5.6 k Ω	300 V
	ZWK 20 Ni	20 W	0.56 Ω to 9.1 k Ω	450 V
	ZWK 40 Ni	40 W	1.1 Ω to 18 k Ω	850 V
	ZWK 60 Ni	60 W	1.5 Ω to 24 k Ω	1200 V
	ZWK 90 Ni	90 W	2.2 Ω to 36 k Ω	1800 V
	ZWK 150 Ni	150 W	3.9 Ω to 62 k Ω	3050 V
AC Ni, AC-AT Ni 	AC01 Ni, AC01-AT Ni	1 W	0.10 Ω to 2.4 k Ω	50 V
	AC03 Ni, AC03-AT Ni	3 W	0.10 Ω to 5.1 k Ω	130 V
	AC04 Ni, AC04-AT Ni	4 W	0.10 Ω to 6.8 k Ω	170 V
	AC05 Ni, AC05-AT Ni	5 W	0.10 Ω to 10 k Ω	230 V
	AC07Ni, AC07-AT Ni	7 W	0.10 Ω to 15 k Ω	330 V
	AC10Ni, AC10-AT Ni	10 W	0.22 Ω to 27 k Ω	520 V



POWER RESISTORS

Vishay Draloric / Beyschlag

Vishay Intertechnology – A Global Industry Leader

Vishay Intertechnology components are used in virtually all types of electronic devices and equipment, in the industrial, computing, automotive, consumer, telecommunications, military, aerospace, power supplies, and medical markets. Vishay has manufacturing plants in the Americas, Asia, Europe, and Israel, as well as sales offices worldwide. Vishay Intertechnology has a diverse portfolio of semiconductors and passive components, including diodes, MOSFETs (metal-oxide semiconductor field-effect transistors), optoelectronic products, selected integrated circuits (ICs), resistors, inductors, and capacitors. This enables it to provide “one-stop shop” service and offer many different parts for each customer design. Its innovations in technology, successful acquisition strategy, superior product quality, and “one-stop shop” service to customers have made the Company a global industry leader.

www.vishay.com

Two of the most important manufacturers of fixed film resistors are the Vishay Draloric and the Vishay Beyschlag brands.

About Draloric

In 1900, in Germany, Mr. Philip Rosenthal, as a sideline to his established business of porcelain tableware, started to manufacture ceramics for electronic applications. Starting in 1910, these were also made in Selb, Germany. In 1936, this electronic ceramics activity was separated from Rosenthal AG and made part of a joint venture with AEG named Rosenthal Isolatoren GmbH, or “RIG.”

The RIG name lasted until 1974, when AEG took over all of RIG and renamed it “CRL” because of its portfolio of passive components. The name was changed again in 1974 to Draloric Electronic GmbH. With the acquisition of Draloric Electronic GmbH by the electronics division of Corning Glass Works in 1981, the name was changed to Corning-Draloric, which lasted until its acquisition by Vishay Intertechnology in 1987.

Vishay Draloric is a leading brand for MELF resistors and ceramic capacitor products. The Vishay Draloric product portfolio also includes thin film flat chip resistors, leaded film and wirewound resistors, and large ceramic power capacitors. As part of Vishay Intertechnology, Draloric Electronic has had production sites in Israel since 1989, and in the Czech Republic since 1991.

Draloric competitors Roederstein GmbH (resistors and capacitors), and Vitramon GmbH (capacitors only) were acquired by Vishay Intertechnology in 1993 and 1994, respectively, and merged with Draloric Electronic GmbH, which has its headquarters in Selb. Since then, the name Vishay Draloric has been used as a brand name for resistor products.

Visit us at: <http://www.vishay.com/company/brands/draloric>