EPCOS Product Brief 2016

Energy Varistors

for the Protection of Power Distribution Systems

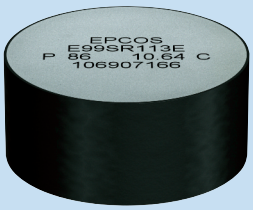
SIOV metal oxide varistors in the E series are designed to be used as active elements in gapless surge arresters for protection of medium and high voltage AC power utility distribution systems against overvoltages. Glass collar passivation makes this series suitable for a broad range of arrester designs such as porcelain housed arresters, or polymer housed arresters with a hollow insulator as well as for molded polymer arresters. The broad range of diameters supports the different class requirements according IEC and ANSI.

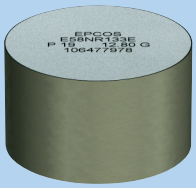
Construction

- Glass passivated collar
- Aluminum termination for pressure contact

Features

- Disk diameter of 32 to 99 mm
- Disk height up to 44 mm
- Stackable for higher voltage ratings
- Based on IEC 60099-4 and ANSI/IEEE C62.11
- Arrester blocks for distribution class
- Arrester blocks for station class





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Energy Varistors: Distribution Class

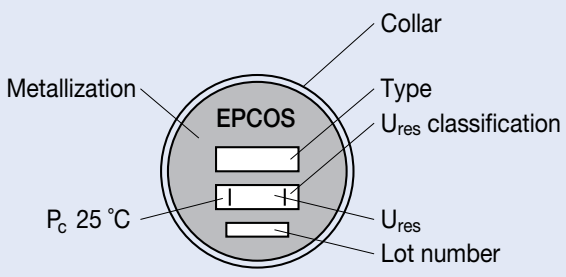
Technical data



Type		E32VR302S	E32VR502S	E32VR602S	E41NR302E	E41NR502E	E41VR602	
Ordering code		B72232 E0302R078	B72232 E0502R078	B72232 E0602R078	B72241 E0302R026	B72241 E0502R026	B72241 E0602R018	Unit
Dimensions								
Diameter	Ø	32 ± 1	32 ± 1	32 ± 1	41.9 ± 0.7	41.9 ± 0.7	41.9 ± 0.7	mm
Height	h	17.7 ± 0.6	29.6 ± 0.6	39.5 ± 0.6	19.5 ± 0.6	29.4 ± 0.6	41.0 ± 0.6	mm
Arresters classification								
Suggested usage in gapless arrester constructions based on IEC 60099-4		5	5	5	10	10	10	kA
Line discharge class								
Suggested usage in gapless arrester constructions based on IEC 60099-4		–	–	–	1	1	1	–
Characteristics								
Suggested rated voltage (max.)	U_r	3	5	6	3	5	6	kV
Continuous operating voltage (max.)	U_c	2.45	4.1	4.9	2.45	4.1	4.9	kV
Reference current	I_{ref}	1	1	1	2	2	2	mA
Reference voltage (min.)	U_{ref}	3	5	6	2.75	4.6	6	kV
Residual voltage at I_n	U_{res}	7.55 ... 8.55	12.55 ... 14.25	15.05 ... 17.05	7.35 ... 8.25	12.25 ... 13.75	15.05 ... 17.05	kV
Nominal discharge current (8/20 µs)	I_n	5	5	5	10	10	10	kA
High current impulse (4/10 µs)[1]		65	65	65	100	100	100	kA
Long duration current impulse (2 ms)		150	150	150	400	400	325	A
Max. resistive power dissipation at U_c	P_c	0.18	0.3	0.35	0.27	0.45	0.5	W
Approx. weight/pcs.		80	130	180	150	225	310	g
Packing unit		50	25	25	20	20	20	pcs.

[1] Secondary insulation required for E32/E41 types

Marking

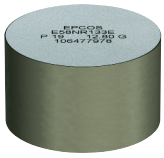


Explanation example for Type E41NR302E

P_c	Resistive power dissipation at maximum continous operating voltage and 25 °C in 10^{-2} W e.g. P 09 = $P_c = 9 \cdot 10^{-2}$ W = 0.09 W
U_{res} (I_n)	Measured residual voltage at nominal discharge current I_n = 10 kA in kV e.g. 7.42 = 7.42 kV
U_{res} (I_n) classification	Residual voltage is classified in 100 V steps and identified by a letter e.g. A

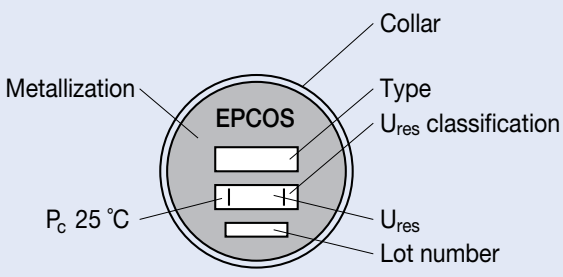
Energy Varistors: Station Class

Technical data



Type		E48NR113E	E48NR133E	E58NR133E	
Ordering code		B72248 E0113S072	B72248 E0133S072	B72258 E0133S072	Unit
Dimensions					
Diameter	Ø	48 ± 1	48 ± 1	59.7 ± 1	mm
Height	h	30.5 ± 0.6	35.4 ± 0.6	35.4 ± 0.6	mm
Arresters classification					
Suggested usage in gapless arrester constructions based on IEC 60099-4		10	10	10	kA
Line discharge class					
Suggested usage in gapless arrester constructions based on IEC 60099-4		2	2	3	–
Characteristics					
Suggested rated voltage (max.)	U_r	0.385 x U_{res}	0.385 x U_{res}	0.415 x U_{res}	kV
Continuous operating voltage (max.)	U_c	U_{res} / 3.2	U_{res} / 3.2	U_{res} / 3.0	kV
Reference current	I_{ref}	2	2	3	mA
Reference voltage (min.)	U_{ref}	0.385 x U_{res}	0.385 x U_{res}	0.415 x U_{res}	kV
Residual voltage at I_n	U_{res}	10.65 ... 12.55	12.65 ... 14.25	12.15 ... 13.75	kV
Nominal discharge current (8/20 µs)	I_n	10	10	10	kA
High current impulse (4/10 µs)		100	100	100	kA
Long duration current impulse (2 ms)		680	680	1000	A
Max. resistive power dissipation at U_c	P_c	0.26	0.3	0.4	W
Approx. weight/pcs.		310	350	550	g
Packing unit		12	12	8	pcs.

Marking



Explanation example for Type E58NR133E

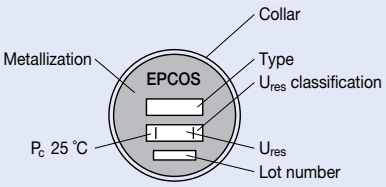
P_c	Resistive power dissipation at maximum continous operating voltage and 25 °C in 10^{-2} W e.g. P 09 = $P_c = 9 \cdot 10^{-2}$ W = 0.09 W
U_{res} (I_n)	Measured residual voltage at nominal discharge current I_n = 10 kA in kV e.g. 12.19 = 12.19 kV
U_{res} (I_n) classification	Residual voltage is classified in 100 V steps and identified by a letter e.g. A

Energy Varistors: Station Class

Technical data

Type	E70NR133E	E78SR392E	E78SR123E	E99SR113E	
Ordering code	B72270 E0133S072	B72278 E0392S003	B72278 E0123S003	B72299 E0113S003	Unit
Dimensions					
Diameter Ø	70 ± 1	78 ± 1	78 ± 1	98.8 ± 1.2	mm
Height h	35.4 ± 0.6	14.5 ± 0.6	44 ± 0.6	44 ± 0.6	mm
Arresters classification					
Suggested usage in gapless arrester constructions based on IEC 60099-4	20	20	20	–	kA
Line discharge class					
Suggested usage in gapless arrester constructions based on IEC 60099-4	4	5	5	–	–
Characteristics					
Suggested rated voltage (max.) U_r	0.425 x U_{res} (10 kA)	0.423 x U_{res} (10 kA)	0.431 x U_{res} (10 kA)	0.444 x U_{res} (10 kA)	kV
Continuous operating voltage (max.) U_c	U_{res} (10 kA)/2.9	U_{res} (10 kA)/2.9	U_{res} (10 kA)/2.9	U_{res} (10 kA)/2.9	kV
Reference current I_{ref}	5	5	5	5	mA
Reference voltage (min.) U_{ref}	0.425 x U_{res} (10 kA)	0.423 x U_{res} (10 kA)	0.431 x U_{res} (10 kA)	0.444 x U_{res} (10 kA)	kV
Measured residual voltage U_{res} (10 kA)	11.85 … 13.45	3.55 … 4.15	10.65 … 12.35	10.35 … 12.05	kV
Residual voltage at I_n U_{res}	12.65 ... 14.55	3.83 ... 4.52	11.50 ... 13.45	11.10 ... 13.00	kV
Nominal discharge current (8/20 µs) I_n	20	20	20	20	kA
High current impulse (4/10 µs)	100	100	100	100	kA
Long duration current impulse (2 ms)	1500	1500	1500	2100	A
Max. resistive power dissipation at U_c P_c	0.5	0.35	0.95	1.5	W
Approx. weight/pcs.	760	390	1180	1890	g
Packing unit	5	15	5	4	pcs.

Marking



Explanation example for Type E99SR113E

P_c	Resistive power dissipation at maximum continous operating voltage and 25 °C in 10^{-2} W, e.g. P 89 = P_c = 89 · 10^{-2} W = 0.89 W
U_{res} (10 kA)	Measured residual voltage at discharge current I = 10 kA in kV, e.g. 10.64 = 10.64 kV
U_{res} (10 kA) classification	Residual voltage is classified in 100 V steps and identified by a letter, e.g. C

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