

### **EPCOS Product Brief 2013**

# **Energy Varistors SIOV-E**

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
- Flame-sprayed 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







### Energy Varistors SIOV-E: Distribution Class

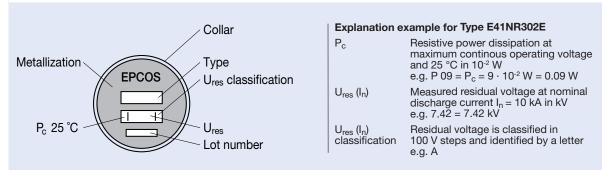
#### **Technical data**

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Туре		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	$17.7 \pm 0.6$	$29.6\pm0.6$	$39.5 \pm 0.6$	$19.5 \pm 0.6$	$29.4 \pm 0.6$	$41.0 \pm 0.6$	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.)	Ur	3	5	6	3	5	6	kV
Continuous operating voltage (max.)	Uc	2.45	4.1	4.9	2.45	4.1	4.9	kV
Reference current	I <sub>ref</sub>	1	1	1	2	2	2	mA
Reference voltage (min.)	U <sub>ref</sub>	3	5	6	2.75	4.6	6	kV
Residual voltage at I <sub>n</sub>	U <sub>res</sub>	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 <sub>n</sub>	5	5	5	10	10	10	kA
High current impulse (4/10 µs	S) <sup>1</sup>	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 $U_{\rm c}$	Pc	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.

<sup>1</sup> Secondary insulation required for E32/E41 types

#### Marking



## Energy Varistors SIOV-E: Station Class

#### **Technical data**

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Туре		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	$35.4 \pm 0.6$	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.)	Ur	0.385 x U <sub>res</sub>	0.385 x U <sub>res</sub>	0.415 x U <sub>res</sub>	kV
Continuous operating voltage (max.)	Uc	U <sub>res</sub> /3.2	U <sub>res</sub> /3.2	U <sub>res</sub> /3.0	kV
Reference current	I <sub>ref</sub>	2	2	3	mA
Reference voltage (min.)	U <sub>ref</sub>	0.385 x U <sub>res</sub>	0.385 x U <sub>res</sub>	0.415 x U <sub>res</sub>	kV
Residual voltage at In	U <sub>res</sub>	10.65 12.55	12.65 14.25	12.15 13.75	kV
Nominal discharge current (8/20 µs)	I <sub>n</sub>	10	10	10	kA
High current impulse (4/10 µs	s)	100	100	100	kA
Long duration current impulse (2 ms)		680	680	1000	A
Max. resistive power dissipation at $U_c$	Pc	0.26	0.3	0.4	W
Approx. weight/pcs.		310	350	550	g
Packing unit		12	12	8	pcs.

Marking

∠ Collar	Explanation example for Type E58NR133E		
Metallization Type Ures classification	P <sub>c</sub>	Resistive power dissipation at maximum continous operating voltage and 25 °C in $10^{-2}$ W e.g. P 09 = P <sub>c</sub> = 9 · $10^{-2}$ W = 0.09 W	
	U <sub>res</sub> (I <sub>n</sub> )	Measured residual voltage at nominal discharge current $I_n = 10 \text{ kA}$ in kV e.g. 12.19 = 12.19 kV	
P <sub>c</sub> 25 °C U <sub>res</sub> Lot number	U <sub>res</sub> (I <sub>n</sub> ) classification	Residual voltage is classified in 100 V steps and identified by a letter e.g. A	

### Energy Varistors SIOV-E: Station Class

#### **Technical data**

		ECODS EXPORTS Voceresor	P age series	28 1034 1064 1066	
Туре	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		1	1	1	1
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.) Ur	0.425 x U <sub>res</sub> (10 kA)	0.423 x U <sub>res</sub> (10 kA)	0.431 x U <sub>res</sub> (10 kA)	0.444 x U <sub>res</sub> (10 kA)	kV
Continuous operating U <sub>c</sub> voltage (max.)	U <sub>res</sub> (10 kA)/2.9	kV			
Reference current I <sub>ref</sub>	5	5	5	5	mA
Reference voltage (min.) U <sub>ref</sub>	0.425 x U <sub>res</sub> (10 kA)	0.423 x U <sub>res</sub> (10 kA)	0.431 x U <sub>res</sub> (10 kA)	0.444 x U <sub>res</sub> (10 kA)	kV
Measured residual U <sub>res</sub> (10 kA) voltage	11.85 13.45	3.55 4.15	10.65 12.35	10.35 12.05	kV
Residual voltage at I <sub>n</sub> U <sub>res</sub>	12.65 14.55	3.83 4.52	11.50 13.45	11.10 13.00	kV
Nominal discharge current I <sub>n</sub> (8/20 µs)	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
$\begin{array}{ll} \text{Max. resistive power} & P_{c} \\ \text{dissipation at } U_{c} \end{array}$	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

Collar	Explanation example for Type E99SR113E			
Metallization Type	Pc	Resistive power dissipation at maximum continous operating voltage and 25 $^{\circ}C$ in 10 $^{-2}$ W, e.g. P 89 = P <sub>c</sub> = 89 $\cdot$ 10 $^{-2}$ W = 0.89 W		
	U <sub>res</sub> (10 kA)	Measured residual voltage at discharge current I = 10 kA in kV, e.g. 10.64 = 10.64 kV		
P <sub>c</sub> 25 °C U <sub>res</sub> Lot number	U <sub>res</sub> (10 kA) classification	Residual voltage is classified in 100 V steps and identified by a letter, e.g. C		

Important information: Some parts of this publication contain statements about the suitability of our products for certain areas of application. These statements are based on our knowledge of typical requirements that are often placed on our products. We expressly point out that these statements cannot be regarded as binding statements about the suitability of our products for a particular customer application. It is incumbent on the customer to check and decide whether a product is suitable for use in a particular application. This publication is only a brief product survey which may be changed from time to time. Our products are described in detail in our data sheets. The Important notes (www.epcos.com/ImportantNotes) and the product-specific Cautions and warnings must be observed. All relevant information is available through our sales offices.

