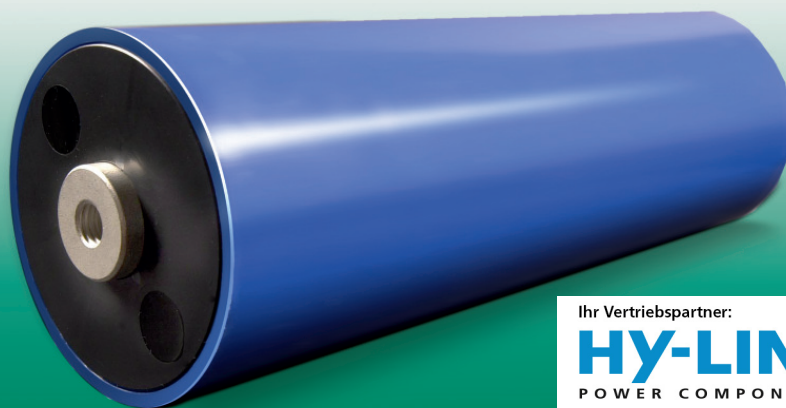


# DSC™ – WHO SAID IT HAS TO LOOK LIKE A SURGE CAPACITOR?

Keeping with its tradition of completely dry products, ELECTRONICON has launched the first MV Surge Capacitor in self-healing technology. The DSC™ surge voltage protection capacitor („surge capacitor“) is the ideal solution for limiting transient overvoltages. In combination with the PD-free layout, the self-healing dielectric provides for extremely long operating life and highest operational safety. Thanks to the solid polyurethane filling, the DSC™ can be installed in any mounting position. Moreover, there are no liquids to threaten the environment or to be considered during disposal at the end of operational life.

With their uncomplicated terminals and the plastic housing, our surge capacitors do not only have a completely different optical appearance than traditional oil-filled ALLFILM capacitors, but also offer substantial savings in weight, space and cost. Consider this: a DSC™ 0.25 $\mu$ F / 12kV weighs 4.1kg compared to a whopping 15kg of market-common capacitors.

Utility model registered and protected by German Patent and Trade Mark Office (DPMA) under file no. 20 2010 009 760.6.



Ihr Vertriebspartner:

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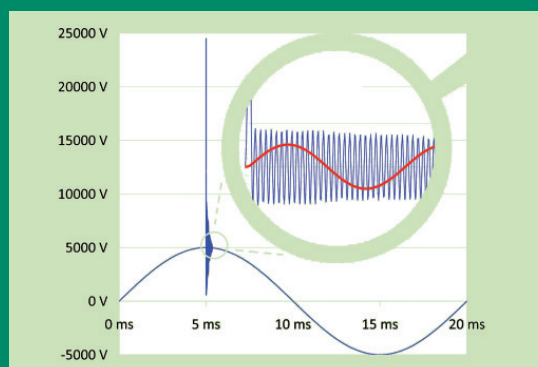
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## SURGE CAPACITORS - A USEFUL ADD-ON, SAVING COST

Sooner or later in their operating life, medium voltage motors and transformers are confronted with transient overvoltages. These glitches are caused either by simple switching operations in the medium-voltage mains, or by atmospheric discharges. Such impulses are called „surge“ and have a rise time of no more than a few microseconds, exceeding a multiple of the rated mains voltage within that short period. The first winding turn of an electrical machine is stressed very heavily by the very steep voltage rise. This sole winding's thin insulation is then the only protection from a voltage breakdown and - hence - failure of the entire equipment.

Surge capacitors are able to smoothen voltage surges provoked by switching operations. The - properly sized - capacitance absorbs the major part of the electrical charge when the overvoltage occurs, and discharges it soon afterwards. Hereby the overvoltage is attenuated to ca. 10% of its maximum level. Simultaneously, this limits the rate of voltage rise, splitting the reduced overvoltage over substantially more winding turns than before; no winding insulation is overloaded by extreme overvoltages anymore.

Surge capacitors are permanently connected to the mains and instantly available without any switching delays in the event of a fault situation. It is recommended to use additional overvoltage arresters for the damping of heavy current pulses of 100kA or more (as are typical for lightning discharges).

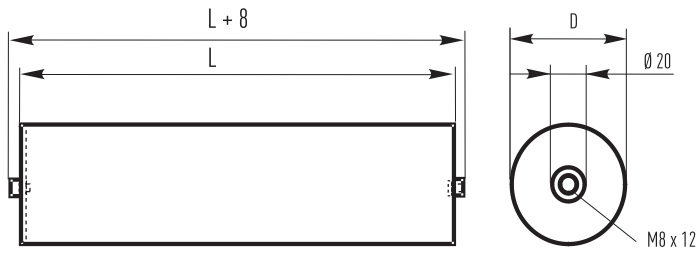


Voltage shape with surge at an MV transformer

red:  
Line voltage with 0.5 $\mu$ F capacitor

According to a study published on an IEEE-conference in 1995, the additional cost and space spent on surge capacitors are well worth the extra expense (approx. 15 - 20% of the motor cost): an alternative over-sizing of the initial motor or transformer windings for enhanced strength against transient over-voltages would require a bigger winding window which would imply a larger machine and a cost increase by approx. 35...50%.

## DRAWING



Dry design - no liquids!



Self-healing dielectric



Built-in discharge resistor

## TECHNICAL DATA

standard .....	tested according to IEC 60871-1
can .....	plastic (UL94: V0)
dielectric material .....	low-loss polypropylene, dry dielectric
filling material .....	solid, based on vegetable oil, non-PCB
humidity class .....	F
mounting position .....	optional
internal protection .....	none
discharge resistor .....	internal; $\leq 75V$ in $\leq 2min$
fire load .....	40MJ/kg
degree of protection .....	IP 00
clearance in air/creepage distance .....	D+L-20mm
$C_N$ tolerance .....	$\pm 10\%$

permitted overvoltages	
8h/d .....	$1.10 \times U_N$
30min/d .....	$1.15 \times U_N$
5min/d .....	$1.20 \times U_N$
1min/d .....	$1.30 \times U_N$
test voltage between terminals .....	$2.15 \times U_N$ 50Hz (10s)
insulation strength .....	5000 s
dissipation losses (capacitor) .....	0.2 W / kvar
operating temperature .....	-40 / +60 °C
storing temperature .....	-40 / +70 °C
statistical life expectancy .....	> 150 000 h

$U_N$ (kV)	$C_N$ ( $\mu F$ )	$I_N$ (A)	$I_S$ (kA)	$U_S$ (kV)	D × L (mm)	m (kg)	order no. Bestell-Nr.
3.3	0.1	0.10	0.6	14	64 × 165	0.6	E93.L16-101R20
3.6	0.25	0.28	1.0	14	90 × 165	1.1	E93.P16-251R20
6.6	0.1	0.21	1.3	26	90 × 285	1.9	E93.P28-101R20
6.6	0.1	0.21	0.8	26	64 × 385	1.3	E93.L38-101R20
7.2	0.25	0.57	2.8	29	116 × 285	3.2	E93.R28-251R20
7.2	0.25	0.57	1.4	29	90 × 385	2.6	E93.P38-251R20
12	0.1	0.38	1.2	48	90 × 385	2.6	E93.P38-101R20
12	0.1	0.38	1.7	48	64 × 620	2.1	E93.L62-101R20
12	0.25	0.94	3.2	48	116 × 385	4.3	E93.R38-251R20
12	0.25	0.94	2.0	48	90 × 620	4.1	E93.P62-251R20
17.5	0.25	1.37	6.3	70	140 × 570	6.3	E93.S57-251R20
17.5	0.25	1.37	2.4	70	90 × 850	5.7	E93.P85-251R20

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