

## Application

Bree Capacitors provide protection against voltage surges for medium-voltage motors and generators.

Due to their design characteristics, medium-voltage rotating machines have reduced insulation and are therefore more prone to failure caused by surges and voltage than other equipment in the same facility. An analysis of such events shows that the surge wave causes a large potential difference in the windings of the machine coil in the first instants of the event, which constitutes a “peak”.

Thus, the large stress on the dielectric insulating the machines can be observed in the first instants of the surge.

Installing some capacitance of a certain value in the circuit causes the “peak” to be delayed, thus reducing the potential difference in the windings. Using a lightning rod in parallel to the capacitance completes the effectiveness of the surge protection.

**Attention:** the capacitor must be installed in a phase-to-ground connection, on the terminal posts of the machine to be protected, and in parallel to the selected lightning rods.

## Fully Tested Equipment

- Bree has its own laboratory that allows it to conduct the routine, type, and special tests set out in international standards (IEEE 18 and IEC 60871).
- Bree's own manufacturing plant has ISO 9001, ISO 14001, and ISO 45001 certification.
- Bree is the nation's largest 100% Brazilian manufacturer of capacitors. The BR in our name stands for Brazil.

## Design Features

All of our capacitors are manufactured as per the following technical specifications:

- “All-film” technology (dielectric with a polypropylene film) with an aluminum foil and a folded margin;
- Impregnation with WEMCOL II biodegradable oil, providing excellent operation at different temperatures;
- Vitrified porcelain bushings as insulators, welded directly to the tank;
- Capacitance tolerance of -0% to +10%, as per the IEEE standards;
- Discharge resistor for 50V in 5 min. or 75V in 10 minutes; (call us for no resistor)
- Installation altitude up to 1000 AMSL; (call us for higher altitudes)
- PCB-free equipment;
- Temperature Class from -40 °C to +50 °C. (call us for other temperatures)



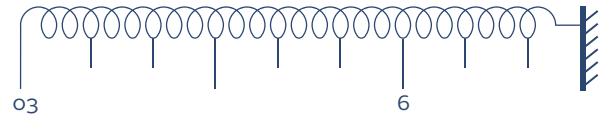
# Voltage Surge Capacitors

## Typical capacitance values for surge protection

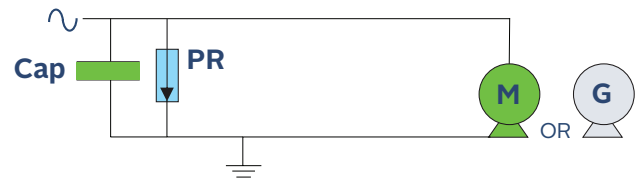
GRID VOLTAGE (KV)	MACHINE NEUTRAL WIRE	PHASE-TO-GROUND CAPACITANCE (UF)	NI (KV)
2,4	Grounded/Insulated	0,5	20/60
4,16	Grounded/Insulated	0,5	20/60
4,8	Grounded/Insulated	0,5	20/60
6,9	Grounded/Insulated	0,5	20/60
11,5	Grounded	0,25	34/100
11,5	Insulated	0,5	34/100
13,8	Grounded	0,25	34/100
13,8	Insulated	0,5	34/100

CAPACITANCE (UF)	NOMINAL VOLTAGE (Vrms)	NI (KV)	DIMENSIONS (mm)			
			B	C	D	E
0,25	7,2	20/60	110	225	105	200
0,5	7,2	20/60	142	257	105	200
0,25	15	20/60	190	375	105	385
0,5	15	20/60	320	505	105	385

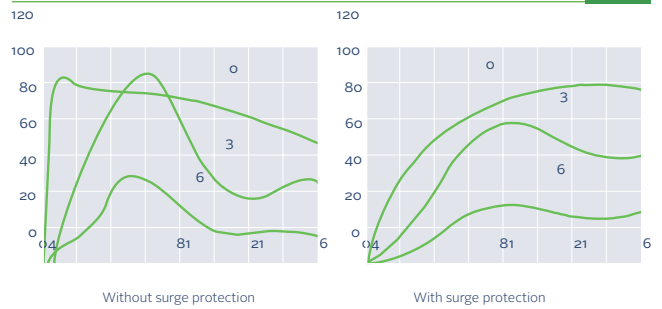
## Relative positions of the machine coil



## Simplified scheme for connecting the voltage surge protection

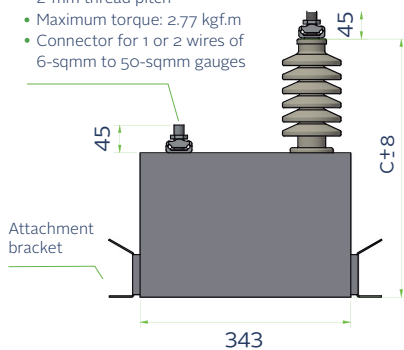


## Voltage Surge distribution in the winding in various relative positions

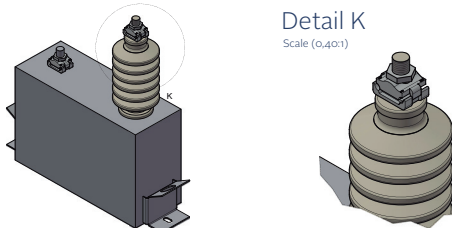
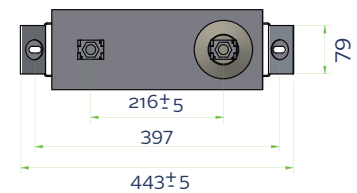
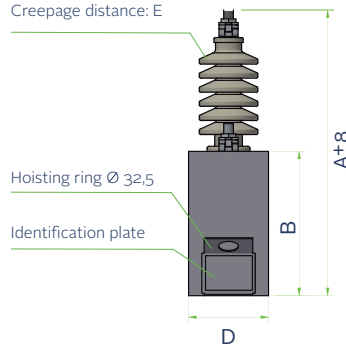


## Technical Drawing

- M16 Pin
- 2-mm thread pitch
- Maximum torque: 2.77 kgf.m
- Connector for 1 or 2 wires of 6-sqmm to 50-sqmm gauges



- Light-gray vitrified porcelain (or epoxy) bushing.
- Creepage distance: E



### Notes:

- Dimensions subject to changes without prior notice.
- Upon prior request, other capacitances, voltages, and insulation levels may be considered.
- Size "C" may be changed at the client's request so as to adjust the attachment of the capacitor to the existing fastening structure.
- Alternatively, epoxy resin bushings may be supplied, which provide superior mechanical rigidity and consequently increased resistance against insulating liquid leaks.

