MAFS

Multiple Chopping Gap

Datasheet

HAEFELY

Current and voltage – our passion

General Description

The multiple chopping gap is a patented Haefely design and is used to chop lightning impulses (on the front and on the tail) as well as switching impulses up to the highest voltages.

The multiple chopping gap serves simultaneously as a load capacitor for the impulse generator and allows excellent reproducibility of the chopping time and does not distort the wave shape until the chopping point.

With an additional secondary unit, the MAFS can be used, in some applications, as a voltage divider.

Rod gaps and sphere gaps (above 1000 kV) draw a substantial pre-discharge current prior to the voltage break-down, causing a voltage drop. This affects the comparison tests when testing power transformers, hence particular attention must be paid to the way the circuit is built.

The sphere distance is automatically adjusted by the Haefely Impulse Generator controls GC 223, GC 257 & HVC 300 (Fiber Optic Connection).

In the automatic mode, the gap distance is set automatically as a function of the charging voltage. The gap distance is displayed on the controls. The chopping is initiated by the first stage, having a triggering spark plug.

A manual control box GSC 219 is available to adjust the gap distance standalone or with non-Haefely control systems

The HV units are made of stacked capacitors with inserted damping resistances. This active part is built on reinforced fibre-glass cylinders.

Our active part technology is derived from our decades-long experience. The copper spheres have tungsten sintered inserts to reduce burn-off. Their distance is set by a precise drive. The upper semi-sphere is attached to a movable frame which makes it possible to adjust simultaneously all spark gaps.

The multiple chopping gaps are equipped with toroid electrodes. The electrodes are made of brushed aluminium. The electrode type is determined by the rated voltage. Fibre-glass struts are required when more than 2400 kV rated MAFS is used. The H base frame of welded steel profiles is equipped with four swivel castors.

Technical Data

Type	Rated impulse voltage LI 1.2 / 50 µs	Capacitance approx.	Int. damping resistance approx.	Min. clearance to walls and ceiling LI neg.	Top electrode type
MAFS 600	600 kV	2400 pF	30 Ω	1.2 m	single toroid
MAFS 1200	1200 kV	1200 pF	60 Ω	2.4 m	single toroid
MAFS 1800	1800 kV	800 pF	90 Ω	3.6 m	single toroid
MAFS 2400	2400 kV	600 pF	120 Ω	4.8 m	double toroid
MAFS 3000	3000 kV	480 pF	150 Ω	6.0 m	double toroid
MAFS 3600	3600 kV	400 pF	180 Ω	7.2 m	double toroid

At standard conditions according to latest IEC 60060-1 and altitudes lower than 1000 m.

Trigger range

For time-to-chop scattering:	< ± 150 ns
With variable gap setting, both polarities	30 % to 100 % U_n
With short circuiting of stages and variable gap	20 kV to U_n

Technical Data – Physical Dimensions

Type	Number of high voltage units	Height * approx.	Base frame approx.	Weight, net approx.	Weight, gross approx.	Shipping volume approx.
MAFS 600	1	2.5 m	1.6 x 1.6 m	500 kg	700 kg	3.5 m³
MAFS 1200	2	4.6 m	1.6 x 1.6 m	700 kg	1000 kg	5.0 m³
MAFS 1800	3	6.5 m	1.6 x 1.6 m	890 kg	1400 kg	7.0 m³
MAFS 2400	4	8.9 m	1.6 x 1.6 m	1155 kg	1700 kg	8.5 m³
MAFS 3000	5	10.8 m	1.6 x 1.6 m	1350 kg	2000 kg	10.5 m³
MAFS 3600	6	13.2 m	1.6 x 1.6 m	1590 kg	2500 kg	12.0 m³

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V2022.02

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