Высоковольтные керамические конденсаторы

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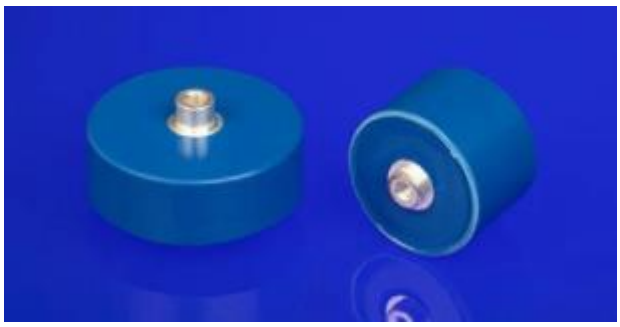
High Voltage Encapsulated Discs



The Technical Ceramics business of CeramTec offers a wide range of high voltage encapsulated discs suited to medical equipment and industrial applications.

We use mainly high K type 2 ceramics with dielectric constants from 1,000 to 10,000 selected for their volumetric efficiency in terms of capacitance.

These ceramic types do show significant and non-linear changes in dielectric constant with temperature and voltage and also exhibit changes with time, compared to type 1 materials.

Our encapsulated discs can be found in applications such as:

- DC power supplies
- Bypass, coupling and smoothing circuitry
- Medical scanners and X-ray power sources where low power ratings are required and larger capacitance changes with temperature can be tolerated
- HF Coupling
- Fast repetition pulse circuitry
- TIG welding (arc initiation) where a low loss factor is required to achieve maximum kVA at high frequencies

Application example

DC Power supplies

Encapsulated High Voltage capacitor discs of the type shown can be used in voltage multiplier circuits for high voltage low power DC supplies such as those used in Medical scanners, X-Ray equipment and electrostatic precipitators.

Parallel strings of series connected capacitors with cross-connected diodes can be used in the multiplier circuit.

The equipment is usually non-portable and made up of large capacitance units - typically 1500pF upwards with voltage ratings of 20-40kV.

In addition to the standard products, custom-made components can be supplied with different dimensions and electrical characteristics.

We have over 50 years of experience in providing quality capacitors suited to our customers exact requirements. We offer testing facilities which check items such as:

- Power frequency testing, 50Hz, up to 250kV
- Impulse testing up to 600kVpk
- Partial discharge testing up to 120kV
- DC testing up to 60kV

These facilities along with our extensive knowledge, ensure you receive a capacitor that optimises your product in your application. For more information on our encapsulated discs, contact us today.

Live Line Capacitors

The Technical Ceramics business of CeramTec has extensive experience of the manufacture of ceramic capacitors for high voltage DC and power frequency applications. These products are used all over the world in onerous service conditions, and are backed by rigorous testing procedures to ensure the electrical integrity and long service life of such components.

Over one million capacitors of the categories described here have been successfully used in Live-Line Indication applications. We have decades of involvement in high voltage system practices and the design of capacitors for those environments.

The capacitors described in this section are used in circuitry indicating the presence of voltage on conductors. A capacitor voltage divider enables a small neon lamp to be illuminated or alternatively the low voltage signal may

be used to feed a sensing circuit which monitors for supply failure and circuit condition.

Applications

To indicate the presence of voltage and for fault detection on power frequency high voltage distribution switchgear (6.6kV-36kV systems).

The capacitor is connected directly to the HV line and a small current (low voltage signal) is passed which illuminates a neon lamp mounted on the front panel of the switch.

Alternatively the low voltage signal may be used to feed a sensing circuit which monitors for supply failure and circuit condition.

The capacitor is normally contained within a resin moulding. Usually the moulding is made by the switch manufacturers themselves in a shape to suit their own particular needs but we can offer certain complete mouldings or can advise on suitable sources.

Theory

In its simplest form the Live-Line Indication consists of a high voltage ac rated capacitor which is connected in series with the neon indicator between the phase and earth lines. (Fig.1) The addition of higher value, low voltage rated capacitor in parallel with the neon is sometimes preferred. (Fig.2) The object is two-fold - firstly to advise the operator that the connections are live and secondly for operation of re-routing systems in the event of inadvertent disconnection.:

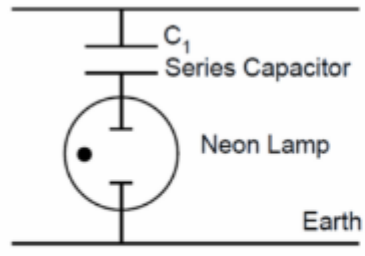


Figure 1

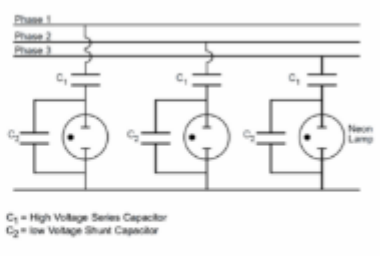
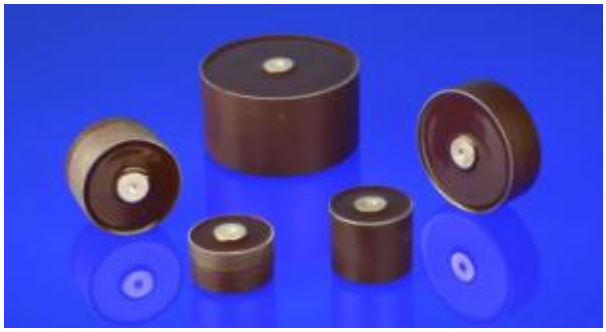


Figure 2

Pulse Power Capacitors



Features

- Resin Encapsulation – which in conjunction with the high dielectric strength ceramic allows for high energy densities.
- Low dielectric loss resulting in low self heating
- Linear temperature coefficient of capacitance
- Negligible piezoelectric/electrostrictive effect – allowing use in extremely high peak current (fast discharge) / high shot life applications
- Low DC and AC voltage coefficients

Applications include

- Gas Lasers
- DC Power Supplies
- Electrostatic Copying Machines
- Lightning Arrestor
- AC Voltage Distribution
- X-Ray Power Supplies

Voltage Multiplier Assembly

A number of capacitors are assembled together with intermediate fittings which allow the connection of diodes to be made. Output voltages in excess of 100kVDC can be produced depending on the number of stages.

Voltage ratings of individual discs range from 8 to 12kVDC assuming that the quality of encapsulation by the user is sufficient to prevent external breakdown.

A variety of intermediate metal fittings are available and the number of individual capacitors in each stack can be varied to meet customers requirements up to a maximum of 12.

Electrostatic Spray Guns

Dry powder paint spraying in automotive white goods or any other metal products requiring smooth uniform paint finish.

High Voltages can be produced from a relatively low voltage AC source using a Voltage Multiplier Assembly i.e. parallel stacks of series connected capacitors and cross connected diodes. These devices find their major application in electrostatic paint spraying equipment.

DC output voltages in excess of 100kV generate a corona discharge at the end of the spray gun and the resulting HV electric field causes the surrounding air to break down creating negatively charged ions. The ions attach themselves to the nearest object or surface and the particles of paint powder passing through this field become charged then attracted to the earthed work piece.

The capacitor stack assembly consists of a number of series connected capacitor discs with a choice of intermediate metal fittings to which the diodes are attached.

A wide range of stacks of up to 12 discs in series are available with voltage ratings of the individual discs from 8 to 12kV DC and capacitance values from 125pF to 1000pF.

Their compact size, low weight and ability to withstand the high voltages generated are the main reasons why these assemblies are used.

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