

Outdoor capacitors help save reactive power

A capacitor, developed for use in outdoor applications, promises to offer a cost-effective way to enable savings on reactive power

Today, in many countries there is a gap between the existing energy transmission infrastructure and the growing demand of consumers. To carry electricity to homes, small industries and farms, either low-voltage transmission lines on poles, or pole-mounted transformers to transfer medium voltages to low voltages, are used.

Residential properties, in particular, do not usually handle power factor correction (PFC) on-site, but to maintain their capacity or even achieve higher efficiency in their electrical systems to forward the active power, utilities are interested in reducing demand for reactive power. There is also potential for saving reactive power to homes, even if each single household only consumes a small amount of reactive power.

Office and residential apartment complexes also represent a sufficient density level to enable savings on reactive power.

One wiring solution is based on fixed individual compensation, with each home permanently and directly connected to an energy meter. Centralised, fixed group compensation using a single pole-mounted capacitor,

Vishay ESTA PhMKDgF capacitors are suited to use in outdoor applications, without the need for any additional enclosures



however, benefits from less wiring, lower time requirements for central maintenance, and easy access for monitoring the operation.

Individual single-phase home compensations have a rating of around 20 μF . In the same voltage and frequency

reduces the risk of unintentional touching of additional electrical components by unskilled persons. Such centralised fixed group high-output compensation capacitors can also be used for indoor applications, such as in the basement of the flat arrangement at its connection point to the energy cable.

Vishay ESTA PhMKDgF capacitors have been especially designed for low-voltage PFC to reduce inefficiencies associated with low-voltage transmission. These outdoor capacitors can be attached directly to utility poles near consumers using optional mounting supports.

Outdoor power capacitors

The outdoor power capacitors are used for three-phase PFC on low-voltage systems of 230 to 1000V and 50 or 60Hz. They feature output up to 56.2 kvar, depending on voltage and frequency. They operate at ambient temperatures of up to 55°C with a maximum average of 45°C a day, and at altitudes of up to 2,000m above sea level. Life expectancy is more than 150,000 operating hours, which

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conditions, one capacitor of a three-phase, high-output, pole-mounted design provides about 3 x 308 μF (delta) and can cover the compensation of 45 to 50 households. This number is not unusual in large flat arrangements. The cost advantage of one unit compared to 45 to 50 single capacitors is obvious.

Installation reduction

Beside the reduction in installation work, there is no disadvantage in having a pole-mounted fixed group compensation capacitor instead of individually fixed capacitors per home. That is because, in view of the consumption of reactive power, energy meters in households can only measure the active, not the reactive consumption. Also, no additional space is needed in the individual meter cabinets and households. This also

results in about 17 years for fixed compensation. This equates to an actual 8,760 operating hours per year, at the rated voltage and within the maximum ambient temperature.

The capacitors can be used without the need for additional surrounding cabinets and without protective covers. Because all moisture is evaporated by the capacitor operating temperature, there is no risk of moisture in the cabinet or at the connection bolts. They have ceramic bushings with a creepage distance of 50mm and airpath of 32mm.

The terminals are tin-coated brass of type M10, which is suitable for copper and aluminum conductors with cable lugs fitting M10 bolts. The corrosion-resistant aluminium casings do not need any further protection.

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