Capacitive voltage transformers

Outdoor operation
Oil-paper insulated

ECF (72 – 550) kV

Current and voltage – our passion
General description

Capacitive voltage transformers of type ECF are used in high-voltage switchgears from 72 to 550 kV. They transmit voltages to standardised, equivalent values for meters, measuring and protective devices.

The capacitive voltage transformer consists of one condenser unit and one electromagnetic measuring unit (EMU). The condenser unit is located in the insulator and consists of one capacitive mixed dielectric which is impregnated with insulation liquid. This active part is hermetically sealed to the outside. For volume compensation of the oil there is a stainless steel expansion bellows in the head section. The operating pressure can be visualized via a monitoring unit. Depending on customer specification, creepage distance or voltage level, the condenser unit consists of up to 3 parts. In order to avoid field distortions, a shielding electrode is used from a voltage level of 420 kV. A high-grade composite or porcelain insulator can be used as insulator. According to the contamination classes of common standards, different creepage distances can be selected.

The EMU is an inductive intermediate voltage transformer which is housed in the foot case of the transformer. It allows the safe transmission of measurement signals. A damping unit ensures increased safety against relaxation oscillation. By using proven materials the voltage transformer is temperature- and accuracy stable over the entire service life. On request, the voltage transformer can be designed in such a way that it can be used as a coupling capacitor for carrier transmission in high-voltage lines.

All metallic housings and flanges consist of a special aluminium alloy and can be painted in various colours. The generously sized terminal box is equipped with a cover that is to be opened sideways. This allows for easy connection of secondary cables. The terminal box is equipped with a flange without holes. On request, cable glands or individual safety devices can be built in.

Advantages of capacitive voltage transformers

- Cost-effective and reliable Design for high and very high voltages
- Expandable for the transmission of high-frequency signals (TFH)
- Fabrication-internal adjustment of the accuracy classes, no on-site adjustment is required
- Temperature- and accuracy stable over the entire service life
- Increased safety against relaxation oscillation due to damping unit
Highlights

- Simple and safe mounting on site for transformers which consist of multi-piece condenser units
- High temperature and precision stability over the entire service life
- Compensation of transient overvoltages in the grid, caused by circuit breakers
- Expandable for high frequency signal (PLC) couplings
- Extendable for the installation of a line trap coil

High and very high voltage

- Tone frequency (PLC) couplings

Easy-to-fit terminal box

- The terminal box with the lid to be opened sideways is secured by captive screws. Apart from terminals, fuses, surge arrester, additional contacts, spark gaps and sealable covers can be built in.
- By default, the terminal box is equipped with a blind flange.
- On request, the capacitive voltage transformer can be equipped with an additional terminal box.
Possible options

- Intermediate-voltage earthing switch
- Intermediate-voltage bushing for check measurement during maintenance
- Power-line-carrier protection – protective device with discharge reactor, overvoltage protection and earthing switch
- Fuses/overload protectors to protect secondary windings
- Secondary windings with taps
- Secondary terminals in bolt design
- Heater unit in terminal box
- Blind flange for the insertion of the secondary cable equipped with cable glands
## Technical data

### Type ECF: 123 – 245 kV

<table>
<thead>
<tr>
<th>Standard</th>
<th>IEC / IEEE</th>
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<tbody>
<tr>
<td>Highest voltage for equipment</td>
<td>kV</td>
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<tr>
<td>Rated power-frequency withstand voltage</td>
<td>kV</td>
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<tr>
<td>Rated lightning impulse withstand voltage</td>
<td>kV</td>
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<tr>
<td>Frequency</td>
<td>Hz</td>
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<td>Accuracy class</td>
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<tr>
<td>Rated thermal limiting output</td>
<td>VA</td>
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<tr>
<td>Max. simultaneous burden (cl. 0.2)</td>
<td>VA</td>
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<tr>
<td>Max. number of VT windings</td>
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### Type ECF: 300 – 550 kV

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### Type ECF Dimensions

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<th>Type</th>
<th>72</th>
<th>123</th>
<th>145</th>
<th>170</th>
<th>245</th>
<th>300</th>
<th>362</th>
<th>420</th>
<th>550</th>
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<tbody>
<tr>
<td>Height of unit*</td>
<td>A</td>
<td>mm</td>
<td>1660</td>
<td>1930</td>
<td>2130</td>
<td>2330</td>
<td>2930</td>
<td>3310</td>
<td>3510</td>
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<td>Height to primary terminal*</td>
<td>B</td>
<td>mm</td>
<td>1520</td>
<td>1790</td>
<td>1990</td>
<td>2190</td>
<td>2790</td>
<td>3170</td>
<td>3370</td>
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<tr>
<td>Depth of unit including terminal box</td>
<td>C</td>
<td>mm</td>
<td>746</td>
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<tr>
<td>Depth of unit base</td>
<td>D</td>
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<td>Min. creepage distance*</td>
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<td>420</td>
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</tbody>
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* with standard composite silicone insulator, creepage distance 25 mm/kV
Global presence

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PFIFNER
Current and voltage – our passion

HIGH VOLTAGE
MEDIUM VOLTAGE
LOW VOLTAGE