A complete range of extra high voltage measurement and protection solutions

Capacitor Voltage Transformer

Answers for energy.
Siemens Capacitor Voltage Transformers are based on technology from Trench, a recognized world leader in the design and manufacture of high voltage equipment for application on electric utility and high energy industrial systems.

Capacitor Voltage Transformers convert transmission class voltages to standardized low and easily measurable values, which are used for metering, protection and control of the high voltage system. As such, the need for accurate and reliable voltage transformation is essential. Additionally, Capacitor Voltage Transformers serve as coupling capacitors for coupling high frequency power line carrier signals to the transmission line.

Today, Siemens is a world-wide leader with an entire range of instrument transformers from 72.5 kV to 800 kV covering:

- Current Transformers
- Capacitor Voltage Transformers
- Voltage (Potential) Transformers
- Combined Units (Combined Current & Voltage Transformers)

The Siemens factory in Aurangabad fulfils the demand of our customers for highly reliable Capacitor Voltage Transformers.
Features

• Meets all IEC and IS metering and protection classes
  (other Standards on request)

• Applications from 72.5 kV–800 kV

• Quality Assurance in accordance with ISO 9001

• Capable of carrier coupling PLC signals to the network

• Optimized insulation system design utilizing state-of-the-art processing techniques with mineral oil & synthetic insulating fluids

• Stability of capacitance and accuracy over a long period of time due to superior clamping system design

• Oil expansion by way of hermetically sealed stainless steel bellows assures the integrity of the insulation system over time

• Maintenance-free oil filled cast aluminum base box

• Superior transient response characteristics

• Passive ferro-resonance suppression circuit provides superior damping while not degrading transient response

• Potential grounding switch to measure capacitance and tan delta
Construction

Siemens CVTs consist of two primary assemblies; the high voltage capacitor sections and the base box, housing the electro-magnetic components.

Series connected capacitor elements, housed in porcelain shells, each hermetically sealed, are referred to as capacitor sections. The dielectric of the capacitor elements is made up of high quality polypropylene film/paper and impregnated with highly processed synthetic fluid. Each capacitor section is equipped with a stainless steel bellow which will allow the synthetic fluid to expand and contract with changes in ambient operating temperature while maintaining the hermetic sealing. It is over these capacitor sections that most of the high voltage will be dropped.

A tap voltage (approximately 5-12 kV depending on type) is taken from the lowest capacitor section and fed to an electromagnetic circuit in the cast aluminum base box. The base box contains the intermediate transformer which will provide the final output voltages via multiple tapped secondary windings, series compensating reactor and ferro-resonance control circuitry. The base box is filled with dried mineral oil, protecting the components from environmental deterioration.

Ferro-resonance is simply and effectively controlled by utilization of low flux density designed magnetic circuitry and a saturable reactor controlled damping circuit connected across the secondary winding. The ferro-resonance suppression circuit does not adversely affect transient response.
Note: Connection between internal terminals are made at the factory as required for each unit.

Typical schematic diagram of a Capacitor Voltage Transformer

General arrangement of capacitor voltage transformer

Electrical Performance

<table>
<thead>
<tr>
<th>Nos.</th>
<th>Description</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>H. V. Terminal (Ø 30X100mm)</td>
<td>Aluminium Alloy</td>
</tr>
<tr>
<td>2</td>
<td>Porcelain Insulator</td>
<td>Porcelain</td>
</tr>
<tr>
<td>3</td>
<td>Base Box</td>
<td>Aluminium Alloy</td>
</tr>
<tr>
<td>4</td>
<td>Top Cover</td>
<td>Aluminium Alloy</td>
</tr>
<tr>
<td>5</td>
<td>Terminal Box</td>
<td>Aluminium Alloy</td>
</tr>
<tr>
<td>6</td>
<td>Lifting Hole</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Highest System Voltage (kV rms)</th>
<th>One minute power frequency withstand voltage (kV rms)</th>
<th>Impulse withstand voltage (1.2/50µs) (KV)</th>
<th>Switching Impulse withstand voltage (250/2500 µs) (KV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>72.5</td>
<td>140</td>
<td>325</td>
<td>----</td>
</tr>
<tr>
<td>123</td>
<td>230</td>
<td>550</td>
<td>----</td>
</tr>
<tr>
<td>145</td>
<td>275</td>
<td>650</td>
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<td>245</td>
<td>460</td>
<td>1050</td>
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</tr>
<tr>
<td>420</td>
<td>630</td>
<td>1425</td>
<td>1050</td>
</tr>
<tr>
<td>765</td>
<td>975</td>
<td>2100</td>
<td>1550</td>
</tr>
</tbody>
</table>
For more information, please contact:

Western Region:
Mumbai office:
Thane Belapur Road,
Thane - 400 601
Tel.: (022) 2762 3990
Fax: (022) 2762 8002

Vadodara office:
Ohm Business Park
Ellora Park, Subhanpura
Vadodara - 390 023
Tel.: 0265-6692 100
Fax: 0265-6692 190

Eastern Region:
Kolkata office:
43, Shanti Palli
Rasbhari Bypass Connector
Kolkata - 700 042
Tel.: (033) 2444 9302
Fax: (033) 2444 9012

Northern Region:
Delhi office:
Plot No. 6-A, Sector 18
Manuti Industrial Area
HUDA, Gurgaon - 122 015
Tel.: (0124) 284 6000
Fax: (0124) 284 6061

Southern Region:
Chennai office:
144, Mahatma Gandhi Road
P. O. Box No. 3323
Chennai - 600 034
Tel.: (044) 2833 4144
Fax: (044) 2833 4450

Siemens Ltd.
Energy Sector - Energy Transmission
Aurangabad Works:
E76 – MIDC Waluj,
Aurangabad, India. 431 136
Tel: +91 240 2565 191
Fax: +91 240 2554 701

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*Product development is a continuous process. Consequently the data indicated in this leaflet is subject to change without prior notice. For latest issue contact our Sales Office.*