OIL INSULATED COMBINED TRANSFORMERS
Trench is a recognized world leader in the design and manufacture of high voltage equipment for application on electric utility and high energy industrial systems.

Oil insulated Combined Instrument Transformers are used to convert high transmission line Voltages and Currents (Voltage up to 145 kV and current up to 5000 A) to standardized low and easily measurable values, which will be used for metering, protection and control of the high voltage system. As such, the need for accurate and reliable voltage and current transformation is essential.

The reliability and security of Trench oil-insulated instrument transformers is based on over 50 years of innovation with oil-insulated units operating under a wide range of environmental conditions.

Oil insulated Combined Instrument Transformers also ensure suitable electrical insulation between high voltage and low voltage measuring equipment.
**MAIN FEATURES**

**General**
- Portfolio available from 72 to 145 kV
- Meet all IEC and ANSI metering and protection classes, including special core classes TPS, TPX, TPY and TPZ ones.
- Rated primary Voltage up to 145 kV, rated primary current: up to 5000A
- Rated Secondary Voltages: 100 V, 100-3 V, 100-3 V, 110 V, 110-3 V, ...
- Rated secondary current of 1A, 2A or 5A
- Primary and/or secondary reconnection available. Rated short circuit withstand up to 200 kA peak
- Suitable also for Line Discharge use
- Fully type tested according to international standards
- The key oil impregnated paper insulation has been optimized after long experience based on famous Freely-Thrench original group
- Special tests are also available to meet specific customer requirements.

**Product design**
- Oil/paper internal insulation
- External insulation with porcelain or composite insulator
- External parts made of aluminum or stainless materials
- CT core/windings located on the top of the equipment
- VT core/winding located on the bottom of the equipment
- Bar-type primary conductor allows higher short circuit current and avoids large voltage drop across the primary winding
- Available to withstand:
  - Effects of internal arc (according to IEC 61869 Standard)
  - Multichopped Test (according to IEC 61869 Standard)
  - Heavy seismic solicitations, according to IEC 62271, IEEE 693 and specific customers' requests (i.e. Chile ETO A.D.20)
- Hermetically sealed. A suitable Inox steel bellows located on the top of the Combined Transformer allows the oil volume variation and keep the internal pressure equal to ambient one in every service conditions.

**Product process**
- Optimized design to manufacturing
- Lean manufacturing concept applied to the whole supply chain
- Modular design allows the use of reduced numbers of components
- Partial discharge free design and process
- Optimized Drying and Soaking Oil Process allows easily the use of special Oils in case of specific Customer’s needs (Low ambient temperature applications or special Oil requirement for various reasons)
- Maintenance free during a long lifetime of more than 50 years
- Trench Management System has been certified to ISO 9001, ISO 14001 and OHSAS 18001 standards

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Thousands of transformers installed and in service for more than 50 years all over the world and in all environmental conditions are the best guarantee of the quality and reliability of our products.
PRODUCT STRUCTURE

- Aluminium top cover
- Oil Level Indicator
- Inox Steel Bellows
- High Voltage Terminals
- Secondary CT’s Cores/Windings
- High Voltage Insulation
- Porcelain/Composite Insulator
- Secondary Terminal Boxes
- High Voltage and Low Voltage VT’s Windings
- VT Magnetic Core
- Oil Sampling Plug
- Earth Terminal
### ELECTRICAL and MECHANICAL DATA

<table>
<thead>
<tr>
<th>Type</th>
<th>Highest Voltage for Equipment (Vrms)</th>
<th>Rated Power-frequency withstand Voltage (Vrms)</th>
<th>Rated Lightning Impulse withstand Voltage (Vpeak)</th>
<th>Arc Distance (mm)</th>
<th>Minimum nominal specific creepage distance (Pollution Level III) (mm)</th>
<th>Minimum nominal specific creepage distance (Pollution Level IV) (mm)</th>
<th>A (mm)</th>
<th>B (mm)</th>
<th>C (mm)</th>
<th>D (mm)</th>
<th>E: Base Fixing (N) (holes &amp; Ø4)</th>
<th>Total weight (kg)</th>
<th>Oil Weight (kg)</th>
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<tr>
<td>IVOKT 72</td>
<td>27.5</td>
<td>140</td>
<td>325</td>
<td>700</td>
<td>1815</td>
<td>2250</td>
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</tbody>
</table>

Data are indicative and are not binding. Dimensions are referred to typical combined transformers equipped with porcelain insulator & according to IEC 61869 Standards – Other options are available. The regular improving on design may cause discrepancies between this document and updated product. On request our sales team will be glad to submit you a firm updated technical & commercial offer fully customized to your specific requests.
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