INSTRUMENT TRANSFORMERS



Product Spectrum



Context

The transmission of energy from the generation sites to the places of use is carried out through high voltage electrical lines and substations as interconnecting points. These substations are carried out with two types of insulation: Air (Air Insulated Substation) or Gas (Gas Insulated Switchgear). At interconnecting points on transmission lines, it is necessary to measure and control the electrical parameters of the transmitted energy. For this aim, devices called Instrument Transformers are used to reproduce primary parameters at scaled down values which are suitable for measuring instruments and protection relays.

Instrument Transformers are mainly divided into two categories: Current Transformers and Voltage Transformers.

The goal of measuring the current and voltage levels on various points of transmission lines is to quantify the amount of transferred energy, and verify the accuracy of the network parameters in order to protect the transmission lines as well as the substation equipment.









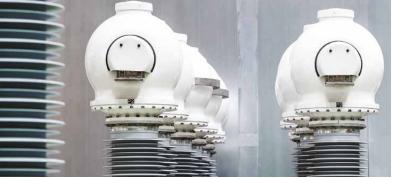
Trench Solution

The Trench Group has a full portfolio of Instrument Transformers that are capable to meet any customer's needs worldwide and can be installed in any environmental condition. Our global team of experts is working every day to ensure a high quality level under any condition as well as to enhance the portfolio with any new feature required by our Customers.

THE TRENCH GROUP PORTFOLIO INCLUDES: Current transformers for AIS and GIS applications Inductive and Capacitive Voltage Transformers for AIS and GIS applications Resistive-Capacitive Dividers for Voltage and Harmonic Measurements Capacitors for various applications (High voltage Circuit-Breakers, Line Compensation, Filters, Couplings, etc.) Power Voltage Transformers for measuring and providing auxiliary power

THE TRENCH GROUP PORTFOLIO IS AVAILABLE IN ALTERNATIVE DESIGN FEATURES: Internal insulation: Paper-Oil, SF6 gas or alternatives (e.g. CleanAir) External insulation: porcelain or composite material Different measuring technologies for current measurement system (ferromagnetic core and copper wires) or unconventional type (optical transducer)





For transmitting electrical power, High Voltage Alternate Current (HVAC) lines (50/60 Hz) are the most utilized infrastructures. The rated voltage stays in ranges from 72 to a maximum of 1200 kV and the transmitted current reaches thousands of Ampere values.

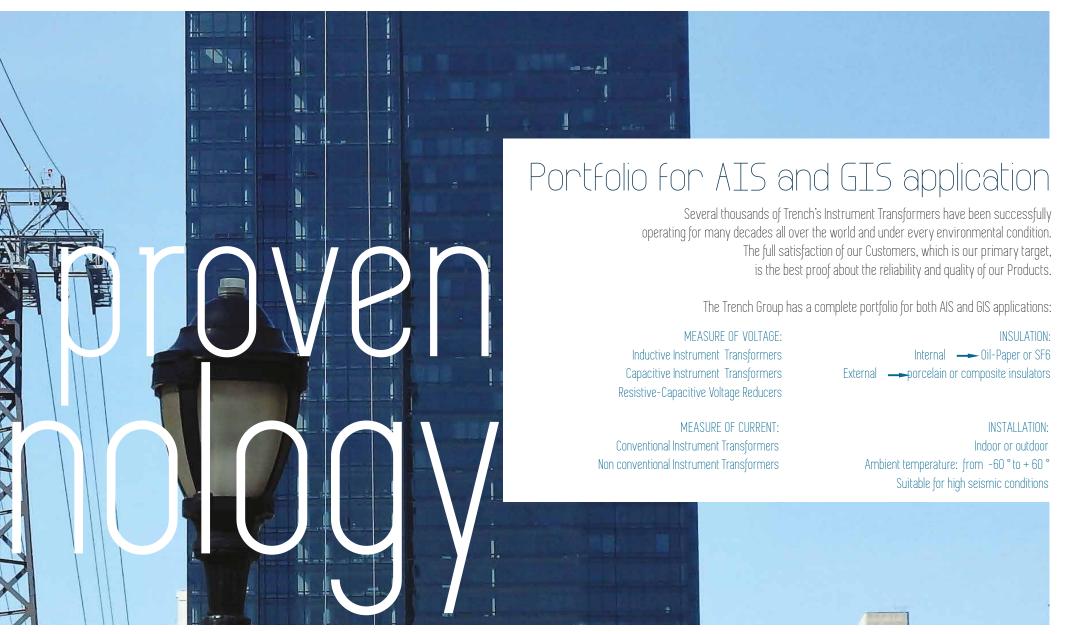
Though the above values do not allow a direct measurement for obvious technical reasons, the need to measure voltage and current at the various points of the line remains, and therefore Instrument Transformers are used with a double purpose:

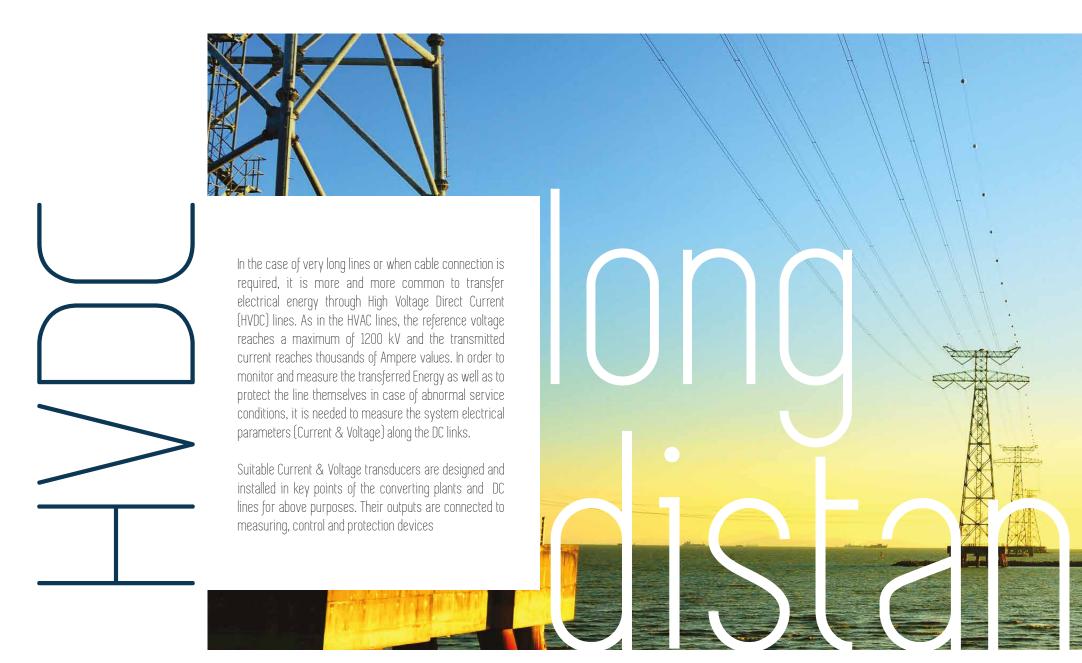
1. Transform the High Voltage and Alternate Current values transmitted by the line in a way that they can be easily read by common measuring devices (about 100 Volts for the voltage and about 1-5 Amperes for the current);

2. Ensure the necessary electrical insulation between the high voltage line and the measuring systems.

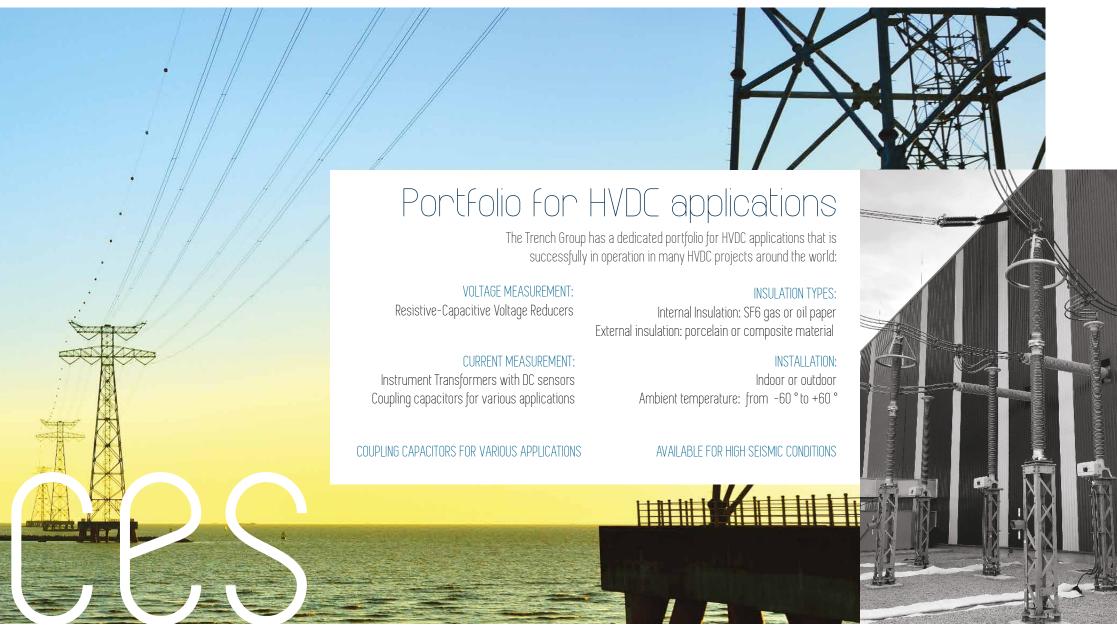


















There are situations where an economic power scource is requireed for temporary or permanent use:

AUXILIARY POWER SUPPLY FOR SUBSTATIONS

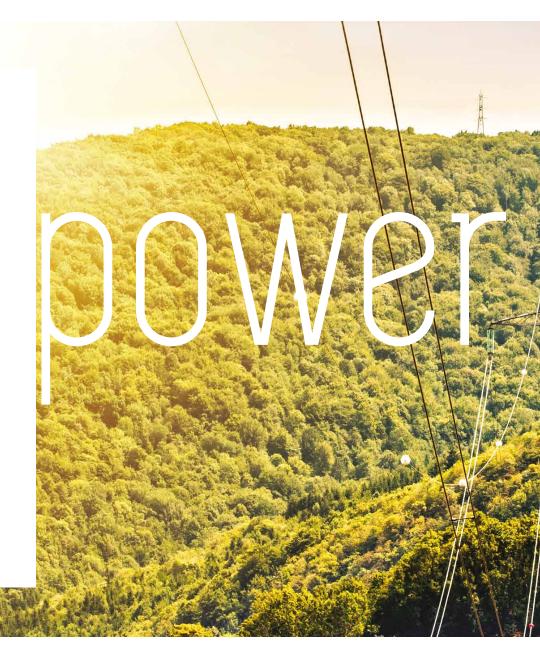
Auxiliary power for substations is commonly supplied by a tertiary winding of the power transformer. A tertiary winding can be avoided by the introduction of a Power Voltage Transformer (Power VT) that supplies the needed power directly from the transmission line to the substation operating as conventional Voltage Transformer at the same time.

ELECTRIFICATION OF REMOTE AREAS

In developing countries or isolated areas (such as villages or farms) where the distribution network is weak or non-existent but transmission lines are close by, a Power VT can serve as an economical and feasible source of power that be customized to the needs of different consumers.

POWER SUPPLY DURING SUBSTATION CONSTRUCTION WORKS

A Power VT can be used as a temporary power generator during the construction of substations, wind farms, power plants, etc. or in any other situation where immediate emergency power is required. It is also possible to equip a trailer with a Power VT to have a mobile power supply instead of using a diesel generator set.









Knowledge, experience and innovation are necessary components for bridging current technology to future social and environmental needs.

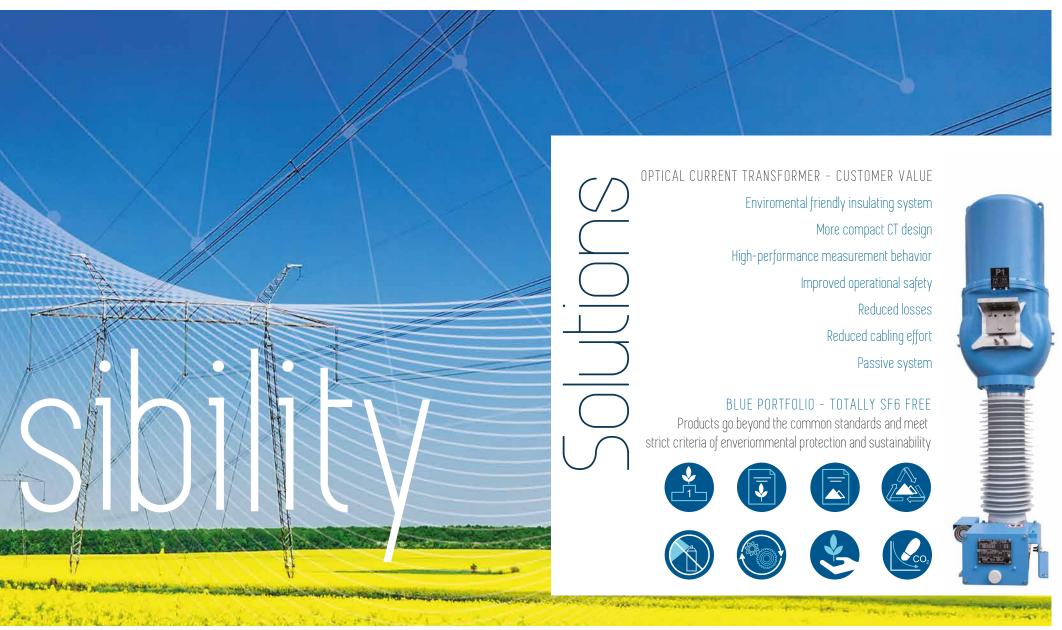
Electrical grids will be more digitalized in the near future.

High voltage products will be built with more environmental friendly technology.

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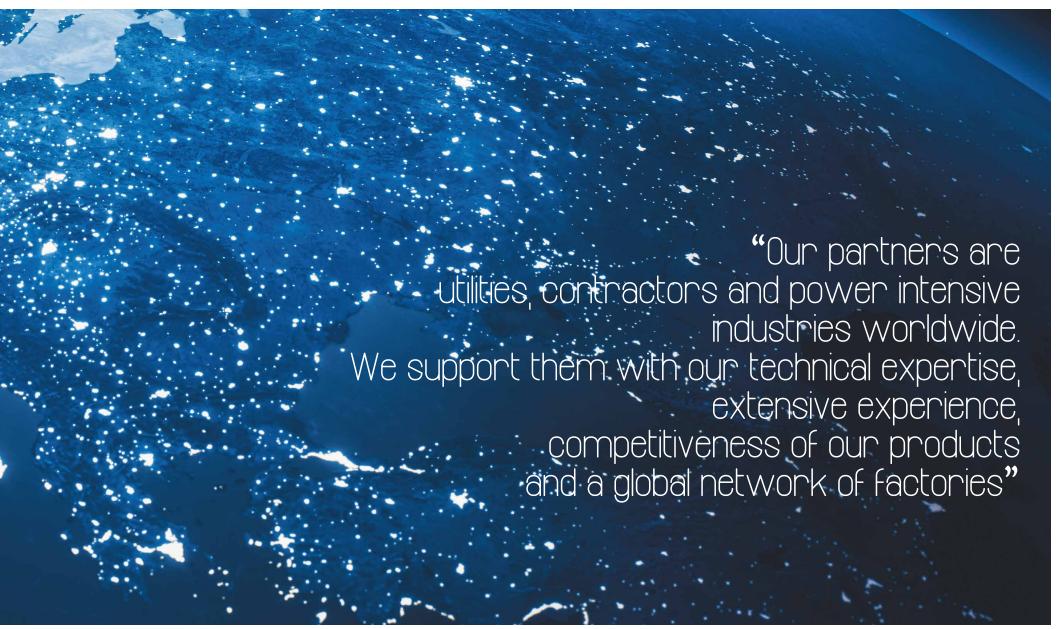
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