

COSI

Compact Optical Sensor Intelligence

Alstom Grid Instrument Transformers is ahead of the competition thanks to its innovative, patented Optical Instrument Transformer technology. It enables full IEC 61850 implementation and sets the benchmark in transmission network architectures for today's and tomorrow's electricity networks and Smart Grids.

Our comprehensive COSI range includes a full offer of Optical Instrument Transformers for AC or DC applications with the following innovative products:

COSI range:

COSI-NXCT
Optical Current Transformer (AC or DC)
COSI-NXMU | Merging Unit
COSI-NXCM | Combined Metering Unit
COSI-NXCT F3
Flexible Optical Current Transformers

Our technology is based on the effects of light influenced by current (Faraday effect) to measure current. Our technology is suitable for use in AC or DC transmission systems.

The transformer can also be used in high-current DC applications, such as large scale aluminum electrolysis companies.



Smart Digital Instrument Transformers Solutions for Smart Grids

COSI-NXCT can also be applied in HVAC systems with a rated voltage of up to 1200 kV or HVDC systems with a rated voltage of up to 800 kV. The equipment can make precise measurements within a range between 1 A and 4800 A. The protective current is up to 216 kA (peak value) and the bandwidth is DC 20 kHz.

A wealth of benefits

Digital Instrument Transformers offer many benefits compared to conventional instrument transformers (oil, SF₆), including:

Wide dynamic range

1 A to 4800 A. One current transformer can cover a wide dynamic range through the same output. The protective current is up to 216 kA (peak value) and the bandwidth is DC to 20 kHz.

Smart Grid ready

COSI products deliver direct digital output according to IEC 61850-9.2 or 1 A for metering applications.

System Cost savings

Drastic reduction of cabling and cubicle costs in substation compared to conventional system.

Standard optical fiber

All signals are transmitted through a standard fiber optic cable (same cable as used in Telecom). By using a globally-available fiber optic cable to connect all electronic equipment, we offer our customers substantial savings and global maintenance.

Lightweight

Typically, an optical sensor represents only 10% of the weight of a oil filled transformer. As transportation costs and ease of installation



Our innovative solutions for YOUR performances

depend on the weight and volume, the benefits are immediately apparent. There is no need for special transportation to protect the equipment against vibrations (truck and hard road). Moreover, the support structure also depends on weight and dimensions. So, global installations costs are also reduced.



Installation flexibility

Bus mounting is possible, as well as horizontal mounting or assembly directly on the circuit breakers. All these configurations are possible with Digital Instrument Transformers, but not with oil filled equipment. The total substation footprint can be reduced by as much as 15 to 25%.

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Increased safety for people, substation equipment and the environment

COSI range is explosion proof. No oil and no SF₆ mean no environmental costs on end-of-life disposal and no leakage problems. Moreover, horizontal transport and (long-term) storage is possible without risk and there are no ferro-resonance or dangerous open secondary concerns.

Near zero maintenance

Time is money, and the optical sensors dramatically reduce the number of outages for maintenance. No oil sampling or DGA are needed. Optical sensors offer remote monitoring for preventive maintenance without tripping.

A seismic solution

Digital Instrument Transformers offer retrofitting flexibility without concern for seismic withstand. Also, they are constructed with a composite line post insulator for maximum seismic endurance.

Secondary circuit saving and "Forgiving secondaries"

In oil filled and SF₆ technology, a magnetic current transformer requires two (or more) wires for each core. Losses in the secondary loop can either dramatically increase the cores sizes or require greater wire selections. The wide dynamic range of sensor and the Ethernet connection limits the number of "secondaries" and makes most of the secondary wiring obsolete.

In oil filled current transformers, eventual modifications are either very costly or impossible. Moreover, it is often impossible to add more secondaries or modify key characteristics once production of CT is in progress. With digital current transformers, additional secondaries or last-minutes changes in specifications can be handled by the electronics. The turns ratio is user-selectable on site.

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Flexibility and inventories reduction

Ratio can be modified any time (via computer connection). This results in very short delivery time (from stock). Moreover, the CT ratio can be adapted according to CT location and there is a significant reduction of customers stock as there is no CT needs for every ratio.

Software evolution

It is possible to update or enhance the software throughout the life of the equipment.

Interchangeability

In the case of an (exceptional) failure in the electronics, all that is needed is a very simple box change. No recalibration is required.

Our technology, expertise and experience are our best assets

Alstom Grid Current Transformer (COSI-NXCT) is a high-end solution developed by NxtPhase (now part of Alstom Grid Instrument Transformers), the USA's recognized pioneer in Optical Current Transformers. Our optical products are installed around the world in more than 300 substations in 19 countries.

NXCT has already been accredited by New York ISO, California ISO, Lapem Mexico, Measurement Canada and Gost in Russia.

In March 2010, to meet the specific requirements of Chinese Smart Grid, COSI-NXCT underwent a dynamic simulation test on a 500 kV transformer substation protection relay in the China Electric Power Research Institute (CEPRI). This is an example of how Alstom Grid is using COSI-NXCT to support the development of Smart Grids, since today's power grids need to deliver more energy with greater flexibility and in a more complex environment – using the same infrastructure.

GRID



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