GE
Grid Solutions

COSI-CT

Optical Current Transformer

Smart Solutions for Smart Grid

Our comprehensive COSI range (Compact Sensor Intelligence) includes innovative digital instrument transformers for AC and DC applications.

The COSI-CT optical current sensor brings a new level of accuracy to sensing over the range between 1 Arms and 63 kArms.

Key Benefits

- Reduced size and weight are attractive benefits compared to conventional oil-filled equipment, allowing placement in compact substations or in retrofit applications where space may be limited.
- Lightweight dry-type insulator and window head design allow pedestal mounting or suspension from a rigid bus.
- Broad dynamic range making this CT particularly suited for both high-precision metering and protection applications at the same time.
- Accurate measurement of DC and AC to the 100th harmonic and the measurement of phase angle is a must for new Smart Grid applications.

The standard digital interface will ensure smooth integration of COSI-CT in the digital substation application.

Performance Features

- Accuracy exceeds ANSI/IEEE Class 0.15S/IEC Class 0.2S for metering and IEC Class 5P/IEEE 10% for protection
- Wide dynamic range
- Bandwidth from DC to 100th harmonic
- No magnetic core saturation
- Excellent phase accuracy
- Digital Interface and analog output

Intrinsically Safe, Environmentally Friendly

- No oil, gas or SF_6
- No hazardous open secondaries
- No violent failure

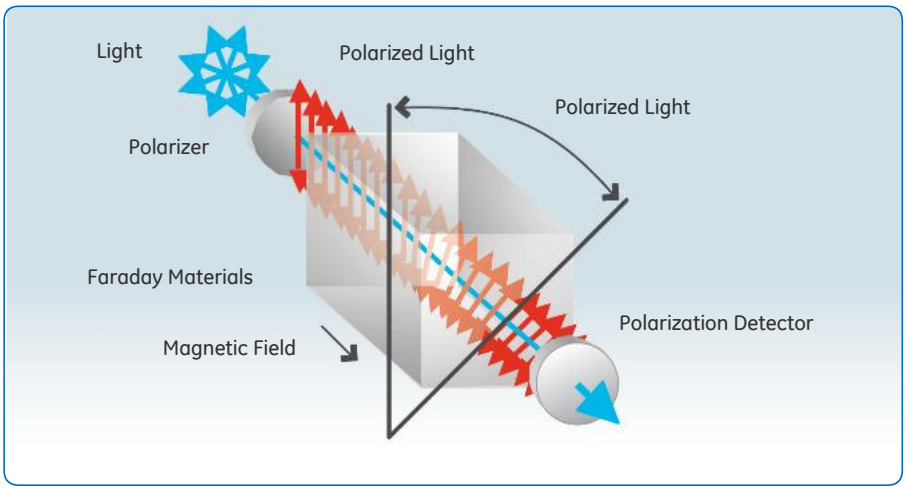
imagination at work

Smart Solutions for Smart Grid

Basic Faraday Effect

In Faraday Effect current sensors; the current flowing through a conductor induces a magnetic field that affects the propagation of light traveling through an optical fiber encircling the conductor.

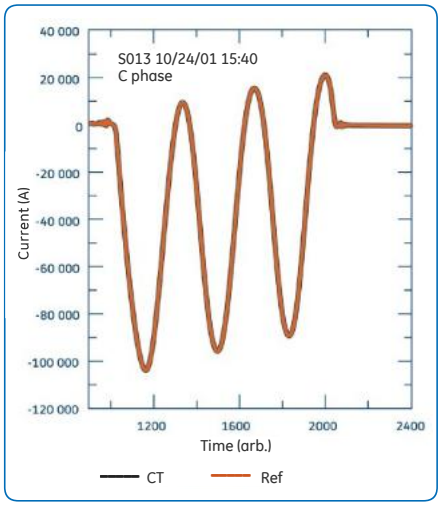
A linear state of polarization rotates in the presence of a magnetic field because the field produces a circular birefringence in the glass. Birefringence refers to an optical material with two indices of refraction.



Metering & Protection Accuracy

The COSI-CT design permits measurements to be made with the highest possible accuracy and stability. To address stringent revenue metering applications, its performance exceeds IEC Class 0.02S and IEEE Class 0.3 accuracy (optional 0.15%) with a dynamic range that extends from 1 A to 4800 A.

The COSI-CT has ultra-accurate and stable phase measurement, which is critical for intertie metering. For protection applications, the COSI-CT exceeds IEC Class 5P accuracy ratings and IEEE 10% accuracy ratings.



Fast Fault Response

- Extreme fast and accurate response
- COSI-CT actually measures the dynamic current
- No distortion due to core saturation, no need for TPY - TPZ specs, yet no danger for secondary equipment.

High voltage bushing

Wide Dynamic Range

Accuracy specification is maintained over a broad dynamic range - from 0.2% to 150% of rated current (extended metering range sensor) and up to 171 kA (protection range sensor). Broad dynamic range allows elimination of separate high and low range CT's.

Wide Bandwith

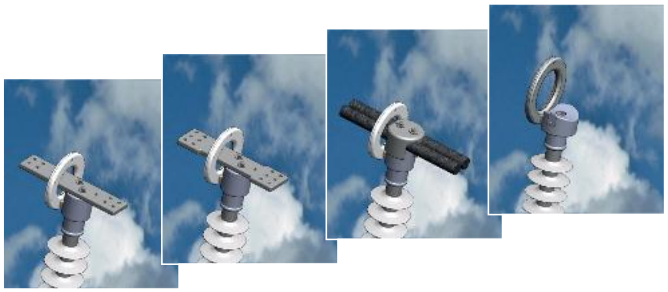
Accurate waveform reproduction up to 6 kHz allows full power quality analysis of harmonics and transients with no sensor-imposed limitations.

Seismic Stable Dry Type Insulator

Field-proven lightweight composite insulator reduces transportation costs, substation support structure requirements, and installation equipment demands. The lightweight design also allows location in seismically active areas.

Choice of Connection Options

New window head design allows a variety of connection options including standard NEMA pads, up to 300 mm rigid bus, or flexible cable pass thru, allowing optimal selection for ease of installation and reliability.



Green Design

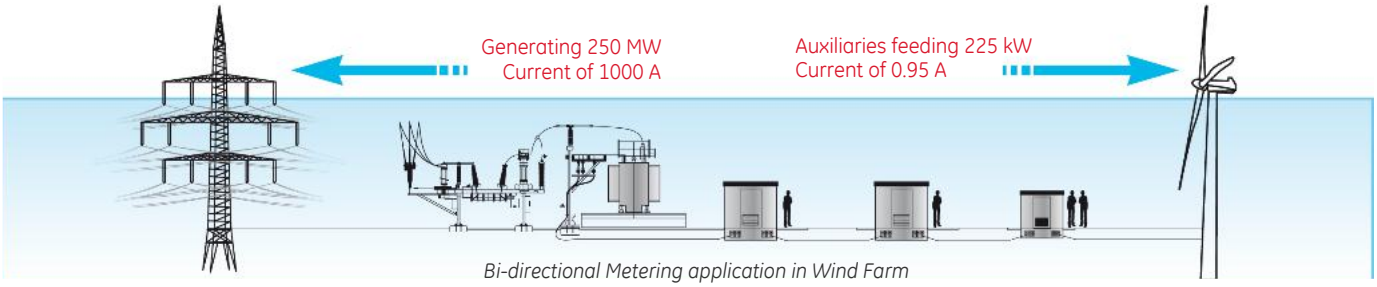
The COSI-CT insulator contains no oil, SF_6 or other gas. There is no internal mechanism for violent failure to endanger personnel or adjacent equipment. There are no environmental concerns or gas to recycle. With an optical design there are also no open secondary concerns.

Low Maintenance

The COSI-CT has no active components at line potential, eliminating the need for costly outages to maintain the electronics. Since there is no insulating oil or paper there are no complex maintenance procedures. The polymeric insulating column employs silicone rubber sheds that do not require live line washing.

Smart Grid Ready with Digital Interface

The standard digital interface will ensure smooth integration of COSI-CT into digital substation applications the accurate measurement of harmonics and phase angle is a must for new Smart Grid applications.



Bi-directional Metering application in Wind Farm

Specifications

Column mechanical & electrical ratings

CT Type		72.5	123	145	245	362	420	550	800
Maximum system Voltage (Um)	kV	72.5	121	145	245	362	420	550	800
Impulse test voltage (BIL)	kV	350	550	650	1050	1300	1550	1880	2100
Minimum creepage distance	in	57	115	115	193	285	562	562	562
	mm	1400	2900	2900	4900	7240	14280	14280	14280
Height	in	54.7	54.7	77.9	107.4	127.1	204.7	204.7	204.7
	mm	1389	1389	1979	2729	3229	5199	5199	5199
Weight	lbs	75	88	88	111	124	177	177	177
	kg	34	40	40	50	56	80	80	80
Static withstand	lbs	675	675	675	900	900	Suspension application only		
	N	3000	3000	3000	4000	4000	Suspension application only		

Ratings and dimensions for IEC pollution Class 2. Other ratings are available.

Environmental

Operating temperature range	- 40° C to 55° C (- 40° F to 131° F) Outdoor Service Conditions
Opto-electronic module	- 5° C to 40° C (23° F to 104° F) Indoor Service Conditions
Seismic capability	0.5 g

Mechanical

Standard pollution withstand	IEC Level II, other ratings available
Insulation	Solid composite insulator
Electronics dimensions	19" x 18" x 8.75" (482 mm x 457 mm x 222 mm) (includes high energy metering interface)

Electronics

Packaged in 2 modules:

Sensor electronics

Current amplifier

Low energy analog interfaces[1]	4 Vrms metering 200 mVrms protection
Dynamic range	< 0.2% error at rated current for 4V output, < 0.5% error at rated current for 200 mV output
	< 2% error at 108 kApeak (using protection sensor)
Bandwidth	0.5 Hz to 6 kHz DC available
High energy analog interfaces[1]	1 Arms [2 ohm burden] or 5 Arms [B0.1 (2.5 VA) burden] nominal at power 0.9 for metering
Dynamic range	< 0.2% error from 1 A to 4000 A (using extended metering range sensor)
Bandwidth	10 Hz to 6 kHz for 1 A metering output
Input power requirements	70 Vdc to 150 Vdc
	Typical power 60 W
Electronic turns ratio	User selectable
Alarms contacts	Data invalid / Maintenance required

Electrical Performance

Type I[3]:	Metering accuracy	IEC Class 0.2S, IEEE Class 0.3, 0.15S
	Protection accuracy	IEC Class 5P, IEEE 10%
Type II[3]:	Extended range std metering accuracy	0.2% (0.2% to 150% of rated current)[2]
Type III[3]:	Extended range high metering accuracy	0.15% (0.2% to 150% of rated current)[2]
	Continuous Current	4800 A Max (4800 A, RF = 1; or 3000 A, RF = 1.33; or 2500 RF = 1.5)
	Rated Current	User specified for up to 4000 A
	Short-time Thermal Current	63 kArms for 1 s

1 Scales linearly with primary voltage and current. / 2 Accuracy window moves with selected ratio. / 3 Other ratings available, consult Grid Solutions.

For more information please contact
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