GridAdvisor Insight RG235 optical medium-voltage and current sensor system

The GridAdvisor Insight RG series optical medium-voltage and current sensor system utilizes a 100% “all optical” measurement platform for unparalleled accuracy and precision of both voltage and current across multiple voltage classes. Installation time for a typical three-phase system is less than 3 hours, resulting in significant deployment savings. All signals from the sensor are connected via optical fiber connections to a “plug & play” modular optical sensor platform m410 modular optical sensor platform that is fully ruggedized and scalable.

Product overview
- 4 kV to 35 kV outdoor rated, 220 kV BIL, 60 Hz
- Includes both current and voltage sensing
- Sensing voltage: 4 kV to 35 kV
- Sensing amperes: 5 A to 25 kA
- Transients: 40 dB (10x steady-state condition)
- Harmonics: measurements to 50th voltage harmonic
- Approximate weight: 15 lb (6.8 kg)

Features and benefits
The GridAdvisor Insight optical medium-voltage and current sensor is a direct replacement for standard potential transformers and current transformers. Because of the “all optical” sensor design, there are no conductive materials used for the measurement of both voltage and current. The insulator body is casted in hydrophobic cycloaliphatic epoxy (HCEP) using a state-of-the-art injection molding process. HCEP construction provides superior arc track, ozone and ultraviolet-resistant properties while maintaining physical strength. The hydrophobic surface properties of the HCEP ensure highly reliable performance in wet or humid conditions. All calibration and performance settings are stored in the ruggedized modular electronics enclosure at the base of the optical cable. The m410 modular optical sensor processor provides a “highly accurate” and “low cost” precision solution for distribution grid monitoring and control.

GridAdvisor optical features
All-optical solution for voltage and current measurements:
- One SKU for 4 kV to 35 kV voltage and current classes
- Modular, hot-swappable and plug & play
- Calibration and offsets are contained within the RG235 sensor

HCEP benefits
- Enhanced water shedding properties
- Reduced contamination-related leakage
- Improved product quality, reliability and UV protection
- Results in a more consistent and reliable product

Installation
The GridAdvisor optical medium-voltage and current sensor installs directly on the conductor wire using anti-rotation, conduction grade, aluminum wire clamps. A shot-gun stick hook located on the top of the GridAdvisor RG235 sensor enables, safe and quick live installations.

Performance
The GridAdvisor Insight optical medium-voltage and current sensor provides both high accuracy and precision that remains constant regardless of applied voltage or current. Average accuracy and precision is ±0.5% within a temperature range of −30 °C (−22 °F) to +85 °C (+185 °F).
Specifications

Sensor
- Insulator body rating 35 kV, 55 ft (17 m) cable length
- Wire clamp adjustable diameter 0.162 to 1.125 inches
- Transients: 40 dB (10x steady-state condition) minimum
- Harmonics: measurements to 50th harmonic
- Accuracy: ±0.5% voltage and current
- Long-term stability ±0.25%

Environmental
- Operational: –40 ºF to +185 ºF (–40 ºC to +85 ºC)
- Relative humidity: 5% to 95%

Typical included components
- Three GridAdvisor RG235 sensors
- Suggested insulation guide

Test reports
Test reports are stored electronically and can be emailed in various formats at the time of shipment.

Certifications
- Acid atmosphere: MIL-STD-810G, Method 518.1
- Salt fog: MIL-STD-810G, Method 509.5
- Temperature shock: MIL-STD-810G, Method 503.5
- Vibration: MIL-STD-810G, Method 514.6, 514.6C-4
- BIL: 200 kV full-wave lightning impulse
- Partial discharge per IEEE® Std. 4

Unit dimensions

SKU: RG235
Additional styles available. Contact your Eaton sales representative.

Typical three-phase monitoring application

GridAdvisor voltage and current configurator

Sensor configuration
- RG = GridAdvisor overhead hanging sensor
- RI = GridAdvisor standoff insulator sensor
- RIC = GridAdvisor standoff insulator with current ring
- RE = GridAdvisor elbow sensor
- REC = GridAdvisor elbow sensor with current ring
- RP = GridAdvisor line post sensor

Sensor type configuration
- Voltage only sensor
- Combination sensor (voltage and current)
- Current only sensor

Sensor insulating rating
- 25 = 25 kV insulator rating (RI and RP only)
- 35 = 35 kV insulator rating (RI, RP and RG only)
- 20 = Standard 200 A elbow (RE only)

Typical three-phase monitoring application

A. RG235 combination sensor (Phase A)
B. RG235 combination sensor (Phase B)
C. RG235 combination sensor (Phase C)
D. Neutral wire connection
E. Optical fiber cable (17 meters/55 feet)
F. Conductor cable
G. Power line pole
H. m410 and electronics in NEMA outdoor-rated enclosure

For Eaton product information, visit
Eaton.com/smartgrid