DISTRIBUTENSE® SENSORS

Current and voltage sensors
Enhancing grid reliability and efficiency
CURRENT AND VOLTAGE SENSORS ENHANCING GRID RELIABILITY AND EFFICIENCY

DistribuSense® sensors
For improved reliability and power delivery

ABB offers a variety of sensors for grid modernization applications, providing utilities with increased reliability and efficiency.

Today, utilities experience unprecedented challenges associated with power delivery. An aging grid infrastructure coupled with increasing consumer demand, stringent regulations, avoiding peak-time cost penalties, and integrating alternative energy sources into the grid are factors utilities must consider to improve power delivery and reliability. More data collection points, enabling greater grid intelligence, are required. Collecting from feeder locations to substations ensures the grid is optimized to address these challenges.

Current and voltage sensors are ideal for providing feeder intelligence that drives decision-making for a variety of important grid modernization applications. Utilities benefit from increased reliability and efficiency by decreasing energy costs, protecting revenue, avoiding costly regulatory penalties, and boosting customer satisfaction. Maximizing these benefits requires understanding grid conditions throughout the entire feeder network.

Sensor portfolio
ABB in Pinetops, NC, offers many styles of current, voltage, and combination sensors. ABB outdoor sensors include medium voltage line post sensors, split-core current sensors, and submersible sensors. In addition, the indoor sensor offering includes several types and sizes of UL-rated indoor sensors.

Benefits
Sensors, also known as electronic instrument transformers or low-power passive instrument transformers, provide many key benefits over traditional instrument transformers. Some of these benefits include the following:

- Reduced chances of failure
- Simpler construction
- Fewer internal failure points
- Reduced footprint
- Lightweight, with small form factors
- More linear response, especially when harmonics are present
- Simplified installations
- Less wiring
- Lightweight, with a small footprint
- Flexibility toward varying load flow
- Linear response
- Extensive dynamic range (no core saturation)
- Can often be retrofitted in existing structures with new relays
- Standardization
- One sensor covers full voltage or current range of traditional instrument transformer family
- Improved inventory management
- Change-out flexibility

Sensor and intelligent electronic device (IED) compatibility
To ensure accurate measurement and proper performance, the sensor and IED must be compatible. Due to the wide variety of relays and controllers offered in the market today, contact the factory or your ABB sales representative to ensure sensor compatibility.
**Outdoor sensors**

**Line post sensors**

Medium voltage line post sensors are installed on primary distribution lines or overhead apparatus and designed to connect with meters, relays, and grid controllers for real-time data acquisition. They are used as a key function in distribution automation solutions:

- Sensing at capacitor banks for Volt/VAR optimization
- Sensing at reclosers and overhead switches for fault detection, isolation, and restoration schemes
- Sensing at the head and end of feeders for conservation voltage regulation
- Sensing at various feeder points supports harmonic analysis and transient and permanent fault detection

For insulation and protection, medium voltage line post sensors are cast in hydrophobic cycloaliphatic epoxy (HCEP). The HCEP material is widely recognized as the superior insulation material for outdoor electrical products. HCEP offers superior arc track, ozone, and ultraviolet-resistance while maintaining excellent physical strength. The hydrophobic surface properties of HCEP enhance water shedding to ensure highly reliable performance in most climates, including heavily polluted environments.

**VLS voltage sensor**

- Provides several voltage outputs for accurate voltage sensing
- Small and lightweight
- Provides accurate, reliable voltage readings at points throughout the grid
- Constructed with military-grade amphenol connectors to ensure long product life
- Offered with low energy analog signal (LEA) voltage outputs (2 - 10 V)

**VCS voltage and current combination sensor**

- Provides several voltage outputs for accurate voltage sensing
- Accurate current sensing provides a 10 V output
- Sensor utilizes technology to improve performance by avoiding the impacts of current cross talk
- Acts as a line post insulator, allowing for easy, live installation without primary taps or cutting the line
- Also offered with fault current measurement capability to 12 kA
WLS voltage and current combination sensor
• Accurate voltage sensing provides a 120 V output
• Accurate current sensing provides a 1 A output
• Effective fault current detection up to 12 kA
• Delivers accurate current wave forms
• Identifies power quality issues by measuring up to the 66th harmonic
• Acts as a line post insulator, allowing for easy, live installation without primary taps or cutting the line

VKS current sensor
• Accurate current sensing provides a 10 V output
• Acts as a line post insulator, allowing for easy, live installation without primary taps or cutting the line
• Also offered with fault current measurement capability to 12 kA

KLS current sensor
• Split-core current transformer design provides a 1 A output for real-time reading of the current wave form
• Effective fault current detection up to 12 kA
• Integrates with a wide selection of controllers
• Acts as a line post insulator, allowing for easy, live installation without primary taps or cutting the line
Outdoor sensors
Submersible current sensor

**RSS-1 submersible current sensor**

The RSS-1 submersible current sensor, the first of its kind in the industry, is designed for non-revenue current measurement in indoor and underground vault applications. Unlike other current transformers and sensors on the market today, the RSS-1 offers a unique design that provides complete hermetic sealing of internal components.

- Long life in harsh submersible environments
- Submersible up to 6.5 feet (2 meters)
- 10 V output
- Voltage clipping to limit secondary output to 65 V (4000 A primary) to protect receiving devices during fault currents
- UL Recognized

Outdoor sensors
Split-core current sensor

**LVS low voltage split-core current sensor**

- Reliable 1A output signal for current measurement
- Small, lightweight, and installs live
- Retrofit application with existing distribution transformers
- Simplifies integration with standard energy metering devices
- Enhances grid visibility without requiring data from endpoint meters
- Outdoor application
- Can also be used as a current neutral sensor

Low voltage sensors are designed with standard current and voltage outputs to power and connect with smart meters for near real time data acquisition to achieve grid modernization objectives.

LVS sensors are insulated with high performance, impact-resistant thermoplastic to preserve quality and performance in harsh environmental conditions. The result is an outdoor rated, compact unit with excellent mechanical, thermal, and accuracy characteristics.
Indoor sensors

KECA 80 C85 indoor current sensor
The KECA 80 C85 current sensor is intended for current measurement in medium voltage air or gas insulated switchgear. It is installed over a bushing insulator, insulated and shielded cable, insulated and shielded cable connectors, or any other type of insulated and shielded conductor. The current sensor is equipped with a clamping system which provides easy and fast installation, making the sensor suitable for retrofit purposes.

Applications
- Gas insulated switchgear
- Suitable for new installations as well as for retrofit purposes
- Rated primary current of application: up to 4,000 A

Ratings
- Highest voltage for equipment: 0.72 kV
- Rated primary current: 80 A
- Cable lengths: 2.2, 3.4, 5 m
- Inner diameter: 85 mm

KECA 80 D85 indoor current sensor
The KECA 80 D85 current sensor is intended for current measurement in medium voltage air and gas insulated switchgear. It is installed over a bushing insulator, insulated and shielded cable, insulated and shielded cable connectors, or any other type of insulated and shielded conductor. The current sensor is split core type, which provides easy and fast installation, making the sensor suitable for retrofit purposes.

Applications
- Air and gas insulated switchgear
- Suitable for new installations as well as for retrofit purposes
- Rated primary current of application: up to 4,000 A

Ratings
- Highest voltage for equipment: 0.72 kV
- Rated primary current: 80 A
- Cable length: 5 m
- Inner diameter: up to 85 mm
KECA 80 C184 indoor current sensor
The KECA 80 C184 current sensor is intended for current measurement in medium voltage air insulated switchgear. It is installed over a bushing insulator, insulated and shielded cable, or any other type of insulated and shielded conductor.

Applications
- Air insulated switchgear
- Rated primary current of application: up to 4,000 A

Ratings
- Highest voltage for equipment: 0.72 kV
- Rated primary current: 80 A
- Cable length: 5 m
- Inner diameter: 184 mm

KEVA 17.5 B21 indoor voltage sensor
The KEVA 17.5 B21 voltage sensor is intended for voltage measurement in air insulated switchgear. It is designed for use as a line post insulator, but can be used as a stand-alone unit as well.

Applications
- Air insulated switchgear
- Suitable for new installations, as well as retrofit purposes
- Rated primary voltage of application: up to 17.5 kV

Ratings
- Highest voltage for equipment: up to 17.5 kV
- Rated primary voltage: 15/√3 V
- Cable length: 5.5 m