Hydrogen in transformer oil, above all other gases, is a key indicator of potential problems, resulting in interrupted operations and unplanned expenditures. Monitoring hydrogen levels with CoreSense™ is the most cost-effective, condition-based maintenance approach to mitigate these risks, and to ensure reliable transformer performance and optimized maintenance planning.

Continuous online monitoring
CoreSense™ provides real-time, continuous, online monitoring of hydrogen and moisture levels in transformer oil. Hydrogen readings can provide an early warning for most transformer faults, whereas moisture monitoring can prevent premature aging of a unit. Early detection of such incipient faults thereby allow you to take preemptive measures, when needed.

Hydrogen-specific sensor
Unlike other products that monitor a combination of gases dissolved in oil, which increase the likelihood of false alarms, CoreSense™ is a hydrogen-specific sensor. Hydrogen is the first indicator of most transformer faults and CoreSense™ can alert the operator to a possible problem. A laboratory Dissolved Gas Analysis (DGA) will need to be performed after a serious alert in order to assess the root-cause of high gas levels in oil.

Easy installation
CoreSense™ is easy to install and use. With its innovative thermal element that induces convection currents by heating the oil, it can be connected to new or existing transformers, all types and brands, and at any location, including the drain valve.

Maintenance free
CoreSense™ is designed for maintenance-free operation. This is the result of heavy-duty, industrial grade design with no moving parts and a robust all-metal enclosure.
- Industrial grade enclosure: IP67/NEMA 4X rating can operate under one meter (3 feet) of water
- The sensor is made of solid-state elements that do not drift over time or require periodic calibration and are not consumables
- There are no batteries to replace, the real time clock is backed up against power failures by an ultra-capacitor

Scalable software with integrated analytics
- Optimize the use of your assets by modeling overload capability, hot spot temperature and insulation aging. This is achieved by monitoring parameters such as oil temperature and load
- The CoreSense™ Hub recognizes ABB e-devices and can connect to other third party sensors that use 4-20mA inputs or Modbus
- The CoreSense™ Hub optional firmware enables these added functionalities on any CoreSense™. Existing CoreSense™ systems are field upgradeable with no additional hardware
### Hydrogen
- **Measurement range**: 0 to 5,000 ppm (µl/l) with a detection limit of 25 ppm (µl/l)
- **Measurement accuracy**: ±25 ppm or ±20% (whichever is higher)

### Moisture
- **Measurement range**: 0 to 1 aw (0 to 100% RH)
- **Measurement accuracy**: ± 0.02 aw (± 2% RH)
- **Range in ppm**: 0 to 60 ppm @ 25°C (77°F) or 0 to 180 ppm @ 55°C (131°F)
- **Measurement accuracy in ppm**: ± 3%
- **Temperature measurement accuracy**: ± 0.2°C (± 0.4°F)

### Electrical specifications
- **Voltage input**: 100 to 240 VAC (50 to 60 Hz)
- **Power consumption**: 150 VA
- **Fuse type**: 1 x 1.0 A/240 V (5 x 20 mm) slow blow (IEC60127 type T)

### Mechanical specifications
- **Dimensions**: 392 x 264 x 158 mm (14.43 x 10.39 x 6.2 in)
- **Weight**: 8 kg (18 lbs)
- **Interface to transformer**: 1.5 NPT male thread
- **Enclosure**: IP67/NEMA4X enclosure, ISO12944 class C4

### Communications specifications
- **Digital Interfaces**:
  - RS485 serial port
  - 2 RJ45 100 base-T Ethernet ports
  - 100 base-FX fiber optic Ethernet port
- **Protocols**: Modbus RTU over RS485 and Modbus TCP/IP over Ethernet
  - Modbus Master on RS485 for reading local sensors (CoreSense™ Hub)
  - DNP3 over RS485 and Ethernet
  - IEC61850 over Ethernet
- **Analog Interfaces**: 3 dry-contact relays for alarms
  - 2 analog 4-20 mA outputs for publishing values
  - 3 analog 4-20 mA inputs for reading external sensors

### Environmental specifications
- **Operating ambient temperature and humidity**: −50°C to 55°C (−58°F to 131°F) with 5 to 95% RH, non-condensing
- **Oil temperature at valve**: −20°C to 100°C (−4°F to 212°F)
- **Oil pressure at valve**: 0 to 1,000 kPA/0 to 10 bar/0 to 145 psi