SENSOR COMPATIBILITY GUIDE
How to select Intelligent Electronic Device correctly
The basic role of current and voltage sensors are to transform current and voltage from the high levels in electrical distribution systems to the standardized values that can be used by low voltage measuring and protection apparatus.

The range of electric values in the power supply systems is very extensive. In order to provide full performance and expected accuracy it is necessary to match the respective values appropriate to connected Intelligent Electronic Devices (IEDs) represented by Protection relays, Fault Passage Indicators (FPIs) and Energy meters.
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1. ABB relays

ABB product families of IEDs and MV sensors offer the widest range of solutions for the protection, control, measurement and supervision of power systems supported by decades of experience from development and operation. ABB IEDs use advantage of ABB MV sensors and operate with secondary signal from Rogowski coil with output of 150mV/180mv for 50/60 Hz in current sensors and also by voltage divider with fixed ratio 10000:1, utilizing correction factors as smart way how to increase overall accuracy performance.

1.1 Protection relays

Relion 605 series
REF601, REJ601 and REM601 are dedicated protection and control relays intended for the protection and control of utility and industrial power systems in secondary distribution networks same as protection and control of medium-voltage and low-voltage asynchronous motors in the manufacturing and process industry. The IEDs provide an optimized composition of protection, monitoring and control functionality (overcurrent, earth-fault, short circuit, phase-discontinuity, negative-phase sequence and thermal-overload protections, inrush current detection, loss of load, circuit-breaker control, reclosing and measurement) in one unit, with the best performance and usability in its class.

Compatibility: ABB MV Current sensors

Relion 620 series
Series increase flexibility and extends the hardware possibilities further compared to the 615 series. REF620 and REM620 are dedicated as feeder management IEDs for protection, control, measurement and supervision in utility and industrial power distribution systems, same as for motor management and supervision of medium and large sized asynchronous and synchronous motors. Advanced and fast fault location of short circuits and earth faults, interconnection protection for distributed power generation, capacitor bank, basic motor and arc protection are common features of Relion 620 series.

Compatibility: ABB MV Current and Voltage sensors.
Relion 640 series
REX640 is a powerful, all-in-one protection and control IED, for advanced power generation and distribution applications. REX640 offers unmatched flexibility throughout its entire life cycle – from ordering through testing and commissioning, to upgrading the functionality of its modular software and hardware to meet new application requirements. Together with ABB sensors REX 640 represents freely configurable IED for flexible tailoring to application-specific requirements.

Compatibility: ABB MV Current and Voltage sensors

1.2 Fault passage indicators

RIO600
RIO600 offers Fault Passage Indication (FPI) functionality in modules SIM4F and SIM8F. RIO600 enables accurate current and voltage measurements from the medium-voltage network utilizing ABB’s light weight sensor technology. Based on the measured values, RIO600 gives directional fault passage indication and reports it to the upper level system using Modbus TCP or IEC 61850 GOOSE. RIO600 also enables power flow and power quality monitoring. With state-of-the-art multi-frequency admittance (MFA) based earth fault indication also high-ohmic transient and intermittent type of earth faults can be reliably detected, even in case of compensated and isolated networks.

Compatibility: ABB MV Current sensors (SIM4F) and ABB MV Current and Voltage sensors (SIM8F)
2. 3rd party IEDs

The evolution of smart grids and the broad application of renewables has created a need for the extensive use of current and voltage measurements for the proper management of power networks. These trends therefore require the use of advanced, low-power sensing technologies instead of traditional solutions using iron-core instrument transformers, due to their physical limitations.

In ABB is perceived the gradual expansion of the compatibility of our portfolio as a natural part of the development of sensors and their use in an increased range of applications in MV systems. Therefore, voltage sensors family KEVA C extends IEDs compatibility list far beyond ABB borders with a secondary output of 3.25 V. New version of KEVA C with 3.25 V output is designed for three primary voltage ratios of 20/√3 kV, 15/√3 kV, 10/√3 kV with option of 2 MΩ/50 pF or 200 kΩ/350 pF rated burden, completely type tested according to IEC 61869-11 which secure the compatibility with 3rd party IEDs.

2.1 Protection relays

Siemens SIPRO-TEC 7SJ81
The protection relay by Siemens provides standard functions of directional and non-directional over current protection with additional functions and detection of ground faults of any type in compensated or isolated electrical power systems. Numerous types of protections functions as arc protection, over voltage protection, frequency protection, power protection and under voltage protection are also included, same as detection of current and voltage signal up to 50th harmonics and many other functions.

Compatibility ensured with: KEVA C with 3.25 V output, rated burden 200 kΩ/ 350 pF

Schneider Electric Easergy P5
The protection relay by Schneider Electric provides standard functions of directional and non-directional phase over current protection, phase under current protection and detection of ground faults of any type in compensated or isolated electrical power systems. Various of protections functions as voltage protection (under/over), frequency protection (under/over), thermal protection, arc protection, rotating machine protection, line protection are also included, same as many other functions.

Compatibility ensured with: KEVA C with 3.25 V output, rated burden 200 kΩ/ 350 pF

2.2 Fault passage indicators

A-eberle EOR-3D compact
Earth fault and short circuit indicator for substations, compact stations up to local grid stations with special requirements. EOR-3D provides directional and non-directional short circuit indication, transient earth fault detection, pulse location and active power direction location method with measurement of reactive power.

Compatibility ensured with: EOR-3D compact (product code U29 + C29): KEVA C (10 000:1), KEVA B (10 000:1), KECA 80 C85, KECA 80 D85 EOR-3D compact (product code U06): KEVA C (3.25 V output, rated burden 200 kΩ/ 350 pF)

Hortsmann ComPass B 2.0
Device provides directional short-circuit and directional earth fault detection same as monitoring of phase currents, phase-phase and phase-ground voltage, power factor and many others in all types of network. Earth fault detection is secured with six different detection methods.

Compatibility ensured with: KEVA C with 3.25 V output, rated burden 200 kΩ/ 350 pF

Kries Inspector IKI-50
Load monitor and fault detection IKI-50 1F PULS Grid-Inspector monitors all electrical measurement values like currents, voltages, power and others. Kries device provides directional and non-directional short circuit detection together with earth fault detection with included failure forecast for all kind of neutral earthing systems.

Compatibility ensured with: KEVA C with 3.25 V output, rated burden 200 kΩ/ 350 pF

Schneider Electric Easergy SC150
Fault passage indicator with current and voltage control and monitoring functions, directional and non-directional phase-phase and phase-ground detection together with broken conductor detection and power detection in one compact body.

Compatibility ensured with: KEVA C with 3.25 V output, rated burden 200 kΩ/ 350 pF
3. Statistical energy meters

Energy meters represent an important role in very accurate measurement of electrical energy in the electricity distribution systems. ABB extended compatibility of Medium-voltage sensor portfolio with Energy meters for applications where the solution based on combination of ABB MV Current and Voltage sensors with dedicated Energy meters provide the most accurate data from the grid.

3.1 Statistical

EnergoService ESM-TM
ESM multifunctional measuring device acts as a measuring transducer, statistical energy meter and power quality analyzer. ESM differentiates energy consumption by season, day type and time of day, providing time-of-use (TOU) data. Statistical energy multimeter is compatible with ABB Current and Voltage sensors according to IEC 60044-8 and IEC 60044-7 standards and operate in accuracy class 0.5S for active energy and class 1 for reactive energy.

Compatibility ensured with: KEVA B, KECA 80 Cxxx.
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