

MEDIUM VOLTAGE PRODUCT

# AdvaSense™ Sensor Compatibility Guide

How to select intelligent electronic device correctly



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**The basic role of AdvaSense™ 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 and Fault Passage Indicators (FPIs).**

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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.

**Note:** For merging of current and voltage sensor output signals AR4 or AR5 ABB adapters to be used.

## 1.1 Protection Relays



REF601, REJ601, REM601

### 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



REF615, REM615,  
RED615, REC615

### RELION® 615 SERIES

The 615 series of relays provides a number of standard configurations and is the ideal choice for a great variety of applications within distribution protection and control. The series include sensors compatible IEDs REF615, REM615, RED615, REC615 dedicated for protection, control, measurement and supervision of overhead lines, cable feeders in utility and industrial power distribution systems, distribution networks, motor protection and line differential protection. Together with sensor technology this IEDs represent extensive range of protection and control functionality like line differential protection with directional or non-directional overcurrent and earth-fault protection, voltage and frequency based protection and measurement functionality, motor protection and protection functionality to detect, isolate and restore power in medium-voltage networks.

#### Compatibility:

- ABB MV Current and Voltage sensors



REX 615

### RELION® REX 615

REX615 is a freely configurable all-in-one protection and control relay for power generation and distribution applications. A wide application coverage combined with a fully modular and scalable hardware and software ensures maximum flexibility and optimal cost-effectivity throughout the relay life cycle – from tailoring to adapting to changing and new application-specific requirements.

#### Compatibility:

- ABB MV Current and Voltage sensors



REF620, REM620

### RELION® 620 SERIES

Series increases 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



REX640

### RELION® REX 640

REX 640 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

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/ $\sqrt{3}$  kV, 15/ $\sqrt{3}$  kV, 10/ $\sqrt{3}$  kV with option of 2 M $\Omega$ /50 pF or 200 k $\Omega$ /350 pF rated burden, completely type tested according to IEC 61869-11 standard which secure the compatibility with 3rd party IEDs.

### 2.1 Protection Relays



Schweitzer Engineering Laboratories SEL-751

#### SCHWEITZER ENGINEERING LABORATORIES SEL-751

The SEL-751 Feeder Protection Relay provides a comprehensive combination of protection, fault-locating features, monitoring, control, and communication in an industrial package.

#### Compatibility ensured with ABB sensors complying with IEC 61869-10 / IEC 61869-11 standards:

- Current sensors from KECA family with 150/180 mV at 50/60 Hz
- Voltage sensors KEVA C, KEVA B (both with transformation ratio 1:10 000, 2M $\Omega$ /50pF)

**Note:** For splitting of current and voltage sensor output signals AR5 ABB adapters to be used.

- Combined sensors KEVCY/KEVCD with 150/180 mV at 50/60 Hz for current measurement and ratio 1:10 000, 2M $\Omega$ /50pF for voltage measurement.

#### SCHWEITZER ENGINEERING LABORATORIES SEL-787L

The SEL-787L Line Current Differential Protection Relay provides a comprehensive combination of protection, fault-locating features, monitoring, control, and communication in an industrial package.

#### Compatibility ensured with ABB sensors complying with IEC 61869-10 / IEC 61869-11 standards:

- Current sensors from KECA family with 150/180 mV @ 50/60 Hz
- Voltage sensors KEVA C, KEVA B (both with transformation ratio 1:10 000, 2M $\Omega$ /50pF)

**Note:** For splitting of current and voltage sensor output signals AR5 ABB adapters to be used.

- Combined sensors KEVCY/KEVCD with 150/180 mV @ 50/60 Hz for current measurement and ratio 1:10 000, 2M $\Omega$ /50pF for voltage measurement.



Schweitzer Engineering Laboratories SEL-787L



Schweitzer Engineering  
Laboratories SEL-700G

### SCHWEITZER ENGINEERING LABORATORIES SEL-700G

The generator protection relay SEL-700G offer complete solution for protection of synchronous generators with an autosynchronizer, flexible I/O, and advanced communication.

#### Compatibility ensured with ABB sensors complying with IEC 61869-10 / IEC 61869-11 standards:

- Current sensors from KECA family with 150/180 mV @ 50/60 Hz
- Voltage sensors KEVA C, KEVA B (both with transformation ratio 1:10 000, 2M $\Omega$ /50pF)  
**Note:** For splitting of current and voltage sensor output signals AR5 ABB adapters to be used.
- Combined sensors KEVCY/KEVCD with 150/180 mV @ 50/60 Hz for current measurement and ratio 1:10 000, 2M $\Omega$ /50pF for voltage measurement.



Schweitzer Engineering  
Laboratories SEL-787-4

### SCHWEITZER ENGINEERING LABORATORIES SEL-787-4

The SEL-787-4 transformer protection relay offers versatile functionality for monitoring, protection and controlling of transformer with advanced automation and flexibility.

#### Compatibility ensured with ABB sensors complying with IEC 61869-10 / IEC 61869-11 standards:

- Current sensors from KECA family with 150/180 mV @ 50/60 Hz
- Voltage sensors KEVA C, KEVA B (both with transformation ratio 1:10 000, 2M $\Omega$ /50pF)  
**Note:** For splitting of current and voltage sensor output signals AR5 ABB adapters to be used.
- Combined sensors KEVCY/KEVCD with 150/180 mV @ 50/60 Hz for current measurement and ratio 1:10 000, 2M $\Omega$ /50pF for voltage measurement.



Schweitzer Engineering  
Laboratories SEL-710-5

### SCHWEITZER ENGINEERING LABORATORIES SEL-710-5

The SEL-710-5 motor protection relay for protection of asynchronous (induction) and synchronous motors offer broken rotor bar detection and variable-frequency drive (VFD) support as well as options for arc-flash detection (AFD), differential protection, and synchronous motor protection.

#### Compatibility ensured with ABB sensors complying with IEC 61869-10 / IEC 61869-11 standards:

- Current sensors from KECA family with 150/180 mV @ 50/60 Hz
- Voltage sensors KEVA C, KEVA B (both with transformation ratio 1:10 000, 2M $\Omega$ /50pF)  
**Note:** For splitting of current and voltage sensor output signals AR5 ABB adapters to be used.
- Combined sensors KEVCY/KEVCD with 150/180 mV @ 50/60 Hz for current measurement and ratio 1:10 000, 2M $\Omega$ /50pF for voltage measurement.



Schweitzer Engineering Laboratories SEL-700BT

### SCHWEITZER ENGINEERING LABORATORIES SEL-700BT

The SEL-700BT motor bus transfer relay is an effective solution for an industrial motor bus transfer system, with multiple source transfer algorithms, flexible I/O, and advanced communications. Automatically transfer the motor bus feeder source in industrial plants to ensure process continuity.

#### Compatibility ensured with ABB sensors complying with IEC 61869-10 / IEC 61869-11 standards:

- Current sensors from KECA family with 150/180 mV at 50/60 Hz
- Voltage sensors KEVA C, KEVA B (both with transformation ratio 1:10 000, 2M $\Omega$ /50pF)  
**Note:** For splitting of current and voltage sensor output signals AR5 ABB adapters to be used.
- Combined sensors KEVCY/KEVCD with 150/180 mV at 50/60 Hz for current measurement and ratio 1:10 000, 2M $\Omega$ /50pF for voltage measurement.

### SIEMENS SIPROTEC 7SY82

The universal protection device SIPROTEC 7SY82 is designed for the connection of LPITs (Low Power Instrument Transformers).

The SIPROTEC 7SY82 universal protection is designed for the following types of protection: protection and control of feeders, detection and selective 3-pole tripping of short circuits in medium-voltage networks, selective detection of all earth faults.

Protection applications and functions: directional and non-directional overcurrent protection of feeders with additional functions, detection of, ground faults of any type in isolated or arcsuppression-coil grounded power systems, overvoltage and undervoltage protection, frequency protection and frequency-rate-of-change protection, power protection and many others.

#### Compatibility ensured with ABB sensors complying with IEC 61869-10 / IEC 61869-11 standards:

- Current sensors from KECA family with 150/180 mV at 50/60 Hz LPCT: KECA x00CL83 with 225 mV output
- Voltage sensors KEVA C, KEVA B (both with transformation ratios 1:10 000, 3.25 V, 2 M $\Omega$ /50 pF)
- Combined sensors KEVCY/KEVCD with 150/180 mV at 50/60 Hz for current measurement and ratio 1:10 000, 2 M $\Omega$ /50 pF for voltage measurement.

### SIEMENS SIPROTEC 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 ABB LPCT and LPVT complying with IEC 61869-10/ IEC 61869-11 standards:

- LPCT: KECA x00CL83 with 225 mV output
  - LPVT: KEVA C, KEVA B with 3.25 V output, rated burden 200 k $\Omega$ / 350 pF.
- Type of connection: RJ45.



Siemens SIPROTEC 7SY82

## 2.2 Fault Passage Indicators



A-eberle EOR-3DS

### A. EBERLE EOR-3DS

Earth fault and short circuit indicator for substations, compact stations up to local grid stations with special requirements. EOR-3DS provides directional and non-directional short circuit indication, short circuit to earth indication and six different earth fault detection algorithms. With a wide range of SCADA protocols, MQTT and PLC functionality the device is especially designed for digital substations.

#### Compatibility ensured with ABB sensors complying with IEC 61869-10 / IEC 61869-11 standards:

EOR-3DS (product code U29 + C29):

- Voltage Sensors KEVA C, KEVA B (both with transformation ratio 10 000:1 and rated burden 2 M $\Omega$ ; 50 pF)
- Current Sensor KECA sensors based on Rogowski coil technology

**Note:** For merging of current and voltage sensor output signals AR4 or AR5 ABB adapters to be used.

- Combined sensors KEVCY/KEVCD with 150/180 mV @ 50/60 Hz for current measurement and ratio 10000:1, 2 M $\Omega$ ; 50 pF for voltage measurement

Type of connection: RJ45

EOR-3DS (product code U07 + C10):

- Voltage Sensor KEVA C, KEVA B (3.25 V output, rated burden 2 M $\Omega$ / 50 pF)
- Current Sensor KECA 100 CL83 (with secondary output 225mV)

Type of connection: Screw type connection - ferrules



A-eberle EOR-1DS

### A. EBERLE EOR-1DS

Earth fault and short circuit indicator for substations, compact stations up to local grid stations with special requirements. EOR-1DS provides, beside Modbus RTU, directional and non-directional short circuit indication, short circuit to earth indication, transient earth fault detection and pulse location. Active power and reactive power location method will be available in future as well by firmware update.

#### Compatibility ensured with ABB sensors complying with IEC 61869-10 / IEC 61869-11 standards:

EOR-1DS (product code U07 + C10):

- Voltage Sensor KEVA C, KEVA B (3.25 V output, rated burden 2 M $\Omega$ / 50 pF)
- Current Sensor KECA 100 CL83 (with secondary output 225mV)

Type of connection: Screw type connection - ferrules

### HORSTMANN 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 ABB sensors complying with IEC 61869-11 standard:

- KEVA B/KEVA C with 3.25 V output, rated burden 200 k $\Omega$ / 350 pF

Type of connection: RJ45

**Note:** For merging of current and voltage sensor output signals AR4 or AR5 ABB adapters to be used.



Hortsmann ComPass Bs 2.0

### HORSTMANN COMPASS BS 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 ABB sensors complying with IEC 60044-7 / IEC 60044-8 standards:

- Current sensors from KECA family with rated primary current 80 A & rated secondary output 150/180 mV at 50/60 Hz
- Voltage sensors KEVA C, KEVA B (both with transformation ratio 1:10 000, 10 MOhm )

**Note:** For merging of current and voltage sensor output signals AR4 or AR5 ABB adapters to be used.

- Combined sensors KEVCY/KEVCD/KEVCR with 150/180 mV at 50/60 Hz for current measurement and ratio 1:10 000, 10 MOhm for voltage measurement.

Type of connection: RJ45



Kries Inspector IKI-50

### KRIES IKI-50 GRID INSPECTOR

Power flow monitoring, fault detection and prediction, as well as feeder controlling with Kries' IKI-50\_1F R2

With its patented algorithm, IKI-50 can utilize the output signal from KEVA voltage sensor to perform cross-calibration on multiple devices within switchgear. This ensures precise voltage measurement in all the feeders of ring main unit.

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 ABB sensors complying with IEC 61869-11 standard:

- KEVA C with 3.25 V output, rated burden 200 kΩ/350 pF

Type of connection: easy pluggable push-in clamps

## 3. Power Quality Analyzers and Statistical Energy Meters

Energy and power quality 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 for applications where the solution based on combination of ABB MV Current and Voltage sensors with dedicated Energy and power quality meters provide the most accurate data from the grid.

### 3.1 Class A Power Quality Analyzers



Averna PQA-FLEX-LPIT

#### **AVERNA PQA-FLEX-LPIT**

PQA-FLEX is a complex platform for detailed Power Quality monitoring. It fully covers the precise measurement according to **IEC 61000-4-30 Ed.3 Class A**. The required precision was successfully tested and can be reached **including the sensors**. Unique methods of sensors frequency calibration inside the meter ensures the highest measurement precision, providing harmonics up to the 100<sup>th</sup> both on voltage and current, optionally also supraharmonics up to 9kHz. PQA-FLEX meter provides all regular electrical quantities, voltage events, captured waveforms, symmetrical components etc. In addition, the platform allows full parallel measurement of **up to 3 complete three-phase voltage and current systems by one meter**, which decreases installation and equipment costs. The meter can also be optionally used as PMU. The meter is also designed to accept combined sensors.

#### **Compatibility ensured with ABB sensors complying with IEC 61869-10 / IEC 61869-11 standards:**

- Current sensors KECA with a rated primary current 80 A and a rated secondary output 150/180 mV at 50/60 Hz and a rated burden 2 M $\Omega$ /50 pF
- Voltage sensors KEVA C and KEVA B, with a transformation ratio 10 000:1 and a rated burden 2 M $\Omega$ /50 pF
- Combined sensors KEVCY and KEVCD with a rated secondary output 150/180 mV at 50/60 Hz for current measurement and with a transformation ratio 10 000:1 for voltage measurement and a rated burden 2 M $\Omega$ /50 pF.

## 3.2 Statistical Energy Meters and Class S Power Quality Analyzers

### SATEC PM174/175

PM174/175 multifunctional measuring device acts as a statistical energy meter and power quality analyzer. The devices in chain with ABB Sensors operate in accuracy class 0.5 and provide a power quality profile of the network in the range of below mentioned limits\*.

#### Compatibility ensured with following ABB sensors complying with IEC 60044-7 / IEC 60044-8 standards:

- Current sensors KECA 80 C104, C184, C260 & KECA 80 D85 up to 650A and KECA 80 C85, KECA 80 C216 & KECA 80 C165 up to 4000A with rated primary current 80 A & rated secondary output 150/180 mV at 50/60 Hz, KECA 250 B1 from 47A up to 2000A with rated primary current 250 A & with rated secondary output 150/180 mV at 50/60 Hz
- Voltage sensors KEVA 24 C, KEVA B (both with transformation ratio 1:10 000, 10 MOhm )
- Combined sensors KEVCY/KEVCD with 150/180 mV at 50/60 Hz for current measurement and ratio 1:10 000, 10 MOhm for voltage measurement.

Type of connection: RJ45

\* Limitation on the measurement of individual harmonics in current. Maximum measurable harmonic is 21<sup>st</sup> for 50 Hz and 18<sup>th</sup> for 60 Hz (1050 Hz)



Satec PM 174

### SATEC PM172 PRO

The PM172 PRO is a panel-mounted power measurement device designed for industrial, commercial, and utility environments. It continuously measures a wide range of electrical parameters—including phase voltages, line currents, real and reactive power, frequency, and accumulated energy—while providing fundamental power quality metrics. Together with ABB Sensors operate in accuracy class 0.5.

#### Compatibility ensured with following ABB sensors complying with IEC 61869-10/IEC 61869-11 standards:

- Current sensors from KECA family with rated primary current 80 A & rated secondary output 150/180 mV at 50/60 Hz,
- Voltage sensors KEVA C, KEVA B up to 24 kV with transformation ratio 1:10 000, 2 MΩ/ 50 pF
- Combined sensors KEVCY/KEVCD up to 24 kV with rated primary current 80 A & rated secondary output 150/180 mV at 50/60 Hz, for current measurement and ratio 1:10 000, 2 MΩ/50 pF for voltage measurement.

Type of connection: RJ45



Satec PM 172 PRO

## 4. Controlled Switching Device

### VIZIMAX SYNCHROTEQ® MV

A compact Control Switching Device (CSD) for 1, 2 or 3 phase medium voltage switchgears, the SynchroTeq® MV is specifically designed for load switching projects up to 69 kV. It is proposed in two versions: **SynchroTeq® MVR** and **SynchroTeq® MVX** respectively.

The SynchroTeq® MV features a comprehensive set of Controlled Switching modes, and performs significantly well in a variety of MV applications:

- Energizing MV transformers: SynchroTeq® MVX features a dedicated control mode for 3-p operated (or gang operated) switchgear or C/Bs or VCBs that aim at reducing in-rush currents and voltage dips/RVCs.
- Capacitor banks, shunt reactors: SynchroTeq® MVR or SynchroTeq® MVX must be matched to 1-p operated (or independent pole operated) switchgear, as well as to 3-p operated switchgear with pole-staggering, or to a relevant combination of unipolar switches or circuit breakers. SynchroTeq® MVX also handles partially-charged capacitor switching.

Both SynchroTeq® MVR and SynchroTeq® MVX are suitable for unipolar switchgear and load in MV switching projects. Among other applications, SynchroTeq® MV is a powerful, communication-enabled IED suitable for: Renewable Power Generation, Industry, Datacenters, Power Grids, Off-grid power systems, FACTS, where MV Switchgear, MV transformers and MV reactive loads are involved.

**Compatibility ensured with ABB sensors complying with IEC 61869-10 / IEC 61869-11 standards with accuracy class 1<sup>(1)</sup> for 17.5/24 kV and accuracy class 3<sup>(1)</sup> for 36 kV for voltage measurement:**

- Current sensors from KECA family with rated primary current 80 A & rated secondary output 150/180 mV at 50/60 Hz
- Voltage sensors KEVA C, KEVA B (both with transformation ratio 1:10 000, 2 MOhm/50 pF)
- Combined sensors KEVCY/KEVCD/KEVCR with 150/180 mV at 50/60 Hz for current measurement and ratio 1:10 000, 2 MOhm/50 pF for voltage measurement.

Type of connection: RJ45 in combination with VIZIMAX adapters.

(1) For additional accuracy class improvement, please contact the ABB representative.



13 Vizimax SynchroTeq® MV

## 5. Remote Terminal Unit

Remote terminal units are smart Intelligent Electronic Devices with remote control of the switching devices for monitoring and protecting medium-voltage feeders. Along with the ABB AdvaSense™ medium voltage current and voltage sensors in combination with IEDs provide high level of protection and fault detection, accurate power quality measurements from the grid.

### Netcontrol Netcon 200

The Netcon 200 is a smart IED for Grid Automation applications. With Netcon 200 the secondary distribution network can easily be managed, medium-voltage feeders can be monitored and controlled and switching devices can be remotely controlled. Netcon 200 monitors currents, voltages, network quality, environmental parameters and manages different fault situations in the distribution network. The Netcon 200 platform supports a comprehensive fleet management solution that makes it easy to remotely control and update the software of the units in the field. Netcon 200 cyber security is on the highest level.

Netcon 200 features bidirectional MV fault detection based on four overcurrent stages and five earth fault stages per feeder. These build upon the voltage and current measurement capabilities of the Netcon 200 VCCC-32-EL. The modules also support the detection of transient (intermittent) earth faults. All the fault stages are included in feeder-specific setting groups that can be remotely swapped when the network switching state, for example, changes. Additionally integrated feeder protection functionality that trips the circuit breaker on a feeder when triggered by the relevant fault stages, is available. It can thus replace the separate protection relays traditionally deployed at secondary substations. For example, three feeders can be protected by a single Netcon 200 consisting of a GWDD-03 module and a VCCC-32-EL module. Additionally, Netcon 200 support power quality measurements for voltage and current, like harmonic components (up to 50th harmonic), THD, Symmetrical components, waveforms, etc.

### Netcontrol product number:

Netcon 200 GWDD-03 52102141

Netcon 200 VCCC-32-EL 52102288

### Compatibility ensured with ABB sensors complying with IEC 61869-10 / IEC 61869-11 standards:

- Current sensors from KECA family with 150/180 mV at 50/60 Hz
- KECA 80 Cxxx according to IEC 61869-10 for 0-current measurement
- Voltage sensors KEVA C, KEVA B (both with transformation ratio 1:10 000, 2 M $\Omega$ , 50pF)
- Combined sensors KEVCY/KEVCD with 150/180 mV at 50/60 Hz for current measurement and ratio 1:10 000, 2M $\Omega$ , 50pF for voltage measurement.

Type of connection: RJ-45 connector with special adapter from Netcontrol



Netcon 200

## 6. Amplifiers

The amplifiers bring options to combine the ABB AdvaSense™ MV Sensors with the IEDs supporting conventional ITs. Low voltage signal of the MV Sensor is amplified to the same level as is the output of conventional voltage transformer. ABB AdvaSense™ MV Sensors are compatible with the 3rd party amplifiers, what is great solution for retrofitting applications. It offers an effective transition solution for customers using IEDs supporting conventional ITs.

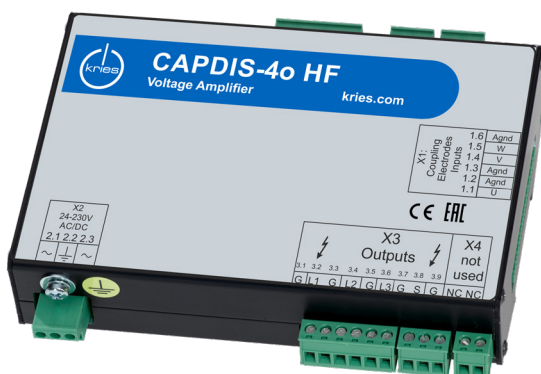
### KRIES CAPDIS-4o

The CAPDIS-4o amplifier provides an output voltage of 3 x 100 VAC in conjunction with three voltage sensors and thus serves as a substitute for three inductive voltage transformers.

### Applications

Connection of protective relays with conventional 100 VAC voltage measurement input.

Connection of universal measuring devices and network analyzers for critical safety applications (no ferroresonance).  
Retrofitting even in confined spaces.



KRIES CAPDIS-4o HF

### Precise and economical

Economical alternative to voltage transformers.

### Safety and handling advantages

Minimal space requirement.  
No additional measuring field.  
No disassembly required for surge voltage tests.  
No ferroresonance hazard.

### The amplifiers Kries CAPDIS-4o offer two product variants:

#### KRIES CAPDIS-4o 0.3%

#### Compatibility ensured with ABB sensors complying with IEC 61869-11 standard:

- Voltage sensors KEVA B, KEVA C with 3,25 V output, rated burden 200 k $\Omega$ / 350 pF with combined accuracy class 0.5/3P for rated primary voltage up to 24 kV  
Type of connection: Ferrules

#### KRIES CAPDIS-4o 0.5%

#### Compatibility ensured with ABB sensors complying with IEC 61869-11 standard:

- Voltage sensors KEVA B, KEVA C with 3,25 V output, rated burden 200 k $\Omega$ / 350 pF with combined accuracy class 1/3P for rated primary voltage up to 36 kV  
Type of connection: Ferrules

## 7. General Compatibility Table

Type of IEDs	IEDs	Sensor standards	Connector type	Current sensors		Voltage sensors		Combined sensors				
				KECA	Rogowski coil	KEVA C / KEVA B	K <sub>v</sub> /K <sub>i</sub> : 10 000:1	Output 3.25 V	KEVCY / KEVCD / KEVCR	Rogowski coil	Voltage divider	
												LPCT
Protection relay	ABB Relion® 605 series (version 1)	IEC 60044-8	RJ45 <sup>(2)</sup>		X							
Protection relay	ABB Relion® 605 series (version 2)	IEC 61869-10	RJ45 <sup>(2)</sup>		X							
Protection relay	ABB Relion® 615 series (version 1)	IEC 60044-8/IEC 60044-7	RJ45 <sup>(2)</sup>		X		X		X			X
Protection relay	ABB Relion® 615 series (version 2)	IEC 61869-10/IEC 61869-11	RJ45 <sup>(2)</sup>		X		X		X <sup>(1)</sup>			X <sup>(1)</sup>
Protection relay	ABB Relion® REX 615	IEC 61869-10/IEC 61869-11	RJ45 <sup>(2)</sup>		X		X		X <sup>(1)</sup>			X <sup>(1)</sup>
Protection relay	ABB Relion® 620 series (version 1)	IEC 60044-8/IEC 60044-7	RJ45 <sup>(2)</sup>		X		X		X			X
Protection relay	ABB Relion® 620 series (version 2)	IEC 61869-10/IEC 61869-11	RJ45 <sup>(2)</sup>		X		X		X <sup>(1)</sup>			X <sup>(1)</sup>
Protection relay	ABB Relion® REX 640 (version 1)	IEC 60044-8/IEC 60044-7	RJ45 <sup>(2)</sup>		X		X		X			X
Protection relay	ABB Relion® REX 640 (version 2)	IEC 61869-10/IEC 61869-11	RJ45		X		X		X <sup>(1)</sup>			X <sup>(1)</sup>
Protection relay	Schweitzer Engineering Laboratories SEL-751	IEC 61869-10/IEC 61869-11	RJ45 <sup>(2)</sup>		X		X		X <sup>(1)</sup>			X <sup>(1)</sup>
Protection relay	Schweitzer Engineering Laboratories SEL-787L	IEC 61869-10/IEC 61869-11	RJ45 <sup>(2)</sup>		X		X		X <sup>(1)</sup>			X <sup>(1)</sup>
Protection relay	Schweitzer Engineering Laboratories SEL-700G	IEC 61869-10/IEC 61869-11	RJ45 <sup>(2)</sup>		X		X		X <sup>(1)</sup>			X <sup>(1)</sup>
Protection relay	Schweitzer Engineering Laboratories SEL-710-5	IEC 61869-10/IEC 61869-11	RJ45 <sup>(2)</sup>		X		X		X <sup>(1)</sup>			X <sup>(1)</sup>
Protection relay	Schweitzer Engineering Laboratories SEL-787-4	IEC 61869-10/IEC 61869-11	RJ45 <sup>(2)</sup>		X		X		X <sup>(1)</sup>			X <sup>(1)</sup>
Protection relay	Schweitzer Engineering Laboratories SEL-700BT	IEC 61869-10/IEC 61869-11	RJ45 <sup>(2)</sup>		X		X		X <sup>(1)</sup>			X <sup>(1)</sup>
Protection relay	Siemens SIPROTEC 7SY82	IEC 61869-10/IEC 61869-11	RJ45 <sup>(2)</sup>		X		X		X <sup>(1)</sup>			X <sup>(1)</sup>
Protection relay	Siemens SIPROTEC 7SJ81	IEC 61869-10/IEC 61869-11	RJ45		X		X		X			X
Merging unit	ABB RIO600	IEC 60044-8/IEC 60044-7	RJ45 <sup>(2)</sup>		X		X		X			X
Merging unit	ABB SMU 615	IEC 60044-8/IEC 60044-7	RJ45 <sup>(2)</sup>		X		X		X			X
FPI	Eberle EOR-3DS (product code U29 + C29)	IEC 61869-10/IEC 61869-11	RJ45 <sup>(2)</sup>		X		X		X			X <sup>(1)</sup>
FPI	Eberle EOR-3DS (product code U07 + C10)	IEC 61869-10/IEC 61869-11	Ferrules		X		X		X			X
FPI	Eberle EOR-1DS (product code U07 + C10)	IEC 61869-10/IEC 61869-11	Ferrules		X		X		X			X
FPI	Horstmann ComPass B 2.0	IEC 61869-11	RJ45 <sup>(2)</sup>		X		X		X			X
FPI	Horstmann ComPass Bs 2.0	IEC 60044-8/IEC 60044-7	RJ45 <sup>(2)</sup>		X		X		X			X
FPI	Kries IKI-50 Grid Inspector	IEC 61869-11	-		X		X		X			X
Power quality	Satec PM174/175	IEC 60044-7/IEC 60044-8	RJ45		X		X		X			X
Power quality	SATEC PM172 PRO	IEC 61869-10/IEC 61869-11	RJ45		X		X		X <sup>(1)</sup>			X <sup>(1)</sup>

Type of IEDs	IEDs	Sensor standards	Connector type	Current sensors		Voltage sensors		Combined sensors			
				Rogowski coil	KECA	LPCT	KEVA C / KEVA B	K <sub>v</sub> /K <sub>i</sub> : 10 000:1	Output 3.25 V	Rogowski coil	Voltage divider
Power quality	Averna PQA-FLEX-LPIT	IEC 61869-10/IEC 61869-11	RJ45	X		X		X <sup>(1)</sup>	X <sup>(1)</sup>		
CSD	Vizimax SynchroTeq® MV	IEC 61869-10/IEC 61869-11	RJ45 <sup>(4)</sup>	X		X		X <sup>(1)</sup>	X <sup>(1)</sup>		
RTU	Netcontrol Netcon 200	IEC 61869-10/IEC 61869-11	RJ45 <sup>(4)</sup>	X		X		X <sup>(1)</sup>	X <sup>(1)</sup>		
Amplifier	KRIES CAPDIS-4o 0.3 % / 0.5 %	IEC 61869-11	Ferrules						X		

(1) Compatible only with KEVCY and KEVCD combined sensors

(2) For merging of current and voltage sensor output signals AR4 or AR5 ABB adapters to be used.

(3) For splitting of current and voltage sensor output signals AR5 ABB adapters to be used.

(4) RJ45 connector with adapter from IEDs producer

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## 8. More Information and Useful Links

It is easy to access more detailed information online. On our webpage you will find additional information regarding sensor compatibility and other ABB related products.

[ABB AdvaSense™ product page](#)

[ABB Relion® product page](#)

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