KEVA 24 B20; KEVA 24 B21 Voltage Sensors
Instructions for installation, use and maintenance
Scope of Contents

1. Operating conditions
2. Technical details
3. Instructions for installation
   - Safety instructions
   - Installation conditions
   - Mechanical installation
   - Secondary cable, secondary connections
   - Connection to IEDs
   - Grounding terminal
4. Instructions for use
   - Routine test report
5. Instructions for maintenance
6. Transport and storage
7. Recommended procedure for disposal of the sensor
Instructions for installation, use and maintenance for the KEVA 24 B20 and KEVA 24 B21 voltage sensors

These instructions for installation, use and maintenance are valid for KEVA 24 B20 and KEVA 24 B21 type voltage electronic transformers (sensors) operating in indoor conditions.

1. Operating conditions

The sensor should be mounted in dry, indoor conditions without excess ingress of dust and corrosive gases. The sensor must be protected against unusually heavy deposits of dust or similar pollution, as well as against direct sunshine. The sensor is designed for standard ambient temperature between -5°C and +40°C (storage and transportation temperature between -40°C and +80°C). The altitude for mounting should be lower than 1000 m above sea level. The sensor may also be used at higher altitudes when agreed upon with the manufacturer.

The voltage sensors are the effective solutions for voltage measuring needed for protection and monitoring in medium voltage power systems. The voltage sensors type KEVA 24 B20 and KEVA 24 B21 are intended for use in voltage measurement in air insulated medium voltage switchgear. The voltage sensors have been designed to be used as a post insulator but can be used as a stand-alone unit as well. The output circuit of the sensor shall be connected to secondary equipment (e.g. relay) specified by the manufacturer. The use of sensor for other purposes than those described above is forbidden.

2. Technical details

For sensor dimensions see separate dimension drawings. Rated values for each individual sensor are mentioned on the rating plate glued to the sensor. Values mentioned on the rating plate must not be exceeded.
3. Instructions for installation

**Safety instruction**
Always ground the sensor grounding terminal.

**Installation conditions**
The sensor should be installed in dry, indoor conditions. The temperature during the assembly must be between 0°C and +40°C. The sensor cable shall not be moved or bent if the temperature is below 0°C.

**Mechanical installation**
There are two possibilities of cable output position from the sensor terminal part, see Fig. 4. The position of the sensor cable from the sensor terminal part determines sensor variant.

---

**Group/Parameter Name** | **IEC Value** | **PC Value** | **Unit** | **Min** | **Max**
--- | --- | --- | --- | --- | ---
Voltage (VAUT) | | | | | |
Primary voltage | 22,000 V | | | | |
Secondary voltage | 100 V | | | | |
VT connection | Wye | | | | |
Amplitude Corr A | 0.9984 | 0.9000 | 1.1000 | | |
Amplitude Corr B | 0.9984 | 0.9000 | 1.1000 | | |
Amplitude Corr C | 0.9984 | 0.9000 | 1.1000 | | |
Division ratio | 10000 | | | 10000 | 20000 |
Voltage input type | CVD sensor | | | | |
Angle Corr A | -0.0400 deg | | | 20.0000 | 20.0000 |
Angle Corr B | -0.0400 deg | | | 20.0000 | 20.0000 |
Angle Corr C | -0.0400 deg | | | 20.0000 | 20.0000 |
Secondary cable, secondary connections
The secondary cable is a special shielded cable designed to give maximum EMI shielding. The secondary cable is inseparable part of each sensor and cannot be additionally extended, shortened, branched, modified, withdrawn or changed due to the guarantee of accuracy and performance of the sensor.

The cable shall be connected directly (or via a connector adapter if needed) to Intelligent Electronic Device (e.g. protection relay). The electrical shielding of cable is connected to connector shielding and shall be earthed on IED side. The cable shall be fixed close to metal wall or inserted inside of metal cable tray far from power cables! The maximal bending radius for the cable is 7.5x cable diameter. The cable cannot to be moved if the temperature is below 0°C. If cable, connector or connector grommet is damaged please contact the manufacturer for instructions.

Connection to the IED
The sensor cable is terminated by shielded RJ-45 plug connector that shall be connected to the inputs of the IED.

A cable not connected to the IED can be left open or short-circuited without any harm for the sensor. Nevertheless it is a good safety practice to earth cables not connected to the IED.

RJ-45 plug connector has 8 contacts and locking latch coupling. The sensor connector plug shall be inserted properly with the IED mating receptacle before completing the coupling with the bayonet lock. Take care and do not use excessive force to plugin and plug-out these connectors.

The used RJ-45-type connectors (EIA/TIA 568A Standard) are screened and designed to guarantee low resistance shielding; they are particularly adapted to applications where electromagnetic compatibility (EMC) is important. The connectors are robust but it is necessary to be careful during their assembly – do not use force!

Grounding terminal
The sensor grounding terminal is located on the same side as the sensor secondary terminal part and shall be connected to the ground during the sensor operation, see Fig. 8.

Note: It is recommended to use a cable tie to fasten long sensor cables approximately 10 cm from the RJ-45 socket.

The sensor plug connector pin’s assignment is shown on Fig. 7. (Front view).
4. Instructions for use

The voltage sensors are used:
• To convert large voltages in the primary circuit of the network to the appropriate signal for the secondary equipment (e.g. IEDs);
• To insulate primary and secondary circuits from each other;
• To protect secondary equipment from harmful effects or large voltages during abnormal situations in the network.
The use of a sensor for other purposes than those described above is forbidden.

Routine test report
The routine test report includes following tests:

a) Verification of terminal marking;
b) Power-frequency withstand test on primary voltage terminal;
c) Partial discharge measurement;
d) Test for accuracy.

**Note:** No power-frequency withstand test on secondary terminals (connector) of the voltage sensor is allowed.

Correction factors are measured separately for each sensor during routine testing and are marked on the rating plate.
The use of correction factors is required condition in order to achieve the declared accuracy class.

5. Instructions for maintenance

Excessive dust or other kinds of pollution shall be brushed off the sensor. Polluted sensors can be cleaned with spirit, petrol or toluene. Otherwise, during normal use the sensors do not need any additional maintenance.

6. Transport and storage

The permissible transport and storage temperature for sensors is from -40 to +80°C. During transport and storage the sensors shall be protected against direct sunshine. The sensors are delivered packed into wooden boxes or transport pallets.

7. Recommended procedure for disposal of the sensor

The sensor does not contain environmentally hazardous materials. For disposal of the product after it has been taken out of use, local regulations, if there are any, should be followed.