Medium Voltage Products

KECA 80 C104; KECA 80 C165 Current Sensors
Instructions for installation, use and maintenance
Instructions for installation, use and maintenance for the KECA 80 C104 and KECA 80 C165 current sensors

This installation, use and maintenance guide is valid for KECA 80 C104 and KECA 80 C165 current sensors (electronic instrument transformers) operating in indoor conditions. The current sensors type KECA 80 Cxxx are intended for use in current measurement in medium voltage switchgear (factory installation).

The case of sensor is made from plastic, the internal parts are shielded and this shielding is earthed. The primary conductor must be insulated for the application voltage. The insulation of primary conductor determines the highest permissible system voltage.

1. **Operating conditions**

The sensor shall be mounted in dry, indoor conditions without excess ingress of dust and corrosive gases. The sensor shall 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.

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 shall not be exceeded.

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**Fig. 1. Example of rating plate (label)**

<table>
<thead>
<tr>
<th>KECA 80 C165</th>
<th>S/N 1VLT5408001587</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ipr: 80 A</td>
<td>Usr: 0.150/0.180 V</td>
</tr>
<tr>
<td>Kpcr: 50.0</td>
<td>Cf.s: al. 1.0078</td>
</tr>
<tr>
<td>fr: 50/60 Hz</td>
<td>Ith/Idyn: 50(3s)/125 kA 0.65 kg E</td>
</tr>
<tr>
<td>IEC 60044-8</td>
<td>Made by ABB 17 Oct 2013</td>
</tr>
</tbody>
</table>

**Tab. 1. Labels abbreviation definitions**

<table>
<thead>
<tr>
<th>KECA 80 C165</th>
<th>Sensor type code</th>
</tr>
</thead>
<tbody>
<tr>
<td>IEC 60044-8</td>
<td>IEC – standards referred to</td>
</tr>
<tr>
<td>Ith/Idyn</td>
<td>Rated short-time (3s) thermal current in kA and rated dynamic current in kA (peak).</td>
</tr>
<tr>
<td>Kpcr</td>
<td>Rated extended primary current factor</td>
</tr>
<tr>
<td>fr</td>
<td>Rated frequency in Hz</td>
</tr>
<tr>
<td>Ipr</td>
<td>Rated primary current in A</td>
</tr>
<tr>
<td>cl</td>
<td>Rated accuracy class</td>
</tr>
<tr>
<td>Usr</td>
<td>Rated secondary voltage in V corresponding to a given rated frequency in Hz.</td>
</tr>
<tr>
<td>Cf.s</td>
<td>Correction factors used for current sensor. Correction factors are measured and calculated separately for each sensor. Amplitude correction factor (aI) is a number by which the output signal of the sensor shall be multiplied in order to have minimum amplitude error. Phase error correction factor (pI) is a number by which the output signal of the sensor shall be increased or decreased (depending on the sign) in order to have minimum phase error.</td>
</tr>
<tr>
<td>18 SEP 2013</td>
<td>Date of manufacturing</td>
</tr>
<tr>
<td>S/N</td>
<td>Serial number</td>
</tr>
</tbody>
</table>

**Fig. 2. Example of data stored in 2D Bar Code**
3. Instruction for installation

Mounting
Sensor is fixed with two screws, see Fig. 4. A neutral silicone shall be applied into the inner sensor groove before mounting the sensor, see Fig. 5. Amount of silicone should be approximately 4 mm. Place the sensor in the center of the measuring area, push the sensor by using a flat mounting fixture covering whole sensor to the surface until there will be no gap between sensor and sheetmetal surface. After this positioning use 2 mounting holders for fixation of sensor position, see blue arrows on Fig. 4. Sensor can be additionally slightly rotated to achieve optimal position after fixation, see Fig. 4 and then the screws shall be tightened by 3-4 Nm.
Secondary connections
The secondary cable is a special shielded cable designed to give maximum EMI shielding. The cable is separable part of each sensor and cannot be changed or withdrawn 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 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. The sensor plug connector pin's assignment is shown on Figure 7. (Front view).

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).

A cable not connected to the IED can be left open or short-circuited without any harm for the sensor. Even during a primary short-circuit the voltage in the secondary circuit of the current sensor will be below 100 V. 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 plug-in 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!
Connection to the sensor
The connection between cable and sensor is provided by LEMO/ODU push-pull type connector, see Fig. 8.

![Fig. 8. LEMO/ODU connector](image)

4. Instructions for use
The current sensors are used:
- To convert large currents 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 currents 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:
- Verification of terminal marking
- Power-frequency withstand test on secondary circuits (see Note 1)
- Test for accuracy

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.

Note 1:
The maximum power-frequency test voltage for current sensor secondary terminals (connector) is 0.5 kV.
Test voltage can be connected between short-circuits signal wires and the earth.

5. Instructions for maintenance
The current sensors do not need any maintenance during the normal use. When needed, sensors can be cleaned by dry cloth or with industrial alcohol. Petrol, toluene or any other solvents are not allowed!

6. Transport and storage
The permissible transport and storage temperature for sensors is -40...+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 sensors do 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.

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