Instructions for installation, use and maintenance for the KECA 80 C184 and KECA 80 C216 current sensors

These instructions for installation, use and maintenance are valid for KECA 80 C184 and KECA 80 C216 type current sensors. The current sensors type KECA 80 C184 and KECA 80 C216 are intended for use in current measurement in medium voltage switchgear. The sensors are intended to be used in factory installation if there will be requirement for current measurement. The cases of sensors are made from plastic, the internal parts are shielded and this shielding is earthed. The primary conductor shall be insulated for the application voltage. The insulation of primary conductor determines the highest permissible system voltage.

1. Operating conditions

The sensor should 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

Technical details for each individual current sensor are mentioned on the rating plate placed on the sensor surface. Values mentioned on the rating plate shall not be exceeded.

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**Tab. 1. Labels abbreviation definitions**

<table>
<thead>
<tr>
<th>KECA 80 C184</th>
<th>Sensor type code</th>
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<tbody>
<tr>
<td>IEC 60044-8</td>
<td>IEC – standards referred to</td>
</tr>
<tr>
<td>Ith/Idyn</td>
<td>Rated short-time (4s) thermal current in kA and rated dynamic current in kA (peak)</td>
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<tr>
<td>Kpocr</td>
<td>Rated extended primary current factor</td>
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<tr>
<td>fr</td>
<td>Rated frequency in Hz</td>
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<tr>
<td>Ipr</td>
<td>Rated primary current in A</td>
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<tr>
<td>cl</td>
<td>Rated accuracy class</td>
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<tr>
<td>Usr</td>
<td>Rated secondary voltage in V corresponding to a given rated frequency in Hz</td>
</tr>
<tr>
<td>Cfs</td>
<td>Correction factors for current sensor. Correction factors are measured and calculated separately for each sensor. Values are given separately for amplitude (a) and phase (p), it is the number by which the output of sensor shall be multiplied.</td>
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</table>

**Fig. 2. Example of data stored in 2D Bar Code**

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3. Instruction for installation

Mounting
The sensor placement is around the internal spout inside the SWG’s monoblock and softly pushed onto four isolative screws (see Fig. 4). Fixation glue is applied on the end of the thread and then the sensor is fastened by four plastic closed nuts and tightened by 0.15 – 0.20 Nm (see Fig. 5.).

![Fig. 4. Installation of current sensor KECA 80 C184 / KECA 80 C216 to the SWG monoblock](image)

![Fig. 5. Fasten the sensor KECA 80 C184 / KECA 80 C216 by nuts, screwed by moment 0.15 - 0.20 Nm](image)
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 RJ45 plug connector (EIA/TIA 568A Standard) that shall be connected to the inputs of the IED. The sensor plug connector pin’s assignment is shown on Fig. 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.

Fig. 6. RJ-45 connector

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 matting 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 sensor does not need any maintenance during the normal use. When needed, sensor can be cleaned by dry cloth or with industrial alcohol. Petrol, toluene or 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 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.