MEDIUM VOLTAGE PRODUCT

AdvaSense™ KECA 80 C85 Current Sensor

Instructions for installation, use and maintenance

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AdvaSense™ KECA 80 C85 current sensor
Instructions for installation, use and maintenance

These instructions for installation, use and maintenance are valid for KECA 80 C85 current sensor (Electronic current transformers according to IEC 60044-8 and low-power passive current transformers according to IEC 61869- 10 standards) operating in indoor conditions.

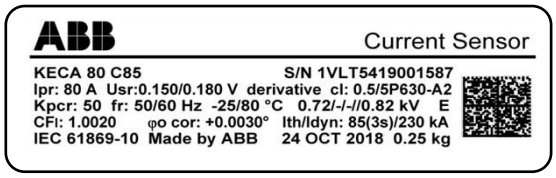
1. Operating conditions

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 -25°C and +80°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 AdvaSense™ current sensor type KECA 80 C85 is intended for use in current measurement in medium voltage switchgear. The current sensor shall be installed over a screened bushing insulator, screened insulated cable or any other type of screened insulated conductor. The case of sensor is made from electrically conductive plastic material which is earthed by grounding wire, the internal parts are shielded by the sensor case. The primary conductor shall be insulated in Medium and Low voltage applications and screened from the application voltage in Medium voltage applications – conductive screening shall be at ground potential. The insulation of primary conductor determines the highest permissible system voltage.

2. Technical details

For sensor dimensions see dimension drawings at the end of these instructions. 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.



01 Example of a sensor label (IEC 61869-10)

01

KECA 80 C85	Type code
S/N	Serial number
Ipr	Rated primary current
Usr	Rated secondary output
cl.	Accuracy class
Kpcr	Rated extended primary current factor
CF_I	Correction factors used for current sensor. Correction factors are measured and calculated separately for each sensor. Amplitude correction factor is a number by which the output signal of the sensor shall be multiplied in order to have minimum amplitude error.
$\varphi_{0\,cor}$	Correction factors used for current sensor. Correction factors are measured and calculated separately for each sensor. Phase error correction factor 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.
fr	Rated frequency in Hz
Ith/Idyn	Rated short-time thermal current in kA / Rated dynamic current in kA
-25/80 °C	Ambient temperature
0,25 kg	Weight
E	Insulation class
IEC 61869-10	IEC – standard referred to
24 OCT 2018	Date of production

Tab. 1. Labels abbreviation definitions according to IEC 61869-10

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02 Example of sensor label (IEC 60044-8)

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03 Example of data stored in 2D Bar Code according to label parameters in picture 02 (IEC 60044-8). Same principle can be applied with label parameters in 01 (IEC 61869-10).

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04 Example of Amplitude Correction factor setting current sensor into REF601

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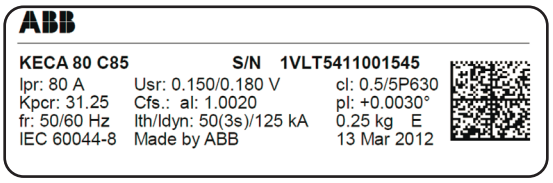
05 Example of Amplitude and Phase error correction factors setting for current sensor into REF615 according to label parameters in picture 02 (IEC 60044-8). Same principle can be applied with label parameters in 01 (IEC 61869-10).



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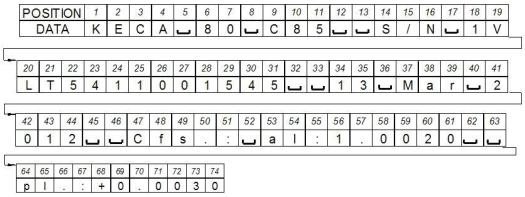

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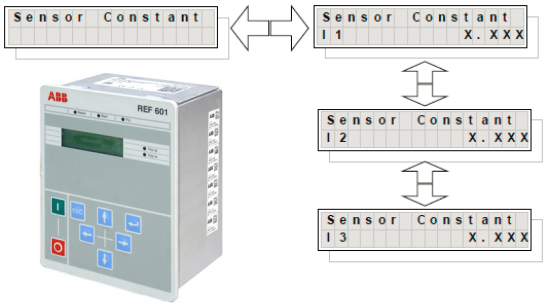

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Group/Parameter Name	IED Value	PC Value	Unit	Min	Max
Analog inputs					
Current(3LCT) 1					
Current (3LCT)					
Primary current		80,0	A	1,0	6000,0
Amplitude Corr A		1,0200		0,9000	1,1000
Amplitude Corr B		1,0200		0,9000	1,1000
Amplitude Corr C		1,0200		0,9000	1,1000
Normal current		80	A	39	4000
Rated secondary Val		3,000	mV/Hz	1,000	50
Angle Corr A		0,0030	deg	-20,0000	20,0000
Angle Corr B		0,0030	deg	-20,0000	20,0000
Angle Corr C		0,0030	deg	-20,0000	20,0000

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05

KECA 80 C85	Type code
S/N	Serial number
Ipr	Rated primary current
Usr	Rated secondary voltage in V corresponding to a given rated frequency
cl.	Accuracy class
Kpcr	Rated extended primary current factor
Cfs.	Correction factors used for current sensor. Amplitude correction factor is a number by which the output of sensor must be multiplied in order to have minimum amplitude error. Phase error correction factor is a number by which the output of the sensor must be increased or decreased (depending on the sign) in order to have minimum phase error.
al	Amplitude correction factor of a current sensor
pl	Phase error correction factor of a current sensor in degrees
fr	Rated frequency in Hz
Ith/Idyn	Rated short-time thermal current in kA / Rated dynamic current in kA
0,25 kg	Weight
E	Insulation class
IEC 60044-8	IEC – standard referred to
13 Mar 2012	Date of production

Tab. 2. Labels abbreviation definitions according to IEC 60044-8

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06 KECA 80 C85 installation
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07 Grounding of a shielded cable
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08 Clamping system installation
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09 Installation of current sensor KECA 80 C85 over an insulated conductor (permissible angle of deviation).

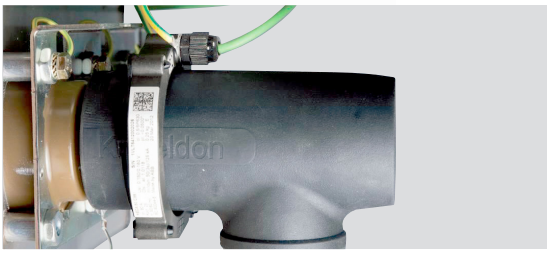
3. Instructions for installation

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 should not be moved or bent if the temperature is below 0°C.

Installation on cable connectors
Sensor is only put on the cable connector without clamping system in use. The final sensor positioning is necessary to perform after final connector installation to the bushing. Place the sensor in the center of the measuring area and use a clamping system for sensor position fixation. Cable sensor output must be at the top. Sensor can be additionally slightly centered to achieve optimal function after fixation, see Figure 6.


clamping system



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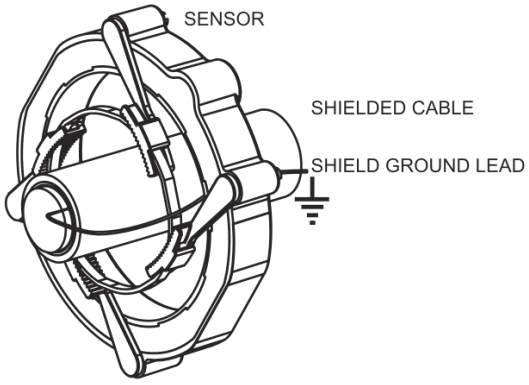
The sensor can be used on many types of cable connectors with outer diameters in the range from 60 mm up to 85 mm (measured after cable connector installation on the bushing). All types of connectors which are used with sensor must be shielded.

Installation on cable
The sensor can be used also for cable installation. In this case the end of the shield near the sensor is grounded by a wire that passes through the sensor window, as shown in Figure 7. The wire must be kept outside the clamping systems. The current flowing in the shield flows through the grounding lead, which is also in the sensor window. The fluxes produced by the current flow in the shield and in the grounding lead are equal but opposite in direction and, therefore, the output of the current sensor is not affected by the flow of current in the shield.



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Clamping system
It is necessary to install tightening strip in the correct position according to Figure 8 where the place for the strip connection must be observed.

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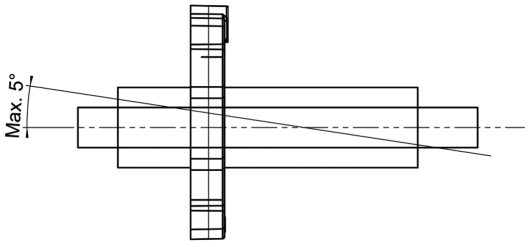
Maximum allowed angle and distance from the center of the straight insulated conductor and the center of the sensor is shown on Figure 9 and Figure 10.



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10 Installation of current sensor KECA 80 C85 over an insulated conductor (permissible deviation in horizontal and vertical direction)

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11 Connector RJ45 (IEC 60044-8)

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12 Connector RJ45 (IEC 61869-10)

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KECA 80 C85 sensor plug connector pin's assignment (IEC 60044-8)

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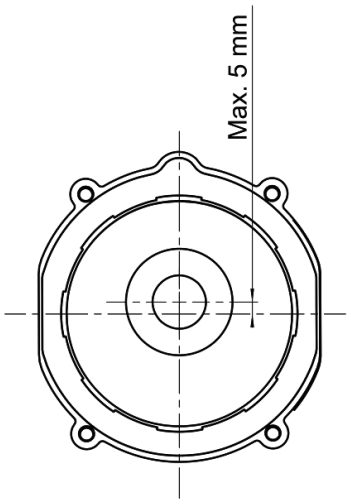
14 KECA 80 C85 sensor plug connector pin's assignment (IEC 61869-10)



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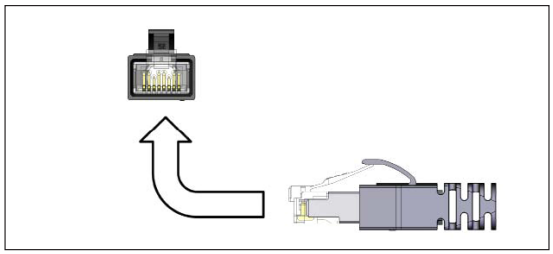

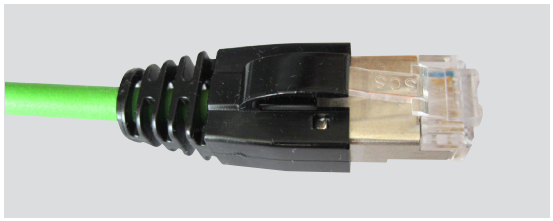

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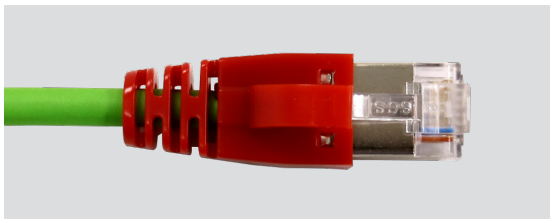

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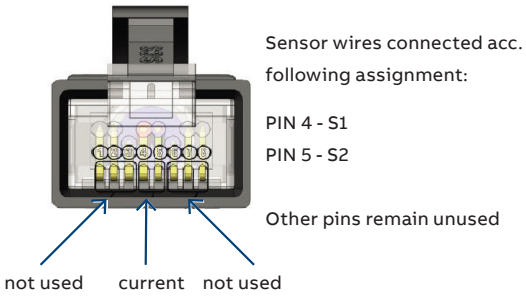
Note: It is recommended to use a cable tie to fasten long sensor cables approximately 10 cm from the RJ45 socket. The sensor plug connector pin's assignment is shown on Figure 12 and 13. (Front view).

Secondary connections

The secondary cable is a single 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 must be connected directly (or via a connector adapter if needed - for more information about connector adapters and coupling adapter refer to Doc. No. 1VLC000710 - Sensor Accessories) to electronic measurement equipment (e.g. IED). The electrical shielding of cable is connected to connector shielding and must be earthed on "electronic measurement equipment" side. The cable must be fixed close to metal wall or inserted inside of metal cable tray far from power cables! The minimal bending radius for the cable is 35 mm. The cable is not to be moved if the temperature is below 0°C. If cable, connector or connector grommet is damaged please contact the manufacturer for instructions.

The used RJ45-type connectors 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!



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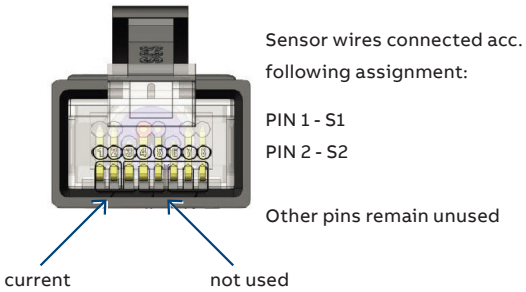

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15 Grounding terminal of current sensor KECA 80 C85

A cable not connected to the relay 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 relay. RJ45 plug connector has 8 contacts and locking latch coupling. The sensor connector plug must be inserted properly with the relay 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.

Grounding terminal
The sensor's grounding terminal is located on the sensor's terminal part and must be connected to the ground during the sensor operation. For proper grounding yellow-green cable (length 0.25 m) terminated with cable eye M8 is used. During the installation cable eye can be adjusted for proper connection to the bushing ground. Minimum bending radius for cable is R20 and must be observed, see Figure 14. Recommended tightening torque for sensor grounding mounting is 2-3 Nm.

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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 terminals / Power-frequency voltage withstand test for low-voltage components
- 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.

5. Instructions for maintenance

Excessive dust or other kinds of pollution must 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

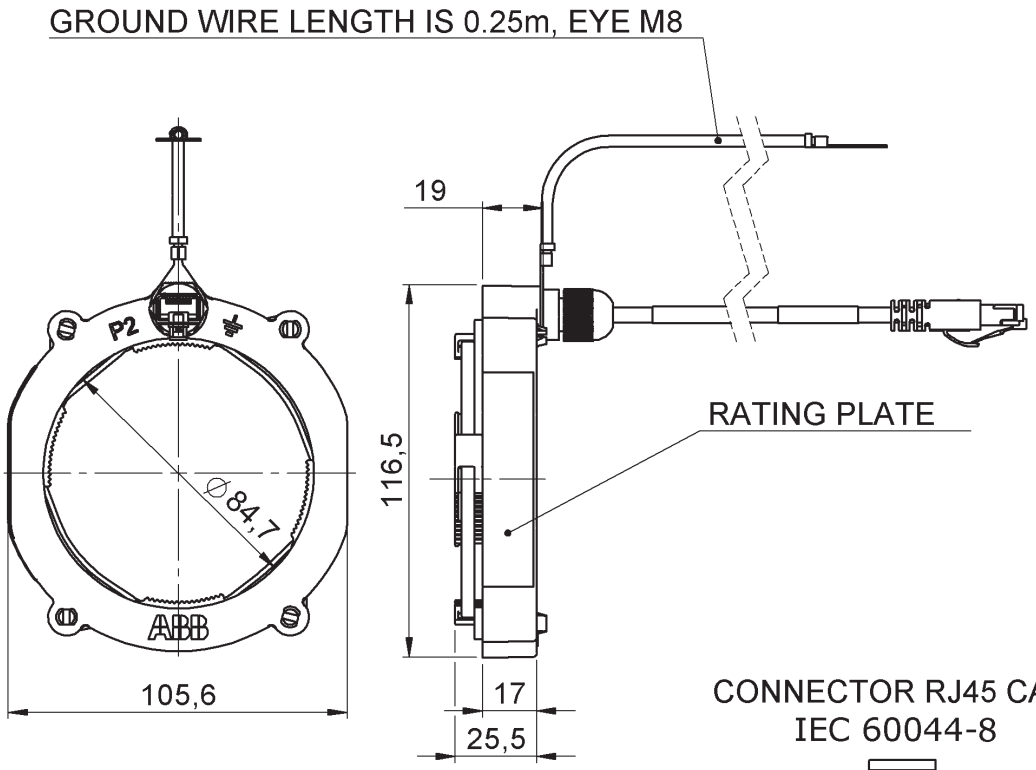
The permissible transport and storage temperature for sensors is from -40 to +80°C. During transport and storage the sensors must be protected against direct sunshine. The sensors are delivered packed into wooden boxes or transport pallets.

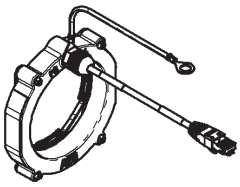
7. Recommended procedure for disposal of the sensor

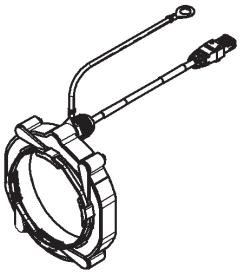
The sensor does not contain environmentally hazardous materials. For disposal of the product after it has been taken out of use, local regulations, if there are any, should be followed.

Dimensional drawing

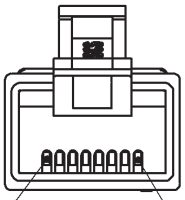
KECA 80 C85







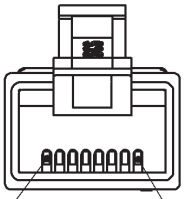
CONNECTOR RJ45 CAT6
IEC 60044-8



PIN 1 PIN 8

PIN 4 - COIL START (S1)
PIN 5 - COIL END (S2)

CONNECTOR RJ45 CAT6
IEC 61869-10



PIN 1 PIN 8

PIN 1 - COIL START (S1)
PIN 2 - COIL END (S2)

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