

MEDIUM VOLTAGE PRODUCTS

KEVA 24 Cxx(c) and KEVA xx C2 4.1(c) Indoor voltage sensors with 3.25V output for NEXANS

Instructions for installation, use and
maintenance



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Instructions for installation, use and maintenance for the KEVA 24 Cxx(c) and KEVA xx C2 4.1(c) indoor voltage sensors

These instructions for installation, use and maintenance are valid for KEVA 24 Cxx(c) and KEVA xx C2 4.1(c) types voltage electronic transformers (Low-power passive voltage transformers according to IEC 61869-11 standard) operating in indoor conditions. τ

The voltage sensors type KEVA 24 Cxx(c) and KEVA xx C2 4.1(c) are intended for use in voltage measurement in gas insulated medium voltage switchgear. The voltage sensors are designed as easy replacement of originally used insulating plugs in the NEXANS separable cable connectors.

Due to their compact size and optimized design sensors can be used for retrofit purposes as well as in new installations. The housing of sensors is made from plastic; the internal parts are shielded and earthed.

| Sensor type designation | Cable connectors | | |
|---------------------------------------|-------------------|---|-----------------------------|
| | Manufacturer | Type | Connecting screw for sensor |
| KEVA 24 C10 KEVA 24 C10c | Nexans-Euromold | (K)400 TB/G; (K)440 TB/G; (K)944 TB/G; (K)400 TE/G; (K)400 BE/G-E; KAA4; 400PB-xSA (x = up to 24 kV) | M16 |
| KEVA 24 C11 KEVA 24 C11c | Nexans-Euromold | (K)400 TB/G; (K)440 TB/G; (K)944 TB/G; (K)400 TE/G (K)400 BE/G-E; KAA4; 400PB-xSA (x = up to 24 kV) | M16 |
| KEVA 24 C24 KEVA 24 C24c | Nexans-Euromold | (K)430 TB; (K)300 PBM/G-630 A; 300 SA-10-xN (x = up to 24 kV) | M16 |
| KEVA 24 C2 4.1 KEVA 24 C2 4.1c | Nexans - Euromold | (K)480 TB/G; (K)484 TB/G; (K)489 TB/G; (K)800 PB/G; (K)804 PB/G; (K)809 PB/G; (K)480 BE/G; 800 SA-10-xN (x = up to 24 kV) KAA8 | M16 |
| KEVA 36 C2 4.1 KEVA 36 C2 4.1c | Nexans - Euromold | M480 TB/G; M800 PB/G; M484 TB/G; M804 PB/G; M489 TB/G; M809 PB/G; 800 SA-10-xN (x=30,33,36); M480 BE/G | M16 |
| KEVA 40.5 C2 4.1 KEVA 40.5 C2 4.1c | Nexans - Euromold | P480 TB/G; P484 TB/G; P489 TB/G; P800 PB/G; P804 PB/G; P809 PB/G; 800 SA-10-xN (x=30,33,36); P480 BE/G | M16 |

Tab. 1. Sensor variants and use in cable connectors

Note: For use in alternative cable connectors please contact ABB.

01 Examples of rating plate on a switchboard (IEC 61869-11)

02 Example of rating plate on the sensor (IEC 61869-11)

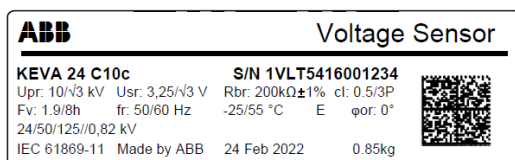
1. Operating conditions

The sensors should be mounted in dry, indoor conditions without excess ingress of dust and corrosive gases. The sensors shall be protected against unusually heavy deposits of dust or similar pollution, as well as against direct sunshine. The sensors are 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 sensors may also be used at higher altitudes when agreed upon with the manufacturer.

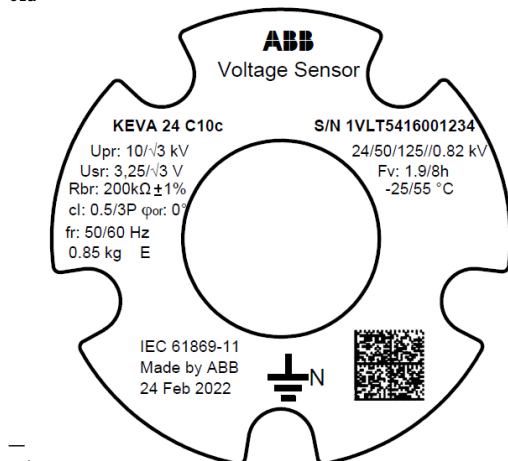
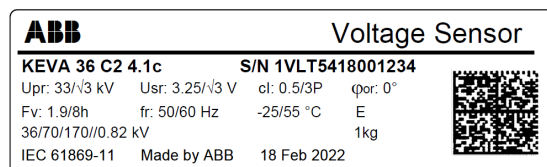
2. Technical details

For sensor dimensions see dimension drawings at the end of these instructions. Interface of KEVA 24 C10(c)/C11(c) sensor (dimensions of sensor cone) is compatible with CENELEC EN 50180 & 50181 type C. Interface of sensors KEVA 24 C24(c) is given by NEXANS, please refer to the sensor drawings below. 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.

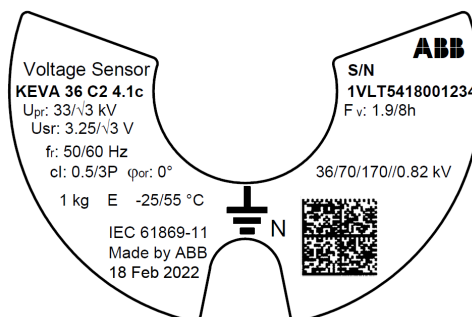
Interface of sensors KEVA 24 C24(c) and KEVA xx C2 4.1(c) are given by NEXANS.



01a



01b



| KEVA 24 C10c | Type code |
|--------------|--|
| S/N | Serial number 1VLT5416001234 |
| Upr | Rated primary voltage |
| Ustr | Rated secondary voltage |
| Rbr | Rated burden (In case of rated burned 2 MΩ, 50pF, this value will not be given on rating plate.) |
| cl | Accuracy class |
| Fv | Rated voltage factor |
| fr | Rated frequency in Hz |
| 24/50/125 kV | Insulation level |
| 0.82 kV | Insulation requirement for secondary terminal - power frequency voltage withstand capacity |
| 0.85 kg | Weight |
| E | Insulation class |
| IEC 61869-11 | IEC – standard referred to |
| -25/55°C | Ambient temperature |
| 24 Oct 2018 | Date of production |

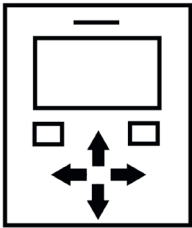
Tab. 2. Labels abbreviation definitions

- 03 Example of data stored in 2D Bar Code
- 04 Sensor mounting system
- 05 Paper towel, glove, mounting grease, smearing of mounting grease by brush or glove

| | | | | | | | | | | | | | | | | | | | |
|----------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| POSITION | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| DATA | K | E | V | A | | 2 | 4 | | C | 1 | 0 | c | | | | | S | / | N |
| POSITION | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 |
| DATA | | 1 | V | L | T | 5 | 4 | 1 | 6 | 0 | 0 | 1 | 2 | 3 | 4 | | | 2 | 4 |
| POSITION | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 |
| DATA | | O | C | T | | 2 | 0 | 1 | 8 | | | C | F | U | : | | 1 | | |
| POSITION | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | |
| DATA | | | | | F | o | c | o | r | : | | | 0 | | | | | | |

03

Connected device shall fulfill requirements according IEC 61869-11 for nominal burden. Standard define to have input impedance 2MΩ and 50pF. Other option to have 200 kΩ ±1% which cover other solution from some other suppliers Impact of other devices with different input impedance can have influence on output of sensors and defined accuracy is not valid.



Required input impedance:
2 MΩ/50 pF
or
200 kΩ/350 pF

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 shall be between 0 and +40°C. The sensor cable shall not be moved or bent if the temperature is below 0°C.

Mechanical installation
The sensors can be mounted into the multiple types of cable connectors according to the used type according Tab. 1. The mounting position for voltage sensor is shown in Fig. 3. The sensor is screwed into the cable connectors. Proper

mounting is ensured by the tightening hex nut of size 24 mm which is part of the grounding cover (recommended tightening torque.

Before mounting of sensor remove dust from the surface of sensor using a paper towel. Then a mounting grease (Nexans-Euromold: Novagard G687 or PE 1352 WT; or any other recommended by producers of cable connectors) must be used on the contact surface between the sensor and the cable connector to avoid the formation of air bubbles. The mounting grease contributes in making interfaces watertight and easy to install, see Fig. 4. Use a brush or a glove for lightly lubricating of the mounting grease.



04



05

Mechanical installation KEVA 24 C10/C11 and KEVA 24 C10c/C11c

The KEVA 24 C10(c)/C11(c) sensors are designed to be fixed to the cable connector using the screw M16 which is a part of the cable connectors, see Fig.5– pictures 4, 5 and 6.

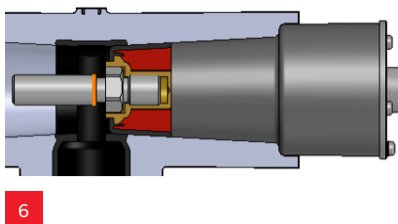
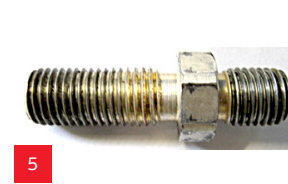
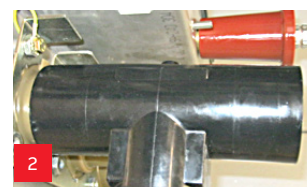
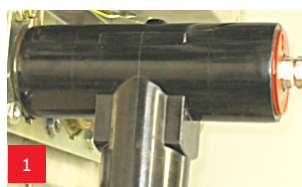
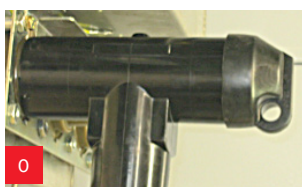
Attention: Be careful when unpacking and handling to avoid damages to the sensor. Damages that occur during unpacking or poor handling will not be covered by the warranty.

Important notes: Do not allow hydrocarbon oils or solvents to contaminate the E.P.D.M. rubber of cable connector.

Mechanical installation according to the next steps, see Fig. 5:

- 0 step the state before of installation process, see picture 0
- 1 step remove the plug cover, see picture 1
- 2 step remove the insulating plug, see picture 2
- 3 step clean the inside surface of the connector by paper towel, consistently must be checked that on the surface of inside cone are not the metal burrs, see picture 3
- 4 step check the tightening of the screw M16,

- 5 step lightly lubricate the Nexans-Euromold: Novagard G687 or PE 1352 WT mounting grease on the inside connector surface (where there is contact between the sensor and the cable connector, see picture 6) by brush or glove, first consistently must be checked that on the surface of inside cone are not any metal burrs, see picture 4
- 6 step screw the KEVA 24 C10(c)/C11(c) sensor, the tightening hex nut of size 24 mm and 22 mm for KEVA 24 C11, recommended tightening torque 50 Nm shall be used, see picture 6, in order to achieve the correct applied torque ensure that there is no lubricant on the threaded parts
- 7 step connect the grounding wire by a screw M8 which is at the frame, see picture 7
- 8 step connect the secondary cable of sensor KEVA 24 C10(c)/C11(c) to the BNC connector (check that secondary cable with the same ID number as mentioned on the sensor label is connected), see picture 8



Mechanical installation KEVA xx C2 4.1(c)

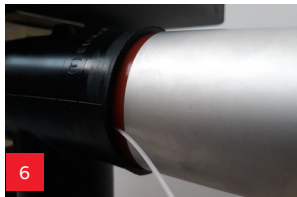
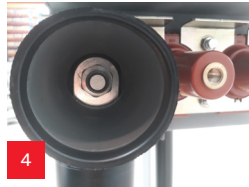
The KEVA xx C2 4.1(c) sensors are designed to be fixed to the cable connector using the screw M16 which is a part of the cable connectors, see Fig. 9 – pictures 4, 5 and 6.

Attention: Be careful when unpacking and handling to avoid damages to the sensor. Damages that occur during unpacking or poor handling will not be covered by the warranty.

Important notes: Never disconnect the connector from energised equipment nor energise a disconnected connector without previously installing on its appropriate corresponding mating part. Do not allow hydrocarbon oils or solvents to contaminate the E.P.D.M. rubber of cable connector. In the event of contamination, wipe the surface clean with a dry cloth.

Mechanical installation according to the next steps, see Fig. 9:

- | | | | |
|--------|--|--------|---|
| 0 step | the state before of installation process, see picture 0 | 4 step | check the tightening of the screw M16, the tightening hex nut of size 22 mm, recommended tightening torque 50 Nm for Nexans shall be used, see picture 4 and 5, in order to achieve the correct applied torque ensure that there is no lubricant on the threaded parts |
| 1 step | remove the protective cap, see picture 1 | 5 step | lightly lubricate the PE 1352 WT silicone grease on the inside connector surface (where there is contact between the sensor and the cable connector) by glove, first consistently must be checked that on the surface of inside cone are not any metal burrs, see picture 4. Clean & lubricate KEVA xx C2 4.1(c) cone interface. |
| 2 step | remove the insulating plug, see picture 2 | 6 step | Insert the nylon vent rod into the receptacle to exhaust the air during the assembly. Screw the KEVA xx C2 4.1(c) sensor, the tightening hex nut of size 22 mm, recommended tightening torque 30 Nm shall be used, see picture 6, in order to achieve the correct applied torque ensure that there is no lubricant on the threaded parts. Remove the venting rod after installation |
| 3 step | clean the inside surface of the connector by paper towel, consistently must be checked that on the surface of inside cone are not the metal burrs, see picture 3 | 7 step | connect the grounding wire by a screw M8 which is at the frame, see picture 7 |
| | | 8 step | connect the secondary cable of sensor KEVA xx C2 4.1(c) to the BNC connector (check that secondary cable with the same ID number as mentioned on the sensor label is connected), see picture 8 |



Mechanical installation KEVA 24 C24 and KEVA 24 C24c

The KEVA 24 C24(c) sensors are designed to be fixed to the cable connector using the screw M16 which is a part of the cable connectors, see Fig. 6 – pictures 4, 5 and 6.

Attention: Be careful when unpacking and handling to avoid damages to the sensor. Damages that occur during unpacking or poor handling will not be covered by the warranty.

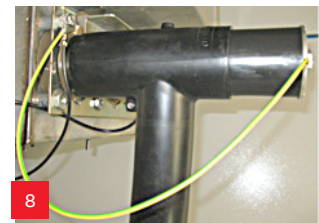
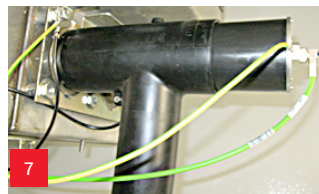
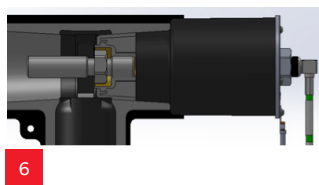
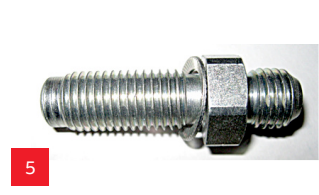
Important notes: Do not allow hydrocarbon oils or solvents to contaminate the E.P.D.M. rubber of cable connector.

Mechanical installation according to next steps, see Fig. 6:

- 0 step the state before of installation process, see picture 0
- 1 step remove the plug cover, see picture 1
- 2 step remove the insulating plug, see picture 2
- 3 step clean the inside surface of the connector by paper towel or dry cloth, consistently must be checked that on the surface of inside cone are not the metal burrs, see picture 3,
- 4 step check the tightening of the screw M16, the tightening hex nut of size 22 mm,

recommended tightening torque 50 Nm for Nexans-Euromold shall be used, see picture 4 and 5, in order to achieve the correct applied torque ensure that there is no lubricant on the threaded parts

- 5 step lightly lubricate the Nexans-Euromold: Novagard G687 or PE 1352 WT silicone grease on the inside connector surface (where there is contact between the sensor and the cable connector, see picture 6) by brush or glove, first consistently must be checked that on the surface of inside cone are not any metal burrs, see picture 4
- 6 step screw the KEVA 24 C24(c) sensor, the tightening hex nut of size 24 mm, recommended tightening torque 30 Nm shall be used, see picture 6, in order to achieve the correct applied torque ensure that there is no lubricant on the threaded parts
- 7 step connect the grounding wire by a screw M8 which is at the frame, see picture 7
- 8 step connect the secondary cable of sensor KEVA 24 C24(c) to the BNC connector (check that secondary cable with the same ID number as mentioned on the sensor label is connected), see picture 8



—
09 RJ45 connector

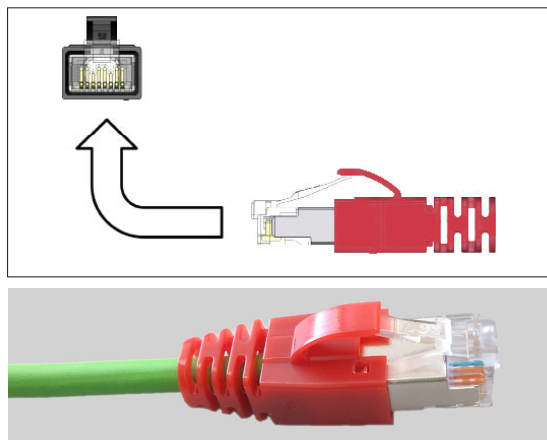
—
10 KEVA 24 Cxx(c)
sensors plug connector
pin's assignment

| Sensor type designation | Cable connectors | | |
|---------------------------------------|-------------------|---|-----------------------------|
| | Manufacturer | Type | Connecting screw for sensor |
| KEVA 24 C10/C11 KEVA 24 C10c/C11c | Nexans-Euromold | (K)400 TB/G; (K)440 TB/G; (K)944 TB/G; (K)400 TE/G; (K)400 BE/G-E; KAA4; 400PB-xSA (x = up to 24 kV) | M16 |
| KEVA 24 C24 KEVA 24 C24c | Nexans-Euromold | (K)430 TB; (K)300; PBM/G-630 A 300 SA-10-xN (x = up to 24 kV) | M16 |
| KEVA 24 C2 4.1 KEVA 24 C2 4.1c | Nexans - Euromold | (K)480 TB/G; (K)484 TB/G; (K)489 TB/G; (K)800 PB/G; (K)804 PB/G; (K)809 PB/G; (K)480 BE/G; 800 SA-10-xN (x = up to 24 kV) KAA8 | M16 |
| KEVA 36 C2 4.1 KEVA 36 C2 4.1c | Nexans - Euromold | M480 TB/G; M800 PB/G; M484 TB/G; M804 PB/G; M489 TB/G; M809 PB/G; 800 SA-10-xN (x=30,33,36); M480 BE/G | M16 |
| KEVA 40.5 C2 4.1 KEVA 40.5 C2 4.1c | Nexans - Euromold | P480 TB/G; P484 TB/G; P489 TB/G; P800 PB/G; P804 PB/G; P809 PB/G; 800 SA-10-xN (x=30,33,36); P480 BE/G | M16 |

Tab. 3 Sensor variants and use in cable connectors

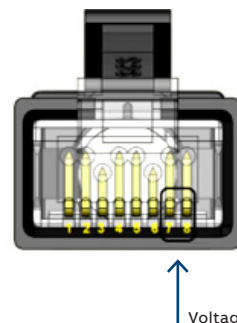
Note: For use in alternative cable connectors please contact ABB.

Note: It is recommended to use a cable tie to fasten long sensor cables approximately 10 cm from the RJ45 socket.



09

The sensor plug connector pin's assignment is shown on Fig. 08. (Front view).



Sensor wires connected acc.
following assignment:

PIN 7 - a
PIN 8 - \perp

Other pins remain unused

Voltage

10

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.

RJ45 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.

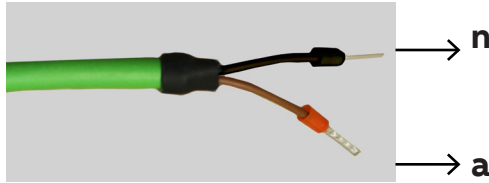
The used RJ45-type connectors (EIA/TIA 568A Standard) are screened and designed to guarantee low resistance shielding; they are particularly adapted to applications where electromagnetic compatibility (EMC) is important. The connectors are robust but it is necessary to be careful during their assembly – do not use force!

11 Ferrules termination

12 The sensor grounding terminal and cable eye

Connection to the IED via ferrules

The sensors cable can be also terminated by ferrules with color-coded secondary terminals for easy installation, see below.

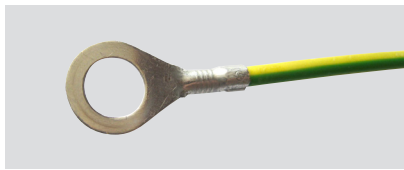


11

Ferrules can be directly connected into IED terminal blocks according to IED installation instructions. In case ferrules are not connected to IED while sensor is connected to energized system, it is recommended to ground white ferrule and also to put cover over red ferrule to avoid any undesirable contact.

Grounding terminal

The sensor grounding terminal is located on the same side as the sensor secondary cable and shall be connected to the ground during the sensor operation. To ground the sensor the grounding wire (length 0,5 m) with the cable eye M8 is used.



12

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 equipments 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:

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

5. Instructions for maintenance

Excessive dust or other kinds of pollution must be brushed off the sensor. Polluted sensors can be cleaned with spirit or petrol. 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 -40°C...+80°C. During transport and storage the sensors shall be protected against direct sunshine. The sensors are delivered packed into paper boxes or transport pallets. The conical surface must be protected against damage.

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.

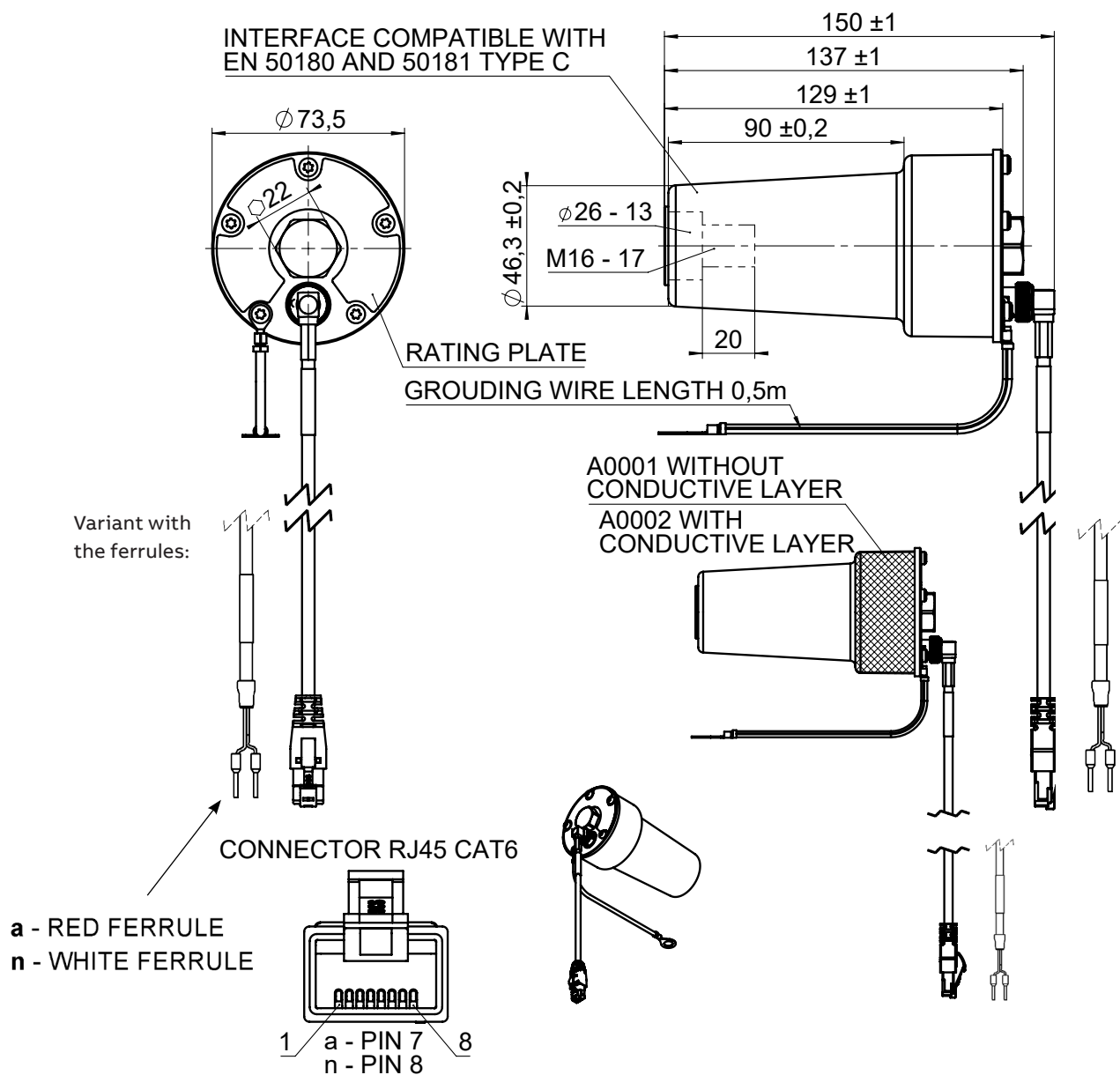
KEVA 24 C11(c)

Outline drawing numbers:

2RKA029214A0001 (KEVA 24 C11)

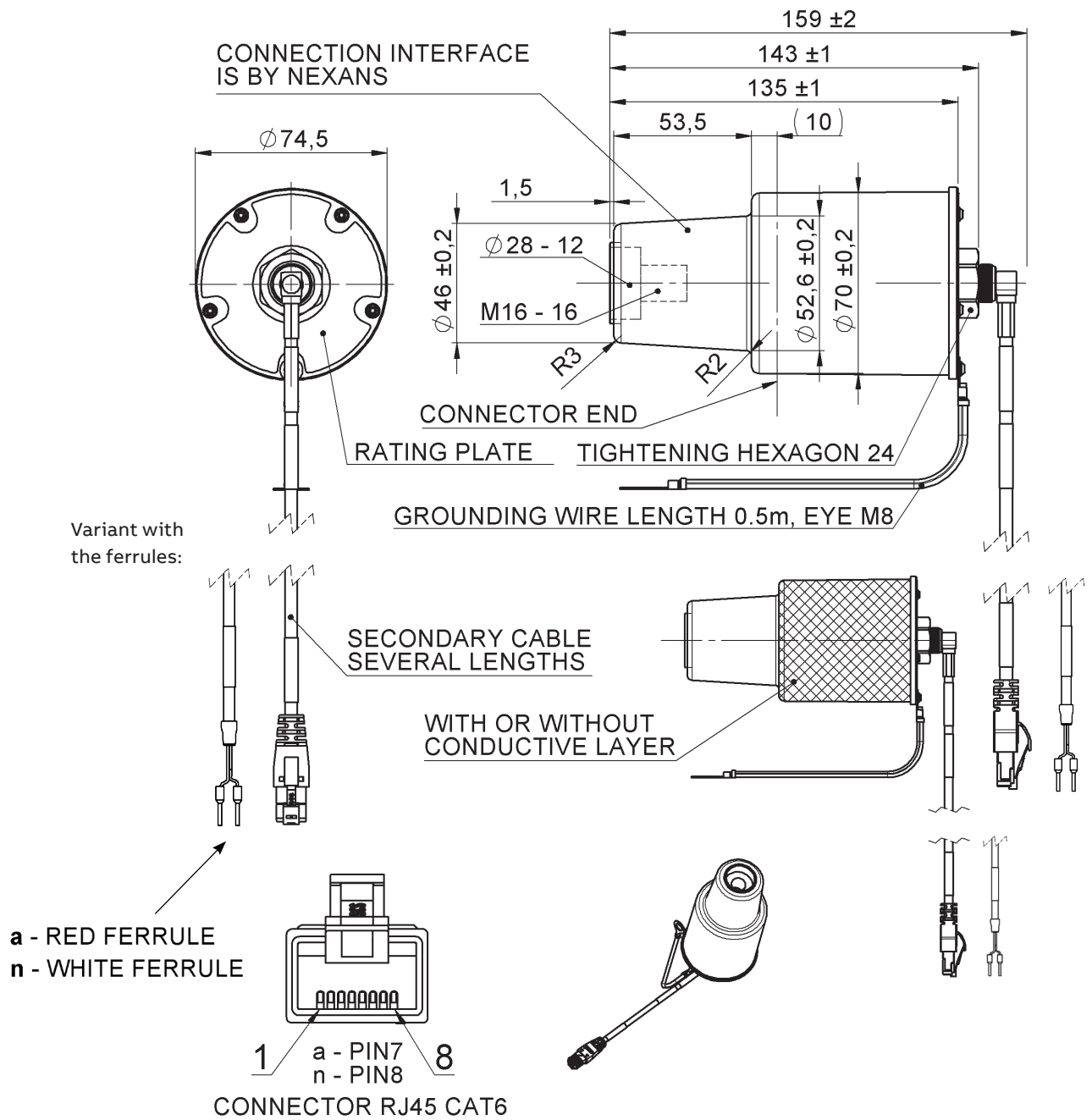
2RKA029214A0002 (KEVA 24 C11c)

Weight: 0.65 kg



KEVA 24 C24(c)

Outline drawing numbers:
 2RKA019520A0001 (KEVA 24 C24)
 2RKA019520A0002 (KEVA 24 C24c)
 Weight: 0.85 kg



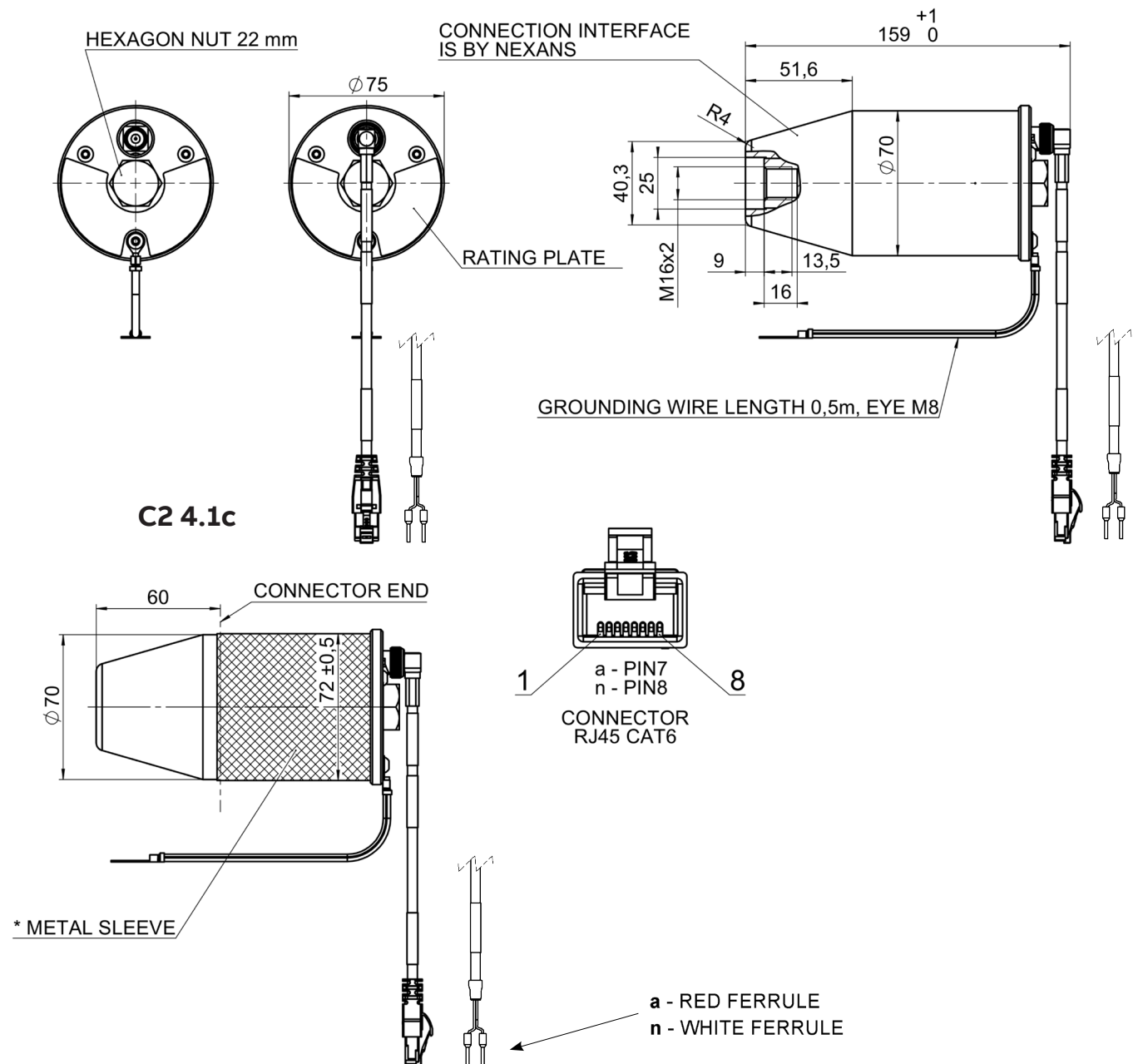
KEVA 24 C2 4.1(c)
KEVA 36 C2 4.1(c)
KEVA 40.5 C2 4.1(c)

Outline drawing numbers:

2RKA024667A0001 (KEVA 24 C2 4.1)
 2RKA024667A0002 (KEVA 24 C2 4.1c)
 2RKA024667A0003 (KEVA 36 C2 4.1)
 2RKA024667A0004 (KEVA 36 C2 4.1c)
 2RKA024667A0005 (KEVA 40.5 C2 4.1)
 2RKA024667A0006 (KEVA 40.5 C2 4.1c)

Weight: 1 kg

C2 4.1



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