Conductivity probes with coaxial measuring cell.
BS – BC

SAFETY INSTRUCTIONS

- Installation, commissioning and maintenance must be carried out by qualified personnel.
- Only connect the device to the voltage specified in the technical features and on the label.
- The operation of the device must be in accordance with and strictly limited to the applications, as mentioned further on and on data-sheet.
- Disconnect all power sources from the device during interventions or maintenance tasks.

DESCRIPTION

Conductivity probes are characterized by the factor of their measuring cell.
BAMO coaxial cells have a factor of 0.01 or 0.1.
The cell factor is the ratio between the measurement done with the cell and real value of that of the liquid.
Example: A probe with a cell factor K = 0.1 immersed in a liquid measures a resistor of 1/10 part of real value.
These cell factors are linked to our manufacturing standards.
(Refer to general documentation 360-01: Conductivity and resistivity probes BS - BC)

CE Conformity: The instruments meet the legal requirements of the current European Directives.

INSTALLATION

Coaxial conductivity probes with K = 0.1 or 0.01 are designed for use under the service conditions specified in the data-sheet 360-01. Barring exceptions, the probes are intended for connection to piping by screwing into a female thread.

The tightening of the probe on the piping must be done using the hexagonal fitting of the probe, not the measuring cell body.

The mounting recommendations are as follows:
- Mount the probes on vertical piping that is constantly full of liquid, with ascending flow (Horizontal piping: acceptable configuration).
- Be sure to install the probe in a place where the measurement will be representative.
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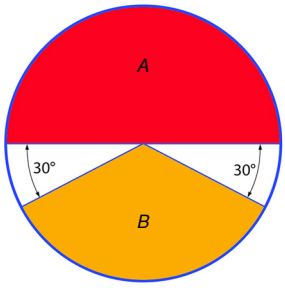
- Avoid flow restrictions such as in dead-end pipes
- Check that the flow speed around the cell does not risk damaging it (mismatch between the diameter of the piping and the diameter of the probe)
- Avoid the presence of suspended solids which could accumulate on the cell and distort the measurement.
- For a conductivity measurement below 2 µS/cm (resistivity above 500 kΩ.cm), make sure that the liquid has not been in contact with air and CO_2 after it has been produced.
  Otherwise, carbon dioxide can dissolve in water and lower the resistivity in few seconds.
- Pay particular attention to the total absence of air bubbles, which in contact with the electrodes will cause disturbances in the measurement.

To avoid the presence of air bubbles or accumulation of particles, the probe has to be mounted at an angle between 0 and -30° with respect to the horizontal plane.

See layout diagram (Pic. 1) with the following areas to avoid:
- A: Retention area for possible air bubbles
- B: Area that may contain particles



Pic. 1

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FEATURES OF THE MEASUREMENT CABLE

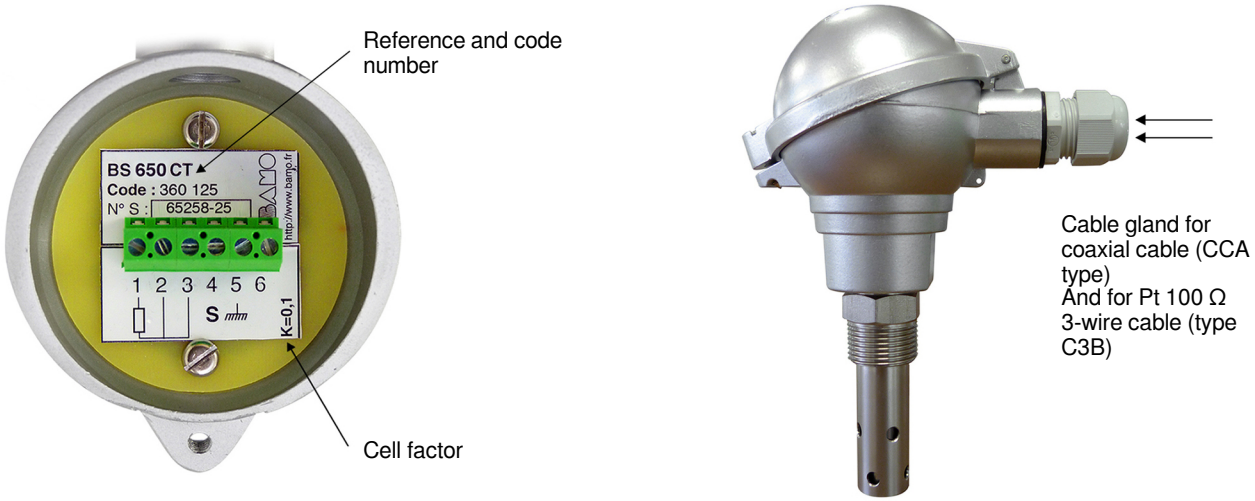
Always respect the maximum cable length between the probe and the monitor BAMOPHAR according the measuring scale and the cell factor, as shown in the table below:

Measuring scale	Cell factor: 0.01	Cell factor: 0.1
20 MΩ	50 m	10 m
2 MΩ	100 m	50 m
200 kΩ	--	100 m
20 kΩ	--	100 m

For conductivity measurements, the cable length can be up to 100 meters regardless of the cell factor and the conductivity scale selected.

ELECTRICAL CONNECTION

Pic. 2 (Example: BS 650CT probe)



Cable (Reference C3B) for Pt 100 Ω sensor (3-wire)
Terminal 1 --> White Wire
Terminal 2 --> Red Wire
Terminal 3 --> Red Wire
Coaxial cable (CCA or BRG) for measurement signal
Terminal 4 --> Central core
Terminal n ° 5 --> Shield

Choice of the measurement cable is important; Because of its resistor value and its own capacitance, it can generate an error of up to 50%, especially for extreme values of high resistivity or low conductivity.
The cable must be in one piece, directly connected from the probe to the monitor BAMOPHAR, without any intermediate connection box.

BAMO recommends the use of the CCA aerated coaxial cable (code 368 100), to be connected with a coaxial connector BNC CCA (code 368 210). For probes with PL259 connector (BS570, BS1284, BS1283/50), the CCA cable (code 368 100) is also recommended. For probes with an integrated temperature sensor Pt100, a standardized cable (code 610 010) 3-wire (1 red & 2 white) is recommended.

For some probe models, the cables are crimped to the probes (BS651CT, BS661CT, BC1425).
For other probes, connect the cable with precaution according to the wiring instructions on the following chapters.

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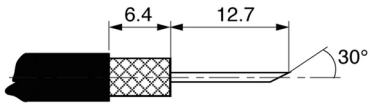
WIRING INSTRUCTIONS - Coaxial cable CCA to a BNC connector

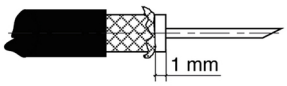
Once the cable is wired on a BNC connector it cannot be removed.

- **Strip the cable as below (Pic. 3)**
  Cut the central core with an angle of 30° for an easier positioning in the connector



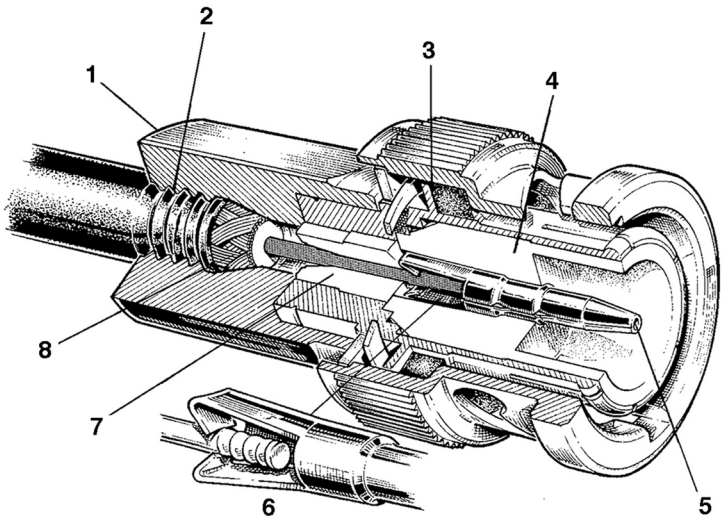
Pic. 3

- **Fold the shield down a millimeter to reveal part of the dielectric.**
  This phase is important, if improperly done, there will be short circuits. (Pic. 4)



Pic. 4

- **Insert the cable into the connector and screw it in using the hexagonal end, pushing lightly the cable to help it.**
- **Screw the connector head, inserting correctly the axial core. (Pic. 5)**



Pic. 5

1/ Hexagonal end to facilitate screwing
2/ Self-threading end (UST)for excellent hold on the cable
3/ Silicone seal against possible moisture
4/ PTFE insulator
5/ Central core
6/ Self-screwing head on the central core
7/ PTFE guide for the central core
8/ Compression of the shield over 360°

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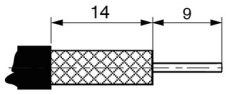
WIRING INSTRUCTIONS - Coaxial cable CCA to a PL259 connector

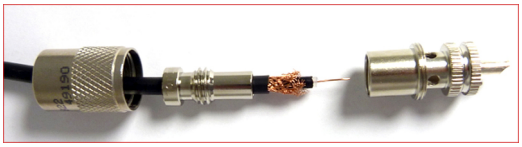
The PL259 connector can be removed after wiring, if necessary.

- **Strip the cable as shown (Pic. 6)**



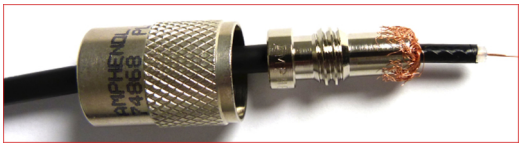
Pic. 6

- **Arrange the parts (Pic. 7)**



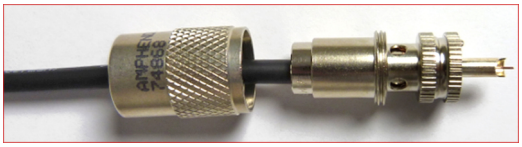
Pic. 7

- **Fold the shield over the intermediate piece as shown (Pic. 8)**



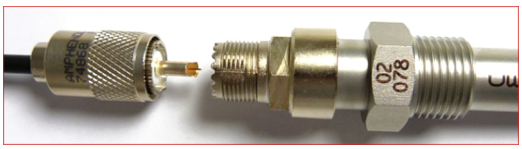
Pic. 8

- **Screw the intermediate piece into the male connector, shield must appear through the holes of the male connector (Pic. 9)**



Pic. 9

- **To ensure electrical continuity of the signal, place a drop of tin solder between the end of the male connector and the core of the cable, then screw the nut onto the male connector (Pic. 10)**



Pic. 10

- **Plug the connector into the probe and screw tightly the nut on the connector.**

CHECKING THE CONNECTIONS

You can check the resitor value between the different wires: Below are some tips for validation of the installation.

Conductor or insulator	Indicative resistor value
Pt 100 sensor: 2 Red and 1 white conductor	100 Ω at 0 ° C
Pt100 sensor at ambient temperature	≈ 110 Ω at 25° C
Central core and shield	infinite
Central core and probe body	infinite
Probe in the atmosphere	infinite

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