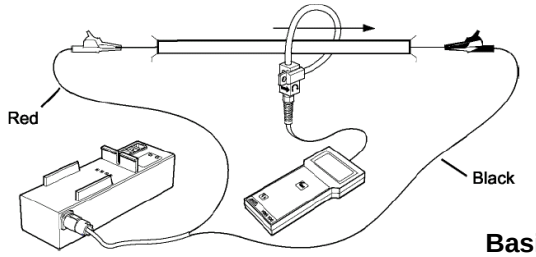
Application overview – KSG 100

1. General function



Principle of Operation

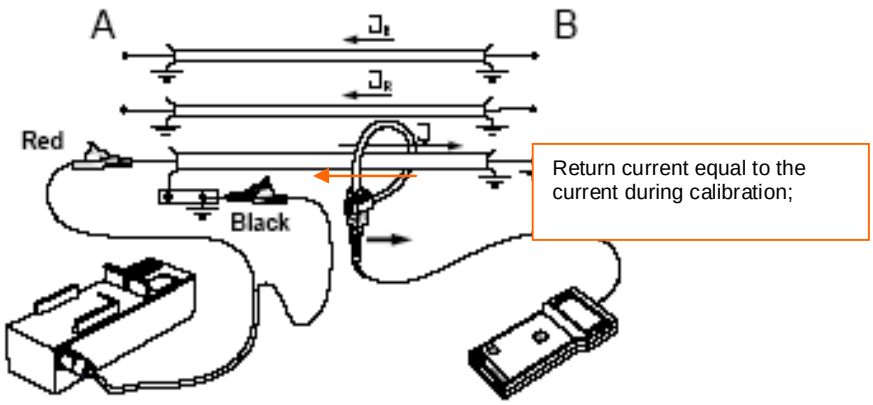
Basic principle of cable identification

Principle of operation of the KSG 100

The transmitter of the KSG contains a capacitor that is charged and then discharged into the target cable. During this process the test sample must be connected in such a way that current can flow through it. The flexible coupler is used to couple the current pulse at the target cable

The direction of flow of the current pulse and its amplitude are indicated on the display of the receiver.

The amplitude of the current pulse is dependent on the loop resistance. To be able to clearly determine the direction of current flow, the positive output is colour-coded red and the flexible coupler marked with an arrow.



The current difference that is calibrated can be measured very accurately. As there are no relevant losses, the displayed current is nearly equivalent to the calibration signal.

e.g. Cal Input … I_{In} 100A

Return current … I_{return} 33A

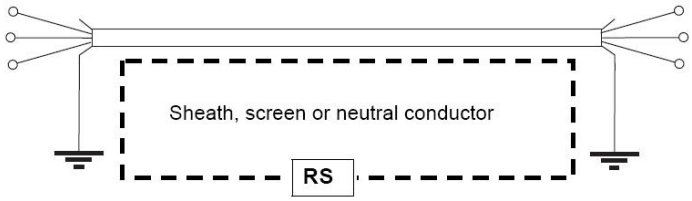
Cal. Signal … I_{cal} 67$A_{diff.}$

At the receiver on site: $I_{display} = I_{In} - I_{return}$

That means if the receiver loop induces a signal of 100% in pos. direction, this is calculated via the actual current difference of 67 A. The return signals on line 2 and 3 will be -50% on display. This is calculated via the reversed polarity and about 33A each.

Depending on the cable arrangement, the signal loop is changing. Please see the operation manual from page 15 to 20. Different possible connection arrangements are explained.

2. Definition of maximum cable length



The cable identification can be carried out even on very long cables. The max. loop resistance is defined with 6 ohms. In long cables the core shall be used as conductor, as the specific resistance is much lower compared to the cable sheath.
In case of inductive signal coupling by means of the current clamp, the cable sheath is to be considered as signal conductor.
The parameters that are influencing the maximum cable length for cable identification by means of inductive coupling are based on the calculation of the specific sheath resistance over the cross section and the length.

3. Accuracy / Certainty of identification

Before the actual process of cable identification begins, the instrument is performing a self calibration whereby the target cable is analysed. During this sequence the receiver analyses the test sample for interference and the amplitude of the pulse. As the signal amplitude is dependent on the loop resistance, the receiver **automatically** sets the internal amplifier to 100% output amplitude. In this way it is ensured that not only the **direction** in which the current pulse flows, but also the **amplitude** is used for the evaluation.
In the final calibration step, the transmitter is synchronised to the receiver using a defined **cycle time**. This synchronisation is performed because during the subsequent cable
identification the receiver will only evaluate the pulses during a period of 100 ms (Phase). This impulse is not affected by any magnetic field, as a high current impulse is used.
Finally there is only one single core fulfilling all the calibrated values with positive direction on site, independent how many cables are faced in the tray or manhole.

These relevant signal characteristics mentioned above can be mentioned shortly as **ATP-signal acquisition**:

A … **A**mplitude and direction of signal;

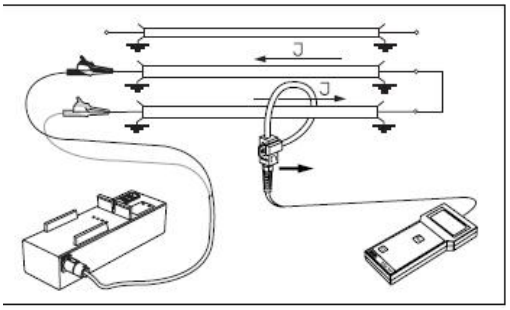
T … **T**ime interval of released signals synchronized with transmitter;

P … **P**hase: same signal direction in the correct cable, all neighbouring cables are used as return wire or do not carry any signal.

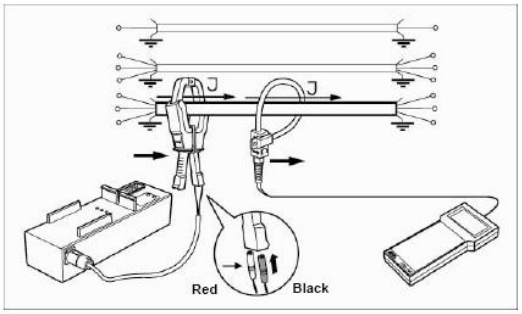
The BAUR KSG 100 is the only instrument available providing such high safety certainty. The fully automatic setting adjustment and calibration minimizes the risk of operating error.

4. Application field:

The signal coupling can be done in two different ways:

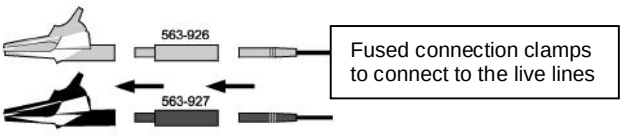


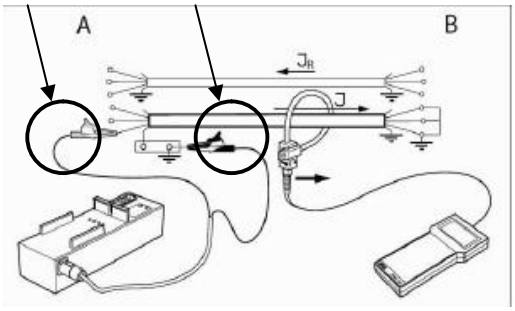
On dead cables, the direct coupling can be performed to the core of the cable. In such arrangements, where the core is used as the conductor, there is no limitation in regards to voltage rating or diameter of the cable. The flexible Rogowski coil can loop a diameter of 200mm and therefore is applicable even on high voltage cables.



For the application on live cables, it is independent whether the load rating is high or low or whether the line voltage is low voltage or even high voltage. As the coupling in that case is done via a current clamp, the restriction is given by the diameter of the clamp only. At present, the largest available current clamp can loop a max. diameter of 125mm.

5. KSG 100 T





The KSG 100 is also available as “Top version”. This set is designed with a different transmitter unit that allows to be connected directly to live low voltage cable with max. 400V AC 50/60Hz.

Furthermore, the Top Version offers the feature to measure the load current of a live cable comparable to a current clamp with direct Ampere – indication.

Advise: Even the current measurement feature is available, a no current indication does not confirm that the cable is de-energized and safe for cutting.