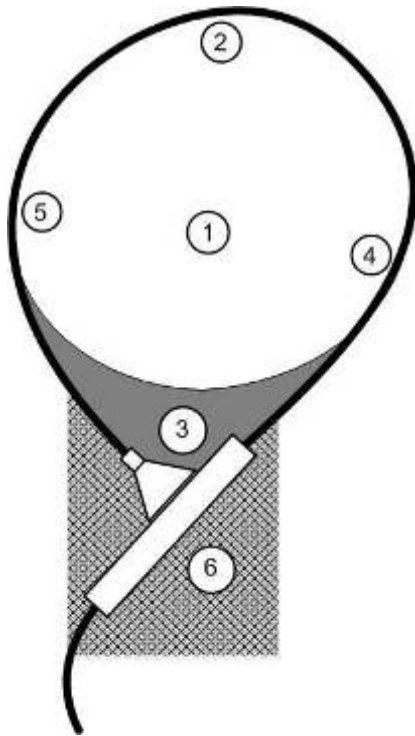


Positional accuracy and external currents

Due to small variations in the winding density and coil cross sectional area the transducer output varies slightly depending on the position of the current in the coil and also the size of the current conductor relative to the coil.

A given conductor of area (1mm²) is moved around the Rogowski loop as shown below. The Rogowski coil is calibrated with the conductor central in the Rogowski loop, ①. The deviation in reading relative to the calibrated value, as the conductor is moved around the loop, is shown in the table. The positional variation is at its worst where the coil clips-together, ③, every effort must be made to keep the conductor away from this area.



The Rogowski loop circumference is 80mm

Conductor Position	Typical Error (%)
①	0.2%
②	± 1.0%
④ ⑤	± 2.0%
③	- 5.0%

Note that with a larger conductor the variation of error with conductor position will decrease and approach the calibrated value.

Error can arise due to the presence of current close to but outside the Rogowski coil which ideally should not provide any reading. However an external current of magnitude 100A adjacent to the coil will give a reading of up to ±2A. The error will significantly decrease as the external current becomes more distant from the coil. Care must be taken to keep any source of external current away from the shaded area position ⑥ as the error will be worse in this region. If the external current (outside the Rogowski loop) is much greater than the current being measured (inside the current loop) then the error maybe significant. This is particularly relevant if the external current is flowing in a nearby multi-turn coil such as a transformer.

