

Cable setup to optimise performance when using MOM3

This application note describes and guides how to optimise and increase the accuracy of measurements with MOM3 on different types of objects.

Connectors for MOM3

The standard connectors for MOM3 are the Kelvin clamps and the Kelvin probes.

Kelvin clamps:

The advantage of using the Kelvin clamps is that they can be attached to both sides of a test object with a "wide" distance, limited only by the length of cables. There is no need to manually hold the clamps during the measurement.



Kelvin probes:

The Kelvin probe cables are handheld and thus limit the possible range (approximately 1 m) to cover the test object. However, they are more intuitive, and the measurement procedure tends to be quicker. The measurement is performed by pressing the yellow button on the probe. The double probe tip is 10 mm in diameter and can thus reach narrow test areas.



Setup of resistance measurement on a busbar joint using Kelvin clamp

The clamps for the current output should be placed at least 0.5 m from the joint. The sense cables should be positioned as close as possible to both sides of the joint (test object).



The reason for having the current clamps apart from the sensing cables is that the current flow shall be evenly distributed on the test object. Therefore, it is important that the sensor cable connector is as close as possible to the test object. Place current clamps at least 0.5 m from the sensor.

Setup of resistance measurements on breakers, switches, busbar connections etc.

When the test object has "smaller" dimensions, the Kelvin clamps can be connected more tightly to the test object. The test cables should be twisted (if possible) as much as possible to increase the accuracy of the resistance measurement.



Twisted sense cables

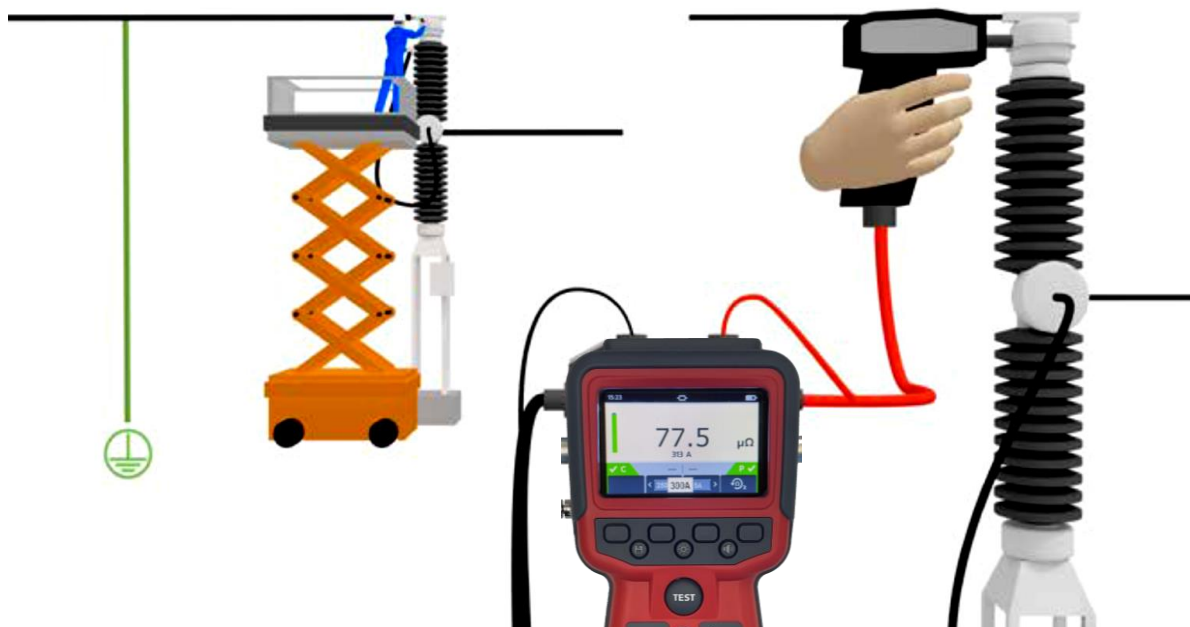
To further improve measurement accuracy, separate twisted sensor cables should be advised. See below picture.



Kelvin clamp with separate test probes

The current clamp used for the MOM3 has a banana contact for the sense measurement. By using this banana contact on the Kelvin clamp, it's possible to use separate sense cables to the test object, connected via the Kelvin clamp cabling to the sense input on MOM3. This setup requires that the sense part (1 of the 2 jaws) in the Kelvin clamp is isolated from the test object. The sense jaw is the upper jaw according to the picture above. The advantage of this type of connection is that a sense probe with small dimensions can reach into tight areas.



Combination of using Kelvin clamp and a Kelvin probe

Measurement on circuit breaker with one side grounded. Here is a combination of one clamp and one probe used

Sometimes the standard current clamps are not suitable or even possible to attach. In these cases, special solutions are necessary. Current cables cannot be extended too much or be replaced with thin cables. The easiest way to create your own solution is to replace the Kelvin clamp on existing cables with another type of clamp.