

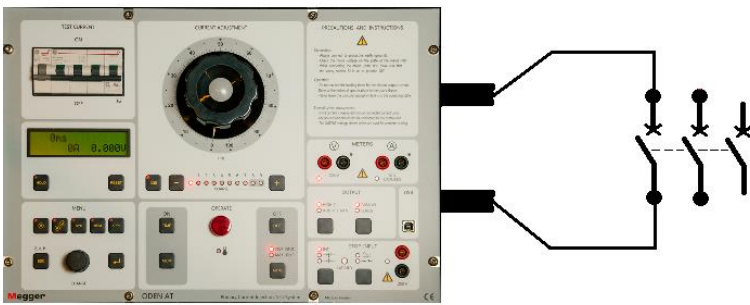
Current cable selection when testing with ODEN and INGVAR

Cable selection

To use ODEN and INGVAR in the best possible way is to determine a suitable current cable for the actual application (hereafter only ODEN is mentioned though the text is valid for both products).

Current cables

Picture below shows a typical application. Testing a low voltage breaker with ODEN.



To determine and use the best possible current cable, means we have to know several things like.

- Current to inject
- Distance to test object
- Duration of test time
- Resistance of test object

To output as much current as possible we have to consider current cable area and length to test object. And as well to consider the impedance of the test setup.

Minimize impedance in cables.

The major part of the impedance is caused by the reactance. Minimizing the magnetic flux will reduce the reactance.

A preferred cable arrangement. Current unit with twisted 2 pairs Multi-cable set. Cables from current unit terminal is twisted together with a cable from the other terminal on the same current unit.



Keep cables with opposite current direction close together to minimize the loop impedance. If the distance to the test object terminals are different it is better to use cables with different length in order to avoid loops.

How to select a current cable for a known test setup and for a decided ODEN setup.

(For reference see the ODEN user manual)

Check the output voltage capabilities on the decided ODEN setup for the desired current output.

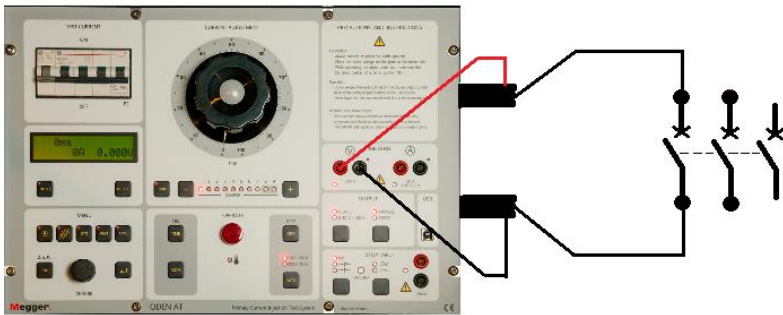
- Use as short cable as possible.
- Estimate the resistance of the test load.
- Add the impedance of the selected current cable (see selection of multi cable sets in the user manual).

Calculate the output voltage: (total resistance in cable and load x test current) = output voltage .
Check if this output voltage doesn't exceed the output capability for the decided ODEN setup.

Check also the current capability according to table (Standard multi-cable sets) in ODEN user manual (both the 20 sec and continuous current)

Note: If the test current exceeds the current limits as stated in the table. It will give a rise in temperature of cable and shorten life time of the cable.

If the desired test current isn't reached for some reason (due to high load, long test cables and small area on test cables). The impedance can be measured. Connect the voltmeter on ODEN to the main current bars on ODEN. Calculate the output voltage ($Z \times I$) and check if it's within the ODEN specification.



Set the current output to a low value, not to activate the breaker.

- 1) Press the **HOLD** button.
- 2) Start the current injection with "ON+TIME"
- 3) Stop current injection.
- 4) Press the **ESC** button repeated times until the impedance value(Z) comes up.

Note: To select an ODEN setup, use the software "Odenselect", (can be downloaded on megger website: www.megger.com. Search for ODEN AT). By typing the output current, desired time, mains voltage and used main frequency. Suggestions on an Oden setup comes up.