

Programma

MJÖLNER 200 Microhmmeter



- Specifically designed for measuring contact resistances of circuit breakers, contacts, disconnect switches, bus-bar joints, and other high current links
- Safer testing using the patented DualGround™ technology to test circuit breakers with both sides grounded
- Fully automatic testing- microprocessor controlled
- Ability to store test results
- Built in thermal printer
- PC interface connection
- Wide measuring range and test currents
- High-power and lightweight

DESCRIPTION

The MJÖLNER is designed to measure the resistance of circuit breaker contacts, bus-bar joints, contact elements in bus-bars and other high-current links. This product is designed with safety, ease of use and versatility in mind.

The micro-ohmmeter can be used anywhere to measure a low resistance value with high accuracy. It conducts true DC ripple free current testing of bus bars, circuit breakers, fuses, etc.

With MJÖLNER 200 it is possible to make measurements according to the DualGround* method. This means that the test object will be grounded on both sides throughout the test giving a safer, faster and easier workflow.

The lightweight and rugged suitcase design makes MJÖLNER 200 an excellent choice when you need a portable solution in the field. When the case is closed, the product can withstand the impact of water, dust or sand – it even floats.

Optional accessories are a remote control and the PC software MJÖLNER Win that is compatible with IPS-CEBEX and have export functions for tables to Microsoft® Excel®.

APPLICATIONS

MJÖLNER 200 test system is designed to serve a number of applications. The most common are contact resistance measurements of low-, medium- and high-voltage breakers and also at bus-bar joints, and other high current links.

The contact resistance measurements concerning breaker testing are particularly called for in the following standards: ANSI C37.09-1979 (5.14), IEC 1208 and IEC 694 (6.4).

If the contact resistance is too high this will lead to power loss and temperature rise, which often leads to serious trouble. To avoid such problems, it is necessary to check the resistance at regular intervals.

The following table demonstrates how important low resistance is at high currents:

Current	Contact resistance	Power loss
10 kA	1 mΩ	100 kW
10 kA	0.1 mΩ	10 kW
1 kA	1 mΩ	1 kW
1 kA	0.1 mΩ	100 W

At 10 kA a contact with the resistance 0.1 mΩ gives a power loss of 10 kW. This power loss in one single point will definitely confer a temperature rise, which may result in overheating and possibly premature failure.

The MJÖLNER 200 Microhmmeter is used as

Application Examples

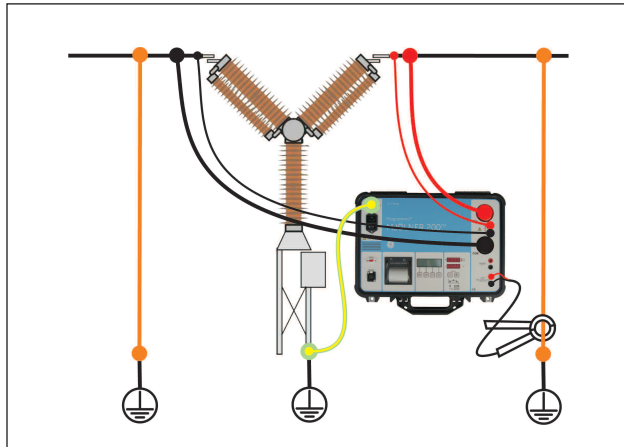


Figure 1 — Additional Safety Feature.
You can make tests with both sides of the test object grounded

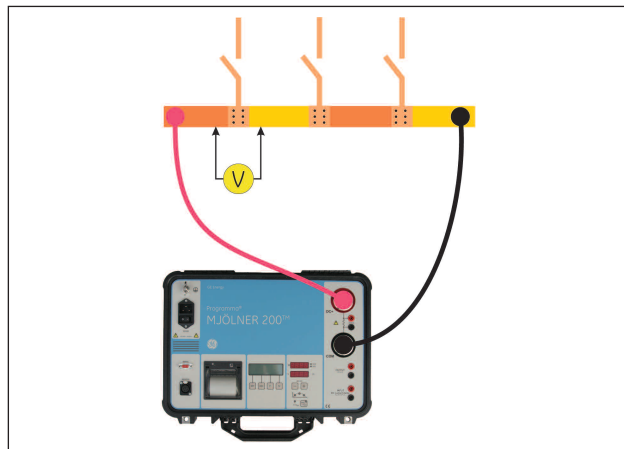


Figure 2 — External Voltmeter.
Measure the voltage drop (voltage) across each contact element within every section of the bus-bar being tested

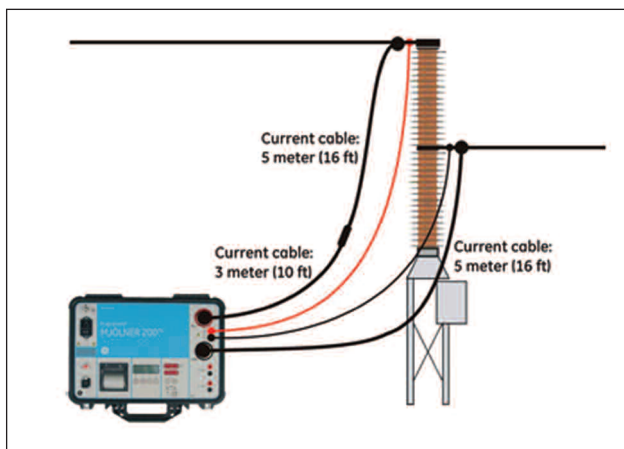


Figure 3 — Current Cables.
The MJÖLNER 200 has extendable test leads that help to minimize the cable length and weight

follows:

Circuit Breaker testing

- Test of circuit breaker contacts
- Test of the connections to the breaker

Testing of Bus-bar

- Test of Bus-bar joints
- Test of connections

Transformer testing

- Winding resistance – not on all type of transformers. (In many transformers there is a need for higher voltage than 5 V.)
- Internal/external connections

Everywhere you need to test a low resistance/ high current connection

- Switches
- Disconnecting devices
- Safety ground connections
- Welding points
- Fuses
- Cables

FEATURES AND BENEFITS

- High-power/light weight — 1000 watts, 8.8 kg (19.4 lbs).
- Direct ohm reading at any current — currents can be set from 5 to 200 A.
- Suitcase shape — comes close to the body making the unit easier to carry.
- Rugged plastic housing — in most cases no need for an additional heavy transport case.
- Current cables in separate bag — perfect balance when carrying the equipment.
- Quick-lock cable connections.
- Can measure with both sides grounded — results in safer testing.
- High current capability, up to 200 A DC — the user avoids problems with incorrect test results due to low test current when testing high current devices such as circuit breakers.
- Resistance measurement at any current — accuracy is not affected by adjustment of the current to a specified value.
- Output protection by thermal sensors + software — enables the user to make maximum use of the high current capability of the instrument without risk of damage
- Internal memory — the user can store up to 100 measurements during field tests and later recall these results via the built in display.
- Calibration shunt (optional) — enables the user to

quickly verify the accuracy of the instrument, in the field.

- Built in printer — fast printing of all test results.
- True DC current — no risk of unintentional tripping of relays.
- Visible results in all light conditions — one LCD and one LED.
- Wide measuring range — from 0.1 micro-ohms to 1 ohm.

Both Sides Grounded

Many utilities require safety grounds remain in place during station outages, therefore, the MJÖLNER 200 was designed with this field safety constraint in mind.

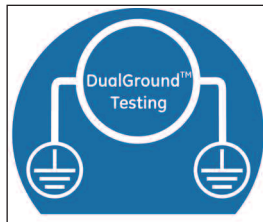
Minimum time shall be spent in the substation and focus shall be on the test rather than the equipment.

The DualGround™ testing method is available for all tests on all circuit breakers.

The following table indicates the Programma instruments that the MJÖLNER 200 works in conjunction with:

Contact resistance	MJÖLNER
Timing	TM1800 with Dynamic Capacitive Unit
Motion	TM 1800
Dynamic Resistance Measurement (DRM)	TM 1800 with DRM 1800
Vibration	CABA Win Vibration

SPECIFICATIONS



Equipment and methods that supports DualGround™ testing are associated with the DualGround symbol. This symbol certifies the use of groundbreaking technology and methods that enables a safe, fast and easy workflow with both sides grounded throughout the test.

Environment

Application field

The instrument is intended for use in high-voltage substations and industrial environments.

Temperature

- Operating:** -20°C to +50°C (-4°F to +122°F)
- Storage & transport:** -40°C to +70°C (-40°F to +158°F)
- Humidity:** 5% – 95% RH, non-condensing

CE-marking

- LVD** EN61010-1:2001
- EMC** EN61326:1997 + A1:1998 +A2:2001 +A3:2003

General

- Power supply voltage** 100 - 240 V AC, 50/60 Hz
- Power consumption** 13 A at 100 V, 6 A at 230 V
- Protection** Thermal fuses, software
- Dimensions** 470 x 357 x 176 mm (18" x 14" x 7")
- Weight** 8.8 kg (19.4 lbs)

Measurement Section

- Measuring Range** 0 - 999.9 mΩ
- Resolution** 0.1 μΩ below 1.0 mΩ
1 μΩ below 10 mΩ
10 μΩ below 100 mΩ
100 μΩ below 1000 mΩ
- Accuracy, 50 – 200 A** Typ ±0.3 μΩ, Max. ±0.6μΩ
10 - 40°C, R < 1 mΩ

Output DC+

- Output voltage (max)** 5.25 V DC at 200 A
- Output current** 5 – 200 A DC
- Max load capacity** 2 min. ON, 10 min. OFF at 25°C (77°F) ambient temperature and full load (25 mΩ at 100 A)

Inputs

- Sense** Max. 20 V between terminals and to protective earth (ground).
- DC current clamp input** Max. 20 V between terminals and to protective earth (ground).
- DC current input sensitivity** Adjustable 0.1 - 20 mV/A
- DC current clamp input impedance** >1 MΩ

ORDERING INFORMATION

Item	Cat. No.	Item	Cat. No.
MJOLNER 200	BM-19190	Optional accessories	
Included accessories		Cable set 5 m (current cables 2 x 5 m, 35 mm ² and sensing cables 2 x 8 m)	GA-03206
Standard cable set 3 m, (current cables 2 x 3 m, 35 mm ² and sensing cables 2 x 3 m)	GA-03205	Cable set 10 m (current cables 2 x 10 m, 35 mm ² and sensing cables 2 x 13 m)	GA-03208
Ground cable	GA-00200	Paper roll for built-in printer	GC-00050
		DC current clamp, 200 A (incl. cables))	XA-12992
		Soft transport case for cables	GD-00360

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