

MJÖLNER 200

Micro-ohmmeter



- **Fully automatic testing – Micro processor controlled**
- **Safe test – DualGround™ and Remote control**
- **True DC – ripple free current**
- **Lightweight suitcase – withstands the impact of water, dust or sand**
- **Built in thermal printer**
- **PC interface connection**

Description

The MJÖLNER™ 200 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. 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.

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.

Features and benefits

1. Grounding terminal
2. Connection and switch for mains voltage
3. Temperature sensor input
4. USB port
5. Remote control connector
6. DC+ current output
 - Quick-lock cable connection
 - True DC current — no risk of unintentional tripping of relays
 - 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
7. Sensing terminals
 - Wide measuring range, from 0.1 mΩ to 1 Ω
8. DC – current output
 - Quick-lock cable connection
9. Displays, LCD and LED
 - Direct ohm reading at any current.
 - Accuracy is not affected by adjustment of the current to a specified value.
 - Visible results in all light conditions — one LCD and one LED
10. Shunt output
 - Calibration shunt that enables the user to quickly verify the accuracy of the instrument, in the field.
11. Adjustment keys
 - To set the measuring current and all menu values
12. DC current clamp sense input
 - Fast printing of all test results.
13. Printer
 - Fast printing of all test results.
14. Keys to control the menu functions
 - Currents can be set from 5 to 200 A.
15. Internal memory.
 - Store up to 100 measurements during field tests and later recall these results via the built in display.
16. Error LED
 - Lit when the adjusted current could not be reached
17. Start/Stop key with status LED
18. Status LED's
 - Indicating the actual measuring status
19. Suitcase shape
 - The unit comes close to the body thus making the unit easier to carry.
 - Rugged plastic housing, in most cases no need for an additional heavy transport case.
20. Current cables in separate bag
 - Perfect balance when carrying the equipment.



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Application examples

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

Both sides grounded

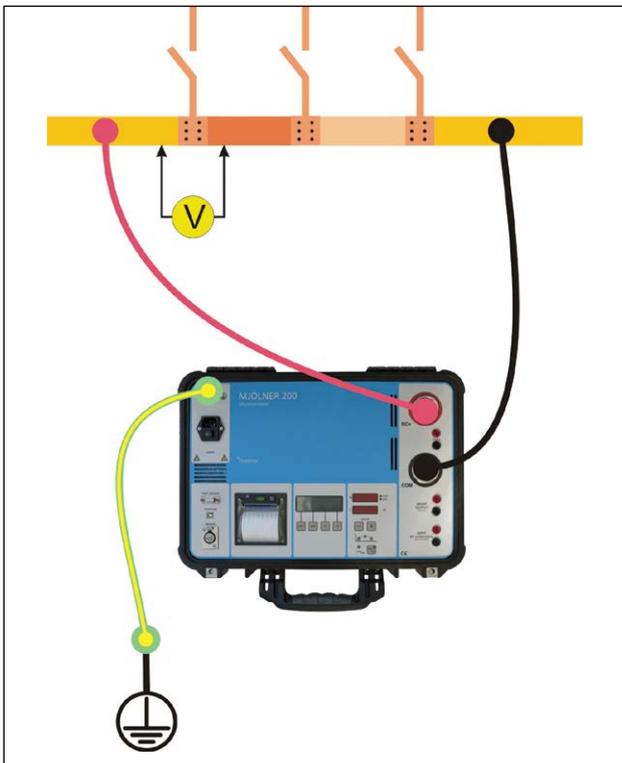
Many utilities require safety grounds remain in place during station outages, therefore, the MJÖLNER 200 was designed with this field safety constraint in mind.

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

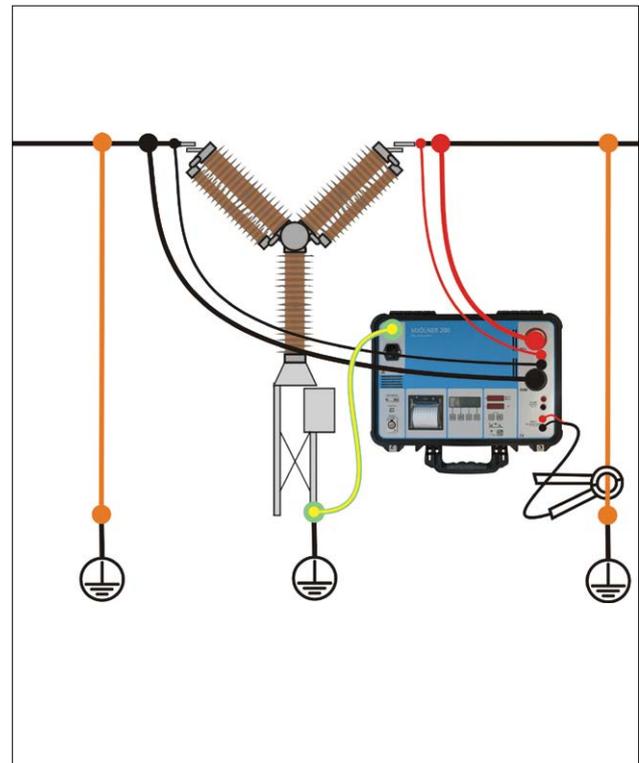
The DualGround™ testing method is available for all tests on all circuit breakers. The following table indicates the Megger instruments that the MJÖLNER 200 works in conjunction with:

Timing	TM1800 with DCM module
Motion	TM 1800
Dynamic Resistance Measurement (DRM)	TM 1800 with SDRM202
Vibration	CABA Win Vibration

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.



Using an external voltmeter, measure the voltage drop (voltage) across each contact element within every section of the bus-bar being tested.



You can make tests with both sides of the test object grounded, an additional safety feature.

Specifications

Specifications are valid at nominal input voltage and an ambient temperature of +25°C, (77°F). Specifications are subject to change without notice.

Environment

<i>Application field</i>	For use in high-voltage substations and industrial environments.
<i>Temperature</i>	
<i>Operation</i>	-20 to +50°C (-4°F to +122°F)
<i>Storage</i>	-40°C to +70°C (-40°F to +158°F)
<i>Relative humidity %RH</i>	5%-95%, non condensing

CE-marking

<i>EMC</i>	2004/108/EC
<i>LVD</i>	2006/95/EC

General

<i>Mains voltage</i>	100- 120, 200-240 V AC, 50 / 60 Hz
<i>Power consumption</i>	(max) 13 A at 100 V, 6 A at 230 V
<i>Protection</i>	Thermal fuses, Software
<i>Dimensions</i>	480 x 350 x 170 mm (19" x 13.7" x 6.7")
<i>Weight</i>	8.5 kg (18.7 lbs)

Measurement section

<i>Measuring range</i>	0 – 999.9 mΩ
<i>Resolution</i>	0.1 μΩ below 1.0 mΩ 1 μΩ below 10 mΩ 10 μΩ below 100 mΩ 100 μΩ below 1000 mΩ

Inaccuracy, 50 – 200 A, at 10 - 40°C

<i>0 – 1 mΩ</i>	Typ ±0.3 μΩ, Max. ±2 μΩ
<i>1 mΩ – 500 mΩ</i>	Typ ±2 mΩ, Max. ±20 mΩ
<i>500 mΩ – 1000 mΩ</i>	Typ ±4 mΩ, Max. ±40 mΩ

Outputs

DC+ / COM

<i>Range</i>	5 – 200 A DC (steps of 1 A)
<i>Output voltage (max)</i>	5.25 V DC at 200 A Ripple ptp < 2% (0 to +50°C)

OUTPUT 100 μV/A

<i>Shunt output</i>	From internal shunt 60 mV at 200 A
<i>Inaccuracy</i>	±1%

Inputs

SENSE

Max. 20 V between terminals and to protective earth (ground).

INPUT DC current clamp

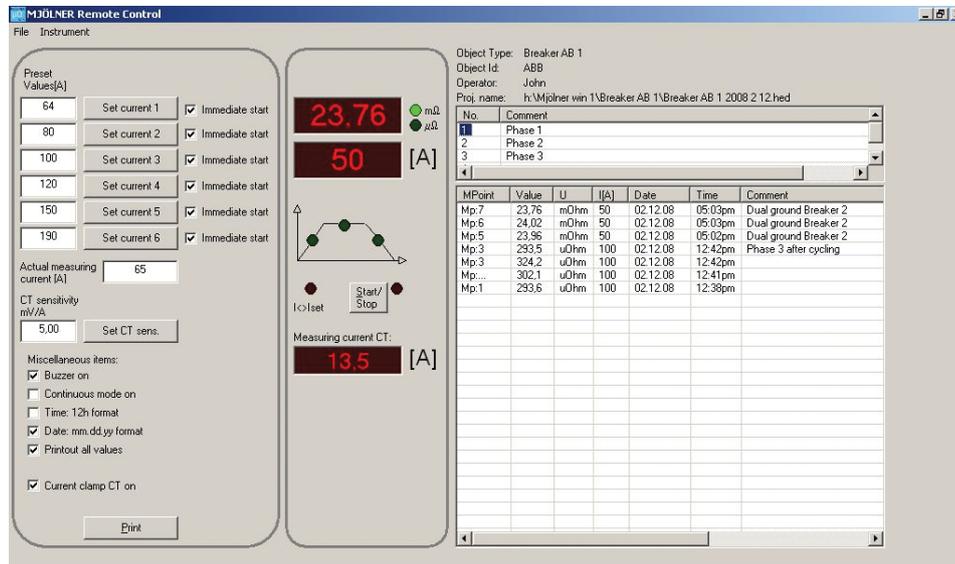
Max. 20 V between terminals and to protective earth (ground).

<i>Input sensitivity</i>	Adjustable 0.1 – 20 mV/A
<i>Input impedance</i>	>1 MΩ

Optional accessories

MJÖLNER Win

The Windows program makes it easy to manage/save all test results in a simple way. All information, meta-data of the test object e.g. a circuit breaker and the test results are stored together and they can easily be transferred to Microsoft® Excel for further analysis..



Remote control

Many times, you place the test equipment on the ground while the cables are connected high up on a circuit breaker. In these situations, it can save a lot of time using a remote control during the test. The remote control has most of the functionality in the MJÖLNER 200 such as starting and stopping, setting the test current and read out the test values



Ordering information

Item	Art. No.
MJÖLNER 200	
Incl. Std. cable set 3 m, (current cables 2 x 3 m, 35 mm ² and sensing cables 2 x 3 m), Ground cable	BD-19190
Incl. Std. cable set 5 m, (current cables 2 x 5 m, 35 mm ² and sensing cables 2 x 5 m), Ground cable	BD-19191
Incl. Std. cable set 3 m, (current cables 2 x 3 m, 35 mm ² and sensing cables 2 x 3 m), Ground cable and DC Current clamp (200 A/20 mV)	BD-19192
Optional accessories	
MJÖLNER Win	
Windows® software	BD-8010X
Remote control	
(5 m cable)	BD-90010
Temperature probe	BD-90012
Thermal paper roll (for printer)	GC-00050
Extension cable set 5 m	
(current cables 2 x 5 m, 35 mm ² and sensing cables 2 x 8 m)	GA-03206
Extension cable set 10 m	
(current cables 2 x 10 m, 35 mm ² and sensing cables 2 x 13 m)	GA-03208
Calibration kit	
200 A/20 mV shunt and instruction	BD-90022
DualGround kit	
DC Current clamp 200 A (incl. cables)	XA-12992
Transport case	
660 x 240 x 550 mm (26" x 9.4" x 21.6") (L x W x H)	GD-00270

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