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 with 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:
IEEE C37.09-1999 and IEC 62271-1 (2011).

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

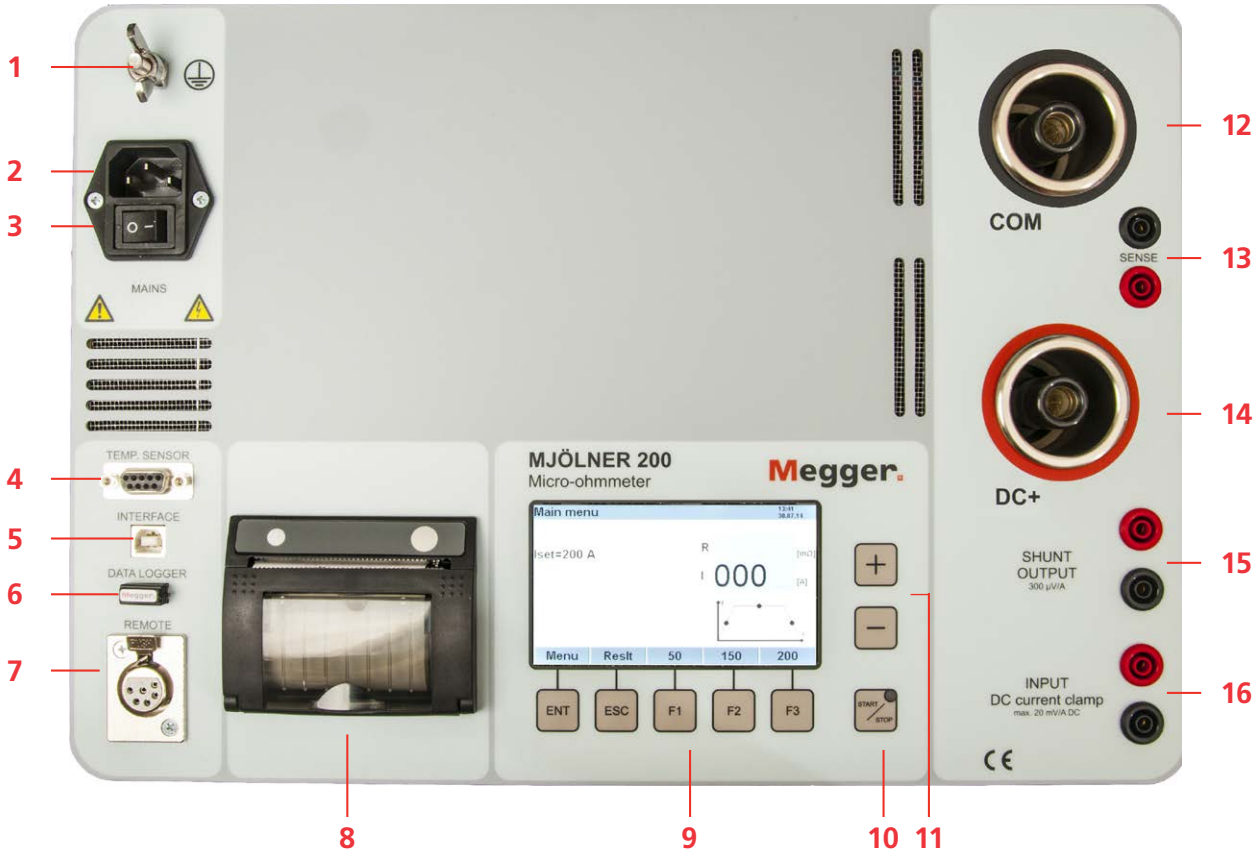
At 10 kA a contact with the resistance 0.1 mΩ gives a power loss of 10 kW. This power loss in one single point will definitely confer a temperature rise, which may result in overheating and possibly premature failure.

Features and benefits

1. Grounding terminal
2. Connection for mains voltage
3. Switch for mains voltage
4. TEMP. SENSOR
   Serial interface for PC (RS232)
   This interface is for connection of a temperature probe for temperature compensating.
5. INTERFACE
   For communication with PC and MJÖLNER Win.
6. DATALOGGER
   Port to connect a USB stick for datalogging. Results can be viewed with Excel.
7. REMOTE
   Remote control connector
   The remote controls current value, start /stop of measurement and print out function.
8. Printer
9. Keys to control the menu functions
10. Start/Stop key with status LED
11. Adjustment keys to set the measuring current and all menu values
12. DC+ current output
13. Sensing terminals
14. DC- current output
15. Shunt output
16. Clamp sense input

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.

Current cables in separate bag
Perfect balance when carrying the equipment.



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

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

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

Both sides grounded

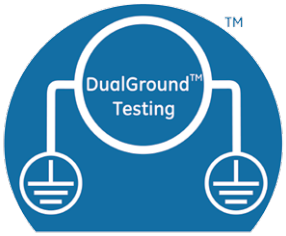
Many utilities require safety grounds remain in place during station outages, therefore, the MJÖLNER 200 was designed with this field safety constraint in mind.

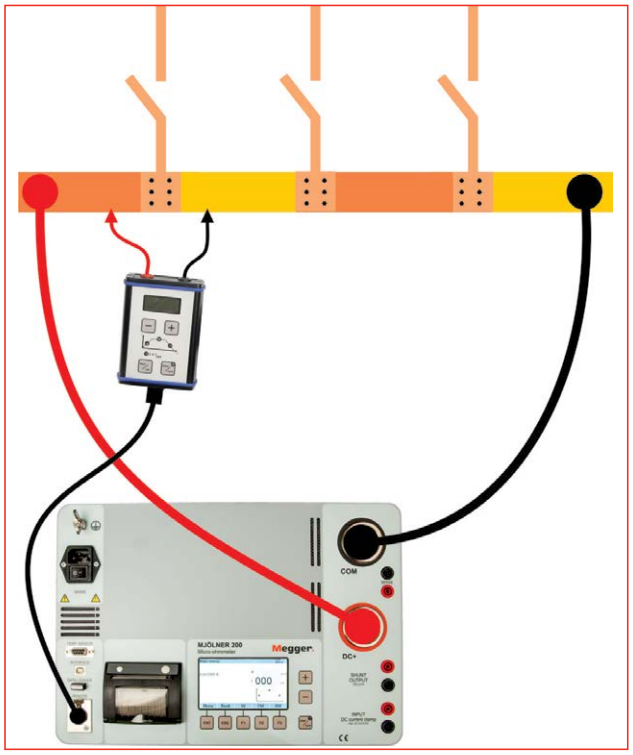
Minimum time shall be spent in the substation and focus shall be on the test rather than the equipment.

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:

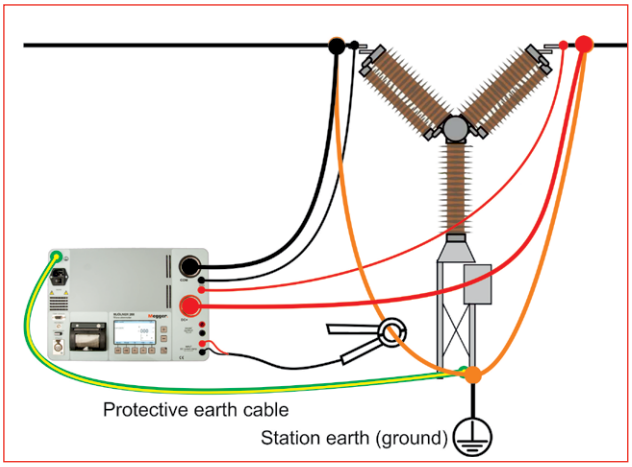
Timing	TM1800 with DCM module
Motion	TM 1800
Dynamic Resistance Measurement (DRM)	TM 1800 with SDRM202

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 the remote control you can 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. Specifications are subject to change without notice.

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	2006/95/EC
EMC	2004/108/EC

General

Mains voltage	100 - 120 / 200 - 240 AC, 50/60 Hz
Input current (max)	13 A at 100 V, 6 A at 230 V (3 sec)
Protection	Fuses (200 mAT and 400 mAT) Thermal fuse, Software Shut off temperature: 70°C (158°F) internal temperature
Dimensions	410 x 330 x 175 mm (16.1" x 13" x 6.9")
Weight	7.6 kg (16.8 lbs)
Display	LCD and LED
Available languages	English, Deutsch, Français, Español, Svenska
Printer	Thermal printer
Thermal paper roll	Width 57.5 mm, diameter 32 mm
Current cables	2 x 3 m (9.8 ft), 35 mm²
Sensing cables	2 x 3 m (9.8 ft), 2.5 mm²

Measurement section

Range	0 – 999.9 mΩ
Resolution	0.01 µΩ below 100 µΩ 0.1 µΩ below 1.0 mΩ 1 µΩ below 10 mΩ 10 µΩ below 100 mΩ 100 µΩ below 1000 mΩ

Inaccuracy	***Typ.***	***Max.***
100 A, ta 25°C, R < 1 mΩ	±0.2 µΩ	±1 µΩ
50–200 A ta 10–40°C, R < 1 mΩ	±0.3 µΩ	±2 µΩ
50–200 A ta 0–50°C, R < 1 mΩ	±0.7 µΩ	±3 µΩ
50–200 A ta -20–50°C, R < 1 mΩ	±1.1 µΩ	±4 µΩ
100 A ta 10–40°C, 1 mΩ < R < 10 mΩ	±6 µΩ	±25 µΩ
50 A, ta 10–40°C, 10 mΩ < R < 100 mΩ	±80 µΩ	±500 µΩ
5 A, ta 10–40°C, 100 mΩ < R < 1000 mΩ	±1 mΩ	±10 mΩ
Current shunt	200 A, 60 mV	
Sense ranges	0-2 mV, 0-20 mV, 0-200 mV, 0-5 V	

Outputs

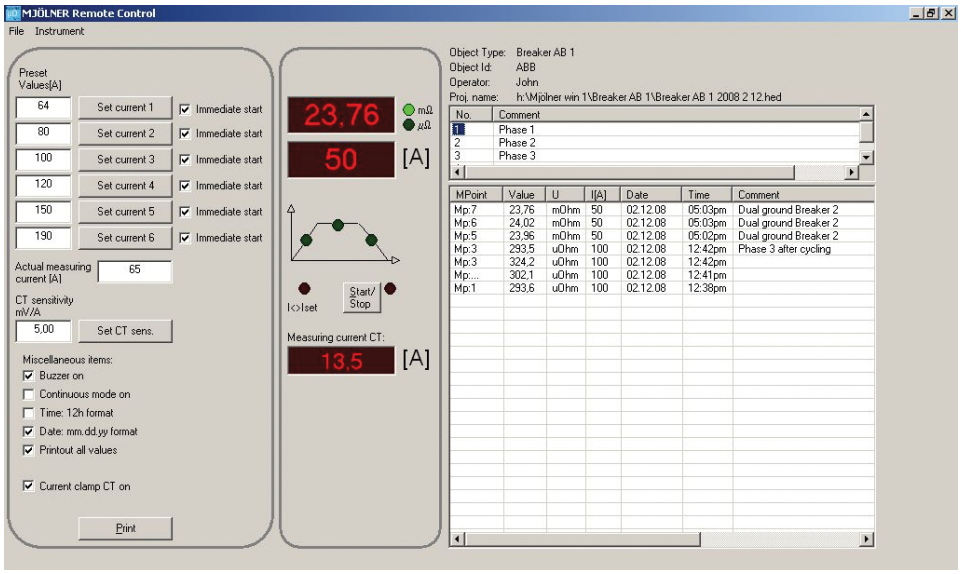
DC+ / COM	
Range	5 – 200 A DC (steps of 1 A)
Max. output voltage	5.25 V at 200 A
Max. ripple	80 mV_{pp}, 28.3 mV_{rms} at 0 - 50 °C (+32°F to +122°F)
Max. load capacity*)	
Continuous	200 A
OUTPUT 300 µV/A	
Shunt output	From internal shunt 60 mV at 200 A
Inaccuracy	±1%

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

*) At 25°C (77°F) ambient temperature

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, read out the test values and connections for voltage sense.

Ordering information

Item	Art. No.
MJÖLNER 200	
Incl. Std. cable set 3 m, (current cables 2 x 3 m, 35 mm² and sensing cables 2 x 3 m), Ground cable	BD-19190
Incl. Std. cable set 5 m, (current cables 2 x 5 m, 35 mm² and sensing cables 2 x 5 m), Ground cable	BD-19191
Incl. Std. cable set 3 m, (current cables 2 x 3 m, 35 mm² and sensing cables 2 x 3 m), Ground cable and DualGround kit (XA-12992)	BD-19192
Incl. Std. cable set 5 m, (current cables 2 x 5 m, 35 mm² and sensing cables 2 x 5 m), Ground cable and DualGround kit (XA-12992)	BD-19193
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 mm² and sensing cables 2 x 8 m)	GA-03206
Extension cable set 10 m (current cables 2 x 10 m, 35 mm² 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 514 x 499 x 280 mm (20" x 19.7" x 11")	GD-00265

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