

# MJÖLNER 600

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

The micro-ohmmeter conducts true DC ripple free current and can be used anywhere to measure a low resistance value with high accuracy. With MJÖLNER 600 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.

Choose the MJÖLNER 600 with excessive power resources for demanding applications, superior measurement accuracy and when 300 Amp continuous is required.

The lightweight and rugged suitcase design makes MJÖLNER 600 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 600 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  
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

### 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

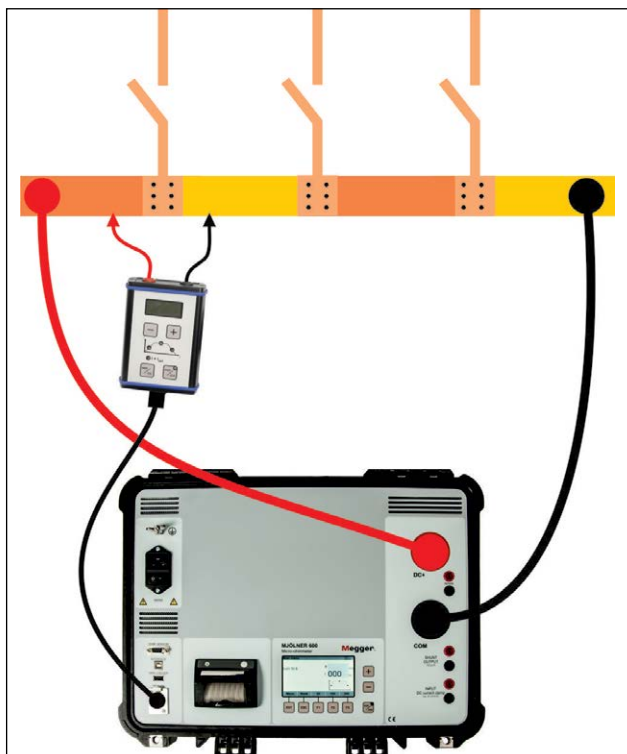
Many utilities require safety grounds remain in place during station outages, therefore, the MJÖLNER 600 was designed with this field safety constraint in mind.

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

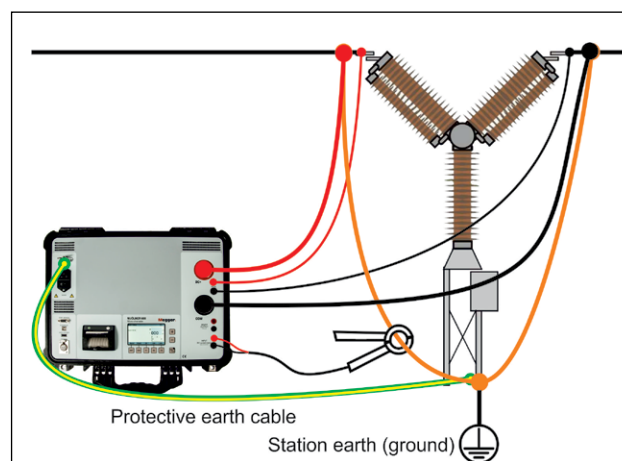
The DualGround™ testing method is available for all tests on all circuit breakers. The following table indicates the Megger instruments that the MJÖLNER 600 works in conjunction with:

<b>Timing</b>	TM1800 with DCM module
<b>Motion</b>	TM 1800
<b>Dynamic Resistance Measurement (DRM)</b>	TM 1800 with SDRM202
<b>Vibration</b>	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 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* 2014/35/EU

*EMC* 2014/65/EU

### General

*Mains voltage* 100 - 120 / 200 - 240 AC, 50/60 Hz

*Input current (max)* 39 A at 100 V, 18 A at 230 V (3 sec)

*Protection* Fuses (200 mA and 400 mA)  
Thermal fuse, Software  
Shut off temperature: 70°C (158°F)  
internal temperature

*Dimensions* 486 x 392 x 192 mm (19" x 15" x 7.5")

*Weight* 13.8 kg (30.4 lbs)

*Display* LCD and LED

*Available languages* English, Deutsch, Français, Español, Svenska

*Printer* Thermal printer

*Thermal paper roll* Width 57.5 mm, diameter 30 mm

*Current cables* 2 x 3 m (9.8 ft), 35 mm<sup>2</sup>

*Sensing cables* 2 x 3 m (9.8 ft), 2.5 mm<sup>2</sup>

### Measurement section

*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

Inaccuracy	Typ.	Max.
100 A, ta 25°C, R < 1 mΩ	±0.2 μΩ	±1 μΩ
50–600 A ta 10–40°C, R < 1 mΩ	±0.3 μΩ	±2 μΩ
50–600 A ta 0–50°C, R < 1 mΩ	±0.7 μΩ	±3 μΩ
50–600 A ta -20–50°C, R < 1 mΩ	±1.1 μΩ	±4 μΩ
600 A ta 10–40°C, 1 mΩ < R < 8.4 mΩ	±6 μΩ	±50 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* 600 A, 60 mV

*Sense ranges* 0-2 mV, 0-20 mV, 0-200 mV, 0-5 V

### Outputs

#### DC+ / COM

*Range* 5 – 600 A DC (steps of 1 A)

*Max. output voltage* 5.25 V at 600 A

*Max. ripple* 80 mV<sub>pp</sub>, 28.3 mV<sub>rms</sub>  
at 0 – 50°C (+32°F to +122°F)

#### Max. load capacity<sup>1)</sup>

*300 A* Continuous

#### OUTPUT 100 μV/A

*Shunt output* From internal shunt 60 mV at 600 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

1) At 25°C (77°F) ambient temperature

## OPTIONAL ACCESSORIES

### Remote control



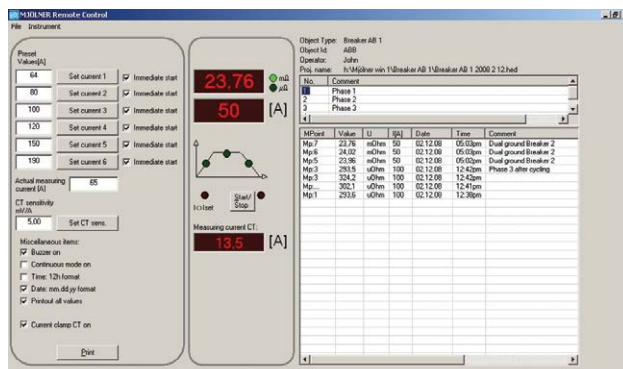
Many times, you place the test equipment on the ground while the cables are connected high up on a circuit breaker. In these situations, it can save a lot of time using a remote control during the test. The remote control has most of the functionality in the MJÖLNER 600 such as starting and stopping, setting the test current and read out the test values.

### Temperature probe



The temperature probe is used for temperature compensation of conductors (copper and other metals).

### 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.

## ORDERING INFORMATION

Item	Art. No.
<b>MJÖLNER 600</b>	
Incl. Std. cable set 3 m, (current cables 2 x 3 m, 35 mm <sup>2</sup> and sensing cables 2 x 3 m), Ground cable	BB-59090
Incl. Std. cable set 5 m, (current cables 2 x 5 m, 35 mm <sup>2</sup> and sensing cables 2 x 5 m), Ground cable	BB-59091
Incl. Std. cable set 3 m, (current cables 2 x 3 m, 35 mm <sup>2</sup> and sensing cables 2 x 3 m), Ground cable and DualGround kit (XA-12992)	BB-59092
Incl. Std. cable set 5 m, (current cables 2 x 5 m, 35 mm <sup>2</sup> and sensing cables 2 x 5 m), Ground cable and DualGround kit (XA-12992)	BB-59093
<b>Optional accessories</b>	
<b>MJÖLNER Win</b>	
Windows® software	BD-8010X
<b>Remote control</b>	
(5 m cable)	BD-90010
<b>Temperature probe</b>	BD-90012
<b>Thermal paper roll (for printer)</b>	GC-00050
<b>Extension cable set 5 m</b>	
(current cables 2 x 5 m, 35 mm <sup>2</sup> and sensing cables 2 x 8 m)	GA-03206
<b>Extension cable set 10 m</b>	
(current cables 2 x 10 m, 35 mm <sup>2</sup> and sensing cables 2 x 13 m)	GA-03208
<b>Calibration kit</b>	
200 A/20 mV shunt and instruction	BD-90022
<b>DualGround kit</b>	
DC Current clamp 200 A (incl. cables)	XA-12992