

# MAGNUS

Step up transformer

## User's Manual



# Megger

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# 1 Safety

## 1.1 General



### Important

read and comply with the following instructions.

Always comply with local safety regulations.

## Symbols on the instrument



Caution, refer to accompanying documents.



Caution, risk of electric shock.



Protective conductor terminal.



WEEE, Waste Electrical and Electronic Equipment. Please utilize your local WEEE collection facilities in the disposition of this product and otherwise observe all applicable requirements.

The unit can also be returned to Megger at any time at no charge for the disposal.

## 1.2 Safety instructions



### Warning

- 1] High voltage/current on input/output terminals.  
The equipment may only be operated by qualified personnel.
- 2] Always use manufacturer approved and supplied cable sets.
- 3] Always connect protective earth (ground).
- 4] The mains output is not separated from mains supply
- 5] Do not leave the power unit switched on unattended.
- 6] The instrument is equipped with a power cord with integral safety ground pin. The equipment must be connected to a grounded mains outlet.  
The instrument case must also be grounded by the separate protective ground wire with connection to the protective earth terminal. This is to eliminate difference in earth potential between the instrument and the device to be tested. Check the continuity of the protective ground wire before each use. Use an easily accessible power outlet. This will ensure that you can disconnect the power quickly in case of a problem.
- 7] Do not attempt to service the instrument yourself. Opening or removing covers may expose you to dangerous voltage. If you attempt to service the instrument yourself the warranty is no longer valid.
- 8] Do not use any accessories that are not intended for use together with the instrument.
- 9] Do not use the instrument for any purpose other than indicated by the manufacturer.
- 10] If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

- 11]** Do not use MAGNUS if the instrument or test leads appear damaged.



**Important**

- 1]** Always turn the equipment off before connecting.
- 2]** The ammeter output must be short circuited when it is not connected to an external ammeter.
- 3]** The red lamp (12) lights up when overheating protection trips. Do not use the Magnus until the light is turned off.
- 4]** Use only approved mains detachable cable set with the instrument. Main supply cables shall be rated for the maximum current for the equipment and the cable shall meet the requirements of IEC60799 (Cord sets and interconnection cord sets). Mains supply cables certified or approved by a recognized testing authority are regarded as meeting this requirement.
- 5]** Use the supplied hook and loop straps for securing the test cables to the test object.
- 6]** Do not expose the instrument to rain or moisture.
- 7]** Disconnect the instrument from the mains before cleaning. Use a damp cloth for cleaning. Do not use liquid cleaners or aerosol cleaners.
- 8]** Refer all servicing to Megger authorized personnel.
- 9]** If you need to return the instrument, please use either the original crate or one of equivalent strength.

# 2 Instrument

## 2.1 General

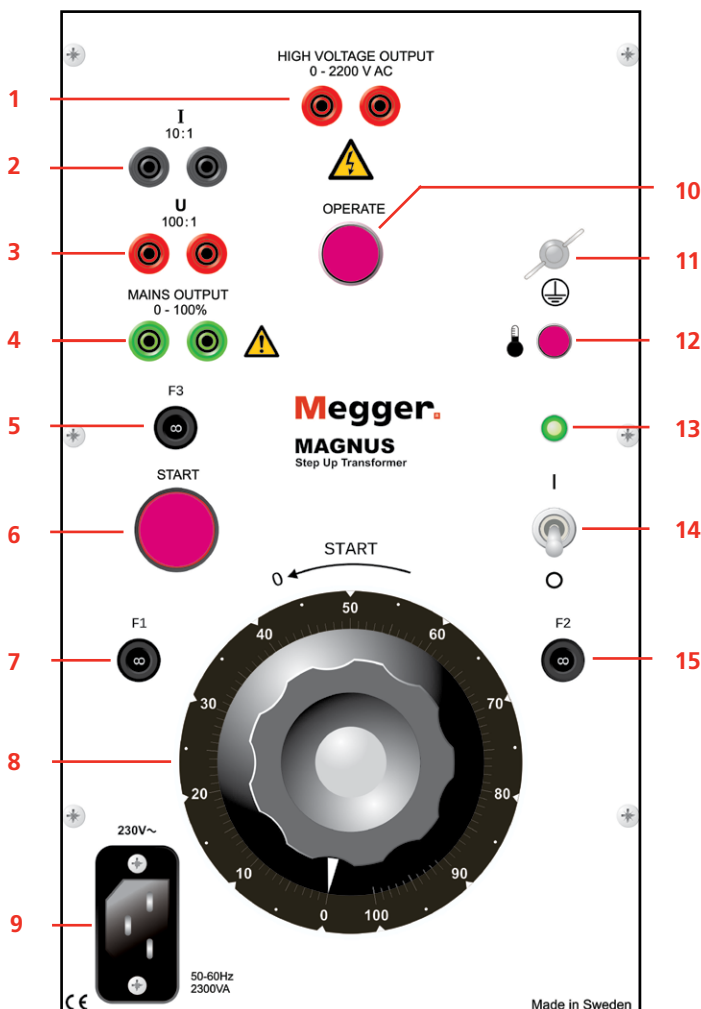
When power systems are put into operation or when faults occur, it becomes necessary to check the instrument transformers to make sure that they are providing test instruments and protective relay equipment with the correct outputs.

MAGNUS permits you to prepare excitation curves for instrument transformers quickly and easily.

MAGNUS is also used to demagnetize current transformer cores and to conduct turn-ratio tests on voltage transformers.

## 2.2 Control panel

1. High voltage output
2. Ammeter output
3. Voltmeter output
4. Mains output
5. F3, Fuse for mains out
6. Start button
7. F1, Fuse for mains input
8. Knob
9. Mains input
10. Operate lamp
11. Ground (earth) terminal
12. Overheating protection lamp
13. Mains indicator lamp
14. Mains switch
15. F2, Fuse for mains input





# 3 Operating instructions

## 3.1 General test



### Important

Read the manual and comply with the Safety instructions before using MAGNUS. Always comply with local safety regulations.

- 1] Connect protective ground (earth) terminal (11).
- 2] Connect the mains cable to a power outlet.
- 3] Connect the test leads only when the mains switch and the knob is set in position "0".



### Warning

For the HIGH VOLTAGE OUTPUT only the high voltage cables should be used, see section "2.2 High voltage cables".

- 4] Connect an ammeter to output (2) and a voltmeter to the output (3).

**Note** *Short circuit the ammeter output (3) if it is not connected to an external ammeter.*

- 5] Check that the knob is set in position "0".
- 6] Press and hold the red button marked "START".  
The "OPERATE" lamp is lit.
- 7] Adjust the voltage by turning the knob.
- 8] When testing CT's ramp down the voltage to "0" before releasing the red button, in order to avoid remanence.

**Note** *In order to maintain accuracy make sure that the burden not exceeds 1.5 VA. Use an ammeter measuring true RMS.*

**Note** *The red lamp (12) lights up when overheating protection trips. Do not use Magnus until the light is turned off.*

## 3.2 Application example

### Prepare an excitation curve

- 1] Connect MAGNUS to the secondary side of the current transformer being tested and also to an ammeter and voltmeter.
- 2] Increase the voltage using the knob.
- 3] Jot down the values of U (voltage) and I (current).
- 4] Repeat steps 2 and 3 until the current (I) rises sharply without any significant rise in voltage (U).
- 5] Conclude the test by reducing U (voltage) slowly to zero, thereby providing demagnetization.



## 3.3 Using the variable mains output

The voltage from the MAINS OUTPUT is variable, 0 to 100% of the mains input voltage. It is not galvanically isolated from mains input.

- 1]** Connect the test leads only when the mains switch and the knob is set in position "0".
- 2]** Adjust the voltage by turning the knob.
- 3]** Turn knob down to zero before disconnecting any cables.

# 4 Specifications

## 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

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

#### Temperature

*Operating* 0°C to +50°C (32°F to +122°F)

*Storage & transport* -40°C to +70°C (-40°F to +158°F)

*Humidity* 5% – 95% RH, non-condensing

### CE-marking

*EMC* 2004/108/EC

*LVD* 2006/95/EC

### General

*Mains voltage* 115/230 V AC, 50/60 Hz

*Power consumption* 2300 VA (max)

*Protection* Fuses: F1, F2, F3 6 A  
Thermal cut-outs

#### Dimensions

*Instrument* 356 x 203 x 241 mm  
(14" x 8" x 9.5")

*Transport case* 610 x 290 x 360 mm  
(24" x 11,4" x 14,2")

*Weight* 16.3 kg (35.9 lbs)  
26.7 kg (58.9 lbs) with accessories and transport case

*High voltage cables* 2 x 10 m (33 ft) / 1,5 mm<sup>2</sup>, 5 kV

### Measuring outputs

*Voltage* 100/1, (max load of 1 MΩ)

*Inaccuracy* ±1,5%

*Current* 10/1

*Inaccuracy* ±1,5% at 2 A output current  
±3% at 0,5 A output current

## Outputs

### Voltage outputs, AC

#### 230 V mains voltage

HIGH VOLTAGE OUTPUT <sup>1)</sup> 0 – 2200 V AC

MAINS OUTPUT <sup>1)</sup> 0 – 250 V AC (Variable transformer, not isolated from mains)

#### Maximum values

Voltage	Current	Max. load time	Rest time
2200 V AC	1 A	30 s <sup>2)</sup>	10 minutes <sup>2)</sup>
250 V AC	6 A <sup>3)</sup>	Continuous	–

### Voltage outputs, AC

#### 115 V mains voltage

HIGH VOLTAGE OUTPUT <sup>1)</sup> 0 – 2000 V AC

MAINS OUTPUT <sup>1)</sup> 0 – 110 V AC (Variable transformer, not isolated from mains)

#### Maximum values

Voltage	Current	Max. load time	Rest time
2000 V AC	1 A	30 s <sup>2)</sup>	10 minutes <sup>2)</sup>
110 V AC	10 A	Continuous	–

1) The HIGH VOLTAGE OUTPUT and the MAINS OUTPUT must not be loaded at the same time.

2) The load time and rest time for the high voltage output is calculated at the maximum output voltage and current. During an excitation test the voltage and current is only at their maximum level at the end of the test.

3) Output protected with a 6 A fuse.



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- Insulation Resistance Test Equipment
- Line Testing Equipment
- Low Resistance Ohmmeters
- Motor & Phase Rotation Test Equipment
- Multimeters
- Oil Test Equipment
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