HAUG GB®

Operating instructions

Electrofieldmeter
Static Meter I

Test Line

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HAUG Static Meter I

Please retain for future reference.

Type: **HAUG** Static Meter I 12.7210.000

1 Proper use

The unit is not approved for use inside explosive areas.
The use in power plants is not allowed.
This unit cannot measure alternating fields > 1 Hz.
The electrofieldmeter must be grounded at the presence of high electrostatic charges.
The first measurement must be conducted at sufficient distance from the object to evaluate the voltage potential safely.
Sparking on the modular system can cause damage to the unit and must be absolutely avoided.

2 Construction and description of measuring instrument

2.1 Basic information about electrostatics

Electrostatic discharge (ESD) causes problems at many electronic working places, especially where sensitive micro-electronics (IC and MOSFET) are handled.
Other industrial areas are also concerned such as telecommunication, plastic converting and explosive areas. ESD can slow down processing speed in manufacturing and is therefore a significant cost problem. Static electricity is generated by personnel, their clothing, handled materials and equipment and can exceed 10.000 volts. Static sensitive electronic devices could be damaged at static voltage levels less than 100 volts. Static voltage exceeding 3.000 V can cause sparking, which is a danger in explosive areas.

2.2 Short description

Small hand-held electrofieldmeter with digital display designed to measure electrostatlc voltage potentials (over pre-selected distance) according the fieldmill influence prlnclple.

2.3 Description

The electrofieldmeter **HAUG** Static Meter I is designed to measure electrostatic voltage potentials over the pre-selected distance (distance between sensor head and object). The selection of the distance is menu-driven and the following distances are available: 1 cm, 2 cm, 5 cm, 10 cm and 20 cm. The internal micro-computer considers automatically the measured field strength (V/m) and the pre-selected distance (cm) to calculate the voltage potential (volt) accordingly. For voltage levels exceeding 1000 V, the digital display will show the values in kV for a better illustration.

2.4 Measurement principle

The electrofieldmeter is a parametric operating amplifier. The influenced charges, caused by the electrical field, generate an alternating current proportional to the electrical field strength. The selective operating amplifier measures the current without taking energy over the averaged time.
There are no radioactive components used inside the unit.

2.5 Calculating the electrical field strength

In order to compare to field strength measuring instruments, the shown tension can be converted into the equivalent field strength. To do this, the shown value has to be divided by the actual measuring distance (in meter).

Example:

Shown value:	2 kV
Actual measuring distance:	2 cm = 0,02 m
Calculated electrical field strength:	E = 2 kV/0,02 m = 100 kV/m

3 Operation

Press the "function/on"-key to switch the unit on. Press the "function/on"-key twice in short intervals to switch the unit off.
The unit will switch off automatically when the "function/on"-key was not used for 5 minutes.

3.1 Hold

The unit has a hold-function keeping the measured value stored on the display . Press the "function/on"-key once shortly to activate the hold function - "hold" will appear then in the first row of the display, while the stored value is shown in the second row. To exit the hold-function, press the "function/on"-key once again shortly and the actual measurement value will appear on the display.

3.2 Measurement ranges

The measurement distance of 2 cm is always indicated after each switch-on. If this distance is used, the unit has to be positioned at the distance of 2 cm monitoring the object. This distance is ideal in most cases, as voltage levels up to 20 kV can be measured (please see Technical Data).
The measurement distance should be increased, if the measurement object is highly charged or when the object has a rough surface. The lowest measurement distance of 1 cm should be selected, where low charges are present and the surface of the object has a smooth surface.

3.3 Change measurement distance

Press and hold the "function/on"-key (approximately 2 s) until "change distance" will appear in the second row. The pre-selected distance in cm will be displayed in the first row. Press the "function/on"-key once shortly to change the measurement distance. With each short press of the "function/on"-key the proposed distance will appear as follows:
2 cm ➔ 5 cm ➔ 10 cm ➔ 20 cm ➔ 1 cm ➔ 2 cm (and so on).
When you reach the right distance, please wait (do not press the "function/on"- key) until the actual measurement value appears in the second row. The new selected distance is now also shown in the first row. Please consider this selected distance for the following measurements. The distance will be measured from the electrode positioned 3 mm apart from the housing on the modulator side. It is necessary to add 3 mm to any selected distance starting from the housing of the unit.

Please note:
The measurement distance will change back to 2 cm after each switch off and on of the unit!

3.4 Distance support

With any equipment you will get 2 distance supports with a length of 26 mm. The distance supports can be screwed into the aluminium plate on the modulator side, which will always provide the right measurement distance for the standard setting of distance = 2 cm.

3.5 Display

The alphanumeric Liquid Crystal Display (LCD) consists of 2 rows for 12 digits each. The measurement distance in cm will be shown in the first row, while the voltage reading in volts is displayed in the second row.
When the level of 999 volts is reached, the display will switch automatically into the kV-mode. The display of the voltage reading appears always in 3 digits, such as: 578 V; 3.85 kV; 24.0 kV and 274 kV respectively.
Select a greater distance if "overflow !" appears on screen!

3.6 Battery control

The measuring unit has a permanent battery voltage control. If the battery voltage is less than 7.5 volts then "Low Battery" appears in the first row of the LCD and the 9 V battery has to be replaced or the accumulator has to be charged with the supplied battery charger!
If the battery voltage will become less than 7.0 volts, then "auto off" will appear for approximately 2 s in the second row and unit will switch off to avoid a total discharge and acid leakage.
Note: Please use Alkaline or Lithium 9 V blockbatteries only or rechargeable NiCd or NiMH accumulators!
If rechargeable batteries are preferred, please use a suitable battery-charger for recharging separately the batteries. Please note the manufacturer's advises !

3.7 Grounding

The unit has to be connected to ground for correct measurements of voltage levels and polarity. Use the grounding socket (4) of the unit for the connection to earth potential. The unit consists of a conductive housing, thus allow the use without grounding cable if the operator is on earth potential (e.g. wears conductive shoes, uses a wrist strap or touches grounded parts with one hand).

3.8 Zero Adjustment

A zero adjustment is normally not necessary. In case, that the unit does not indicate U = 000 V while the modulator system is shielded (e.g. grounded person covers the modulator system with one hand), use the trimmer (6) for zero adjustment. The last digit can be ignored as the caused measurement failure is much lower than the specified tolerance.

4 Maintenace and Repair

Except the battery the instrument does not contain any parts which require maintenance or repair by the user. Any repairs or adjustments neccessary may only be carried out by **HAUG GmbH & Co. KG**. If a unit is faulty, take it out of operation and send it to **HAUG GmbH & Co. KG**.
It is very important not to touch parts of the modulator system. The parts must be free of foreign materials, such as dust, any spray or similar particles as well as condensed water. If needed, the modulator system could be cleaned with alcohol and a dust-free tissue, when switched off. Please avoid any deformation of rotor!

4.1 Replacement of battery

The 9 V blockbattery has to be replaced when "Low Battery" appears on screen. Please switch the unit off before opening the battery compartment. Take out the battery and remove the connector clip. Put the connector clip on the new battery and put it into the compartment. Close the compartment.

5 Technical Data

Dimensions: 70 x 122 x 26 mm (W x L x H)

Weight: Meßgerät 130 g (ohne Batterie)

Power supply: 9 V - Alkaline Blockbatterie IEC 6F22 or 9 V NiCd or NiMH-accumulator

Measurement range:

distanz	1 cm → 0 .. 10 kV	max. resolution	1 V
distanz	2 cm → 0 .. 20 kV	max. resolution	2 V
distanz	5 cm → 0 .. 50 kV	max. resolution	10 V
distanz	10 cm → 0 .. 100 kV	max. resolution	10 V
distanz	20 cm → 0 .. 200 kV	max. resolution	20 V

Display: 2 rows alphanumeric LCD

Operating time: approx. 10 hours at continuous operating

Operating temp.: +5 °C to +50 °C

Funktion Key:

on	1 x press shortly "function/on"
hold	1 x press shortly "function/on" to activate or deactivate
distance	1 x press and hold "function/on" until "change cm" appears 1 x press shortly "function/on" to select appropriate distance wait for app. 2 s to take over new distance
off	2 x press shortly "function/on"

Adjustment: a plate capacitor is used providing homogeneous field, plate size 100 mm x 100 mm, distance between both plates is 20 mm, the modulator system is centered in one plate connected to ground

Warranty:
We provide a warranty of 12 months if the unit is used correctly following the operating instructions. We do not provide warranty for the battery or mechanical damage caused by improper handling. No warranty is provided in case of opening the device by the user!

HAUG Static Meter I

Legende

1. Modulator system
2. LCD - Display (2 x 12) alphanumeric
3. Function key
4. Grounding socket
5. Battery compartment
6. Zero adjustment trimmer

made by

Static Meter 1 v01gb

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