

Manual

Feldmeter FM 6

FIELDMETER

FM6

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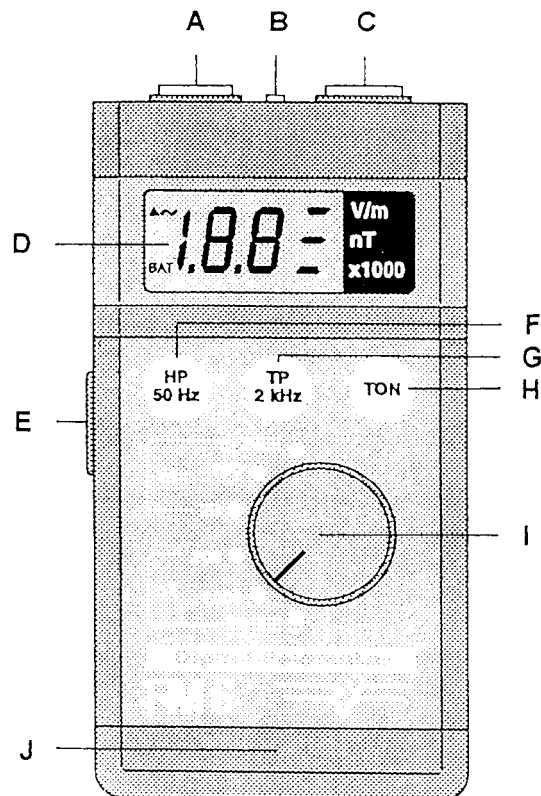
1 General hints

1.1 Operating environment

Delivery contents:

- Feldmeter FM 6
- Earthing cables with earthing band
- Measuring probe

1.2 Instrument description



- A) AC/DC-output
- B) Earthing socket
- C) Measuring probe socket
- D) Display
- E) On/Off Switch
- F) Filter button
- G) Low Pass push button
- H) Push button for tone
- I) Field dial
- J) Battery compartment (at rear)

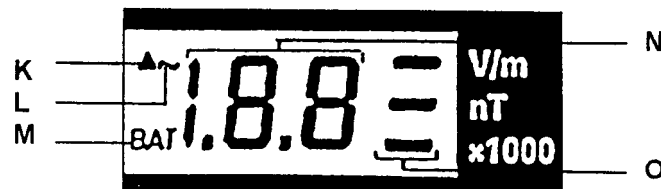
- A: Earthing socket
When measuring the electric field and body voltage the black (grounding) earthing cable is plugged into the earthing socket.
The other end of the cable comes with a crocodile clip to make an earth e.g. at the power point earth protection contact* (do NOT put into the holes!!!), or with help of the earthing band to a water pipe, or to a bare (metal) position at the radiator etc.
*for a European type powerpoint
- B: Measuring probe socket
The measuring probe for the measurement of electric or magnetic fields, or the red measuring cable for the measurement of body-tension is plugged into the measuring probe socket.
To ensure a good seat and contact the plug should be screwed home tightly.
- D: Display
The display indicates the measured values (digital) and the different instrument functions. Please refer 1.3 Display function.
- F: Filter button
Pressing the filter button activates this function which appears as a wave symbol ~ in the display.
Pressing the button again deactivates this function.
The active filter measuring frequency is an upper one of 100kHz down to 500Hz.
- I: Field dial
Turning of the dial activates the following measuring fields:
- electric field in V/m (Volt per Meter):
 - * 0 - 20 V/m
 - * 0 - 200 V/m
 - * 0 - 2000 V/m

- magnetic field in nT (Nanotesla):
 - * 0 - 200 nT
 - * 0 - 2000 nT
 - * 0 - 20 000 nT

- J: Battery compartment
This is on the rear face of the instrument and is opened with a flat object, e.g. screwdriver, keys etc. The instrument is fitted with one 9V block battery.
- E: On/Off switch
The switch is found on the left side of the instrument and is activated by pushing upwards.

1.3 Display functions

In the following figure these display elements viewed.



- [K] Filter function (low pass 2kHz) If " Δ " is viewed the filter function is activated.
- [L] Filter function (high pass 50Hz) If "~" is viewed the filter function is activated.
- [N] Measurement value
- [O] Measurement field indicator
- [M] : Battery warning
If "BAT" is viewed the battery should be replaced otherwise a false measurement could appear.

1.4 Set-up

Before the first measurement the following steps should be completed:

- open the battery compartment at the rear of the instrument with a flat object making sure that the instrument is switched off (on/off switch);
- insert a 9V Block battery or a Akku;
- close the battery compartment;
- insert for the measurement of electric and magnetic fields the measuring probe or for the measurement of body voltage the red measuring cable tightening the screws of the plug solidly;
- if required earth the appliance with the earthing cable;
- switch on the instrument;
- turn the dial to the required field type and sensitivity level.

2 Measurement

2.1 Preparation for the measurement

To make effective measurements and reach valid results certain preparations should be made. The following points are especially noteworthy:

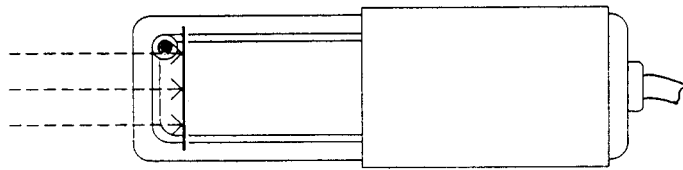
- One should be clear over which spatial areas and what is to be measured and be ready with a (folded) plan. The measured field strengths are written down on the plan. The exact value is read with a still measuring probe.
- the purpose of a measurement is always twofold: The local pre-existing peak value is found and its cause determined, with the goal that these extreme values are substantially reduced.

All equipment is preferably switched on, including equipment that only operates from time to time e.g. refrigerator, stove.

The occupants should not exceed for the different average loads specific threshold values. Thus places where one is detained for long periods of time, e.g. for work, rest and or sleeping areas especially should have low field strengths.

- threshold values recommended by different experts are:
electric Field : 10 - 100 V/m
magnetic field: 10- 1000 nT
body voltage: 0- 1 V
- It is preferable to achieve a lower value. Often simple measures will suffice, e.g. disconnecting extension leads and socket-strips at night, will considerably decrease the field.
- note that the strength of electric and magnetic fields increases with a decrease in the distance to the field producer.

2.2 Measurement of electric alternating fields



Electric alternating fields originate around wires, when an electric alternating current is active. The higher the tension, the larger the electric field.

These fields are active around the wires even if the associated appliance is not switched on.

The electric field is effectively shielded by the earth of interconnected materials e.g. walls, trees, people, etc.,. Therefore wires and appliances need only be regarded when measuring interior areas, relevant areas or in adjoining walls, because exterior influences are mainly shielded by the walls.

An obvious exception to this are high voltage lines which generate very strong electric fields.

For the measurement of the electric alternating field the measuring probe of the field meter is installed.

During outdoor measurements the measuring person is normally in direct contact with the ground and thus the electric potential of that earth which is transferred through to the rubber grip of the field-meters measuring probe.

The installation of the earthing cable is therefore not necessary.

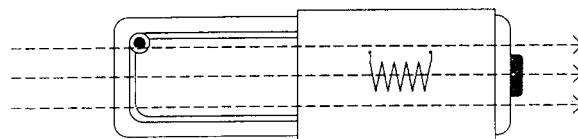
Indoor measurements indicate that the potential strongly

fluctuates because of the varying influences, e.g. insulating floor covering and footwear, on the measuring person. To achieve comparable measurements and strongly validated results, the field meter should be grounded with the earthing cables. This could occur at the earth protection contact (do NOT put into the holes !!!) of the powerpoint (NB European powerpoint), or with the aid of the earthing band attached to the plumbing.

So as not to falsify the measurement result, the measuring probe must be held during the measurement with the rubber grip. The probe should be kept clear of the shielding effect of the human body. The body should be positioned such that the front part of the hand does not shield the source of the suspected electric field. The front part of the measuring probe must be clean and dry, and therefore occasionally wiped with a clean dry rag.

The measuring probe should be moved quietly and evenly, because short-forward jerky movements artificially raise measurements as a consequence of moving through parallel electric fields.

2.3 Measurement of magnetic alternating fields



Magnetic fields originate around each cable through which an electric current flows.

The fields originate only if the associated appliance is

switched on. The greater the current, the stronger the field.

Magnetic fields can not be practically shielded.

Hence at that measurement due regard should be given to the disturbing fields that are located outside the measuring area.

The solution is to maintain a large distance from the field created or preferably the elimination of the appliance.

For the measurement of the magnetic alternating field the measuring probe of the field-meter is installed.

Earthing is not necessary.

The measurement of the magnet field is strongly direction dependent. Therefore the probe is rotated slowly in all directions, until the field meter shows the maximum measurement.

The probe can then be moved slowly without rotation in different directions stopping at each change in direction so that the measurement may steady, so that cause of the field can be found.

2.4 Measurement of body and object voltage

The human body in an electric alternating field is inescapably connected to that field. A alternating voltage therefore arises in the body that could reach a value of up to of some dozen volts.

For the measurement of body voltage, the red measuring cable with the hand electrode is plugged into the field-meter and the hand electrode is held by the hand of the person to be measured.

The field meter is earthed for this type of measurement.

The control dial is switched to the desired electric field range(V/ m) but instead of volts per meters only VOLTS is read.

The body voltage of the person can be reduced when the

surrounding electric alternating field is reduced.

Similarly when the human body contacts a metallic object, e.g. bedstead, desk-lamp etc., in the electrically loaded area it is like an antenna and a voltage is created. The object with this alternating-voltage beams off a field, that increases the overall electro smog load. The induced voltage of an object could be eliminated through careful earthing.

For the measurement of object voltage the measuring spike with the red measuring cable is used instead of the hand electrode. The measuring spike must not be brought into contact with parts under voltage. Do NOT put into the socket!

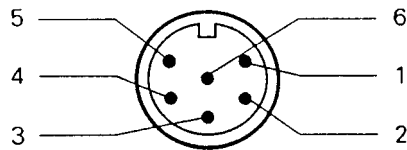
3 Guarantee

Each field-meter FM6 is run through a quality test prior to leaving the manufacturer.

A guarantee of 1 year is granted on pre-existing faults in materials or fabrication that have to be returned. The guarantee claim of the FM6 is void through inappropriate treatment, especially the opening of the case.

The customer shall pay the shipping expenses to the manufacturer.

For a speedy resolution of the problem it is an advantage, if a short description of the fault is included.

4 Technical data:

- 1: - 9V input**
2: AC output
3: push button
4: DC output
5: + 9V input
6: Ground

Dimensions in mm :FM6 :155 x 80 x 36
 Probe : 130 x 40 x 24
 cable : 0,75 m
 Earthing cable: 5 m
 Voltage cable 1,50 m

Weight :FM6 with Battery : 215 g
 Probe : 118 g

Display : LCD, 2 1/2

Parallel direction : TRMS

Frequency band : without Filter : 16 Hz - 100 kHz \pm 1 dB
 with Filter: 16 Hz - 500 Hz \pm 1 dB

Measuring fields : electric field : 20/200/2000 V/m
 magnetic field : 200/2000/20000 nT
 AC Voltage: 20/200 (/2000) V

Feldmeter FM 6

Manual

Accuracy (at 50 Hz) : electric field $\pm 10\%$
magnetic field $\pm 5\%$
voltage $\pm 2,5\%$

Operating temperature range:- 5°C - 55°C
Amperage : 13 mA
Voltage input : 9 V E-Block