

FIELD DETECTOR FD10

combinova



Field Detector FM 10 is a 3-axis magnetic field meter dedicated to evaluate and verify compliance to occupational exposure limits stated by **EU Directive 2013/35** or other limits stated by national laws and regulations or international standards.

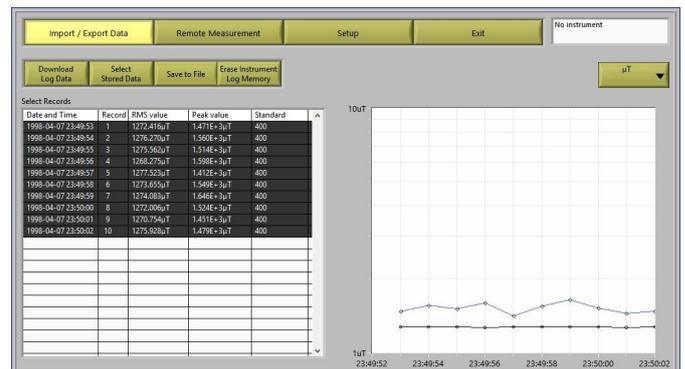
With the frequency range from 10 Hz to 400 kHz you will cover applications like:

- Electric power production and distribution
- Induction heating and hardening
- Industrial magnetizers and demagnetizers
- Electric welding
- Industrial electrolysis
- Electric vehicles
- Electric railways
- Furnaces arc melting
- Equipment for transcranial magnetic stimulation

FD 10 also can be used for pre-compliance measurements of electric fields.

PC Software

A PC Software is included for remote control, download of stored data, instrument set up and for export of data to Excel for reporting



Accessories

The instrument will be delivered with:

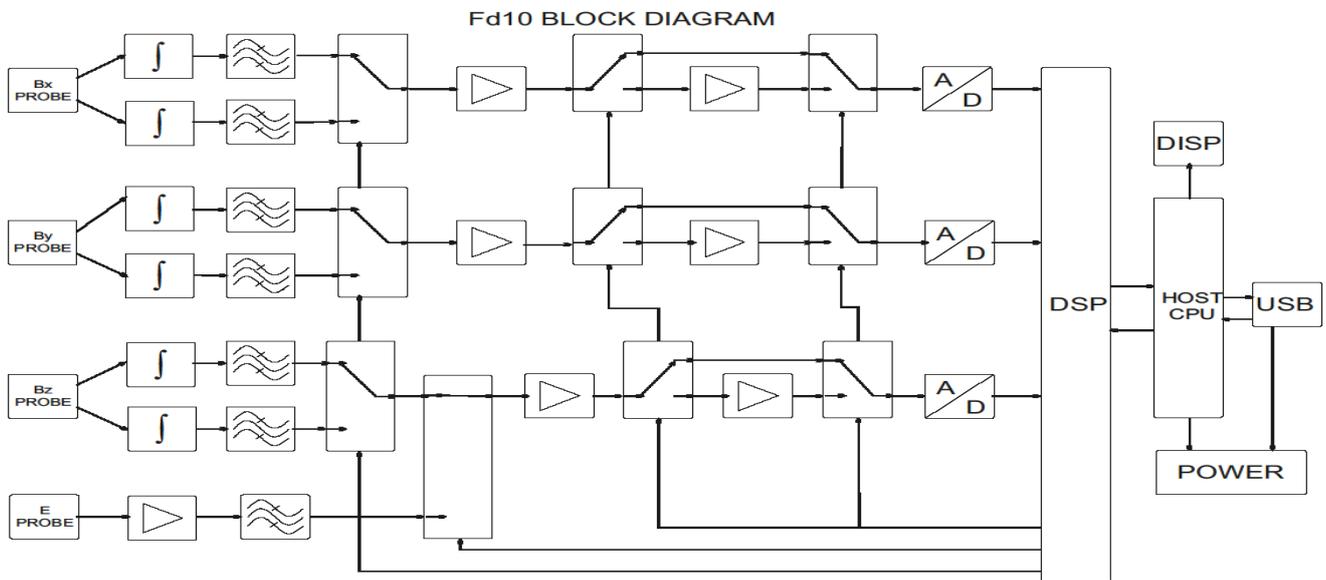
- An hard cover instrument case
- Carrying case in fabric
- A users manual
- An USB stick for installation of the PC-software

Specification High-lights

Frequency range:	8 Hz— 400 kHz (-3 dB) typical
Measuring range	
Magnetic fields:	50 nT—100 mT
Electric fields:	5 V/m—10 kV/m
Measuring mode:	Time domain

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Description of measuring technic

Magnetic field measurements

FD 10 has three 2.5 cm² coils with, one coil for each direction X, Y and Z. The magnetic fields is inducing an electric signal to each coil with the same frequency as the magnetic field. In the Box Chart above you will get an schematic description of the signal processing.

FD 10 is meeting the requirements in IEC/EN 61786-1 for magnetic field meters

Electric field measurements

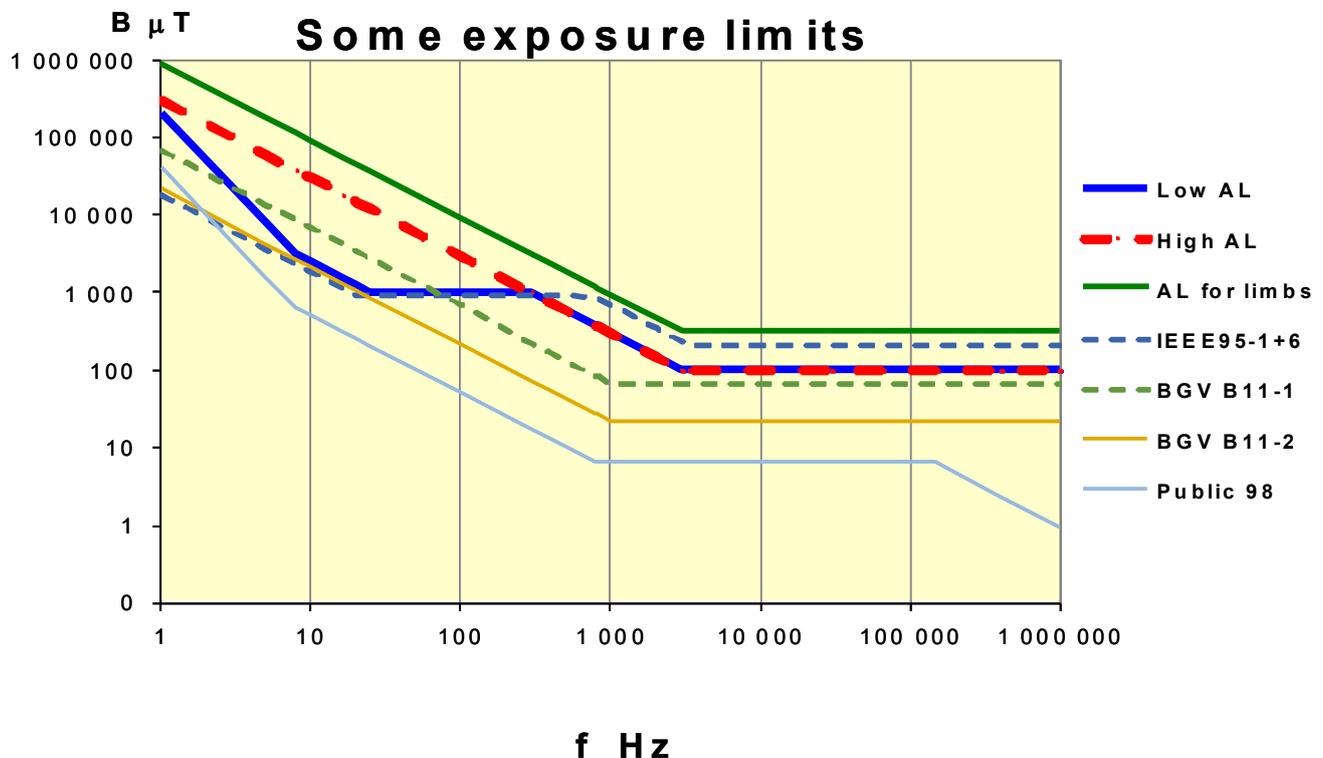
FD 10 provide an earth related electric field measurement. This measurement gives a measurement of the electric field that is related to the actual exposure of a person. Another method is to have a free-floating probe that measure the unperturbed field. The exposure limits from the EU-directive are set for the unperturbed measurement. The earth related measurements will mostly give higher measurement values compared to the unperturbed measurements which will be more representative to the actual exposure when a person enter into an electric field. FD 10 is possible to use for pre-compliance test.

With the PC-software that will be delivered with the instrument you will be able to:

- Set the instrument parameters as
 - ◇ Time and date
 - ◇ Tesla, A/m or Gauss for magnetic fields
- Remote measurement of individual measurements or start and stop of continuous measurements/logging
- Download other limits of choice

The directive is stating the minimum requirements for workers exposure to EMF. Some countries have more restricted limits. Combinova will be able to create filter parameters that will respond to such specific limits.





EU Directive 2013/35 about limitation of workers exposure to EMF

From 2016-07-01 the directive has to be implemented as national laws and regulations. The Directive is stating the minimum requirements of workers exposure for electro-magnetic fields. In the diagram above you will see how the action values are decreasing when the frequency increases. The limits in the directive stated for magnetic fields is:

- Action Level Low (AL_{Low})
Human exposure Below AL_{Low} there is now risk for any sensory or health effects
- Action Level High (AL_{High})
Human exposure below AL_{High} there is no risk for any health effects but there could be a risk for sensory effects as retinal phosphenes and minor transient changes in brain
- Action Level Limbs (AL_{Limbs})
This level is permitted for limbs exposure for localized magnetic fields.

Workers at particular risk (with active or passive implanted medical devices or pregnant workers) should not be exposed for stronger fields as stated in the EU Recommendation 1999/519. This EU Recommendation is referring to the limits for Public exposure from the guidelines of ICNIRP from 1998.

Other Exposure Limits

FD 10 will be able to store six different exposure limits at the time. There will be a library with the following exposure limits available for down loading to the instrument.

- Action Level Low (AL_{Low})
- Action Level High (AL_{High})
- Action Level Limbs (AL_{Limbs})
- ICNIRP 1998 Public equal to EU recommendation 1999/519
- BGV B11-1 (Germany)
- BGV B11-2 (Germany)
- IEEE 95-1 and IEEE 95-6

Technical Specification FD 10

Frequency range 8Hz – 400 kHz (-3 dB) typical

MAGNETIC FIELDS

Operating range % mode 0.01% - 500 % of chosen limit, in two ranges of magnetic fields

Resolution 0.001%

Operating range Tesla mode 50 nT – 100 mT in three ranges:

High gain (Low signal) from 50 nT to 1 mT with a resolution of 10 nT

Medium gain (Medium signal) from 500 nT to 10 mT with a resolution of 100 nT

Low gain (High signal) from 5 μ T to 100 mT with a resolution of 1 μ T

Accuracy for range High gain $\pm 5\%$ of reading + 10 nT from 15Hz - 250 kHz

Accuracy for range Medium gain $\pm 5\%$ of reading + 10 nT from 15 Hz - 250 kHz

Accuracy for range Low gain $\pm 5\%$ of reading + 1 μ T from 15 Hz – 250kHz

ELECTRIC FIELDS

Operating range V/m mode 5 – 10 000V/m with a resolution of 1 V/m

Accuracy $\pm 5\%$ of reading + 1 V/m from 10 Hz to 300 kHz

Logging from PC 1/sec - 1/10 min

Each measurement contains:

- Date and time
- T or Gs or A/m or % or V/m
- Dominating frequency
- Chosen standard

Limits The instrument shall be able to download 6 standards and present the result as % of their magnetic field limits as for example:

- ICNIRP Public 1998 Equal to EU Recommendation 1999/519
- EU Directive 2013/65 AL Low, AL High, AL Limbs
- Germany BGV 11
- USA IEEE 95-1+95-6
- Or other limits of choice or,
- Flat frequency response measured in Tesla, Gauss or A/m.

PC Software Included for downloading stored data, remote control, data presentation and printing

Battery Charged Li-ion Battery Charged over USB-interface

Display Graphic 128 x 128 dots

Presentation on the Display Tesla, Gauss, A/m or %-value, V/m, Dominating frequency, RMS and Peak, Measuring mode, Battery Status, Memory status and Operating mode (Charging, logging, waiting....)

Communication USB

Buttons 2

The right button for shifting Measurement parameters

The left button for measuring

Dimensions 205 x 70 x 35 mm

This specification can be subject for changes without prior notice