

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.

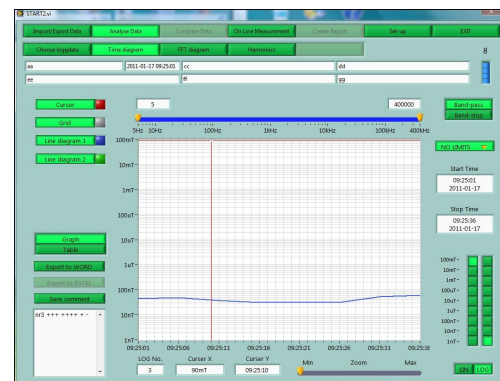
With the frequency range from 10 Hz to 400 kHz you will cover applications like:

- 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, set up of logging parameters 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 installation CD for the PC-software

Specification High-lights

Frequency range: 10 Hz— 400 kHz

Measuring range

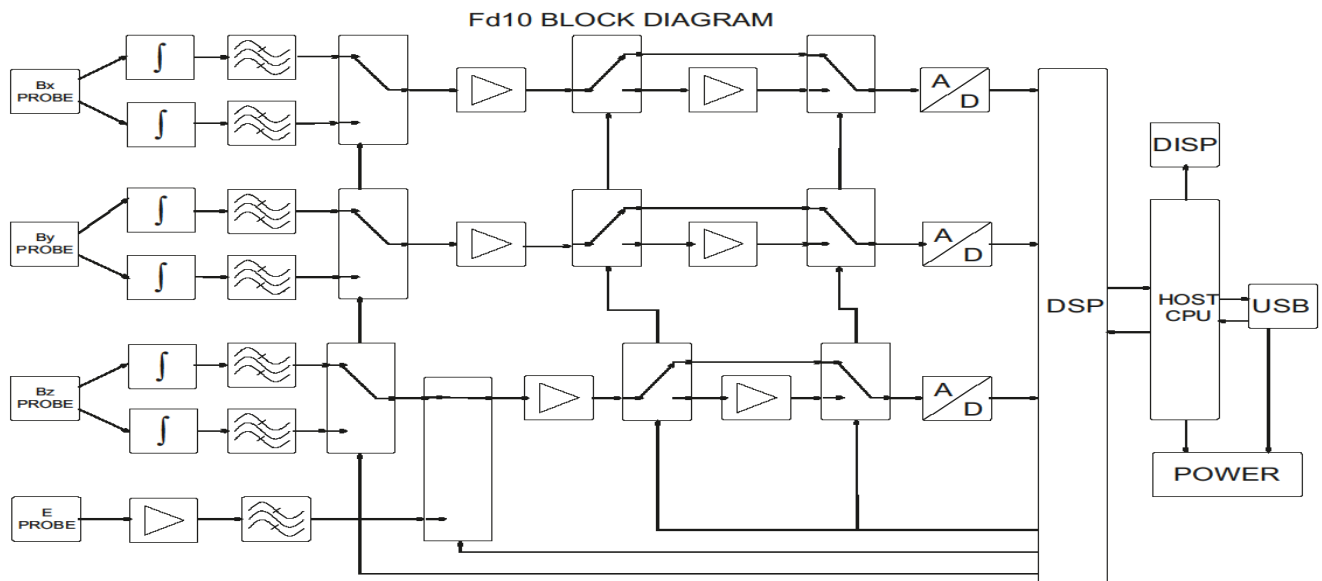
Magnetic fields: 50 nT—100 mT

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

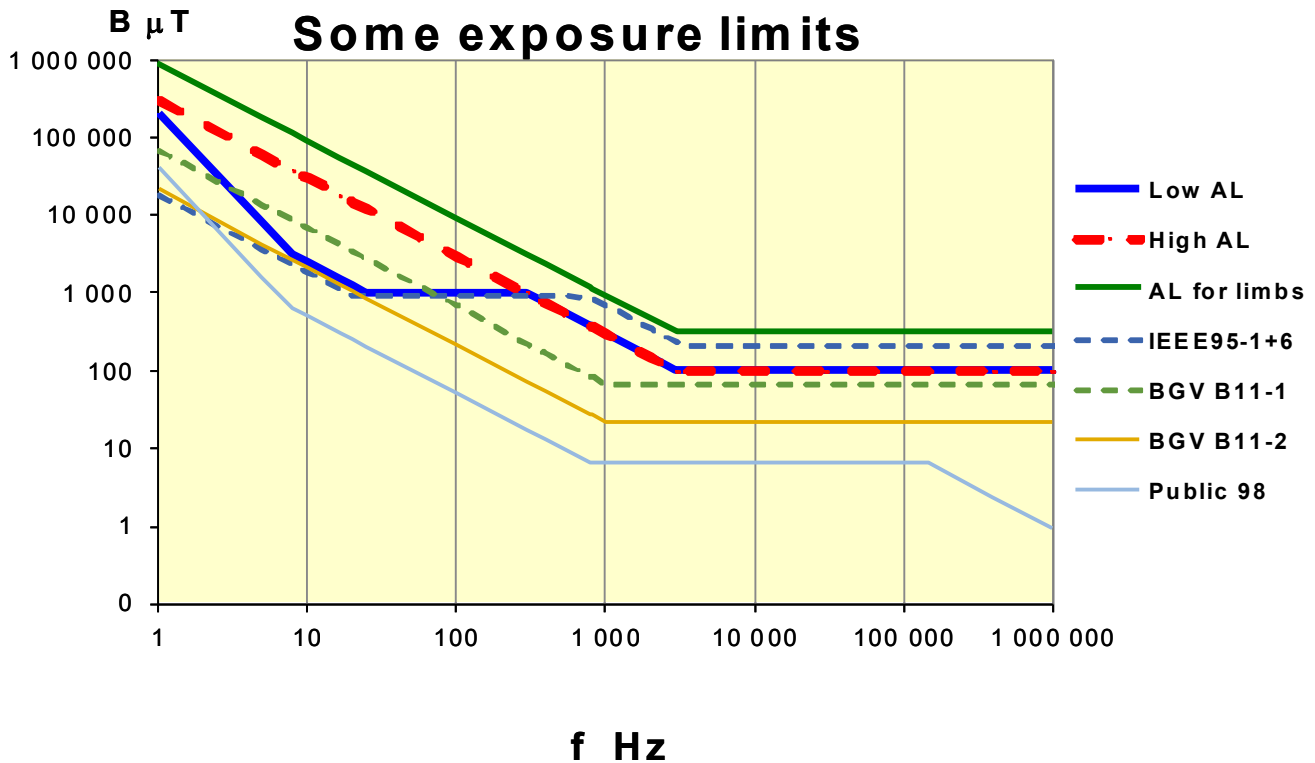
FD 10 provide an earth related electric field measurement. This measurement gives a measurement of the electric field that is related to the actual exposure of a person. Another method is to have a free-floating probe that measure the unperturbed field. The exposure limits from the EU-directive are set 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
- Set logging parameters as
 - ◇ Logging speed
 - ◇ Date and time for starting logging
 - ◇ Date and time for stopping logging
 - ◇ Choice of limit or normal mode measuring
- 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	10 Hz – 400 kHz
MAGNETIC FIELDS	
Operating range % mode	0.01% - 500 % of limit for magnetic fields defined within chosen standard
Resolution	0.001%
Accuracy	±5% of reading + 0,001%
Operating range Tesla mode	50 nT – 100 mT in two ranges: Low from 50 nT to 1 mT with a resolution of 10 nT High from 5 µT to 100 mT with a resolution of 1 µT
Accuracy for measuring range Low	±5% of reading + 10 nT
Accuracy for measuring range High	±5% of reading + 1 µT
ELECTRIC FIELDS	
Operating range V/m mode	5 – 10 000V/m with a resolution of 1 V/m
Accuracy	±5% of reading + 1 V/m
Logging	1/sec - 1/10 min 100 000 measurements in T or (and) % or V/m storage capacity + dominating frequency. Each measurement shall contain: <ul style="list-style-type: none">• Date and time• T or Gs or A/m or % or V/m• Dominating frequency• Logging method (manual, manual start/stop, Time start /stop)• 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: <ul style="list-style-type: none">• 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 or for stop and start logging