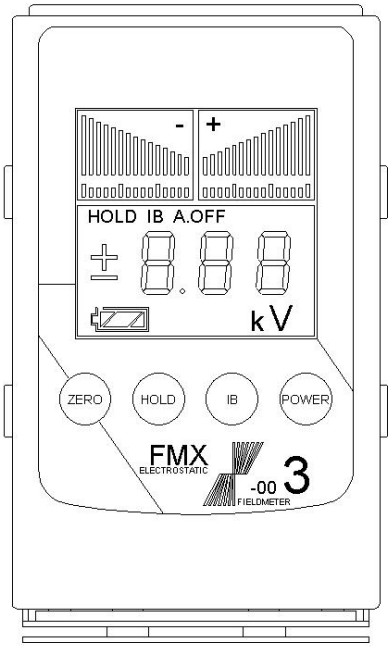
# FMX – 003




Veldsterktemeter
Feldstärkenmessgerät

Fieldmeter
L'appareil de mesure de champs


| | | | |
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CE

USER'S MANUAL FOR FMX-003

## 1. Introduction

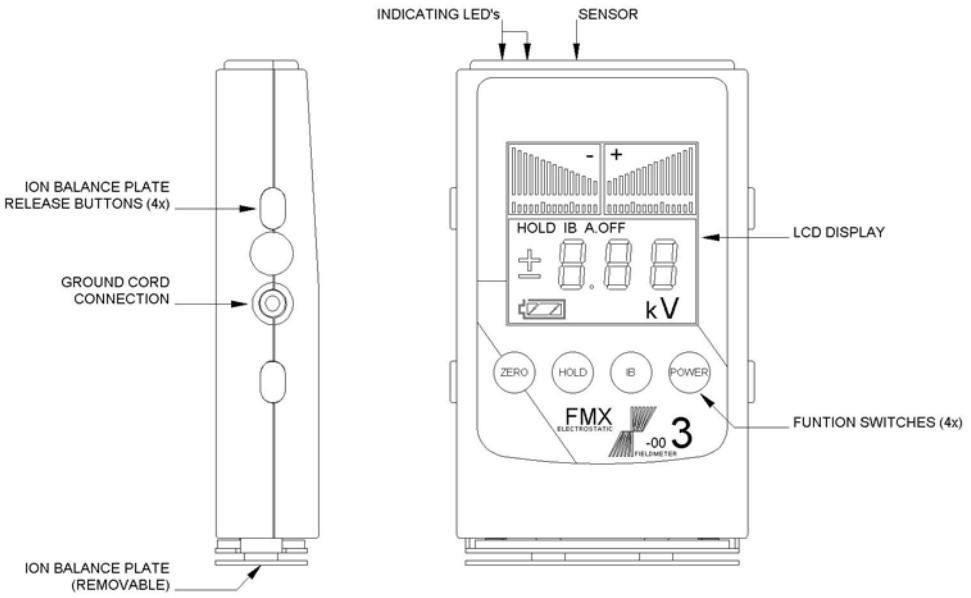
Read this manual completely before you put this product into use.
Follow the instructions set out in this manual to ensure proper operation of the product and to be able to invoke guarantee.
The guarantee terms are stated in the General Conditions for the Sale and Delivery of Products and/or Performance of Activities by  (Nederland) B.V.

## 2. Safety

- The FMX-003 is intended for use in areas that are free of water, oil, solvents and other conductive contaminants.  Exposure to such contaminants will cause failure of the electrical insulation system in the product. Formulation of dew on the fieldmeter must be avoided.
- Do not insert any object in the opening for the sensor located at the measuring side of the instrument; no foreign substance should ever enter into the sensor opening.
- Do not operate near corrosive fumes of acid/alkali or corrosive gases such as chlorine.
- Do not use the FMX-003 in a fire and/or explosion hazardous environment.
- If changes, adjustments, etc. have been made without prior consent in writing, the instrument loses its CE-approval and guarantee.
- Repairs shall be made by a skilled electrical engineer.
- This equipment must have proper earth reference for accurate measurements.

## 3. Use and operation

The FMX-003 is an accurate electrostatic fieldmeter for tracing and measuring electrostatic charges. It can be used to establish if and where (discharge) anti-static bars must be fitted. Due to its compact design it is possible to perform measurements in difficult spots. POWER on/off, ZERO adjustment, Ion Balance (IB) and HOLD are all push button operations. The HOLD button allows the display to retain the static charge reading. This is especially useful where the display is difficult to see during measurement. The static charge is detected by the measuring probe and processed by a microcomputer and can be read on a display. The FMX-003 measures static voltages within +/- 20kV at a distance of 25mm. Distance indication LED's facilitate the establishment of the measuring distance.



This fieldmeter can also be used for ion balance voltage measurements. Ion balance voltage measurements to +/- 200V is possible by attaching the Ion Balance Plate and using the light blue push button switch marked IB. The plate can be kept attached to either end of FMX-003 when not in use. The FMX-003 is switched off automatically approximately 5 minutes after it has been switched on. This feature can be switched off, simply press and hold the red POWER button for at least three seconds when turning the FMX-003 on. Three led bars, the A-OFF sign and three beeps indicate that the feature automatic switch-off has been disabled.

## 4. Technical specifications

| | | |
|---|---|---|
| Power supply: | 9 V DC alkaline battery, ICE code 6LR61 (±30 hours life time) | |
| Measuring range: | 0 - ±1,49 kV, (Lo range) | |
| | ±1 - ±20 kV, (Hi range) | |
| | Hysteresis range | ±1 - ±1,5 kV |
| | Ion balance | 0 - ±200 V |
| Measuring distance | 25 mm (between FMX and object to be measured) | |
| Response time: | <1 second | |
| Accuracy: | ± 10 % | |
| Polarity: | Positive and negative | |
| Measuring frequency: | 5 times per second | |
| Graphical display: | Red | positive polarity |
| | Blue | negative polarity |
| | Precision | ±0,1 kV Lo range |
| | | ±1,5 kV Hi range |
| | | ±15 V ion balance |
| Numerical display: | □.□□ = 0 - ± 1,49 kV | Lo range |
| | □□.□ = ± 1 - ± 20 kV | Hi range |
| | □□□ = 0 - ± 200 V | Ion balance |
| Automatic switch-off: | After 5 minutes | |
| Buzzer: | Beep sound will be heard during the following actions:<br>- Power on: one beep<br>- Power on with Auto Off feature disabled: [Depress power button for more than 3 seconds] three beeps<br>- Auto power-off: short beeps at 1 second interval for 5 seconds before power off<br>- Over range: Continuous sound | |
| Operating temperature: | 10 - 40 °C | |
| Relative humidity: | 0 - 60%RH (non-condensing) | |
| Housing: | Conductive plastic (ABS) | |
| Size: | 123 mm (L) x 73 mm (W) x 25 mm (H) | |
| Weight: | 170g | |

The measuring accuracy is not affected by air ionization.

# 5. Putting into use

## 5.1. Checks

- Check that the measuring instrument is undamaged and that you have received the correct version.
- Check that the data on the packing slip corresponds with the data shown on the product received.

*If you have any problems and/or in the case of ambiguity:*
*please contact  or your regional agent.*

## 5.2. Putting into use

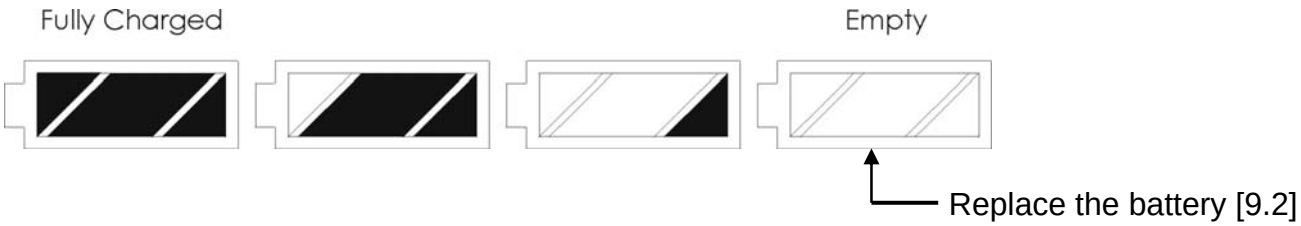
**Warning:**

- **The measuring instrument may be severely damaged when subjected to vibrations or shocks, or when it is dropped.**

- Upon receipt of the measuring instrument the battery is fitted.
- Suspend measurement when the voltage reading is outside the measuring range. If the range is exceeded, there is a possibility of damaging the sensor.
- It is possible to use this product in ionized air. However, the specified accuracy of within 10% cannot be guaranteed.
- Do not press on the LCD display.

## 5.3. Battery check.

Switch the instrument on [POWER]
The battery indicator on the display shows the state of battery.




## 5.4. Earthing the measuring instrument

The case of the FMX-003 is made of a conductive resin which provides an earth reference for the measuring circuit. To ensure accurate measurement, the person performing the measurement must be in good contact with earth, or the instrument must be earthed using the supplied grounding lead.

# 6. Operation

## 6.1. Switching on and off

### Switch-on

– Press the red button [POWER] (buzzer audible for 1 second, distance indicating LED's lit)
*When the measuring instrument is switched on, the graphic and numerical indications and the battery symbol are displayed.*

### Switch-on with continuous mode

– Press and hold the red button [POWER] for at least three seconds when turning the FMX-003 on (Three led bars, the A-OFF sign and three beeps indicates that the instrument is switched in continuous mode)
*The FMX-003 will NOT turn itself off automatically after five minutes. When the measuring instrument is switched on, the graphic and numerical indications and the battery symbol are displayed.*

– When the instrument is switched in continuous mode, the red indicating LED's will be turned off automatically after one minute to reduce the consumption of the battery. To turn the LED's on again press [HOLD] button twice. Once turned on again the LED's remain on for one minute.

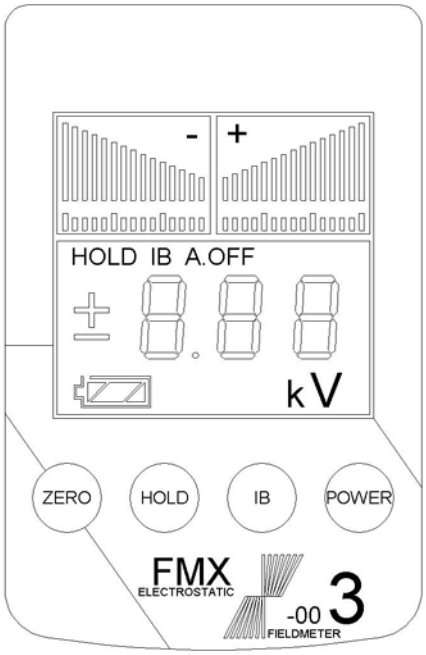
### Switch-off

– Press the red [POWER] button. (distance indicating LED's extinguished)

## 6.2. HOLD function

No measurements can be conducted with the [HOLD] function switched on. The latest measurement value is maintained on the display.
*The text [HOLD] is visible on the display, the distance indicating LED's are extinguished).*

– Press the green button [HOLD] to switch the HOLD function on and off.




## 6.3. Zeroing

**Attention:**
- **Zeroing is not possible if the display of an activated instrument shows a value > 0,3 kV.**
- **Zeroing is not possible if the [HOLD] function is active.**

1. Point the measuring instrument to a non-charged (earthed) surface.
2. Press the grey button [ZERO] to zero the display.

### 6.4. Determining the measuring distance using the distance indicating LED's

1. Switch the instrument on.
2. If HOLD has been switched on: Switch HOLD off.
3. Aim the measuring instrument to a surface, holding it at a distance of 3-4 cm.
   *(circles of distance indicating LED's are visible).*
4. Move the measuring instrument towards the surface.
5. When the two circles of the distance indicating LED's form a single concentric unit, the correct measuring distance is reached (25 mm).




### 6.5. IB function

The IB button is blue and prepares the fieldmeter for Ion Balance measurement. Refer to section 8 for details.

## 7. Static charge measurements

### 7.1. Summary

The measuring accuracy depends on the size of the area to be measured. The FMX-003 has been calibrated for 0 - 20 kV for a flat measuring area of 150 mm x 150 mm and a measuring distance of 25 mm. Incorrect values will be displayed when measurements are conducted from a different distance or on a smaller area.

### 7.2. Measurement

1. Switch the instrument on (press [POWER] button once) when sensor and distance LED's face an uncharged object.
2. Zero the measuring instrument when the reading is not zero.
3. Hold the measuring instrument 25 mm away from the area to be measured.
4. Press the button [HOLD] *(the measured value is retained).*
5. Read the measured value.
6. If the measuring instrument is in the HOLD mode: Switch HOLD off to measure again.

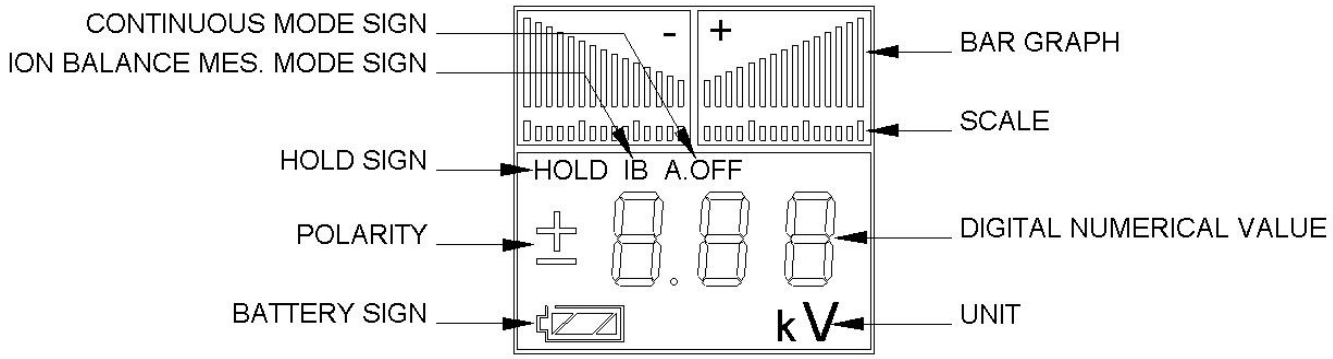
**The buzzer will continuously emit an alarm signal and the graphic display will flash at a measurement value > 20,1 kV.**

☞ **Hint:**

- **For measuring values above 20 kV, keep the instrument at a distance of 60 mm. In that case, multiply the reading by a factor of 2. Then the maximum measured value is 40 kV.**

⚠ **Warning:**
**Attempts to measure too high a charge may damage the sensor.**

### 7.3. Reading the display




The measured values are shown digitally and graphically on the display. The polarity is shown by [+] or [-]. Graphically [-] negative is shown in blue and [+] positive in red.

- Measurement values < ± 1.49 kV are shown with an accuracy of 2 decimals.
- Measurement values ≥ ± 1 - ± 20 kV are shown with an accuracy of 1 decimal.
- Measurement values between 1 and 1.5 kV are within the hysteresis range and are shown with an accuracy of 1 or 2 decimals, depending on the LO or HI measuring range.
- The measurement value is shown without decimal during ion balance measurements.

## 8. Operation of Ion Balance Measurement

The FMX-003 can easily be used to measure ion balance voltage (residual voltage). During static charge measurement, the ion balance plate is attached to the bottom end normally. For ion balance measurement it should be removed and attached to the top end in front of the sensor.

### 8.1. Placing the ion balance plate

1. Remove the plate assembly (depress the IB plate release buttons on either side of the fieldmeter).
2. Insert the plate assembly into the other end of the fieldmeter (the end with the logo) until it clicks into place.
3. Connect the instrument with earth, using the supplied grounding lead.

### 8.2. Operation

#### 8.2.1. Switch-on
- Press the [POWER] button.
- Press the [IB] button, to turn on the ion balance measuring circuit.

*The text [IB] is visible on the display, the distance indicating LED's do not light up.*

#### 8.2.2. Switch-off
- Press the [POWER] button.

#### 8.2.3. Zeroing

**Attention:**
- **Zeroing is not possible if the display of an activated instrument shows a value >50 V.**
- **Zeroing is not possible if the [HOLD] function is active.**

1. Point the measuring instrument to a non-charged (earthed) surface.
2. Press the grey button [ZERO] to zero the display.

### 8.3. Measurement

**Warning:**
**For reliable measurements the relative humidity must not exceed 60%.**

**Note**
- **To obtain proper measurements, earthing of the measuring instrument is essential.**
- **The buzzer sounds continuously, when a value higher than 220 volts is displayed (overrange). Stop measurement in this case.**

1. Earth the ion balance plate to remove any remaining static charge.
2. Earth the conductive case with the supplied grounding lead.
3. Switch on to the IB measuring, [POWER] button once and then [IB] button once. *The distance indicating LED's do not light up.*
4. Point the measuring instrument to an earthed surface.
5. If reading > zero: press the [ZERO] button.
6. Hold the measuring instrument in the ionized air flow to be measured.
7. The measuring instrument indicates the voltage measured (V) and the polarity.

## 9. Maintenance

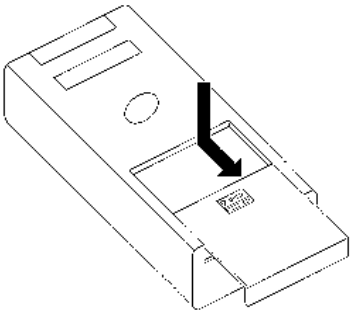
### 9.1. General

- Keep the measuring instrument clean.
- Replace the battery when indicated by the battery indicator [5.3].

### 9.2. Replacing the battery

**Warning:**

– **Pay attention to the polarity when connecting the battery.**



1. Remove cover at the rear.
2. Remove the old battery.
3. Connect the new battery and insert it into the battery compartment.
4. Close cover.

**Hint:**

– **If the measuring instrument will not be used for a long period: remove the battery.**

## 10. Faults

| Problem | Cause | Remedy |
|---|---|---|
| The FMX has been switched on, but when it approaches an electrostatically charged object to be measured, the reading does not react | The FMX is in the HOLD mode | Switch the HOLD mode off |
| The zero button has been pressed, but the FMX cannot be reset | The FMX is in the HOLD mode | Switch the HOLD mode off |
| | Internal zero point has shifted | Return FMX for calibration |
| The FMX has been switched on, but the display shows no symbols | Battery voltage too low | Replace the battery |
| | Display is defective | Replacement or repair is necessary, send the FMX to for repair |
| One of the symbols on the display is lacking, or the display shows Error ("Err") | Display or sensor is defective | Replacement or repair is necessary, send the FMX to for repair |
| Buzzer does not operate | Faulty buzzer | Replacement or repair is necessary, send the FMX to for repair |
| Voltage measured at ion balance is too low | Adhesion of dirt or condensation on the ion balance plate. | Clean the plate ultrasoncally and dry it properly. If this does not help, send measuring plate to for repair |

Table 1: Faults

## 11. Repair / Calibration

The measuring instrument has been calibrated
recommends to have the measuring instrument checked annually.
There are no spares for the measuring instrument.
Send the measuring instrument to for repair and/or calibration.
Request an RMA form by sending an e-mail to service@ .nl.
Pack it properly and clearly state the reason for return.

## 12. Disposal



**Once it reaches the end of its useful life, this electronic equipment must be disposed of separately.**

Adhere to the applicable local environmental and other rules when disposing of the product.