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Safety Test Solutions

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E-FIELD PROBE

EF1891

Measuring electric fields from 3 MHz to 18 GHz

using instruments in the NBM-500 family

- **General public and occupational field exposure from radio broadcasting, telecoms, and radar**
- **Isotropic (non-directional) measurement**
- **64 dB dynamic range without changing measurement range**

The probe contains three orthogonally arranged dipoles with detector diodes. The three voltages, corresponding to the spatial components, are available individually at the probe output. The NBM basic unit calculates the resulting isotropic field strength.

APPLICATIONS

The probe detects electric fields from 3 MHz to 18 GHz, covering the fields generated by broadcasting, telecoms, and radar. The dynamic range from 0.6 V/m up to 1,000 V/m (64 dB) makes the probe ideal for measuring exposure in both the general public and the occupational environment.

PROPERTIES

The probe is designed with mechanical and electrical properties ideal for field use. The probe head is made of foam material to provide effective protection for the sensors, while having excellent RF characteristics. The electric destruction limit of 1,600 V/m for continuous wave signals is several times higher than any of the human safety limit values.

CALIBRATION

The probe is calibrated at several frequencies. The correction values are stored in an EPROM in the probe and are automatically taken into account by the NBM instrument. Calibrated accuracy is thus obtained regardless of the combination of probe and instrument.

SPECIFICATIONS [a]

Probe EF1891	Electric (E-)Field	
Frequency range [b]	3 MHz to 18 GHz	
Type of frequency response	Flat	
Measurement range	0.6 to 1000 V/m (CW) 0.6 to 35 V/m (True RMS)	100 nW/cm² to 265 mW/cm² (CW) 100 nW/cm² to 325 µW/cm² (True RMS)
Dynamic range	64 dB	
CW damage level	1600 V/m	700 mW/cm²
Peak damage level [c]	16 kV/m	70 W/cm²
Sensor type	Diode based system	
Directivity	Isotropic (Tri-axial)	
Readout mode / spatial assessment	3 separate axes	
UNCERTAINTY		
Flatness of frequency response [d] Calibration uncertainty not included	±1 dB (10 MHz to 3 GHz) +2/ -1 dB (3 to 7 GHz) +3/ -1 dB (7 to 11 GHz) +3/ -4 dB (11 to 18 GHz)	
Linearity Referred to 0.2 mW/cm² (27.5 V/m)	±3 dB (0.8 to 1.65 V/m) ±1 dB (1.65 to 3.3 V/m) ±0.5 dB (3.3 to 300 V/m) ±0.8 dB (300 to 1000 V/m)	±3 dB (170 to 720 nW/cm²) ±1 dB (720 nW/cm² to 2.9 µW/cm²) ±0.5 dB (2.9 µW/cm² to 24 mW/cm²) ±0.8 dB (24 to 265 mW/cm²)
Isotropic response [e]	±1 dB (27 MHz to 1 GHz) ±2 dB (1 GHz to 18 GHz)	
Temperature response	+0.2/ -1.5 dB (±0.025 dB/K @ 10 to 50 °C)	
GENERAL SPECIFICATIONS		
Factory calibration frequencies	3/ 10/ 27.12/ 100/ 200/ 300/ 500/ 750 MHz 1/ 1.8/ 2.45/ 3/ 4/ 5/ 6/ 7/ 8.2/ 9.3/ 10/ 11/ 18 GHz	
Recommended calibration interval	24 months	
Temperature range Operating Non-operating (transport)	 0 °C to +50 °C -40 °C to +70 °C	
Humidity	5 to 95 % RH @ ≤28 °C	≤26 g/m³ absolute humidity
Size	318 mm x 66 mm Ø	
Weight	90 g	
Compatibility	NBM-500 series meters	
Country of origin	Germany	

(a) Unless otherwise noted specifications apply at reference condition: device in far-field of source, ambient temperature 23±3 °C, relative air humidity 25% to 75%, sinusoidal signal
(b) Cutoff frequency at approx. -3 dB @ 3 MHz/ -4 dB @ 18 GHz
(c) Pulse length 1µsec, duty cycle 1:100
(d) Frequency response can be compensated for by the use of correction factors stored in the probe memory
(e) Results are calculated from the maximum and minimum response obtained during the full revolution about the stem of the probe, oriented 54.7° to the electric field vector.

ORDERING INFORMATION

	Part number
Probe EF1891, E-Field for NBM, 3 MHz – 18 GHz, Isotropic	**2402/02B**
Probe EF1891, E-Field, ACC - with accredited (DAkkS) calibration, basic unit required	**2402/02B/ACC**

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