

# E-field probe type 9, H-field probe type 10



## E-field probe Type 9

3 MHz to 18 GHz (26.5 GHz)

## H-field probe Type 10

(10 MHz) 27 MHz to 1 GHz

For isotropic measurement  
of electromagnetic fields

Probe type 8 (see data sheet for E-field probe type 8) covers the entire spectrum of telecommunications applications since almost all terrestrial radio services fall within its frequency range.

When making measurements under near-field conditions, it is necessary to determine the electric and magnetic field components separately. Probe type 10 is needed in such cases. It is designed to handle the major radio services such as short wave, VHF, television and GSM. It also covers most industrial frequencies, such as 27 MHz and 433 MHz.

In radar systems and satellite installations, frequency ranges above 3 GHz are also used. Probe type 9 is designed for such applications. Its wide dynamic range is particularly useful in radar work. Radar signals have a large crest factor, i.e. their peak values are much greater than their RMS values. Moreover, most radar antennas rotate and the measuring device can capture only a portion of the energy actually transmitted.

All of the probes (types 8, 9 and 10) make use of detector diodes. Compared to thermocouples, diodes offer a much wider field strength measuring range (e.g. 0.5 V/m to 1000 V/m, i.e. a dynamic range<sup>1)</sup> > 60 dB).

Another problem associated with thermocouples, i.e. their rapid destruction at excessively high levels, is either avoided with diodes or occurs much later. The base devices, including the display, are shielded against electromagnetic radiation in order to avoid interference or damage at these high field strength levels.

1) Here, the dynamic range is the ratio of the highest and lowest measurable field strengths.

Dynamic range	Field strength ratio	Dynamic range	Field strength ratio
0 dB	1 V/m : 1 V/m	30 dB	30 V/m : 1 V/m (100 V/m : 3 V/m)
10 dB	3 V/m : 1 V/m	40 dB	100 V/m : 1 V/m
20 dB	10 V/m : 1 V/m	60 dB	1000 V/m : 1 V/m

**Specifications\* for the E-field probe**

**Type 9**

Sensor type . . . . . electrical field (E)	Isotropy deviation
Directional characteristic . . . . . isotropic	Field probe only . . . . . typ. $\pm 0.5$ dB ( $f > 10$ MHz)
Frequency range . . . . . 3 MHz to 18 GHz	Probe and meas. unit. . . . . typ. $\pm 1.5$ dB (10 MHz to 8 GHz)
typ. 3 MHz to 26.5 GHz	typ. $\pm 2$ dB ( $f > 8$ GHz) <sup>3)</sup>
Specified meas. range . . . . . 1.2 to 1000 V/m	Overload protection
3.2 mW/m <sup>2</sup> to 2.6 kW/m <sup>2</sup>	CW . . . . . 0.7 W/cm <sup>2</sup> (1600 V/m)
Dynamic range . . . . . typ. 60 dB	Pulse . . . . . 70 W/cm <sup>2</sup> (16 kV/m)
Absolute error at 27.5 V/m and 100 MHz . . . . . $\pm 1.0$ dB	H-field suppression . . . . . $> 20$ dB
Linearity referred to	Temperature response (0 to +50 C). . . . . $\pm 0.8$ dB
27.5 V/m and 100 MHz . . . . . $\pm 1.0$ dB for 3 to 1000 V/m	$\pm 3.0$ dB for 1.2 to 3 V/m
Frequency response	Calibration
Probe type 9, taking into account	Probe type 9 includes calibration certificate for absolute
the typical CAL factor <sup>1)</sup> . . . . . $\pm 1.5$ dB (10 MHz to 100 MHz)	accuracy as well as typ. CAL factors for frequency
$\pm 2.4$ dB (100 MHz to 8 GHz)	dependency.
$\pm 3.0$ dB (8 GHz to 18 GHz)	Probe type 9C with extended calibration for frequency
Probe type 9C with extended calibration <sup>2)</sup>	dependency.
taking into account CAL factor and including	Recommended confirmation interval . . . . . 24 months
calibration accuracy. . . . . $\pm 0.5$ dB (10 MHz to 200 MHz)	
$\pm 1.4$ dB (200 MHz to 8 GHz)	
$\pm 1.8$ dB (8 GHz to 18 GHz)	

\* Unless otherwise stated, all specifications hold under the following assumptions: Sinusoidal signals; device in far-field of a source; probe lead parallel to magnetic field component; ambient temperature +23 °C  $\pm 3$  C; relative air humidity 25 % to 75 %.

1) EMR-200/-300 in combination with probe type 9 (BN 2244/90.22)  
 2) EMR-200/-300 in combination with probe type 9C (BN 2244/90.23)  
 3) Probe lead perpendicular to direction of propagation

**Specifications\* for the H-field probe**

**Type 10**

Sensor type . . . . . magnetic field (H)	Isotropy deviation
Directional characteristic . . . . . isotropic	Field probe only . . . . . typ. $\pm 0.6$ dB ( $f < 800$ MHz)
Frequency range . . . . . 27 MHz to 1 GHz	Probe and meas. unit . . . . . typ. $\pm 1$ dB <sup>3)</sup>
typ. 10 MHz to 1 GHz	Overload protection
Specified meas. range . . . . . 0.03 to 16 A/m	CW . . . . . 20 A/m (15 W/cm <sup>2</sup> )
Dynamic range . . . . . typ. 55 dB	Pulse . . . . . 200 A/m
Absolute error at 0.125 A/m and 100 MHz . . . . . $\pm 1.0$ dB	E-field suppression . . . . . $> 20$ dB
Linearity referred to	Temperature response (0 to +50 °C) . . . . . $\pm 0.8$ dB
0.125 A/m and 100 MHz . . . . . $\pm 1.0$ dB for 0.07 to 16 A/m	$\pm 3.0$ dB for 0.03 to 0.07 A/m
Frequency response	Calibration
Probe type 10, taking into account	Probe type 10 includes calibration certificate for absolute
the typical CAL factor <sup>1)</sup> . . . . . $\pm 1.0$ dB (27 MHz to 300 MHz)	accuracy as well as typ. CAL factors for frequency
$\pm 2.0$ dB (300 MHz to 1 GHz)	dependency.
Probe type 10C with extended calibration <sup>2)</sup>	Probe type 10C with extended calibration for frequency
taking into account CAL factor and including	dependency.
calibration accuracy. . . . . $\pm 0.5$ dB (10 MHz to 300 MHz)	Recommended confirmation interval . . . . . 24 months
$\pm 0.65$ dB (300 MHz to 750 MHz)	
$\pm 1.2$ dB (750 MHz to 1000 MHz)	

\* Unless otherwise stated, all specifications hold under the following assumptions: Sinusoidal signals; probe lead parallel to magnetic field component; ambient temperature +23 °C  $\pm 3$  °C; relative air humidity 25% to 75%.

1) EMR-200/-300 in combination with probe type 10 (BN 2244/90.26)  
 2) EMR-200/-300 in combination with probe type 10C (BN 2244/90.27)  
 3) Probe lead perpendicular to direction of propagation

**Ordering information**

<b>E-field probe type 9</b>	<b>BN 2244/90.22</b>	<b>H-field probe type 10</b>	<b>BN 2244/90.26</b>
<b>E-field probe type 9C</b>	<b>BN 2244/90.23</b>	<b>H-field probe type 10C</b>	<b>BN 2244/90.27</b>
with extended calibration		with extended calibration	
Nato Stock No.	NSN 6625-66-142-8744	Nato Stock No.	NSN 6625-66-142-8743

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