



Introduction

The Magnetic Field Meter BMM5 has been developed primarily for the measurement of magnetic fields emitted by VDU:s (Visual Display Units). The instrument measures the RMS (Root Mean Square) - value of the magnetic flux density in the frequency range 2 kHz - 400 kHz. The BMM5 has an immediate response and displays the measured value in nanoteslas (nT), which makes for quick and easy operation.

Norms for the testing of VDU:s have been issued among others by **SWEDAC** (formerly MPR) in Sweden. The BMM5 conforms to these norms.

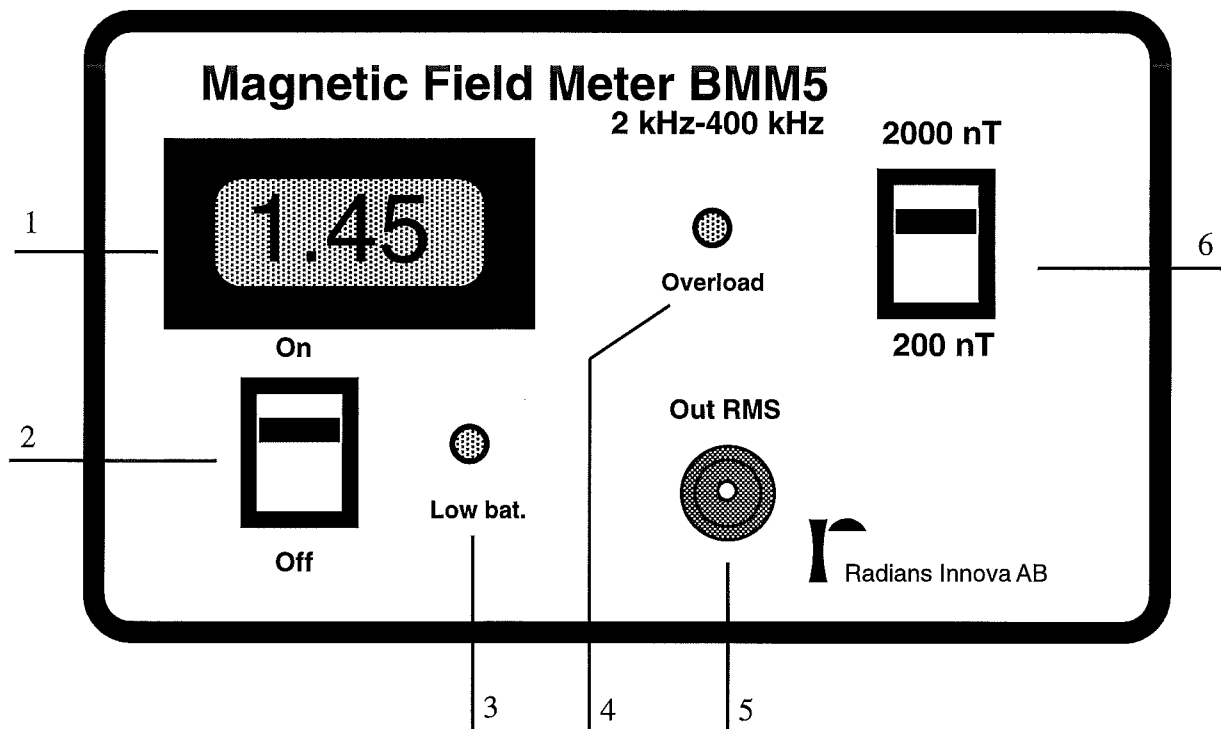


Fig. 1. Magnetic Field Meter BMM5, front panel

1. **Digital display.** Displays the RMS- (Root Mean Square) value of the measured magnetic flux density.
2. **On/Off switch**
3. **Battery indicator.** Flashes when the batteries are empty.
4. **Overload indicator.** Lights when the instrument is internally overloaded.
5. **Monitor output.** Outputs a voltage proportional to the measured RMS value of the magnetic flux density. 2 V full scale output.
6. **Sensitivity selector.** 200 nT or 2000 nT full scale.

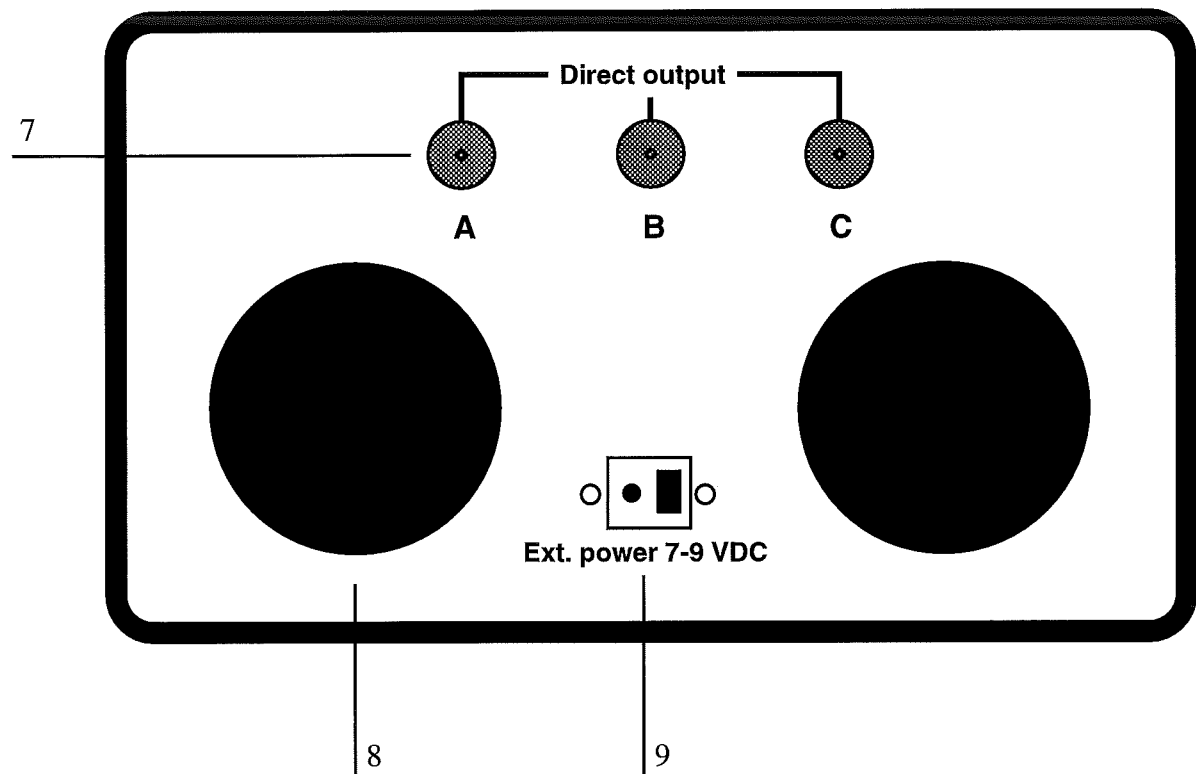


Fig. 2. Magnetic Field Meter BMM5, rear panel

7. **Direct output** from each of the three measuring coils. Provides a voltage proportional to the instantaneous flux density through each of the coils.
8. **Battery compartment**
9. **Input for external supply voltage** 7 - 9 V DC, center pin negative. The external supply voltage must be floating with respect to instrument ground.

Tripod Mounting

The probe handle is equipped with a thread suitable for photographic tripods.

Operation

The instrument is turned on by means of the On/Off switch (2) on the front panel. The measured magnetic flux density can be read out directly on the digital display. It is good measuring practice to use the 200 nT range as far as possible. Change to the 2000 nT range if the red overload indicator (4) lights or if the readout on the display exceeds full scale (199.9).

The probe can be used hand held or tripod mounted. The direct outputs (7) can be connected to an oscilloscope or

spectrum analyzer for a complete analysis of the signal.

The monitor output (5) can be connected to an x/t-recorder or data logger for long term measurements.

Due to the noise level in the instrument electronics, the display will not show exactly zero, even in the absence of magnetic fields. The internal noise is typically 0.8 nT, which is added in a square-root manner to the measured signal:

$$\text{Display} = \sqrt{\text{noise}^2 + \text{signal}^2} .$$

At a signal level of 3 nT, the error due to noise will be less than 3.5 %.

The BMM5 Magnetic Field Meter can be used for measurements according to the methods described in the MPR 1990-8 norm.

Measurement principle

The instrument probe is composed by three orthogonal coils (A, B, C) This arrangement makes the measured value independent of probe orientation. The signals induced in the coils represent the time derivative of the magnetic flux density

$$\frac{dB_{A,B,C}}{dt}$$

Where B_A, B_B, B_C are the signals from the three coils respectively. These signals are integrated and filtered to represent the magnetic flux density in the frequency range 2 kHz - 400 kHz. The RMS (Root Mean Square) value of the magnetic field is electronically calculated as:

$$B_{RMS} = \sqrt{\text{average}(B_A^2 + B_B^2 + B_C^2)} .$$

Measurements can be made for all frequencies between 2 kHz and 400 kHz. The time-variable signals B_A, B_B, B_C are available on the rear panel of the instrument (7).

Technical specification; BMM-5:

Measuring ranges:	200 nT, 2000 nT
Accuracy:	better than (1.5 nT + 5% of reading)
Frequency range:	
Broadband (-3dB):	2 kHz - 400 kHz
Outputs:	
Display ¹ :	Digital LCD
' Out RMS ' ² :	BNC
Sensitivity:	2 V corresponds to full scale
Output impedance:	1.8 k
' Direct out ' ³ :	3 BNC, one for each axis
Sensitivity:	2 V corresponds to full scale
Output impedance:	200
Power supply:	Batteries (6 x 1.5 V IEC R14) or external power supply 7 - 9 V DC, center pin negative. External power supply must be floating with respect to instrument ground.
	'Battery low' is indicated on the front panel
Current consumption:	70 mA
Size:	
Electronic unit:	210x150x80 mm
Measuring probe:	430 mm length
Weight:	2.3 kg without batteries

1 The digital display shows the root-mean-square value of the magnetic flux density vector magnitude within the instrument's frequency range.

2 The voltage on the output '**Monitor**' is proportional to the root-mean-square value of the magnetic flux density vector magnitude within the instrument's frequency range.

3 There are three outputs '**Direct out**', one for each measuring coil. The voltage on each of these outputs is directly proportional to the instantaneous value of the magnetic flux density through the corresponding coil within the frequency range (2 - 400 kHz).

Radians Innova reserves the right to change the above specifications without notice.

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