

ESR/NMR Control Unit

1022700 (115 V, 50/60 Hz)
1022702 (230 V, 50/60 Hz)

Instruction sheet

08/20 SD/ GH



- 1 Control unit
- 2 Power supply

1. Safety instructions

The ESR/NMR control unit conforms to safety regulations for electrical measuring, control and laboratory equipment as specified in DIN EN 61010 Part 1. It is to be operated in dry rooms as appropriate for the use of electrical equipment.

The supplied plug-in power supply unit complies with the standard for safety transformers DIN EN 61558-2-6 and the output voltage is a non-hazardous contact voltage.

Safe operation of this equipment is guaranteed as long as it is used as stipulated. However, there is no guarantee of safety if the equipment is used incorrectly or carelessly.

If there is any suspicion that the equipment can no longer be operated without risk (e.g. if visible damage is detected), the equipment must immediately be with-drawn from use and secured in such a way as to prevent its inadvertent operation.

- Only use the instrument in a dry environment.
- Do not apply any external voltage to the output sockets.
- Use only with the supplied plug-in power supply.

2. Description

The ESR/NMR control unit is used in conjunction with the ESR module (1022705) to investigate electron spin resonance (ESR) in DPPH (diphenyl picryl hydrazyl) and with the NMR module (1022706) to study nuclear magnetic resonance (NMR) in glycerine, polystyrene and Teflon.

Resonances can be observed as a result of transitions induced by high frequencies due to changes in an external magnetic field. Resonance absorption curves can be viewed using a simple dual-channel oscilloscope.

The control console provides control and power-supply voltages for the test probe being used and for the pair of coils. It also provides a suitable signal for an oscilloscope and displays the value of the high-frequency signal in Hertz.

The ESR/NMR control unit numbered 1022700 is designed for 230 V/ 50-60 Hz ($\pm 10\%$) mains voltage supplies, while 1022702 is for 115 V/ 50-60 Hz ($\pm 10\%$).

3. Equipment supplied

- 1 Control console
- 1 Plug-in power supply, 12 V AC (230 V, 50/60 Hz) or
- 1 Plug-in power supply, 12 V AC (115 V, 50/60 Hz)

4. Technical data

Control console

- Probe input: 4-pin Lemo socket
- Coil connectors: Sawtooth current source, 0 – 250 mA, 50 ms, pair of co-axial connectors
- Magnetic field output: proportional to coil current, 0 to 1 V, BNC socket
- Signal output: Resonance signal, 0 to 1V, BNC socket
- Frequency range: 45 to 75 MHz approx.(ESR)
11 to 15 MHz approx. (NMR)

General data:

- Power supply: Plug-in power supply 12 V AC, 2.0 A, coaxial power connector 5.5 x 2,5 mm, cable length: 2m
- Operating temperature: 5 °C till 40 °C

- Maximum relative humidity: 80 %
- Dimensions: console
170x105x45 mm³
Plug-in power supply
100 x 90 x70 mm³
- Weight: approx. 1050 g incl. power supply

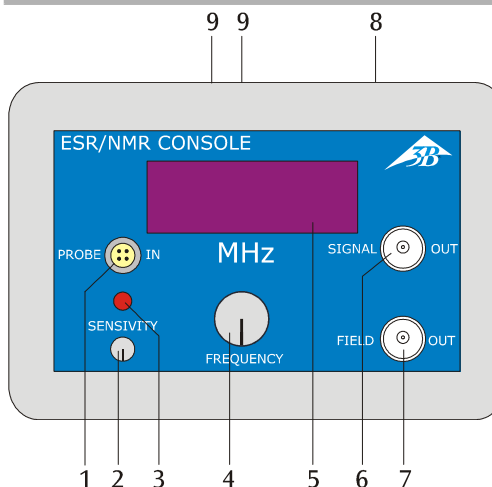
Electromagnetic compatibility:

- Emission: EN 55011:2009
- Immunity: EN 61326-1:2013

Electrical safety:

- Safety regulations: DIN EN 61010-1
DIN EN 61558-2-6
- Transformer: safety transformer according to DIN EN 61558-2-6
- Appliance class: 2
- Pollution severity: 2
- Type of protection: IP20

5. Control console panel



- 1 Connection socket for test probe
- 2 Sensitivity trimmer
- 3 Sensitivity indicator
- 4 Frequency selector
- 5 Frequency display
- 6 Signal output
- 7 Magnetic field output
- 8 Socket for power supply
- 9 Coil connector

6. Additionally required equipment

1 ESR module	1022705
or	
1 NMR module	1022706
1 Digital oscilloscope, 2x30 MHz	1020910
or	
1 PC Oscilloscope, 2x 25 MHz	1020857
2 High-frequency cables	1002746

7. Operation

For set-up and experiment procedure see instruction manual for ESR (1022705) and NMR (1022706) modules.

8. Care and maintenance

- Before cleaning the equipment, disconnect it from its power supply.
- Use a soft, damp cloth to clean it.

9. Disposal

- The packaging should be disposed of at local recycling points.
- Should you need to dispose of the equipment itself, never throw it away in normal domestic waste. Local regulations for the disposal of electrical equipment will apply.

