

PRODUCT INFO SHEET

Double-Resonance (X/F—H) Static *In-Situ/Operando* WB NMR Probe for Battery & Energy Storage Materials Research

Description

Specialized double-resonance (X/F—H) static *in-situ/operando* NMR probes for researching energy storage materials, including batteries and electrochemical cells, available for wide-bore systems from 200 MHz to 500 MHz. The X-channel tuning range covers ^{13}C to ^{31}P and ^6Li with additional nuclei to be discussed. In addition, the probe is equipped with a high-power decoupling channel on ^1H or ^{19}F . Automatic tuning/matching is integrated into the probe.

The probe is optimized for *in-situ/operando* plastic capsule cells, including solid-state cells, but can also be equipped with a coin cell module for the analysis of coin and pouch cells. The probe is equipped with three current collector ports next to the RF coil, through which an electrochemical cyler can be connected to the sample/cell to perform *in-situ/operando* NMR experiments. Integrated channels for optional gas or liquid flow through the cell enable research on electrocatalytic reactions, metal–air batteries and similar chemistries.





Technical Data

RF Capabilities

Fields:	200 MHz to 500 MHz (Wide-Bore); other fields to be discussed
X-Range:	^{13}C to ^{31}P and ^6Li ; other nuclei to be discussed
F—H-Range:	^1H with low-H probe background or ^{19}F with low-F background; Option: ^{19}F to ^1H to be discussed
Tuning/Matching:	Integrated automation Option: external automatic tune/match (eATM) ROBOT automation Option: manual

Temperature Control

VT Range:	-30°C to +100 °C
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Electrochemistry

Ports:	Three current collector ports for working, counter, and reference electrode Option: four current collector ports for EIS applications Cycling with up to at least 2 A current Compatible with all electrochemical cyclers
Samples/Cells:	Plastic cell capsule cells (OD 8, 11, and 15 mm) Solid-state cells (OD 11 mm) Plastic-bag cells and home-built/customized cells Option: module for coin and pouch cells (max. dimensions 25x24x7 mm); available frequency ranges to be discussed
Flow Chemistry:	Flow in- and outlet ports, e.g. for electrocatalysis cells

Options

Optics Module:	Analysis of photoreactive materials
Goniometer:	Fully automated or manual single-axis goniometer, e.g. to adjust the sample/cell orientation relative to the magnetic field

