

Polarean 2881

Polarization Measurement Station



The 2881 Polarization Measurement System provides a calibrated measurement of the polarization of hyperpolarized gas. The system includes a Helmholtz pair with power supply, a Q-switched tuned NMR circuit with a precision layer wound 300-turn NMR coil, and a computer equipped with a National Instruments DAQ card for data acquisition, analysis, and storage. No additional equipment is required. A factory calibration to thermally polarized water is standard, with subsequent field calibrations available upon request. Polarization analysis software enables individual polarization measurements as well as automatically measuring polarization over time to accurately measure polarization decay rates.

System Overview and Specifications

The 2881 Polarization measurement system can be operated on site by personnel who have undergone appropriate training. This system can be used to perform calibrated ^3He polarization measurements, calibrated ^{129}Xe polarization measurements, auto-mated polarization decay measurements as well as automatic data file saving and retrieval. The nominal specifications* of the 2881 Polarization Measurement Station is as follows:

^3He Polarization Repeatability (1%<P<100%)	±1% rel.
^{129}Xe Polarization Repeatability (3%<P<100%)	±2% rel.
^3He Polarization Accuracy (1%<P<100%)	±3% rel.
^{129}Xe Polarization Accuracy (3%<P<100%)	±5% rel.
^3He minimum detection (SNR=1 at 1 bar)	0.1%
^{129}Xe minimum detection (SNR=1 at 1 bar)	1%
Field magnitude	0 - 30G

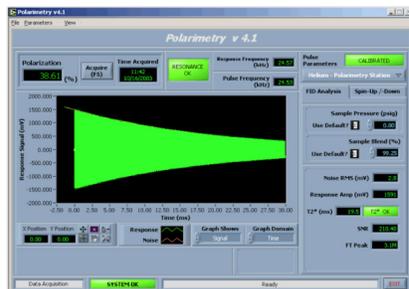
* Specifications provided assuming gas at standard pressure in Polarean gas sample bag and using default pulse parameter sets.

System Components

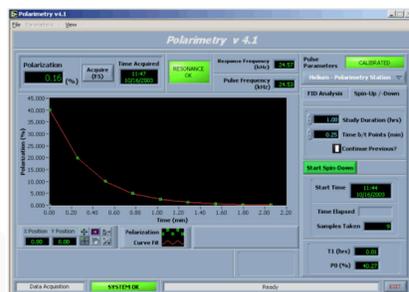
- 24" Helmholtz Coils
- Precision-wound NMR surface coil
- Low-field NMR Circuitry (24kHz)
- Polarimetry 4.3 software interface
- Adjustable power supply
- Dose bag positioning for reliable measurements
- Q-switched NMR circuit operable at 25kHz or 60kHz (nominal values)
- Precision layer wound NMR coil
- Dose bag positioning for reliable measurements
- Polarization analysis software
- File saving and retrieval

Optional Services

- Annual re-calibration services



Analyze FID's in time or frequency domains



Track polarization over time to measure decay rates

Dimensions

- Keyboard in:
60cm D x 70cm W x 170cm H
(22" D x 26.5" W x 65.5" H)
- Keyboard out:
120cm D x 70cm W x 170cm H
(46" D x 26.5" W x 65.5" H)

Laboratory Space Requirements

- Minimum room dimensions:
 - width 50" (1.3m)
 - depth 100" (2.6m)
 - height 84" (2.2m)
- Ferrous materials to be at least 3' (1m) away from the polarization measurement station
- Local ambient magnetic field preferably less than 1 Gauss

Electrical Requirements

- 115V, 60 Hz, 20A
- NEMA 5-20R receptacle

Environmental Requirements

- 100W maximal power load
- Room temperature between 68-75 °F (20-24 °C)