

EV1-LNA TEMPERATURE CONTROL



Description

The Model EV1-LNA provides the ADE Vibrating Sample Magnetometers with the fastest and easiest to use temperature control system on the market.

Where competitive temperature control systems typically require a separate setup for low and high temperatures, ADE has managed to integrate low and high temperature operation in one single all quartz sample chamber.

Low System Noise

The all quartz & platinum design of the EV1-LNA ensures minimal impact on the noise performance of the system in the most common system setup. Because of this, the system noise at temperature with the EV1-LNA temperature control is 3 times lower than the VSM noise of any competing system. EV series VSMs will achieve a system noise of 2.5 μ emu with the temperature option in place, at 0.1 s per point!

High Maximum Field

The EV1-LNA system is designed in such a way that the impact on maximum system field is minimized. Because of this the EV series VSMs consistently have significantly higher maximum fields at temperature than competing systems.

Temperature Range

The EV1-LNA provides a continuous temperature range from 100 K – 1000 K all with the same hardware setup. Competing systems require a hardware change from cryostat to oven in the middle of your temperature sequence. This type of hardware change is not only cumbersome and time consuming, it may also cause discontinuities in the measurement data.

Ease of use

The EV1-LNA system was designed with ease of use as one of the primary design goals. The sample temperature chamber is mounted on a vertical slide. Quick and easy changes between room temperature and low/high temperature measurements can be made by simply sliding the temperature chamber in place. Switching between room temperature and high temperature measurements can be accomplished in a few seconds.

Samples may be heated to 1000 K in 2 minutes and cooled to liquid nitrogen temperature in 5 minutes. No sample chamber vacuum is required, so changing samples can be almost as fast as at room-temperature operation.

Automatic execution of complicated temperature experiments is standard for this system. All tested parameters may be plotted vs. temperature in the system's powerful software.

- ◆ Temperature range 77 K to 1000 K
- ◆ One single temperature chamber for low and high temperature experiments
- ◆ Easy sample changes
- ◆ No pumping/ vacuum required
- ◆ Fields to 2.7 Tesla
- ◆ Minimal impact on noise performance
- ◆ Sensitivity with temperature chamber in place 0.5 μ emu



Model EV1-LNA specifications

Range	Mode	Resolution	Stability
77 K Fixed	Nitrogen gas	0.01 K	0.1 K
90 K to 600 K *	Nitrogen gas cooled by liquid nitrogen	0.01 K	5 K*
110 K to 600 K	Nitrogen gas cooled by liquid nitrogen	0.01 K	0.2 K
300 K to 500 K	Nitrogen Gas or Argon Gas or Air	0.01 K	0.2 K
300 K to 600 K	Nitrogen Gas or Argon Gas	0.01 K	0.2 K
300 K to 1000 K	Argon Gas	0.01 K	0.2 K

*Due to phase changes of the gas (between liquid and gas) it may be difficult to achieve a stable temperature for temperatures below 100K. By making the proper adjustments, a stable temperature can be reached for values above 100K.

Required gas

- Argon
- Nitrogen (99.95% pure for measurements below room temperature)

Gas Pressure

80 PSI (5.5 bar)

Gas flow rate

10-20 SCFH (Standard Cubic Feet per hour (5-10 l/min)

Liquid Nitrogen required for experiments below room temperature

Maximum sample size

The sample space is a cylinder of 10 mm diameter.
8 disk or cylinder.

Rectangular samples: 8 mm largest dimension (vertically mounted)

Square samples 5.5mm x 5.5 mm (horizontally mounted)

Maximum field at low or high temperature

EV 5 VSM	1.5 T
EV 7 VSM	1.7 T
EV 9 VSM	2.1 T
EV 11 VSM	2.7 T
Model 10 VSM	2.2 T (optimal vector performance at 2.0 T)

Noise at temperature

	0.1 sec per point	10 sec per point
EV 5, EV 7, EV 9	2.5 μ emu	0.5 μ emu
EV 11, Model 10 VSM	5.0 μ emu	0.5 μ emu