

SPECIFICATIONS

LINSEIS has developed the LSR-3 Platform as a powerful and comprehensive tool for the characterization of thermoelectric materials (bulk as well as thin films). Both, the Seebeck-Coefficient and Electrical Conductivity / Resistivity can be measured fully automatically and simultaneously up to a maximum temperature of 1500°C. The platform can be equipped with a variety of different accessories and options (including high-resistance, low-current, camera, thin film and many more).

LSR-3

Sample holder	Sample is sandwiched between two electrodes (at least one electrode can be heated). Optional adapter for thin films and foils.
Temperature Range	Infrared furnace: RT to 800°C/1100°C Resistance furnace: RT to 1500°C Low temperature furnace: -100°C to 500°C
Heating rate	0.01 to 100 K/min (Infrared furnace) 5 to 10K/min (Resistance furnace) up to 10K/min (Low temperature resistance furnace)
Temperature precision	+/- 1.5K or +/- 0.25% (full range)*
Sample size (Cylindrical or Bar shaped)	2 to 5 mm footprint and max. 23 mm long up to 6 mm in diameter and max. 23 mm long
Sample size (Disc-shaped)	10, 12.7, 25.4 mm
Measuring Range	
Seebeck-Coefficient	1µV/K to 250mV/K (static dc method)
Electric Conductivity (Four-probe method)	0.01 to 2x10 ⁵ S/cm <i>(optional: high resistance option up to 200 MOhm, and low current option for currents as low as 0.1 mA)</i>
Resolution	
Seebeck-Coefficient	10nV/K
Resistivity	10nOhm
Accuracy	
Seebeck-Coefficient	+/-7%
Resistivity	+/-10%
Repeatability	
Seebeck-Coefficient	+/-3,5%
Resistivity	+/-5%
Vacuum	10E-3 mbar

Atmosphere	Inert, reducing, oxidizing, vacuum Low pressure helium gas recommended
Power requirement	LT/800°C/1500°C: 230V/208V; 16A; 50Hz/60 Hz 1100°C: 3*230 V / 3*16 A (3 Phase)
Electrode material:	Nickel (-100°C up to 500°C) Platinum (-100°C up to 1500°C)
Thermocouples:	Type K/S/C
Options:	Harman option for direct ZT-determination Camera option for superior resistivity measurement accuracy Thin film Adapter / Foil Adapter (free-standing films) Low-current option for currents as low as 0.1mA (rec. for thin films) High-Resistance option for samples with a resistance up to 200MΩ
Linseis Package	Software Including configuration wizards, connection test, IV-plotting options, automatic data evaluation, comprehensive plotting capabilities and many more.

*depends on utilized thermocouple