H91 Thermal Hall-Effect System

Miniature Instec probing stage with the Lakeshore M91 FastHall controller

DESCRIPTION

For applications requiring electrical device or material characterization, Instec is proud to offer our modular **H91 Hall Effect Measurement System**. The H91 system is a combination of a temperature and environmentally controlled test cell from Instec, and the powerful M91 FastHall controller from Lakeshore. Synchronize electrical measurements with temperature control to study temperature dependent phenomena via Lakeshore's MeasureLINK Software. Choose from a number of temperature control options, accessories, and magnetic field options to optimize system performance for any sample or application.

KEY FEATURES

Instec Test Cells – Precision Temperature Control

Choose between the 3 options for temperature and environmental control test cells from the Instec -PM or -MP family, including

- **H91-Gyz** [-190°C* to 600°]
- **H91-Vyz** [-190°C* to 400°C under vacuum]
- **H91-HTyz** [Room Temp to 1000°C]

Each test cell includes 4x or 6x manually positioned cantilever probers (also compatible with wire bonded samples), and an mK2000B temperature controller.

**Cooling below room temp requires optional LN2 cooling system*

Basic H91 characterization system utilizing Instec HCP621G-PMH probing stage(H91-G Option), mK2000B temperature controller, and Lakeshore M91 FasHall controller

Lakeshore M91 FastHall Controller

The MeasureReady® M91 is an immensely powerful and versatile all-in-one Hall Effect measurement system. With automated measurement optimization, fast measurement speeds, and easy to use interface, the M91 makes analyzing samples under 4-point or Hall Bar incredibly simple. Measure up to 10Mohm with the standard model, or up to 200Gohms with the HR model.

- **H91-xy Standard M91**
- **H91-xy-HR High-resistance capable M91**

Use the M91 to measure a number of properties:

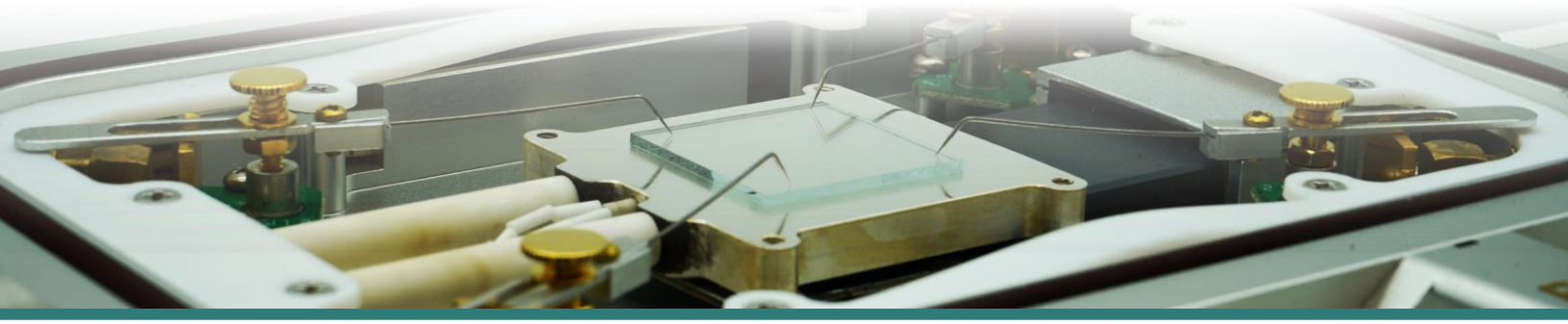
- 2 wire resistance
- 4 wire resistance
- Sheet Resistance
- Contact Check
- Hall Voltage
- Mobility
- And More!

Magnetic Field Application Options

Hall-effect measurements require a strong and uniform magnetic field. Provide your own magnetic field source, or choose between a permanent magnet, or upright electromagnet system. All test cells utilize water cooling to keep the frame as compact as possible no matter the temperature range or magnetic field option.

MeasureLINK Software Integration

Control the Instec mK2000B temperature controller via Lakeshores MeasureLINK software Via the INSTEC Application Pack. Automate device measurement along with temperature control and magnetic field application. Plot, analyze or export data as needed.



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Instec Probing Chamber Options and Specifications

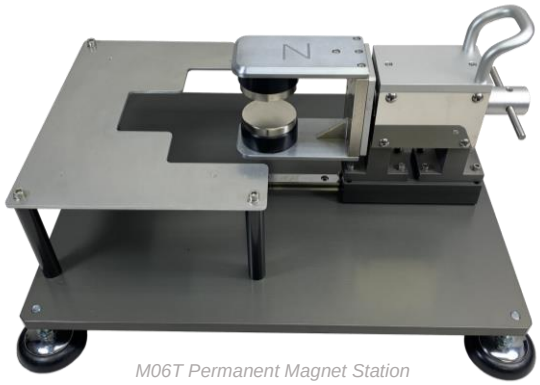
Optimize system performance for any application

Test Cell Package	H91-Gyz (HCP621G-PMH)	H91-Vyz (HCP421V-MPH)	H91-HTyz (HP1000V-PMH)
Non-paramagnetic construction (50mm radius around sample area)	✓	✓	✓
Temperature Controller	LVDC Output mK2000B		
Power Requirments	150W max		650W max
Temperature Range	-190°C to 600°C	-190°C to 400°C	Room Temperature to 1000°C
Cooling Method	LN2 Circulation		No Active cooling
Temperature Sensor	Embedded 100 Ohm RTD		Embedded S-type thermocouple
Temperature Resolution	0.01°C		0.1°C
Temperature Stability	±0.05°C (>25°C), ±0.1°C (<25°C)		±1°C
Max Heating Rate	+30 °C/m @100°C	+30 °C/m @100°C	+50 °C/m <850°C, +20 °C/m>850°C
Max Cooling Rate	-50°C/m @100°C	-50°C/m @100°C	N/A
Thermal Block Material	Silver		Silicon Carbide
Electrical Probers	4x or 6x hand positioned electrical probers		
Electrical Prober Connections	Triaxial BNC		
Optical Access	Visual access via reflection (transmission aperture available with custom order*)		
Minimum Objective Working Distance	8mm		8.8mm
Observation Window	Ø18mm viewing aperture (Ø22mm x 1mm Glass)		Ø38mm viewing aperture (Ø42mm x 1mm Glass)
Top Viewing Angle	±48°		±60°
Window Defrost	External Window Defrosting Fixture		
Sample Area	42mm x 38mm	42mm x 38mm	25mm x 25mm
Inner Chamber Height	5.5mm		6mm
Atmospheric Control Ratings	Gas purge: 0.5 BAR Rough Vacuum: 1mBar	Gas purge: 0.5 BAR Low Vacuum: 10uBar High vacuum Upgrade: 10nBar	Gas purge: 0.5 BAR Low Vacuum: 10uBar High vacuum Upgrade: 10nBar
Frame Cooling	Integrated water block for frame cooling with optional chiller system (recommended above 200°C)		Integrated Water block for frame cooling (required above 200°C)
Mounting	Standard models Include tapped holes on frame and removable L-brackets Mounting adaptors for specific instruments available by request		
Appx Frame Dimensions	180mm x 130mm x 26.5mm	174mm x 180mm x 25mm	180mm x 130mm x 26.5mm
Weight [Aluminum Frame]	1500g		1550g

Magnetic Field Options

The M06T permanent magnet station provides a convenient method for applying a magnetic field to samples for hall effect measurements. The 0.5T permanent neodymium magnet can be flipped to reverse the field direction for non-FastHALL measurements.

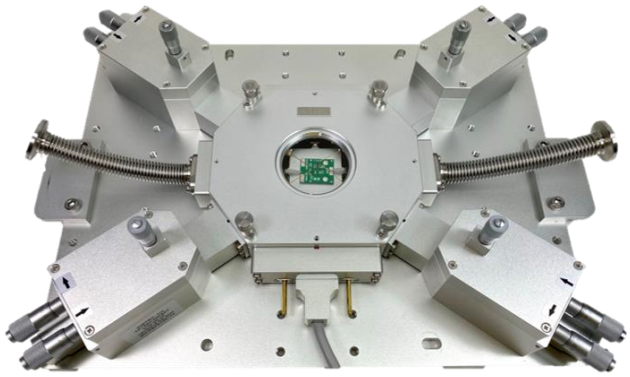
For higher strength magnetic fields, or for variable field measurements, several variable electromagnetic field sources are available. Contact Sales@instec.com for more information about electromagnet systems.



M06T Permanent Magnet Station

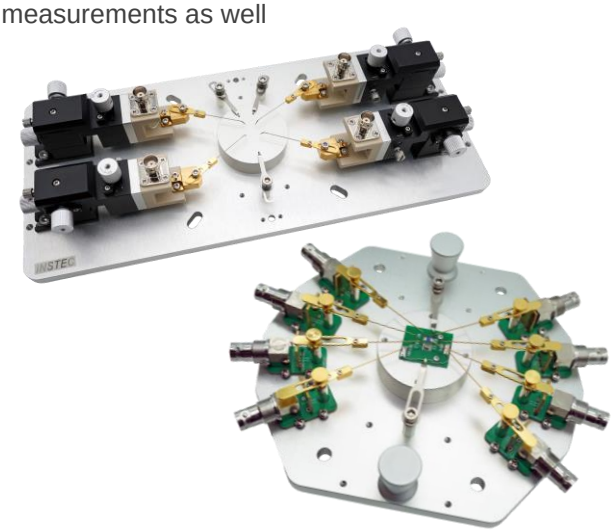
- **H91-x0** No Magnetic Field Source
- **H91-x1** 0.5T Permanent Magnet M06T
- **H91-x2** 0.5T Electromagnet Station
- **H91-x3** 1.5T+ Electromagnet Station

SIMILAR PRODUCTS



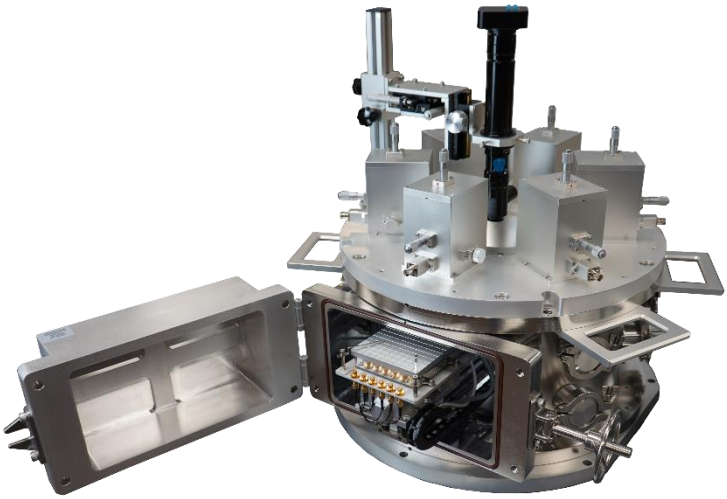
-MPS Modular Probing Stations

Heating and cooling stations available with all the same temperature control options as the -PM series. -MPS probing stations are highly flexible and customizable for any application. -MPS models offer up to 8 electrical probers- either externally adjustable probers or fixed manual probers. Gas tight and vacuum tight chamber options are available for condensation prevention or environmental condition testing. By request, some -MPS system can be configured for Hall Effect measurements as well



P02S-PM Benchtop Probing Solutions

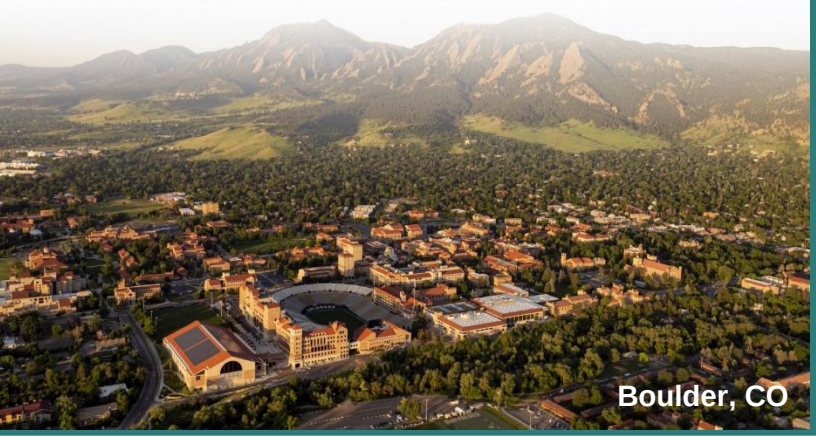
P02S-PM system are convenient benchtop tools for light-duty electrical probing. The base model P02S-PM includes spring-loaded probers for quick and easy probe landing, while the upgraded -XYZ variant includes miniature XYZ controllable probers for smaller pads. With customizable prober layouts, easy customizability, and a low price point, these benchtop probers can serve as a great alternative to full-size probing solutions. Optional thermal chuck add-ons may be available to add temperature control capabilities.



Custom Probing Chambers

such as the TP104V-MPS+ offer powerful features for semi-automatic probing on a large scale. Motorized sample XYZ combined with externally positioned overhead probers enable on-wafer testing under vacuum with simultaneous precision temperature control. Optical access via an overhead window easily accommodates a tube microscope for probe landing.

About Us



INSTEC
FOCUS ON EXCELLENCE

INSTEC is a scientific instrument (INS) technology (TEC) company focused on precision thermal control.

Founded in 1984 by a group of pioneering liquid crystal physics researchers from the University of Colorado Boulder, our goal is to create unique scientific instruments in diverse fields and industries.

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