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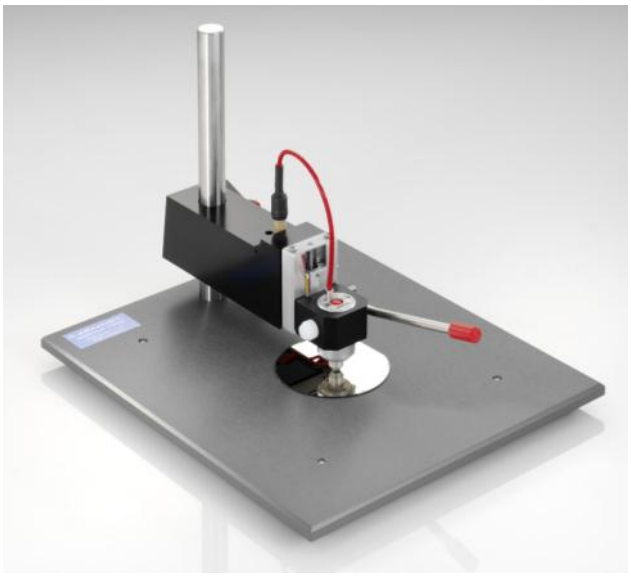
JANDEL ENGINEERING LTD.

General Purpose Four-Point Probing System

Multi Height Probe with RM3000 Test Unit



The Multi Height Probe combined with the RM3000 Test Unit is our most popular combination for use in measuring a wide range of materials and sample sizes.

The probe portion of the system, the Multi Height Probe, comprises a hard anodized aluminum base 25cm wide, 29cm deep and 0.8cm thick. A 19mm diameter stainless steel column 20cm high screwed to the base supports the probe head raising and lowering mechanism incorporating the vertical slide, operating lever shaft, and micro-switch. The vertical slide carries the probe-head, secured by a clamp screw. The probe-head is positioned so that the micro-switch does not pass current until the probes have made contact, lost motion ensures that the current is switched off before the probes are raised. The probe arm can be easily positioned on the vertical shaft to various heights to allow probing onto either flat materials or large or thick materials. For example, a shallow dish containing LN_2 could be placed on the base plate and the arm could be positioned to allow the probe to be lowered onto a sample submerged in liquid nitrogen. Materials up to 10" x 10" x 6" tall (or 12” x 12” x 6” tall - same price) can be positioned under the probe arm. If necessary, a taller vertical post can be supplied for use in measuring taller items. The Multi Height Probe can withstand temperature up to 150^{0}C. The Cylindrical probe head, one of which is included with the Multi Height Probe, can withstand temperatures from 77K up to 120^{0}C in it's standard configuration. A modification to the Cylindrical probe will allow it to withstand temperatures from 77K up to 200^{0}C in an oven, somewhat higher if used on a hotplate. The Multi Height Probe is limited to a150^{0}C temperature limit in an oven, but can be used with a hot plate at higher temperatures if certain precautions are taken.

Optionally, at no additional charge, the Multi Height Probe can be supplied with four mounting holes so that it can easily be upgraded in the future to add the 25mm travel X-Y sample stage with 76mm (~3") diameter vacuum hold-down sample chuck. The addition of the X-Y stage converts the Multi Height Probe into the Multi Height Microposition Probe.

The system incorporates the Jandel Cylindrical probe head which is built to high standards of quality and accuracy. A brochure regarding the Cylindrical probe can be found here:
http://www.fourpointprobes.com/jandelcylindrical.pdf

Information regarding the constructions and specifications of the Jandel Cylindrical probe can be seen here:
http://www.fourpointprobes.com/cylindrical_app_notes.pdf

The RM3000 Test Unit is a specialty electronics instruments designed specifically for the four point probe measurement. It features high accuracy, an excellent range, and many features which simplify the four point probing measurement. The following are features of the RM3000 Test Unit:

- The measurement range of the RM3000 Test Unit is from 1 milliohm-per-square (10^-3) up to 5 x 10^8 ohms-per-square with 0.3% accuracy. The volume resistivity range is from 1 milliohm-cm (10^-3) up to 10^6 ohms-cm (more conductive materials can be measured if in the form of a thin film).
- The RM3000 includes PC control software which can be used for data logging (storing data in the CSV format) and measurement conversion to ohms-per-square or ohms-cm.
- The RM3000 provides simultaneous readout of input current and either mV, ohms-per-square, or ohms-cm. Ohms-cm readout requires input of sample thickness for thin films, or tip spacing if measuring bulk samples.
- The RM3000 has onboard non-volatile memory so that up to 50 measurements can be stored internally and then downloaded and saved all at one time using the software. Alternately, each measurement can be saved to a PC as it is made.
- The RM3000 has an auto-range button that can be used to automatically determine the optimum input current for a given material without using the trial and error method.
- The RM3000 has forward (FWD) and reverse (REV) buttons to reverse the direction of current flow. A common way to determine if a measurement is valid is to reverse the direction of current flow and then check to see if the forward and reverse voltage readings correlate well, i.e., the values should be similar, but with the reverse current voltage being a negative value.
- The RM3000 allows input of correction factor when making sheet resistance or volume resistivity measurements
- The RM3000 interfaces with optional AFPP motorized Z-motion arm

SPECIFICATIONS

Superior Current Source

- 10nA to 100mA (99.999mA) current source selectable in steps to 5 decimal place resolution
- Current set numeric keypad
- 4 default preset current programs (user programmable)

Superior Inbuilt DVM

- Input Impedance 1,000,000,000,000 ohms
- Input Bias current 4pA
- DVM 1300mV range and 130mV range
- 130mV accuracy
- 0.2% +/- 5uV resolution (10uV or 1uV) range
- 1300mV accuracy 0.2%+/-100uV resolution
- 100uV Ohms/Square
- Rapid Zeroing null function for DVM

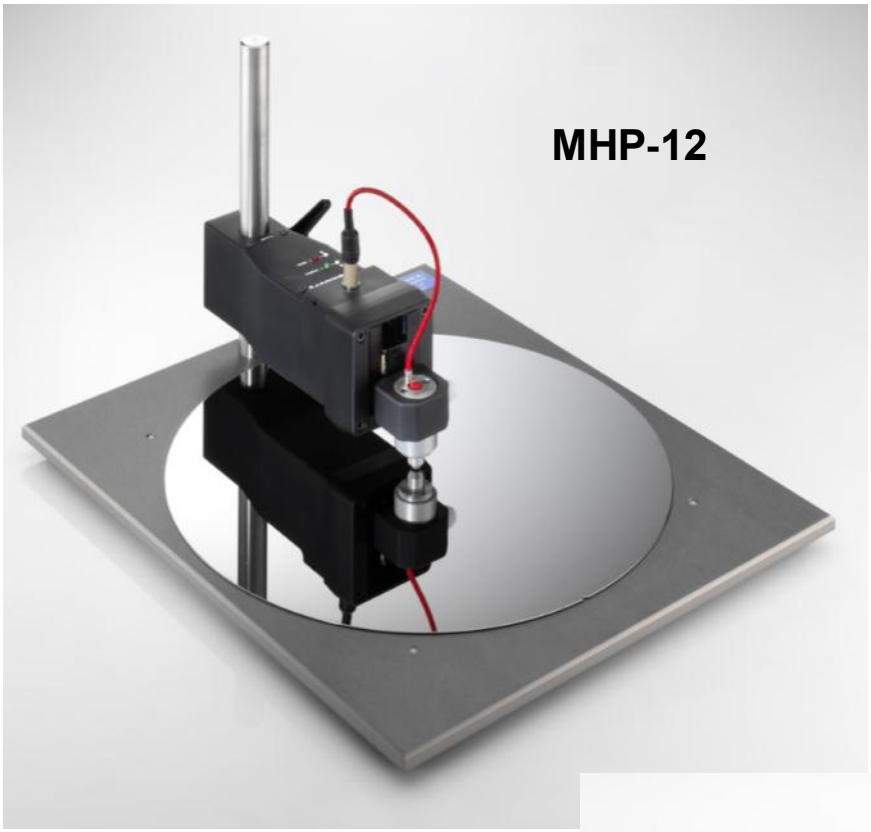
FEATURES

- 28 Key high quality Keypad
- 16x2 line LCD Display for simultaneous indication of Set Current and either
- Ohms/Sq, Ohms-cm, or mV
- Auto-Ranging capability to determine the optimum input current based upon the material being measured.
- Intuitive operation
- Microprocessor controlled
- Reduced Footprint
- Robust Attractive ABS Case
- Accurately measures down to 10's of milliohms/square without external meter
- 4mm socket facility to connect an external meter
- RS232/USB connectivity for control and for collecting data in CSV format

- Automatic compliance voltage limit protects your sample which reduces maximum voltage as higher currents are set 5-40V
- Warning messages when compliance limit is reached, or DVM input exceeded
- Self test facility
- Flash upgradeable software
- CE Marked
- AD/DA converters and amplifiers for the DVM and setting the Current source and DVM, are Burr Brown 110V or 240V operation (selectable)

Downloads:
Instruction manual (476K PDF file) for the Multi Height Probe
A high resolution image of the Multi Height Probe
Instruction manual (688K PDF file) for the RM3000 Test Unit

Click here to request a price quotation for the Multi Height Probe combined with the RM3000 Test Unit:
sales@bridgetec.com



Multi Height Probe with Optional Large Base Plate for Probing Substrates up to 12” x 12”

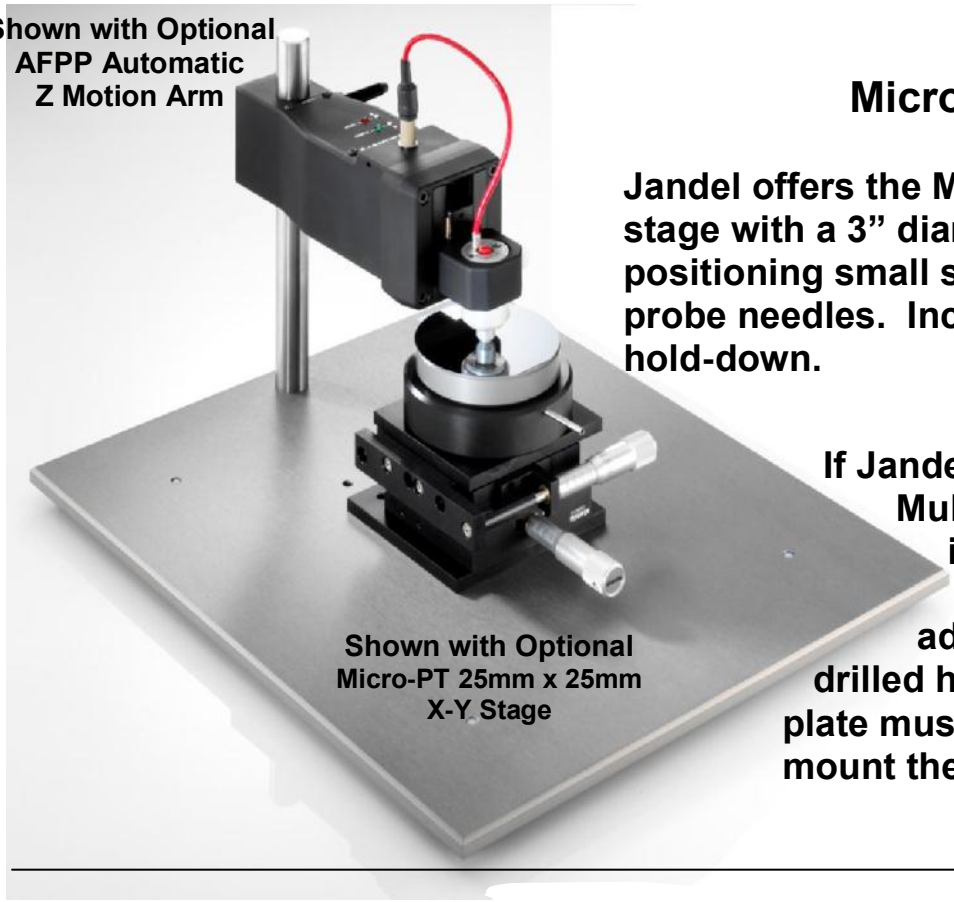
Same Price as 10” x 10” sample Base Plate.

Shown with Optional AFPP Motorized Z Motion Arm

One Jandel Cylindrical probe is included with the Multi Height Probe

Jandel RM3000 Test Unit

Multi Height Probe Sample Stage Options



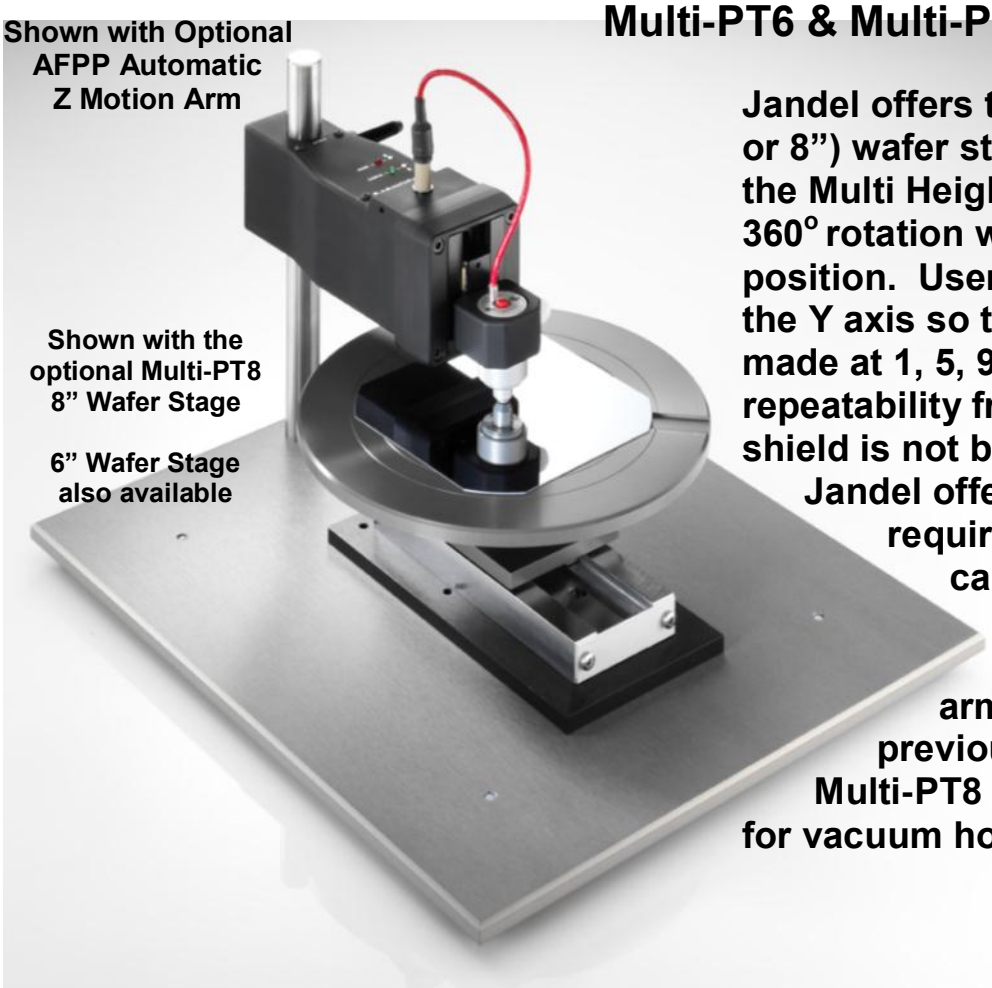
Shown with Optional AFPP Automatic Z Motion Arm

Shown with Optional Micro-PT 25mm x 25mm X-Y Stage

Micro-PT Stage Option

Jandel offers the Micro-PT 25mm (1") travel X-Y stage with a 3" diameter wafer chuck for use when positioning small samples under the four point probe needles. Included is the facility for vacuum hold-down.

If Jandel knows in advance that the Multi Height Probe may be upgraded in the future to add a sample stage, it can be supplied at no additional charge with the pre-drilled hole pattern. Otherwise, the base plate must be returned to the factory to mount the 1" travel stage.



Shown with Optional AFPP Automatic Z Motion Arm

Shown with the optional Multi-PT8 8" Wafer Stage

6" Wafer Stage also available

Multi-PT6 & Multi-PT8 Wafer Stage Options

Jandel offers the Multi-PT6 and Multi-PT8 (6" or 8") wafer stages as an option for use with the Multi Height Probe. The wafer stage has 360° rotation with detents at each 90 degree position. User defined detents are set along the Y axis so that measurements can be made at 1, 5, 9, or more positions with 1mm repeatability from wafer to wafer. A light shield is not built into the system, however, Jandel offers a black cloth light shroud if required. The probe Z motion arm can be either the motorized version as shown here, or the manually raised and lowered arm as shown at the top of the previous page. The Multi-PT6 and Multi-PT8 wafer stages include a facility for vacuum hold-down for the wafer.