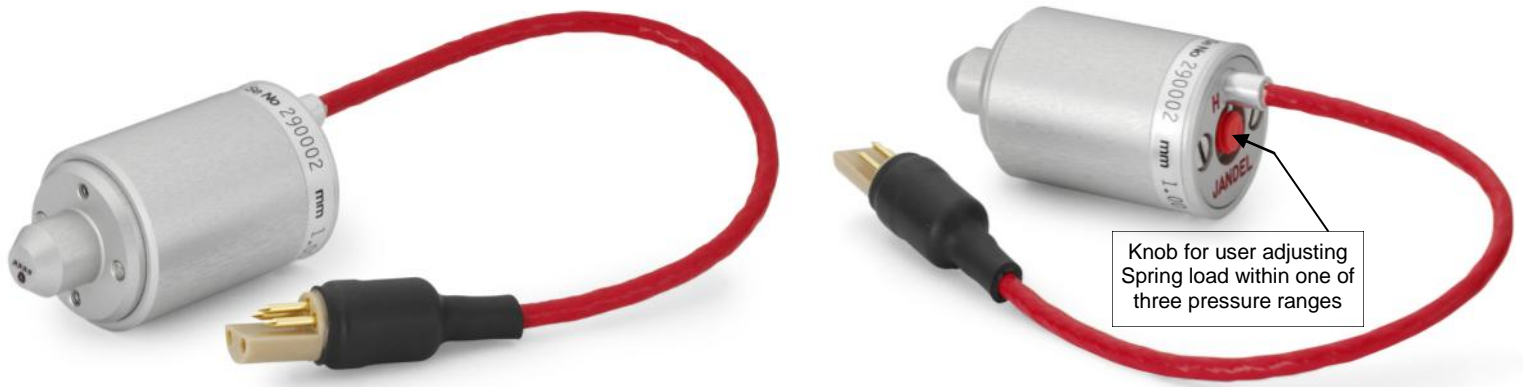


JANDEL Engineering Limited Cylindrical Four-Point Probe Head



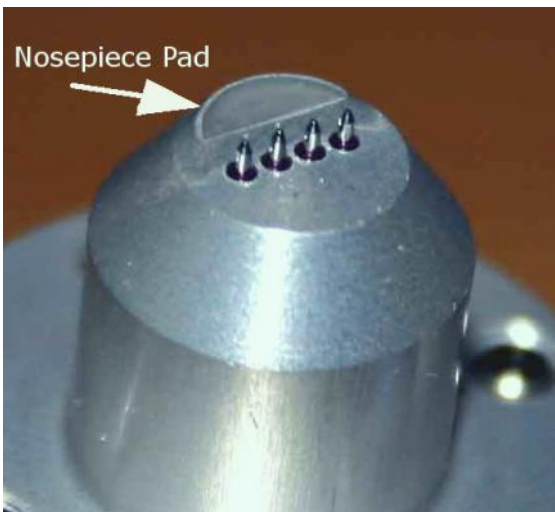
JANDEL ENGINEERING LTD. manufactures the Cylindrical probe to be compatible with the Jandel Multi-position Wafer Probe, the Hand Applied Probe, the Microposition Probe, the Multi Height Probe, the Multi Height Microposition Probe, as well as various OEM wafer mapping systems. It can be built into custom engineered four point probing systems using the [mounting adaptor](#) which Jandel offers. All Jandel probes are built to a high level of mechanical accuracy. Specifications for radii, spacing, and planarity are verified by video inspection system and optical interferometer. Loads are verified by electronic force gauge. Each probe is fitted with both an upper and lower jeweled needle guide. Additional information about probe quality can be found in the [Jandel probe head application notes](#).

The Cylindrical probe is available in [a version usable in a vacuum environment](#). In it's standard configuration it can withstand temperatures from 77K up to 120°C, and it is available in a modified version for use at temperatures up to 200°C in an oven (300°C on a hot plate). It has a 1" diameter body and is 1.9" high (25.4mm x 48.5mm high). Weight is 40 grams.

PROBE SPACING	25 to 50 mils (0.635mm to 1.27mm) in 5 mil (127 micron) increments, also 1.0mm and 1.59mm. 20 mil (0.5mm) available on special order.
TOLERANCE	+/-0.01 mm
ARRANGEMENT	Linear or Square array
NEEDLES	Solid Tungsten carbide Ø 0.40 mm (Ø 0.30 mm for close-spacing) 45 degree included angle, phosphor-bronze connecting ligament
OTHER MATERIALS	50% osmium alloy tips available
RADII	12.5 µm min. to 500 µm max. polished with 2 µm diamond
RETRACTION TO INSULATING PAD	0.5 mm
PLANARITY	+/- 0.025 mm or better
LOADS	Low: 10-30g, Medium: 30-60g High: 60-150g
LEADS	4-way cable Teflon insulated (screened on cylindrical)
ELECTRICAL LEAKAGE	10 ¹³ ohms resistance between needles at 500 volts

Cylindrical Probe Tip Pressure Adjustment

The Jandel Engineering Cylindrical Probe has user adjustable tip pressure within one of three ranges. The probe can be purchased with a tip pressure range of either 10 to 30, 30 to 60, or 60 to 150 grams of force per tip. Within a given range, the user can adjust the pressure by turning the small red knob on the top of the probe either clockwise so that it increases the pressure, or counterclockwise to decrease the pressure. In the case shown here, this is a "60+" probe which has the range of 60 to 150 grams of pressure, and which has been factory set to 100 grams of force per tip. One can take a pointed object such as paperclip and gently turn the red knob by pushing the small metal peg located on this probe at the 6 o'clock position. Turning the knob counterclockwise towards the "L" will lower the pressure to a minimum of 60 grams. Turning the knob clockwise towards the "H" will increase the tip pressure up to a maximum of 150 grams. One can mark the body of the probe with an ink pen to record the location at which the pressure was originally set.



Jandel Cylindrical Probe Nosepiece Pad

The nosepiece pad on Jandel four point probe heads is made of acrylic. The pressure for each tip is individually set using a custom made electronic force gauge to insure an accurate tip pressure, or "load". The process of adjusting each probe includes lowering the probe head until the nosepiece pad has touched the material under test. At this point, where each tip has fully retracted into the probe body, the factory set spring load is set. For example, if a probe is to be set to 100 grams, once adjusted, each tip will be exerting 100 grams of force at the point where the probe head has been lowered until the nosepiece has touched the material.

The probe to the left has been fitted with a jeweled nosepiece pad instead of the acrylic pad. The standard operating temperature range for the Cylindrical probe is from LN₂ temperature (77K) up to approximately 120°C. For a nominal fee, minor modifications can be made which include the use of high temperature solder and replacing the standard nosepiece pad with a jeweled pad which increases the operating temperature up to 200°C, for use in an oven. The probe can withstand up to 300°C if used for short periods of time on a hot plate in the open air.



Small Shroud

The Jandel Cylindrical probe can be supplied with the **Small Shroud** which is fitted onto the nose-piece. It is designed to help steady the probe when applying the probe head by hand.

Small Shroud Mounted onto the Nosepiece of a Cylindrical Probe



Each shroud is turned and then hand fitted to match the nosepiece it is supplied with. The small shroud should also fit other probes of the same type (e.g., you could move it from one Cylindrical to another, but not necessarily from a Cylindrical to a Compact). The shroud is adjusted so that it fits the height of the pad on the probe it is supplied with - therefore if moving it from one cylindrical to another there may be a small change in load applied if the two probes have different pad styles or pad thicknesses, or if the tip retraction distance for one probe was different from the other. Probe tip retraction for the Cylindrical probe is standard at 0.5mm which is measured at the point where the pad touches the material being measured. This is for informational purposes as it really shouldn't affect day-to-day usage.

Custom Nosepieces



Jandel can supply customized nosepieces to satisfy special requirements. Shown here are an acrylic nosepiece, a beveled nosepiece, and a nosepiece with a rectangle probe tip array instead of the usual linear or square array.