

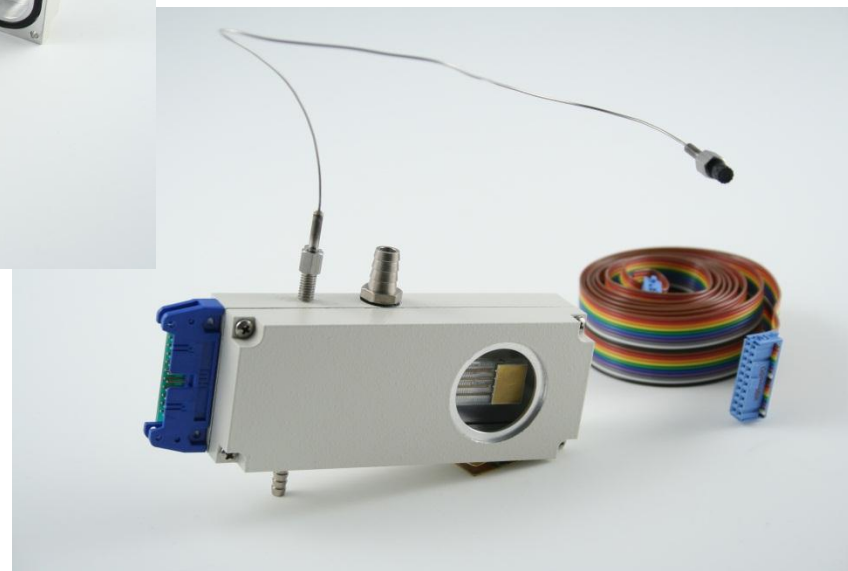
The background features a series of overlapping, curved lines in shades of blue and red, creating a sense of motion and depth. The lines are thicker in some areas and fade out in others, giving a dynamic, swirling effect.

OPTICAL PROPERTIES MEASUREMENT SYSTEMS

TYPES OF OPTICAL EXPERIMENTS

- Transmission
- Reflection
- Refraction
- Sideways propagation
- Raman
- Laser Studies
- Absorption

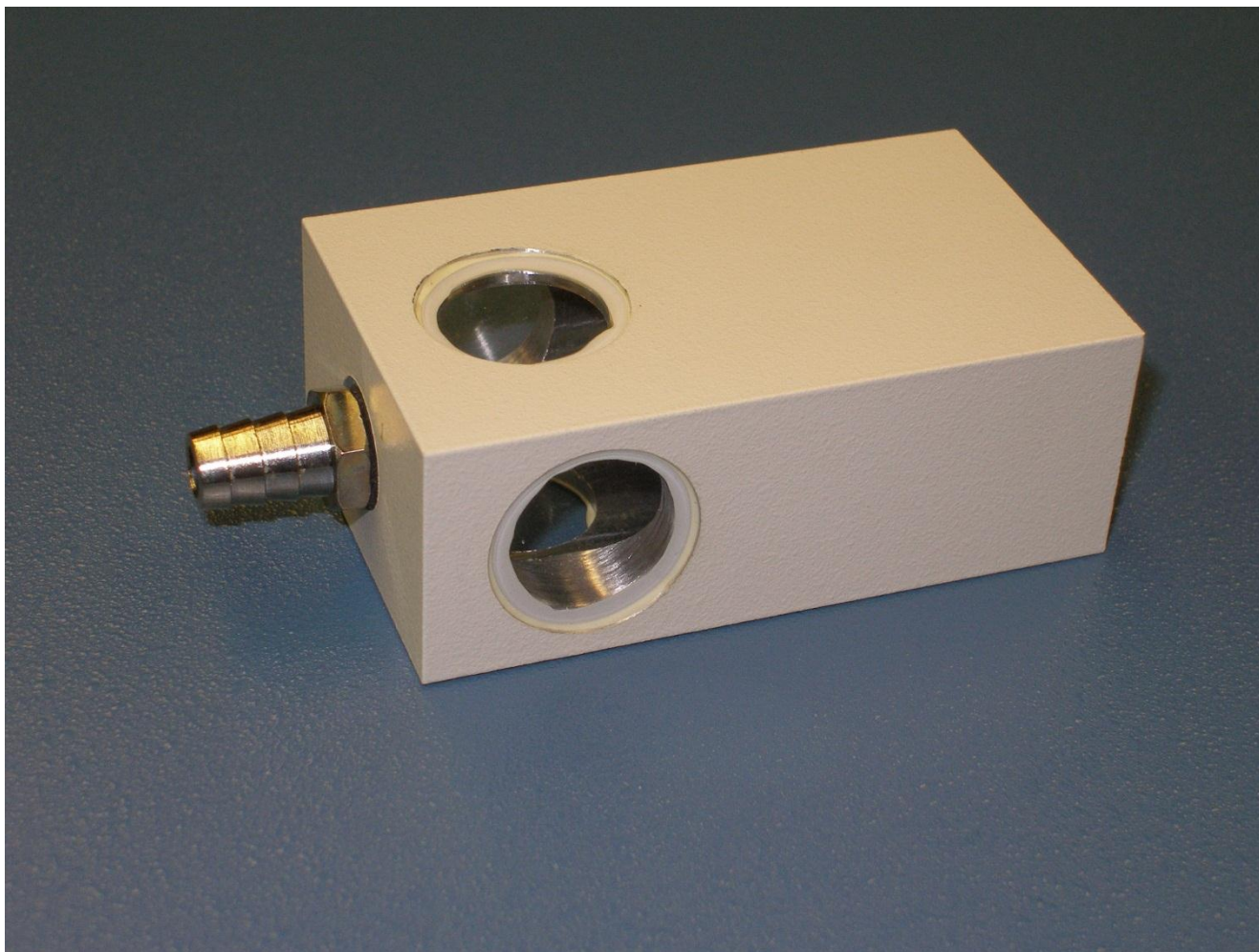
SYSTEM I AND SYSTEM IT



SYSTEM II



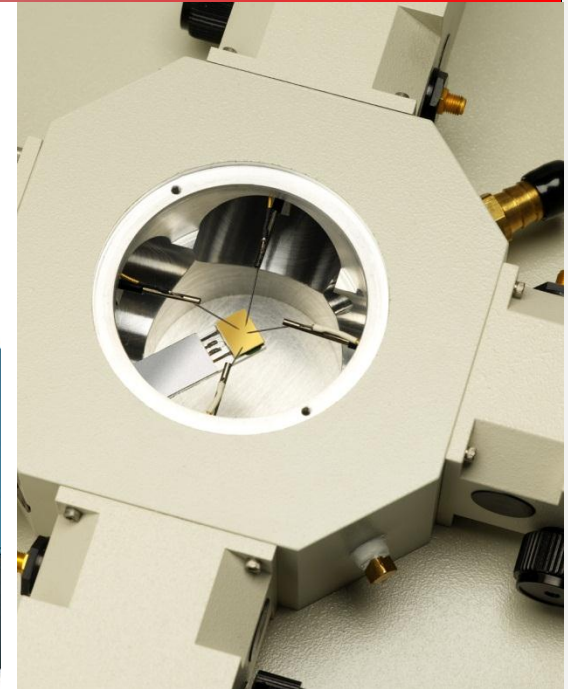
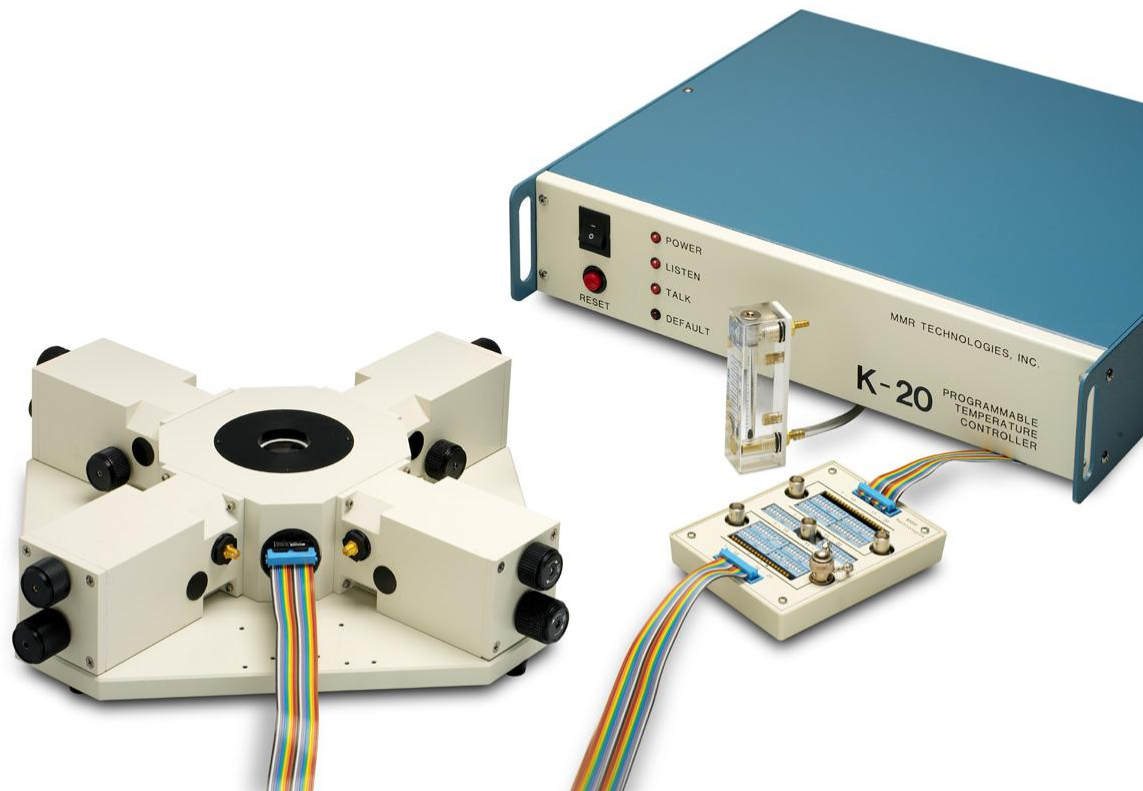
SYSTEM IIB RAMAN SPECTROSCOPY



SYSTEM IIT OPTICAL TRANSMISSION



THE VTMP/LTMP SYSTEM



CHOOSING AN OPTICAL SYSTEM

INSTRUMENT TYPE	WORKING DISTANCE	REFLECTION EXPERIMENTS	REFRACTION EXPERIMENTS	TRANSMISSION EXPERIMENTS	RAMAN EXPERIMENTS
System I	6 mm or 12 mm	yes	yes	no	no
System II	(with Interleaf - 25 mm or 31 mm)	yes	yes	yes	no
System IIB	12 mm	yes	yes	no	no
System IIB Raman		yes	yes	possible with special chamber ^a	yes
System IIT	3 mm or 6 mm	yes	yes	yes	possible with special chamber ^b
Microprobe ^c	29 mm	yes	yes	possible with special plate ^d	no

- A modification on the standard Raman chamber can give a chamber with three windows instead of three.
- A special System IIT chamber can be made with two removeable window mounts on the top and the bottom and two fixed-side windows.
- The Microprobe system is mentioned here but will not be covered in detail. For further detail, refer to 'Variable Temperature Microprobe (VTMP / LTMP) Systems' on page 3-1.
- The Microprobe chamber can have a special bottom plate to allow transmission experiments.

COMPONENTS IN AN OPTICAL SYSTEM

- Pure high-pressure gas (greater than 1800 psi)
 - Gas Lines, Pressure Gauge, etc
- Filter/Dryer Apparatus
- Refrigerator
- Computer
- Temperature controller
- Circuit Breakout Box
- Vacuum Pump
- Vacuum Chamber

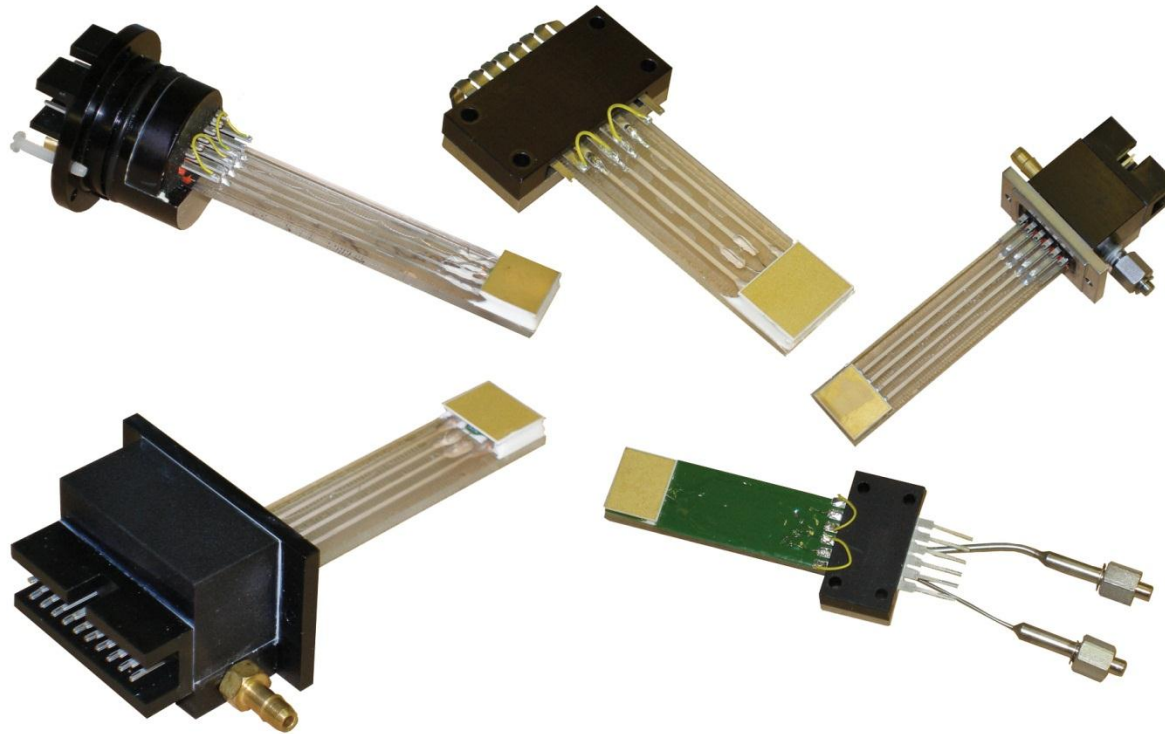
GAS, LINES, GAUGES, ETC

- 99.998% Prepurified Nitrogen at 2640 psi or higher
- High Pressure Nitrogen Regulator
- High Pressure Nitrogen Lines (supplied)
- Gas Flow Meter (supplied)

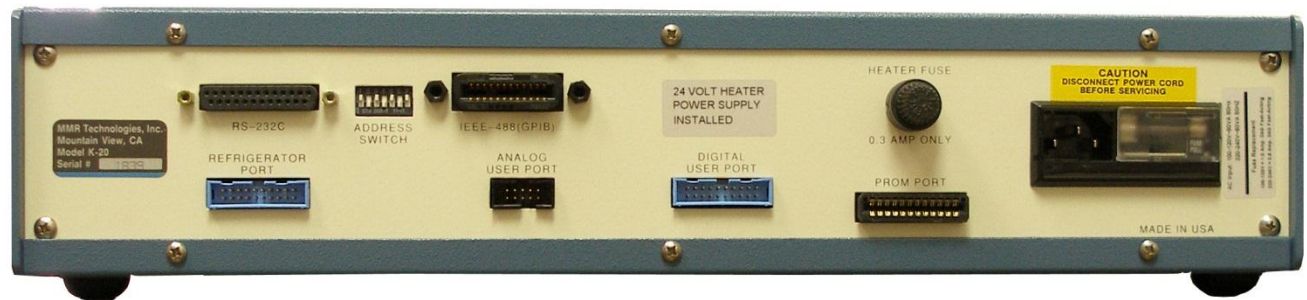
FILTER/DRYER SYSTEMS



THE JOULE-THOMSON REFRIGERATORS



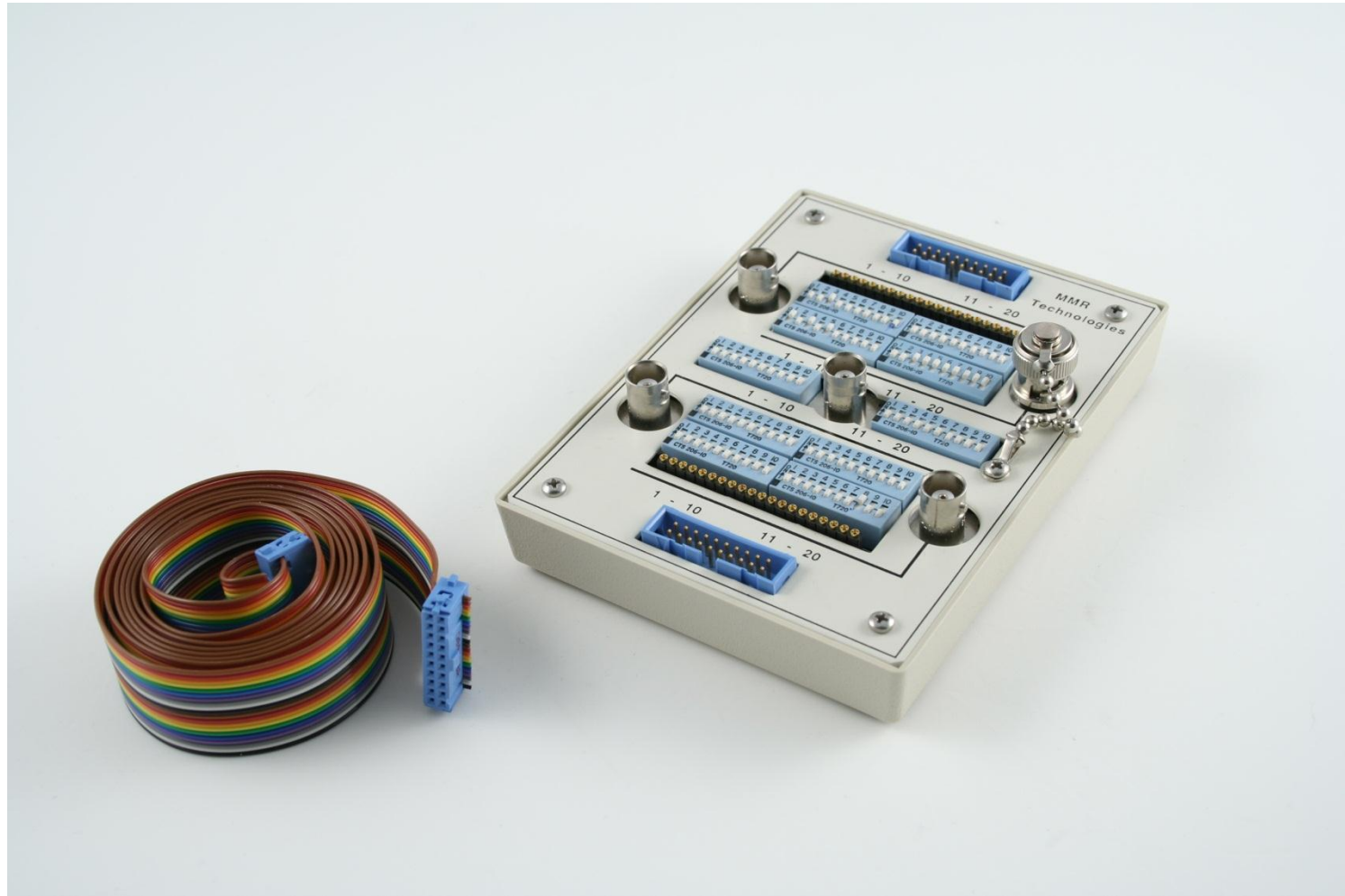
K-20 PROGRAMMABLE TEMPERATURE CONTROLLER



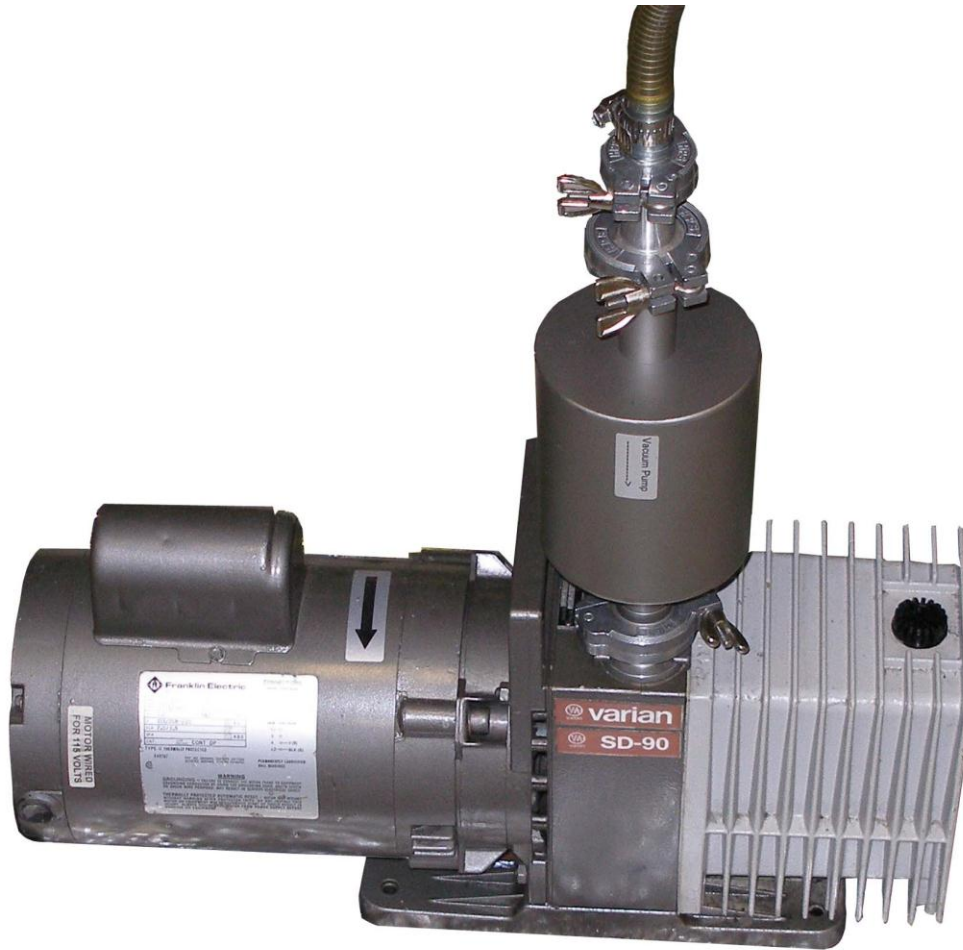
COMPUTER SYSTEM

- Pentium Processor, 1 GHz minimum
- CD-ROM Drive (4x)
- 250 MB RAM
- 50 MB free on hard drive
- 1 RS232 Serial Port or USB Port

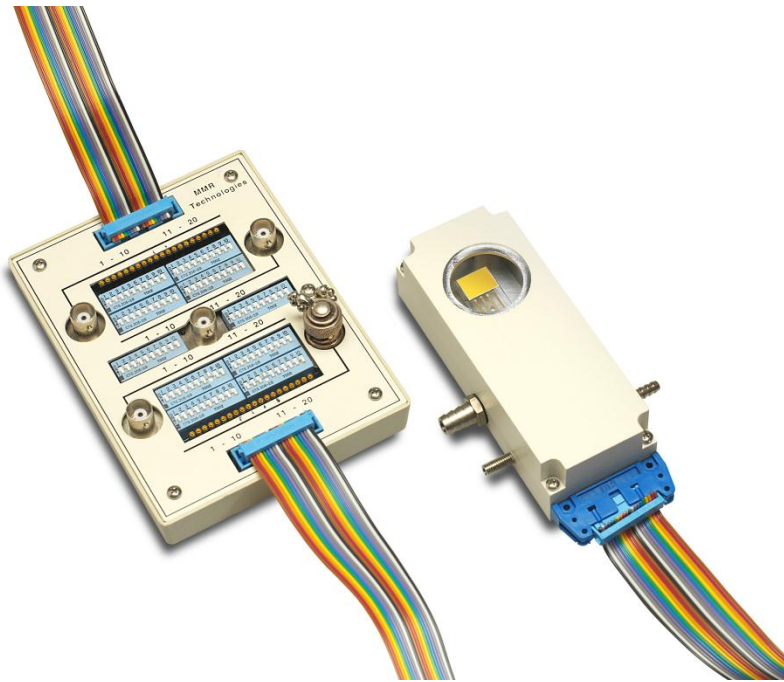
CIRCUIT BREAKOUT BOX



VACUUM PUMP AND ACCESSORY KIT



VACUUM CHAMBER



POSSIBLE TEMPERATURE RANGES

Kelvin Scale

- 70 K to 580 K
- 80 K to 580 K
- 70 K to 730 K
- 80 K to 730 K
- 300 K to 730 K

Centigrade Scale

- - 200 °C to 305 °C
- - 190 °C to 305 °C
- - 200 °C to 455 °C
- - 190 °C to 455 °C
- 25 °C to 455 °C

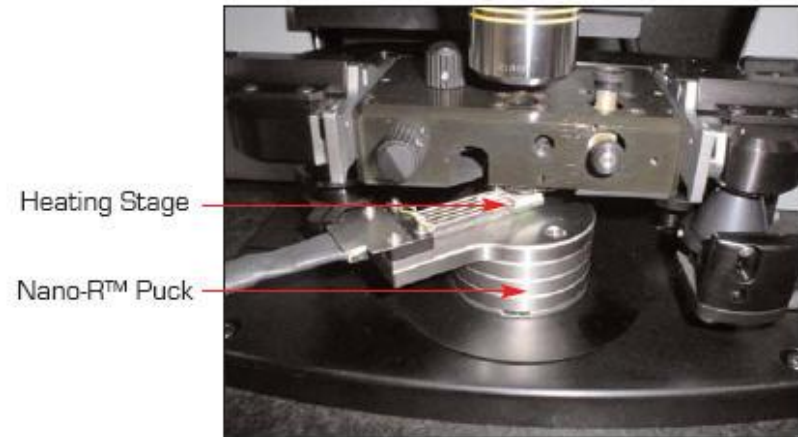
$$K = °C + 273$$

POTENTIAL APPLICATIONS

- Integration into an optics system
 - Raman Spectroscopy
 - Fluorescence Imaging
 - UV-Vis Experiments
- Biological Samples
- Nanotechnology
- Physics and Chemistry
- Materials Research
- ... and more

OTHER SETUPS INTEGRATED INTO

- X-Ray Diffraction Systems
- Atomic Force Microscopy
- Scanning Electron Microscopes
- Specialized vacuum chambers
- Custom built instrumentation





**THANK YOU FOR YOUR TIME AND
ATTENTION**

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