



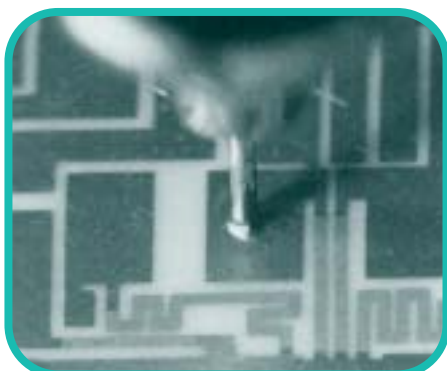
TECHNOLOGIE GMBH

Microelectronic equipment • development, manufacturing and sales

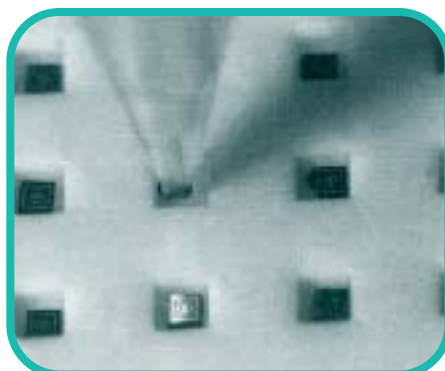
Micro-Manipulator-System GM-100



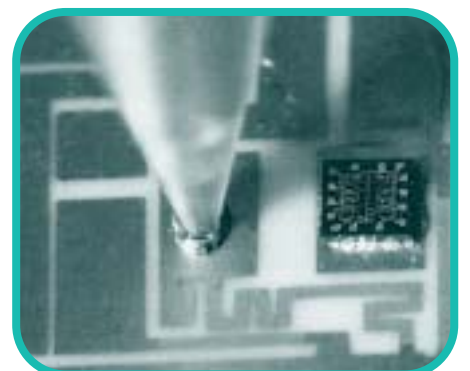
The Micro-Manipulator in use for die mounting



Dispensing of epoxy



Chip pick-up



Chip attach

Micro-Manipulator-System

Universal laboratory instrumentation including many options for development and small-batch hybrid-circuit production. Valuable aid in large-scale production for die-mounting, pull-testing, repairing of defective circuits as well as checking and trimming of prototypes. This brochure describes the basic equipment and available options as well as their uses in various setups.



Epoxy Die Mounter

- Precisely controlled deposition of epoxy on substrates.
- Exact placement of micro-electronic components.
- Coating of bonded semiconductors.
- Sorting of dice in chiptrays.

Recommended Items:

Basic Manipulator: GM-100
Dispenser: DV-100
Epoxy Die Mounter: BE-101
Work Holder: SC-106
Vacuum Pickups: 01 to 04
Dispensing Needles: 24 to 29
Vac./Compr. Air Supply: DV-150

Pneumatic Tweezer Head: PK-116
Epoxy Cartridge: BE-101-10
Microscope: Stereo Zoom
Finger Switch: GM-100-10
Counterweight: GM-100-01
Workhead Stand: KS-119
Cartridge Holder: KH-115



Pull Tester

- Destruct pull testing of wire bonds.
- Non-destruct pull testing of minimum wire bond strength.
- Straightening bent or short-circuited bond wires.

Recommended Items:

Basic Manipulator: GM-100
Work Holder: SC-108
Non-destruct Pull-Tester: PT-102
and/or PT-103

Destruct Pull-Tester: PT-110
Micro-Hook: PT-102-01
Microscope: Stereo Zoom
Workhead Stand: KS-119



Repair Station

- Removal of defective epoxy mounted or soldered components.
- Separation of epoxy short-circuits.
- Removal of hardened epoxy remainders from mounting surfaces.

Recommended Items:

Basic Manipulator: GM-100
Die Removal Head: CE-104
Heated Work Holder: HT-121
Temperatur controller: TR-120

Pneumatic Tweezer Head: PK-116
Epoxy Die Mounter: BE-101
Dispenser: DV-100
Microscope: Stereo Zoom
Workhead Stand: KS-119



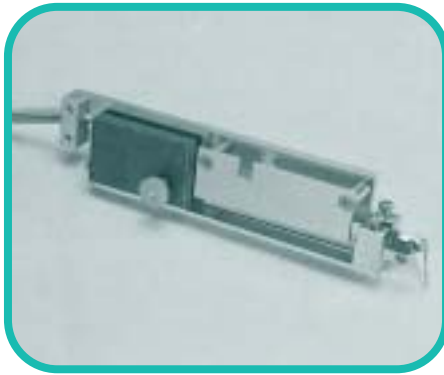
Checking/Trimming Station

- Rapid location of invisible short-circuits (e.g. underneath capacitors).
- Applying supply voltages.
- Measuring at checkpoints within a circuit.
- Measuring and trimming resistors.
- Checking and trimming capacitors.
- Separation of leads and short-circuits.

Recommended Items:

Basic Manipulator: GM-100
Measuring Head: MK-109
Milling Head: FK-105
Test Adaptor: PA-141

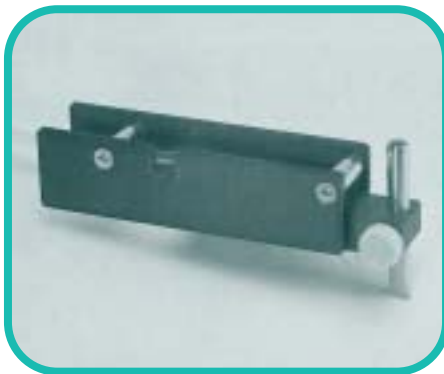
Pneumatic Tweezer Head: PK-116
Control Device: FK-105-10
Work Holder: SC-106
Microscope: Stereo Zoom
Workhead Stand: KS-119



Probe MK-109

Designed as electrical testing unit for the Basic Manipulator GM-100 with two separately spring-supported probe tips. The spacing between the two is adjustable from 0 to approx. 12 mm (1/2"). Any commercially available measuring instrument can be connected. Rapid location of short-circuits underneath capacitors caused by conductive epoxy or short-circuited leads. Speedy measurement of voltage, resistance or diode characteristics within a circuit. Indispensable for error location.

- Testing at checkpoints of different height.
- Spacing between tips readily adjustable.
- Simple, easily exchangeable probe tips (e.g. pins).



Die Removal Head CE-104

Rapidly exchangeable working head for removing defective dice from hybrid circuits. The head features a sharp-edged steel tool which cuts off the die. This same tool can then be used to remove the hardened epoxy remainders from the mounting surface. Use of a heated work holder, such as HT-121, greatly facilitates this process. In place of the steel tool a sharp-pointed ceramic rod can be used to separate short-circuited leads.

- Perfect cleaning of bonding site.
- Universal use.
- Easy to operate.
- No maintenance required with the exception of resharpening the tool.



Milling Head FK-105 with Control Device FK-105-10

The milling head consists of a high-speed electric motor and a chuck for a diamond drill or milling tool. The motor is suspended by an adjustable spring support. The tool tip can be moved in three dimensions for separating leads on hybrid circuits, for trimming resistors and capacitors, and for many other tasks. The Control Unit FK-105-10 provides a separate power supply for the Milling Head FK-105. Continuous operation is possible as well as on-off switching by the hand switch

GM-100-10. The milling head can also be connected directly at the dispenser DV-100 (only for continuous run).

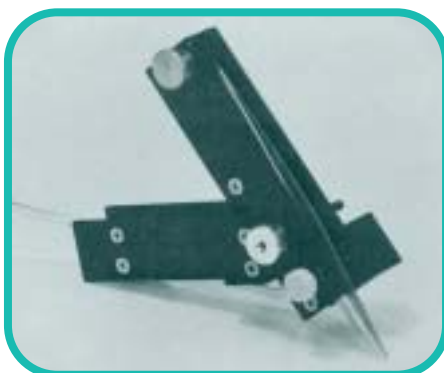
- Adjustable inclination
- Spring-supported.
- Versatile use.



Heated Work Holder HT-121 with Temp. Controller TR-120

The Heated Work Holder with 60 mm diameter and electronic (PID) Temperature Controller serves for preheating and soldering single substrates. Adjustable to different substrate sizes up to 2" x 2". Temperature continuously variable between +60°C and +360°C to within +/- 1°C. The PTFE coating of the Heated Work Holder permits handling it even if operated permanently.

- Handy and compact, easily moveable by hand.
- Precisely adjustable temperature with high constancy and digital display.
- Versatile use as mounting and bonding aid, for soldering and for removal of defective components.
- Adjustable height (option) as heated chuck for ball bonders.
- Up to 450°C (option).



Pneumatic Tweezer Head: PK-116

A mechanical head for a variety of applications – pick and place of small parts like semiconductor die with sensitive surfaces, MELF-Resistors, small pins, or for removal of bonding wires. The working head accepts a large number of standard tweezer styles. The distance between the tweezer points is adjustable from 0 to 10 mm., the movement from 0 to 10 mm, and the angle from vertically to 15°. The gripping force depends on the air pressure provided by

the dispenser DV-100 used as the controller with the finger switch GM-100-10.

- Multipurpose tool
- Versatile because of use with standard tweezers
- Gentle and reproducible grip
- Using this tool will prevent the damage of fragile parts particularly in a confined working area.



Basic Manipulator GM-100

The Basic Manipulator GM-100 is an exclusive 5:1 X, Y, Z positioner. It is mounted on a 150 x 320 mm (6" x 13") polished chromium-plated steel plate. The manipulation area is approx. 25 x 25 mm. The ball grip is optimally adaptable to any size hand. The work heads are simply locked in place in the work head holder allowing rapid exchangeability. The spacing between the base plate and the working-head holder is variable within 35 mm (1 1/2"). The adjustable microscope support

is provided with a bore hole for mounting B & L microscopes. Other microscope adaptors are available.

- Rapid exchange of working heads.
- Universal use in laboratories, production and servicing.
- X, Y, Z positioner.
- Simple, straight-forward design.



Dispenser DV-100

The dispenser DV-100 provides control for pressure, time and vacuum for the Epoxy Die Mounter BE-101. It is therefore suitable for dispensing of viscous materials. Operation requires 1 to 4 bar (15 to 60 psi) of pressure and at least 0,4bar (40 %) of vacuum. A precision timer (0,2 to 6 s) controls the pressure valve. Pressure is adjustable from 0 to 4bar. The quantity of epoxy dispensed by BE-101 depends on the viscosity of epoxy, the size

of the dispensing needle and the adjusted pressure and time. The work-head BE-101, the Finger Switch GM-100-10 or a foot switch trigger:

- Dispenser action with preset timing.
- Dispenser action with interruptions.
- On-Off switching of vacuum.



Vacuum/Compressed Air Supply DV-150

The DV-150 contains a double membrane pump that supplies the Dispenser DV-100 with compressed air and vacuum. In addition to the vacuum and compressed air connections the device also has a middle port that acts as the outlet of the vacuum pump and the inlet of the compressed air pump. By closing this connection both pump parts are switched in series. This permits the use of the device either as vacuum pump with higher vacuum or as compressed air generator with higher pressure.

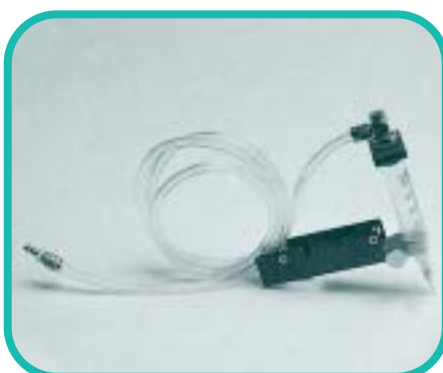
Technical Data:	Single:	In Series:
Suction capacity	5.5 l/min	5.5 l/min
Max. pressure	2 bar	4 bar
Max. vacuum	250 mbar	60 mbar
Power connection	220 V/80 VA	
Dimensions	250 x 100 x 200 mm	



Epoxy Die Mounter BE-101

For quick and easy die attach. Using the Dispenser DV-100, a wide range of microelectronic components can be epoxy- or solder paste bonded to substrates or PCB's. Features a spring-supported rotary head carrying the epoxy cartridge with dispensing needle, and vacuum pick-up nozzle. Automatic switchover from vacuum to pressure is achieved by turning the head. Contact pressure of pick-up adjustable from 30 to 300 cN. (Shown together with KS-119).

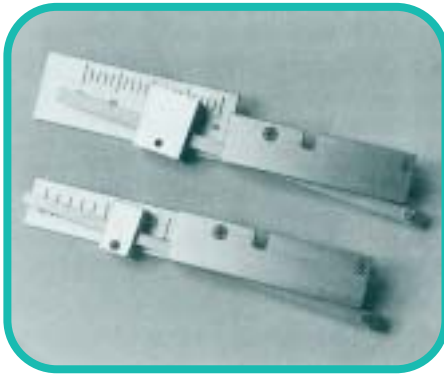
- Extremely simple handling, rapid replacement of epoxy cartridge, dispensing needle and pick-up nozzle.
- Operator can simultaneously watch and control deposition of epoxy and placement of die, minimizing improper die mounting.
- Rapid dispensing in droplets or strips (for large surfaces), also for coating of bonded semiconductors.



Cartridge Holder KH-115

Enables the fitment a 5 ccm cartridge in the Micro-Manipulator. For example, a large quantity of bonded semiconductor chips can be coated with drops of plastic material. Coating with the Manipulator under the microscope guarantees continuous dispensing without damaging the bond wires. The device can also be used for dispensing glue, fat or other liquids in difficult places where high exactitude is necessary (Shown with cartridge and adaptor – see DV-80 – additional devices).

- Safe and reliable coating of bonded semiconductor chips.
- Rapid exchange of disposable cartridges.



Non-destruct Pull Testers PT-102 and PT-103

For non-destruct testing of wire bonds. A ball bearing mounted beam balance carries a micro-hook on one side and a displaceable weight on the other (PT-102 for 0 to 10 cN and PT-103 for 10 to 50 cN). The hook is positioned underneath the wire to be tested by means of the GM-100 Manipulator and lifted up vertically. At the touch point the wire is loaded by the weight, independent of the upward hand movement. The pull-force is adju-

sted to approx. 1/10 of the bond strength. The short travel of the micro-hook ensures rapid operation without destroying of the bonds.

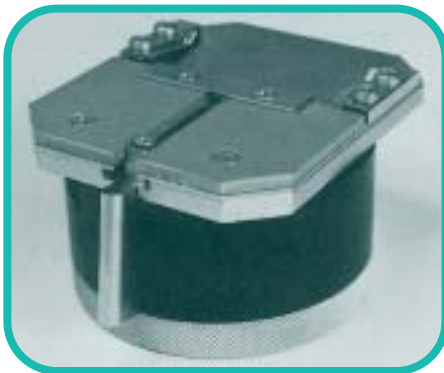
– Rapid and reliable operation – ideal for 100 % bond-wire pull-testing and straightening of bent bond wires.



Destruct Pull Testers PT-110-01 to -25

Used for determining the strength of wire bonds (PT-110 for 3 to 30 cN and PT-111 for 10 to 100 cN). These Pull Testers use a spring balance with a trailing pointer and record the pull at which the bond wire breaks (shown with head stand KS-119).

- Rapid wire bond testing.
- Convenient to use.
- Maintenance-free operation.
- High reliability.
- Indispensable tool for adjusting wire bonders.
- Test ranges from 1,5 cN to 250 cN through choice of spring balance.



Work Holder SC-106

Accepts 2" x 2" standard chiptray and flat hybrid circuits or PC-boards. It is easily adaptable for substrates from 2 x 6 mm up to approx. 60 x 100 mm. Required for all tasks performed by Micro-Manipulator, such as die mounting, pull testing, repairing, trimming, etc.

- Sturdy construction.
- Rapid adaptation to different substrate sizes.
- Universal use (also as chuck for ultrasonic wire bonders).

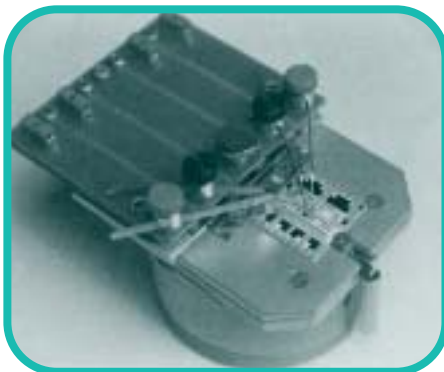


Work Holder SC-108

The Work Holder SC-108 serves to hold circuits with connections projecting downwards in a grid of 2.54 mm. Similar to the substrate holder SC-106 it can be adjusted over a large range and is therefore exactly adaptable to each size of circuit. For die mounting a standard chiptray can also be held. Simply by repositioning the central stopper, the SC-108 can accommodate DIP circuits or substrates with a length of up to 4", for applications such as pull-testing. Necessary for use with the Micro-Manipulator at circuits with vertical connections.

Especially recommended for pull testing:

- Sturdy construction.
- Easily adaptable for different sizes of circuits.
- More practical and versatile than SC-106.



Test Adaptor PA-141

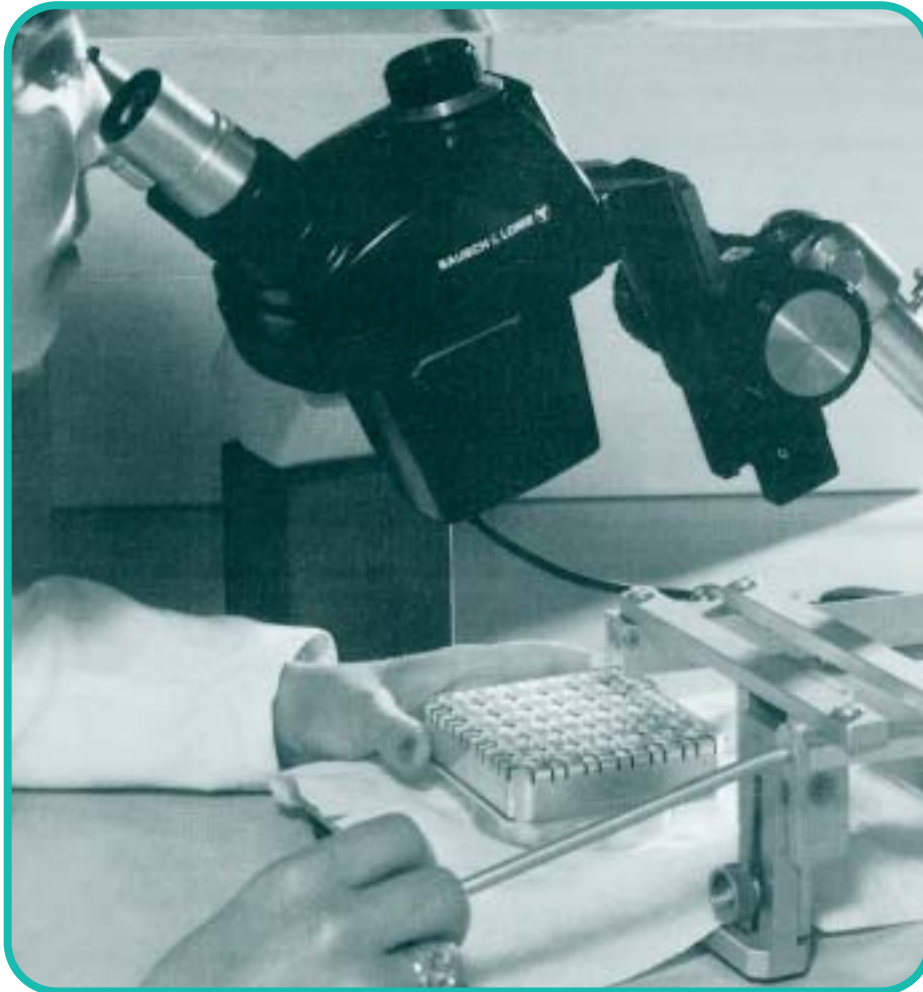
The Test Adaptor permits the contacting of 1 or 2 resistors as well as the applying of voltages at certain points of a circuit. In this way, resistors can be contacted simply or according to Kelvin method and can be trimmed by the use of the milling head FK-105. For testing, specific parts of the circuit can be biased through the adapter and measured with the Probe Head MK-109 without the danger of damaging other parts of the circuit.

Universal Micro-Manipulator

The Micro-Manipulator with its different work heads is a versatile piece of equipment which lends itself to a wide range of applications in microelectronics. It is

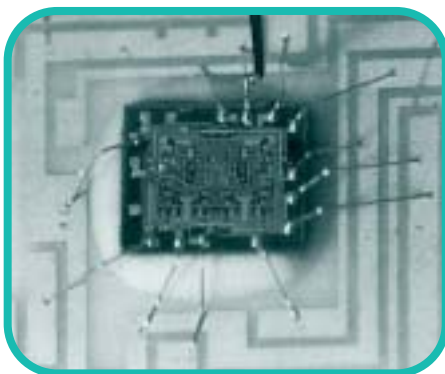
useful not only in servicing and in the laboratory but also in small-batch production. It readily converts into a die mounter, a destruct or high-speed non-

destruct pull-tester (wire bond tester), a repair station or a checking and trimming tool. The design of the basic Manipulator and its work heads is simple and straight-forward so that virtually no operator training is required and operation is practically maintenance-free. Any defects that may occur can be quickly eliminated by the operator which saves the time of a costly tool setter. When using the Micro-Manipulator for epoxy die mounting the operator can at simultaneously watch and control the deposition of the epoxy and the placement of the die. This minimizes improper die mounting. In its capacity as a destruct pull tester the handy Manipulator is an indispensable tool for adjusting bonding machines. In hybrid circuits there are always some bond wires that are not reliably bonded. A skilled operator can test up to 3 bond wires per second with the Micro-Manipulator in non-destruct wire bond pull test mode; i. e. you can now afford 100 % wire bond pull testing. Unfortunately, not all circuits prove to be functioning properly in a test. With its test adaptor and probe tips the Micro-Manipulator can help you to detect defects in the circuits. Epoxy short-circuits underneath capacitors can be rapidly located. The die removal head and a heated work holder permit removal and replacement of defective components without destroying the circuit.



100 % bond pull test with the Micro-Manipulator.

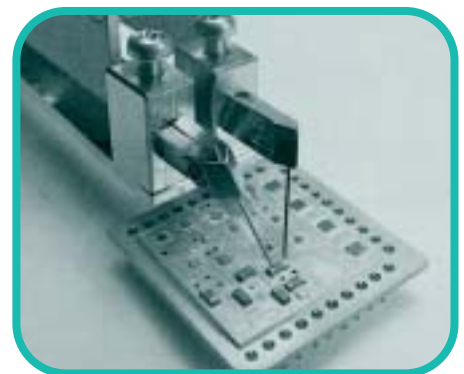
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Micro-hook PT-102-01



Removing a chip with CE-104



Testing with MK-109



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