

DIAPART 7100  
7200  
8200

**THE BEST SEPARATING PRINCIPLE**  
For pre-scored circuit board!  
Separating process without stress due to diamond disc!  
Components are no more damaged by the separating procedure!

*Pre-scored Circuit Board Separating Machines*



**Mutronic**®

## **DIAPART 7100/7200 Pre-scored Circuit Board cutter (for circuit boards with scribed panels)**

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## **DIAPART 7400 Separating automatic machine (for circuit boards without slots)**

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\* Separate literature DIAPART 7400 with detailed information and technical data available on request.

## **DIAPART 8200 Pre-scored Circuit Board cutter (for circuit boards with milled grooves)**

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### **Note:**

Brochures and other information publications sometimes need updating, supplementing and correction after only a very short time, thanks to constant advances in the pace of new and further developments of products and machine options.

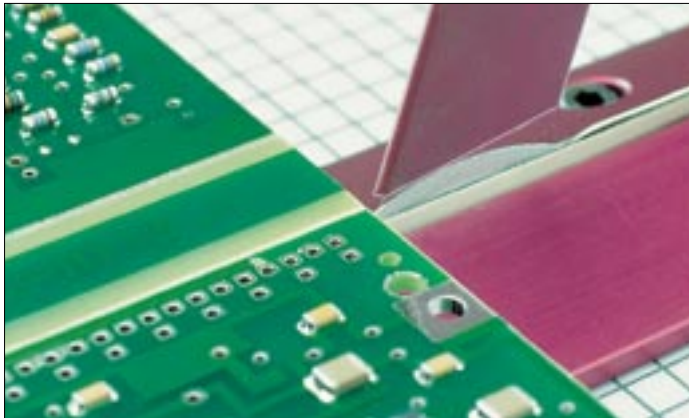
We have therefore decided to print most of our brochures ourselves. This enables us to provide speedy and constantly updated issues of requested information. We would, however, ask you to forgive the difference in printing quality when compared to high-gloss offset printing methods. You can also avail of information with high-resolution illustrations in the internet.

The machines illustrated in the pages of this brochure are mainly depicted with optional expansions. The price list contains further details relating to accessories and optional equipment. Please contact us if you feel you need further clarification. The illustrations of machines, options and accessories may deviate from the colour, shape and design, both technical and constructional, of the delivered goods.

You can find information on other *Mutronic* products (along with information on trade exhibitions) in the internet under: [www.mutronic.de](http://www.mutronic.de)

# DIAPART 7100/7200

Pre-scored Circuit Board's with **scribed panels**



PBC boards with scribed panels are divided by a thin diamond cutting disk.

The cutting procedure is smooth and free of unravelling. The cut edge is almost perfect. Components are not damaged by the stress-free procedure.

## DIAPART 7100

The panel feed is manual. The respective scribe marking to be cut is laid on a special guide rail and centered automatically.

Subsequent sliding through of the panel permits the cutting operation to be completed in seconds. The residual dust is extracted.



## DIAPART 7200

The panel feed is manual. The respective scribe marking to be cut is laid on a special guide rail and centered automatically.

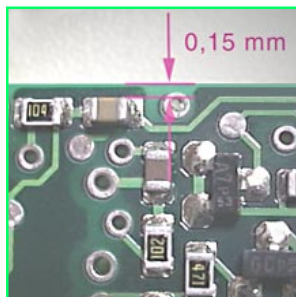
Subsequent sliding through of the panel permits the cutting operation to be completed in seconds. The residual dust is extracted.



# SEPARATING PROCEDURE FREE OF STRESS - THEREFORE, NO LONG-TERM FAILURE!

With the DIAPART 7100/7200, Pre-scored circuit boards are separated especially gentle by a diamond cutting-off wheel WITHOUT STRESS ON COMPONENTS!  
Long-term failures of components do not occur, especially to chip capacitors, which are positioned immediately next to the separating line.

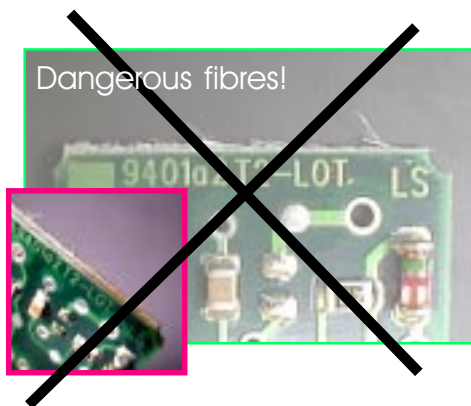
Further advantages of the DIAPART cutting process:



High packing density, thanks to component mounting close to the edge:  
A guarantee that components with a minimum mounting clearance of only 0.15 mm to the outer edge remain undamaged during cutting!



Panels with components projecting beyond the edge:  
The diamond disk cuts the panels in the safe area below the components without coming into contact with these.

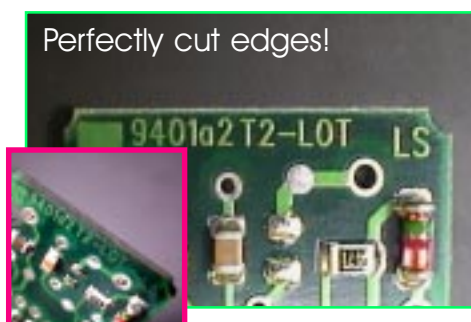


## Unravelling:

Cutting with punch, roller or keyway systems is economical, but has

disadvantages:

- Functional breakdown due to fibres in mechanical components
- Hand injuries during insertion
- large dimensional tolerances



## Smooth cut!

With the DIAPART 7100/7200 Pre-scored board separating saw, boards are separated precisely. Without setting-up costs!

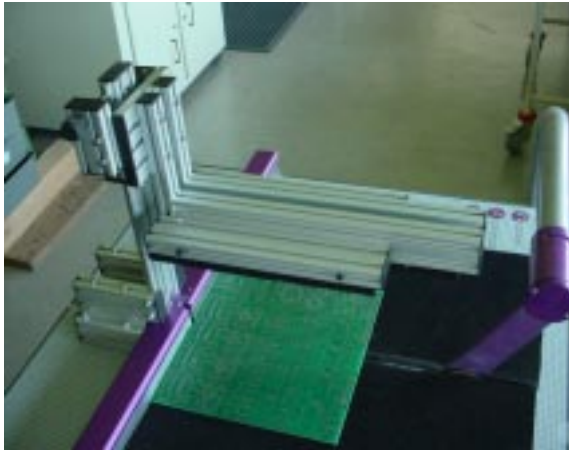
Result:

- Clean, smooth cutting edges without fibres emerging
- Absolute, reproducible accuracy
- No danger of injuries to hands on contact
- No long fibres



# DIAPART 7200

## MANUAL CLAMPING for Cutting Circuit Boards with **Cut Grooves**



Clamping lever up

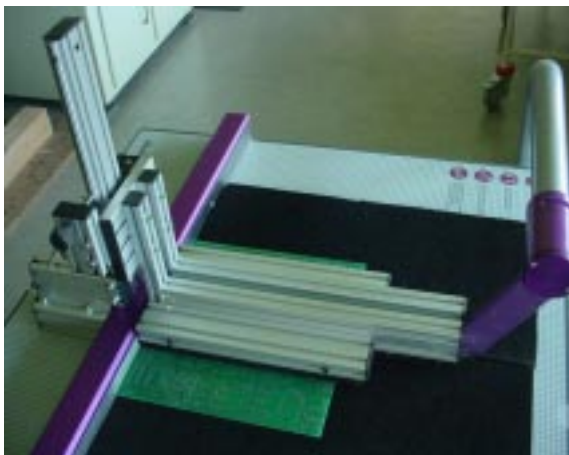
All formats of boards can be clamped from the top very quickly and securely by manual clamping.

The clamping lever can be locked automatically in the uppermost position.

The clamping lever is loosened with one hand and lowered onto the board.

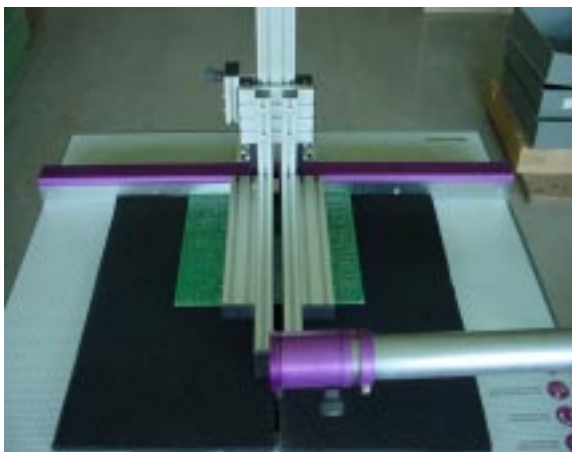
On the bottom, the clamping lever is fitted with an 8 mm thick conductive foam material.

The suction cleaning from the top is not affected.



Clamping lever down

- Advantages:
- Even pressure onto the components
  - Fitted with an electrical table drive, the machine becomes semi-automatic



Clamping lever from the front

# TECHNICAL DATA: DIAPART 7100/7200

Purpose of utilisation:

For pre-cut, pre-scored circuit boards, SMD or conventionally, one or both sides populated or without insertion

Advantages:

- High cutting performance up to 100 mm/sec.
- Absolutely accurate cutting edges with high dimensional accuracy, without unravelling!
- The scribe markings on the PBC panels can be produced cheaper and stronger:
  - a) A scribing depth of ca. 0.3 mm is sufficient.
  - b) Only one side need be scribed.
- The continuous height adjustment of the diamond cutter means that PBC's with projecting components can also be cut without damaging them.
- Dust is extracted efficiently by specially developed dust conveyer chambers.
- Conductor paths can extend to the furthest edge of the individual panels, and components can be fitted up to a distance of 0.3 mm from the edge of the PBC without any problem.
- No mechanical overloading occurs during cutting.
- The machine is earthed to protect touch-sensitive parts.
- The compact construction permits operation on every level working table.

Further details:

*DIAPART 7100:*

- for small to middle sized pre-scored circuit boards.
- Component height up to 5 mm (see page 7, figure 4).
- Rigid table: the pre-scored circuit board is moved on the steel guide across the diamond milling disc and separated in this way (see page 7, figures 5 and 6).
- The milling disc can be lowered without steps; due to this, cutting can be carried out under overhanging components (connectors etc.) (See page 5).

*DIAPART 7200:*

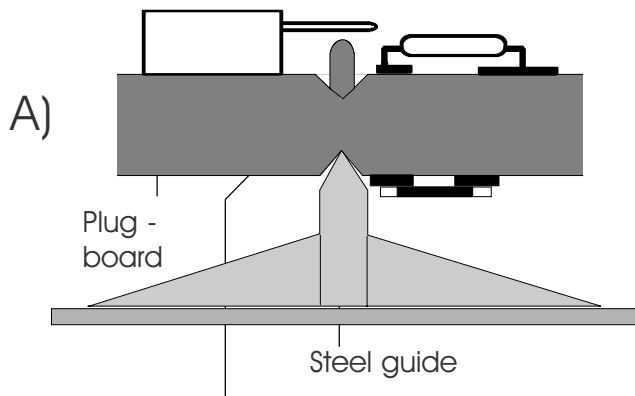
- Suitable for all sizes, which are known to us.
- Component height up to 18 mm (see page 7, figure 10).
- Slide table: the pre-scored circuit board is positioned on the steel guide. It is moved by the slide table to the diamond milling disc and cut in this way.
- The steel guide with milling disc can be lowered without step; due to this cutting can be carried out under overhanging components (plugs, etc.) (See page 4).

Working procedure:

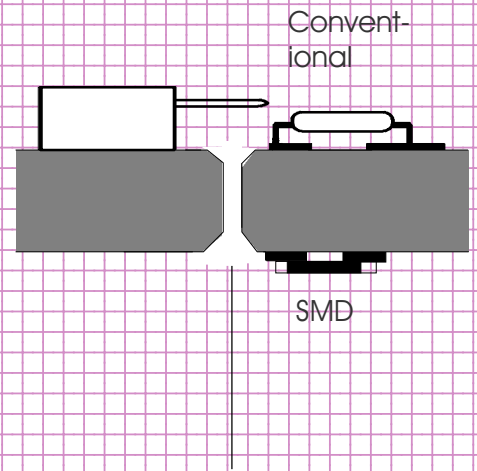
The pre-scored circuit board is placed with the scored groove onto the polished steel guide and moved forward. (7100). In this way, a 0.25 mm thick diamond disc cuts the pre-scored board directly in the scored groove.

The machine, type 7200 has, in addition, a slide table with prismatic guide and a larger usable height.

# ADVANTAGES OF THE NEW PRE-SCORED BOARD SEPARATING SYSTEM *DIAPART 7100/7200*:



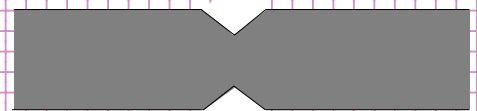
Separating disc 0.25 mm,  
Height-adjustable, due to which  
separating of pre-scored board with  
overhanging components is  
possible without problem!



- No fraying
- cutting free of burr,  
therefore no after  
treatment necessary.



Until now: low stability, as a deep  
scoring depth is  
necessary for the  
breaking procedure.



Now: high stability, as the  
scoring for the  
separating procedure  
has to be carried out  
less deep.



Until now: scoring on both sides  
necessary to be able to  
carry out the breaking  
procedure.



Now: scoring on one side is  
sufficient for centring;  
due to this, lower  
manufacturing costs.

## TECHNICAL DATA:

	<i>DIAPART 7100</i>	<i>DIAPART 7200</i>
Area of application:	For smaller format panels (up to 150 mm edge length)	For panel dimensions up to 320 mm and more
Speed:	3000 -12000 min <sup>-1</sup>	2000 - 10000 min <sup>-1</sup>
Motor output:	600 Watts	1200 Watts
Power output	ca. 200 Watt	ca. 400 Watt
Switching-on time:	100% (cont. operation)	100% (cont. operation)
Cutting height:	0 - 2 mm	0 - 3 mm
Panel height:	max. 5 mm <sup>1)</sup>	max. 18 mm <sup>1)</sup>
Traversing path:	-	310 mm slide table path (450)
Tool:	Ø 63 mm x 0,25 mm <sup>2)</sup>	Ø 100 mm x 0,2, 0,3, 0,4 mm <sup>2)</sup>
Dimensions:	see dimensional drawing	see dimensional drawing
Weight:	ca. 14 kg	ca. 26 kg
Connected load:	230 V/ 50 Hz	230 V/ 50 Hz / 16 A
Noise level:	idling ca. 72 dbA cutting ca. 78 dbA	idling ca. 71 dbA cutting ca. 78 dbA
ESD-Protection:	earth connection for wrist joint band	earth connection for wrist joint band
Working temperature:	+15° to 25° C	+15° to 25° C
Special characteristics:	overheating cutoff, electronic torque cutoff, load-dependent tacho-control motor speed, double-V-belt	overheating cutoff, electronic torque cutoff, load-dependent tacho-control motor speed, special-V-belt

<sup>1)</sup> See dimensional drawing page 9

<sup>2)</sup> DIAPART-pre-scored board separating devices, for safety reasons, are designed for exclusive use of DIATOOL saw blades and separating discs. See price list.



## DIMENSIONS DIAPART 7100:

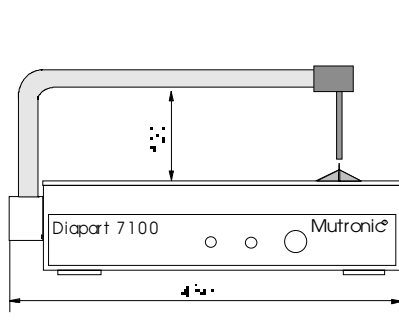


Figure 1

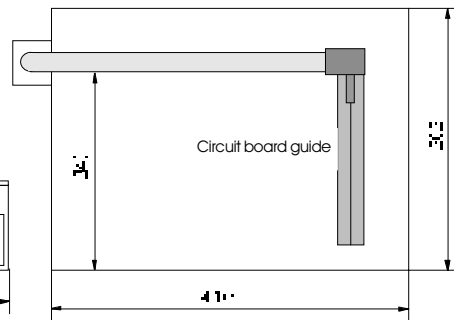


Figure 2

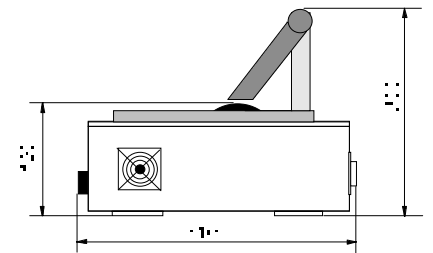


Figure 3

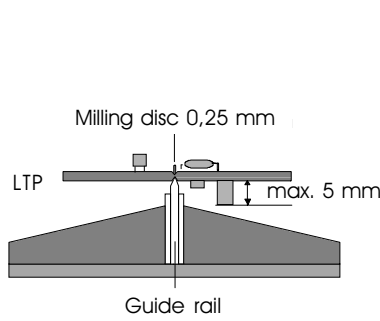


Figure 4

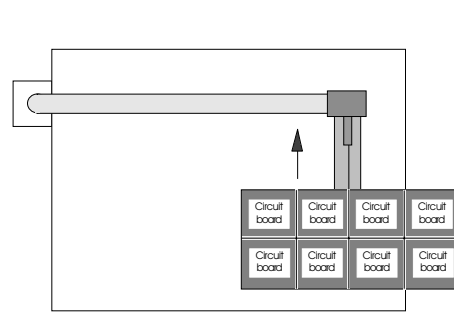


Figure 5

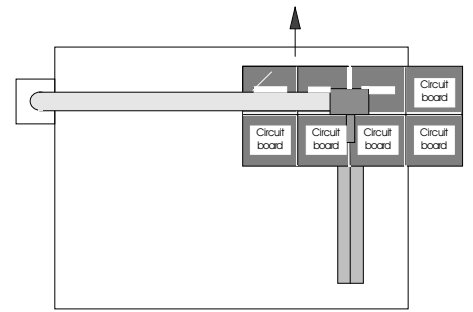


Figure 6

## DIMENSIONS DIAPART 7200:

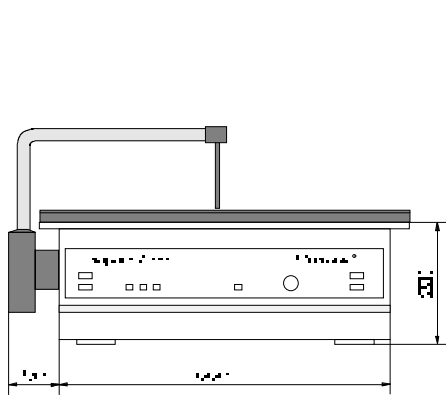


Figure 7

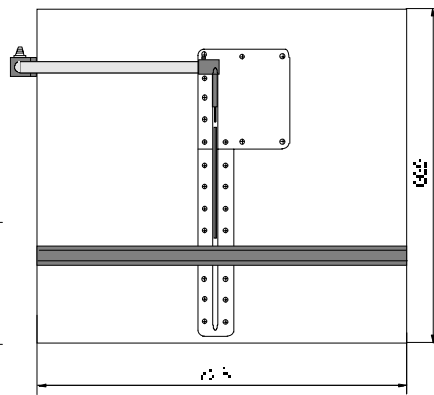


Figure 8

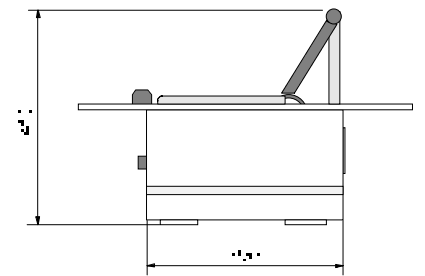


Figure 9

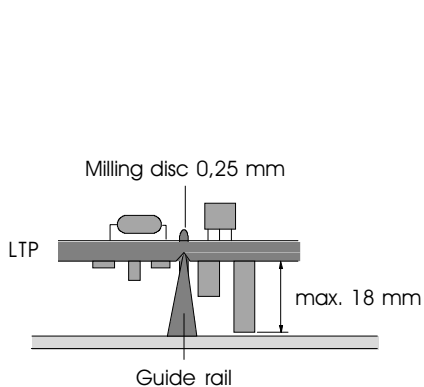


Figure 10

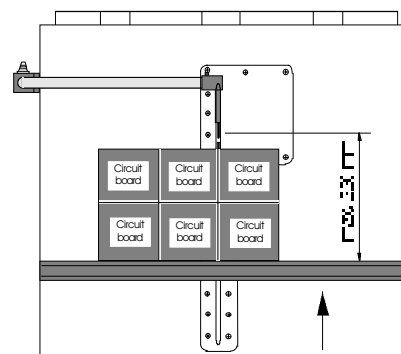


Figure 11

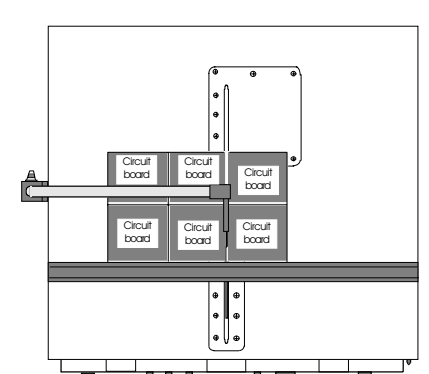


Figure 12

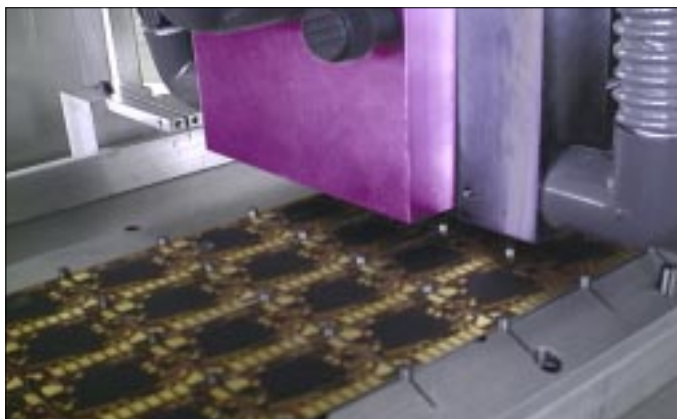
# DIAPART 7400

## Circuit board separation automatic device



For the manufacture of medium and large series in one or more shift operation, we supply CNC-controlled automatic devices with manual or automatic feed and removal.

The *DIAPART 7400*, based on a specially designed modular system, is manufactured to customer specification.



### Cutting quality

The cutting edge is perfect:  
Smooth and without fraying out

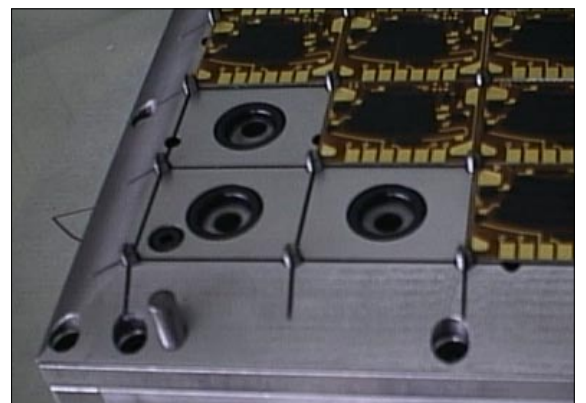
The precision of the cut is 0.05 mm.

The pre-scored circuit boards are separated by a thin diamond disc (Picture). The separating procedure is carried out smooth and without stress. Dust is sucked off at the same time.

### Clamping systems

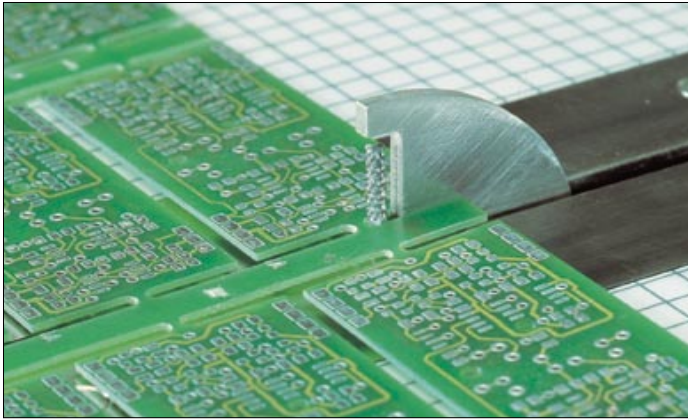
Holding of the separated pre-scored board is carried out by vacuum (figure) or by mechanical devices for nutten fitted on one or both sides.

Removing devices, automatic handling systems and pallet devices are designed to customer requirements.



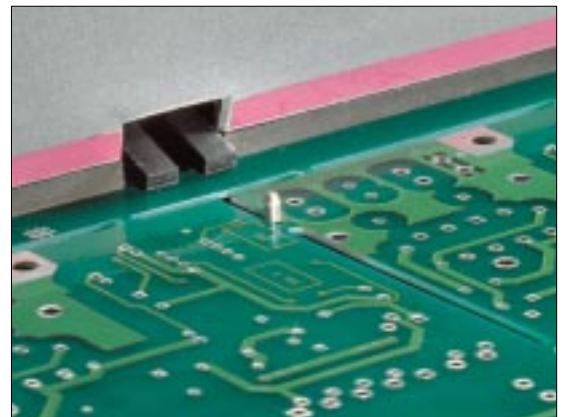
# DIAPART 8200

## Pre-scored Circuit Board's with **milled roots**



PBC panels with pre-milled residual roots are divided by a high-speed rotating hob. A hardened steel tongue behind the hob takes up accurate guidance. The cutting procedure is smooth and free of unravelling.

The cutting procedure is smooth and free of unravelling. The cut edge is almost perfect. Components are not damaged by the stress-free procedure.



## DIAPART 8200

The feed is electrical on this machine, being actuated by a pedal switch.

Centring is identical to type 8100 by placing the grooves on index pins. As an option, for very large pre-scored circuit boards, an electromechanical clamping device can be supplied.

The rate of feed can be set step less.

# TECHNICAL DATA: DIAPART 8200

Purpose of utilisation:

Cutting pre-milled panel PBC's, SMD or conventional, with fittings on one or both sides. Perfect functional panel cutting system free of disadvantages and side-effects of previous methods.

Function:

Removal of panel connection roots with diamond-toothed millers and indexed guidance system.

Advantages:

- High cutting performance, 2 - 5 roots per second (depending on panel thickness)
- Smooth milled outer edge
- High dimensional accuracy of cut-off LTP panels
- No damage to components caused by mechanical forces
- Slide table permits rational handling (8200)
- No setup time - ready for operation in 30 seconds
- Efficient dust extraction via air conveyor chambers flat extraction nozzle

Further details:

DIAPART 8200:

- pneumatic pivoting of guide head
- pneumatically lowered index pins
- Hob change with pneumatic collet chuck
- Electromechanical clamping device for large pre-scored circuit boards (option)
- Working area ESD coated
- SF spindle, speed adjustment from 10.000 - 50.000 min<sup>-1</sup>
- Automatic control of dust vacuuming facility

Working procedure:

The pre-scored circuit board is placed against the stop ruler of the sliding table (8200) or the parallel stop (8100) and positioned by the index notch element. By this it is ensured that in the following processing step, the milling bit removes exactly the seams between the circuit board!

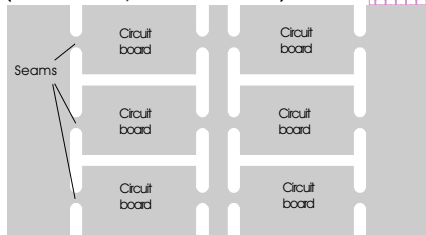
A hardened steel tongue, which is located behind the milling bit, serves, apart from its protective function against unintended contact, an additional positioning and guiding function.

The table plate can be coated with conducting foam material to protect the components from static charging and it also gives a mechanical protection to the SMD-components on the underside. The conventional populated circuit board side is always on the top for the milling procedure. The processing of the circuit boards with mixed placement can, therefore, be carried out without a problem.

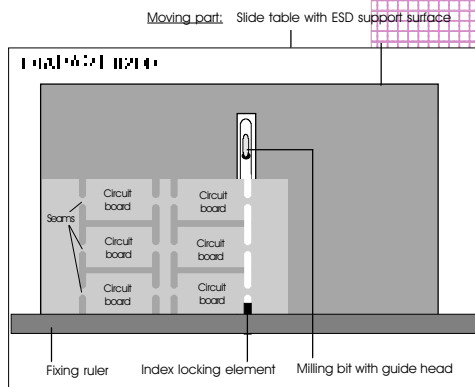
# Possible Pre-scored Circuit Boards Variants

## Pre-scored circuit board design variant A\*

(Seams only in X-direction)



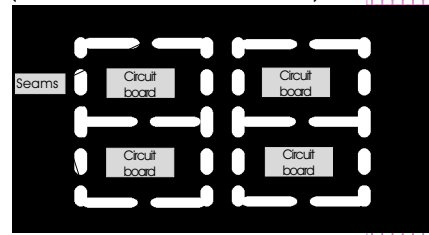
The seam grooves are milled right round the pre-scored circuit board.  
Edge is closed.  
The LTP has to be turned by 90°.



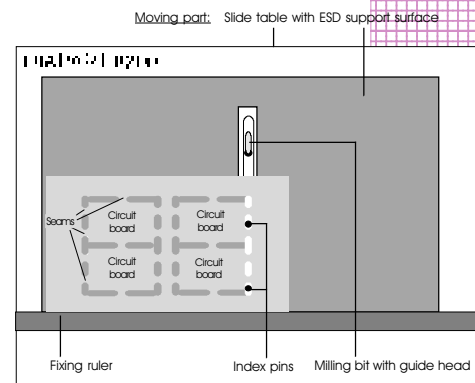
Positioning is effected by the index notch element, as the grooves are milled up to the end. This is the optimum precondition for an exact and economical separating of pre-scored circuit boards.  
Absolute right angularity between the pre-milled grooves and the edge contours must be guaranteed by the LTP-supplier.

## Pre-scored circuit board design variant B

(Seams in X- and Y-direction)



Seam grooves are milled in a straight line to the LTP-edge!  
The LTP does not have to be modified.  
The LTP has to be turned by 90°.



Positioning is carried out by two movable index pins, which are lowered during the milling procedure. The right angularity of the pre-milled grooves with the edge contours is not a precondition, but it is of advantage, as one can then, in addition, work with the stop ruler (higher precision!)

\*) We recommend for new designs, as a matter of principle, take into account a straight pre-scored circuit board design (variant A) with free phased out grooves on both sides of the circuit boards (as shown on the drawing)!



## DIAPART 8200

Area of application:	for panels up to 320 mm more on request
Spindle performance:	300 Watts (SF spindle)
Speed:	5.000 - 50.000 min <sup>-1</sup>
Collet chuck:	standard 3 mm <sup>1)</sup>
Milling width:	1,0 mm - 3 mm
Clamping:	pneumatic with pushbutton
Traversing path:	ca. 320 mm slide table
Comp. air supply:	integrated compressor
Panel height:	max. 12 mm <sup>2)</sup>
Spindle and clamping ring interlock:	electronically secured
Dimensions:	see dimensional drawing
Weight:	ca. 42 kg
Connected load:	230 V/ 50 Hz / 16 A
Noise level:	idling ca. 74 dbA cutting ca. 79 dbA
Working temperature:	+ 15° to 25° C
ESD-Protection:	earth connection for wrist joint band

<sup>1)</sup> Other sizes on request

<sup>2)</sup> See dimensional drawing Page 15

# DIMENSIONS DIAPART 8200:

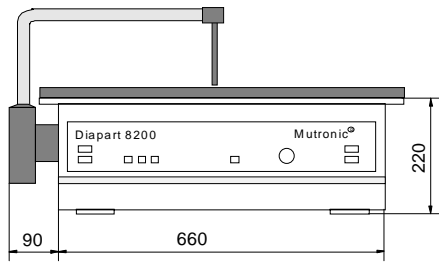


Figure 19

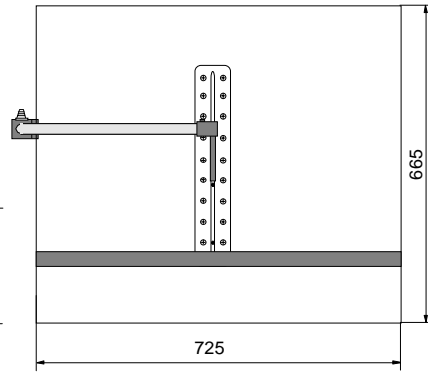


Figure 20

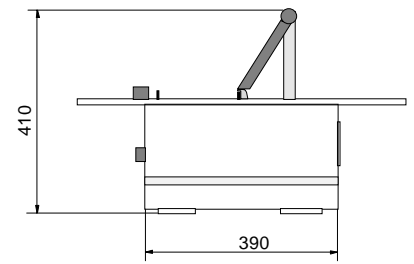


Figure 21

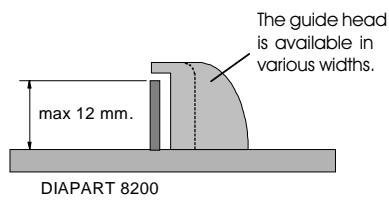
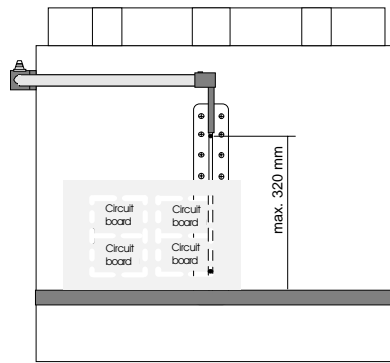
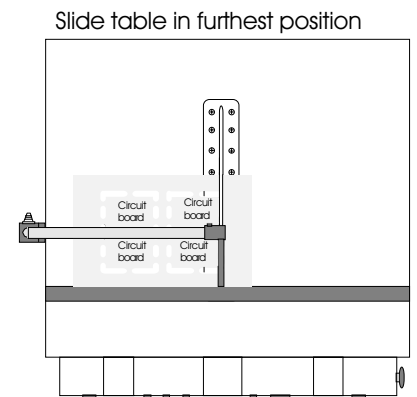


Figure 22



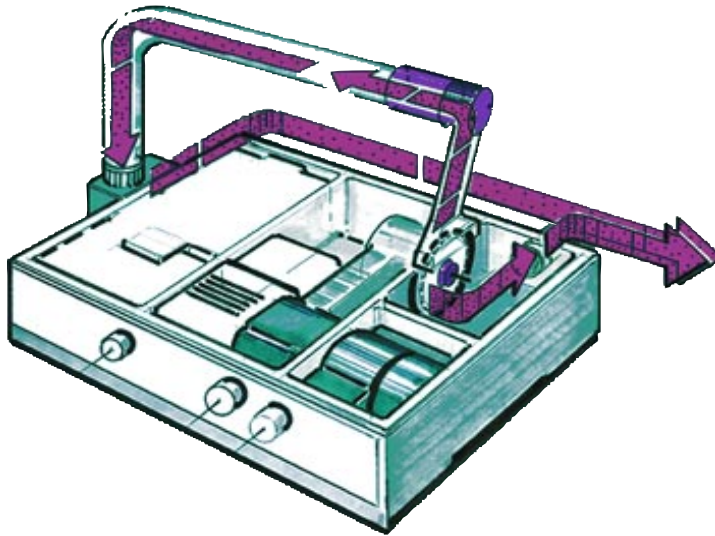
Slide table in foremost position  
Figure 23



Slide table in furthest position  
Figure 24

# DIAVAC-VACUUMING SYSTEM

Benefits both your health and the environment



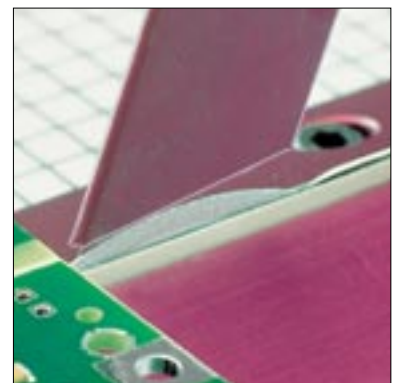
Materials which produce fine or health-endangering dust should always be machined in conjunction with the use of an extraction unit. This particularly applies to machining of fibre-strengthened materials (PCB's, fibre-strengthened plastics etc.)



Using *DIAVAC* extraction units prevents fine dust particles being blown out into the atmosphere. Not every extraction unit is suited to this task. The *DIAVAC* extraction units are equipped with a special fine dust filter and thus guarantee optimum results. A socket is provided for connecting the unit.

Chips and dust particles are picked up and removed by the air flow of the vacuuming facility. This is possible, because the suction arm is equipped with an efficient air ducting system with an extremely narrow nozzle head.

Simultaneously, also the dust from underneath the table plate is also sucked off via a Y-branch.



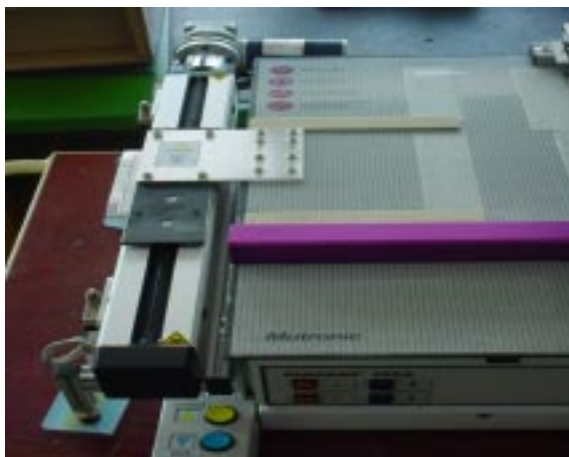
# ACCESSORIES DIAPART 7200 / 8200



Machine cabinet (Item No.: 10.06550)  
is used to include the two  
Diavac 800 suction systems.



Parallel catch for DIAPART 7200 / 8200  
for separating unetched printed circuit  
boards.



Electrical table feed  
(Item No.: 10.11900)



# TECHNICAL QUALITIES

## Drive mechanism and safety

*DIADISC* precision machines are equipped with special high-speed balanced motors to maintain an universal and broad speed range as possible. An electronic speed regulator controls the motor spindle. The respective load is determined and additional output is readied automatically if necessary.

The speed can be steplessly adjusted throughout the entire range. It is characteristic of the speed that it does not remain entirely constant when the motor is under load, but rather adapts itself accordingly in critical situations.

The tendency of drills and milling hobs to block (along with the possibility of tool fracture as a result) is thus considerably reduced. ■

## Material and quality



The construction and assembly elements used (milled and turned parts, ball bearings, etc.) are made exclusively of high-quality materials, such as non-corrosive stainless steel, special anodised aluminium or brass. Particularly important construction parts, such as chassis, bearing seats, pulleys and drive shafts are made of solid raw material turned, milled and ground on precision CNC machines.

Punched and bent parts are not used, due to their tolerance and stability characteristics. Parts from other suppliers, such as motors, control electronics and bearings, are produced exclusively in Germany, Austria and Switzerland in accordance with our production and quality stipulations. This ensures a long-term guarantee of both precision and the supply of spare parts. ■

## Development and production



All *DIADISC* machines are developed in our production facilities and brought to their final technical maturity under the direction of engineers and experienced technicians. The machines are designed for lengthy periods of application, constructed with suitable stability and comply with currently valid standards.

Newly developed options are so designed as to be also suitable in most cases for retrofitting older serial models. Machines and options are thus useful long-term investments.

The entire final production and quality control is carried out at our works in Rieden. ■

Further options and detailed information are contained in the separate price list. Please make enquiries in advance with regard to prices in the event of placing an order, as these can be subject to change.





Precision for laboratory and

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