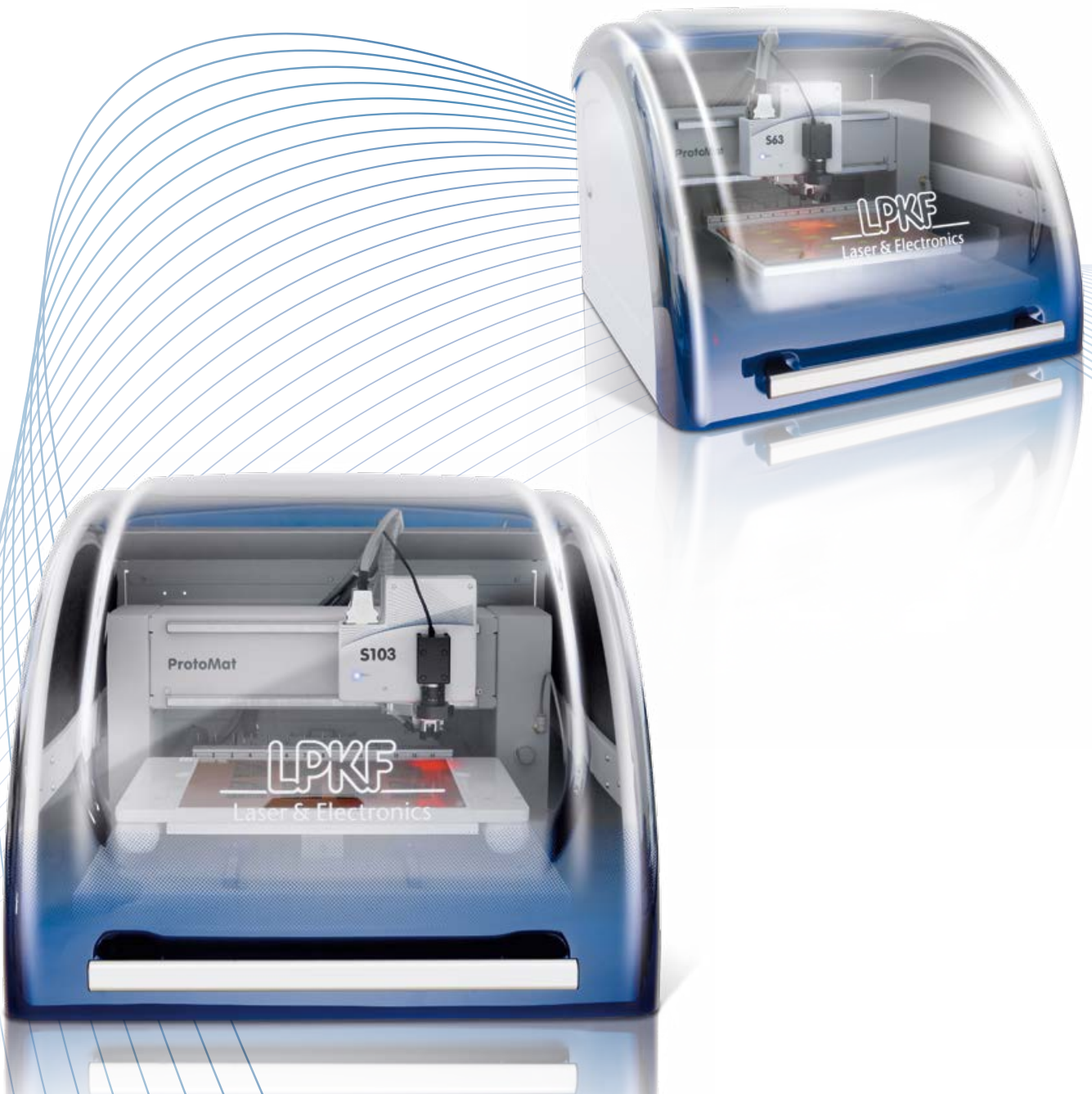


Professional In-House PCB Prototyping
LPKF ProtoMat Circuit Board Plotters



LPKF
Laser & Electronics

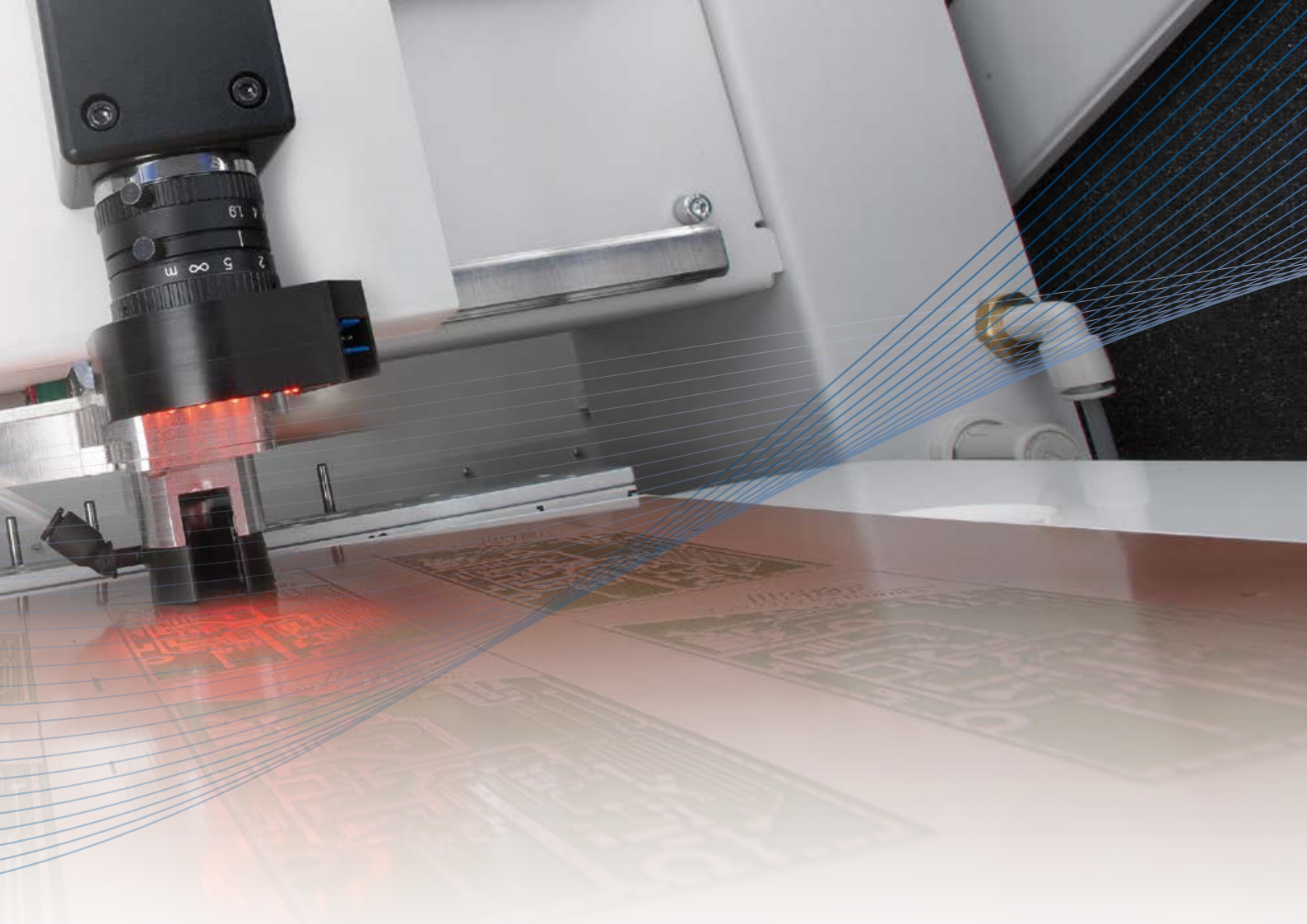


Design it. Build it. Today.

From design to finished PCB prototype in a few hours - it's possible with LPKF systems. Versatile benchtop PCB milling machines suitable for any engineering environment are doing the job. Its applications range from analog to RF.

LPKF equipment offers cost-effective, environmentally friendly equipment for each stage of the prototyping process, from design verification to structuring and board assembly. It allows customers to produce fully functioning boards quickly and easily.

The ProtoMat S series features upgrade options to handle structuring, cutting, and many other prototyping tasks for both single layer and multilayer boards.



Flexible Solutions

Optional features and upgrade kits increase the application range of LPKF ProtoMats, simplifying the prototyping process, expanding product functionality and opening the door to new forms of production. These features are already standard on some machines.

Automatic Tool Change

Accommodates up to 15 tools and includes drill bit inspection and automatic milling width adjustment. Enables automated production without manual intervention.

Milling Width Adjustment

Provides a pre-defined tool penetration depth and ensures a consistent milling track width.

Optical Fiducial Recognition (camera)

Significantly faster and more accurate than the front-to-back system. Virtually indispensable in structuring multilayer boards and double-sided PCBs. Includes automatic drill break inspection and immediate measuring function. Standard on the S63 and S103.

Powerful System Software Included

The new standard for PCB prototyping: LPKF CircuitPro lets you quickly implement complex layouts. A wide range of features, optimized milling times and intuitive operator guidance ensure rapid success.



CircuitPro

Vacuum Table

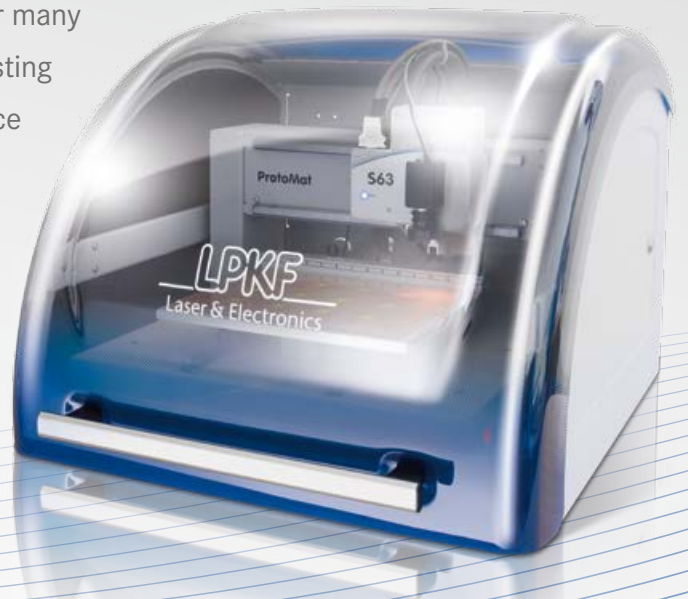
Secures the work piece flat across the entire work surface and eliminates substrate irregularities such as twisting and warping. Allows both flexible and rigid-flex PCBs to be machined with ease. Standard on the S103.

Dispenser

Accurately applies soldering paste onto structured PCBs with compressed air. Uses LPKF CircuitPro for data preparation.

Producing High-Performance Boards

Making an electronic prototype is a critical step for many development projects and is the basis for initial testing and engineering validation. LPKF ProtoMats produce boards that match the quality of outsourced PCBs by delivering high signal integrity and SMT component capability.



LPKF ProtoMat S63

LPKF ProtoMat S63: The All-Around System

The LPKF ProtoMat S63 handles virtually any in-house prototyping application with ease. Its high speed capabilities accommodate structures as small as 100 μm . The extensive features make the S63 the perfect addition to any development environment.

Features of the LPKF ProtoMat S63:

- High speed spindle (60 000 rpm), ultra-fine resolution (0.5 μm) and accuracy ($\pm 0.02 \text{ mm}$)
- Simple quick-release tool holder
- Acoustic cabinet for quiet operation
- Automatic tool change (15 tools)
- Automatic milling width adjustment
- Optical fiducial recognition (camera)
- Upgradeable to LPKF ProtoMat S103

**Upgrade kit available:
ProtoMat S63 to S103**

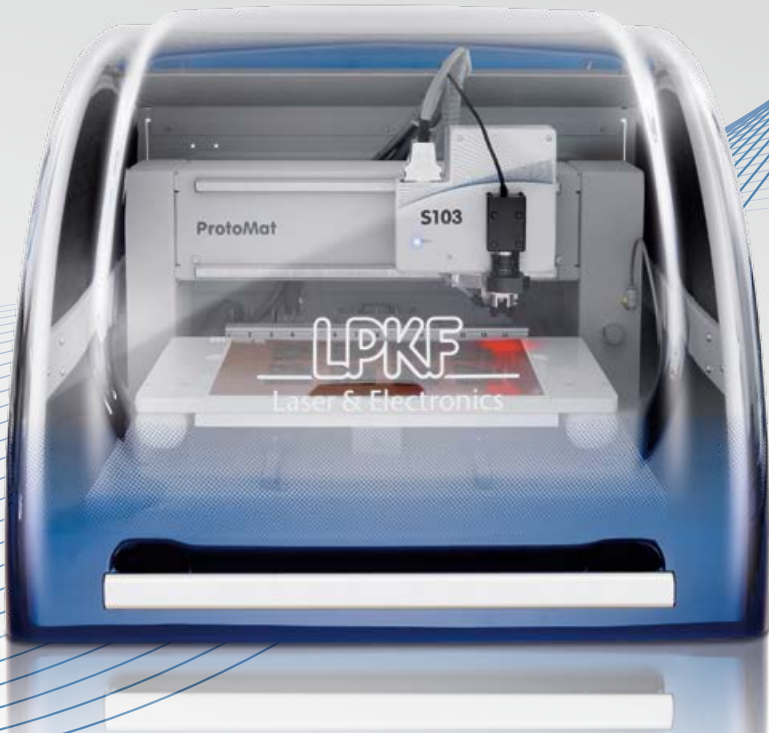


Other Accessories:

- Dust extraction
- Measuring microscope
- Compressor

Find additional information inside our free "In-House Rapid PCB Prototyping" product catalog.





LPKF ProtoMat S103

LPKF ProtoMat S103: The Premium System

The ProtoMat S103 is the most advanced model in the S series. The fully equipped system is suitable for all applications, including multilayer and RF boards. The non-contact pneumatic working depth limiter allows substrates with delicate surfaces to be machined. This reliable, easy to use system is all you need for cost-effective, high-quality prototype production.

The S103 has all the features of the ProtoMat S63 plus:

- Highest available speed (100 000 rpm)
- Pneumatic working depth limiter
- Vacuum table

The ProtoMat S63 can be Upgraded to the Top-of-the-Line S103



An upgrade kit quickly turns the ProtoMat S63 ...

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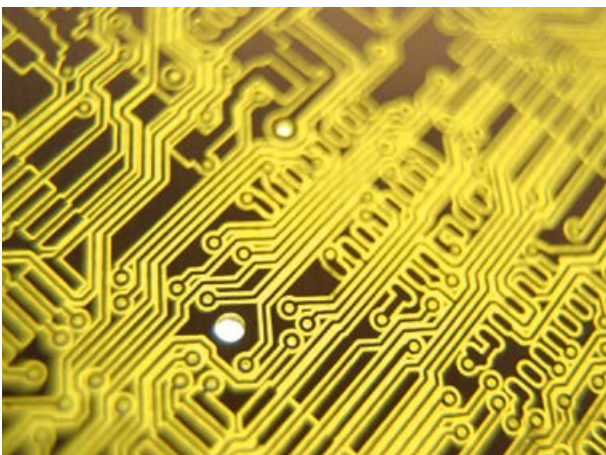


... into the ProtoMat S103!



Applications

LPKF ProtoMats are essential tools for anyone developing and producing small batches of PCB prototypes. Moreover, ProtoMats can be used for a variety of applications besides “just” structuring circuit boards.



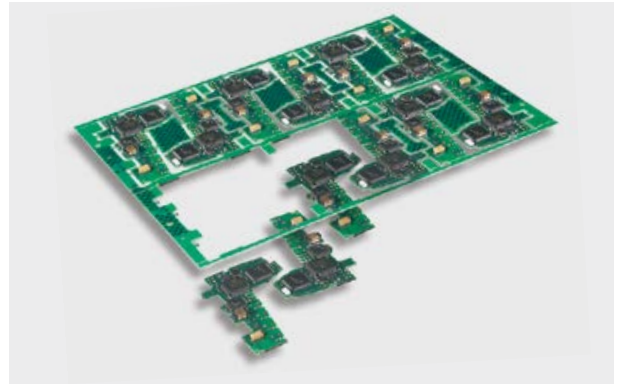
Structuring Circuit Boards

LPKF ProtoMats mill the PCB structure in the fully coated substrate. High-speed spindles ranging from 60 000 to 100 000 rpm, a resolution as fine as 0.25 μm (0.01 Mil) and extremely high repeatability ensure ultra-fine structures. In RF & microwave applications, the ProtoMat S103 showcases its high spindle speed to the fullest by achieving extremely clean structuring results.



Working with Flex and Rigid-flex Circuit Boards

Flex and rigid-flex circuit boards are difficult to secure on the working surface. The vacuum table available for LPKF ProtoMat systems solves this problem. RF tools are excellent for machining relatively soft material.



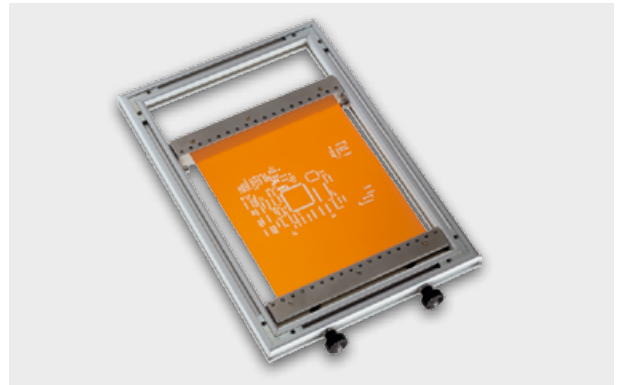
Depaneling

When designing PCBs, multiple layouts can be arranged on a substrate. LPKF ProtoMats are great for cutting these circuit boards from the base material. On precut panels, the ProtoMats can be used to cut break-out tabs.



Engraving/Cutting Plastics and Aluminum

All LPKF circuit board plotters are capable of structuring, drilling mounting holes, and engraving front panels. The S63 and S103 ProtoMats are also 2.5D capable, which allows slots or deeper recesses to be added to housing parts.

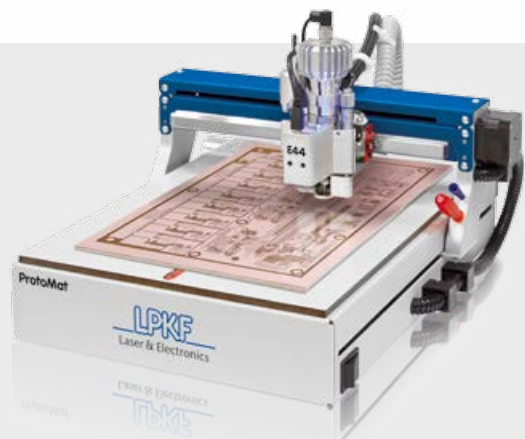


Milling of Soldering Paste Stencils

In prototyping, milled polyimide stencils are a great alternative to steel stencils. They can be produced in-house within minutes. The milling data is designed in LPKF CircuitPro.

An Ideal Training Solution

The LPKF ProtoMat E34/E44 is perfectly suited for milling and drilling circuit boards. This ProtoMat is especially designed for training purposes. It's about the size of an A3 (14.6" x 17.7") sheet of paper and has no upgrade options.



Technical Specifications	ProtoMat S63	ProtoMat S103
Part no.	127411	127410
Max. material size and layout area (X/Y/Z)	229 mm x 305 mm x 35/22 mm (9" x 12" x 1.4/0.9")*	229 mm x 305 mm x 35/22 mm (9" x 12" x 1.4/0.9")*
Mechanical resolution (X/Y)	0.5 µm (0.02 mil)	0.5 µm (0.02 Mil)
Repeatability	± 0.001 mm (± 0.04 mil)	± 0.001 mm (± 0.04 Mil)
Precision of front-to-back alignment	± 0.02 mm (± 0.8 mil)	± 0.02 mm (± 0.8 Mil)
Milling spindle	Max. 60 000 rpm, software-controlled	Max. 100 000 rpm, software-controlled
Tool change	Automatic, 15 positions	Automatic, 15 positions
Vacuum table	Optional	Included
Milling width adjustment	Automatic	Automatic
Working depth limiter	Mechanical	Pneumatic
Tool holder	3.175 mm (1/8")	3.175 mm (1/8")
Drilling speed	120 strokes/min	120 strokes/min
Travel speed (X/Y)	Max. 150 mm/s (6"/s)	Max. 150 mm/s (6"/s)
X/Y-drive, Z-drive	3-phase stepper motor, 2-phase stepper motor	3-phase stepper motor, 2-phase stepper motor
Solder paste dispense rate	≥ 0.3 mm (≥ 0.011") (soldering point), ≥ 0.4 mm (≥ 0.015") (pad)	≥ 0.3 mm (≥ 0.011") (soldering point), ≥ 0.4 mm (≥ 0.015") (pad)
Dimensions (W x H x D)	670 mm x 540 mm x 840 mm (26.4" x 21.3" x 33")	670 mm x 540 mm x 840 mm (26.4" x 21.3" x 33")
Weight	58 kg (128 lbs)	60 kg (132 lbs)
Operating conditions		
Power supply	90 – 240 V, 50 – 60 Hz, 450 W	90 – 240 V, 50 – 60 Hz, 450 W
Compressed air supply	4 bar (58 psi), 50 L/min (1.76 cfm)	6 bar (87 psi), 100 L/min (3.5 cfm)
Required accessories	Dust extraction	Dust extraction

* Value for Z without/with vacuum table

Upgrade Kit S63 > S103	
Part no.	127702
Contents	Vacuum table, S103 milling head with pneumatic working depth limiter



LPKF Service & Support

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LPKF Laser & Electronics AG sells and markets products and provides support in more than 50 countries. Find your local representative at www.lpkf.com.

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