SCHUNK®

PLANOS - a gripping experience

Reliable vacuum clamping

EXCEPTIONAL PRECISION FROM THE COMPETENCE LEADER.

PLANOS – the universal clamping system

Reliable and efficient

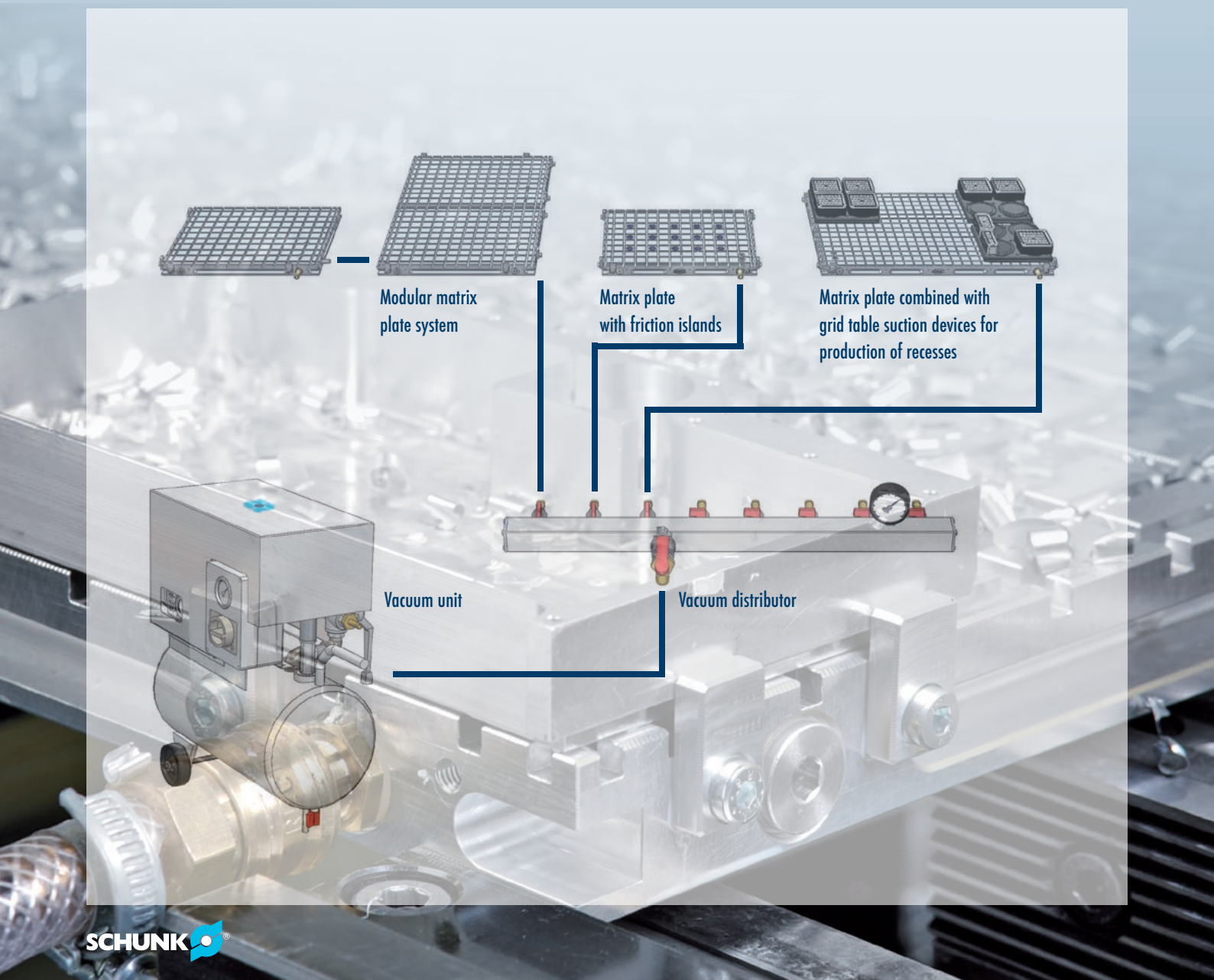
As the leading expert in clamping technology and gripping systems, SCHUNK knows where to find potential for efficient solutions and how best to utilize it. Customers profit form the innovative power of our dedicated family-owned company.

Short set-up times – High holding forces – Maximum precision

PLANOS matrix plates from SCHUNK clamp two-dimensional workpieces with a flat bottom reliably and quickly, ensuring minimal set-up times for machining centers. Even components that are difficult to clamp mechanically are child's play with PLANOS, which holds them precisely and without deformation.

PLANOS is a modular system that uses clamping claws or a quick change pallet system to connect the matrix plates to the machine table. The matrix pates can be combined in a way that suits the workpiece geometry, the machining method and the horizontal forces that need to be absorbed. This ensures maximum flexibility and simple handling.

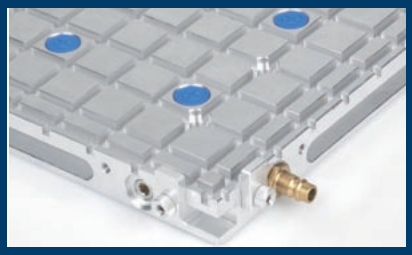
PLANOS clamping system: a flexible, modular design



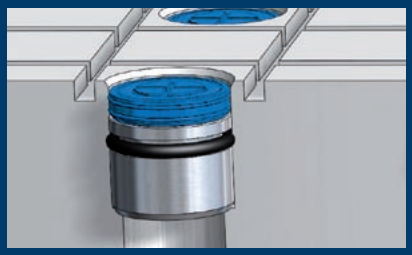
Unique – PLANOS friction islands

Maximum holding force for reliable clamping

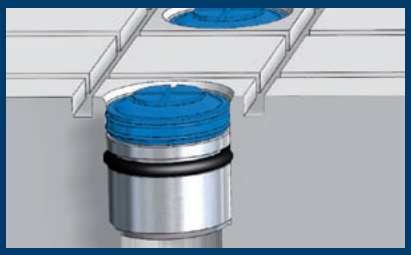
30% greater shearing forces



Matrix plate with friction islands



Inactive friction island

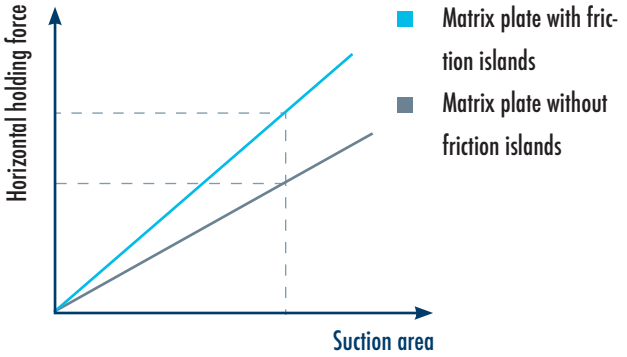


Active friction island

New for SCHUNK: Matrix plates with friction islands

- Up to 30% greater horizontal holding forces
- Friction islands exert no additional force on the workpiece
- Oil and ozone-resistant, can be replaced individually when worn out
- Automatic activation and deactivation via vacuum supply

30% more holding force thanks to friction islands



Practical example*

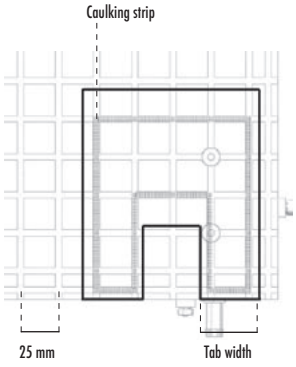
Workpiece material	Steel S235	Alu EN-AW 2007
Workpiece dimensions	200 x 240 mm	200 x 240 mm
Effective suction area	approx. 350 cm^2	approx. 350 cm^2
Vertical holding force, calculated	2.8 kN	2.8 kN
Horizontal holding force, measured		
Without friction islands, approx.	400 N	390 N
With friction islands, approx.	510 N	480 N

The data shown here are guideline values based on test results, and should only be used as an example. The holding forces must be tested under the actual conditions for each application.

* Lubricated with drilling emulsion (8% oil) and -800 mbar pressure difference.

Reliably clamping complex workpieces

PLANOS matrix plates are available with a wide range of different grid dimensions. For simple workpieces, only rough grid dimensions are required. For complex workpieces, the precise grid dimensions offered by matrix plates ensure that the caulking strip is positioned close to cut-outs and recesses, thus allowing flexible sealing of cut-outs, retaining the system vacuum and minimizing losses of clamping force.

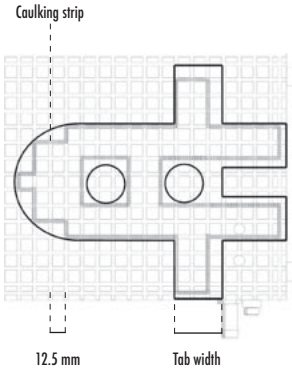


Simple workpiece

- Simple geometric structure
- Few tabs and recesses/cut-outs
- Tab width > 30 mm

Recommendation:

Grid dimension 25 x 25 mm



Complex workpiece

- Complex geometric structure
- Several tabs and recesses/cut-outs
- Tab width < 30 mm

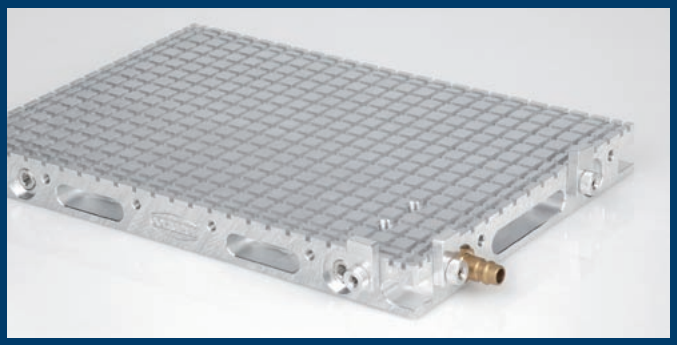
Recommendation:

Grid dimension 12.5 x 12.5 mm

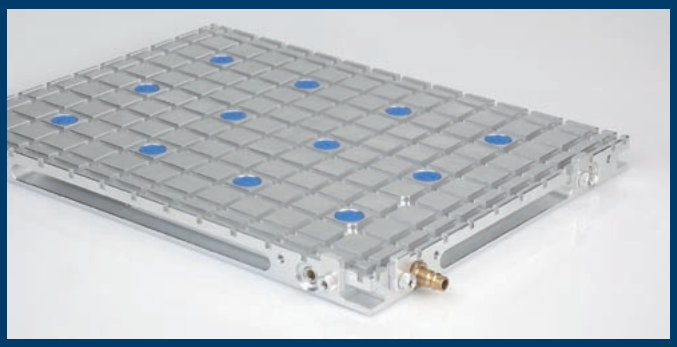
PLANOS – the right solution for any application

Matrix plates for distortion-free clamping of two-dimensional components

Application



Matrix plate without friction islands



Matrix plate with friction islands

- High-strength aluminum base body
- Modular system can be expanded to increase the effective suction area
- High precision (height tolerance +/-0.02 mm)
- Short set-up times and simple handling
- Mechanical back stops as positioning aids and for absorption of additional shearing forces
- High degree of flexibility due to modular design principle
- Simple production of cut-outs and recesses using a combination of matrix plate with grid table suction devices
- Up to 30% greater holding forces thanks to optional friction islands
- Automatic activation and deactivation of friction islands via vacuum supply

Ordering data for matrix plate SMPL-300x200x28

Type	Dimensions [mm]	Grid dimension[mm]	Grid slot dimension[mm]	Id-No.
SMPL-300x200x28-12.5-3	300x200x28	12.5x12.5	3x3	0425000
SMPL-300x200x28-25-3	300x200x28	25x25	3x3	0425001
SMPL-300x200x28-25-3-R	300x200x28	25x25	3x3	0425002

Delivered complete with back stops, hose clips, seal plugs and caulking strip. SMPL -...R variant complete with friction island

Ordering data for matrix plate SMPL-300x400x28

Type	Dimensions [mm]	Grid dimension[mm]	Grid slot dimension[mm]	Id-No.
SMPL-300x400x28-12.5-3	300x400x28	12.5x12.5	3x3	0425003
SMPL-300x400x28-25-3	300x400x28	25x25	3x3	0425004
SMPL-300x400x28-25-3-R	300x400x28	25x25	3x3	0425005
SMPL-300x400x28-30-5	300x400x28	30x30	5x5	0425006
SMPL-300x400x28-30-5-R	300x400x28	30x30	5x5	0425007

Delivered complete with back stops, hose clips, seal plugs and caulking strip. SMPL -...R variant complete with friction island
Available with grid slot dimension 5x5 mm for combination with the SCHUNK matrix plate with grid table suction device for producing cut-outs.

Ordering data for matrix plate SMPL-300x600x28

Type	Dimensions [mm]	Grid dimension[mm]	Grid slot dimension[mm]	Id-No.
SMPL-400x600x28-12.5-3	400x600x28	12.5x12.5	3x3	0425008
SMPL-400x600x28-25-3	400x600x28	25x25	3x3	0425009
SMPL-400x600x28-25-3-R	400x600x28	25x25	3x3	0425010
SMPL-400x600x28-30-5*	400x600x28	30x30	5x5	0425011
SMPL-400x600x28-30-5-R*	400x600x28	30x30	5x5	0425012

Delivered complete with back stops, hose clips, seal plugs and caulking strip. SMPL -...R variant complete with friction island
Available with grid slot dimension 5x5 mm for combination with the SCHUNK matrix plate with grid table suction device for producing cut-outs.
*Two vacuum connections are required when combining these variants with the grid table suction devices. Vacuum distributors on page 6.

Vacuum unit

Flexible and reliable vacuum generation

Powerful and reliable

Reliable vacuum clamping technology requires reliable components. That is why SCHUNK, the leading expert for clamping technology and gripping systems, offers a comprehensive range of powerful vacuum units in addition to the PLANOS matrix plates. These vacuum units guarantee maximum flexibility and a high degree of reliability.

SCHUNK's high-quality vacuum units are equipped with an oil-lubricated vacuum pump and a liquid separator, which also serves as a vacuum reservoir. Integrated system monitoring guarantees maximum process reliability. The interfaces provided allow the operator to connect any SCHUNK vacuum unit to the control unit of a CNC machining center.

1. Vacuum connection
2. Ball cock for activating the vacuum
3. Optical level display
4. Operating unit with vacuum switch, pressure gauge and acoustic warning device
5. Inspection glass for checking the oil level in the vacuum pump
6. Drain valve

Design

- Emergency stop function prevents the vacuum pump from being damaged by taking in liquids
- Operating vacuum monitoring
- Optical and acoustic warning devices
- Visual reservoir level monitoring
- Manual valve for draining liquid and interrupting the vacuum supply
- Advanced vacuum unit with secondary automation available on request

Choosing the right vacuum unit

Clamping face	Recommended suction power	Vacuum unit
< 1,200 cm^2	6 m^3/h	SVAGG-6-L
< 5,000 cm^2	18 m^3/h	SVAGG-18-L
< 1 m^2	40 m^3/h	SVAGG-40-L
< 2 m^2	63 m^3/h	SVAGG-63-L

Important notes on system design:

A complete system comprises a matrix plate and a vacuum unit. In addition to the Vacuum on/off and level monitoring functions, the SCHUNK vacuum unit also includes system monitoring using a built-in vacuum switch that can be synchronized on site via the interface with the machine control system. If there is a loss of clamping force, the monitoring system automatically interrupts the machining sequence.*

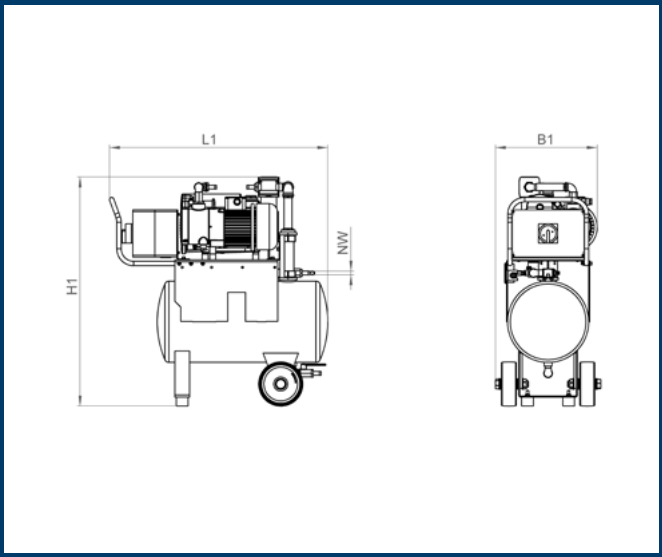
*In accordance with BGI 5003, Section 2.5.2.7

Complete solutions for vacuum generation

Vacuum unit, accessories and spare parts

Ordering data for SVAGG vacuum unit

Type	Id-No.
SVAGG-6-L Basic	0425050
SVAGG-18-L Basic	0425051
SVAGG-40-L Basic	0425052
SVAGG-63-L Basic	0425053



Design data for SVAGG vacuum unit

Type	L1 [mm]	B1 [mm]	H1 [mm]	NW1 [mm]
SVAGG-6-L Basic	690	330	700	12
SVAGG-18-L Basic	743	377	778	12
SVAGG-40-L Basic	1024	435	965	25
SVAGG-63-L Basic	1024	435	965	25

Technical data for SVAGG vacuum unit

Type	Max. Vacuum [mbar]	Suction capacity at 50 Hz [m3/h]	Voltage at 50 Hz [V]	Current range 50 Hz [A]	Rated power at 50 Hz [kW]	Protection class	Sound level at 50 Hz [db/A]	Weight [kg]
SVAGG-6-L	-980	6	175-260 / 300-450	1.9 / 1.1	0.25	IP 54	48	30
SVAGG-18-L	-980	18	190-260 / 300-450	3.3 / 1.95	0.55	IP 54	63	48
SVAGG-40-L	-980	40	200-240 / 345-420	4.8 / 2.8	1.1	IP 54	64	85
SVAGG-63-L	-980	63	200-240 / 345-420	6.2 / 3.6	1.5	IP 54	65	100

Ordering data for spare and accessory parts

Type	Id-No.
3 mm caulking strip SDI-SCHN-CR20 3	0425100
3.5 mm caulking strip SDI-SCHN-CR20 3.5	0425101
5 mm caulking strip SDI-SCHN-CR 20 5	0425102
5.5 mm caulking strip SDI-SCHN-CR 20 5.5	0425103
Clamping claw SSPAN-PRA-M12	0425104
Back stop SANSG-MPL (w/set screw and knurled nut)	0425105
Friction island SREIB-IN	0425106
Vacuum hose SVSL 21-12 PVC-G	0425107
Vacuum hose SVSL 34-25 PVC-DS	0425108
Hose clamp SSSB 16-27	0425109
Hose clamp SSSB 20-32	0425110
Hose clip SST G1/4-AG12	0425111
Hose clip SST G3/4-AG12	0425112
Hose clip SST G3/4-AG25	0425113
Distributor SVTR G3/4-IG 8xG1/4	0425114

Other accessory and spare parts available on request

Type	Dimension [mm]	Id-No.
Mini-Plate-R	175x175x7	0425120
Mono-Base-8	80x80x8	0425121
Quad-Base-R	175x175x15	0425122
Mono-Base-R R30	96x96x15	0425123
Mini-Plate 30	212x212x8	0425124
Mechanical clamping modules R30	175x175x45	0425125
Suction cup 1	80x80x30	0425126
Suction cup 2	80x40x30	0425127
Suction cup 3	80x28x30	0425128

Other accessory and spare parts available on request

Practical examples

PLANOS matrix plate for metalworking

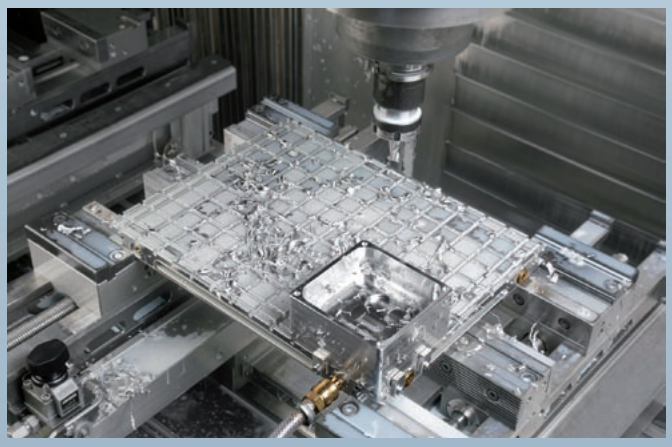
Clamping device for space/aircraft applications

Modular individuality: combine mechanical clamping elements and matrix plates

Workpiece geometries in the aerospace industry can be very complex. As such, they usually require a special clamping solution tailored to the individual application. Maximum precision and gentle workpiece machining are of great importance here.

PLANOS matrix plates from SCHUNK can be used to mount even thin workpieces gently and reliably. They minimize set-up times and grant the user a high degree of flexibility.

Efficient clamping of aluminum cubes

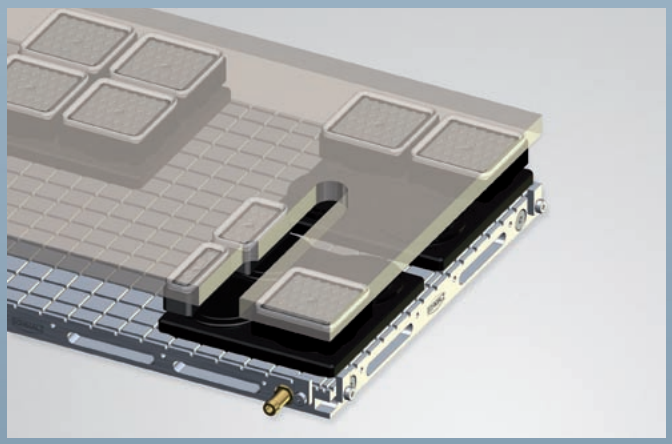


PLANOS matrix plate on a CNC machining center

The PLANOS matrix plate is mounted on the machine table using mechanical clamping modules. These clamp the thin-walled bottom of the workpiece precisely and without distorting it, thus allowing efficient 5-axes machining.

The vacuum is generated by the powerful SCHUNK SVAGG vacuum unit. The SVAGG's compact design makes it portable and allows it to be transported to the site of installation on rollers.

Milling through a workpiece



Grid table suction device for drilling and milling through workpieces

With grid table suction devices from SCHUNK, you can even produce cut-outs. In addition to this, the workpiece is machined with low height tolerances in the first stage. In the second stage, the grid table suction devices are inserted directly into the matrix plate grid and arranged. The workpiece can then be drilled without damaging the matrix plate or the component.

Catalog order

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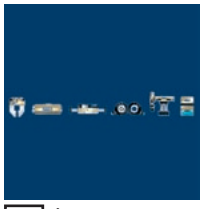
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