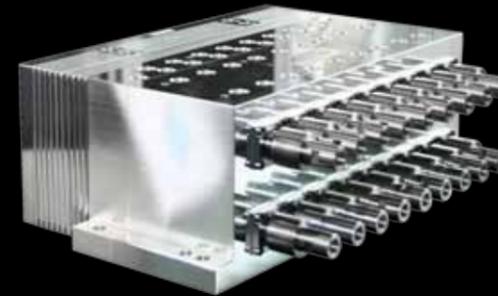


GROTEFELD

The driving force.



GROTEFELD

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Programme summary

GROTEFELD units

for the woodworking, plastics processing and aluminium processing industries and for the trades

The driving force.



GROTEFELD

GROTEFELD

Dear Reader,

as you know, even the best technology is subject to a constant process of further development and change, but we will keep you up-to-date with the latest state of the art. This catalogue provides an insight into our product range.

This catalogue is intended as a source of ideas, not as a list of article numbers. It is designed to arouse your interest in the wealth of varieties in which our products are available and to give you some idea of just what can be achieved today. Let us advise you. One thing you can be sure of is that we will also find a technically and economically optimum solution for you, too.

For more than 50 years we have carried the GROTEFELD philosophy in our hearts. We live, think and breathe GROTEFELD. And we are proud of the results.

We produce almost everything ourselves with our ultra-modern machinery, for the quality of the end-product is decisive. And that encompasses everything from engineering design (3D-CAD systems) through manufacture (CNC machines) to assembly. Our vertical integration is now over 90%. Only DIN parts, such as screws and bolts, ball bearings and electric motors, are still purchased as merchandise from selected premium suppliers.

Our quality control department is equipped with the very latest measuring instruments and test benches which we have developed ourselves in order to guarantee the outstanding quality of our products.

In addition, we offer a service ensuring that your production process runs smoothly and safeguards your investments.

Our experience forms the basis for your success in the long term. Make use of our capacities!

Best regards,

A handwritten signature in black ink, appearing to read 'Carsten Clauder'.

Carsten Clauder

Why GROTEFELD

Direct contact with leading machine manufacturers and end-users throughout the world has made us a recognized specialist and partner for trade and industry. Cutting is our job – for wood, plastics and aluminium. For several decades, we have designed, developed and built machining units for machines and CNC machining centres to the highest standards.

GROTEFELD units stand for top quality, precision and durability. They offer good value for money, making their use most appropriate. GROTEFELD can supply the right unit – functional, fully matured and without compromises – for every machining job.



Sawing, drilling, milling and tracing ...

... we can offer you competence, know-how, quality and service – all from a single source.

GROTEFELD

GROTEFELD

COMPETENCE

Competence is the ability to distinguish between right and wrong, and to act professionally, logically and responsibly. Every employee at GROTEFELD has this competence.

In all corporate processes, a highly specialized team of advisers, technicians, engineers and production workers ensures that the customers' requirements are optimally met.

GROTEFELD units are like Swiss clockwork: highly precise gear wheels with maximum durability.



KNOW-HOW

All the various machining processes must be known precisely so that the different machining tasks, such as sawing, drilling, milling and tracing, can be optimally handled.

This knowledge of different branches and production processes, together with the ability to develop new approaches in collaboration with leading machine manufacturers and end-users, is essential in order to produce high-quality cutting units.

That is why using new manufacturing and engineering methods is just as much a part of GROTEFELD as the regular further training provided for our employees.

GROTEFELD units are intelligently designed and technically sophisticated.

QUALITY

A product's quality depends on its properties and capabilities. GROTEFELD consequently attaches top priority to ensuring the highest possible quality.

These quality standards are assured through conscientious engineering design and the use of proven technology, state-of-the-art manufacturing methods and permanent quality controls in all manufacturing processes.

The precise functioning demanded by the market is permanently incorporated into all company processes. Quality requirements are documented and assured by our in-house inspection and test laboratory.

GROTEFELD units are high-quality products „Made in Germany“.



SERVICE

Ensuring the satisfaction of its customers is GROTEFELD's prime objective. Maintenance and the supply of spare parts – even after decades – for all units which we produce are therefore a matter of course.

Service begins at the moment of making contact with the customer and continues without interruption. This is guaranteed by all our employees. A service that creates confidence.

GROTEFELD: Service from the very first moment.



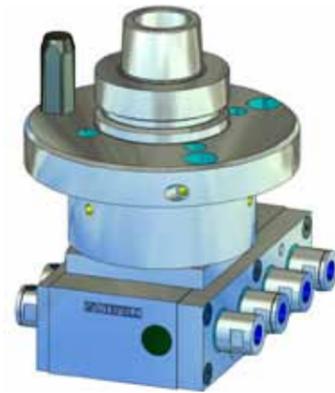
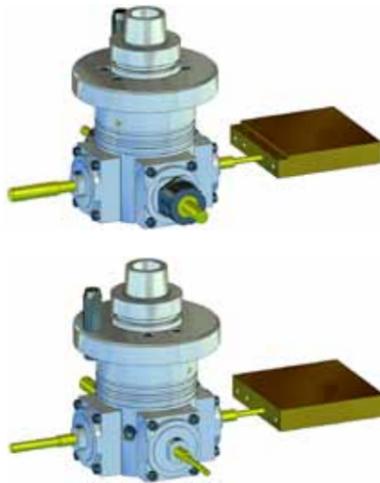
W01
angular sawing heads

The angular sawing head series **W01** have one continuous processing spindle. The receptacle is a sawing- or nut milling receptacle. The turning direction of the receptacle is opposite to the drive turning direction. The drive speed is transmitted in a ratio of 1:1,55 to the tool receptacles. The maximum spindle speed is 10,000 rpm in interval operation.



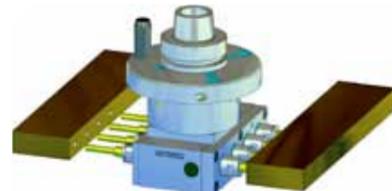
G03
angular heads

The angular heads of the series **G03** are equipped with up to 4 processing spindles. The spindle turning direction of all tool receptacles is always equal to the drive turning direction. The drive speed is transmitted in a ratio of 1:1,55 to the tool receptacles. The maximum spindle speed in interval operation is 18,000 rpm.



W04
angular heads

The angular drilling head series **W04** can be equipped on two opposite sides with up to 5 horizontal drilling spindles. The minimum spindle distance is 20,0 mm. The spindle turning direction is according to the number and position of the spindles R.H./L.H. The drive speed is transmitted in a ratio of 1:1. A maximum spindle speed of 6,000 rpm is possible in permanent operation.



G06-1.1
angular heads

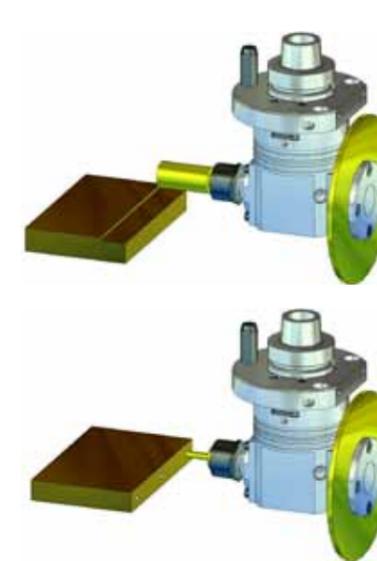
The angular heads of the series **G06-1.1** have a continuous machining spindle. The drive speed is transmitted in a ratio 1:1,55 to the tool receptacles. The maximum spindle speed is 20,000 rpm in interval operation.



G06-1.2
angular heads

The angular heads of the series **G06-1.2** have a continuous machining spindle with two tool receptacles. One of the receptacles is turning equal to the drive turning direction, the other is turning opposite to the drive turning direction.

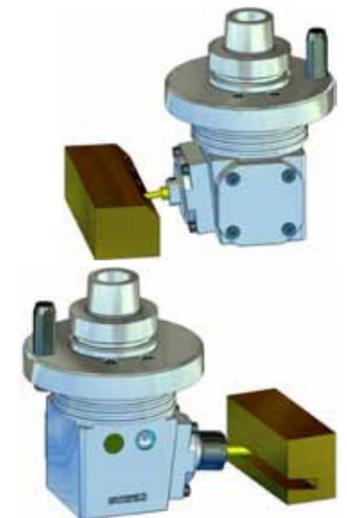
Different from the G10 housing type, no further spindles can be put in the G06 casing type. The drive speed is transmitted in a ratio of 1:1,55 to the tool receptacles. The maximum spindle speed in interval operation is 20,000 rpm.



G07
angular heads

The angular heads of the series **G07** offer you the possibility to choose an angular head with a fixed spindle position between 10° bended up and up to 10° bended down. In the two-spindle-execution the 180° opposite tool receptacle may have another angle than the other tool receptacle. The determined angle cannot be modified afterwards. The spindle turning direction is opposite to the drive turning direction.

The drive speed is transferred to the tool receptacles in a relation of 1:1. The maximum spindle speed is 18,000 rpm in interval operation.





G08
angular heads

The angular heads **G08** have three machining spindles and are especially made for the processing with long drills in a small area. The distance from the center of the aggregate to the end of the tool receptacle is only 40mm.

The spindles are arranged in an angle of 120°. The spindle rotation of all tool holders is equal to the drive turning direction. The maximum spindle speed is 12,000 rpm in continuous operation.



W09
angular heads

The angular heads of the series **W09** offer you the possibility to choose an angular head with a fixed spindle position between 10° bended up and up to 10° bended down. The determined angle cannot be modified afterwards. The spindle turning direction is right / left. The drive speed is transferred to the tool receptacles in a relation of 1:1.

The maximum spindle speed is 6,000 rpm in permanent operation.



G10
angular heads

The angular heads of the series **G10** are equipped with a continuous processing spindle with two possibly different tool receptacles. One of the receptacles is turning equal to the drive turning direction, the other is turning opposite to the drive turning direction.

The other existing processing spindles are arranged in an angle of 90° to the continuous processing spindle. The spindle turning direction of these tool receptacles is always equal to the drive turning direction. The drive speed is transferred in a relation of 1:1,55 to the tool receptacles. A maximum spindle speed up to 18,000 rpm while interval operation is possible.



G10-4.5
angular heads

The angular heads of the series **G10-4.5** are equipped with a continuous processing spindle with two possibly different tool receptacles. One of the receptacles is turning equal to the drive turning direction, the other is turning opposite to the drive turning direction.

The other existing processing spindles are arranged in an angle of 90° to the continuous processing spindle. The spindle turning direction of these tool receptacles is equal to the drive turning direction, that of the lower spindle opposite to the drive turning direction. The drive speed is transferred in a relation of 1:1,55 to the tool receptacles. A maximum spindle speed up to 18,000 rpm is possible in interval operation.



G11
angular heads

The angular heads of the series **G11** can be equipped with up to two tool receptacles to all 5 sides.

This results a maximum configuration of up to 10 drilling receptacles. The minimum spindle distance is 21,5 mm. The spindle turning direction is according to the number and position of the spindles R.H./L.H. The drive speed is transferred to the sideway tool receptacles in a ratio of 1:1,55, to the downside spindles in 1:1. A maximum spindle speed of 10,000 rpm is possible in permanent operation.

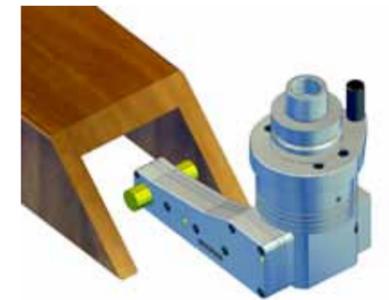


G12
angular heads

The angular heads of the series **G12** are equipped with a short processing spindle and two tool receptacles.

They are especially suitable for producing Elepart holes. One of the receptacles is turning equal to the drive turning direction, the other is turning opposite to the drive turning direction.

The drive speed is transferred in a ratio of 1:1,93 to the tool receptacles. A maximum spindle speed of 10,000 rpm is possible in permanent operation.





G15-1.1-F
angular heads

The angular heads of the **G15** series are used as edge notching aggregate. The smallest cut-out can be 52 x 62 mm. The drive speed is transmitted in the ratio 1:1,55 on the tool receptacles. A maximum spindle speed of up to 12,000 rpm is possible in interval operation.



G16
angular heads

The angular heads of the series **G16** are especially designed for the processing of lock case millings. The housing is cranked so that a small partial circle is achieved with a long mounted tool. They are equipped with a continuous processing spindle with max. two opposite tool receptacles. Therefore the spindle turning direction of one of the two tool receptacles is equal to the drive turning direction, the other is turning opposite to it.

A maximum spindle speed of 12,000 rpm is possible in permanent operation. The maximum spindle speed in interval operation is 15,000 rpm.



W17
angular heads

The angular heads of the series **W17** are equipped with one processing spindle which can be arranged in a determined angle in the area from 0° (horizontally) up to 90° max. (vertically). The determined angle cannot be modified afterwards. The spindle turning direction is opposite to the drive turning direction. The drive speed is transferred to the tool receptacle in a relation of 1:1. With regard to the type W17-1.2-SB the spindle can be arranged with a sawing and a drilling receptacle according to the above mentioned indications. A maximum spindle speed of 18,000 rpm is possible in interval operation.



W19
angular heads

The angular heads of the series **W19** were developed as processing heads for work piece edges and are a particular small sized and light type series. They are equipped with a continuous processing spindle with two possibly different tool receptacles 180° opposite towards each other. Therefore the spindle turning direction of one of the two tool receptacles is equal to the drive turning direction, the spindle turning direction of the other tool receptacle is opposite to it. The drive speed is transferred in a relation of 1:1 to the tool receptacles. A maximum spindle speed of 12,000 rpm is possible in permanent operation.



G19
angular heads

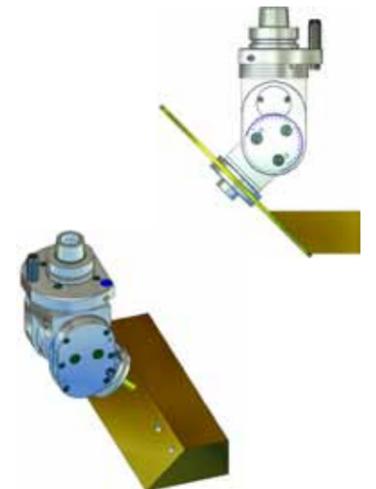
The angular heads of the series **G19** are used for drilling the sides of workpieces. The special feature is the very slight profile of just 7.5 mm from the bottom of the unit to the middle of the drill bit holder. This makes it, for example, possible to drill parts laterally that are manufactured in the nesting process directly after milling. The drive speed is transferred in a ratio of 1:1,99 to the tool receptacles. The maximum spindle speed is 8,000 rpm.



G25
angular heads

The angular milling heads **G25** have a machining spindle continuously adjustable by scale. The adjustment range is 0° (vertical) up to 100° to both sides. The spindle turning direction is opposite to drive turning direction.

The drive speed is transmitted in a ratio of 1:2,06 to the Collet receptacle and 1:1,48 to the Sawing receptacle. The maximum spindle speed is 18,000 rpm in interval operation.





G30
angular heads

The angular heads of the series **G30** are especially designed for milling of horizontal surfaces. The casing is equipped with one processing spindle for receptacle of tools with an aluminium base.

The spindle turning direction of the tool receptacle is opposite to the drive turning direction. The drive speed is transferred to the tool receptacle in a relation of 1:1,29. The maximum spindle speed is 12,000 rpm in interval operation.



G46
angular heads

The angular heads of the series **G46** have a continuous machining spindle. This implies that the spindle direction of one of the tool receptacles is equal to the drive turning direction, the other tool receptacle is opposite to it. The drive speed is transmitted in a ratio 1:2,6 to the tool receptacles. The maximum spindle speed is 24,000 rpm in interval operation.



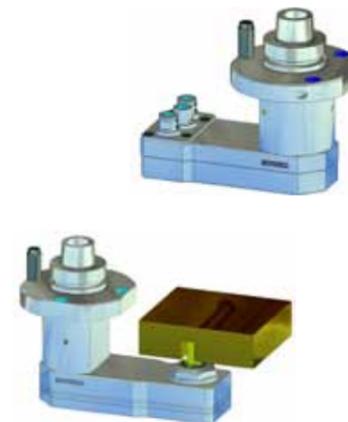
W56
angular milling heads

The angular milling heads **W56** are equipped with one processing spindle, which can be arranged in a determined angle from 15° up to a maximum of 31° downwards. The determined angle cannot be changed later. The spindle turning direction is opposite to the drive turning direction. The drive speed is transferred in a ratio of 1:2,06 to the tool receptacle. The maximum spindle speed is 16,000 rpm in interval operation.



G200
angular heads

The underfloor drilling milling aggregate **G200** is due to its design conceived for drilling or milling the bottom side of workpieces. The spindle turning direction of the tool receptacle is opposite to the drive turning direction. The drive speed is transferred in a ratio of 1:1 to the tool receptacle. The maximum spindle speed is 12,000 rpm in interval operation. The dimensions are variable and can be created on almost any size you want.



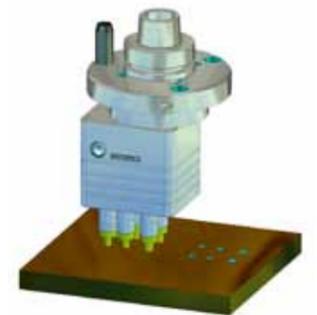
UNI2
drilling gears

The drilling gears of the **UNI2** series can be manufactured with spindle distances from 20 mm. The gears can produce holes with a diameter of up to 32 mm with a speed range from 645 to 10,000 rpm in continuous operation. The maximum transferable capacity is 3.2 kW. Spindle speed and drill pattern can be selected freely, the drilling gears are available for all standard hinges.



DPL
drilling gears

The multi-spindle drilling gears **DPL** are available with customized drill patterns. In standard configuration the minimal distance between spindles is 16 mm. Smaller distances are available on request, depending on the application range. During the construction was attempted to keep the speed gap between the spindles as low as possible. If possible the drive speed is transmitted in a ratio of 1:1. At different spindle distances within a drilling gear it is often necessary to vary the speeds of the individual spindles because of different gears. The spindle speeds are 4,500 rpm in permanent operation and 6,000 rpm in interval operation.





STB multi-spindle drilling gears

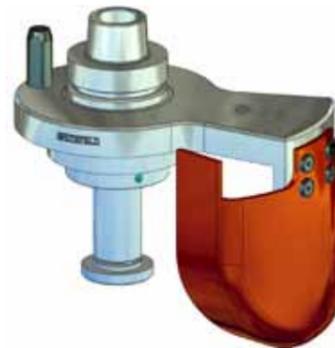
The multi-spindle drilling gear **STB** series are suitable for the processing of materials with steel insert. The shank of the center spindle is 5 mm longer than the outer spindles. The speed of max. 4,500 rpm is transferred in a ratio of 1:1 to the central spindle. The speeds of the outer spindles depend on the distance.



DN-VCM vertical chisel mortiser

The vertical chisel mortiser **DN-VCM** can be used to make square holes. They have a tool spindle with a rotating tool holder and a fixed inclusion for square tools. The spindle direction is equal to the drive turning direction.

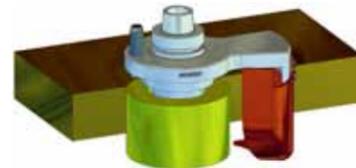
The drive speed is transferred in a ratio of 1:1 to the tool receptacle. The maximum spindle speed is 5,000 rpm in permanent operation.



DN-SPL chip guiding system

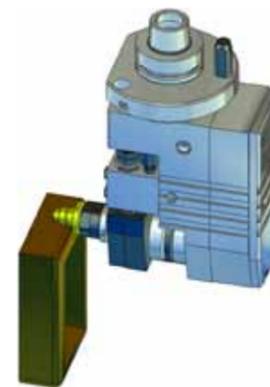
The chip guiding systems of the series **DN-SPL** have a tool receptacle according to your specifications. The direct receptacle DN-SPL is used for direct reception of tools for the processing of solid wood or wood-like composite materials.

The standing adapter casing (due to torque support) is used for mounting chip deflectors, according to the used profiling tool. The maximum spindle speed is 18,000 rpm in permanent operation.



FN2 tracing spindles

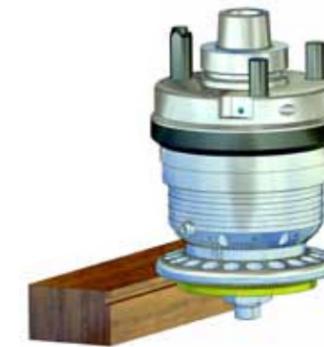
The tracing spindles **FN2** are equipped with a collet receptacle for shaft milling cutters. The spindle turning direction is opposite to the drive turning direction. The drive speed is transferred to the tool receptacle in a ratio of 1:3. The maximum spindle speed is 10,000 rpm in interval operation. The tracing stroke is 1,0 mm in X(Y)- and in Z-direction. The 2D-Horizontal-tracing spindle is used for light rounding, chamfering and equalizing of the upper and the lower panel edges (for example at soft- or postforming). The spindle traces by copying the surface of the panel and so it ensures that the processing is made equal to these traced surfaces.



GT05 tracing spindles

The tracing spindle series **GT05** work with a spring suspended stroke of 10 mm. The distance of the tool receptacle to the tracing arm or bell is constant.

The sensing device is guided over the workpiece surface and adapts the suspension stroke through the different workpiece tolerances. In that way for example Lammello-connections, grooves or feathers are always done in a constant distance to the surface from the working piece. For different materials, it is necessary to adapt the tracing force. At the GT05 this can easily be changed by the user with an adjustment screw. Depending on the surface of the workpiece either sliding rings of polyamide or hard chrome plated steel can be used, on request with blow-off nozzles. The height between the tracing bell to the tool can be adjusted continuously by scale. The maximum speed is 18,000 rpm.



GT06 tracing spindles

The tracing spindle series **GT06** can be used for making radii at the top and bottom edges of for example stairs.

The distance of the tool receptacle to the two tracingbells are always constant. The sensing device is guided over the workpiece surface and adapts to the workpiece tolerances due to the sprung stroke. As a result, processing always takes place at a constant distance from the surface.

The stroke of 10 mm in these tracing spindles is not only one-sided, it is 5 mm upwards and downwards.

This makes it possible to process the upper and then the lower side of the workpiece, without having to change the unit. The force is, as with all Grotefeld tracing spindles, adjustable.

The vertical distance of the tracing bells to the tool can be adjusted continuously by turning them. It is not necessary to change the tool for different workpiece thicknesses;

the max. workpiece thickness to be machined is 68 mm.





FN6
tracing spindles

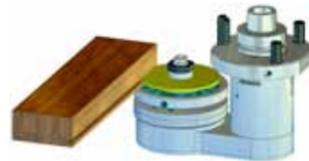
The tracing spindles series **FN6** have a shank receptacle and are used for drilling in a constant distance to the traced surface of the workpiece. So you get on uneven surfaces a constant distance relative to the surface with a tolerance of ± 0.05 mm.

The tracing spindle must be provided with a tracing piece. The material of the tracing piece should be chosen depending of the surface constitution. Available is a piece of steel or polyamid.



FU7
tracing spindles

The Tracing spindle series **FU7** are used for scanning the lower side of the workpiece and makes a milling cut parallel to it. They have a spindle with a tool receptacle for saw blades or disc cutters. There are also other possible tool receptacles. The drive speed is transferred 1:1 by a belt drive to the tool receptacle. The maximum spindle speed is 12,000 rpm in interval operation. The tracing bell has an outer diameter of 120 mm and allows a maximum tool diameter of 100 mm. The tracing stroke is 5 mm.



FN10
2D-tracing spindles

The 2D-Tracing spindle **FN10** is used for rounding, chamfering or milling of workpiece edges. It sampled at the same time from the top and front face of the workpiece and works with a spring suspended stroke, each 10 mm in horizontal and vertical direction. Unevenness in the material can be equalized thereby. The sensing device is made with adjustable sliders on the workpiece surface and conforms to the tolerances due to a spring suspended stroke.

As a result the processing is always in the same distance to the surface of the workpiece. For different materials, it is necessary to adjust the tracing force. At the FN10 this can easily be changed steplessly with adjustment screws by the user. Depending on surface characteristics of the workpiece either sliding pieces of polyamide or hard chrome plated steel can be used.

The maximum speed is 14,000 rpm.



FN12
tracing spindles

The Tracing spindle series **FN12** are used for rounding or chamfering edges of workpieces. They are scanning the lower side of the workpiece and work with a spring suspended stroke of 10 mm in vertical direction. Unevenness in the material can be equalized thereby.

The sensing device is made with adjustable sliders on the workpiece surface and conforms to the tolerances due to a spring suspended stroke.

As a result the processing is always in the same distance to the surface of the workpiece. For different materials, it is necessary to adjust the tracing force. This can easily be changed steplessly with an adjustment screw by the user. Depending on surface characteristics of the workpiece either sliding pieces of polyamide or hard chrome plated steel can be used. The maximum speed is 18,000 rpm.



FN19
tracing spindles

The tracing spindle series **FN19** work with a spring suspended stroke of 10 mm. The distance of the tool receptacle to the tracing rollers is constant. The sensing device is guided over the workpiece surface and adapts the suspension stroke through the different workpiece tolerances. In that way for example Lammello-connections, grooves or feathers are always done in a constant distance to the surface from the working piece. For different materials, it is necessary to adapt the tracing force.

This is set before the delivery to the requested force. Depending on the surface of the workpiece either tracing rollers of rubber or steel can be used. On request the tracing device can supplied with blow-off nozzles. The height between the tracing rollers to the tool can be adjusted continuously. The maximum speed is 9.708 rpm.



FN7-1.0
Vertical suction unit

The vertical suction unit **FN7-1.0** is suitable for applying labels to work piece surfaces. The self-adhesive labels are removed by a suction plate from a printer and glued to the desired position on the workpiece. The suction plate has a sprung stroke to compensate tolerances. The suction of the unit is generated by the rotation of the drive spindle. The suction power can be regulated by the speed (max 10,000 rpm). Suction plates of synthetic materials are available in different sizes.





GT22 marking units

The labeling units of the **GT22** series can hold highlighters, felt-tip pens or something else, with which workpieces can be labeled.

The inserts for pens are available in different diameters. The aggregates can be taken up in woodworking machines and stored like any other aggregate in the tool changer.

The pen is spring suspended to avoid damages by tolerances in the workpiece surface. The sprung stroke is 8 mm; the spring force can be adjusted from 5N-20N.

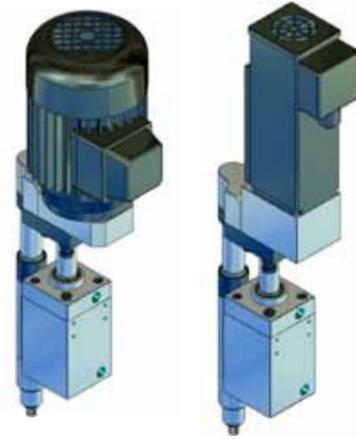
Also available are these units with a receptacle for keyed drag knives with which for example protective films can be cut on material surfaces without damaging the surface. Even without turning the C-axis it is possible to cut small radii.



GS50 threading unit

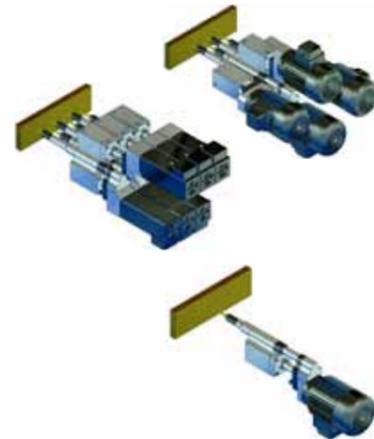
The threading unit **GS50** is suitable for threads from M3 to M14 by changeable leading spindles. It can be used for the processing of plastic, aluminum and steel. The series is in its construction similar to the B050 series of drilling units.

Accordingly the mounting elements of the B050 can also be used for the GS50. The spindle is driven by an electric motor via toothed belt drive. The speed can be controlled by a frequency converter.



B030 drilling units

The drilling units of the series **B030** are the smallest units with pneumatic feed. These units are suitable for working with wood and plastic. The B030T units are specially designed to reach a small drilling center distance. With this unit the smallest drilling distance of 32 mm can be achieved in a quantity of 4. The units are available with 50 and 80 mm stroke. The drive capacity is 0.45 kW.



B050 drilling units

The **B050** series is the middle power class of drilling units with pneumatic feed. These units are suitable for working with wood and plastic, light metal and steel. They can be used with different tool receptacles and for multi spindle drilling gears. The drilling units of the B050 series are available with 80 to 125 mm stroke.

All cylinders are equipped with magnetic pistons, so that cylinder switches can be used for controlled processings. The drive capacity is 1.1 kW. The use of reducing gears allows a reduction of rotation speed while keeping the power of the engine and increases the spindle torque.



Reduction gear 050

The **Reduction gear** can be used in conjunction with the direct drive drilling unit B050D and B050D-St. The gears are accessories. The installation can be done in the factory and also afterwards at the customer. The use of the gear allows the reduction of speeds while maintaining the drive capacity of the motor and increases the torque of the drilling spindle.



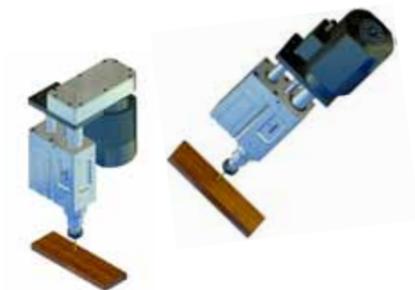
B100 drilling units

The **B100** series is the upper power class of the drilling units with pneumatic feed. These units are suitable for working with wood and plastic, light metal and steel. For the processing of light metal and steel they are supplied with a hydraulic damping. The necessary holes are available in standard units, so that an addition of the units can also be done later.

They can be used with different tool receptacles and for multi spindle drilling gears. The drilling units of the B100 series are available with 80, 100, 150 and 200 mm stroke.

To allow the use under various spatial conditions, the units can be equipped with different types of drives. This results in the basic types: Direct drive - B100D and Belt drive - B100A.

If special speeds are required, the units can be added by a reducing gear RZG100. This can achieve the required speed by a predefined ratio.

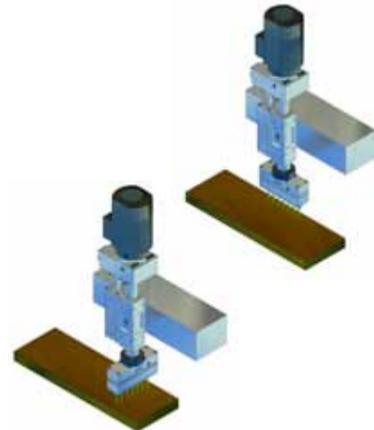




DVM050 swivel units

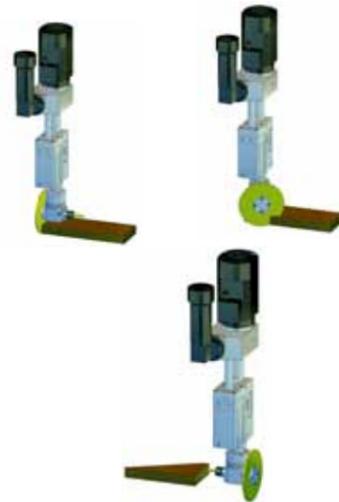
The swivel units of the series **DVM050** offer the possibility to rotate GROTEFELD aggregates with clamping rings up to 90° (C-axis).

The rotary movement is pneumatically actuated; the angle can be adjusted by end stops. The units have a stroke of 80 mm (Z-axis). The maximum speed is 5,600 rpm.



DVM100 swivel units

The swivel unit series **DVM100** are similar in construction and structural dimensions to the GROTEFELD drilling units B100. They have a stroke of 80mm or 100 mm and a spindle speed of 2,800 rpm. The swiveling-process is done by a servo motor. All angles between 0° and 360° can be selected by the controller. Servo motor and controller are optionally available.



B045D drilling spindles

The drilling spindles **B045D** are units without an own pneumatic feed.

To reach the required stroke, the units can be mounted for example on slide units or machine axes.

The drilling spindle B045D relates to the series 100 and can be equipped with all tool holders of that series.



B060D drilling spindles

The drilling spindles **B060D** are units without an own pneumatic feed.

To reach the required stroke, the units can be mounted for example on slide units or machine axes.

The Drilling spindle B060D is equipped with a receptacle for collets with the size 25. Other tool receptacles can be used, too.



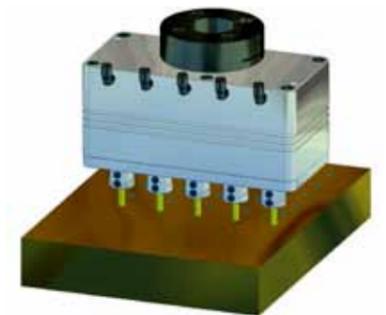
D045-AN driving units

The drive unit **D045-AN** is designed for the propulsion of multi-spindle drilling gears up to a maximum speed of 6,000 rpm. The gears must be supplied with a clamping ring of the series B100. The necessary drive piece is part of the drive unit.



ADU air drill unit

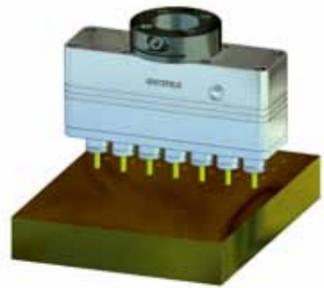
The **ADU** gear with air feedings removes dust from the boreholes directly while drilling. It can be built with distances of min. 30 mm. The Spindle rotation is always right. The maximum speed in continuous operation is 6,000 rpm; the spindle power is 3.2 kW between 1,000 and 6,000 rpm. The shank receptacles $\varnothing 10H7$ with side clamping screws can used with air drills. The maximum allowed air pressure is 6 bar.





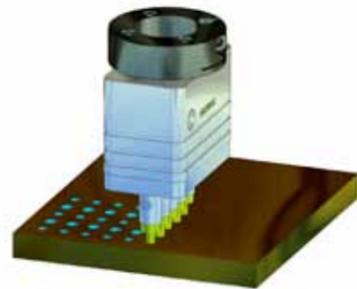
UNI2 drilling gear

The drilling gears with clamping ring of the **UNI2** series are suitable for GROTEFELD drilling units and direct drives. They can be manufactured with spindle distances from 20 mm. The gears can produce holes with a diameter of up to 32 mm with a speed range from 645 to 10,000 rpm in continuous operation. The maximum transferable capacity is 3.2 kW. Spindle speed and drill pattern can be selected freely, the drilling gears are available for all standard hinges.



DPL multi-spindle drilling gears

The multi-spindle drilling gears **DPL** with clamping ring for drilling units are available with customized drill patterns. The minimal distance between spindles is 16 mm. During the construction was attempted to keep the speed gap between the spindles as low as possible. If possible the drive speed is transmitted in a ratio of 1:1. At different spindle distances within a drilling gear it is often necessary to vary the speeds of the individual spindles because of different gears. The spindle speeds are 4,500 rpm in permanent operation and 6,000 rpm in interval operation.



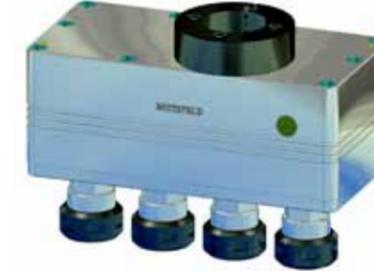
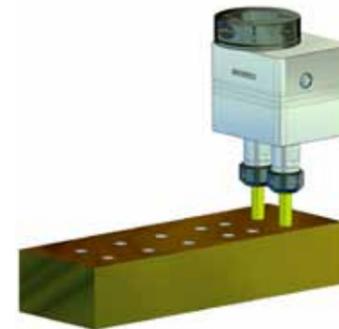
STB multi-spindle drilling gears

The multi-spindle drilling gear **STB** series are suitable for the processing of materials with steel insert. The shank of the center spindle is 5 mm longer than the outer spindles. The drive speed of max. 4,500 rpm is transferred in a ratio of 1:1 to the central spindle. The speeds of the outer spindles depends on the distance.



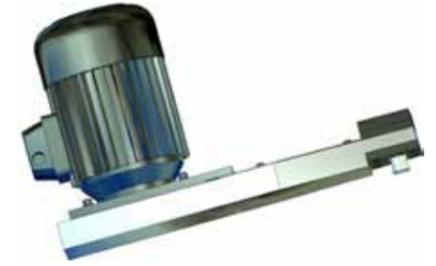
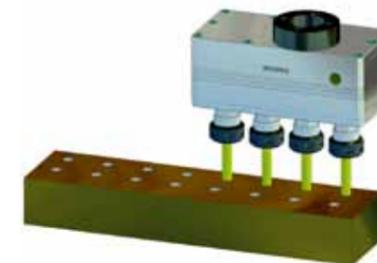
VS12 multi-spindle drilling gears

The multispindle drilling gears of the series **VS12** are available with spindle distances of min. 38 mm. They are equipped with collet receptacles Type „N„ (12 mm max.). The turning direction of the spindles is „RIGHT“. The maximum spindle speed is limited to 4,500 rpm.



VS16 multi-spindle drilling gears

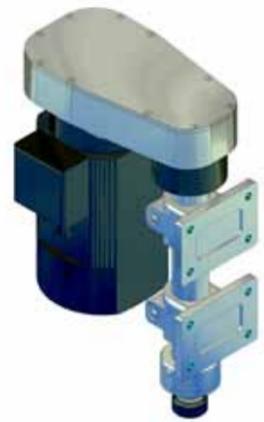
The multispindle drilling gears of the series **VS16** are available with spindle distances from 44 mm. They are equipped with collet receptacles Type „O“ (16 mm max.). The turning direction of the spindles is RIGHT. The maximum spindle speed is limited to 4,500 rpm.



B200W angular drilling spindles

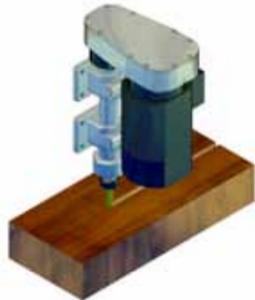
The angular drilling spindles series **B200W** are units without own feed. These units are suitable for working with wood, plastic, light metal and steel in confined and tight spaces within and below work pieces. To reach the required processing stroke, for example, the units can be mounted on cross slides or machine axes. The units can be individually adapted to specific customer requirements. Due to the belt drive transmission ratios up to a maximum spindle speed of 13,000 rpm are possible. For mounting the unit the cover and the sides of the case are available. In addition, the units can be equipped with a foot bracket motor.





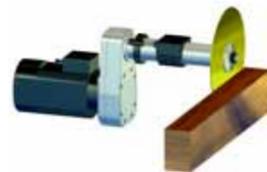
F045
milling spindles

The milling spindles **F045** are units without own feed. To reach the required processing stroke, for example, the units can be mounted on cross slides or machine axes. The spindles are equipped with a tool receptacle for collets size 16 (maximum shaft diameter 16 mm). Alternative tool receptacles also can be used. For the use in different space conditions, the spindles of the F045 series can be equipped with different types of drives.



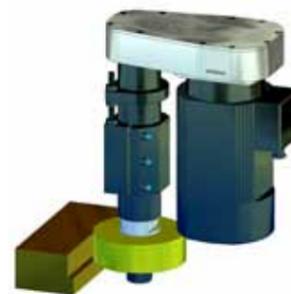
S060
sawing spindles

The sawing spindles of the series **S060** are units without own feed. To reach the required processing stroke, for example, the units can be mounted on cross slides or machine axes. The mounting takes place over an integrated clamping element. These units are suitable for working with wood, plastic, aluminum and steel. The tool receptacle is an integrated part of the saw units. This Saw receptacle is suitable for blades with a hole of 30 mm and a thickness of minimum 1.0 to a maximum of 5.0 mm. Saw blades up to a maximum diameter of 400 mm can be used. The following drive capacities are available: 1.7 kW, 2.2 kW and 2.8 kW.



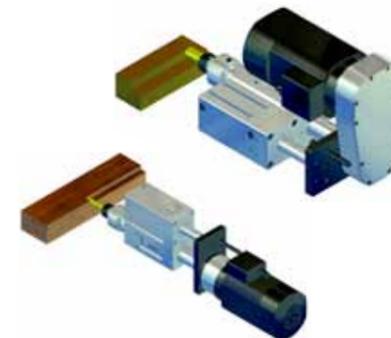
F070
milling spindles

The milling spindles of the series **F070** are units without own feed. To reach the required processing stroke, for example, the units can be mounted on crossslides or machine axes. The mounting takes place over an integrated clamping element. These units are suitable for working with wood, plastic, aluminum and steel. The F070 milling spindles are available with a tool receptacle for collets size 25, max. ø25 mm (Version P) or are equipped with a milling cutter ø30 mm (Versions F).



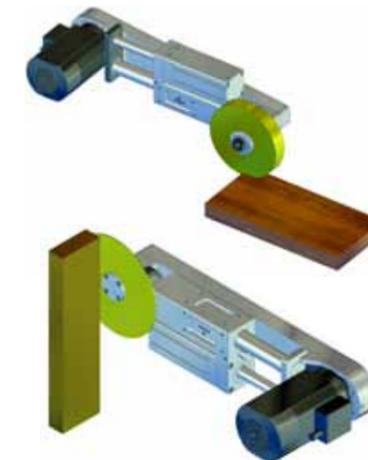
F100
milling spindles

The milling spindles of the series **F100** are units with pneumatic feed. These units are suitable for working with wood and plastic, light metal and steel. For the processing of light metal and steel they are supplied with a hydraulic damping. The necessary holes are available in standard units, so that an addition of the units can also be done later. To allow the use under various spatial conditions, the units can be equipped with different types of drives.



F100W
sawing- and milling units

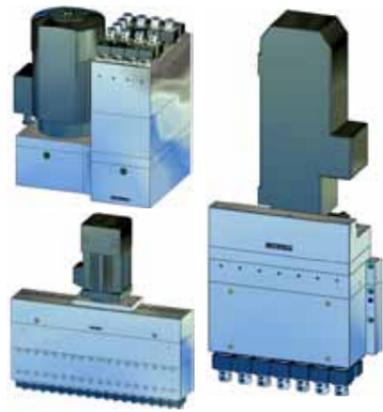
The angular sawing- and milling units of the series **F100W** are equipped with a pneumatic feed. These units are suitable for working with wood, plastic, light metal and steel. For the processing of light metal and steel they are supplied with a hydraulic damping. The necessary holes are available in standard units, so that an addition of the units can also be done later. The units of series F100W are available as left and right versions.



DBE01
drilling spindle units

The drilling spindle unit series **DBE01** are designed for the use in CNC machines and have been proved for many years in practical use. The units are driven by wheels; all the spindles are turning right. Therefore, these units are also suitable for processing metal materials. Each single spindles can be submitted 50 mm, units with longer stroke are available on request. The drilling feed itself must be provided by the feed of the machine. Depending on customer request the drilling spindle units are formed different, the minimal spindle distance is 25 mm.



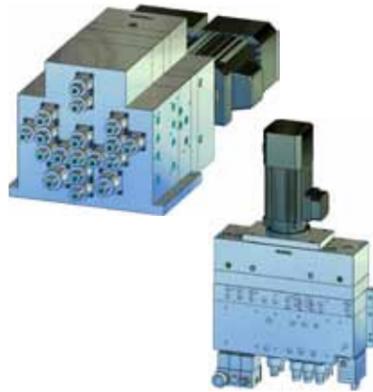


DBE04 drilling spindle units

The drilling spindle unit series **DBE04** are designed for the use in CNC machines and have been proved for many years in practical use. The units are driven by wheels.

Each single spindle can be submitted 50 mm; units with longer stroke are available on request. The drilling feed itself must be provided by the feed of the machine.

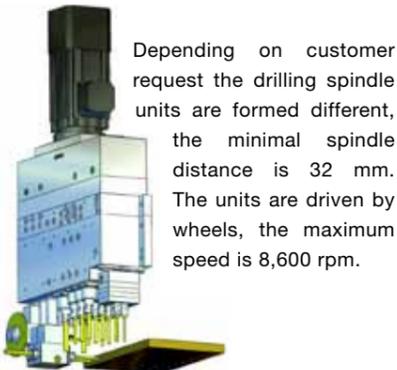
Depending on customer request the drilling spindle units are formed different, the minimal spindle distance is 32 mm.



DBE24 drilling spindle units

The drilling spindle unit series **DBE24** are designed for the use in CNC machines and offer the possibility to arrange more than 2 rows in a distance of min. 32 mm. Almost all drill patterns can be realized to customer specification. The vertical drilling spindles can be combined with horizontal and vertical drilling gears with drilling distances of min. 16 mm.

Each single spindle can be submitted 50 mm; units with longer stroke are available on request. The drilling feed itself must be provided by the feed of the machine.



Depending on customer request the drilling spindle units are formed different, the minimal spindle distance is 32 mm. The units are driven by wheels, the maximum speed is 8,600 rpm.

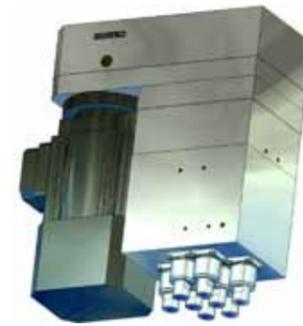
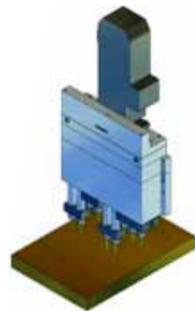


TBE04 drilling spindle units

The drilling spindle unit series **TBE04** are designed for the use in CNC machines and have been proved for many years in practical use.

The units are driven by toothed belts. Each single spindle can be submitted 50 mm; units with longer stroke are available on request. The drilling feed itself must be provided by the feed of the machine.

Depending on customer request the drilling spindle units are formed different, the minimal spindle distance is 32 mm.



TBE24 drilling spindle units

The drilling spindle unit series **TBE24** are designed for the use in CNC machines and offer the possibility to arrange more than 2 rows in a distance of min. 32 mm.

Almost all drill patterns can be realized to customer specification. The units are driven by toothed belts, all the spindles are turning right. The vertical drilling spindles can be combined with horizontal and vertical drilling gears with drilling distances of min. 16 mm. Each single spindle can be submitted 50 mm; units with longer stroke are available on request.

The drilling feed itself must be provided by the feed of the machine. The maximum speed is 8,600 rpm.



HSB01 drilling spindle units

The drilling spindle units **HSB01** are designed for drilling small diameters with high speeds.

They are suitable for the use in CNC machines and offer the possibility of more than 2 rows in a distance from 32 mm.

Almost all drill patterns can be realized to customer specification. Each single spindle can be submitted 30mm; units with longer stroke are available on request.

The maximum speed is 30,000 rpm.



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