



MACHINE OVERVIEW

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DAMA TECHNOLOGIES AG

DAMA TECHNOLOGIES is a Swiss machine tool producer specialized in the field of solutions for machining ultra-hard, advanced materials, such as high-performance ceramics, glass, sapphire, carbide...

DAMA (**DA**rmstädter **MA**schinenfabrik) established in 1947 in Darmstadt quickly became one of the biggest optical machine producer worldwide. Today the tradition is continued by the 2001 founded and privately owned **dama technologies ag**, with the brands DAMA and METEOR.

DAMA does not only offer a wide range of machines but does also supports its customers in case of any production or process problems. With its ultrasonic grinding and lapping solutions, DAMA is one of the leaders worldwide in this emerging technology. Located in the north-east of Switzerland, a region known for its long lasting tradition in machine production, DAMA gets all the resources necessary for the development, production and service of high-end grinding and polishing machines. Following a strategy of high vertical integration, ensures the quality as well as the flexibility of the company. With more than ten thousand installed machines worldwide in the last 60 years, customer can profit of a long and profound experience in machining hard materials.



Machine overview

In the machine-range of DAMA AG there is a complete serie of different grinding machines:

- Ultrasonic machining systems
- Internal/External cylindrical grinding machine
- Slicing machines
- Single surface and 3-D generators
- Contour grinding machines
- Lens grinding machine
- Grinding and polishing machines
- Drilling and reboring machines
- Chamfering machines

This selection of modern machines of high technology and modular conception is making it possible to meet the specific and special customer-wishes.

Modular Grinding Machine System

For the machining of glass, ceramic and other hard brittle materials

Thanks to the modular design it is possible to customize the dama-grinding machines with standard components to customer-specific requirements.

The machines are available with or without ultrasonic assisted grinding technology.

The range starts with a simple 1-axis flat grinding machine over 3-axis trepanning, internal/external grinding or slicing machines up to 5-axis ultrasonic supported grinding centers with automatic tool changing system.

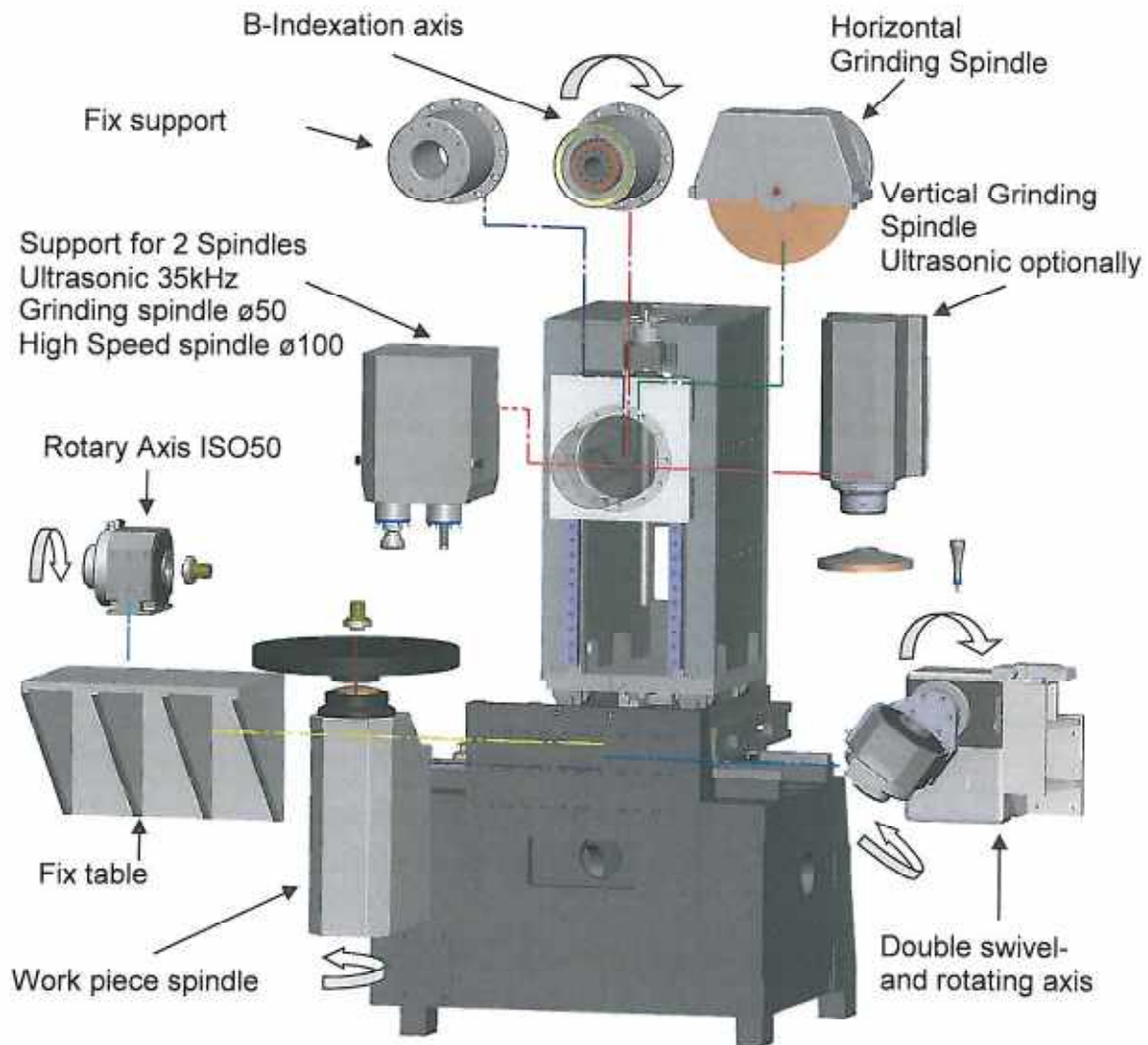
The linear axis are driven by linear motors or trough precision ball screws. The linear roller guides ensure a smooth movement.

These axes are separated from the working area in order to perfectly protect them from grinding swart. A strong grey cast iron machine frame is the base of the precision.

Options as swivel- and indexing axis, work piece spindles, grinding spindles with or without ultrasonic, ultrasonic spindles, automatic tool changing device, force measurement system etc. complete the offer.

The B&R control PP520 system offers an easy work environment. Specific dialogues for drilling, trepanning, slicing, flat or lens grinding simplify the set up and shorten the programming. Individual designed dialogues for specific parts lead to a significant competitive edge. The touch screen gives a good process overview and is a comfortable interface. The ISO programming possibility sets nearly no limits on complex geometries – especially in combination with a CAM solution. Optionally, the machine is also available with a Siemens 840D.

Different accessories – such as centrifugal separators – and a wide range of diamond tools supports your grinding problem solution.



Possible executions

- | | |
|--|--|
| - Flat grinding machine | X- and Z-Axes, Work piece spindle |
| - Lens grinding machine: | X-, Z- and B-Axes, Work piece spindle |
| - Slicing machine: | X-, Z- and Y-Axes, Fix table or rotating axis |
| - Trepanning machine: | X-, Z- and Y-Axes, Fix table |
| - 5-Axes grinding center: | X-, Y- and Z- Axes, Double swivel- and rotating axis |
| - Internal/External cylindrical grinding machine | X-, Z- and B-Axes |
| - Polygone grinding machine | X-, Z-, B- and C-Axes |

Technical data

| CNC-Axes | Travel path | Speed | Display | Torque Nominal/Max |
|--------------------|--------------------|--------------|----------------|-------------------------------|
| X-Axis | 450mm | 5m/min | 0.001mm | |
| Y- Axis | 200mm | 5m/min | 0.001mm | |
| Z- Axis | 400mm | 5m/min | 0.001mm | |
| B-Indexing axis | +/-91° | 60 °/s | 0.001° | 60Nm/180Nm |
| B-Axis work piece | +/-96° | 60 °/s | 0.001° | 200Nm/1000Nm |
| Rotary axis ISO 50 | 360° | 600 rpm | 0.001° | 25Nm/60Nm |

| Spindles | Speed rpm | Power | Automatic clamping | Fixation device |
|--|------------------|--------------|-------------------------------|------------------------|
| Workpiece spindle | 100-1'000 | 0.75kW | yes | collet |
| Workpiece spindle | 20-200 | 1.5kW | yes | plan plate Ø550 |
| Ultrasonic 35kHz | 500-8'000 | 0.75kW/1.5kW | no | Ø12,2 M8 |
| Grinding spindle ø120 with ultrasonic chucks 30-45kHz | 0-18'000 | 7.5kW | yes | HSK-E 50 |
| Grinding spindle ø50 | 500-8'000 | 0.75kW/1.5kW | no | coneV15 |
| Grinding spindle ø100 | 0-8'000 | 4kW | no | HSK 63 C |
| High speed spindle ø80 | 0-40'000 | 4kW | yes | HSK 32 E |

Technical alterations subject to change.



USG Universal Grinding Machine



**For the machining of glass,
ceramic and other hard brittle
materials**

The ultrasonic-assisted machining center USG was developed in order to fully benefit from the ultrasonic grinding and machining technology. The machine is based on the modular design from dama grinding machines. It can easily be expanded by adding axis or spindles to fulfil specific requirements. The basic machine consists of 3 linear axes which are driven by servo motors through precision ball screws or optionally (X and Y) by linear motors. The high precision linear roller guides ensure a smooth movement. These axes are separated from the working area in order to perfectly protect them from grinding swart. A strong grey cast iron machine frame is the basis of a stable and vibration free grinding process.

Options as swivel- and indexing axis, work piece spindles, automatic tool changing, work piece fixation devices, 3-d touch probes, tool probes etc. complete the offer to supply full solutions.

Different spindle types as well as a broad range of tools and tool holders are available for a wide range of application. The offered internal flushing with up to 40 bars and pressure control provide an excellent support to work with micro grinding pins. The force measurement system with automatic feed rate adjustment supports for process optimisation and guarantees a high repetition accuracy.

The B&R CNC control system offers an easy to work environment. Specific dialogues for drilling, trepanning, slicing, flat or lens grinding simplifies the set up and shortens the programming. Individual designed dialogues for specific parts lead to a significant competitive edge. The touch screen gives a good process overview and is a comfortable interface.

The ISO programming possibility sets nearly no limits on complex geometries – especially in combination with a CAM solution. Different accessories – such as centrifugal separators, high pressure pumps, vision systems – support the solution to your production problems.

Technical data

| | | |
|---------------------------------|------------------------------|------------------|
| X-Axis | travers path | 460 mm |
| | digital display | 0,001 mm |
| | feed rate | 0 - 3000 mm/min |
| Y-Axis | travers path | 200 mm |
| | digital display | 0,001 mm |
| | feed rate | 0 - 3000 mm/min |
| Z-Axis | travers path | 400 mm |
| | digital display | 0,001 mm |
| | feed rate | 0 - 1000 mm/min |
| B-Axis (optional) | range depending on execution | |
| | digital display | 0.001° |
| Force measuring system (Z-axis) | | |
| 1. range | | 0 – 50 Newton |
| 2. range | | 0 – 500 Newton |
| Electrical connection | | 3 x 400V, 50Hz, |
| | | L+N+PE / 32A |
| Compressed air connection | | 6 bar |
| Dimension | | 1800x1800x2400mm |
| Weight | | 4000kg |

Technical alterations subject to change.



UST 300 Ultrasonic Drilling Machine

For the machining of glass, ceramic and other hard brittle materials



The ultrasonic machine type Erosonic UST 300 is a compact ultrasonic drilling machine to work with rotational diamond tipped tools and ultrasonic support. The ultrasonic support increases the working speed and decreases the working forces substantially. This leads to higher surface quality (homogeneity), less induces stress during machining and shorter working time.

The machine has 3 CNC linear axes, an ultrasonic spindle with internal cooling and a pressure monitoring as well as a force measuring system for monitoring and controlling of the process forces. A touch-screen control with simple dialogues and the possibility of ISO programming offers the best possible support with many possibilities to the user. A comprehensive range of tools offers solution to most of the processing problems.

The machine is particularly suitable for drilling and boring of small diameters but also complex 3-D grinding work can be performed. It can be equipped with a touch probe (Blum Pico) to control and compensate the tool wear.

Technical data

| | | |
|--|-----------------|-----------------------------------|
| Work piece table | | 220 x 140 mm |
| Traverse path | | X: 220 mm / Y: 100 mm / Z: 190 mm |
| Feed rate | | 1 – 5000 mm/min |
| Digital display | | 0,001 mm |
| Smallest / biggest hole | | 0.30mm / 20mm |
| Ultrasonic spindle programmable | | 500 – 8'000 rpm |
| Ultrasonic generator frequency | | 35 kHz / 600 W |
| Force measuring system for feed control for Z-axis | | 0 – 20N / 0 – 200N |
| Electrical connection | | 3 x 400V, 50Hz, L+N+3xPE / 16A |
| Compressed air connection | | 6 bar |
| Coolant tank | | 30 lt |
| Dimension | Machine | 570 x 620 x 740 mm |
| | Control cabinet | 420 x 800 x 420 mm |
| Weight | Machine | 160 kg |
| | Control cabinet | 20 kg |

TECHNICAL ALTERATIONS

SUBJECT TO CHANGE



EASY SHAPE 2000 Cylindrical Grinding Machine



Easy Shape is the newly developed cylindrical and polygon grinding machine range. It is used to grind carbide blanks, ceramic, glass, etc. in the diameter range of 0.5 to 100mm. An ISO50 work piece head offers a wide range of possibilities for work piece clamping. Different dialogues support the machine operator and shorten the programming of simple shapes without restrictions for geometrical complexity:

- „Teach-in“ for simple diameter reduction over a certain length
- „Peal Grinding“ to generate carbide blanks for the cutting tool industry
- „Dressing“ for dressing of grinding wheels
- „Polygon Grinding“ for simple automatic grinding of 2-d non cylindrical geometries

For all dialogues only the final contour is defined or the dxf file loaded. All the infeed steps are automatically calculated. Customised dialogues are available on request.

The machine builds up on a vibration-reducing polymer concrete machine base. The grinding spindle is on the z-axis table and the work piece headstock on the x-axis. High precision roller guides guarantee a high rigidity and running smoothness. X- and z-axis are driven by recirculating ball screws and servomotors. The machine can be run in automatic mode, but also in inching function or hand wheel. The work piece headstock can optionally be equipped with a torque motor. With this additional axis (C) it is possible to grind 2-d polygons such as dies, punches or rotary cams. For high precision requirements optical scales are recommended.

Technical data

| | |
|---|-------------------------------------|
| Machine length | 1350 mm |
| Machine length with panel | 1600 mm |
| Machine width | 1100 mm |
| Machine width with panel | 1500 mm |
| Machine height | 1500 mm |
| Machine height with dust exhaust | 1800 mm |
| Working height | 1250 mm |
| Machine weight | 1400 kg |
| Electrical connection | 3 x 400 V, 50Hz, 3L+ N + PE |
| Back –up fuse | 16 A |
| Grinding diameter | 0 – 120 mm (Grinding wheel-Ø200 mm) |
| Precision | ± 0.01 mm |
| Max work piece length (grinding length) | 400 mm (250mm) |
| Diamond tool (min. – max.) | Ø150 – 225 mm |
| Grinding spindle | 1000 – 6000 rpm (stepless) |
| Grinding spindle power | 2.2 kW (option 3.5kW) |
| X-axis | 150 mm |
| Max x-axis speed | 5000 mm/min |
| Workpiece spindle | 100 – 700 rpm (stepless) |
| Z-axis speed | 0 - 5000 mm/min |
| Exhaust connecting piece | Ø100 mm |
| Central lubrication | |
| Colour | RAL 7035 / 3003 |

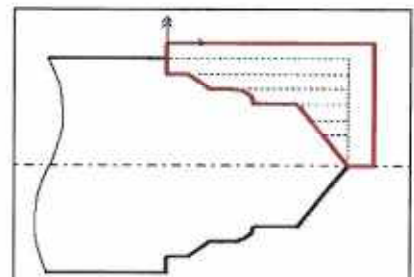
| | | |
|---------------|---------|----------|
| Prog. Nummer | 99 | |
| Nullpunkt | 1 | |
| Start Dm X | 50.000 | Teuchel |
| End Dm X | 40.000 | |
| Start Punkt Z | 0.000 | Teuchel |
| End Punkt Z | -80.000 | Teuchel |
| Zustellung | 1.500 | Prechtel |

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| | | |
|------------------|-------|---------|
| Vorschub Zustell | 100.0 | |
| Vorschub Arbeit | 50.0 | |
| Abheben | 0.500 | |
| Drehzahl Wz. Sp. | 5000 | |
| Drehzahl Ws. Sp. | 300 | Neutral |

Startschleifen

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TECHNICAL ALTERATIONS SUBJECT TO CHANGE

RMD 100 / 200 / 500 Rounding machine

For the production of round and cylinders from blocks or plates of glass, quartz, ceramics etc.



The RMD range of machines provides an efficient production of precise circular blanks from square and polygonal glass blocks. Except for manual loading and unloading the machines operate fully automatically. The control is extremely operator-friendly and permits easy programming of each process step.

The diamond tool works at a 45° angle (RMD100 and RMD200) or at a right angle (RMD500) to the rotating workpiece axis. The cylindricity can be adjusted by swivelling the workpiece axis. All movement axes are equipped with prestressed recirculating ball guides and are driven by stepper motors over ball screws. The directly driven precision smoothing spindle and the workpiece spindle are steplessly speed-controlled. The electrical cabinet containing the control components is installed in the machine frame (RMD100/RMD200) or mounted to the rear of the machine frame (RMD500).

The working area of the RMD100 and RMD200 is completely protected by a hood which can be tilted back. Loading and unloading is done by a sliding door. At the RMD 500 the access to the working area is assured by a hinged door with sight window in the full protection hood.

Special seals prevent the ingress of wheel swarf and splashing water in guides and drive elements. The machines are of ergonomic design, easy to clean and requires practically no maintenance. The axes are centrally lubricated.

The RMD machines is assembled on a welded base frame. The generous dimensions and the excellent stability provided by the entire design assure a high precision and a long service life.



Technical data

| Type | RMD 100 | RMD 200 | RMD 500 |
|-------------------------------------|---------------|---------------|---------------|
| Length (mm) | 1400 | 1620 | 1800 |
| Width (mm) | 1500 | 1800 | 1600 |
| Height (mm) | 1400 | 1400 | 1850 |
| Height of centres (mm) | 1130 | 1130 | - |
| Weight (kg) | 780 | 1200 | 1250 |
| Installed power (kW) | 3.8 | 5 | 5 |
| Compressed air connection (bar) | 6 | 6 | 6 |
| Max. working dia. (mm) | 100 | 200 | 520 |
| Min. working dia. (mm) | 3 | 6 | 100 |
| Max. length of glass cylinders (mm) | 100 | 180 | 300 |
| Dia. of diamond tool (mm) | 77-88.5 | 100 | 150 |
| Tool speed (r/min.) | 1000-6000 | 1000-6000 | 2550-5000 |
| Tool drive capacity (kW) | 0.55 | 1.1 | 1.1 |
| Tool feed travel (mm) | 80 | 120 | 245 |
| Workpiece speed (r/min) | 0-400 | 0-400 | 20-215 |
| Rate of feed (mm/min.) | 1-1000 | 1-1000 | 1-800 |
| Rapid feed rate (mm/min.) | 3000 | 3000 | 3000 |
| Feed travel (mm) | 130 | 250 | 315 |
| Clamping pressure | 1700N / 6 bar | 1700N / 6 bar | 2000N / 5 bar |

TECHNICAL ALTERATIONS SUBJECT TO CHANGE

SGM Slicing and Grinding Machine

The SGM machine is designed for processing glass and ceramics materials. The structure with the horizontal grinding spindle allows the use as a cutting machine, milling machine or surface grinder (also possibility to grind aspherical lenses).

All linear motion axes are located in the rear (dry) part of the machine, which is separated by a sliding stainless metal sheet wall of the processing room. All movement axes are equipped with prestressed recirculating ball screws.



The axes are driven by servo motors. Stable linear roller guides guarantee smoothness and stability for production of high quality optical components. Upon request, all axes can be equipped with glass scales.

The precision grinding spindle $\varnothing 100\text{mm}$ is usually offered with an outer cone, but can be fitted on request with ISO40 or HSK63. The belt-driven grinding spindle is protected by sealing air from pollution.

The dialog interface allows easy and comfortable programming. Simple programs can be entered through different dialogs on the Touch-Screen Panel PP520. More sophisticated programs can be written in ISO code. An USB and LAN connection offers the possibility to down- and upload programs as required.

The grinding process can optionally be controlled and commanded by the spindle power or a force measurement system, which helps especially for slicing and grinding very small and thin-walled contours. This system offers also a perfect environment for process parameter optimisation as well as grinding wheel evaluation.

The construction of the machine is based on the modular grinding system of dama technologies ag. The construction allows the use of changeable fixtures, as well as dividing devices or driven rotary tables.

Technical data SGM

| | | |
|---------------------------------|--|---|
| X-axis | travers path digital display feed rate | 470mm 0.001 mm 0 – 3'000 mm /min |
| Y-axis | travers path digital display feed rate | 200 mm 0.001 mm 0 – 3'000 mm /min |
| Z-axis | travers path digital display feed rate | 400 mm 0.001 mm 0 – 1'000 mm /min |
| Spindle | - ø100 mm grinding spindle with 2.5 kW - programmable from 500 – 5'000 rpm | |
| Force measurement (optional) | 1D piezoelectric measurement system Feed control of Z-axis | |
| Control | for X, Y and Z-axis movement B&R PP520 - Touch screen as operator interface - Force indication optional - Spindle load indication - Emergency stop B&R CNC control - Logic unit for 3 axes and 1 spindle - hand wheel | |
| Splashing protection | doors with window, complete stainless steel enclosure | |
| Dimension | Length x width x height | 200 x 180 x 240cm |
| Weight | ca. 3'100 kg | |
| Electrical connection | 3x400V / 50Hz, 3L+N+PE / max. 32A | |
| Compressed air supply | 6bar | |
| Colour | RAL 7035 / 3000 | |
| CE-conformity | The machine complies with the European directives and CE regulations. | |



TECHNICAL ALTERATIONS SUBJECT TO CHANGE

SSM Surface Grinding Machine

The grinding machine type SSM is designed for grinding flat and spherical components up to $\varnothing 500\text{mm}$. With the appropriate options, the machine can also be used for grinding of aspheric lenses and prisms or precision contour grinding.

The SSM is available with 1 to 5 axes. The basic equipment consists of a vertical NC axis (Z), a belt-driven spindle with internal flushing and a work-piece spindle.

An optional HSK spindle is available, which can also be connected with an automatic tool changer. The axes are separated from the working area in order to perfectly protect them from grinding swart. The complete machine cover is made of stainless steel to provide an easy to clean environment and a long life time of the machine.

The work-pieces are hold by vacuum or pneumatic clamping devices. The grinding process can optionally be controlled and managed by a force measurement system or by the spindle power. The control of the machine features different feed rates during grinding and a dwell time at the end of the grinding process for smoothing the surface.

The B&R CNC control system offers an easy to work environment. Specific dialogues simplifies the set up and shortens the programming. The touch screen gives a good process overview and is a comfortable interface.

The machine is based on the modular machine concept from dama technologies ag. A wide range of options, such as tool measurement device, coolant pressure monitoring system, optical working control system and fixation plate etc. guarantee to match perfectly the required specifications.



Technical data SSM

| | | |
|---------------------|-----------------|------------------|
| X-axis | Traversing path | 470 mm |
| | Digital display | 0,001 mm |
| | Speed | 0 - 5'000 mm/min |
| Y-axis | Traversing path | 200 mm |
| | Digital display | 0,001 mm |
| | Speed | 0 - 5'000 mm/min |
| Z-axis | Traversing path | 400 mm |
| | Digital display | 0,001 mm |
| | Speed | 0 - 5'000 mm/min |
| B-axis (optionally) | Swivel range | +/- 45° |
| | Digital display | 0,001° |



| | | |
|-------------------------------------|---|--------------|
| Spindle | 4 kW, programmable from 500 – 5'000 rpm | |
| Workpiece spindle | 1.5 kW, programmable from 20 – 200 rpm Carrying plate with vacuum clamping up to ø550 | |
| Force measuring system (optionally) | 0 – 200 (2000) Newton for feed control for Z-axis | |
| Control | for X, Y, and Z-axis movement B&R PP520 - Touch Screen as operator interface - Force indication optionally - Spindle load indication - Emergency stop B&R CNC control - Logic unit for 3 axes and 1 spindle - Hand wheel | |
| Splashing protection | doors with windows, complete stainless steel enclosure | |
| Dimensions | Length | ca. 2'000 mm |
| | Width | ca. 1'800 mm |
| | Height | ca. 2'400 mm |
| | Weight | ca. 3'100 kg |
| Electrical connection | 3x400V / 50Hz, 3L+N+PE / max. 32A | |
| Compressed air connection | 6bar | |
| Colour | RAL 7035 / 3003 | |
| CE-conformity of | The machine complies with the European directives the CE regulation | |

TECHNICAL ALTERATIONS SUBJECT TO CHANGE

FSA 80 Spherical/Flat Grinding Machine

Easy to use – efficient in action

The spherical grinding machine FSA 80 was developed for surface generating of plano and of spherical lens surfaces and this both in concave and/or convex generating work.

As the FSA 80 works full-automatically and is very easy to set up, the machine is used for serial production as well as prototyping or small lot sizes. Its solid and sturdy construction assures highest accuracy to the surface to be generated and a long life time of the machine.

The entire machine is constructed upon a distortion free c-type welded base. The work-piece spindle is integrated in the X-axis table and is equipped with a rotary feedthrough for pressure air or vacuum. The belt driven grinding spindle is driven by a water cooled and frequency controlled motor and offers internal cooling.

The machine features a numerical controlled z-axis that is driven by a servo motor. A manual B-axis (swiveling head) and X-axis (optionally as NC axis) with digital read out on the control support the operator in setting it up. The control shows all axis position and can store up to 100 pre-setting values for quick change. All programming is done through the self-explanatory touch screen. An angle calculator helps to produce new parts.



Technical Data

| | | |
|-------------------------------|-----------------|------------------------------|
| X-axis | travers path | 160 mm |
| | digital display | 0.005 mm |
| Z-axis | travers path | 150 mm |
| | digital display | 0.001 mm |
| | feed rate | 5000 mm/min |
| B-axis | swiveling path | 0-45 ° |
| | digital display | 0.002 ° |
| Work piece spindle | | 200 - 1000rpm |
| Grinding spindle programmable | | 500 - 6'000rpm |
| Electrical connection | | 3 x 400V, 50Hz, L+N+PE / 16A |
| Compressed air connection | | 6 bar |
| Dimension | | 1000 x 1000 x 1900mm |
| Weight approx. | | 850 kg |

TECHNICAL ALTERATIONS SUBJECT TO CHANGE



TPM Drilling and Trepanning Machine

The TPM machine is used for drilling and trepanning of discs and rounds in glass, ceramics and other hard and brittle materials. Depending on the type of the spindle, holes of $\varnothing 1 - 100\text{mm}$ are possible.

The basic machine includes three linear axes (X, Y, Z) and a belt-driven spindle with internal cooling. An optional HSK spindle is available, which can also be connected with a tool changer. The machine guarding that separates the working area with the movement area is made of stainless steel and guarantees a long life, as well as an easy to clean environment.

The drilling process is controlled by a precise measurement system, which allows the machine to adjust the maximum possible drilling speed as well as to have 100% process control. This leads to higher productivity and quality.

The dialog interface allows easy programming; customers not familiar with CNC machines will be able to operate the machine with minimal training. The machine is also equipped with an interface for ISO programming and modern communication (LAN, USB) plus state of the art CAM support is also included.

The TPM trepanning machine is based on the modular machine concept from dama technologies ag. A wide range of options, such as tool measurement device, coolant pressure monitoring system, optical working control system and fixation plate etc. guarantees to match perfectly the required specifications.



Technical data TPM


| | | |
|-------------------------------------|---|------------------|
| X-axis | Traversing path | 470 mm |
| | Digital display | 0,001 mm |
| mm/min | Speed | 0 – 3'000 |
| Y-axis | Traversing path | 200 mm |
| | Digital display | 0,001 mm |
| mm/min | Speed | 0 – 3'000 |
| Z-axis | Traversing path | 400 mm |
| | Digital display | 0,001 mm |
| | Speed | 0 – 1'000 mm/min |
| B-axis (optionally) | Swivel range | +/- 60° |
| | Digital display | 0,001° |
| Workpiece table | 600 x 300mm with 50mm grid | |
| Spindle | 2.2 kW, programmable from 500 – 5'000 rpm | |
| Force measuring system (optionally) | 0 – 50 (500) Newton for feed control for Z-axis | |
| Control | for X, Y, und Z-axis movement B&R PP520 - Touch screen as operator interface - Force indication optionally - Spindle load indication - Emergency stop B&R CNC control - Logic unit for 3 axes and 1 spindle - hand wheel | |
| Splashing protection enclosure | doors with window, complete stainless steel | |
| Dimensions | Length | ca. 2'000 mm |
| | Width | ca. 1'800 mm |
| | Height | ca. 2'400 mm |
| | Weight | ca. 3'100 kg |
| Electrical connection | 3x400V / 50Hz, 3L+N+PE / max. 32A | |
| Compressed air connection | 6bar | |
| Colour | RAL 7035 / 3003 | |
| CE-conformity directives of | The machine complies with the European the CE regulation | |



TECHNICAL ALTERATIONS SUBJECT TO CHANGE

SPF 150 / 300 / 500 / 650 Smoothing and Polishing Machine

For flat optical components of high precision

- The present design follows a newly developed modular concept
 - Each spindle, of both smoothing and polishing device, features its own drive.
 - The tool contact forces are individually controlled pneumatically, which permits you to attain smoothed and polished surfaces of top quality.
 - The double eccentric drive forms a unit which copes with all smoothing and polishing work.
 - Thanks to the individual adjustment at the eccentric it is possible to generate any number of polishing patterns. The result is an optimal quality achieved in the shortest possible time.
- 
- The machine features a welded, sturdy base frame covered by a solid plastic plate.
 - The smoothing and polishing tubs are recessed in the top plate and removable.
 - The working spindles and eccentrics are driven over toothed belts, a solution which provides enormous advantages in respect of loss of force and service-friendliness.
 - The speeds are freely selectable.
 - Spindle stability and precision are assured by a suitable cone and ball arrangement.
 - On request the machine stations can be operated individually.

Technical data

| <i>Type</i> | <i>SPF 150</i> | <i>SPF 300</i> | <i>SPF 500</i> | <i>SPF 650</i> |
|----------------------------------|----------------|----------------|----------------|----------------|
| Length (mm) | 1250 | 1450 | 1900 | 1900 |
| Width (mm) | 700 | 900 | 1250 | 1250 |
| Height (mm) | 1450 | 1500 | 1600 | 1600 |
| Weight (kg) | 550 | 700 | 900 | 900 |
| Working range plain to R+/- (mm) | 80 | 100 | 100 | 100 |
| Tub diameter (mm) | 250 | 320 | 500 | 650 |
| Workpiece diameter max. (mm) | 100 | 250 | 450 | 600 |
| Workpiece spindle connection | M27/DIN 58725 | M27/DIN 58725 | M39/DIN 58725 | M39/DIN 58725 |
| Space requirement (mm) | 1400 x 900 | 1400 x 900 | 1500 x 900 | 1500 x 900 |
| Power connection (kW) | 4 | 4 | 5 | 5 |
| Air - connections (bar) | 6 | 6 | 6 | 6 |
| Number of spindles | 2 | 2 | 2 | 2 |
| Workpiece speeds (rpm) | 10-200 | 10-180 | 5-100 | 5-100 |
| Eccentric speeds (rpm) | 10-100 | 10-100 | 5-50 | 5-50 |
| Working pressure (N/bar) | 175 / 4 | 210 / 4 | 550 / 4 | 550 / 4 |

TECHNICAL ALTERATIONS SUBJECT TO CHANGE



PLM 450 Precision Flat Lapping and Polishing Machine

The PLM450 is a floorstanding lapping and polishing machine for flat components. The machine consists of a solid and sturdy welded base frame which is covered with a heavy steel plate. The smoothing and polishing bowl is inserted in a cut-out of the table plate. The working spindle is driven by a gear motor over a toothed belt. The speed is controlled by a frequency converter and the actual speed is indicated on a digital read out (optionally).

The machine can be equipped with different lapping or polishing plates with diameter 420mm. Abrasive such as Silicon carbide, boron carbide, aluminium oxide or diamond suspended in oil based vehicles are used for lapping and polishing, depending on the workpiece material.

The conditioning ring position can be lateral adjusted in order to control plate flatness finely. The machine has 3 pneumatically controlled stations. The pressure force is indicated over a manometer. The basic machine can be delivered without driven lapping stations.



Technical data

| | |
|---------------------------------|------------------------|
| Machine length | 750 mm |
| Machine width | 630 mm |
| Machine height | 1650 mm |
| Working height | 1000 mm |
| Machine weight | 350 kg |
| Electrical connection | 3x400V, 50 Hz, 3L+N+PE |
| Compressed air supply | 6 bar |
| Max. workpiece diameter | 140 mm |
| Max. workpiece height ca. | 20mm |
| Lapping plate diameter (max.) | 420mm |
| Lapping plate speed | 20 – 100 rpm |
| Spindle power | 0.75 kW |
| Numbers of stations | 3 pneumatically |
| Speed of driven lapping station | 50 – 250 rpm |
| Pressure force | 0 – 400 N |
| Driven lapping stations | optional |

TECHNICAL ALTERATIONS SUBJECT TO CHANGE



TS-100 Tangential Grinding Machine

The TS 100 is used to grind the edge and the face of optical lenses in a tangential grinding mode. The machine works in change spindle procedure. The maximal grinding diameter is 85mm and the traveling axis of the work piece spindle is 100mm (Z-axis). The grinding process is fully automatic. The machine is equipped with a NC control. A simple dialog offers an easy programming with Teach-In function. An optical scale guarantees a high diameter precision and repeatability.



The machine is placed on a welded steel frame. The electrical cabinet is integrated in the machine base on the left bottom of the machine. The control sits on the left side of the machine and the touch screen interface allows an easy programming and monitoring of the grinding process. The easy to operate control offers wide possibilities, is quickly understood and allows intuitive programming.

The machine has a protection hood for the work space, which can be slit to the left side. In the automatic mode, the protection hood cannot be opened during the process.

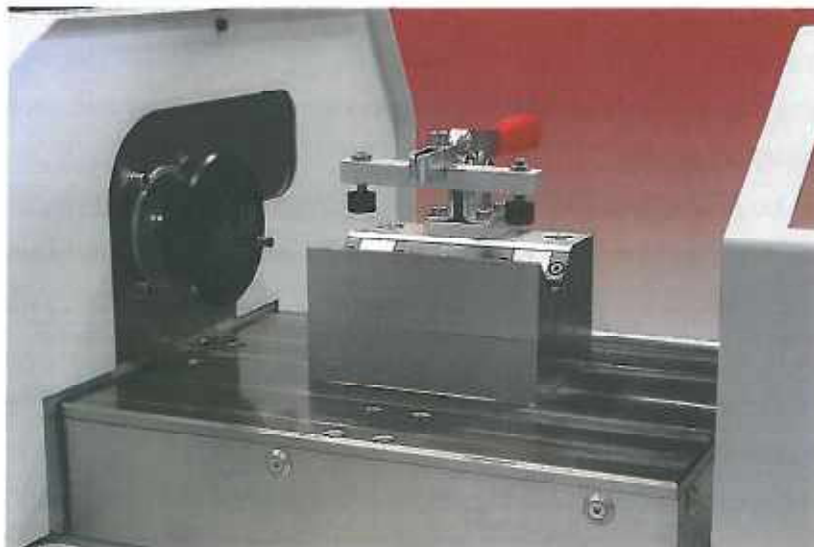
The spindle is driven by a three-phase motor using a multiple belt. The speed of the spindle can be adjusted from 2000 to 6000 rpm and a grinding wheel with a diameter of 100mm can be mounted. The centering spindle is driven directly by a frequency controlled motor and the speed adjusted between 200 and 1000 rpm.

The machine has a protection hood, which can be swiveled to the left side. When the protection hood is opened during operation, the machine stops automatically and shows an error message "door open". The whole machine base has a slight drop to one corner, where the water outflow is located.

Technical Data

| | |
|------------------------------------|--------------------------|
| Machine length | 1250 mm |
| Machine width | 700 mm |
| Machine height | 1350 mm |
| Centre height spindle | 70 mm |
| Centre height spindle from floor | 1020 mm |
| Machine weight | 420 kg |
| Electrical connection | 3x400V, 50Hz, 3L+ N + PE |
| Back-up fuse | 16A |
| Elect. connection cooling unit | 1x230V, 50Hz, 0.16-0.25A |
| Maximum machining diameter | 85 mm |
| Digital display machining diameter | 0.001 mm absolute |
| Feed stroke X-axis | 100 mm |
| Feed rate | 0 - 4000 mm/min |
| Repetition accuracy | + / - 0.002 mm |
| Diamond tool | Ø100 mm |
| Tool speed | 2000 - 6000 rpm |
| Tool drive power | 0.55 kW |
| Workpiece speed | 200 - 1000 rpm |
| Workpiece drive power | 0.135 kW |

TECHNICAL ALTERATIONS SUBJECT TO CHANGE



LG 300 / 450 / 750 Chamfering Machine

To produce straight outer edges on components of the optical industry



- The DAMA LG-series is designed to meet the high demands of the optical industry on facet quality and dimensional accuracy of straight or prismatic bodies.
- The design is based on the well – proven prism carriage principle widely applied in metal-working equipment.
- Appropriate extensions and adaptations make this model particularly suitable for machining glass parts.
- Being portable the machine can always be placed where it is needed.
- Apart from a standard 230 V mains connection nothing is required (110 V available).
- Thanks to a short setup time and changeover possibilities within minutes the appliance is equally suitable for individual pieces and series production.
- The sturdy housing assures quiet running of the machine.
- Tilting of the retaining prisms provides optimal access to smoothing wheel and cooling.
- The speed is steplessly adjustable.
- The facet height can be preset by a microscrew. Readjustment is possible at any time.
- The feed rate can be adjusted to suit the material quality by moving the prism carriage.
- Depending on the facet height the prism carriage is moved past the smoothing wheel at a faster or slower rate.
- There is no scratching as the prism carriage is moved on rollers over a ball bearing guide. This is a major advantage in case of previously polished surfaces.
- Scratch protection tape for already polished surfaces and holders for small components are available as options.
- Diamond tools of different grains available.

Technical Data

| | | |
|--------------------------|---------|----------------------------------|
| Dimensions (LxWxH) | LG 300: | 560 x 320 x 240 mm |
| | LG 450: | 840 x 320 x 240 mm |
| | LG 750: | 1440 x 320 x 240 mm |
| Prism length | LG 300: | 300 mm |
| | LG 450: | 450 mm |
| | LG 750: | 750 mm |
| Process length | LG 300: | 100 mm |
| | LG 450: | 250 mm |
| | LG 750: | 550 mm |
| Weight | LG 300: | 20 kg |
| | LG 450: | 24 kg |
| | LG 750: | 29 kg |
| Motor drive | | 230 V / 50 Hz, 240 W |
| Speed | | 10'000 - 19'000 r/min |
| Smoothing speed | | 15 – 28 m/sec |
| Smoothing wheel | | Ø 30 mm, diamond |
| Facet height | | 0,1 – 3 mm (in steps of 0.1 mm) |
| Cooling water connection | | 30 lt |
| Cooling water tub | | Connecting piece at cooling head |
| Drain pipe | | At cooling tub |
| Prism carriage 30°/60° | | Option for LG 300 and LG 450 |
| HOLDERS for small pieces | | Option |
| Scratch protection tape | | Option |
| Prism widening device | | only for LG 450 and LG 750 |

TECHNICAL ALTERATIONS SUBJECT TO CHANGE

METEOR MM-12

Precision Small Drill Grinding Machine

For precise grinding and point- thinning of right-and lefthanded drills form
0,2 – 13mm (0,008-0,51 inches), in one position.

Technical data

| | |
|-------------------|---|
| Clamping range: | Precision 4-jaw chuck 0,2 - 6,2 mm up to 13mm with precision collets |
| Point angle | 90-180° option 0-180° |
| Clearance angle | 0-45° |
| Drill length max. | 160 mm (for longer drills on requirement) |
| Spindle speed | 5400 r/min |

Carborundum, borazon and diamond grinding wheels in different grits and forms.

Motor AC single phase 230V (110V)/170 W

Clock- and counterclockwise turning, dynamic motor brake

Microscope magnifying 15x with built-in light

Halogen working lamp

Net weight 30kg (66 lbs)

Dimensions 480x280x450 mm

TECHNICAL ALTERATIONS SUBJECT TO CHANGE



METEOR MM-12-US Grinding Center for Small and Microtools

For grinding of right- and left hand small tools in high precision, engraving tools, boring tools, one and more-lipped milling cutters and radius milling cutters

Technical data

Clamping range: with collets 1,0 – 13mm
 with chuck (option) 0,2 – 6,2mm

Basic machine with grinding spindle:

Spindle Speed 5400 rpm

Motor AC single phase 230 (110) Volt, 50/60Hz
170W

Clock- and counterclockwise turning, Dynamic motor brake

Printed circuit board

Halogen machine light

Carborundum, borazon or diamond wheels available in various grits and shapes

Universal grinding center USE-99-2

6-axes adjustable with measuring-scale

Microscope magnifying 10x with built-in light

Tool holder with deviding table

Lateral stops for the positioning repeatability

Weight 35kg

Square required 480 x 280 x 500 mm



TECHNICAL ALTERATIONS SUBJECT TO CHANGE

Meteor Modular System

BGM-99 + WA-99 + BSG-99 = MM12
 BGM-99 + WA-99 + TV-99 = MM12-TV
 BGM-99 + WA-99 + PD-99 = MM12-PD
 BGM-99 + WA-99 + DH-99 = MM12-DH
 BGM-99 + USE-99-2 = MM12-US

BSG-99



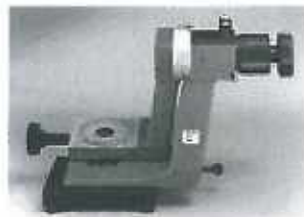
Drill grinding attachment
 Article no. B 4006740S

BGM-99



Basic machine
 Article no. BGM 1 0022

WA-99



Angle adjustable arm
 Article no. B 1000190S

PD-99



PCB-drill grinding machine
 Article no. B 4006770S

USE-99-2



Universal toll grinding attachment
 Article no. B 100012-0Z

DH-99



Deep-hole grinding attachment
 Article no. B 4006760S

TV-99



Monitor / Camera-System
 Article no. B 4006750S