VERTICAL GRINDING MACHINE
VG 110
The trend towards the miniaturization of components continues, while simultaneously, the requirements for precision are increasing.

To meet these requirements, EMAG has developed the VG product family – designed for the vertical high-speed machining of small workpieces. Practical experience, particularly in the automotive and hydraulic industries, show that the quality of the finished products and success in the user’s market place, increase through good machining quality.

This vertical production grinding machine is a true complete solution when it comes to the precision machining of small chucked parts. Thanks to the modular VG 110 series, the user can select either a “traditional” grinding process, or can make full use of the multiple functions available on the machine, which allow for a combination of turning and grinding. The primary use for the VG 110 is the economical machining of small workpieces with a diameter of between 2 and 60 mm, in large batch sizes.

The traditional internal and external circular grinding and non-circular grinding processes are used in addition to machining processes involving hard turning and grinding. This allows all sections of the workpiece that can be machined with turning processes to be hard or soft-finish turned, then finish-ground in the same clamping operation (mainly after the pre-turning operation), if this is necessary to meet the required quality level. This streamlined process guarantees higher workpiece quality, while simultaneously reducing cycle times. Additionally, this process decreases the wear on grinding tools requiring them to be dressed less often.
Due to the modular machine concept, the tool equipment can be customized to fit the required machining task. The following variations are available:

+ One or two internal grinding spindles for circular or non-circular grinding
+ One internal or external grinding spindle and one turning tool

THE BENEFITS:

+ High precision
+ Optimum accessibility, quick machine set-up
+ Small footprint
+ Low chip-to-chip time
+ Chips fall downward
+ Complete machining in a single clamping operation
+ Optional: Turning tool
+ Ease of operation
+ Pre- and post-process measurement possible
+ Circular and non-circular grinding

TECHNICAL DATA

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chuck diameter</td>
<td>up to 190 mm</td>
</tr>
<tr>
<td>Machining diameter</td>
<td>up to 100 mm</td>
</tr>
<tr>
<td>X-axis travel</td>
<td>460 mm</td>
</tr>
<tr>
<td>Z-axis travel</td>
<td>225 mm</td>
</tr>
<tr>
<td>Spindle flange to DIN 55026</td>
<td>Size 5</td>
</tr>
<tr>
<td>Max. number of revolutions, non-circular / circular</td>
<td>500 / 6,000 rpm</td>
</tr>
<tr>
<td>Grinding spindle speed</td>
<td>30,000 – 90,000 rpm</td>
</tr>
<tr>
<td>Tool unit</td>
<td>1 or 2</td>
</tr>
</tbody>
</table>
EXCEPTIONAL, COMPACT DESIGN

The VG 110 is characterized by its extremely compact design with no additional units. The machining area can be accessed via the front of the machine. The energy container and the fluid and electrical components are mounted at the back.

The VG 110 offers all modern grinding technologies:

- Grinding tools – e.g., ceramic or galvanized CBN grinding wheels
- Sensor technology – adaptive grinding, initial cut detection, touch dressing
- Dressing technology – dressing spindle for use of diamond form rolls
By combining this machine concept with an automatic loading and unloading system, the VG 110 is able to achieve the lowest cost per piece, while guaranteeing a low-intervention operation. Once the grinding process is completed, the finished workpieces are returned to the same pallet they were originally taken from.

An additional benefit is the easy to use Sinumerik 840 Dsl control unit – software from EMAG makes the programming and operation of this machine simple.
LOADING AND UNLOADING – FLEXIBLE OR WORKPIECE-SPECIFIC

The VG 110 stands out thanks to its unbeatable accessibility and the ease with which tooling can be performed. A front loading door has been included which provides easy access to the entire machining area. This front panel can be opened to give direct access to all moving components if maintenance is required. The increased accessibility makes the loading process very convenient, which is essential in order to achieve shorter machining times.

An additional decrease in machining times can be achieved by loading using a workpiece shuttle. Workpieces are transported to the machining area with the shuttle and then lifted to the clamping fixture by a lift-up loader. With this system a loading/unloading time of approximately 5 seconds can be achieved, depending on the clamping device.
VERTICAL GRINDING MACHINE VG110

Loading and Unloading

Loading position
Short travel distances, high speeds, outstanding rigidity and an integrated cooling system lead to short idle times, high productivity and high precision.

The X- and Z-axes are separate so that maximum accuracy can be achieved when machining small workpieces. The vertical Z-axis is equipped with a linear drive unit, which allows the grinding spindles to make short, quick oscillating strokes. The X-axis determines the accuracy and is completely removed from the machining area in the vertical arrangement. The high-resolution measuring system is positioned a mere 100 mm from the machining area, creating optimum conditions for extremely high accuracy.
All production grinding machines in the VG series have a machine base made of MINERALIT® polymer concrete which has eight times better damping properties than gray cast iron.

Vibration damping by EMAG machine bases made of MINERALIT® polymer concrete

In comparison: Vibration damping by machine bases made of gray cast iron
EMAG Salach GmbH

Salach
Austrasse 24
73084 Salach
Germany
Phone: +49 7162 17-0
Fax: +49 7162 17-4027
E-mail: info@salach.emag.com

Frankfurt
Martin-Behaim-Strasse 12
63263 Neu-Isenburg
Germany
Phone: +49 6102 88245-0
Fax: +49 6102 88245-412
E-mail: info@frankfurt.emag.com

Leipzig
Pitterstrasse 26
04159 Leipzig
Germany
Phone: +49 341 4666-0
Fax: +49 341 4666-114
E-mail: info@leipzig.emag.com

Munich
Zamdorferstrasse 100
81677 München
Germany
Phone: +49 89 99886-250
Fax: +49 89 99886-160
E-mail: info@muenchen.emag.com

Austria
Glaneckerweg 1
5400 Hallein
Austria
Phone: +43 6245 76023-0
Fax: +43 6245 76023-20
E-mail: info@austria.emag.com

Denmark
Horsvangen 31
7120 Vejle Ø
Denmark
Phone: +45 75 854854
Fax: +45 75 816276
E-mail: info@daenemark.emag.com

Sweden
Glasgatan 19B
73130 Köping
Sweden
Phone: +46 221 40305
E-mail: info@sweden.emag.com

Hungary
Gerenda 10
1163 Budapest
Hungary
Phone: +36 30 9362-416
E-mail: lbujaki@emag.com

Czech Republic
Lolkova 766
103 00 Praha 10 – Kolovraty
Czech Republic
Phone: +420 731 476070
E-mail: mdelis@emag.com

Poland
ul. Krzycka 71A / 6
53-020 Wrocław
Poland
Phone: +48 728 389 989
Fax: +48 601 371 353
E-mail: info@poland.emag.com

Market Companies

EUROPE
ZETA EMAG Srl
Via dei Mille 31
20098 San Giuliano Milanese (Mi)
Italy
Phone: +39 02 905942-1
Fax: +39 02 905942-24
E-mail: zetaemag@emag.com

NODIER EMAG INDUSTRIE
2, Parc des Fontenelles
78870 Bailly
France
Phone: +33 130 8047-70
Fax: +33 130 8047-69
E-mail: info@nodier.emag.com

ZETA EMAG Srl
Sucursal en España
Pasaje Arrahona, nº 18
Polígono Industrial Santiga
08210 Barberà del Vallès (Barcelona)
Spain
Phone: +34 93 7195090
Fax: +34 93 7297107
E-mail: info@emh.emag.com

EMAG UK Ltd.
Chestnut House,
Kingswood Business Park
Holyhead Road
Albrighton
Wolverhampton WV7 3AU
Great Britain
Phone: +44 1902 37609-0
Fax: +44 1902 37609-1
E-mail: info@uk.emag.com

EMAG OOO
ul. Akademika Chelomeya 3/2
117630 Moscow
Russia
Phone: +7 495 287 0960
Fax: +7 495 287 0962
E-mail: info@russia.emag.com

EMAG (China) Machinery Co., Ltd.
Building A3 & B7 Cangneng Europe & America Technology Park
No. 8 Loujiang Rd. (N.)
215400 Taicang
Jiangsu, China
Phone: +86 512 5357-4098
Fax: +86 512 5357-5399
E-mail: info@emag-china.com

EMAG (Chongqing) Machinery Co., Ltd.
No. 10th Lailong Road
Y ongcuan District
402160 Chongqing
China
Phone: +86 23 49783399
Fax: +86 23 49783388
E-mail: info@emag-china.com

TAKAMAZ EMAG Ltd.
1-8 Asahigaoka Hakusan-City
Ishikawa Japan, 924-0004
Japan
Phone: +81 76 274-1409
Fax: +81 76 274-8530
E-mail: info@takamaz.emag.com

EMAG L.L.C. USA
38800 Grand River Avenue
Farmington Hills, MI 48335
USA
Phone: +1 248 477-7440
Fax: +1 248 477-7784
E-mail: info@usa.emag.com

EMAG MEXICO
Maquinaria EMAG Mexico S de RL de CV
Av. Hercules 301 Nave 1
Poligono Empresarial Santa Rosa
76220 Santa Rosa Jauregui, Queretaro
Mexico
Phone: +52 442 291 1552
Fax: +52 442 291 1552
E-mail: info.mexico@emag.com

EMAG DO BRASIL
Edificio Neo Corporate Offices, CJ 1503
Rua Enxovia, 472
04711-030 São Paulo SP
Brazil
Phone: +55 11 38370145
Fax: +55 11 38370145
E-mail: info@brasil.emag.com

AMERICA
EMAG INDIA Pvt. Ltd.
Technology Centre
No. 17/G/46-3, Industrial Suburb,
2nd Stage, Y eshwantpur,
Bengaluru – 560 022.
India
Phone: +91 80 50050163
E-mail: info@india.emag.com

EMAG KOREA Ltd.
Rm204, Biz center, SKn Technopark,
124 Sagimakgol-ro, Sangdaewon-dong,
Jungwon-gu, Seongnam City,
Gyeonggi-do, 462-721
South Korea
Phone: +82 31 776-4415
Fax: +82 31 776-4419
E-mail: info@korea.emag.com

AT HOME ALL OVER THE WORLD.
Sweden
Glassgatan 19B
73130 Köping
Sweden
Phone: +46 221 40305
E-mail: info@sweden.emag.com

Hungary
Gerenda 10
1163 Budapest
Hungary
Phone: +36 30 9362-416
E-mail: lbujaki@emag.com

Czech Republic
Lokova 766
103 00 Praha 10 – Kolovraty
Czech Republic
Phone: +420 731 476070
E-mail: mdelis@emag.com

Poland
ul. Krzycka 71A / 6
53-020 Wroclaw
Poland
Phone: +48 728 389 989
Fax: +48 601 371 353
E-mail: info@poland.emag.com

Turkey
Sanayi Cad. No.: 44
Nish İstanbul Sitesi D Blok
D: 155 Yenibosna – Istanbul
Turkey
Phone: +90 532 694 54 44
E-mail: ckoc@emag.com

ASIA
EMAG (China) Machinery Co., Ltd.
Building A3 & B7 Cangneng
Europe & America Technology Park
No. 8 Loujiang Rd. (N.)
215400 Taicang
Jiangsu, China
Phone: +86 512 5357-4098
Fax: +86 512 5357-5399
E-mail: info@emag-china.com

EMAG (Chongqing) Machinery Co., Ltd.
No. 10th Lailong Road
Yongchuan District
402160 Chongqing
China
Phone: +86 23 49783399
Fax: +86 23 49783388
E-mail: info@emag-china.com

EMAG INDIA Pvt. Ltd.
Technology Centre
No. 17G/46-3, Industrial Suburb,
2nd Stage, Yeshwanthpur,
Bengaluru – 560 022.
India
Phone: +91 80 50050163
E-mail: info@india.emag.com

EMAG KOREA Ltd.
Rm204, Biz center, SKn Technopark,
124 Sagimaekgol-ro, Sangdaewon-dong,
Jungwon-gu, Seongnam City,
Gyeonggi-do, 462-721
South Korea
Phone: +82 31 776-4415
Fax: +82 31 776-4419
E-mail: info@korea.emag.com

TAKAMAZ EMAG Ltd.
1-8 Asahigaoka Hakusan-City
Ishikawa Japan, 924-0004
Japan
Phone: +81 76 274-1409
Fax: +81 76 274-8530
E-mail: info@takamaz.emag.com