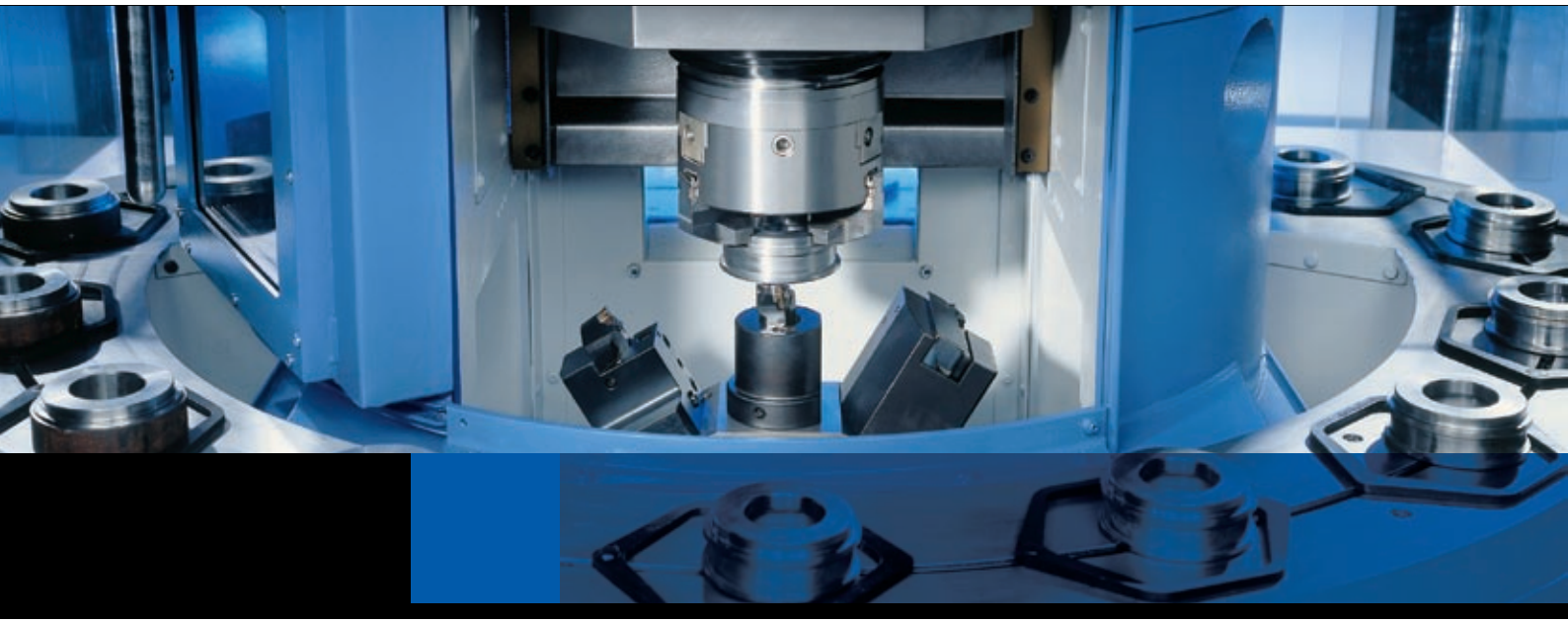
Vertical Turning Machine

VL 3
VL 5
VL Y



EMAG

Automation + turning integrated into a single machine and implemented on the smallest of footprints.
The outstanding characteristics of the VL series of machines are high productivity levels, an extremely high degree of constantly maintained precision, outstanding operational safety and ease of operation.
VL stands for short travels and great acceleration.
Ideal for small to medium batches. VL – an altogether economical solution.

V L 3
V L 5
V L Y

VERTICAL PICK-UP TURNING MACHINE

Turning + automation = VL.

The system with many advantages:

- integrated automation, low capital outlay
- automatic workpiece changeover in the shortest possible time
- short travels for loading and machining, resulting in shortest possible cycle times
- high degree of availability
- ideal chip flow conditions
- very short chip-to-chip times
- small footprint

Every VL embodies the experience gained from over 6000 EMAG vertical turning centers in the field. Well-designed components, highest standards of quality, an extensive range of standard equipment and an excellent price-performance ratio are all included with the VL.

V L 3
V L 5
V L Y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VL 3
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VL Y
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VL 5

Every VL is a manufacturing cell – with workhandling integrated.

Every VL is a manufacturing cell where loading and unloading of the workpieces is integrated. A recirculating conveyor belt, equipped with carrier prisms, takes the workpieces to the pick-up station behind the machining area. At the front of the VL finish-machined components can be removed and raw-parts inserted as and when necessary.
The NC conveyor belt does not require resetting. When production changes to another workpiece, the new transport-specific data is entered into the control together with the NC part program.

On the VL, the guideways for the slides, the energy supply system, the turret housing and the pick-up station are all kept separate from the machining area. The vertical construction and the absence of telescopic covers guarantee ideal chip flow conditions.

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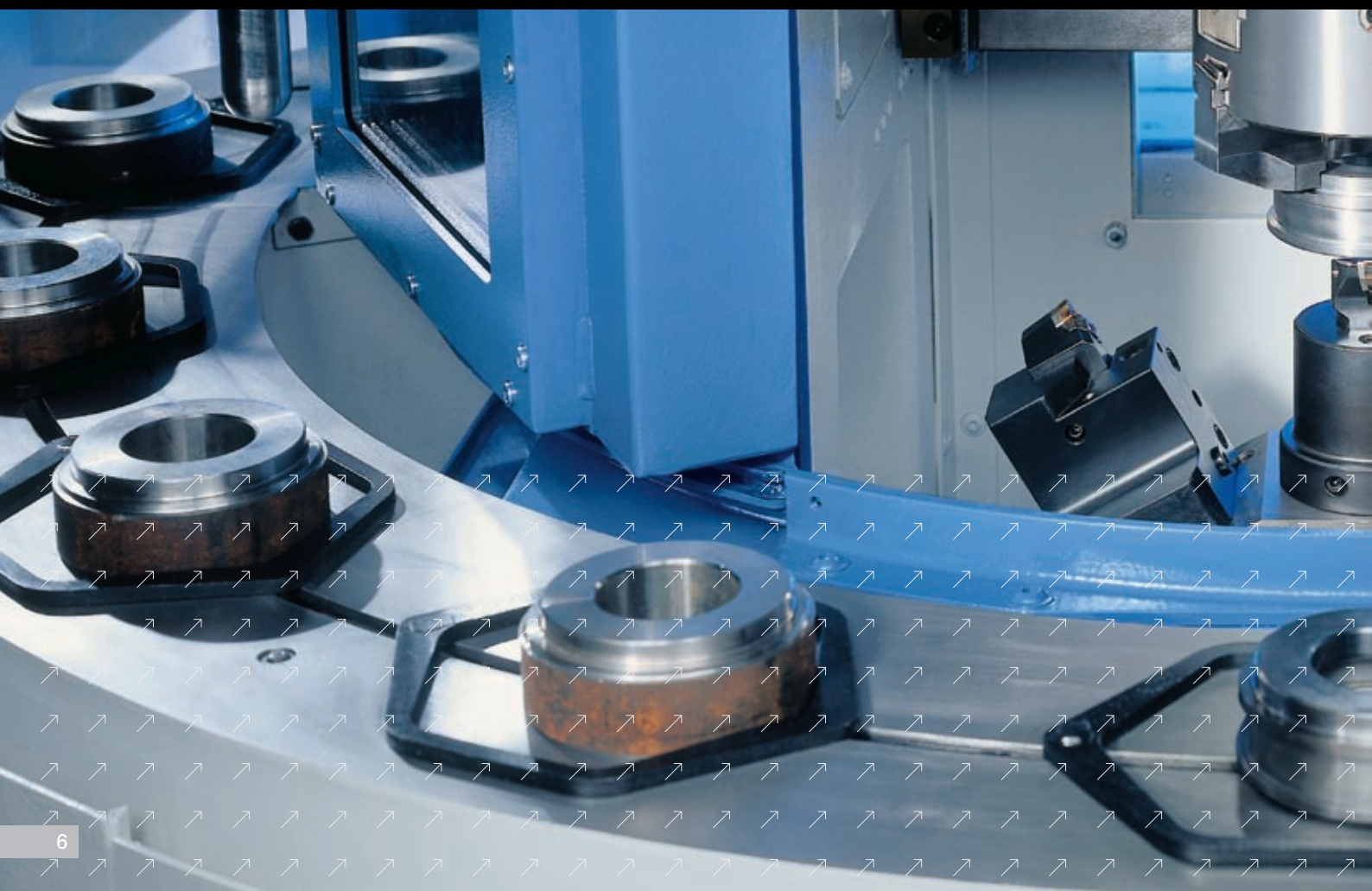

One automation system for many different workpieces.

The recirculating, prism-type loading frames – the carrier prisms – that take the components to and from the pick-up station are of simple design and require no resetting. They accommodate a large variety of workpieces of different size, shape and diameter. Even large component families can be machined with the same carrier prisms and without the need for resetting.

A release system on the gimballed pick-up station prevents damage to the machine. When a workpiece that has been positioned incorrectly in its carrier prism arrives at the pick-up station, the machine's emergency stop is activated and the pick-up station tipped out of harm's way. As soon as the workpiece is removed, the pick-up station returns to its loading position.

V L 3
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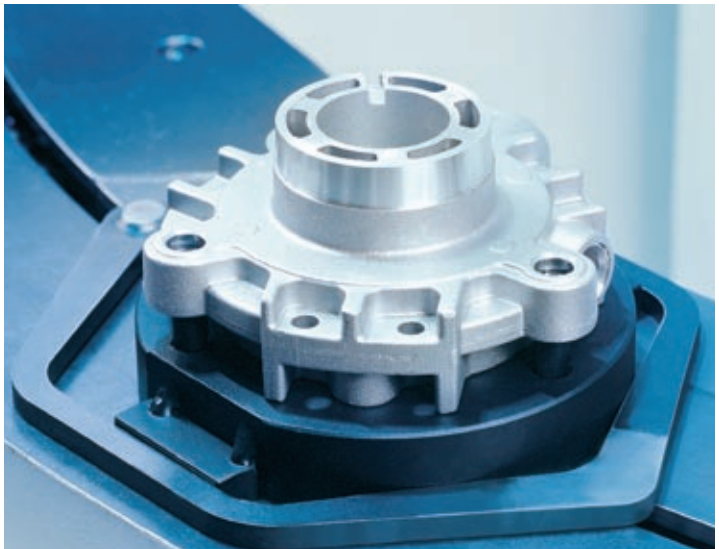
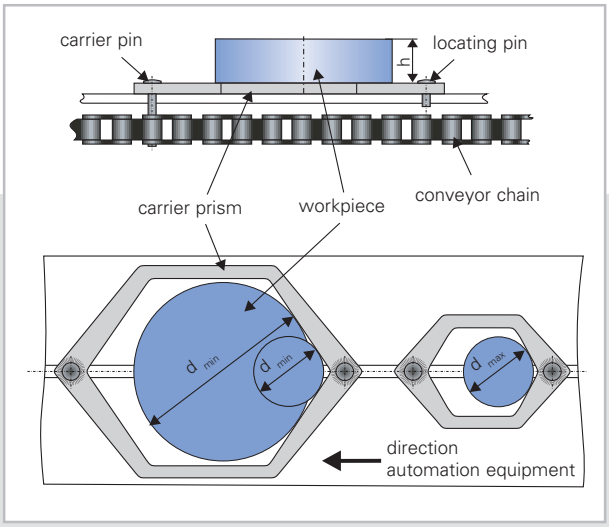
To accommodate asymmetrical, long and thin workpieces or components that require special alignment, the carrier prisms will accommodate workpiece receptors or pallets of simple design. This allows for a multitude of work-pieces to be loaded and unloaded fully automatically.





The principle of recirculating automation

Workpieces on the storage conveyor

workpiece dia. d	VL 3	VL 5	VL Y
30 - 85 mm	27 comp.	30 comp.	30 comp.
30 - 130 mm	18 comp.		20 comp.
30 - 160 mm		18 comp.	
80 - 220 mm		14 comp.	
workpiece height h	100 mm	110 mm optionally max. 145 mm	110 mm

Reliable machine modules for great process integrity.

Driven by rapid response, frequency controlled, maintenance-free three-phase motors, the overhead slide travels free of play and stick-slip. The encapsulated linear measuring systems in X- and Z-axis and the maintenance-free, centrally lubricated guideways of the slide are completely separate from the machining area.

The high-precision, preloaded linear roller guides in X- and Z-axis are the cornerstone for high-precision turning work. They also permit the use of high axis speeds and rapid acceleration.

V L 3
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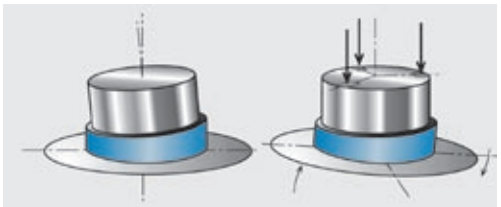
In the pick-up station the conveyor belt centers the workpieces in their carrier prisms, as directed by the NC program. A gimballed stop plate presses the work-piece against the chuck jaws and the contact surface of the clamping device.

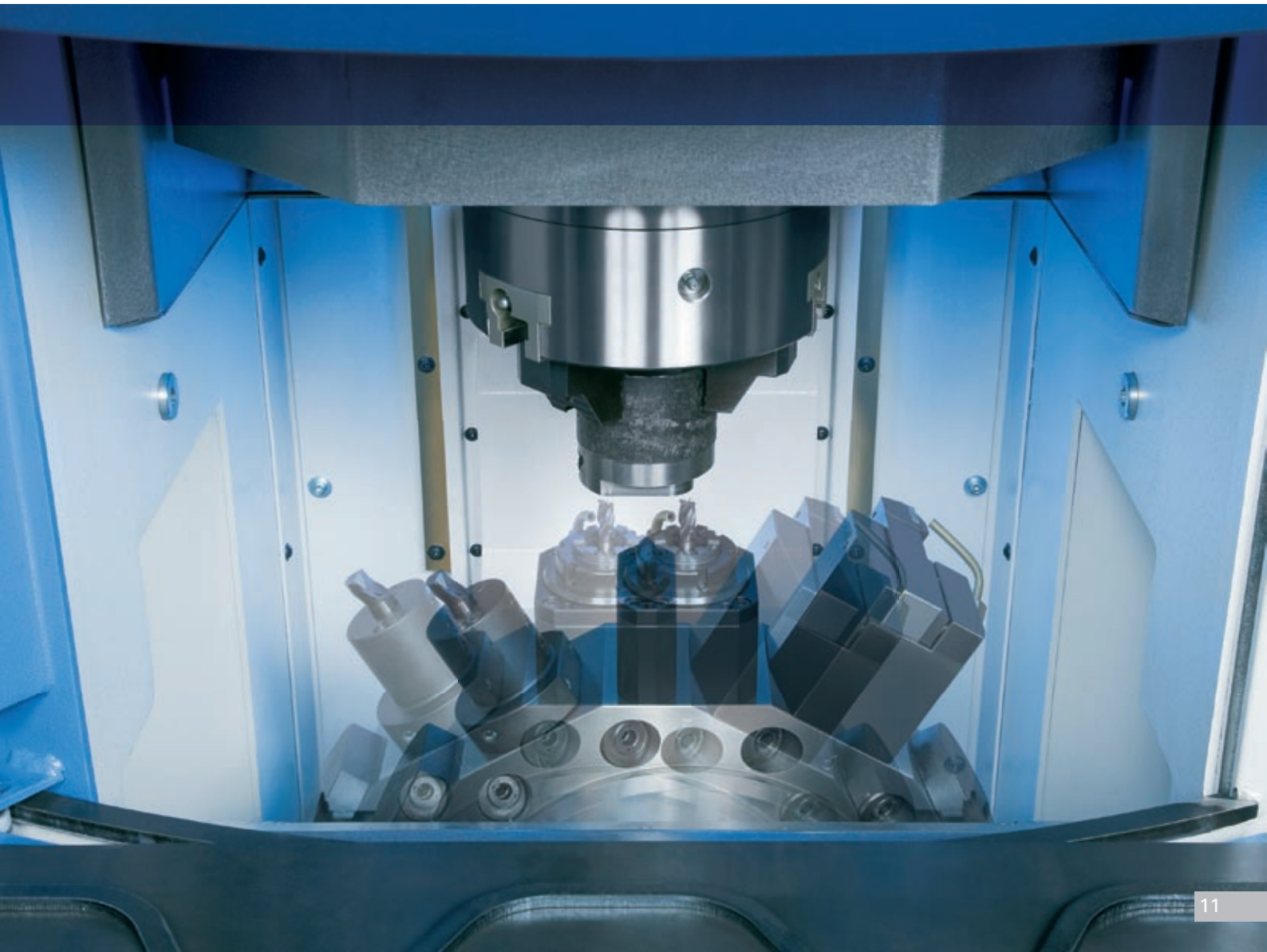


The raw-part arrives askew at the pick-up station. The reason could be a burr, a casting fault or an uneven cut-off.

The vertical jaw pressure of the chuck aligns the workpiece before it is picked up.

The outstanding feature of the rapid response12-station disc-type turret with electrical indexing drive is its very short indexing times. All tool stations accommodate live tools for drilling and milling work (VDI tool receptors to DIN 69880).
For drilling operations the workpiece is very quickly moved into position by the C-axis. For contour milling work it is machined at programmable feedrates.

VL with Y-axis.
The VL is now also available with Y-axis. This allows the machining of very complex geometries. In fact, with the Y-axis off-centre drilling and milling can now be done without the need for expensive special tools.



Quality and ease of maintenance.

The ergonomic layout of the machines of the VL series is the basis for optimal working conditions. All components attended by the operator are no further away than 500 mm, making it easier to operate and maintain the machine. The layout also saves time in repairing and maintaining the machine and offers a clear view as well as easy access to the ball screw, the X-axis drive and all supply systems (hydraulics, coolant, cutting fluid and central lubrication). Once the side panels have been taken off, the overhead slide and its constituent components are also fully accessible.

V L 3
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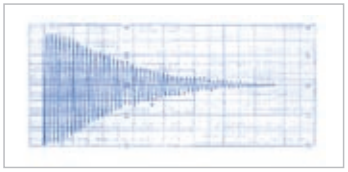
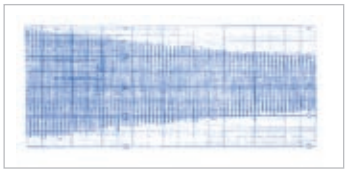
V L Y

Short, symmetrical force distribution is a precondition for the high static and dynamic rigidity of the VL. The thermo-symmetrical construction and absolute, direct position feedback systems allow for the smallest diameters to be machined to tightest tolerances with precision and great process capability.

The machine base in high quality MINERALIT® has exceptional damping qualities. This results in a better surface finish and an extended tool life.



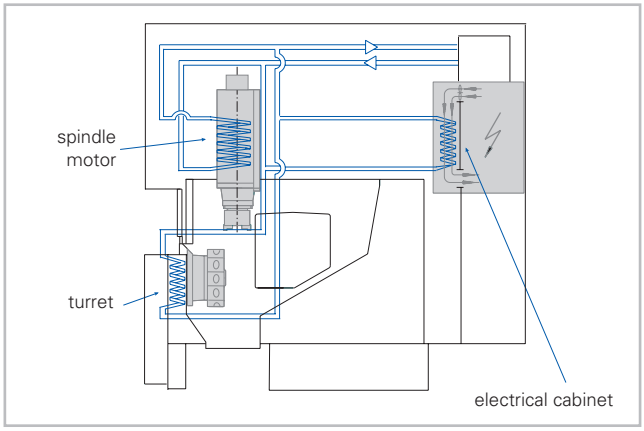
Vibration damping effect on EMAG machine bases made of the polymer granite MINERALIT®.



Comparison: vibration damping effect on cast iron machine bases.

A forklift can move this „hook-up-and-install“ machine to a new location in next to no time.

All machine elements that influence the precision of the machine are fluid-cooled. A heat exchanger keeps the temperature of spindle motor, turret and electrical cabinet in line with the ambient temperature.



Technical data.

Capacity		VL 3	VL 5	VL Y
Chuck diameter	mm	160	250	170
Swing diameter	mm	210	260	210
X-travel	mm	400	570	570
Y-travel	mm	–	–	± 25
Z-travel	mm	200	200	200
Loading time				
depending on workpiece	s	2 - 4	2 - 4	2 - 4
Main spindle				
Spindle nose to DIN 55 026	Size	5	6	6
Spindle bearing, front	dia. in mm	80	110	110
Spindle speed, max.	rpm	7,500	4,500	4,500
optional	rpm	–	5,500	–
Main drive				
AC asynchronous motor				
Power rating at 40% duty cycle / 100% duty cycle	kW	24 / 16	28 / 18	28 / 18
Torque at 40% duty cycle / 100% duty cycle	Nm	158 / 102	320 / 202	320 / 202
Feed drive				
Rapid traverse speed in X	m/min	60	60	60
Rapid traverse speed in Y	m/min	–	–	15
Rapid traverse speed in Z	m/min	30	30	30
Feed force in X / Y / Z	kN	5	5	5
Ball screw in X / Z	dia. in mm	40	40	40
Ball screw in Y	dia. in mm	–	–	32

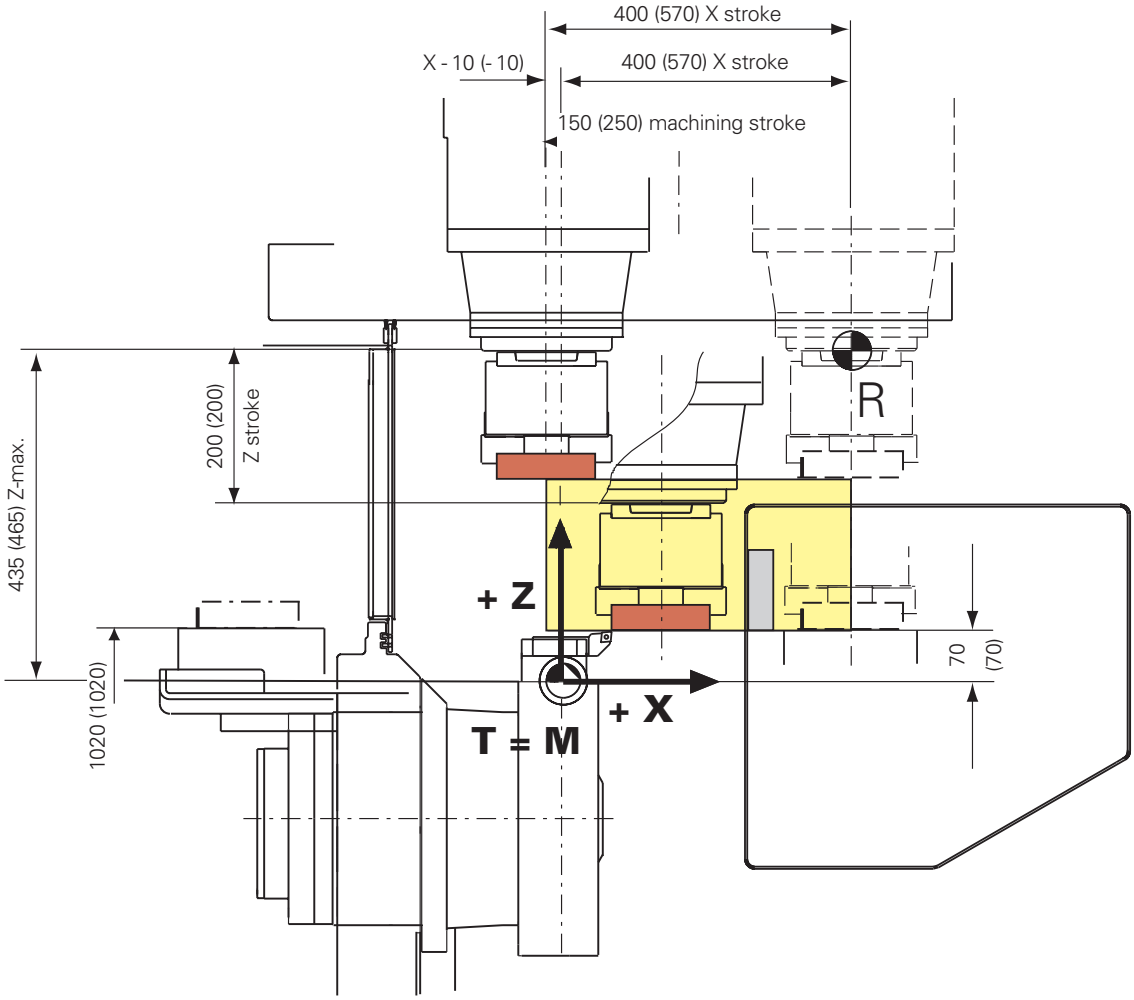
Disc-type turret			VL 3	VL 5	VL Y
Tool receptors					
for cylindrical shanks to DIN 69880		Qty	12	12	12
Shank dia.		mm	40	40	40
Live tools:					
max. power rating		kW	8.5	8.5	8.5
max. speed		rpm	6,000	6,000	6,000
max. torque		Nm	40	40	40
full power at speed of		rpm	3,000	3,000	3,000
Turret indexing time		s	0.3	0.3	3.0
Electrical equipment					
Operating voltage		V	400	400	400
Control voltage	DC	V	24	24	24
	AC	V	230	230	230
Frequency		Hz	50	50	50
Total installed power rating					
without live tools		kW	28	40	40
with live tools		kW	31	42	42
Lead fuse		A	50	63	63
Electrical standards				VDE 0113	VDE 0113
Control system					
FANUC 18iTB					
SIEMENS SINUMERIK 840 D Solution Line					
Weights and measurements					
Length		mm	2,450	2,700	2,700
Length incl. chip conveyor		mm	3,600	3,800	3,800
Width		mm	1,900	2,050	2,050
Height		approx. mm	2,300	2,400	2,400
Weight		approx. kg	5,500	7,000	7,000

Subject to technical changes

Technical data.

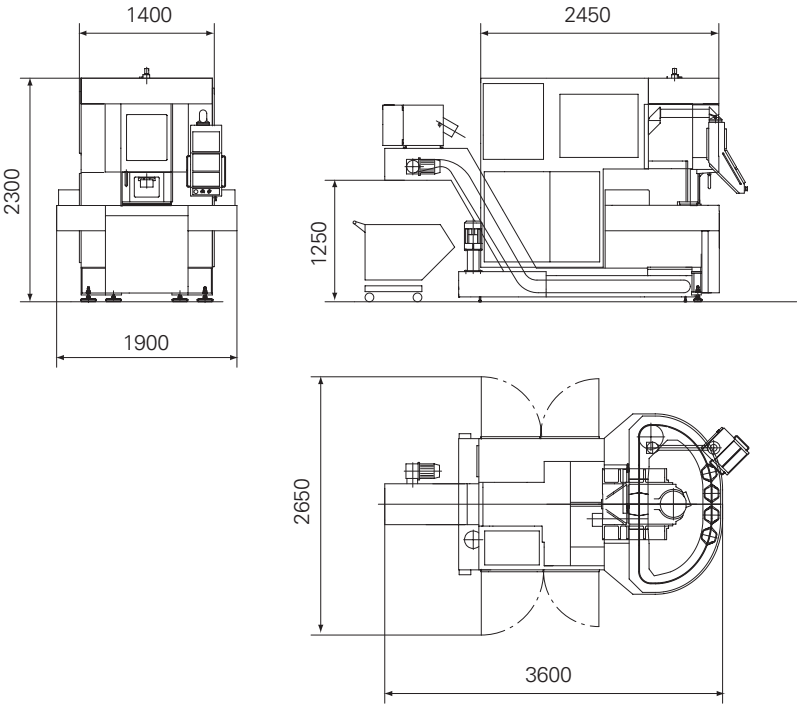
Machining area VL 3 / VL 5

Values for VL 5 in brackets
Dimensions in mm



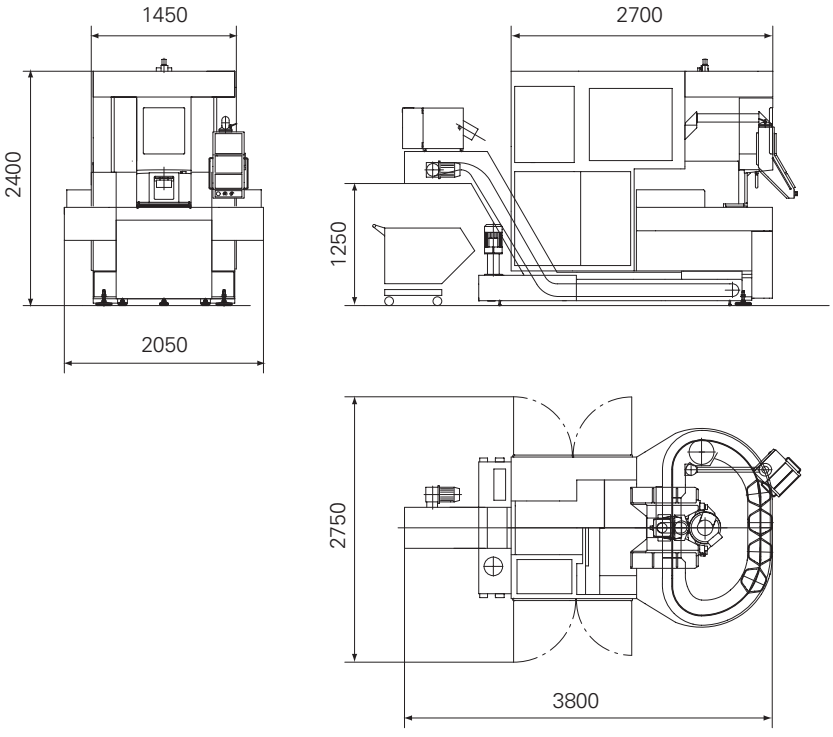
Floor plan VL 3

Dimensions in mm



Floor plan VL 5 / VL Y

Dimensions in mm



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At home in the world.

EMAG
Gruppen-Vertriebs- und Service GmbH

Salach
Austrasse 24
73084 Salach
Germany
Phone: +49 (0)7162 17 0
Fax: +49 (0)7162 17 820
E-mail: info@salach.emag.com

Frankfurt
Orber Strasse 8
60386 Frankfurt/Main
Germany
Phone: +49 (0)69 40802 0
Fax: +49 (0)69 40802 412
E-mail: info@frankfurt.emag.com

Köln
Robert-Perthel-Strasse 79
50739 Köln
Germany
Phone: +49 (0)221 126152 0
Fax: +49 (0)221 126152 19
E-mail: info@koeln.emag.com

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

Herford
Arndtstrasse 8
32052 Herford
Germany
Phone: +49 (0)5221 9333 0
Fax: +49 (0)5221 9333 25
E-mail: info@herford.emag.com

München
Zamdorferstrasse 100
81677 München
Germany
Phone: +49 (0)89 99886 250
Fax: +49 (0)89 99886 160
E-mail: info@muenchen.emag.com

WORLDWIDE

NODIER EMAG INDUSTRIE S.A.
Service commercial Unital:
38, rue André Lebourblanc - B.P. 26
78592 Noisy le Roi Cedex
France
Phone: +33 1 30 80 47 70
Fax: +33 1 30 80 47 69
E-mail: info@nodier.emag.com

EMAG MAQUINAS HERRAMIENTA S.L.
Pasaje Arrahona, No.18
Centro Industrial Santiga
08210 Barberà del Vallès (Barcelona)
Spain
Phone: +34 93 719 5080
Fax: +34 93 729 7107
E-mail: info@emh.emag.com

ZETA EMAG SpA
Viale Longarone 41/A
20080 Zibido S.Giacomo (MI)
Italy
Phone: +39 02 905942 1
Fax: +39 02 905942 21
E-mail: info@zeta.emag.com

EMAG (UK) Ltd.
Chestnut House,
Kingswood Business Park
Holyhead Road
Albrighton
Wolverhampton WV7 3AU
Great Britain
Phone: +44 1902 376090
Fax: +44 1902 376091
E-mail: info@uk.emag.com

KP-EMAG
ul. Butlerova 17
117342 Moscow
Russia
Phone: +07 495 3302574
Fax: +07 495 3302574
E-mail: info@kp.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
Colina de la Umbria 10
53140 Boulevares
Naucalpan Edo. de Mèxico
Mexico
Phone: +52 55 5 3742665
Fax: +52 55 5 3742664
E-mail: info@mexico.emag.com

EMAG DO BRASIL Ltda.
Rua Schilling, 413
Vila Leopoldina
05302-001 São Paulo
SP, Brazil
Phone: +55(0)11 3837 0145
Fax: +55(0)11 3837 0145
E-mail: info@brasil.emag.com

Dänemark
Horsvangen 31
7120 Vejle Ø
Denmark
Phone: +45 75 854 854
Fax: +45 75 816 276
E-mail: info@daenemark.emag.com

Schweden
Glasgatan 19B
73130 Köping
Sweden
Phone: +46 (0)221 40305
E-mail: info@sweden.emag.com

Österreich
Dorfstrasse 343
5423 St. Koloman
Austria
Phone: +43 (0)6241 640
Fax: +43 (0)6241 26204
E-mail: info@austria.emag.com

EMAG Machine Tools (Taicang) Co., Ltd.
Room 2315 B, Far East International Plaza
No. 317 Xianxia Road
200051 Shanghai,
P.R. China
Phone: +86 21 62 35 15 20
Fax: +86 21 62 35 01 18
E-mail: info@china.emag.com

EMAG INDIA Private Limited
#12, 12th Main Street, 17th Cross
Malleswaram
Bangalore - 560 055,
India
Phone: +91 80 2344 7498
Fax: +91 80 2344 7498
E-mail: info@india.emag.com

EMAG KOREA Ltd.
Lotte IT Castle 1st B/D, Rm 806
550-1, Kasan-dong
Kamchun-gu
153-803 Seoul
South Korea
Phone: +82 2 2026 7660
Fax: +82 2 2026 7670
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

EMAG SOUTH AFRICA
P.O. Box 2900
Kempton Park 1620
Rep. South Africa
Phone: +27 11 3935070
Fax: +27 11 3935064
E-mail: info@southafrica.emag.com

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