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Stopping 420 Horsepower in its Tracks

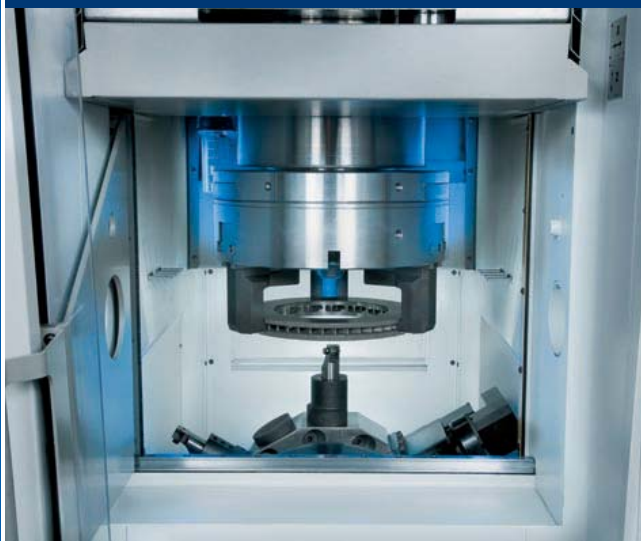


The demands on the brake systems in sports cars are high:

The requirements are: to withstand the extreme stresses of a race track, but also to guarantee comfortable stop-and-go traffic in the city. On the Audi R8 the relevant output peaks are controlled by two fixed yoke disk brakes with eight pistons each for the front suspension and four pistons per wheel brake at the back. The doweled composite brake disks – the front ones with a diameter of 380 mm, the ones at the back 356 mm – are particularly complex in design, as they consist of a friction ring doweled on to an aluminum braker block. EMAG has now developed a manufacturing system for the complete machining of the internally ventilated brake disks and the friction rings, which consists of two VSC 500s and a VLC 500 production center.

The Workpieces

Workpieces	Internally ventilated brake disks 3 varieties of friction rings
Material	GG 25 (cast iron)
Workpiece application	Brake system in Audi R8



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The Machine	Machining process	Cycle time	Cutting data
OP 10 – VSC 500	Boring, plus rough-machining of the friction surfaces with an NC lift-off toolholder	60 s	Turning = 600m/min
OP 20 – VLC 500	OD turning, drilling and reaming of the dowel bores with driven tools (angular heads)	60 s	Turning = 600m/min Dowel bore drilling = 120m/min Dowel bore reaming = 90m/min
OP 30 – VSC 500	Drilling and reaming of the remaining dowel bores with angular heads	60 s	Dowel bore drilling = 120m/min Dowel bore reaming = 90m/min
The Tools	Turning with ceramics (dry) Drilling and reaming with carbide tools and minimum quantity lubrication (Lubrix)		

Energize



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Your Production!

ECM – Electro-Chemical Machining is the generic term for a variety of electro-chemical operations and indicates that workpieces are machined by electrolytically dissolving metal. The process is used in aerospace engineering, automotive, medical equipment, micro system and power supply industries.

It can be applied to most metals such as nickel and titanium based high-alloy materials, and to hardened metals. None of the disadvantages experienced with conventional machining – e.g. tool wear, mechanical stresses, micro-fissures caused by heat transfers, surface oxidation or the need for subsequent deburring operations – are present in this process, as it is a contactless procedure with no heat input.



Technology	Electro-chemical machining
Materials	Steel, titanium, copper, aluminum, all common alloys and hardened metals
Application	Deburring, polishing, 3D-contouring

For further information please
go to: www.ecm.emag.com

VL 5i – Top Performance

Machining, automation, work-handling and measuring – all on one machine.

The outstanding characteristics of the VL 5i Vertical Pick-Up Turning Machine are high productivity levels, extremely high and constantly maintained precision, great operational safety, and ease of handling. Short travels and a compact machine design make for short loading and cycle times. The standard equipment includes the machine base and overhead slide in MINERALIT®, which is known for its outstanding damping qualities that reduce vibrations to a minimum.



The Machine VL 5i

Capacity

Chuck dia., max.	mm	250
Swing diameter	mm	270
X- / Z-travel	mm	660 / 300

Work spindle

Spindle speed, max.	rpm	4,500
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Main drive

Asynchronous motor		
Power rating at 40% duty cycle / 100% duty cycle	kW	28 / 18
Torque at 40% duty cycle / 100% duty cycle	Nm	300 / 200

Tool receptors for cylindrical shanks to DIN 69880	Qty	12
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Comes Standard

MORE POWER to be found also at: www.vl5i.emag.com



VTC Platform – Multifunctionality

You Give Us the Task – We Supply the

The VTC series is ideal for complex manufacturing tasks: whether you are looking for high metal removal rates in turning, milling or grinding – the VTC series offers the user the possibility to integrate almost all machining processes, allowing for the supply of complete production lines that include both green and hard machining operations on one platform!

The advantage? When requirements change, the machines can – with little effort – be equipped with new technology modules for the production of new workpieces. The possible combination of technologies makes for great flexibility in the VTC's application.

Here is indeed a manufacturing system that orientates itself on your requirements!

The following technology modules are available for the VTC:

- Green turning
- Milling
- Drilling
- Hobbing
- Hard turning
- Scroll-free turning
- Grinding / simultaneous grinding
- Synchronous support grinding
- Out-of-round grinding



Milling / Drilling / Turning



Scroll-Free Turning

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Solution!



4 Axis Turning

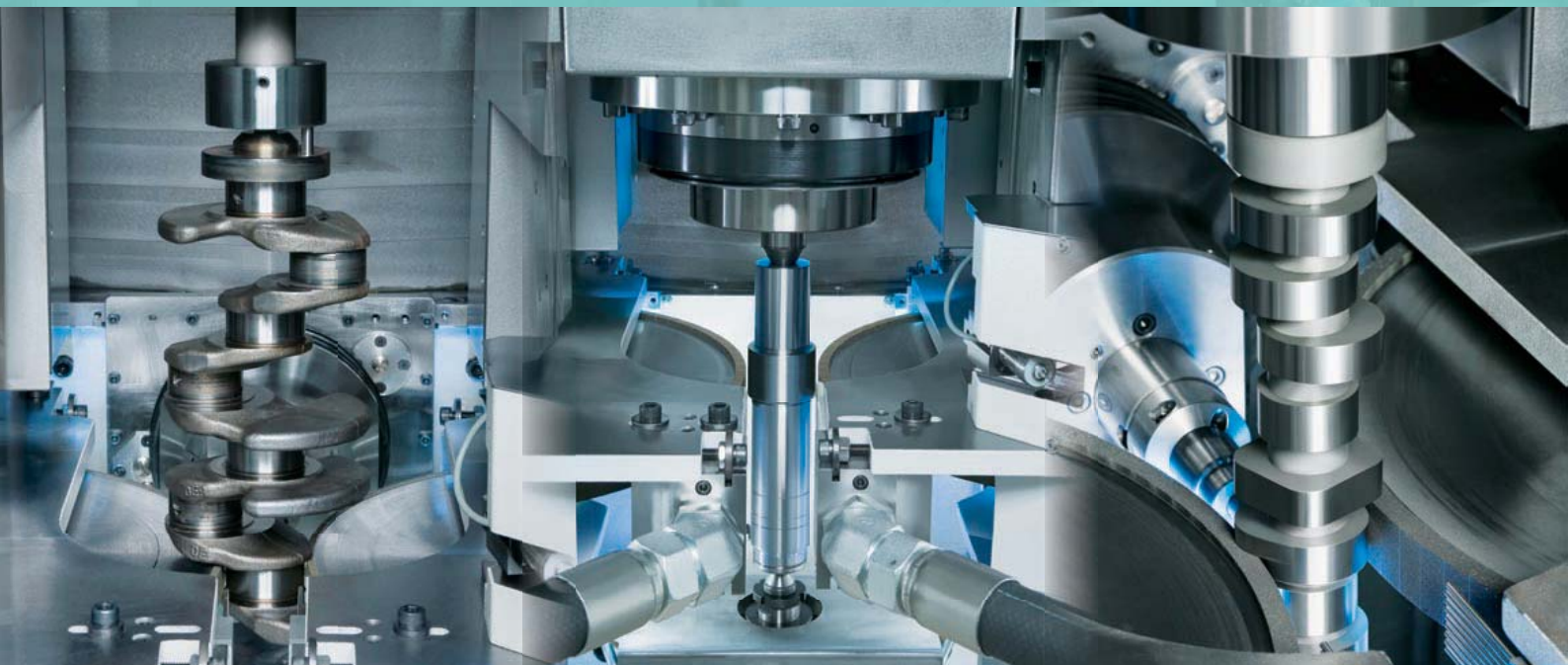
Milling



Hard Turning / Grinding

Turning / Finishing

Simultaneous Grinding



Crankshaft Grinding

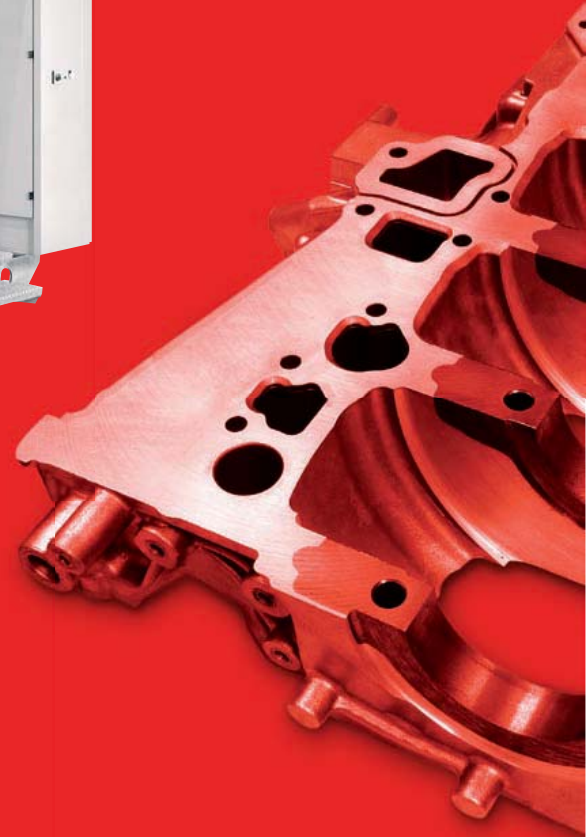
Synchronous Support Grinding

Out-of-Round Grinding

The BM

The SW Transfer Center for

- Standard basic machine with monobloc design
- Project-specific drilling and milling units
- Workpiece or fixture pick-up
- Manual or automatic loading

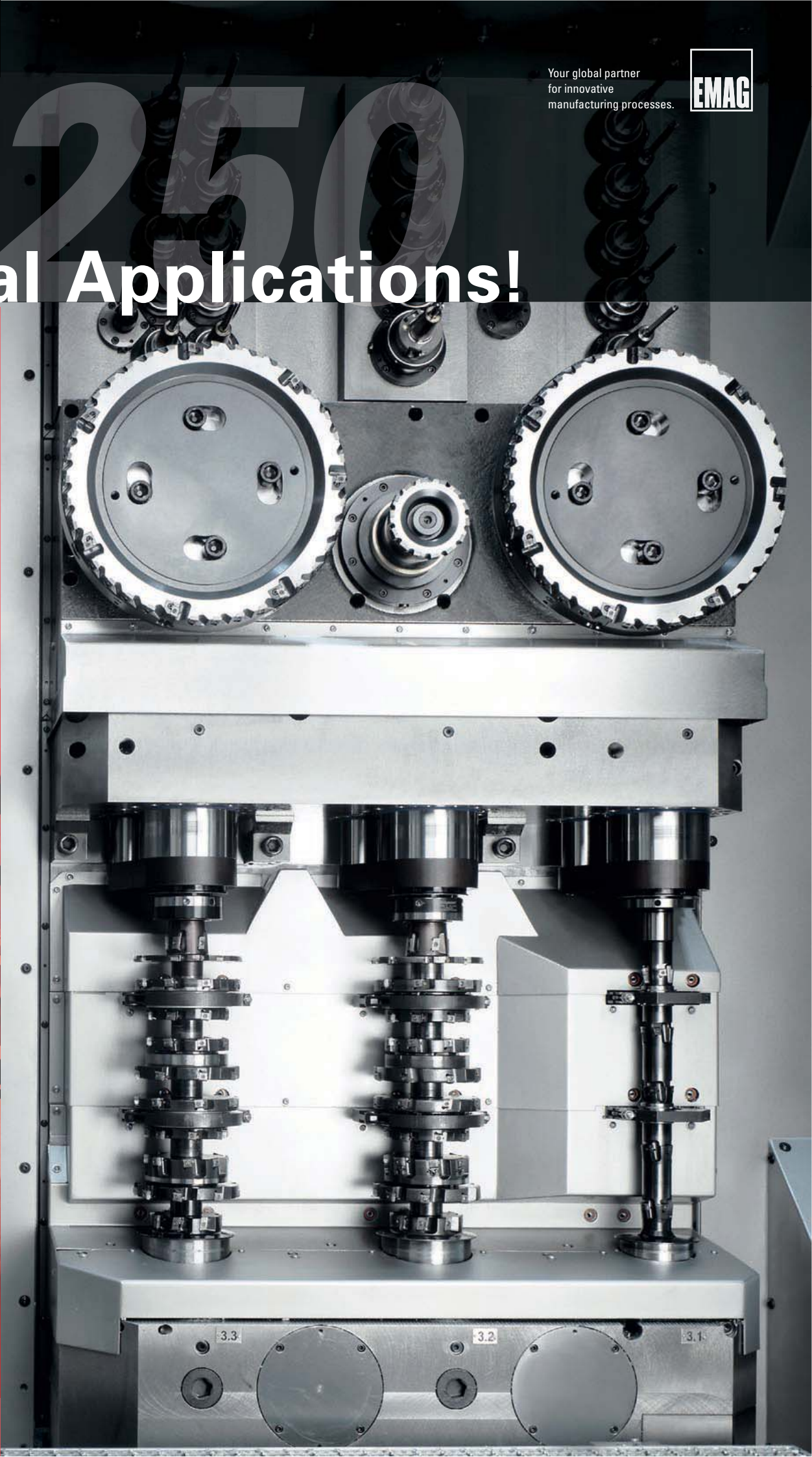


The Machine		BM 1250
Capacity		
X-axis (alternatively)	mm	700 (1,900)
Y-axis	mm	1,250
Z-axis	mm	500
Work spindle		
Total weight of drilling heads, max.	kg	6,000
Power rating, max.	kW	120
Surface for work spindles	mm	1,000 x 1,900
Feed drive		
Rapid traverse speed in X / Y / Z	m/min.	60 / 60 / 50
Axis acceleration in X / Y / Z	m/s ²	5 / 8 / 10
Feed force in X / Y / Z, max.	Nm	22,000 / 22,000 / 28,000

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1250 Special Applications!





THE EMAG GROUP – WORLD-WIDE PARTNER
IN FORWARD LOOKING PRODUCTION TECHNIQUES.

EMAG
Gruppen-Vertriebs- und Service GmbH

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

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

Köln
Robert-Perthel-Strasse 79
50739 Köln
Germany
Phone: +49 7162 17-0
Fax: +49 7162 17-820
E-mail: info@koeln.emag.com

Leipzig
Pittlerstrasse 26
04159 Leipzig
Germany
Phone: +49 341 4666-0
Fax: +49 341 4666-014
E-mail: info@leipzig.emag.com

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

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

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

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

Polen
Spółka Z Ograniczoną
Odpowiedzialnością
Oddział w Polsce
Miodowa 14
00-246 Warszawa
Poland
Phone: +48 22 5310500
Fax: +48 71 3137359

Belarus
ul. Timirjazeva, 65 B, Pom. 78 (K.1101)
220035 G. Minsk
Belarus
Phone: +375 296 205100
Fax: +375 17 2547730
E-mail: info@emag.by

NODIER EMAG INDUSTRIE S.A.
38, rue André Lebourblanc - B.P. 26
78592 Noisy le Roi
France
Phone: +33 130 8047-70
Fax: +33 130 8047-69
E-mail: info@nodier.emag.com

EMAG MAQUINAS HERRAMIENTA S.L.
Pasaje Arrahona, No.18
Centro Industrial Santiga
08210 Barberá del Vallés (Barcelona)
Spain
Phone: +34 93 7195080
Fax: +34 93 7297107
E-mail: info@emh.emag.com

ZETA EMAG Srl
Viale Longarone 41/A
20080 Zibido S.Giacomo (MI)
Italy
Phone: +39 02 905942-1
Fax: +39 02 905942-22
E-mail: zetaemag@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

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 México
Mexico
Phone: +52 55 5374266-5
Fax: +52 55 5374266-4
E-mail: info@mexico.emag.com

EMAG DO BRASIL Ltda.
Rua Schilling, 413
Vila Leopoldina
05302-001 São Paulo
SP, Brazil
Phone: +55 11 38370145
Fax: +55 11 38370145
E-mail: info@brasil.emag.com

EMAG SOUTH AFRICA
P.O. Box 2900
Kempton Park 1620
Rep. South Africa
Phone: +27 11 39350-70
Fax: +27 11 39350-64
E-mail: info@southafrica.emag.com

EMAG Machine Tools (Taicang) Co., Ltd.
Building 3, Cang Neng
Europe & American Technology Park
No. 8 Lou Jiang Rd. (N.)
215400 Taicang
P.R. China
Phone: +86 512 5357-4098
Fax: +86 512 5357-5399
E-mail: emag@emag-china.com

EMAG INDIA Private Limited
#12, 12th Main Street, 17th Cross
Malleswaram
Bangalore - 560 055,
India
Phone: +91 80 23447498
Fax: +91 80 23447498
E-mail: info@india.emag.com

EMAG KOREA Ltd.
Rm204, Biz center,
SKn Technopark, 190-1,
Sangdaewon-dong,
Joongwon-gu, Seongnam City,
Gyeonggi-do, 462-721,
South Korea
Phone: +82 31 77644-15
Fax: +82 31 77644-19
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

