UHE

5-axis High Speed Universal Machining Center

FIDIA

UHE1000/1600

5-axis High Speed Universal Machining Center

3 separate castings morphology grant outstanding accuracy and high performances in any milling condition. 5-axis interpolation in combination with the rotary table allow 5-side machining of complex components, in a single, easy set-up.

UHE High-Speed Machining Centers have application in different sectors:

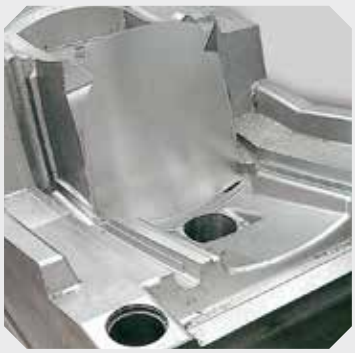
Aerospace
- structural parts
- landing gears
- turbine discs
- turbine blades
- impellers
- composite routing

Automotive
- plastic injection moulds
- stamping dies
- forging dies
- die-casting dies
- tire moulds and models
- prototyping and styling models

General Mechanical
- energy power components
- machine tool
- transmission gears
- complex shaped parts

Prototyping

Forging



Plastic injection and die casting

Turbine discs

Tires moulds

Complex shaped parts

UHE1000

Swiveling head driven by torque motor

UHE have the most efficient structure for multi-sided high performance machining, increase of productivity, flexibility and repeatability.
Main characteristics:

- 1000 x 800 x 700 mm travels on X/Y/Z axis
- 1000 x 800 mm rotary table, 1500 kg payload
- 0.001° swiveling head
- Torque motor driven B axis on swiveling head and Worm gear driven C axis rotary table
- Spindle: 18000 rpm HSK63A (with 26/32 kW 124/154 Nm) or 24.000 rpm HSK63A (with 21/27 kW 85/116 Nm)
- Simultaneous 5 axis machining
- Great flexibility to manufacture individual parts
- Maximum stability thanks to balanced load distribution
- Highest machine precision and repeatability is achieved reducing the axis overlapping
- Sliding front and side doors with a super wide opening for any easy load-download of parts

Simultaneous 5-axis high accuracy machining

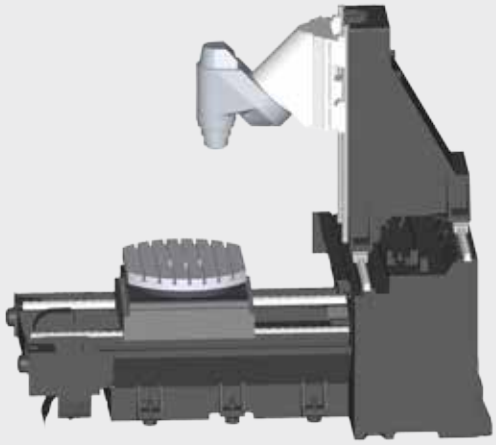
High rigid casting frame

Rigid casting frame

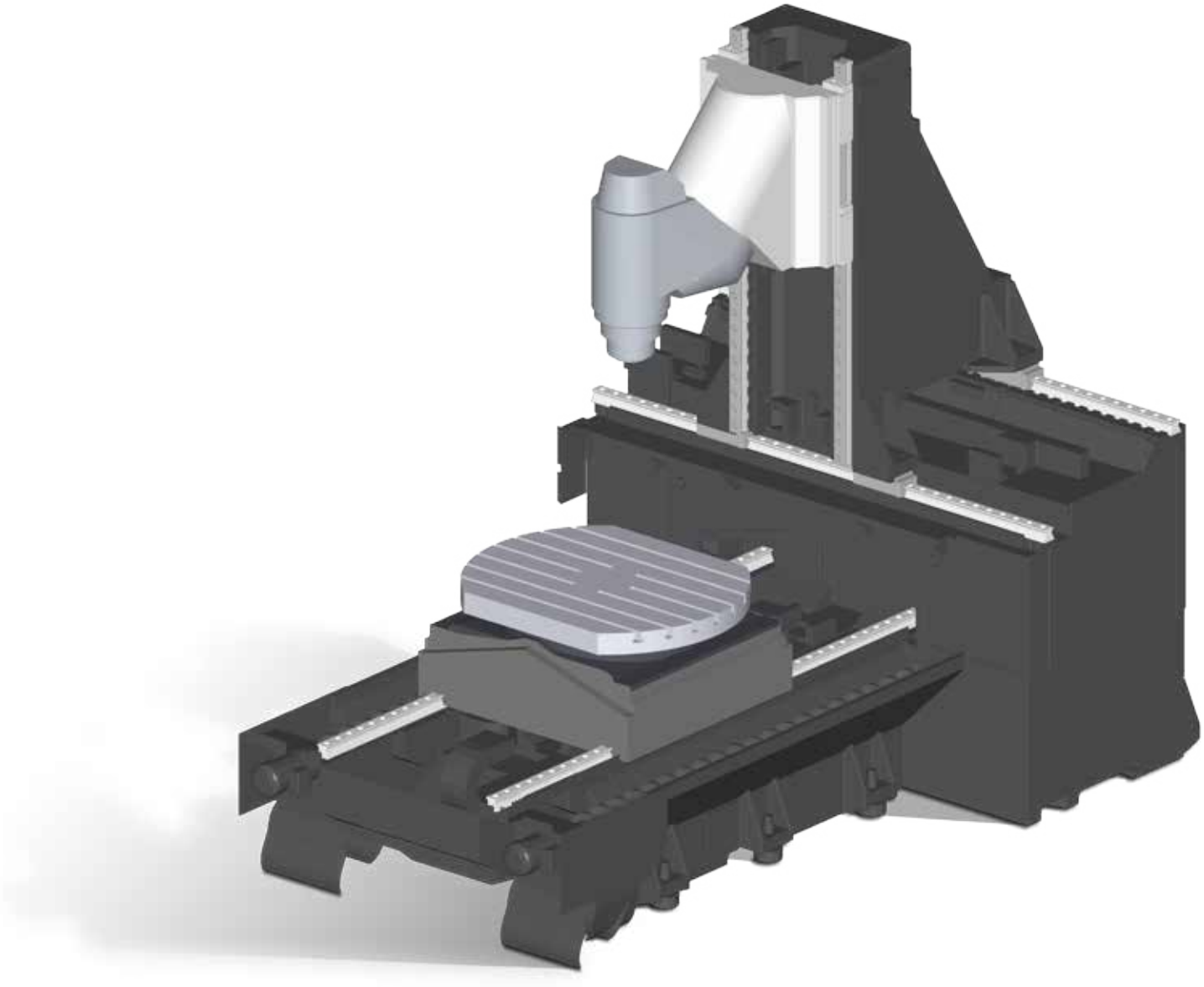
The most advanced FEM technology has been utilized to design an extremely rigid casting frame.
The machine is composed by 3 separate casting parts: machine bed, X axis column and spindle headstock.

Outstanding Accuracy

High-end standard equipment guarantee both outstanding accuracy and high performances of the machine.
High precision linear scales on 3 linear axis X Y & Z.
High precision direct rotary encoders for the B & C axis.



FEM technology to achieve the best performance



Axes technology

High rigid and heavy duty roller type linear guideways

Ball screws

High precision Φ50mm ballscrews on 3 axis are directly coupled to powerful AC servo motors to provide the utmost results in high speed cutting with best finishing quality.

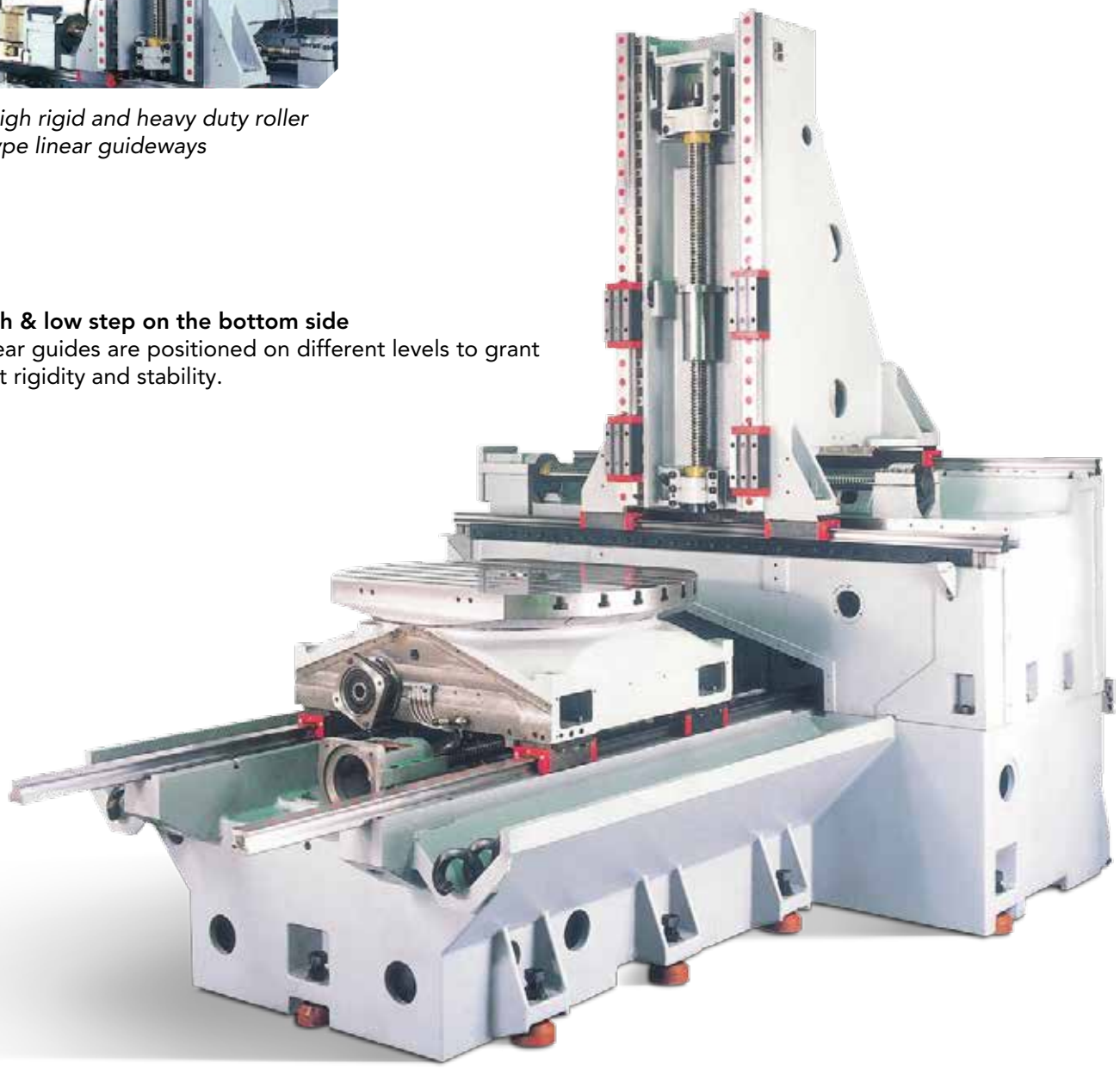
Roller Guideways

Highly rigid - heavy duty roller type linear guideways, provide low starting inertia, low friction, high acceleration rates and optimize machine response in high speed cutting.

Ladder bed

The one piece casting ladder bed has been designed to increase column resistance and rigidity.

High & low step on the bottom side
Linear guides are positioned on different levels to grant best rigidity and stability.



B Axis Innovative Swiveling Head

The latest technology torque motor manages the B axis continuous swivel milling head and guarantees maximum dynamic and linearity: the absence of traditional mechanical transmission allows much higher quality of surface finishing. The reading system with a direct angular encoder, grants precision and reliability. Suitable clamping torque is grant by an hydraulic brake system.

The fully automatic 0.001 degrees indexing from vertical to horizontal positions gives the operator all the flexibility for multi-sided machining without re-setting the workpiece. Moreover, 5 axis machining is performed by the rotary table in combination with the swiveling head.

"B" axis continuous swiveling head

C Axis durable rotary Table

The table incorporates a standard 1000 x 800mm clamping plate and is driven by AC Servomotor. It can be indexed 0.001° by an high precision worm gear and high precision direct rotary encoder. Clamping torque over 4.000 Nm is grant by an hydraulic brake system.

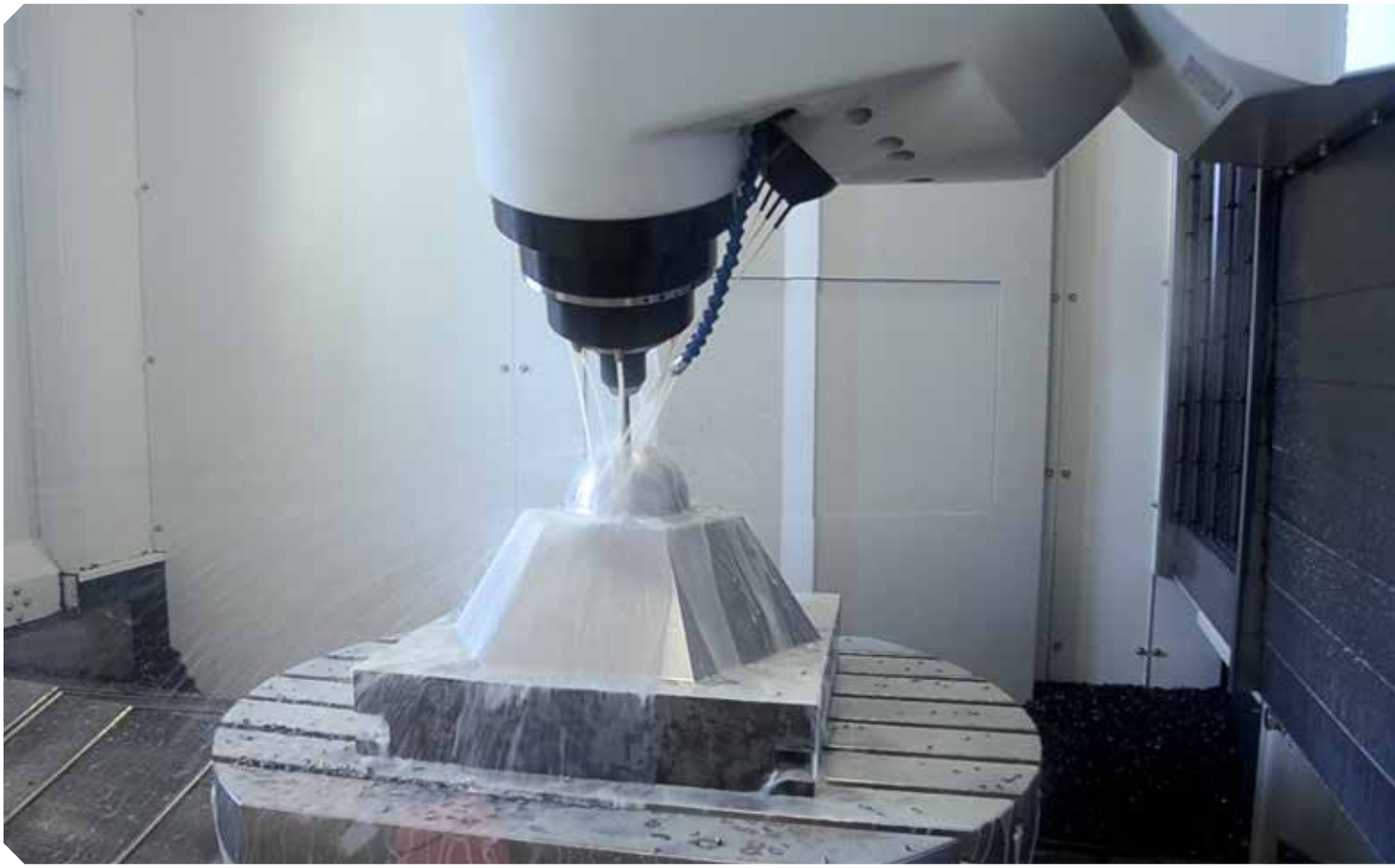
Wide Throat Distance

The very wide distance, 700mm between spindle center and X axis slideway cover, gives the operator a great convenience for different workpiece setup.

Wide distance between spindle center and the X axis bed

Automatic Tool Changer

40 positions chain type with a double swing arm ATC is a standard.
Optional is a 52 position version.



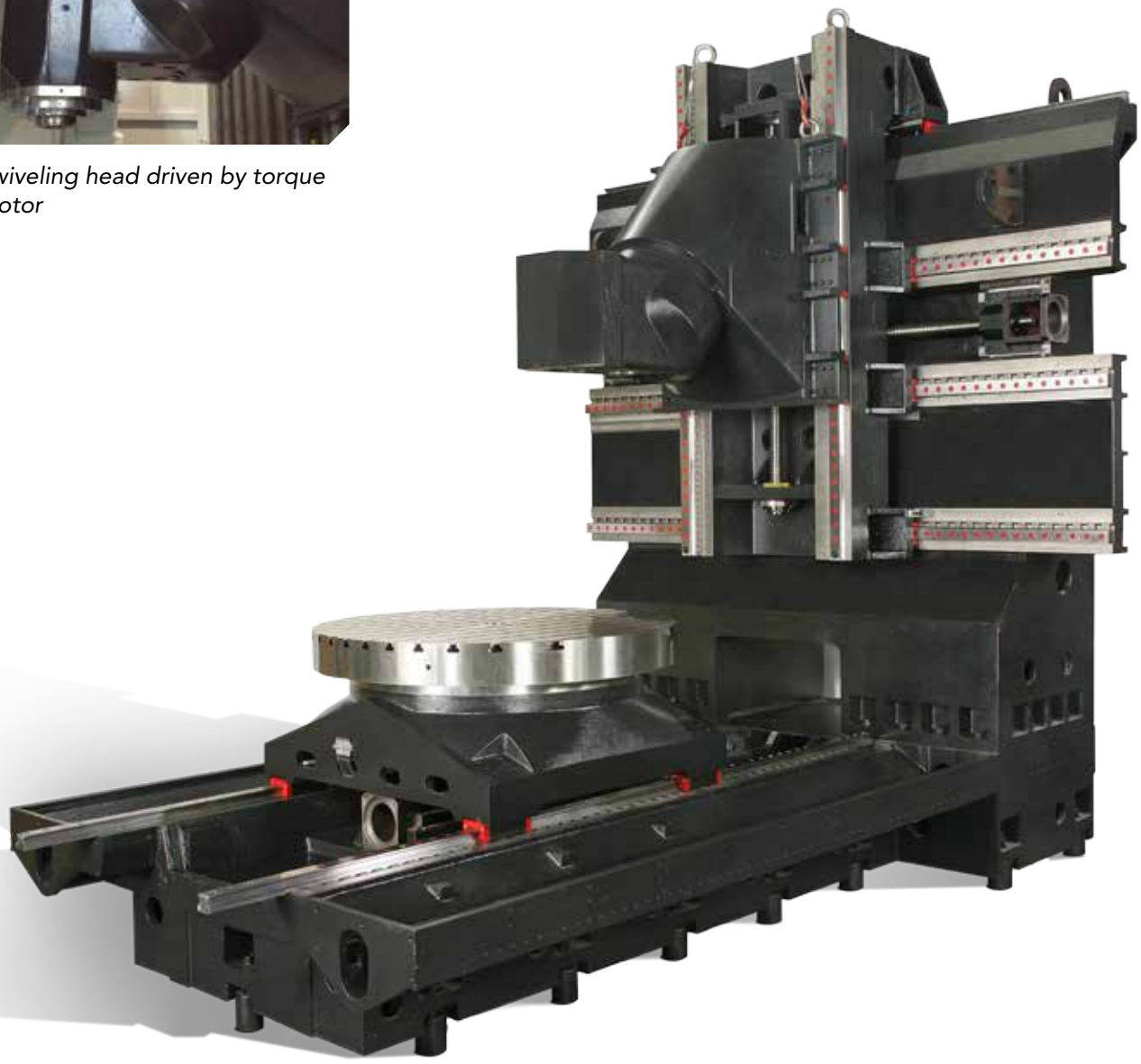
UHE1600

Rotary table with 4000 Kg word load driven by torque motor

Swiveling head driven by torque motor

Latest innovation in combination of both bridge type machine and travelling column type machine for heavy duty 5 axis simultaneus machining.
Main characteristics:

- 1620 x 1260 x 1050 mm travels on X/Y/Z
- Ø 1320 mm torque motor rotary table, with 4000 kg work load
- 0.001° swiveling head with torque motor
- Standard 8000 Rpm HSK-A100 /BT#50- 36/45 kW 340/418 Nm with Ø 100mm Ceramic bearings motor spindle (Optional 15.000 Rpm HSK-A-100 20/26kW 290/317 Nm)
- Exclusive 4 linear guideways system on X axis grants maximum rigidity and allows heavy duty cutting operations.

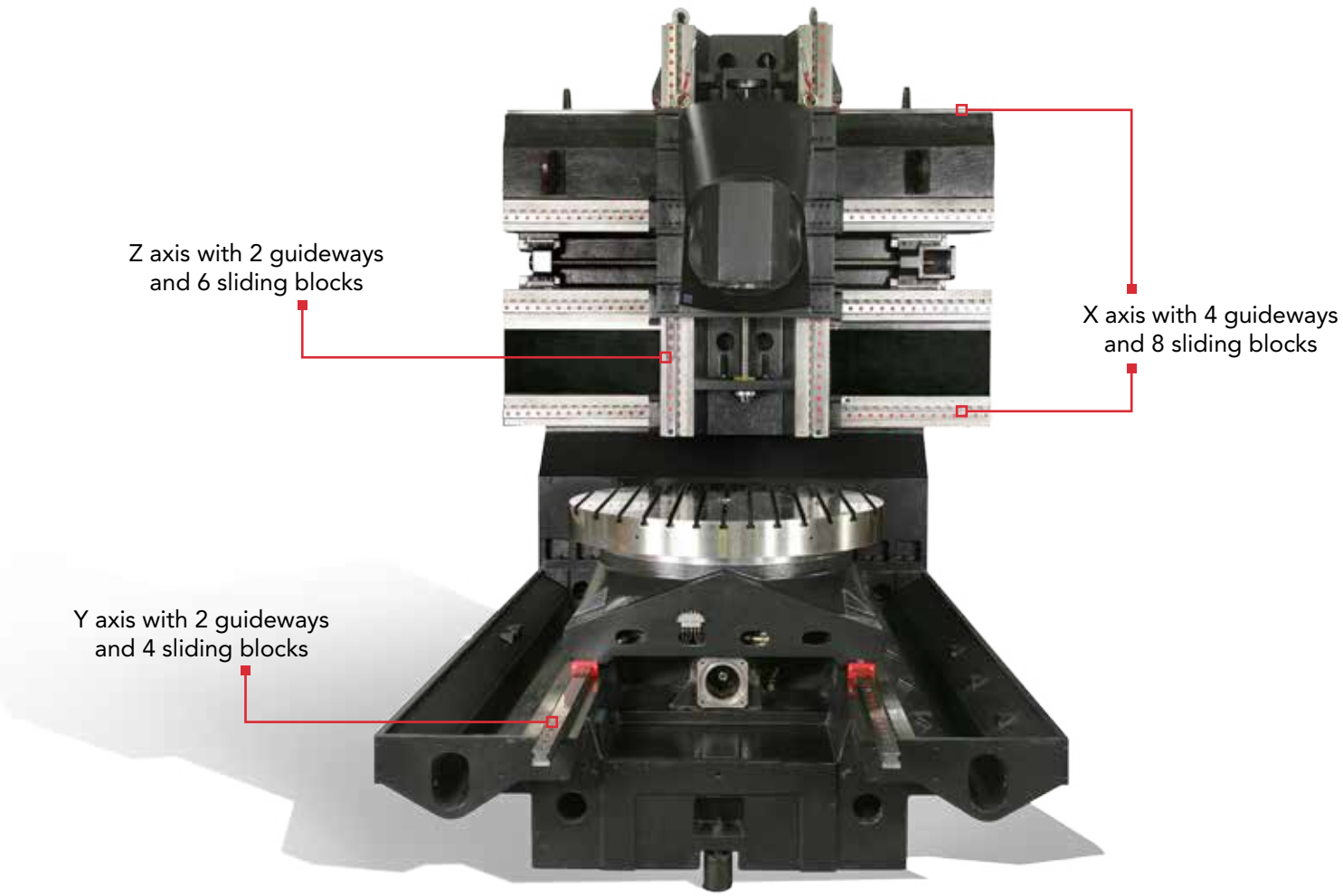


Rigid casting frame
The most advanced FEM technology has been utilized to designed an extremely rigid casting frame.

Roller guideways
Highly rigid - heavy duty roller type linear guideways, provide low starting inertia, low friction, high acceleration rates and optimize machine rigidity and dynamics.

Ball screws
High precision ballscrews on 3 axis are directly coupled to powerful AC servo motors to provide the utmost results in high speed cutting with best finishing quality.

High speed milling
The extreme rigidity and precision of the machine allow high speed milling machining.
The Fidia CNC and Fidia Digital Drives provide the best milling results on the machine tool, optimizing speed accuracy and best quality surface, by using advanced feed and acceleration smooth dynamics algorithms, thus preserving mechanical component life.



Fidia Numerical Control

Simple and reliable machining

Fidia controls have always been appreciated for their high level performance and comprehensive range of features supplied.
The user interface environment allows to operate with the maximum flexibility in any machining condition: program coming from CAM systems, 5 axes machining with RTCP function, mechanical machining such as slots, threads and pullers programmed directly on board of the machine by using ISOGRAPH.

nC19

Standard Software for High-Speed cutting and 5-axes Management

- **Look-Ahead "VELOCITY FIVE™"** with new "Dyna" parameter (machine dynamic advanced control, see below)
- **RTCP** and **VIRTUAL QUILL** management
- Interface with **HMS** (Head Measuring System) optional device for 5 axis heads and roto-tilting tables measuring and qualification. The **HMS** allows the automatic calibration of rotary axis. Equipped with 3 sensors connected to the CNC, the **HMS** system is managed by a specific measurement software. By processing incoming data in real time, the software is able to check and correct geometric error, positioning accuracy and the **RTCP** parameters for the heads and tables.

Velocity Five™

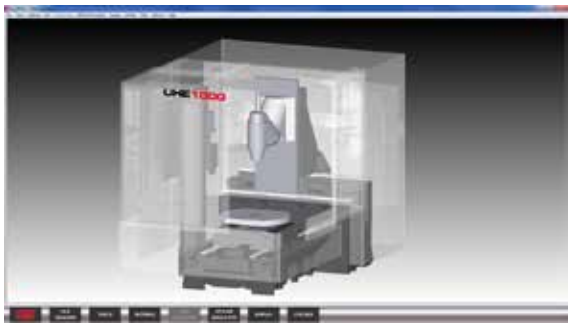
The speed and quality of machining for sculptured surfaces are the most well known and appreciated features of Fidia controls.
The combination of Fidia controls with the Xpower technology drives increases more than ever milling performances bringing them even closer to excellence.
The direct access to all the drive's parameters enables to control the motors and, therefore, the axes, in the best possible way even in the most critical condition of use.

HMS™ – Head measuring system

The HMS™ is a device designed for measuring and checking continuous, indexed bi-rotary heads and roto-tilting tables.
HMS™ is a high-precision instrument and provides an alternative to the traditional checking method using dial gauges. It has many advantages:

- a drastic reduction in checking time
- measurement of all head and/or table positions
- measurement of RTCP parameters
- automatic insertion of correction values in the CNC.

Easy to install and use, HMS™ can also be used by operators with no particular expertise.
A full report is available at the end of the calibration cycle detailing the measurements made and the compensation values inserted.



C40 VISION™ numerical control

C40 is the most power numerical control on the market for high-end application, 5 axes and HSC machining.
C40 is equipped with multi core processor, powerful graphic board and 64 bit operating system for perfect computation and virtual machining of the tool path using ViMill®.
On-board operativity is enhanced by the large 19" Touch screen.

ViMill®

The integration of ViMill® on FIDIA Controls, allows the machine operator to visually check any possible collision or unexpected movements between tool, head and machine with the actual workpiece just before pressing the start push button or during the real milling process.
The ViMill® function proves to be very useful during machine operation and in case of program stop and re-start. In fact, even if the part program has been duly verified with off-line simulation solutions, many CNC parameter settings can produce machine movements that are not possible to check using conventional off-line methods.
When using the ViMill® function, the operator can visually check all axes and movements. The most critical time to do so is just before pressing start.
By using ViMill® zooms and graphic functions, it is very easy to verify the milling, to avoid rough mistakes and even check small undesired movements.

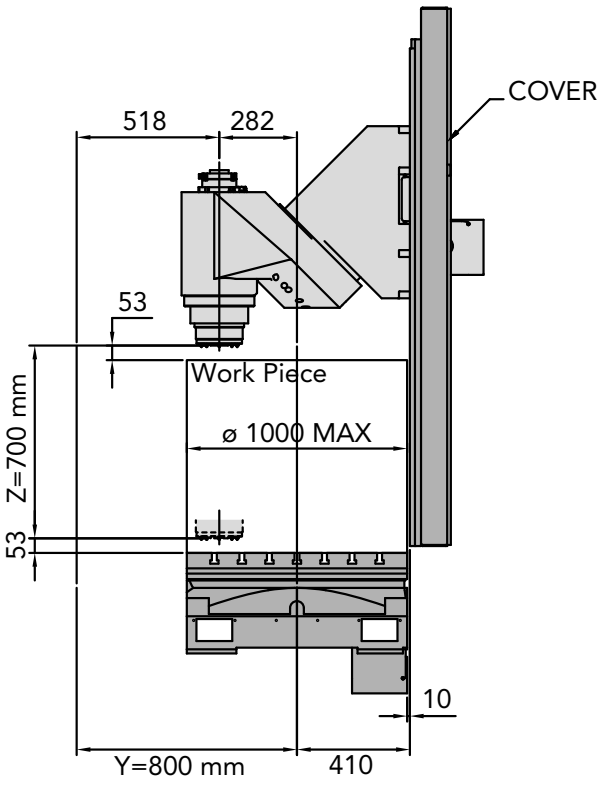
HPX21 – handheld pushbutton panel

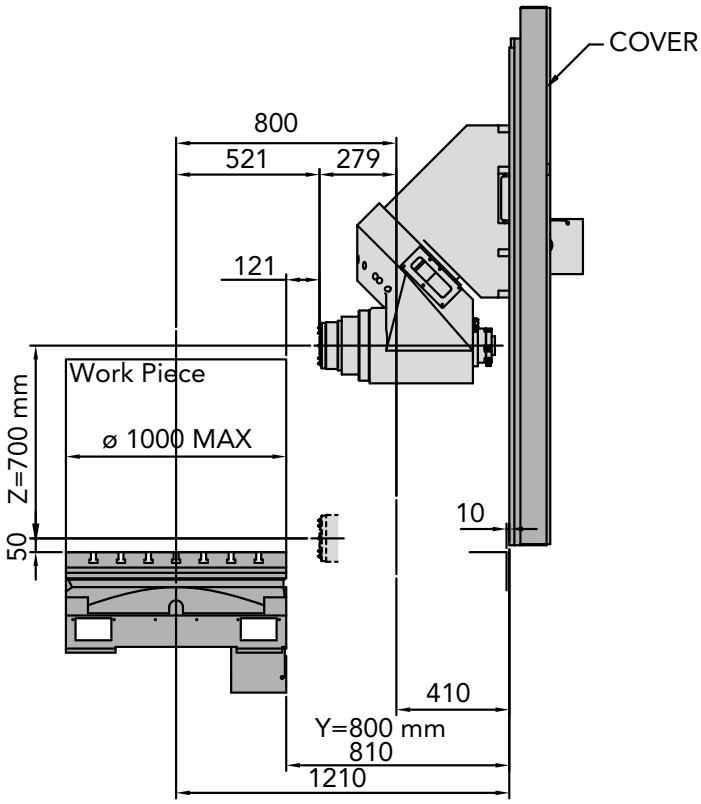
The HPX21 portable pushbutton is the comfortable solution to manually move the machine. One electronic handwheel, 16 pushbuttons and 2 overrides for feed rate and spindle speed are used to operate close to the working area.

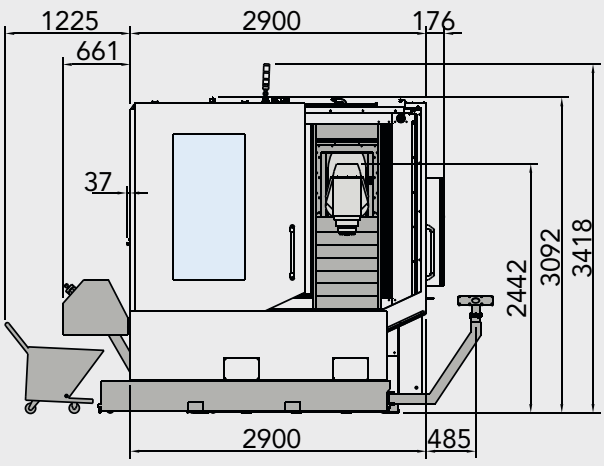
HPJ21 – handheld pushbutton panel

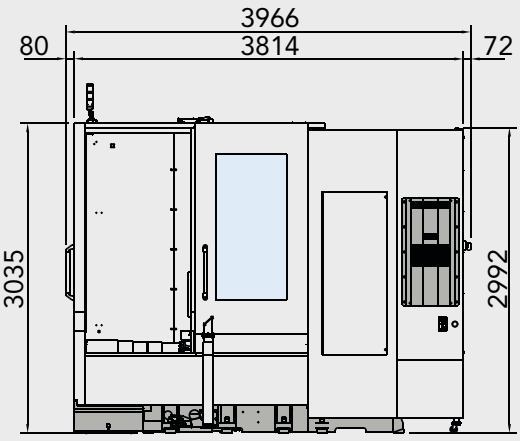
Handheld pushbutton panel with handwheel, feed potentiometer, 3 pushbuttons for axis selection and handwheel resolution, 2 pushbuttons for axis movement in jog, HOLD and RELEASE buttons.
Available with a spiral cable (max. 4.5 meters) or a metal sheath cable with a length of either 8 or 13 meters.

UHE1000 - Working Envelope

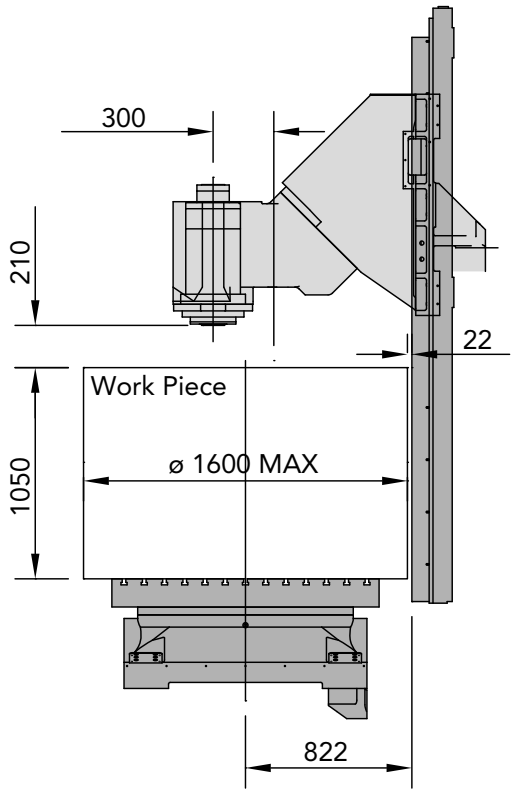


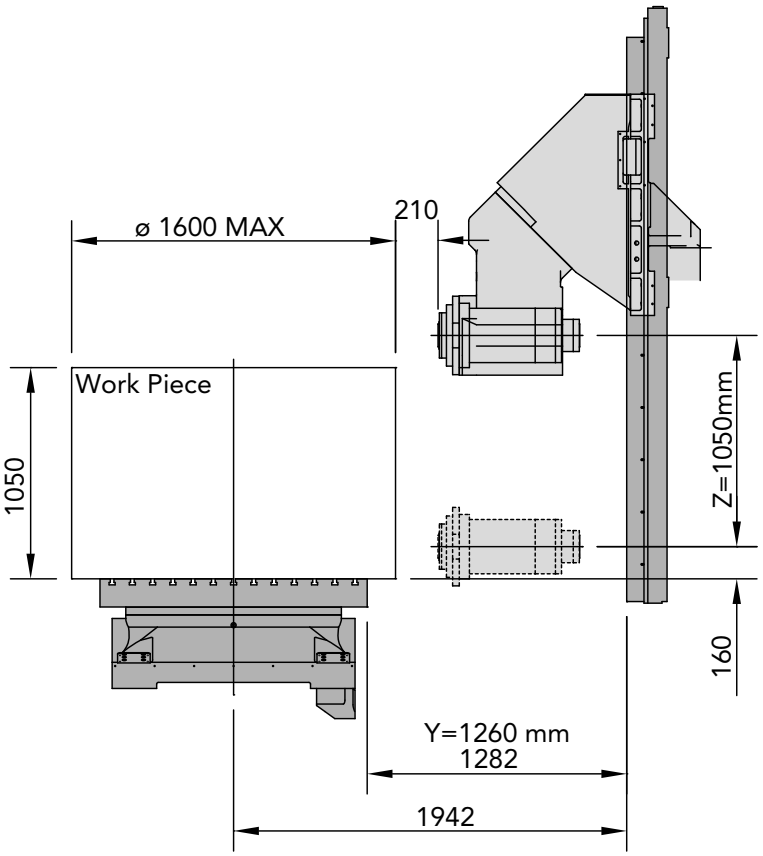


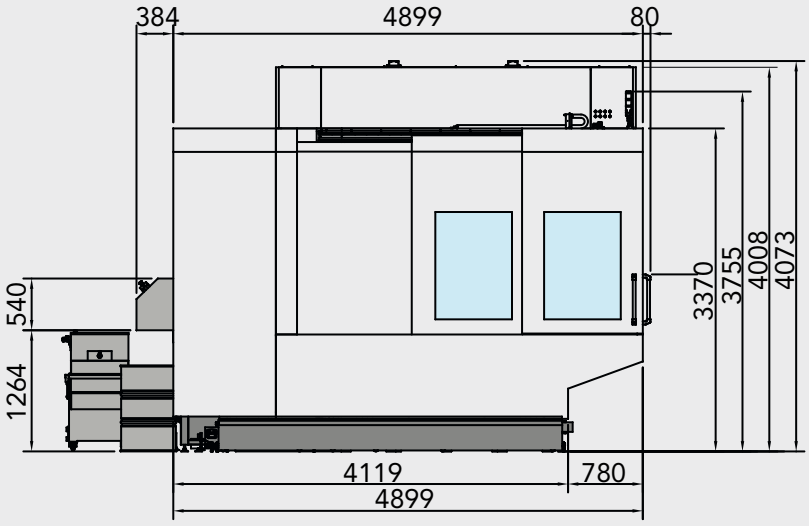


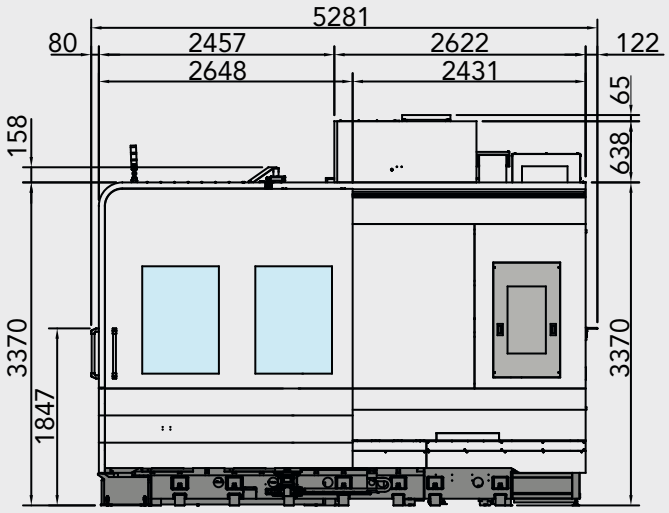


UHE1600 - Working Envelope









UHE Technical Characteristics

Model	UHE1000	UHE1600
Table		
Motor drive	Worm gear	Torque motor
Overall size	1.000 x 800 mm	Diam. 1400 mm
Distance floor - table top	1000 mm	
T-slot	18 H7	
Central hole	50 H7	
Minimum increment	0.001°	
Maximum load	1.500 kg	4.000 kg
Max. rotating diameter	800 mm	1.400 mm
Positioning/repeatability accuracy (note 2)	VDI 3441 P=10'' PS=4''	
Clamping torque	3090 Nm	3430 Nm
Max feed	11.1 rpm	60 rpm
Milling swivel head		
Travel	0° ÷ 180°	
Indexing increment	0.001°	
Positioning/repeatability accuracy (note 2)	VDI 3441 P=10'' PS=4''	
Clamping torque	3.430 Nm	5.880 Nm
Max feed	16.6 rpm	12 rpm
Linear axis travel and feed		
X	1.000 mm	1.620 mm
Y	800 mm	1.260 mm
Z	700 mm	1050 mm
Maximum feed	24 m/min	
Spindle		
Power S1/S6 – Torque S1/S6	26/32 kW - 124/154 Nm	36/45 kW - 340/418 Nm
Taper	HSK 63A or BT#40	HSK 100A or BT#50
Speed	18.000 rpm (Optional 24.000 rpm HSK63A)	8.000 rpm (Optional 15.000 rpm HSK 100A)
ATC		
No. of positions	40	60
Tool to tool time	3 sec	
Max tool diam./lenght (note 1)	120 mm / 300 mm	180 mm /400 mm
Max tool weight (note 1)	7 kg	10 kg
Ballscrews		
Diam. (X/Y/Z axis)	50/50/50 mm	55/55/63 mm
Pitch (X/Y/Z axis)	12/12/12 mm	16/12/12 mm
Precision class	C3 - mm/300mm : 0.008	C3 - mm/300mm : 0.008
Linear roller guides		
Width X/Y/Z	55/55/55 mm	
No. of guides - shoes X/Y/Z	2-4 / 2-4 / 2-4	4-8 / 2-4 / 2-6

Model	UHE1000	UHE1600
	Miscellaneous	
Tool lubrication pressure/tank	1 bar/400 lt	2 bar/400 lt
Power Supply required	20 KVA	
Machine floor space LxWxH	4000 x 4000 x 3500 mm	7000 x 5500 x 4500 mm
Machine net weight about	15.000 kg	30.000 kg
Note 1: may change according to spindle type		
Note 2: values measured in air conditioned room		

Included in basic machine	UHE1000	UHE1600
Linear scales on linear axis, high precision rotary encoder on B&C axis	✓	✓
Full splash guard	✓	✓
Chain type chip conveyor & bucket	✓	✓
Coolant system	✓	✓
Indication lamp for alarm/work/dwell/end of the job	✓	✓

Main options	UHE1000	UHE1600
	Optional electro spindles	
18000 Rpm HSK 63A Grease built in, 26/32 Kw 124/154 Nm	✓	
24000 Rpm HSK 63A Oil air built in, 21/27 Kw 85/116 Nm	✓	
15000 Rpm HSK 100A Grease built in, 20/26 Kw 290/317 Nm		✓
	Others	
Coolant through spindle 20 Bars	✓	✓
RMP60 Workpiece probe & Fidia MQR10 measuring cycles	✓	✓
NC4 Tool lenght & radius measurement	✓	✓
HMS/02 measuring and calibration system	✓	✓
ATC with 52/60/80 positions	✓	✓
Working area mist collector 900m3/h 1.5 Kw	✓	✓
Oil skimmer	✓	
Pallet changer - Twin pallets 1000x800mm	✓	

EMC/CE/ISO CERTIFIED

FIDIA S.p.A.
Corso Lombardia, 11
10099 San Mauro Torinese - TO - ITALY
Tel. +39 011 2227111
Fax +39 011 2238202
info@fidia.it
www.fidia.com

FIDIA GmbH
Robert-Bosch-Strasse 18
63303 Dreieich-Sprendlingen - GERMANY
Tel. +49 6103 4858700
Fax +49 6103 4858777
info@fidia.de

FIDIA Co.
3098 Research Drive
Rochester Hills MI 48309 - USA
Tel. +1 248 6800700
Fax +1 248 6800135
info@fidia.com

FIDIA Sarl
47 bis, Avenue de l'Europe
B.P. 3 - Emerainville
77313 Marne La Vallee Cedex 2 - FRANCE
Tel. +33 1 64616824
Fax +33 1 64616794
info@fidia.fr

FIDIA Iberica S.A.
Parque Tecnológico
Laida Bidea, Edificio 208
48170 Zamudio - Bizkaia - SPAIN
Tel. +34 94 4209820
Fax +34 94 4209825
info@fidia.es

FIDIA DO BRASIL LTDA
Av. Salim Farah Maluf, 4.236 - 3° andar
Móoca - SÃO PAULO - Cep 03194-010 - BRAZIL
Tel. +55 11 29657600
Fax +55 11 20212718
info@fidia.com.br

FIDIA JVE
Beijing Fidia Machinery & Electronics Co., Ltd
Room 1509, 15/F Tower A. TYG Center Mansion
C2 North Road East Third Ring Road,
Chaoyang District
100027 BEIJING - P.R. CHINA
Tel. +86 10 64605813/4/5
Fax +86 10 64605812
info@fidia.com.cn

FIDIA JVE
Shanghai Office
28/D, No.1076, Jiangning Road
Putuo District
Shanghai 200060 - CHINA
Tel. +86 21 52521635
Fax +86 21 62760873
shanghai@fidia.com.cn

OOO FIDIA
c/o Promvost
Sushovskiy Val, Dom 5, Str. 2, Office 411
127018 Moscow - RUSSIA
Tel.: +7 499 9730461
Mobile: +7 9035242669
sales.ru@fidia.it
service.ru@fidia.it

Service centres:

FIDIA GmbH - SERVICE CZ
CZ- 74706 Opava
Tel/Fax +420 553 654 402
sales.cz@fidia.it

FIDIA S.p.A. - SALES & SERVICE UK
32 Riverside, Riverside Place
Cambridge - Cambridgeshire
CB5 8JF - United Kingdom
Mobile: +44 - (0)7425 838162
sales.uk@fidia.it

3H MAKINA
Atasehir Bulvari, Ata 2/3
Plaza, Kat: 9 No: 80
Atasehir - Istanbul - TURKEY
Tel.: +90 216 456 10 43
Fax: +90 216 456 75 23
sales.tr@fidia.it
service.tr@fidia.it

AXIS SYSTEMS
T8 ~ T9 ~ T20, "INSPIRIA"
Old Mumbai - Pune Highway,
Pune – 411044, India
Cell : +91 9881245460
service.in@fidia.it

P.V. ELECTRONIC SERVICES C.C.
P.O. Box 96
Hunters Retreat 6017
Port Elisabeth SOUTH AFRICA
Tel. +27 41 3715143
Fax +27 41 3715143
sales.za@fidia.it

SHIYAN FIDIA SERVICE CENTRE
N.84 Dong Yue Road,
Shiyan, Hubei - CHINA
Tel. +86 719 8225781
Fax +86 719 8228241

CHENGDU FIDIA SERVICE CENTRE
Huang Tian Ba
Chengdu, Sichuan - CHINA
Tel. +86 28 87406091
Fax +86 28 87406091

IE-MAT s.r.l.
Bv. De Los Calabreses 3706
Barrio: Boulevares.
Córdoba - ARGENTINA
CP: X5022EWW
Tel. +54 351 5891717
sales.ar@fidia.it

Manufacturing plants:

FIDIA S.p.A.
Via Valpellice, 67/A
10060 San Secondo di Pinerolo
TO - ITALY
Tel. +39 0121 500676
Fax +39 0121 501273

FIDIA S.p.A.
Via Balzella, 76
47100 Forlì
ITALY
Tel. +39 0543 770511
Fax +39 0543 795573
info@fidia.it

SHENYANG FIDIA NC & MACHINE CO., LTD.
No. 1 17 Jia Kaifa Rd.
Shenyang Economic & Technological Development Zone
110141 Shenyang - P.R. CHINA
Tel. +86 24 25191218/9
Fax +86 24 25191217
info@fidia.com.cn

Research centres:

FIDIA S.p.A.
c/o Tecnopolis
Str. Provinciale per Casamassima Km 3,
70010 Valenzano
Bari - ITALY
Tel. +39 080 4673862

ENG - 17/08