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FINAL QUOTATION No. 07-29-F rev 4 AV/gg Sheet no. 1 - date 25/10/2007
rev.3 AV/av date: 16/04/2007

MACHINE no° 2

PRICE SUMMARY EURO

			BASE
A118	"T" SQUARE BORING MILLING MACHINE PROG 215TR 12 X-AXIS MM **4000** – Y-AXIS MM 3000 W-AXIS MM 2000 – Z-AXIS MM **900** SPINDLE DIAMETER MM **150** TABLE DIMENSIONS MM 1800 X 2300 COMPLETE WITH :		
B045	CNC HEIDENHAIN MODEL Itnc 530 AFC HEIDENHAIN ADAPTATIVE TOOL CONTROL TOP TELESERVICE		
G001	INTERNAL COOLING DIN 69871		
H002	PAPER CLEANING AND FILTERING PLANT		
P025	READY TO RECEIVE AUTOMATIC UNIVERSAL HEAD TA100/3 (1°) SUPPLY WITH THE MACHINE NO. 1		
N002	AUTOMATIC TOOL CHANGER MC-OV-13-6 60 PLACES		
S010	SAFETY PROTECTION COLGAR WILL SUPPLY ONLY THE PROJECT FOR THE OPERATOR'S AREA AND FOR THE TABLE AREA		
X001	LASER TEST		
X002	NAS TEST		
X004	TRAINING COURSE		
X006	ASSEMBLING AND START UP		

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A118 CNC "T" SQUARE BORING-MILLING MACHINE TYPE PROG 215 TR 12

MOTOR RATED POWER :
- DUTY CYCLE S1 (100%) – KW 41
- DUTY CYCLE S2 (30 Min.) – KW 56

- Siemens Motors
- **Hydrostatic bearing system** on X-Y-W – B axes
- Automatic hydraulic clamping on X –Y – W – B axes
- Spindle axis equipped with brake installed on motor
- Recirculation ball screws on X, Y, W and Z axes; double pinion with backlash elimination and rack on B axis.
- Axes feed motors Brushless-Siemens

TRAVELS

X-Axis	Longitudinal travel of table	mm	**4000**
Y-Axis	Vertical travel of headstock	mm	3000
W-Axis	Axial travel of column	mm	2000
Z-Axis	Axial travel of spindle	mm	**900**
B-Axis	Rotation of table		continuous
	Positioning angle for 360.000 pos.		0,001°
B-Axis	with automatic indexing on	pos.	4 x 90°
B-Axis	diameter of hydrostatic surface	mm	1200

Rotation of the pieces in the middle of the X axis travel

Table dimensions	mm	1800 x 2300
Table plate thickness	mm	200
Dimension of T slots on table plate (standard)	mm	28
T-slots pitch	mm	180
Max. admissible load evenly distributed on the table surface	kg	15000
HEADSTOCK SECTION	mm	410 X 505
Headstock projection	mm	500

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HEADSTOCK		
Boring spindle diameter	Ø	**150**
Internal diameter of milling spindle front bearings	Ø	170
Spindle taper	ISO	50
Spindle 2 speed :	r.p.m.	4 ÷ 3000
- at constant torque		
- at constant power		
Max.torque	**Nm**	**2300**
FEED RATES		
B Axis rotation	r.p.m.	0,002 ÷ 2
Rapid traverses X,Y,W Axes	mm/Min	20000
Rapid Z Axis	mm/Min	15000
Rapid B Axis	r.p.m.	0.002 ÷ 2
Working thrust	N	20000
Max torque with clamped table	Nm	30000
Max torque in contouring	Nm	20000
MOTOR POWER		
A.C. Spindle motor duty cycle S1 (100%)	kW	41
A.C. Spindle motor duty cycle S2 (30 min.)	kW	56
A.C. linear axes feed motor	Nm	15
A.C. circular axes feed motor	Nm	15
Total installed power	Kva	90
Approximate net weight	Kg	34.500

COMPLETE WITH:
- Tool cooling system
(With tank and pump to be built-in into foundation)
- Fixing and levelling screws
- Control panel near to the machine with independent totem and possibility to orient and to rotate it.

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- Heat exchanger unit
- Measuring systems - direct type :
  • Heidenhain optical scales LB 382 C • Encoder ROD 780 C
- **24 Volt connection near the machine headstock for customer light**
- **Colgar will supply only roject of the interfacing plate for installation of manual existing customer accessory head**
- **Machine ready for next installation of radio probe by M&H, excluded all the M&H components and the installation**
- **Rear single plastic cable chain**
- **Double telescopic protections for X axis and front side of machine bed**
- **Plate protection between telescopic protection and foundation, to avoid chips going under the beds**
- **Possibility to load/download the tools from the tool changer chain even the machine is in RUN mode, with the priority of the tool changer chain to save the operator work**

THE MACHINE IS MANUFACTURED IN COMPLIANCE WITH CE REGULATIONS AND SAFETY NORMS.
Colgar supplies the project of the safety protection around the machine and the operator area including the software.
Customer will provide for all the mechanical protections around the table including their installation.

B045 CNC NUMERICAL CONTROL HEIDENHAIN MODEL iTNC 530 - 5 AXES + SPINDLE
complete with:
- Colour screen BF120 TFT 15" (complete with cables)
- Keyboard TE 420
- Spindle orientation
- Basic software
- Logic
- Memory for pieces programms
- Hard disk memory 6 Giga Byte
- Interface card for drivers
- Input/output cards
- Lines V.24/RS232-C
- Lines V11/RS422
- Measuring systems
- Cables and connections
- Start-up and guarantee through Heidenhain
- Use and maintenance handbooks

INCLUDED:-

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- *B016* **ELECTRONIC REMOTE PORTABLE** control HR 410 (complet with cables and connection)

- **SOFTWARE FOR THE COMPENSATION OF AUTOMATIC HEADS GEOMETRY ON ORTHOGONAL POSITIONS IS INCLUDED**

- **AFC Heidenhain adaptive control**, allows optimization of the cutting speed on the profile as a function of machine tool and spindle performances, after precise sampling performed directly on the machine. Allows control of tool wear, breakage, adaptation and lifespan.

- **COLGAR TOP TELESERVICE**

Telediagnostic operator Program complete with :

Help on CNC

By pushing the button HELP on the CNC, the operator can have an immediate textual multi-line diagnostic corresponding to the visualized error message.

Problem solving CD
Documentation on CD
Preventive maintenance management

Teleservice complete with :

HEIDENHAIN Software Teleservice
Router
Cables from router to CNC
Card Ethernet TCP/IP

From customer's side must be available N.1 internet access coded and dedicated close to the electrical board

G001 TOOL INTERNAL COOLING THROUGH SPINDLE TAPER

Standard solution
DIN 69871 AD - coolant and/or air passing through the centre of the machine main taper and accessory heads taper

H002 PAPER FILTERING PLANT

For cutting fluid with double delivery pressure, suitable for steel, cast-iron, aluminium and other kind of metal workings.

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Filtering procedure:
The "dirty" fluid to be filtered is collected or in the cheap conveyor tank or in an additional tank located in the foundations throughout a metallic mesh filtration (the choice between the two alternatives is taken by Colgar's technical dept. depending on the machine configuration, and it will be shown on the final lay-out drawings which shall be approved by the customer).
From this tank, the "dirty" liquid is pumped throughout a pump into a paper filtering plant, DTE 150 delivery 160 lt/min., complete with electric gauge for end-reel, and then it is collected in a tank having a total filtered fluid capacity of 1000 liters and a filtering degree of 30 microns.
The tank is provided with:
- an electropump with low pressure delivery (Q=100 lt/min. P=4 bars) for the external cooling, and with
- an electropump with high pressure delivery (Q=30 lt/min. P=15 bars) for the internal cooling.

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N002 AUTOMATIC TOOL CHANGER MODEL MC-OV-13-6
CHAIN MAGAZINE ON FLOOR

With n° 60 tools - Pitch 130 mm -

Spindle taper	ISO 50 DIN 69871 – DIN 69872 ISO 50 UNI 8487/1 – UNI 8487/2/A	
Magazine chain	N°	60
Chain pitch	mm	130
Max.tool diameter	mm	125
Max tool length	mm	300
Max tool diameter (when adjacent pocket is empty)	mm	250
Max tool weight	kg	30
D.C. Motor for chain rotation	kW	3,3
Tool changing time (on horizontal spindle)	sec.	20
Tool changing time (on vertical spindle)	sec.	30

The changing times of the toolings are calculated with the head in changing position following to ISO Norms 10791

The tool is changed in the
HORIZONTAL SPINDLE

Complete with:
- Motors for chain rotation and for carriage movement with exchange arm to deliver, pick up and change the tools
- Feeders and electrics located in proper cabinets
- Central unit for the hydraulic controls
- Control panel for the manual control step-by step of all change functions.
- N.2 CNC AXES
- Tool Management Package

Technical description as per sheet FDT 7.3-1

SHANKS AND RETENTION
KNOBS EXCLUDED

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S010 CE PROTECTIONS FOR "T" MACHINES :

The perimetric safety barriers are component of the boring milling machine simple only by appearance, but to be personalized for every machine and for every working environment in which the machine is placed. The safety norms for the operators are very restrictive, and for this reason the whole area around the machine is interested.:

High protections: at Customer's charge including mechanical and electrical installation according to COLGAR project.
They are made with metallic panels and inspection windows only for the operator area. The opening of the doors can take place only when the machine is stopped to avoid any sudden interruption of the program and to guarantee safety to the operators.

Low protections around the table at customer charge including mechanical and electrical installation according to Colgar project,
with metallic barriers and provided with doors with security lock for the loading/unloading of the piece in the machining area and for the operator's access.
The opening of the door can take place only when the machine is stopped to avoid any sudden interruption of the program and to guarantee security to the operators.
The height of the protections in relation to the norms depends on the distance they have from the more exposed working area; the min. height allowed is 1400 mm. because it does not allow their climbing. In case the protection is brought nearer to the working zone, the height of the protection must be increased and its metallic meshes must become closer or, in alternative, the protection must be completely closed and manufactured with metallic panels and inspection windows.
A door to load the part on the machine is in front the table.

Complete PLC program and logic function at Colgar charge

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X001 LASER TEST
Test according to Norms VDI-DGQ 3441 by means of Laser-Interferometer to align the measuring system and for repeatability of linear axes positioning.
To be carried out at Nordmark Maskinfabrik A/S works.

X002 NAS TEST
Test according to Norms NAS with machining of one workpiece positioned on XY plans and its following measurement.
To be carried out at Nordmark Maskinfabrik A/S works.

X004 TRAINING COURSE
Training course how to operate the machine lasting 5 working days, held by one of our specialized technicians at customer's plant.
Travel, board and lodging included.
CNC programming not included

X006 ASSEMBLING
Assembling , start-up and geometric test of machine by our technician on the spot, with the help of your personnel for the use of your lifting means (cranes etc.), for service operations and connections.

Not included into supply :
- Necessary and appropriate cranes and tools for unloading and assembling
- Materials and relevant installation for :
  - Covers and protection plates around the machine
  - Chips and fluids conveyor sheets
  - Pipes and cables raceways into foundations

Travel, board and lodging expenses of Colgar Engineers during assembling, set-up, test and traning.: at Customer's charge.

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OUR MACHINES ARE PAINTED WITH FOLLOWING STANDARD COLOURS :

Machine	**BLUE**	**RAL 5005**
Safety barriers and control panel	**WHITE**	**RAL 9003**
Electrical cabinets	**GREY**	**RAL 7035**
Automatic tool changer	**BLACK**	**RAL 9005**
Accessory heads	**RED**	**RAL 3001**
Machine's covering with walls	**WHITE**	**RAL 9003**

For any special paints a price difference will be quoted.

TECHNICAL DOCUMENTATION SUPPLIED WITH THE MACHINE (one paper copy and one copy on CD) in English language

MECHANICAL:

1) User and maintenance manual
2) General hydraulic diagram
3) Preventive maintenance sheet
4) List of materials subject to wear (filter cartridges)
5) List of recommended spare parts
6) Mechanical/hydraulic drawings for troubleshooting
7) Complete machine list including all components installed with: code-location-quantity-manufacture (only on request and only in Italian).

ELECTRICAL:

1) Functional electrical diagram
2) Wiring diagram
3) Electrical service manual
4) CNC Manual
5) User and programming manual
6) Drives manual
7) Measurements systems manual

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V02 - SALES CONDITIONS

- PACKING: Included

- DELIVERY TIME: 1st April 2008 except sold except causes of force major.
The delivery time refers to the time when machine is ready to be tested at our workshop.

- PAYMENT:
30% at the order
60% at machine testing in our Works before shipment
10% with confirmed and irrevocable letter of credit payable against presentation of testing report and in any case within 60 days from shipment date

- TESTING: Machine testing is performed according to ISO standards and the following:

- Test booklet ISO 3070/II for boring and milling machines with movable column
- Test booklet ISO 3070/III for boring and milling machines T-type with suitable integrations
- Specific notebook for rotary traverse tables
- Specific "Colgar" standards for accessories

Preliminary test performed at Colgar's works in the presence of the purchaser's technicians involves checking the complete supply, its functionality and control of geometric accuracy (excluding those which cannot be implemented with the final foundations missing).
Final test and inspection will be performed after installation at the purchaser's works and will involve final acceptance of the supply and starting date of the warranty.
If the purchaser uses the system before the final test and inspection has been endorsed, it shall be deemed as accepted with starting date of the warranty and contractual payment terms commencing immediately.

- LAY-OUT: Within 3 months of contract signature , Colgar shall submit an installation lay-out proposal which must be verified by the Purchaser and accepted or modified within 20 days of receipt. Upon expiry of this period without receiving a reply, Colgar

shall consider the proposed lay-out to be tacitly approved and shall start to produce the machine according to this project.
In the event of modifications, received within the established terms, Colgar shall return the new lay-out modified within 20 days and shall wait acceptance for the following 20 days.
Modifications shall be limited solely to positioning of the machine and relative systems and shall not include variations in structure and dimensions.

- FOUNDATIONS: Machine foundations shall be implemented by the Purchaser according to the following diagrams drawn up by Colgar:-

- lay-out with overall dimensions of all supply components
- lay-out corresponding to the foundation plan with spacing of jacks, implementation of formworks to house the tie-rods, slopes and levels
- technical specifications with admissible loads and deformations to submit to the civil engineering office appointed by the Purchaser for implementation.

The Colgar supply excludes:

- the necessary geological checks
- calculation and implementation of the foundations
- waterproofing of the foundations
- supply and laying of quick setting cement to anchor the jacks and foundation tie-rods.

- ERECTION AND START-UP: During assembly and setting at work performed by Colgar, the Purchaser must provide Colgar technicians with the assistance of its skilled personnel to use handling means and cranes.
If the lifting means available are unsuitable for appropriate handling, the Purchaser shall hire suitable means at his expense.
The following are excluded from the supply and assembly by Colgar:

- implementation and positioning the coverings of the ducts to house cables and pipes,
- implementation and positioning of the metal plates to convey chips and protective gratings,
- supply of oil (the machine will be delivered without oil) which must be provided by the Purchaser in compliance with Colgar's indications,
- everything else not specified in the offer.

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To allow installation of the machine it is essential that the foundations are fully completed and the plant layout works have been terminated (electricity, compressed air, water, dedicated telephone line if needed) and brought close to the machine, on pain of our technicians returning to us with all costs charged to the Purchaser (should these be chargeable to Colgar) and reprogramming of installation according to Colgar's availability.

Costs for travel, stay and transfer of our technicians not included in the contract shall be charged according to the tariffs in force at the time in which they occur.

- GUARANTEE: Machine is guaranteed for a period of 12 months from installation, max 15 months from shipment, according to UCIMU conditions.
Accessories acceptance and guarantee is separated from machine guarantee.
Guarantee covers replacement of defectous parts in our workshop and manpower for eventual necessary replacement on machine.
Travel and accommodation of our technician at Customer's charge.

- SAFETY: Machine manufactured in compliance with the existing European norms "Machine Directive 98/37/CEE"

- VALIDITY: 60 days

For all terms that are not covered by the present conditions please refer to the UCIMU general sales conditions for machine tools

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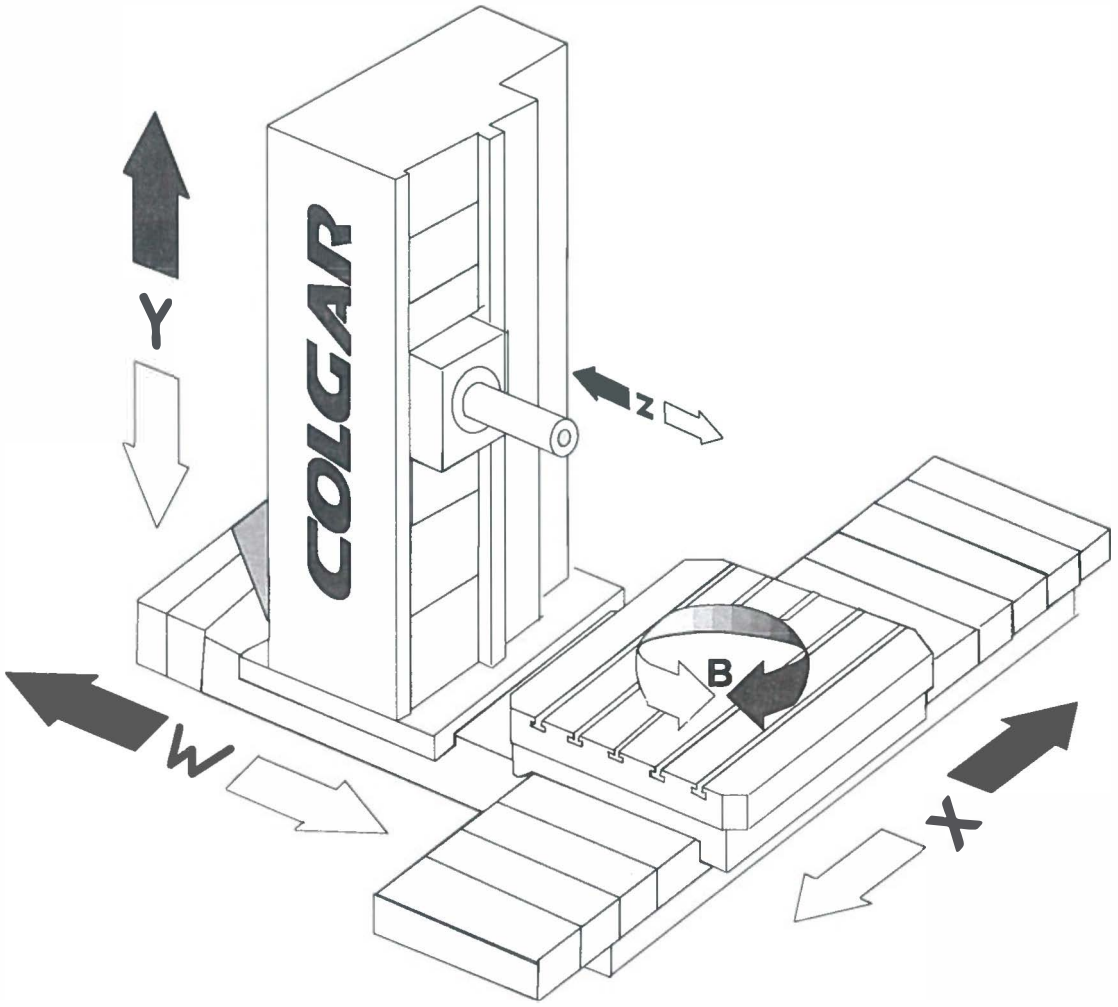
A118 PROG 215 TR 12



"T" SQUARE TYPE WITHOUT RAM WITH SPINDLE

X-Axis	:	longitudinal travel of table
Y-Axis	:	vertical travel of headstock
Z-Axis	:	axial travel of spindle
B-Axis	:	continuous rotation of table
W-Axis	:	axial travel of column