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ISO 9001/2000

## CIM1000 FMS WORK-CELL



The work-cell CIM-1000 makes possible the steel, aluminium, resins and plastic working and the execution of mechanic particulars, in general, with high accuracy, starting to the 3-D drawing through CAD-CAM systems. All process is controlled through a powerful software of monitoring, which is present on a computer station of supervision.

The CIM-1000 is purposed to learning on different disciplines of industrial automation as:

- Introduction to ISO format program using industry-standard G and M codes
- Study of planning's language for robot and use of anthropoid robot
- Knowledge of the planning's language of PLC
- Use and study of the planning's language of systems CAD-CAM
- Use and study of monitoring software and supervision

### COMPOSITION:

- No.1 milling machine "**CL-100**" complete of tools changer, sliding door protection with automatic opening-closing and safety interlock, pneumatic chuck, CNC FAGOR 8040 and I/O for work-cell connection,
- No.1 lathe "**T-100**" complete of automatic tool changer, protection with automatic closing and opening, pneumatic spindle, CNC FAGOR 8040 and I/O for work-cell connection
- No.1 anthropoid robot "**CATALYST**" with 5 axes as gauging robot loading of CNC lathe and CNC machining and I/O for the connection with the work cell
- No.1 motorised linear slide for the movement of the anthropoid robot
- No.1 motorised ring conveyor belt of the total linear length of 4mt, which is complete of pallet of charge and discharge
- No.1 computer station for the complete supervision of the work cell, which is complete of software of monitoring, software CAM-CAD
- No.1 electric control cupboard complete of PLC
- Full work-cell protection with metallic grille and access door with electric protections

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**CIM1000  
FMS WORK-CELL**

## TECHNICAL CHARACTERISTICS

### A) CNC MILLING WORK CENTER "CL-100"

- Electrically welded steel plate frame with cast iron saddle;
- Rolled balls re-circulating threads
- CNC unit: FAGOR 8040
- DC motor drives with closed loop speed control
- Digital feedback of DC motors, with encoder position control
- Axis motors: 0.17Nm permanent magnets DC with 1:5 reduction gear
- Travel: X=160 mm, Y=100mm, Z=120mm
- Repeatability: 0.03 mm
- Accuracy: 0.03 mm
- Spindle/working surface distance: 180mm
- Working surface size: 380 x 130mm
- Tool holders: ISO 30
- Max. tool diameter: 20 mm
- Spindle motor power: 1HP AC
- Axis fast displacement speed: mm/1' 2500
- Spindle speed: 0-5600 rev./1'
- Automatic tool changer: 3 tools



- Cooling and lubrication included;
- Automatic pneumatic vice;
- Automatic opening/closing protective doors
- Kit of 3 clamp holders – 3 clamps and 6 tools included;
- Power supply: single-phase 220V;
- Size: 1300 x 700 x 980 (h) mm approx.;
- Weight: 250 kg approx.;



- Automatic tool holder with fast manual tool replacement: 2 10X10mm section tools
- Cooling and lubrication included;
- Tool kit included;
- Power supply: single-phase 230V;
- Size: 1200 x 700 x 620 (h) mm approx.;
- Weight: 200 kg approx.

### B) CNC LATHE T-100

- 45° slanting electrically welded steel plate bed with cast iron saddle;
- Rolled balls re-circulating threads;
- CNC unit: CNC FAGOR 8040 with CAD-CAM connection;
- DC motor drives with closed loop speed control through encoder;
- 0.17 Nm. DC axis motors with 1:5 reduction gear;
- Travel: X=100mm, Z=220mm;
- Height of centres: 260mm;
- Maximum workable diameter: 160mm;
- Repeatability: 0.03 mm;
- Accuracy: 0.03 mm
- Automatic Opening/closing protection
- Chuck motor power: 1HP AC
- Axis fast displacement speed: mm/1' 2500
- Chuck speed: 0-5600 rpm;

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## CIM1000 FMS WORK-CELL

### C) ROBOT CATALYST

Anthropoid 5 axes 1K robot complete of electric-control clamp

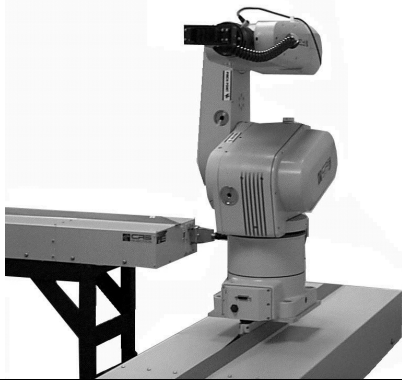
- Repeatability: +/- 0.03 mm
- Weight 19 Kg
- Speed 5.1 m/s
- 5 axes
- 40W D.C. motor axes
- Position control with optic encoder

#### Axes travel and Max speed

- J1 360° 210°/second
- J2 110° 210°/second
- J3 125° 210°/second
- J4 220° 551°/second
- J5 roll 360° 1102°/second
- Controller with control up to 8 axes



- Programming software included
- Programming Keyboard included
- Electric-control clamp with opening 0-56mm included



### D) LINEAR AXIS

- 1m length
- Motorised with D.C motor
- Position control with optic encoder
- Accuracy 0.05mm
- It is totally controlled and managed like 6° axis, from robot controller

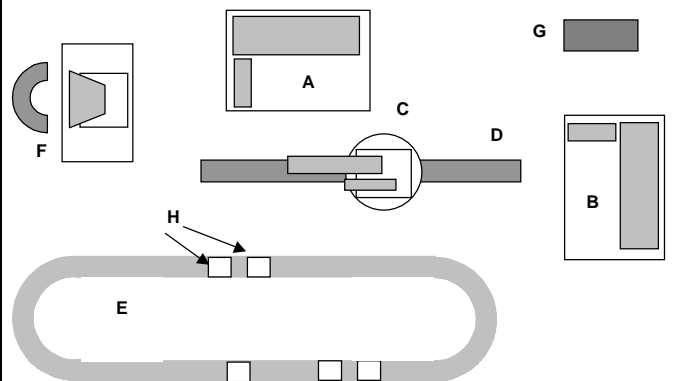
### E) MOTORISED RING CONVEYOR BELT

To simulate the real work conditions inside an industrial area, the work-cell preview a ring conveyor belt (L=4 m. linear) where the pallets circulate.

This fact makes possible to identify, in real time, the shuttle where the objects can be arranged during the different working phases.

The system will know to recognise, in every working phase, which working has been carried out and, according to the program, to arrange eventual operations of completion.

The belt is comprehensive of motorization and PLC of management.



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## CIM1000 FMS WORK-CELL



### F) SUPERVISION STATION

- Bench with 15/10 sheet steel made, cable leg, working surface with rounded and gum bordered edge, complete of electrification with magneto-thermal and differential automatic brake, 230V a.c. sockets
- No.2 upholstered armchair complete with armrest;
- PC Pentium (last version), Case MINITOWER RAM 256 Mb., HD. 40 Gb, Video Card, N. 1 Floppy Disk from 1.44 Mb, keyboard, CD ROM reader 52x Eide, Mouse, Colour Monitor 19"
- Monitoring and supervision software
- CAM-CAD Software for lathe and work centre

### G) ELECTRIC CUPBOARD

- The electric cupboard contains all the control circuits, of powerful and logic PLC for the management of the work cell.
- General feed 230V A.C.

### G1) Full WORK-CELL protection and access doors with electric interlock

- The mechanic powers and the speeds of the Robot arts, impose a strict protection of all the interested working area during the movements.
- The solution preview from us is the placement of a metallic grilled protection with door protected with electric interlock, to prevent the unwanted introduction in the working area during the operation of the FMS.
- The electrical wiring foresees a coming block signal from the microswitch which forbids immediately the Robot control, causing the stop both of the robot and the positioning slide.

### Tender specifications

A FMS WORK-CELL, which is the integration of different industrial machines, presented with the didactic correct mark to facilitate to the students the learning of the flexible systems of working –FMS-.

The modularity of the work-cell makes possible to the teacher to plan a didactic gradual course which allow the use of every singular machine in an independent way, up to the complete control of the work-cell in a completed way and under the supervision of a powerful software of monitoring.

Machine power motors of 1kW approx.; Mechanical accuracy < 0,03mm;

It must be supplied with computer, ready wired, ready programmed and ready to run.

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