

MANUFACTURER



FAGOR AUTOMATION

CNC 8060





CNC 8060

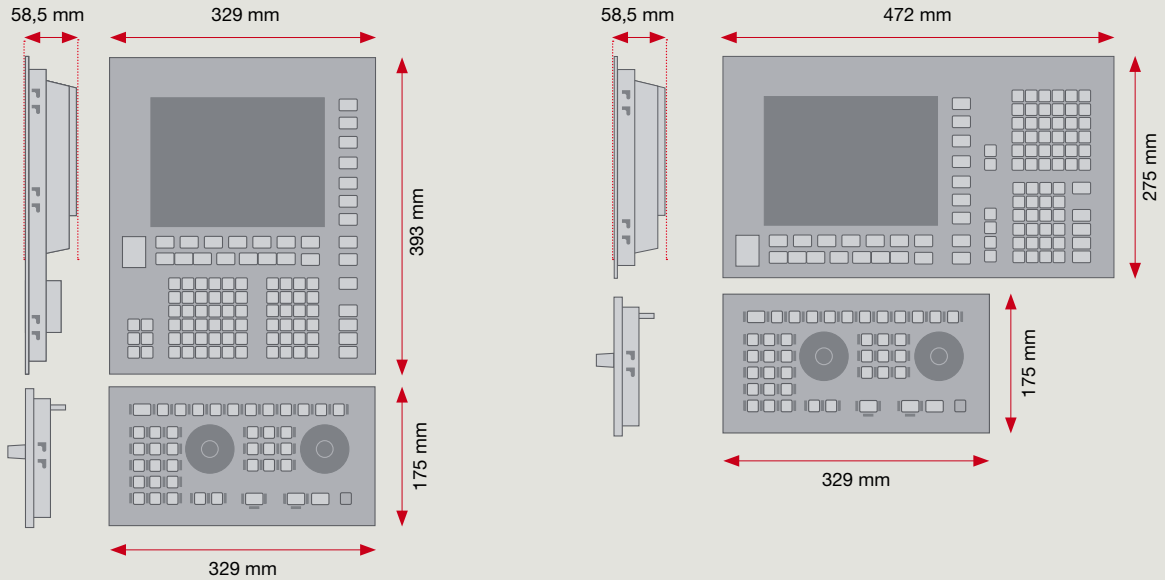
The ideal solution for precision milling, mold making, slant bed lathes and other high production machines

The CNC 8060 offers two distinct ways of programming adapting to user's machining needs: The ISO-G code language for large/ medium production runs (optimizing machining time) and the ICON conversational language for small production runs and prototyping (reducing programming time).

Technical characteristics

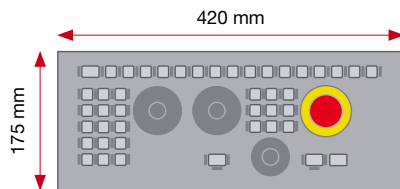
Axes + spindles	Up to 7
Interpolated axes	4
Execution channels	Up to 2
Communication Bus	Sercos, CAN
Interfaces	Ethernet, USB
Monitor	10"
Touch screen	Yes
Tandem axes and spindles	Yes
Main microprocessor	64 bits

Solutions tailored for your machines

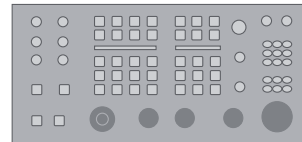


Options

Fagor operator panel (JOG) with E-stop button and spindle potentiometer.



Proprietary operator panel.



Built for tough industrial environments

The keyboards and monitors for CNC 8060 are designed to guarantee maximum sealing protection in any industrial environment.

The rear mounting mechanism provides protection against dirt and liquids and complies with IP65 (NEMA 12) sealing standard.

The advance hardware design ensures long maintenance free life as the use of batteries and fans is eliminated.

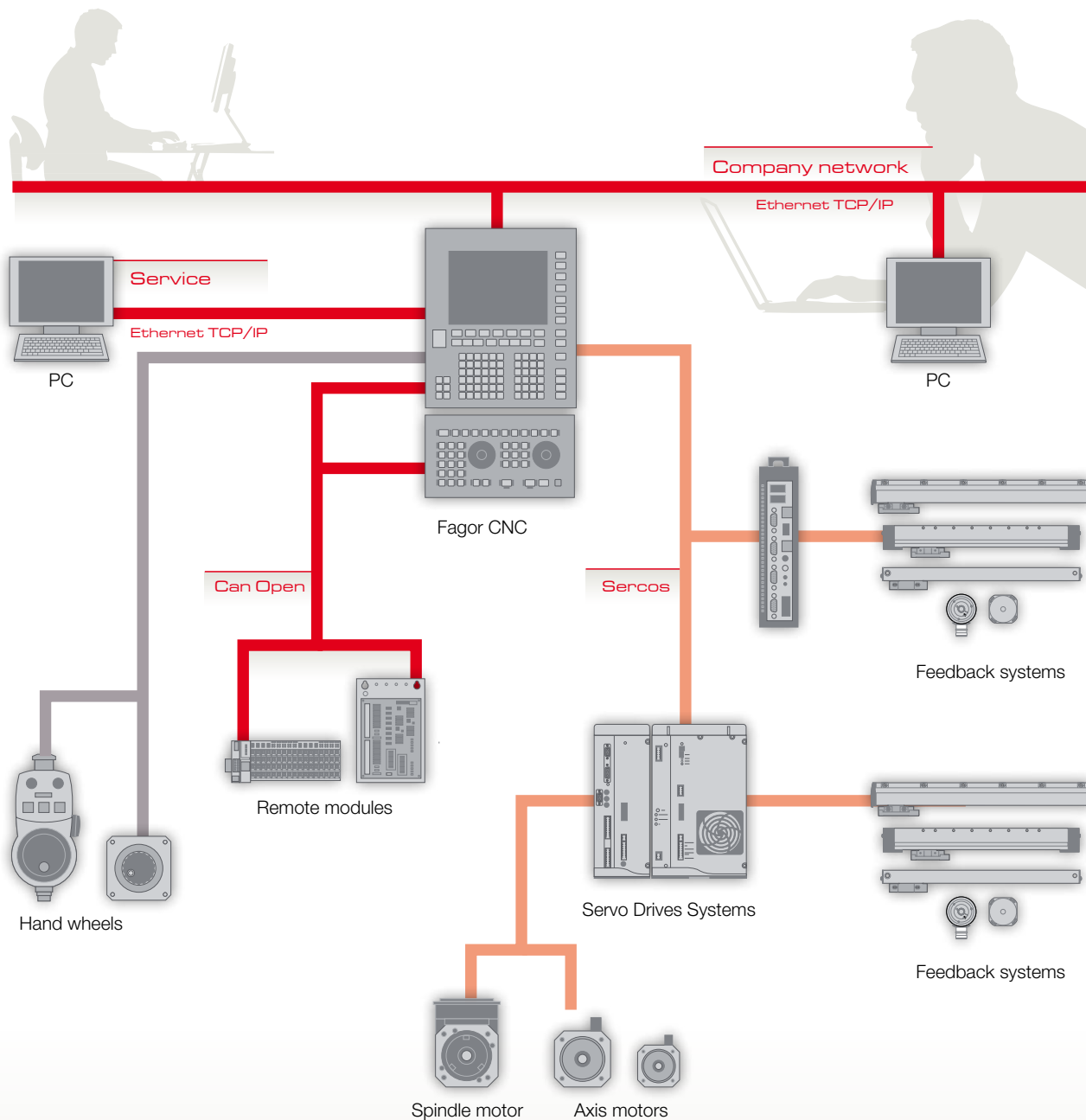
This sleek design minimizes heat dissipation and hence can be housed inside smaller enclosures without requiring any cooling fans.

Completely integrated solu

A unique Integrated platform for all your needs

Fagor Automation's unique integrated platform brings together every electronic element of your machine- the CNC , digital servo motors and drives, linear and angular feedback and ensures seamless integration, guaranteeing robust machine design and extreme performance to obtain maximum efficiency.

These elements working in perfect harmony and intelligently selecting and executing the machining algorithms to exceed user's expectations – EVERYTIME.





Reliable, robust and durable: Total quality

In order to ensure superior system performance under tough ambient conditions (temperature, vibrations etc.), various product testing methods like HALT-HASS process (unique, accelerated product reliability test methods) for detecting and resolving any product weakness are used ensuring very high product reliability at launch.

Greater data exchange flexibility with external devices (USB, local network, web etc.) increases the threat of potential virus attacks from external intrusion. The CNC operating system is shielded with FBWF, a feature that protects it against virus attacks as well as any unexpected shutdowns and wrongful software installations.

The quality, robustness and reliability of Fagor Automation systems has been accredited and certified by many renowned agencies (TÜV, CE, etc.).



Continuous innovation to meet our customer's needs

A major part of Fagor Automation's successful history is due to our constant investment commitment in company's infrastructure and R&D+i (Research, Development and innovation). This allows us to continuously develop leading products for the marketplace.

Fagor's technical center in Spain, called AOTEK has also jointly participated with other domestic and international research centers and universities on many prestigious technical projects like POWER-OM, ReBORN, CHAMELEON and IMPELER etc.

Fagor Automation recently increased its R&D+i capabilities by adding 2 new technical centers in Ivrea (Italy) and Beijing (China).



Commitment to environment

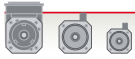
Development and implementation of advance technologies has helped us to create more "GREEN" CNC designs without needing any batteries or fans hence removing such environmentally unfriendly components demonstrating our commitment to preserving and protecting the environment.

Using regenerative power supplies with our digital servo drive systems eliminates the heat loss generated by resistors during motor braking while returning that energy to the power source- hence providing economical savings while helping the environment.

The CNC 8060 also contains a wide set of documentation including technical manual which can be accessed by utilizing the on screen help key.

Completely integrated solution

Offering complete solution



Spindle Motors

Fagor Automation offers a wide range of motors for a broad range of application requirements.

Small compact motors balance for high speed starting at 3.7 kW and expanded to large machine, high power applications up to 130 kW. Designed for low noise & vibration levels all the way up to 15,000 rpm.

Offered as an option, motors with dual winding (Y/Delta, star/triangle) and direct drive with a built-in hold in the shaft for automated tool cooling. (Coolant through the Spindle feature).

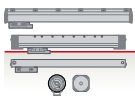
Axes motors range from 3000 rpm to 6000 rpm and a stall torque from 1.7 NM up to 115 Nm.



Servo Drive Systems

The Fagor Automation's digital servo drive system is the perfect solution for the machine tool manufacturer who demand high performance machining.

Fagor Automation drives are designed to obtain maximum efficiency from their motors thus offering a true high performance solution for both spindle and axis control.



Feedback Systems

Fagor Automation offers complete range of Absolute, Coded and Incremental optical linear and rotary encoders for increasing machining accuracy and performance.

The encoder sends the real position data of the machine movement to the CNC, and hence minimizing errors due to thermal behavior of the machine, ball screw and other mechanical errors.

Fagor Automation offers incremental and absolute solutions according to the requirements of the machine with measuring lengths between 0.070 m and 60 m, and 0.1 μm resolution and 3 μm accuracy. These solutions utilize TDMS[®] (Thermally determined mounting system) that prevents measuring errors due to temperature changes and have the ability to work at feed rates up to 120 m/minute.

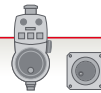




Remote CAN I/O modules

These modules are easy to install.

Can be mounted at strategic points of the machine, thus having extra logic inputs and outputs distributed next to the devices. Using these modules makes it easier to lay out the elements of the electrical cabinet and therefore translates into reduced costs due to fewer cable/wiring being utilized.



Hand wheels

Fagor Automation offers various solutions for jogging the axis using hand wheels, allowing the machine operators to visually inspect the components while also assisting with the set-up.

The intelligent hand wheels (with built-in LCD screens) also allow monitoring and execution of many machining functions.



Simulator for PC

This feature simulate the PC to operate like CNC.

It is an ideal training tool which compliments the design and programming department (CAD-CAM) as it allows editing/programming capability away from the noise and distractions of the manufacturing floor.



Customization Tools

The CNC 8060 offers many easy to use customization tools to meet the requirements of unique machine characteristics offered by many OEMs, hence offering them the ability to stand out in the market place.

Utilizing the FGUM software, the OEM can effortlessly create new machining cycles, diagnostic or calibration and set-up screens.

Power and accuracy



From the larger pieces to very small ones

Utilizing various built-in tools the CNC 8060 provides outstanding surface finish while maintaining very tight tolerances.



Gantry / Tandem axes / Feedback combination

The CNC has been designed to easily adapt to all kinds of machine structures. When working with Gantry axes or pair of axes that must move at the same time and in synchronism, the operator must only program the movements of one of the axes and the CNC will manage the movement of the structure.

Tandem servo systems are structures that have two motors mechanically coupled (slaved) and making up a single transmission system (axis or spindle). They are used to move axes on large machines with the added benefit of reducing the effect of backlash when reversing the movement. As far as the user is concerned, the operation is the same as with a Gantry axis.

For large machine structures, the CNC allows mix of Tandem axes with Gantry axes. The feature of feedback combination is very useful in such type of structures.

Combining the accuracy of a linear encoder with the motor feedback reduces the effect of vibration when reversing the movement of the machine. The part finish is greatly improved.



*We machine parts
as small as human hair*

Nano-metric precision machining

Inclined plane machining

The CNC 8060 can manage standard kinematics (parallel, spherical spindles, rotary tables etc.) and machine specific OEM kinematics. The CNC allows machining in inclined plane without having to make any mechanical set-up adjustments. Once the axis/tool has been manually or automatically oriented, it is enough to define the inclined plane and carry out various machining operations like pockets, rotations, etc.



The unique HSSA (High Speed Surface Accuracy) machining system allows CNC 8060 the ability to machine smooth contours, with best surface finish and highest precision.

The CNC 8060 with its 64 bits of processing power can easily manipulate enormous data points received from CAD-CAM programs and interprets them with third degree algorithms using splines (like Akima, NURBS, etc.) generating a path very close to the original while maintaining the programming tolerances.

The axis position is updated every 250 μ s reproducing the original geometry with nano-metric accuracy.

Optimizing machine efficiency

Faster and more economical set-up tools

Setting up an advance CNC machine tool can be both challenging and very time consuming due to lack of right set-up tools. Fagor Automation offers a large library of set-up tools including on board oscilloscope, Ball bar test, Bode Diagram and servo tuning software like Finetune etc.

Set-up wizard

Fagor Automation offers a quick set-up wizard for easier integration of its complete system hence substantially reducing the machine build-time. Based on the machine configuration the OEM is guided thru automatic selection of PLC program and some basic machine parameter allowing you to move the axes instantaneously.

Auto adjustment of axis (Finetune software)

The FTUNE program automatically optimizes the various servo control loops of the machine to obtain the highest performance as demanded by the machine manufacturers.

Combining the set-up wizard with Finetune provides the following benefits:

- A big reduction in machine set up time.
- Reduce set up time minimizes machine tool production costs.
- Better quality axis and spindle adjustment
- The intuitive auto-tuning software doesn't require any specialized skills.
- It prevents and eliminates mistakes that normally occur during manual adjustment process.
- Achieving optimum adjustment greatly enhances the life of machine's mechanical components.
- The simplicity of auto-tune software allows the user to tweak it's performance as the machine dynamics change over prolong usage.

Bode diagram

Is a tool for determining the machine's frequency response. With this information, it becomes possible to filter vibrations produced from the resonance of mechanical design of the machine, thus allowing the machine builder/user to obtain best adjustment and stability.

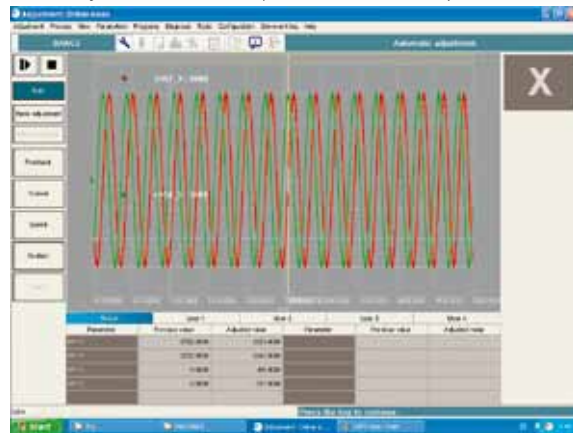
Circularity (roundness) test

Helps improve the behavior of the axes when reversing their moving direction. When executing a circle, the feature graphically compares the actual path with the theoretical path and then provides the necessary tools for the correct adjustment.

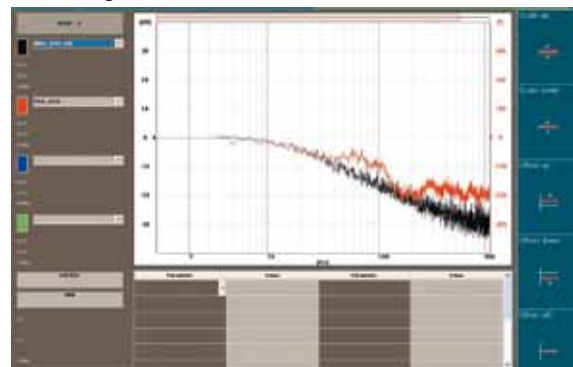
Oscilloscope

The oscilloscope feature is a tool which provides assistance when adjusting the axes performance. It allows the ability to display and correct the machine performance and dynamic behavior with the help of 4 work channels which show both analog and digital variables.

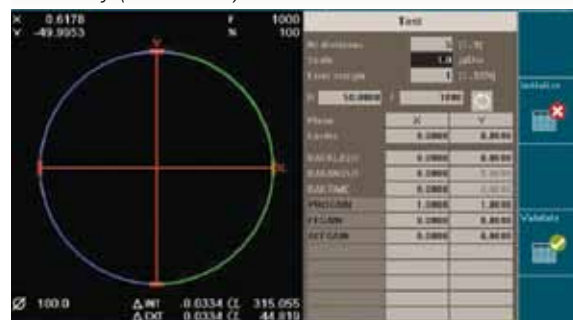
Auto adjustment of axis (Finetune software)



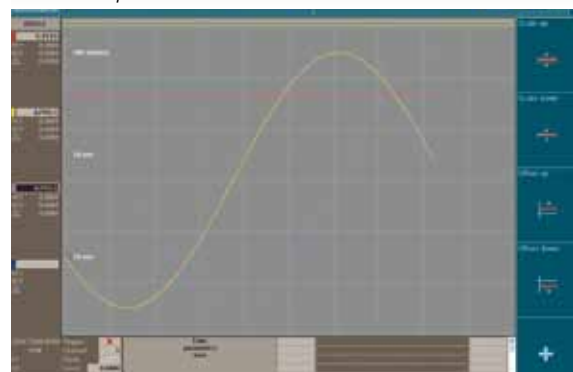
Bode diagram



Circularity (roundness) test



Oscilloscope



maintenance tools

Tele-diagnosis



Tele-diagnosis

The CNC 8060 offers tele-diagnosis software as standard allowing the OEM to connect to the machine user via internet to inspect, troubleshoot and repair the machine tool.

This feature allows the machine builder to provide quick technical assistance without having to send a technician to user's site hence eliminating unnecessary and expensive travel in many cases.

Black box

The CNC 8060 "black box" registers and saves all machine movements, operations and commands.

The analysis of this data is a very useful tool in determining the cause of any machine incident.

File encryption



File encryption

Fagor Automation offers the manufacturers the possibility to protect their "know-how" using a file encryption system.

The manufacturer can select the file to be protected, encrypt it and delete the original file.

The program will continue to work exactly the same way as before, but it cannot be displayed, edited or modified.

Incidence alert



Incidence alert

Machining of large complex parts or batch production takes a long time and doesn't require operator presence at all times. Under such circumstances an incidence may occur which could prevent the machine to continue working, affecting productivity.

The "Process Informer" feature can send text messages (SMS) and emails informing the machine user it's status hence allowing him to take immediate corrective action.

OEM integrated documentation



OEM integrated documentation

The machine manufacturers can enter their own PLC messages to warn the operator about preventive and maintenance measures.

The PLC messages may refer to maintenance manuals, text files, photos or even videos. This feature helps to reduce the OEM's maintenance tasks while minimizing machine idle time since the user has access to all the necessary information to resolve the problem.

Global support network



We'll assist you wherever you are

Our worldwide network ensures quick response time to any technical support you may require with our products at any time.

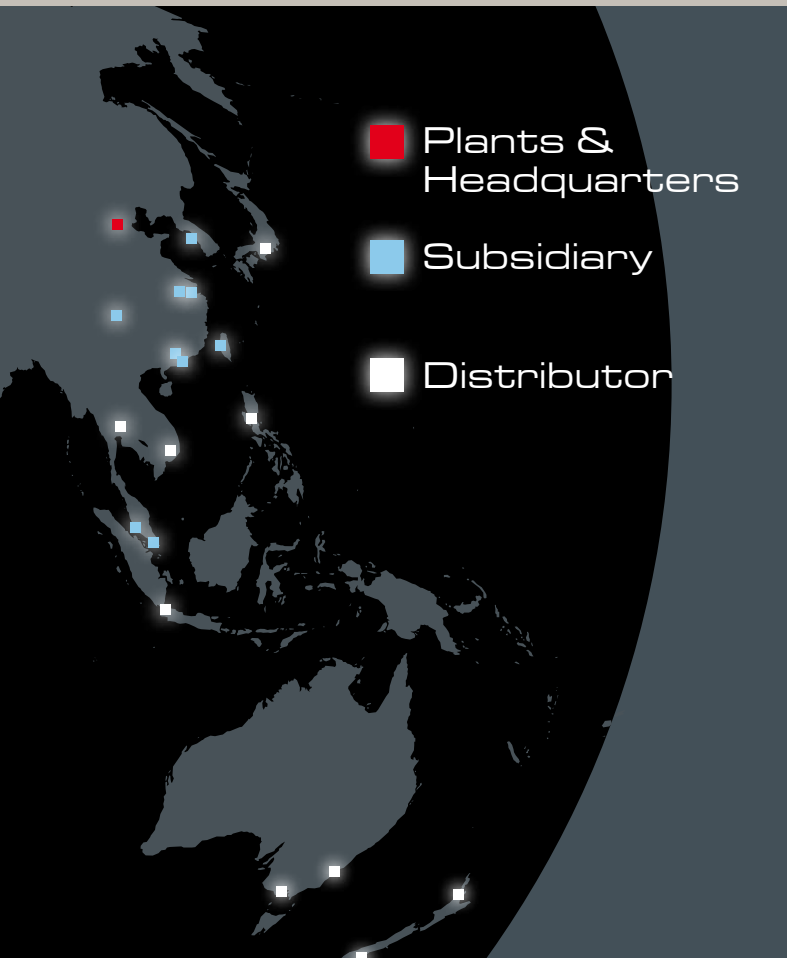
Our global network consists of more than 30 branch offices and 40 distributors.

Personalized attention

Fagor Automation's sales and application team works very closely with their customers ensuring best solution is chosen for every application.

A team of highly specialized engineers from Fagor Automation works on site with the customers during the setup of the product ensuring best performance from the product and making adjustments to obtain highest machining quality.





Unparalleled commitment to customer support

In a more and more competitive world the machine down time is expensive and hence it is critical to partner with an organization which values customer support as its highest priority.

Fagor Automation offers high quality pre and post sales assistance through qualified personnel to meet all your requirements.

Guaranteed non-stop production

Fagor Automation guarantees minimum down time in case a situation may occur requiring any spare parts. Our foremost priority is to minimize the production stoppage time.

Our standard product exchange policy ensures the customer is back up and running in record time producing parts and making money.



Maintenance

Fagor Automation provides a comprehensive maintenance service plan both for repairing or replacing a part.

“On Site Service”: Repairing and resolving the problem at customer’s site including replacement of parts.

“In House Repair Service”: Machine repair service at various Fagor Automation facilities around the world.

“Nonstop Production Service”: Provides immediate replacement of the part instead of repairing so that the machine ideal time is minimized.

Technical characteristics

Hardware

LCD monitor	10"
LCD monitor with Touch screen	△
Spindle override potentiometer	△
Basic axis configuration	3
Maximum axis configuration	6
Maximum configuration of interpolated axes	4
Maximum configuration of spindles	3
Maximum configuration of execution channels	2
User memory	Minimum 500 Mb
Connector for external Compact Flash (**)	○
Ethernet	○
USB connections	2
Block processing time	1 ms
Maximum local digital I/O	16/8
Max. expansion Remote digital I/O	1024/1024
Digital servo drives	○

Generic features

Look-ahead blocks	300
Maximum number of tools	1000
Languages supported	10 (*)
Serial line that may be configured as RS232, RS422 or RS485	△
Third-party kinematics	○

Setup tools

Finetune software (Auto-adjustment)	○
Bode diagram	○
Oscilloscope	○
Ball bar test	○
Tele-diagnosis	○
Bidirectional leadscrew compensation	○
Cross compensation	○
Gantry axes	○
Tandem axes / spindles	△
Combined feedback	○

Adaptation to the machine

Work in non-orthogonal planes	○
Customizable interface	○
OEM/user cycles	△
Infinite rotary axis	○
Independent channel axes	○
Axis parking	○
Electronic cams	△
Polynomial interpolation	○
Number of probes (switching)	2
Hirth axes	○

PLC

Inputs/Outputs	1024/1024
Marks	8192
Number of PLC messages	1024
Number of PLC errors	1024
Registers	1024
Timers	512
Counters	256
Spindle control via PLC (positioning, oscillation)	○

Programming / Browsing

Pop-up browsing	○
Simultaneous execution and simulation	○
Program encryption	○
Interruption subroutines	○
Coordinate system rotation (pattern rotation)	○
Manual intervention during machining	○
Selection of active kinematics by program	○
Feedrate override	0...200%
Max. feedrate (mm/min)	500000
Acceleration with jerk control	○
Maximum spindle speed	100000
Spindle speed override	0...200%
Spindle ranges (gears)	4
Automatic gear management	○
Spindle orientation	○
Spindle synchronization on the fly	△
Subroutine levels, max.	20
Interrupt routines, max.	4

○ Standard

△ Optional

(*) English, Spanish, Italian, German, French, Basque, Portuguese, Chinese, Russian and Czech.

(**) Use SLC grade industrial Compact Flash.

Fagor Automation shall not be held responsible for any problems caused by using other lower-quality Compact Flash.





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Fagor Automation holds the ISO 9001 Quality System Certificate and the CE Certificate for all products manufactured.

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