MANUFACTURERS

Quercus

A NEW GENERATION OF CNC SYSTEM

FAGOR AUTOMATION

Open to your world

quercus

Quercus

Powerful. Compact. Smart.

All inclusive. The next generation transformational technology that leaves everything else behind.

This new system comes stacked with host of outstanding new features.

Fagor Automation presents QUERCUS, a CNC Automation System, at your fingertips. This is a combination of decades of our knowledge and experience in machine tool sector, together with, technological advancements of the future. QUERCUS will completely TRANSFORM your overall CNC and automation experience.

The advantages of the QUERCUS system:

- CNC with improved and agile control algorithms and very compact hardware.
- Redesigned servo drives and power supplies, with revamped power and control circuits using the most technologically advanced electronics.
- Inclusion of the latest servo bus, Sercos III, using Industrial Ethernet technology at super-fast 100 MBd.
- Extremely simplified hardware assembly of regulated DC power bus.
- Introduction of new features for auto configuration, tuning and diagnosis resulting in streamlined and efficient installation.

QUERCUS incorporates all of the current market's requirements while also being open to integrate future enhancements. The system will ensure our customer's continued growth while providing access to all future technologies and developments.

ADVANCED TECHNOLOGY

CUTTING-EDGE REDESIGN

More powerful control algorithms and hardware with latest in electronics technology.

The complete redesign of our CNCs incorporating CPUs with improved and expandable features (such as higher processing speed, more memory capacity, etc.) in all models, provides support for more powerful and AGILE control algorithms and further reinforces an already innovative and flexible system.

We have completely revitalized our CNCs and created a very compact hardware platform.

All the drives and power supplies have been redesigned using state-of-the-art electronic components, saving substantial space for both the new power circuits and the control electronics. This means more power with smaller modules, which, in turn, means reduced space requirements inside a machine's electrical cabinet.

We have also taken into account all aspects of assembly. It is now easier, safer and more efficient: the power buses (24 Vdc BUS) are protected by an easy-to-open cover plate. The DC BUS connections for Servo Drives are made using easy-to-install plates included as accessories.

Even more compact

Easier and more efficient assembly

More powerful algorithms

Technological innovations

Improved CPU

ETHERNET

NEW SERCOS III SERVO BUS

Back to simplicity. Easier-to-use Industrial Ethernet-based connections.

Industrial Ethernet connection

Easy connection

Higher frequency

Centralization of information

Bus speed

100MBd

Fagor Automation introduces a new servo communication bus between the CNC and the drive modules. The Industrial Ethernet-based Sercos III bus means- speeds of up to 100 MBd can be achieved.

With ultra-fast communication bus, the CNC can receive and manage a lot more information sent by the servo and spindle axes and centralize the information management. Consequently, the system's configuration is automated, since it detects any connected modules (auto detection), such as servo drives, motors, feedback devices like linear encoders etc.

This centralization of information also allows for:

- Remote version updates including new feature enhancements for connected modules.
- Improvements to diagnostics and the access to all the variables of the system using the built-in CNC Oscilloscope, from the servo drives to feedback and motor.
- Improved integration and advanced control for multi-axis functions (Gantry, Tandem, Synchronism, Kinematics, etc.).

And all this has been achieved with a significant simplification of the cabling system, with replacement of optical fiber with easier to install STP Ethernet cables (Shielded Twisted Pair).

FULL DIGITAL

WE TALK DIGITAL...
AND WE CAN SPEAK WITH EVERYONE

Serial encoder-ready.

Feedback inputs are developed for real-time FeeDat (Fagor), SSI, BISS, EnDat, etc. serial communication protocols. This represents a totally digital system,
from command to all the way to feedback, since all the involved modules communicate via digital protocols.

A full digital interface ensures better control stability, greater noise immunity and guaranteed nanometric precision.

These feedback inputs are standardized for all the elements connected to the control bus, both for the CNC and the servo drives, and includes regenerative power supplies when used. The improved new connectors are smaller, more secure and compact.

$1\,nm = 10^{-9}\,m$

Nanometric resolution

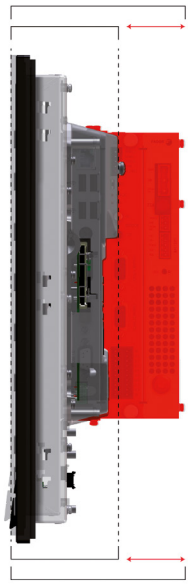
Compatibility and integration

Full digital

EVEN SMALLER IN SIZE

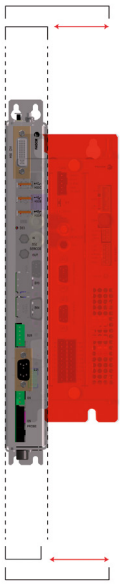
BOTH FOR CNCs AND FOR DRIVE MODULES

The redesigned CNC*elite* platform is extremely compact. Drive modules are also available with dual axis management -saving cabinet space.



45%

Reduction for integrated CNCs



60%

Reduction for modular CNCs

CNC

Reduction of around 45 % to 60 % (depending on the model) in size compared to the previous CNC platform.

Drive modules

With the availability of single and double modules, a unique drive module is capable of controlling 2 axis.

Technical details:

- Servo drive range from 7 to 275 A, with same size amplifiers able to deliver higher current capacity. The dual axes option is just 78 mm wide and is able to combine ...7+7, or 12+12, or 21+21 or 30+30 A.
- The non-regenerative power supply is only 78 mm wide up to 45 kW.
- Important reductions in size for regenerative power sources, with 30 and 45 kW in only 156 mm wide and 65 and 80 kW in only 234 mm wide.
- The auxiliary modules size has been reduced to just 39 mm.

Auxiliar modules.

39 and 78 mm

Drives: from 7 to 55 A.
Double drives: up to 30+30 A.
PS: up to 45 kW.
RPS: 20 kW.

78 mm

Drives: 80 and 120 A.
RPS: 30 and 45 kW.

156 mm

Drives: 160 and 225 A.
RPS: 65 and 80 kW.

234 mm

Drives: 275 A.
RPS: 160 kW.

390 mm

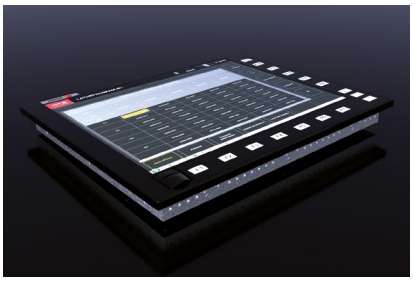
CENTRAL UNIT

COMPLETE MECHANICAL COMPATIBILTY FOR THE *elite* FAMILY OF CNCs

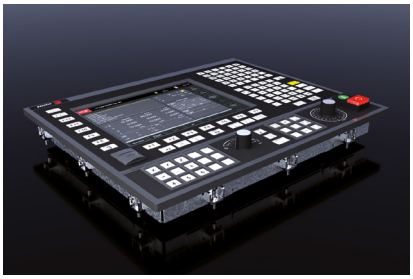
Provides maximum flexibility when designing the machine control panel.

Wide variety of monitors and panels can be directly mounted to any elite CNC central unit providing you the possibility to create your own integrated and customized CNC unit.

All central units are mechanically compatible with our keyboards and monitors hence allowing the manufacturers to maintain the same cabinet size irrespective of the CNC model used.

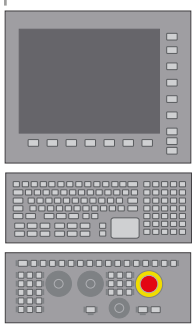


Integrated CPU for models 8060 / 8065 / 8070

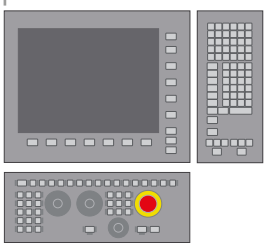


Greater flexibility for CNC configurations with an integrated monitor

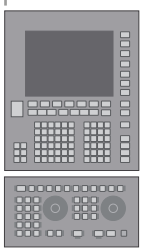
15” Vertical



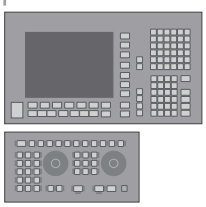
15” Horizontal



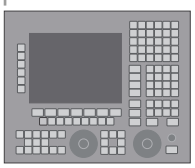
10.4” Vertical



10.4” Horizontal



10.4” Compact



VESA MOUNT

NEW INSTALLATION SYSTEM FOR MONITORS

Utilizing a simple VESA adapter, the CNC can be directly mounted to various sizes of monitors.

Available for modular CNCs:

We have a new universally acceptable assembly arrangement to attach a modular CNC directly to a Fagor or a third-party monitor. This allows various new possibilities for machine manufacturers for their control cabinet design. This unique and new installation method provides an alternative to cabinet assembly. Its small size and a thickness of only 36.5 mm, means a very sleek control panel or cabinet.

36.5 mm

thick

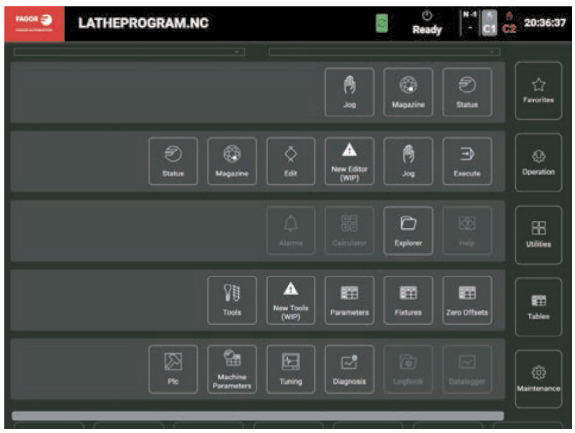
WEB TECHNOLOGY-BASED HMI*elite*

EASY TO PROGRAM AND PORTABILITY TO OTHER PLATFORMS

Newly designed multi platform HMI, based on HTML5 technology with modern appearance and simple navigation.

The HTML5 based software allows for the screen contents and the aesthetics to be modified and customized in a simplified manner. The redesigned user windows enhance the appearance and make it more intuitive and user friendly.

Adaptable to all screen formats, wide, panoramic or compact.



This web based technology allows the user interface to be displayed appropriately on any portable device.

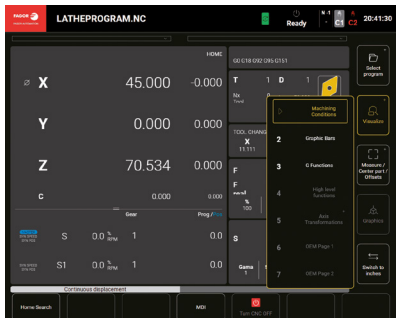
Android iOS Windows Linux

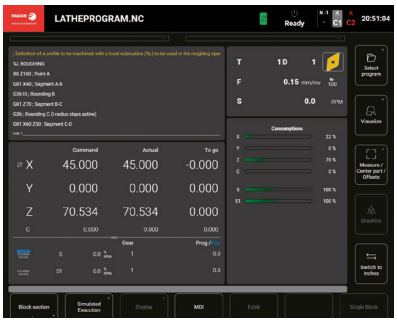
< HTML5 >

Advantages of HTML5 multi-platform

Remote and portable device connections are possible. The remote connection allows immediate and easy access for diagnosis or monitoring of unattended machine, for data collection and analysis purposes including troubleshooting.

The web-based technology HMI multiplatform means easier customizations and a single development can visualize the interface on all types of platforms, such as Windows, Android, iOS, Linux, etc.





ADAPTABLE TO ALL WORK ENVIRONMENTS

FLEXIBILITY AND FULL CUSTOMIZATION

Providing you with all the necessary tools and support to develop specific applications to your customer's requirement.

Since inception Fagor CNC systems are widely popular for milling and turning applications, however we have provided complete customized solutions for many other types of industries, like:

- Grinding
- 3 D printing
- Fabrication equipment
- Additive machining
- Stone & Marble cutting
- Water jet
- Wood working
- Punching etc.

Fagor CNCs offer tools and support for the development of customized solutions for machine manufacturers and users.

This flexible and open system allows you to develop customized solutions providing you a clear competitive advantage.

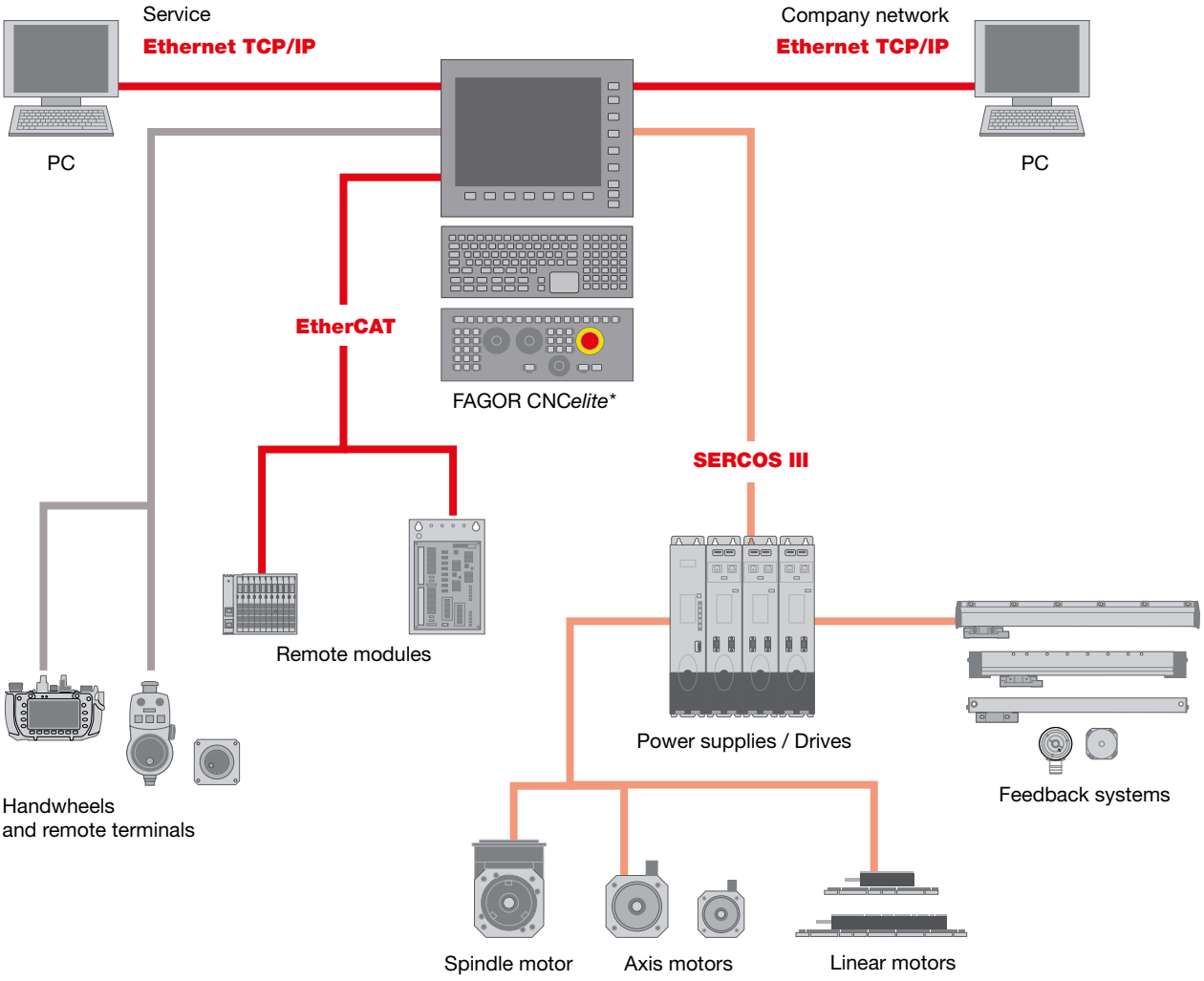
For example, custom cycles can be easily developed for unique or repetitive operations. User friendly interface ensures easy operation.

This flexibility allows us to easily adapt to new emerging sectors such as additive machining and 3D printing.

COMPLETELY INTEGRATED SOLUTION

A SINGLE INTEGRATED PLATFORM FOR ALL YOUR NEEDS

Fagor Automation's uniquely 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 máximum efficiency.



** Refer to CNC configurations on page 19*

INNOVATIVE AND SEAMLESS SYSTEM CONFIGURATION

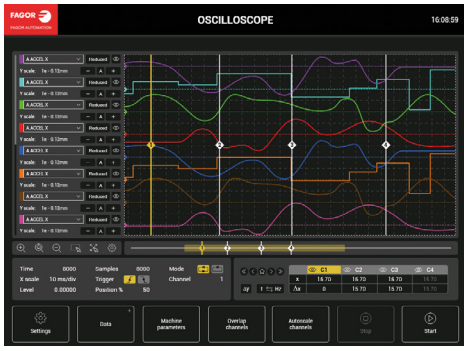
The CNC manages the data flow between all the connected elements: motors, feedback devices, power supplies, etc.

Fagor's new QUERCUS system optimizes all machine performance parameters by managing the main control loops from the proprietary system software installed in the CNC.

Besides many other new features, the CNC auto-detects the hardware on startup and and identifies all connected Fagor motors.

OPTIMIZING MACHINE EFFICIENCY

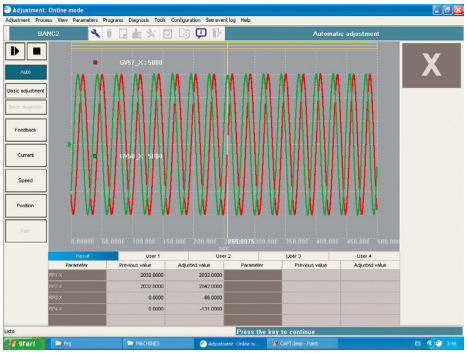
Fagor Automation includes a wide range of calibration tools as standard, simplifying the CNC setup.



Oscilloscope

Improved Oscilloscope
The Oscilloscope tool provides assistance when adjusting axes and other machine related performance parameters. With QUERCUS all the variables of the complete CNC system (CNC, Drives, Motors, Feedback, etc.) can be simultaneously analyzed using the eight channels of this powerful on board Oscilloscope tool.

Auto adjustment of axis (Finetune software)
The Finetune program automatically optimizes the various servo control loops of the machine to obtain the highest performance as demanded by the customers.

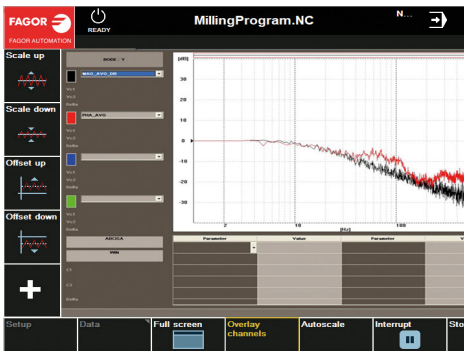


Auto adjustment of axis (Finetune software)

Finetune allows:

- A big reduction in machine set up and production time.
- Better quality 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 the machine's mechanical components.
- The simplicity of auto-tune software allows the user to tweak its performance as the machine dynamics change over prolong usage.

Bode diagram
Used to display and adjust the machine's frequency response with this digital tool, and thus allowing you to filter vibrations produced from the resonance of mechanical design of the machine.



Bode diagram

Roundness (circle) test
Helps improve the behavior of the axes when reversing their moving direction.


ROGRAM.NC
Ready
22:06:05
Jog
Magazine
Status
Favorites
Status
Magazine
Edit
New Editor (WIP)
Jog
Execute
Operation
Alarms
Calculator
Explorer
Help
Utilities
Tools
New Tools (WIP)
Parameters
Fixtures
Zero Offsets
Tables
Plc
Machine Parameters
Tuning
Diagnosis
LogBook
Datalogger
Maintenance
Execute

CNC

elite FAMILY

TAILOR-MADE SOLUTIONS FOR YOUR NEEDS

We offer wide range of CNC models for various machine types based on their complexity and application ensuring the best price to performance ratio always. A WIN WIN situation for both the OEM and the end-user.

CNC 8058*elite*

Small and medium size lathe applications with optional C axis.
Milling applications for simple machining.

CNC 8060*elite*

Milling machines and machining centers for high speed die and mold making.
Production lathes with optional C & Y axis.

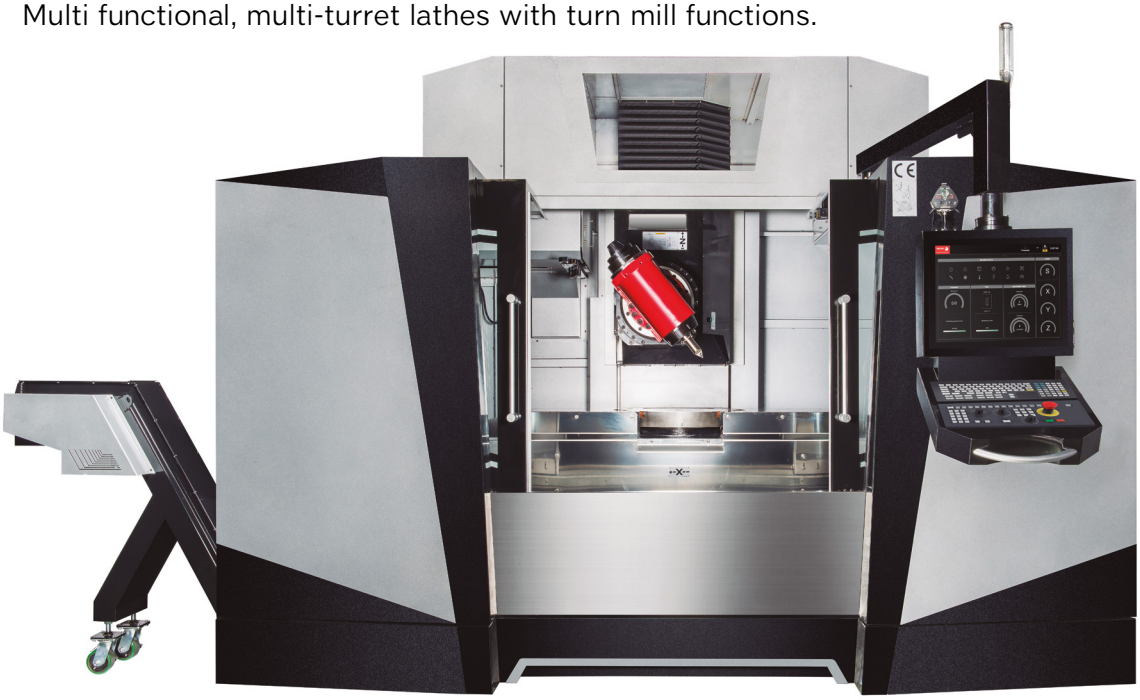
CNC 8065*elite*

Complex milling machines, 5 axis, large boring mills etc.
Complex lathes, C-axis, Y-axis, 5 axis multi-channel, turn-mill combination, etc.

WITH FEATURES FOR THE MOST DEMANDING MACHINES

EVERYTHING YOU NEED TO INCREASE THE SHOP FLOOR PRODUCTIVITY

At the forefront of high-speed and 5-axis machining.
Multi functional, multi-turret lathes with turn mill functions.



HSSA (High Speed Surface Accuracy)

The Fagor HSSA machining system offers the most advanced algorithms that seamlessly blend the tool path trajectories calculated to reduce vibrations and obtain high quality machining.

You can easily select the type of machining you want to obtain:

- As fast as possible (roughing).
- As accurate as possible.
- The best surface quality.

DMC (Dynamic Machining Control)

With this feature, the CNC automatically adapts the machining feed rate according to the tool force (load).

During machining when at critical moments, the spindle load is high or when the tool comes into contact with the material at the beginning of a cutting cycle, the feed rate is reduced to protect the tool and, when power consumption is low (spindle load), the machining feed rate increases to optimize the cutting.

All this happens automatically and with an auto selflearning process. User can define the active parameters during machining.

3+2 and 5-axis machining

Fagor offers you a complete solution for your machine with kinematics.

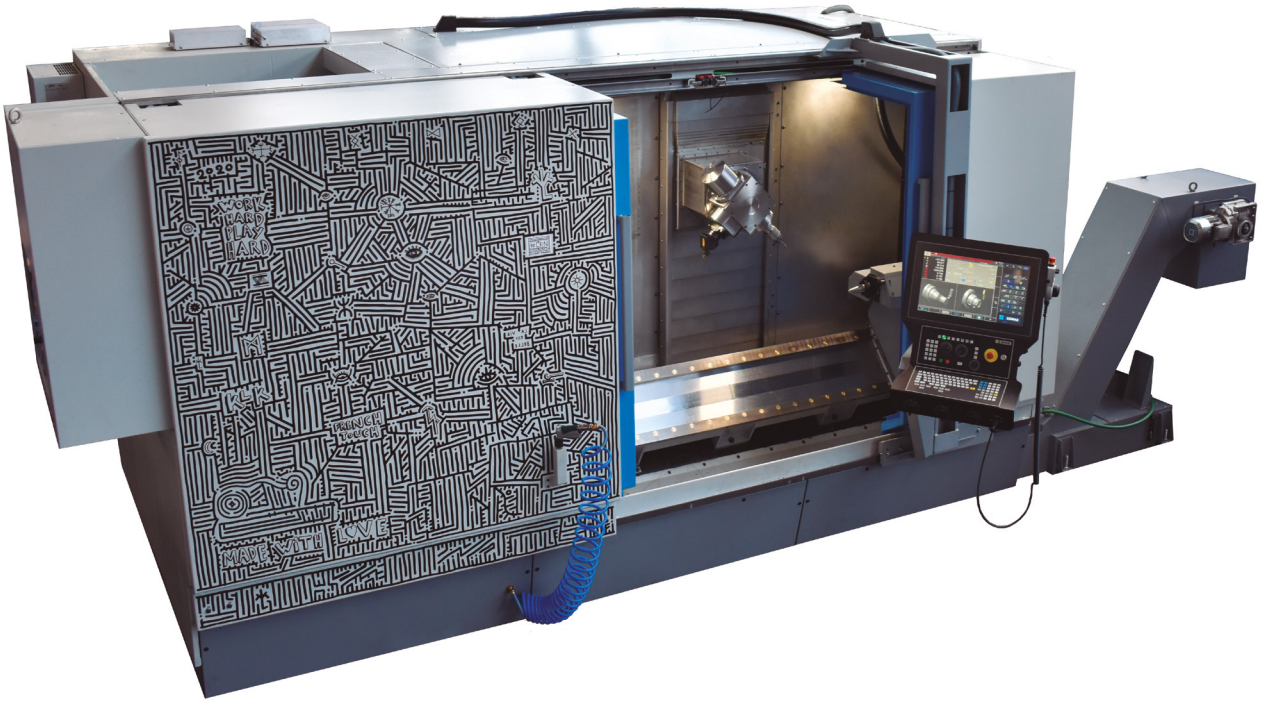
- Library of kinematics.
- Work in inclined planes, 3+2, 4+1, etc. and continuous 5-axis RTCP machining.

If, at anytime during the life of the machine tool it is necessary to readjust the kinematics, Fagor offers a conversational cycle that will carry out such corrections automatically.

FCAS (Fagor Collision Avoidance System)

The FCAS option (Fagor Collision Avoidance System) monitors tool movements in real time to avoid collisions with in the machine's working envelop.

When the FCAS option detects the possibility of a collision, it stops the movement, within the safety margin defined by the machine manufacturer, and will only allow away movement until it is in a safe area.



Lathe – Milling machine

To improve the productivity and accuracy of machining operations, it is becoming increasingly desirable for milling machines to perform some turning operations or vice-versa.

The Fagor CNC offers you the option of utilizing the full potential of the milling machine on a lathe and vice versa, providing a work environment and specific functions for such purposes.

Vertical and multi-channel lathes

Fagor CNCs have a specific operational (work) interface for vertical and multi-turret lathes.

Both the work interface and the fixed cycles or machine graphics are adapted to the specific configurations of such machine types.

DINDIST (Dynamic Distribution of machining operations)

We also offer specific features for the management and programming of multi-turret lathes.

DINDIST allows you to program on one of the CNC channels (as on a simple lathe) and the CNC will distribute the machining passes between the two turrets, saving considerable time in your machining operations.

FFC (Fagor Feed Control)

When proving the part for the first time or during continuous machining if vibrations or chatter are observed (change of tool type etc.), It may be necessary to change the feed rate and spindle speed to obtain best results.

By utilizing FFC function a user can press a specific key so that the modified feeds and speeds are memorized by the program for the subsequent part cycles.

TOOLS

FOR PRODUCTIVITY AND MAINTENANCE

By offering most advanced tools for production control and maintenance we can ensure your machine performance is always maximized.

Telediagnosis (Remote Troubleshooting)

From a remote location a technician can securely connect to your CNC to diagnose and solve issues you may have with your machine.

This powerful tool not only allows the technician to optimize axis and spindle tunning but also modify PLC, parameters, programs etc.

Integrated manuals

Following on our commitment towards environment protection and sustainability Fagor has adopted digital documentation for all technical products.

Every CNC has a built in library of all doumentations, which is only a “HELP” key away.

Predictive maintenance

Using our free auto-tuning tool, FINETUNE you can evaluate and modify the current performance of your machine. This information can be easily compared to previously stored machine data and corrective measures can be performed, including detection of future mechanical failures.

Remote machining control

Certain operations do not require constant operator presence either because the process is highly automated or because the operation takes a long time.

During such processes Fagor’s “Process Informer” feature can notify you via e-message if the process is interrupted or requires attention due to any possible errors allowing you to act immediately.

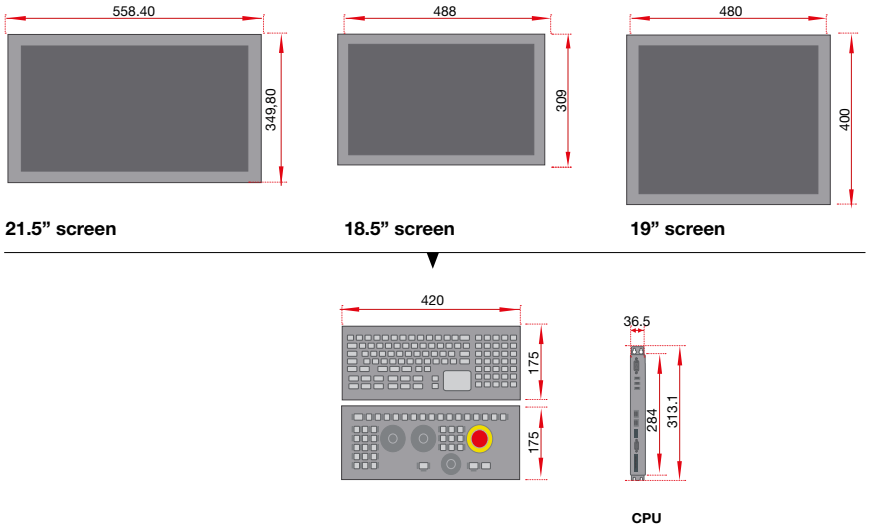
CONFIGURATION

MODULAR CONFIGURATION

CUSTOMIZED SOLUTIONS.

Fagor offers three different screen sizes allowing users the flexibility to choose the right configuration for their application.

Additionally it is possible to connect third party monitors to the CNCs.

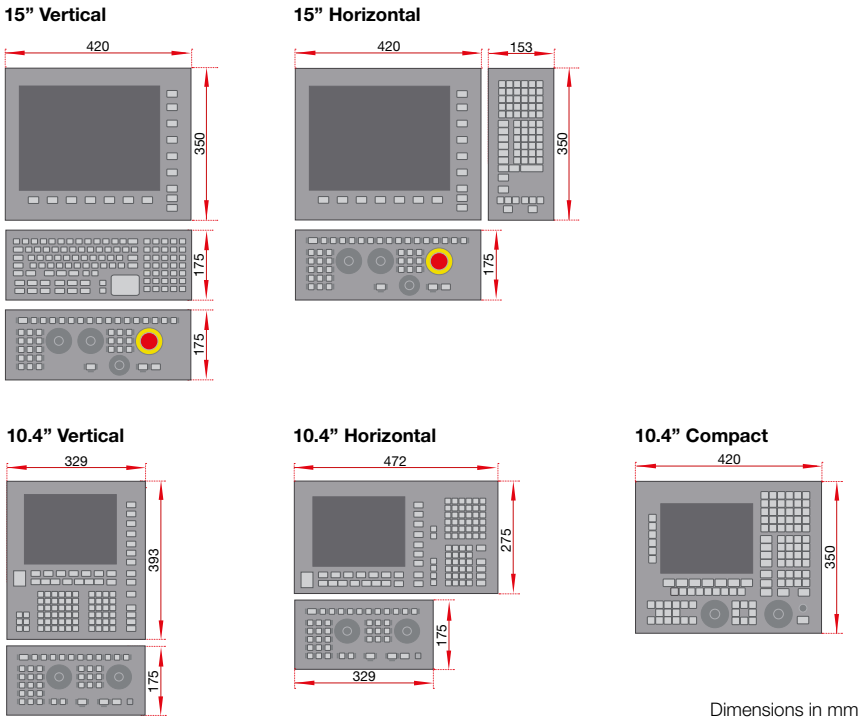


Dimensions in mm

INTEGRATED CONFIGURATION

INTEGRATED SOLUTIONS.

All models have a central unit integrated into the monitor, with a 15” or 10.4” screen (the 8058 CNC is only available with the 10.4” compact model).



Dimensions in mm

TECHNICAL CHARACTERISTICS

	CNC 8058*elite*	CNC 8060*elite*	CNC 8065*elite*
Main characteristics			
Monitor	10.4", 18.5" and 21.5"	10.4", 15", 18.5", 19" and 21.5"	10.4", 15", 18.5", 19" and 21.5"
Touch Screen	Δ (*)	Δ	Δ
Ethernet	•	•	•
USB connections (integrated /modular)	2 / 4	2 / 4	4 / 5
Hard disk memory (Total memory / Free user memory)	15 GB / 3.5 GB free	20 GB / 8.2 GB free	20 GB / 8.2 GB free 40 GB / 26.8 GB free
Connector for CFast memory expansion	•	•	•
Maximum axis configuration	5	9	31
Maximum configuration of interpolated axes	4	4	32 (**) (***)
Maximum configuration of spindles	2	3	6 (**)
Maximum configuration of execution channels	1	2	4
Maximum configuration of nodes (axes + spindles)	6	10	32
Maximum local digital I/O	16/8	16/8	16/8
Maximum remote digital I/O expansion	1024/1024	1024/1024	1024/1024
Sercos III, Digital Drive System	•	•	•
Analog and EtherCAT Servo Drive System (auxiliary)	Δ	Δ	Δ
Setup and maintenance tools			
Finetune (Auto-adjustment & Predictive maintenance)	•	•	•
Bode diagram	•	•	•
Oscilloscope	•	•	•
Logic analyzer	•	•	•
Volumetric compensation FVC Standard	–	–	Δ
Volumetric compensation FVC Advanced	–	–	Δ
Third-party kinematics	•	•	•
Kinematics calibration	–	–	Δ
Gantry axes	•	•	•
Tandem axes / spindles	Δ	Δ	•
Tangential control	–	–	•
Process Informer (Incident messages)	•	•	•
Tele-Diagnosis	•	•	•
Fagor I4.0 Connectivity Pack	Δ	Δ	Δ
Infinite rotary axis	•	•	•
Independent channel axes	•	•	•
Axis parking	•	•	•
Multi-axis management	•	•	•
Electronic cams	–	Δ	Δ
Spindle synchronization	–	Δ	Δ
PLC			
Inputs/Outputs	1024/1024	1024/1024	1024/1024
Marks	8192	8192	8192
Number of PLC messages	1024	1024	1024
Number of PLC errors	1024	1024	1024
Registers	1024	1024	1024
Timers	512	512	512
Counters	256	256	256
Spindle control via PLC (positioning, oscillation)	•	•	•

	CNC 8058*elite*	CNC 8060*elite*	CNC 8065*elite*
Standard features			
Languages supported	16 (****)	16 (****)	16 (****)
Integrated manuals	•	•	•
Pop-up navigation (drop-down menus)	•	•	•
Built-in calculatora	•	•	•
FMC (Fagor Machining Calculator)	Δ	Δ	Δ
Machining time estimate	•	•	•
HD Graphic simulation	Δ	Δ	•
Simultaneous execution and simulation	•	•	•
Open system	–	–	Δ
Customizable interface	•	•	•
OEM/user cycles	Δ	Δ	Δ
Program encryption	•	•	•
Programming / Machining			
ISO and parametric language	•	•	•
IIP (Interactive Icon-based Pages) programming language	Δ	Δ	•
Graphic assistance for programming	•	•	•
DXF converter	•	•	•
FGE (Fagor Geometry Editor)	•	•	•
Block processing time	2 ms	1 ms	0.167 ms
Look-ahead blocks	150	300	2400
Nanometric accuracy	•	•	•
Basic machining algorithms (HSSA I)	Δ	–	–
Advanced machining algorithms (HSSA II)	–	Δ	•
DMC (Dynamic Machining Control)	–	Δ	Δ
Dynamic Override	•	•	•
Dual-purpose (lathe & mill) machine	–	Δ	Δ
RTCP	–	Δ	Δ
FCAS (Fagor Collision Avoidance System)	–	–	Δ
Virtual axis	•	•	•
Additive & trajectory flywheel	–	•	•
Recovery & continuation of machining	•	•	•
Cancel Continue	•	•	•
Tool inspection	•	•	•
Tool life monitoring	•	•	•

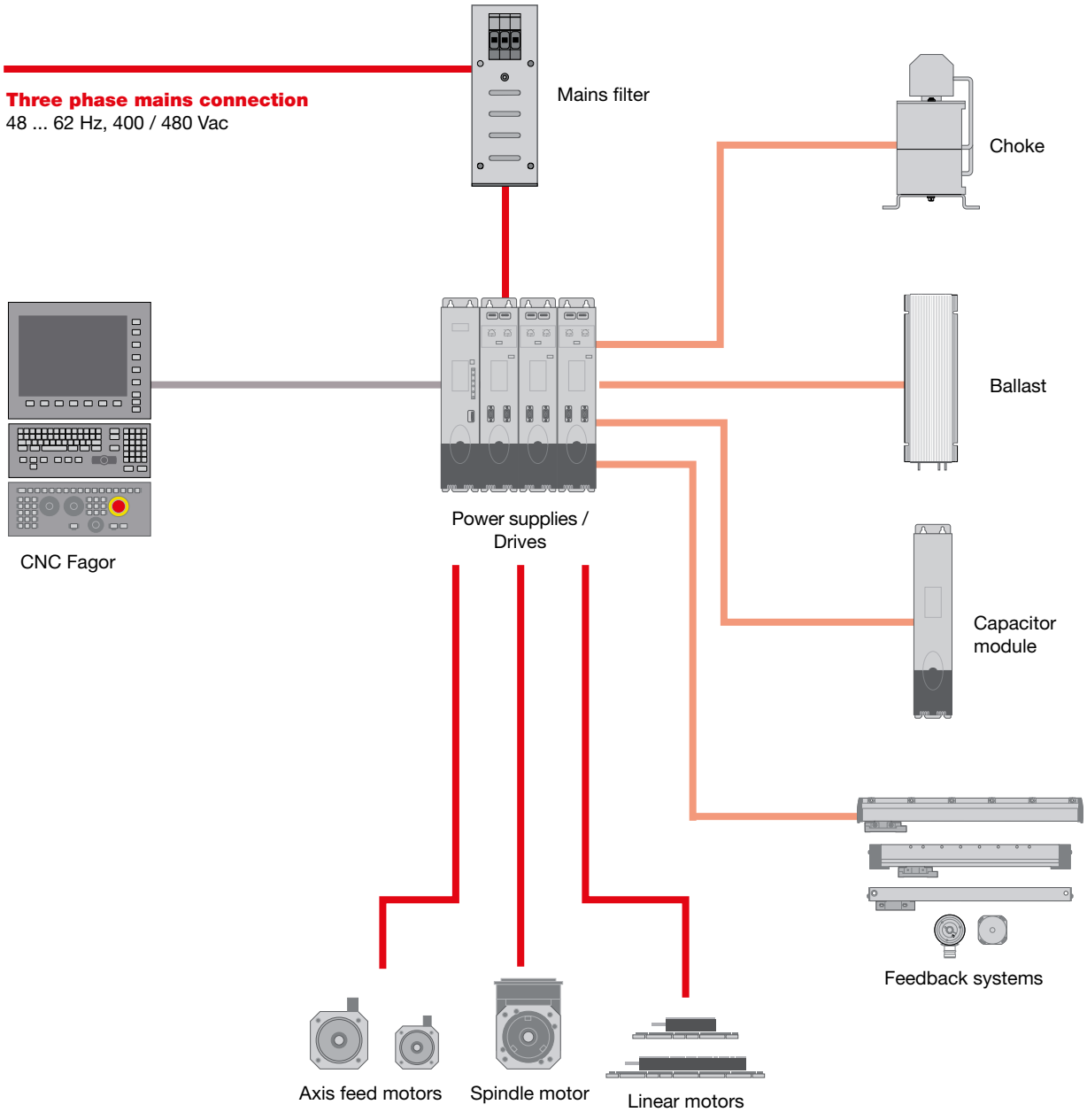
– Not available.
• Standard.
Δ Optional.
(*) Not available on integrated models.
(**) Up to 10 interpolated axes, 32 interpolated axes under development.
(***) Products manufactured by Fagor Automation since April 1st 2014 will include “-MDU” in their identification if they are included on the list of dual use products according to regulation UE 428/2009 and require an export license depending on destination.
(****) English, Spanish, Italian, German, French, Basque, Portuguese, simplified Chinese, traditional Chinese, Russian, Czech, Korean, Turkish, Dutch, Polish and Swedish.

POWER SUPPLIES / DRIVES

COMPLETELY INTEGRATED SOLUTION

A SINGLE INTEGRATED PLATFORM FOR ALL TYPE OF APPLICATIONS

Starting with the CNC, driven by the servo motors and accurately positioned by feedback systems- Fagor offers a complete solution for your machines.



AXIS AND SPINDLE DRIVES

QC-DR Series

The drives are available in both modular and stand-alone configuration. Directly connected to power supply they provide the appropriate voltage and frequency to servo motors controlling the speed and position.

Second Feedback Input (Optional)

A second feedback to manage accurately the machine position using external linear or rotary encoders.

Motor feedback input

It reads the signals coming from an encoder mounted on the motor to know its exact position and speed.

SERCOS III interface connector

To manage motor torque and feedback devices.

AXIS DRIVES QC-DR* Series

Digital drives connected with CNC*elite* to control synchronous motors for axis speed and position control.

Simple QC-DR drives capable of controlling single axis servomotor.

	I rated (A) at 4 kHz / at 8 kHz	I peak (0.5 s) (A) at 4 kHz / at 8 kHz	Pcal (kW) at 4 kHz / at 8 kHz	Consumption of control circuits	Width
QC-DR-007	3.5 / 3.5	7.0 / 7.0	2.4 / 2.4	0.7	78 mm
QC-DR-012	6.0 / 5.4	12.0 / 10.8	4.2 / 3.7	0.7	78 mm
QC-DR-021	10.5 / 9.8	21.0 / 19.6	7.3 / 6.7	0.9	78 mm
QC-DR-030	15.0 / 15.0	30.0 / 30.0	10.4 / 10.4	0.9	78 mm
QC-DR-040	20.0 / 20.0	40.0 / 40.0	13.9 / 13.9	0.9	78 mm
QC-DR-055	27.5 / 27.5	55.0 / 42.0	19.1 / 14.5	0.9	78 mm
QC-DR-080	40.0 / 40.0	80.0 / 80.0	27.7 / 27.7	1.2	156 mm
QC-DR-120	60.0 / 60.0	120.0 / 120.0	41.6 / 41.6	1.2	156 mm
QC-DR-160	80.0 / 80.0	160.0 / 160.0	55.4 / 55.4	2.5	234 mm
QC-DR-225	112.5 / 112.5	225.0 / 225.0	77.9 / 77.9	4.5	234 mm
QC-DR-275	137.5 / 137.5	275.0 / 275.0	95.3 / 95.3	5.0	390 mm

Double QC-DR drives capable of controlling 2 axes servomotors.

	I rated (A) at 4 kHz / at 8 kHz	I peak (0.5 s) (A) at 4 kHz / at 8 kHz	Pcal (kW) at 4 kHz / at 8 kHz	Consumption of control circuits	Width
QC-DR-07+07	3.5 / 3.5	7.0 / 7.0	2.4 / 2.4	0.7	78 mm
QC-DR-12+12	6.0 / 5.4	12.0 / 10.8	4.2 / 3.7	0.7	78 mm
QC-DR-21+21	10.5 / 9.8	21.0 / 19.6	7.3 / 6.7	0.9	78 mm
QC-DR-30+30	15.0 / 15.0	30.0 / 30.0	10.4 / 10.4	0.9	78 mm

SPINDLE DRIVES QC-DR* Series

Digital drives connected with CNC*elite* to control synchronous or asynhronous motors for spindle speed and position control.

	IS1 (A) at 4 kHz / at 8 kHz	0.7xIS1 (A) at 4 kHz / at 8 kHz	IS6-40 % (A) at 4 kHz / at 8 kHz	PS1 (kW) at 4 kHz / at 8 kHz	PS6-40 % (kW) at 4 kHz / at 8 kHz	Consumption of control circuits	Width
QC-DR-021	10.5 / 9.8	21.0 / 19.6	7.3 / 6.7	11.2 / 5.2	14.5 / 6.8	0.9	78 mm
QC-DR-030	23.0 / 17.5	16.1 / 12.2	30.0 / 22.8	15.9 / 12.1	20.8 / 15.7	0.9	78 mm
QC-DR-040	30.0 / 22.0	21.0 / 15.4	39.0 / 28.6	20.7 / 15.2	27.0 / 19.8	0.9	78 mm
QC-DR-055	42.0 / 30.0	29.4 / 21.0	54.6 / 39.0	29.1 / 20.8	37.8 / 27.0	0.9	78 mm
QC-DR-080	62.0 / 48.0	43.4 / 33.6	80.6 / 62.4	42.9 / 33.2	55.8 / 43.2	1.2	156 mm
QC-DR-120	92.3 / 70.0	64.6 / 49.0	120.0 / 91.0	64.0 / 48.5	83.1 / 63.0	1.2	156 mm
QC-DR-160	124.0 / 95.0	86.8 / 66.5	161.2 / 123.5	85.9 / 65.8	111.6 / 85.5	2.5	234 mm
QC-DR-225	189.0 / 125.0	132.3 / 87.5	224.9 / 162.5	130.9 / 86.6	155.8 / 112.5	4.5	234 mm
QC-DR-275	250.0 / 154.0	175.0 / 107.8	275.0 / 169.4	173.2 / 106.7	190.5 / 117.3	5.0	390 mm

(*) Products manufactured by Fagor Automation since April 1st 2014 will include "-MDU" in their identification if they are included on the list of dual use products according to regulation UE 428/2009 and require an export license depending on destination.

POWER SUPPLIES

QC-PS / QC-RPS Series

QC series power supplies can be connected to three-phase power from 400-480 Vac, 48 to 62 Hz and provide power to the drive modules through the power bus. They also manage the energy dissipation during braking of motors.

QC-PS Series

Non-regenerative power supplies. The excess energy generated during motor deceleration or braking is dissipated as heat using resistors.

	Mains frequency and mains voltage	Output voltage at the DC BUS	Output rated power at the DC BUS	Output rated current at the DC BUS	Auxiliary power supply	Minimum external Ballast resistor	Width
QC-PS-025	Three-phase 48 ... 62 Hz, with a voltage range between 400-480 Vac ±10 % Vac	565-800 Vdc	25 kW (400 Vac)	44 A	24 Vdc | 7 A (integrated)	18 Ω	78 mm
QC-PS-045			45 kW (400 Vac)	79 A	24 Vdc | 15 A (external QC-APS-15)		

QC-RPS Series

Regenerative regulated power supplies are capable of feeding the power back to the mains during deceleration or braking. They provide a programmable DC output voltage (regardless of main incoming voltage) and the surplus energy is returned to mains with a near-one power factor reducing the consumption of the system without generating additional heat.

	Mains frequency and mains voltage	Output voltage at the DC BUS	Output rated power at the DC BUS at 400 Vac	Output rated current at the DC BUS at 400 Vac and 625 Vdc	Auxiliary power supply for the control signals of the devices connected to the DC BUS	Choke (Not integrated into the QC-RPS power supply)	Mains filter	Width
QC-RPS-020	Three-phase 48 ... 62 Hz, with a voltage range between 400-480 Vac ±10 % Vac	600-750 Vdc	19 kW (400 Vac)	32 A	24 Vdc | 15 A (external QC-APS3-15)	CHOKE RPS-20	MAIN FILTER 42A-A	78 mm
QC-RPS-030			31 kW (400 Vac)	52 A		CHOKE RPS-45	MAIN FILTER 42A-A	156 mm
QC-RPS-045			46 kW (400 Vac)	76 A			MAIN FILTER 75A-A	
QC-RPS-065			65 kW (400 Vac)	109 A		CHOKE RPS-75-3	MAIN FILTER 75A-A	234 mm
QC-RPS-080			80 kW (400 Vac)	134 A			MAIN FILTER 130A-x	
QC-RPS-160			161 kW (400 Vac)	269 A		CHOKE RPS-160	MAIN FILTER 275A	390 mm

ACCESSORY MODULES

Mains filters

It is mandatory that a proper Fagor mains filter is installed between the main and the QUERCUS system. It also complies with the European Directive 2014/30/EU.

MAIN FILTER 42A-A
MAIN FILTER 75A-A
MAIN FILTER 130A-A & MAIN FILTER 130A-B
MAIN FILTER 180A-A
MAIN FILTER 275A

Chokes

Installing chokes (inductances or coils) is mandatory when using QC-RPS regenerative regulated power supplies and they must always be wired between the power supply and the -KM1 main contactor which is installed after the mains filter.

CHOKE RPS-20
CHOKE RPS-45
CHOKE RPS-75-3
CHOKE RPS-160

External Ballast resistors

They are used to dissipate excess energy generated at the power bus during deceleration or braking of electrical motors.

They must be used with QC-PS power supplies and QC-BPM-100-B module.

Model	Ω	W
ER+TH-18/1100	18	950
ER+TH-18/1800	18	1300
ER+TH-18/2200	18	2000
ER+TH-18/1000+FAN	18	2000
ER+TH-18/1500+FAN	18	3000
ER+TH-18/2000+FAN	18	4000

QC-APS-15 | QC-APS3-15 auxiliary power supply

The QC-APS-15 supplies 24 Vdc | 360 W for the control circuits of the devices connected to the DC BUS.

The QC-APS3-15 generates 24 Vdc. It has a soft-start circuit for charging the power DC BUS and a snubber circuit for the motor protection.

During mains power outage, both auxiliary power supplies continue to provide 24 Vdc to feed the drive system hence ensuring a secure and controlled stop of all axes.

	QC-APS-15	QC-APS3-15
INPUT		
Voltage	Three-phase, 400 (1-10 %) Vac to 480 (1+10 %) Vac	
Frequency	48 ... 62 Hz	
Rated current	0.65 A	
Rated power	450 W	
OUTPUT		
Voltage	24 (1±5 %) Vdc	
Rated current	15 A	15 A
Rated power	360 W	360 W
SOFT-START		
Soft-start circuit	NO	YES
Maximum capacity allowed at the DC BUS	–	15 mF
Maximum load current	–	8 A
SNUBBER		
Motor protection circuit	NO	YES
Maximum power allowed	–	160 W

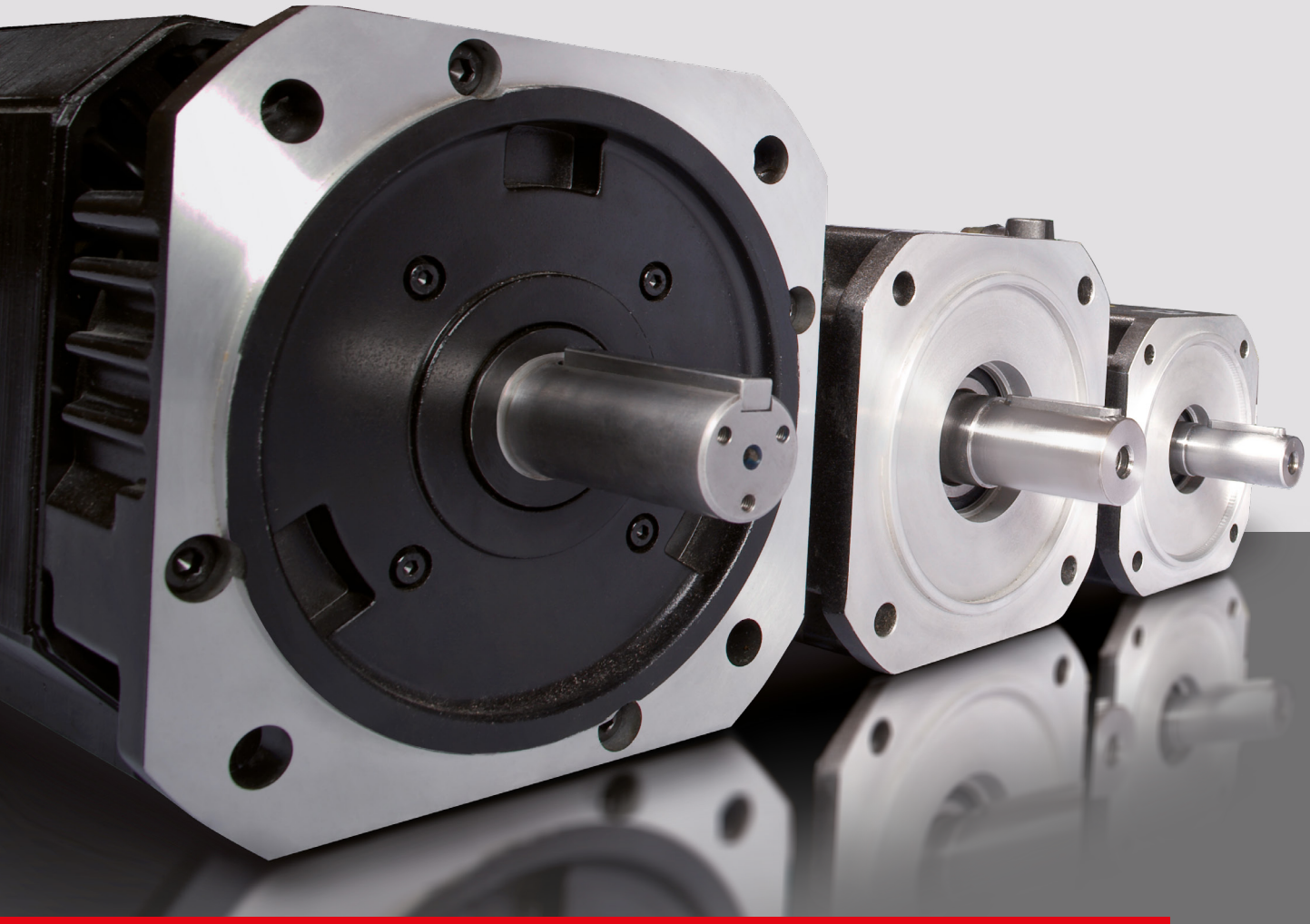
QC-CM-75 capacitor module

When using non-regenerative (QC-PS) power supplies, these capacitors store the energy returned to mains during braking.

It has a capacity of 7.38 mF and can support a maximum voltage of 797 Vdc at the power bus.

QC-BPM-100 power bus protection module

This module is for QUERCUS systems with a regenerative power supply. It is essential whenever there is a synchronous spindle used.
It must be connected to at least one external braking resistor (maximum of three braking resistors).



MOTORS

CUSTOMIZED SOLUTIONS

A VERSATILE, HIGH-PERFORMANCE FAMILY OF MOTORS

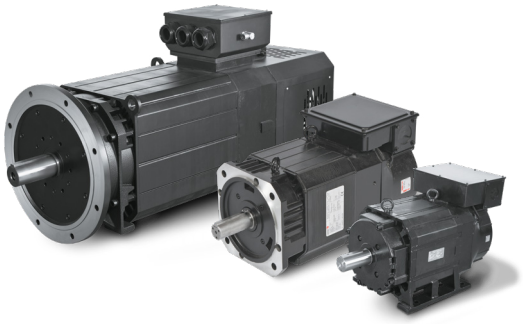
Fagor motors are a perfect match for all types of machine tool spindles providing great reliability and optimum performance for any application. Available in wide power range their rugged design using special high speed bearings and other unique construction features ensures quality and versatility.

These motors combined with QUERCUS axis drives provide a reliable, compact and high performance system.

These compact motors don't require any additional cooling and are also available with forced ventilation for certain models, which helps to increase the nominal power depending on the machine requirement.

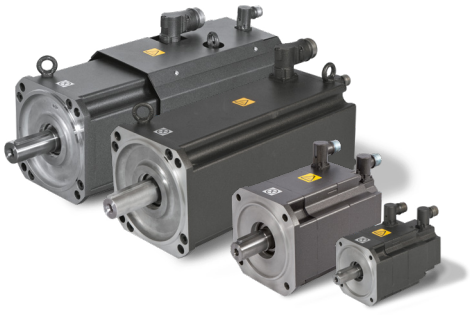
Spindle motors

- Power: 3,7 – 130 kW
- Speed: Up to 15,000 rpm



Axis motors

- Torque: 0,5 - 115 N·m
- Single and multi-turn absolute encoders
- Options: With brake, electro-ventilated, with seal…

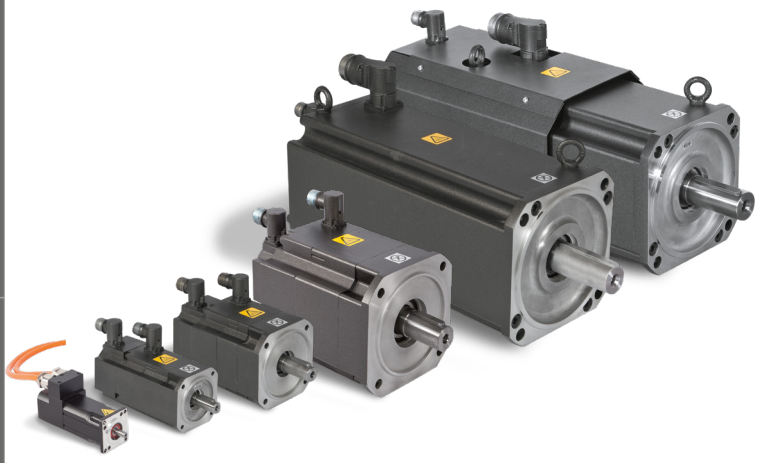


Linear motors

- Nominal / peakforce: Up to 4584.1 / 9069.1 N
- With and without water cooling

AXIS MOTORS

FKM Series



The FKM series are high performance permanent magnet synchronous motors suitable for wide ranging and most demanding applications for new generation of machine tools.

These motors together with QC-DR drives form a compact and reliable high performance system. The feedback system can be configured based on the application.

As an option, all sizes except the FKM96 can be ordered with a built-in brake.

General characteristics

Temperature sensor	PTC KTY84-130 thermistor (only for FKM9), PTC111-130 thermistor (only for FKM1), RTD Pt1000 thermoresistance
Shaft end	Keyless shaft (option: with key)
Mounting methods (according to IEC 60034-3 standard)	IM B5, IM V1, IM V3
Balancing (according to DIN 45665 standard)	Half-key balancing, Class N (standard), Class R (optional)
Insulation class (according to IEC 60034-1 standard)	Class F (155 °C / 311 °F)
Protection degree (according to IEC 60034-5 standard)	Models FKM 94, 95 and 96: IP 65 Rest of models: IP 64 (standard) and IP 65 (optional)
Ventilation	Optional on models FKM 66, 82, 83, 84, 85
Holding brake	Optional on all models except FKM96
Feedback	Single and multi-turn absolute sinusoidal 1024 ppt 1 Vpp encoder (Resolution: 2^{26})

Model	Stall torque [N·m]	Peak torque [N·m]	Stall current [A] / Peak current [A]						Intertia [kg·cm²]		
			2000 rpm	3000 rpm	4000 rpm	4500 rpm	5000 rpm	6000 rpm	without brake	with brake	extra brake
FKM12	0.54	2.2				0.93 / 4.3			0.07	0.138	–
FKM14	0.95	3.8				1.15 / 5.3			0.11	0.178	–
FKM21	1.7	7						2.8 / 11	1.6	1.72	–
FKM22	3.2	13		2.4 / 10			4.0 / 16	4.5 / 18	2.9	3.02	–
FKM42	6.3	25		4.6 / 19		6.9 / 28		8.5 / 34	8.5	9.04	–
FKM43	9	36	3.6 / 14.4	5.5 / 21.8	8.2 / 32.7				16.7	17.24	–
FKM44 (*)	11.6	47	4.6 / 19	8.2 / 33	10.7 / 43				16.7	17.24	18.4
FKM62	8.9	35		7.1 / 28	9.3 / 37			13.1 / 52	16	17.15	–
FKM63	12.5	51	4.9 / 20.1	9.2 / 37.1	12.3 / 49.5				29.5	31.16	–
FKM64	16.5	66	6.5 / 26	12.1 / 48	16.2 / 64				29.5	30.65	–
FKM66 (*)	23.5	94	10.5 / 42	16.4 / 66					43	44.15	44.7
FKM66 V (*)	32	94	12.8 / 37	22.3 / 66					43	–	44.7
FKM82	32	96	13.2 / 39	19.8 / 59	26.4 / 79				103	134.8	–
FKM82 V	40	96			33.0 / 79				103	134.8	–
FKM83	41	123	17.0 / 51	27.1 / 81					150	181.8	–
FKM83 V	60	123		39.6 / 81					150	181.8	–
FKM84	52	156	21.5 / 64	32.2 / 96					197	228.8	–
FKM84 V	80	156	33 / 64	49.5 / 96					197	228.8	–
FKM85	74	222	29.3 / 87						243	274.8	–
FKM85 V	100	222	39.6 / 87						243	274.8	–
FKM94	68	204	25.4 / 99						430	483	–
FKM95	93	279	33.1 / 129						550	603	–
FKM96	115	345	42.1 / 164						660	–	–

V Electro-ventilated motor.
(*) Extra braking torque variant available.

LINEAR MOTORS

FLM Series

High Precision.
High Speed and high acceleration.
No limitation on travel stroke.
Minimum maintenance and long service life.

Compare to traditional ball screw mechanism linear motors have no mechanical contact between motor coil and the track.

With minimum mechanical contact between bearings, a machine tool with linear motors can achieve higher speeds with better precision, faster dynamic response and more reliability.

General characteristics

Maximum coil temperature	100.0 °C
Maximum bus voltage	600 Vdc
Magnetic period	42.0 mm
Insulation class	Class B (130 °C)
Protection grade	IP 00
Compliance with global standards	RoHS

Description

Example: FLM100-W-B4

	Coil						
FLM	**100**	**W**	**B4**	**KK2**	**NH**	**6.0**	**NFB**
Model	Size	Cooling Options	Segment	Termal sensor	Hall Options	Cable Length	Ferrite Bead Options
FLM	50 **100** 150 200	Water Cooled	234-236 mm - B2 402-404 mm - **B4** 572-618 mm - B6	Pt100	No Hall Sensor	6.0: 6 m	Motor cable terminated in flying leads

Example: FLM100-TL252

	Track		
FLM	**100**	**TL252**	**E**
Model	Size	Track Length	Cover Type
FLM	50 **100** 150 200	168 - TL168 **252 - TL252** 420 - TL420	**Epoxy cover**

Performance Parameters

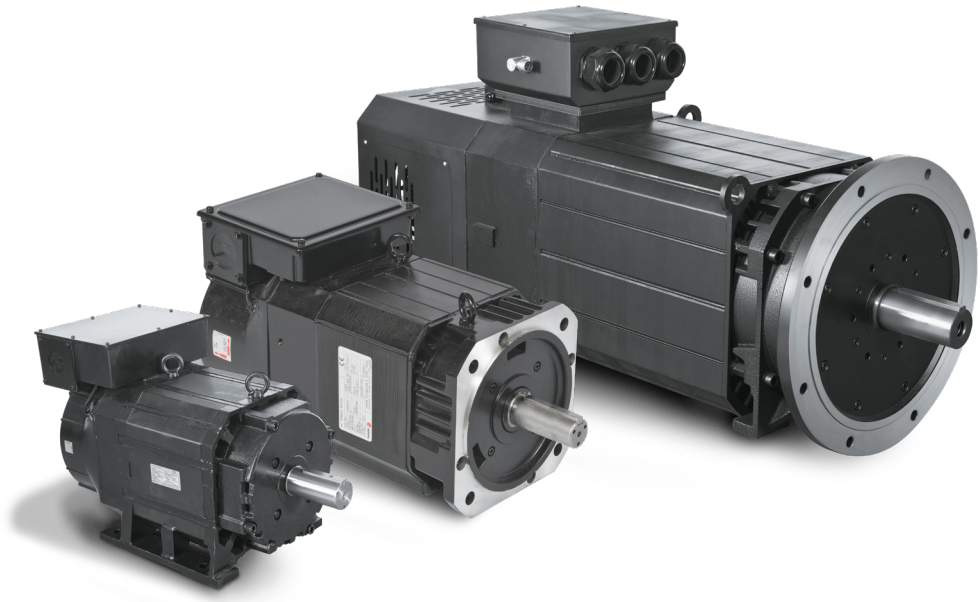
Model	Continuous force @100°C N	Peak force N	Force constant ±10% N/Arms	Resistance (L-L) @25°C ±10% Ω	Inductance (L-L) ±30% mH	Electrical time constant ms	Continuous current @100°C Arms	Peak Current Arms	Continuous power dissipation @100°C W	Attraction force kN
FLM50-W-B2	579.6	805.3	76.5	2.8	63.6	22.7	8.2	14.4	364	1.3
FLM50-W-B4	1159.3	1610.5	76.5	1.4	31.8	22.7	16.4	28.8	727.9	2.7
FLM100-W-B2	1033.9	1511.5	160.1	6.8	103.2	15.1	6.8	12	609.6	2.7
FLM100-W-B4	1976.5	3023	160.1	3.4	51.6	15	13	24	1123.7	5.4
FLM100-W-B6	2873.7	4534.6	240.1	5.1	77.4	15.1	12.6	24	1577.5	8
FLM150-W-B4	2599.3	4578.5	242.4	4.8	77.1	16.1	11.3	24	1177.3	8
FLM150-W-B6	3762.3	6867.7	363.6	7.2	115.6	16.1	10.9	24	1646.6	12.1
FLM200-W-B4	3183.4	6046.1	320.1	6.5	101.6	15.7	10.5	24	1372.8	10.7
FLM200-W-B6	4584.1	9069.1	480.2	9.8	152.4	15.6	10	24	1903.6	16.1

Mechanical Parameters

Model	Coil mass ±10% kg	Coil length ±10% mm	Track mass per meter ±10% kg
FLM50-W-B2	4.9	234	4.8
FLM50-W-B4	9.1	402	
FLM100-W-B2	8.3	236	8.6
FLM100-W-B4	14.8	404	
FLM100-W-B6	21.3	572	
FLM150-W-B4	18.5	404	15.2
FLM150-W-B6	27.5	572	
FLM200-W-B4	24.1	404	22.4
FLM200-W-B6	38	618	

SPINDLE MOTORS

FM7 / FM9 Series



The asynchronous FM7 - FM9 series motors can operate with all types of machine tool spindles, providing great reliability and optimum performance that the application requires.

The FM7/FM9 series motors cover a vast range of power (kW) spectrum, have a robust design and extremely low vibration under any conditions. The design uses special high speed bearing ensuring quite operation at all speeds and spindle loads.

FM7 Series

- **E01/E02 series:** Spindle motors with a vast range of power spectrum and up to 12,000 rpm.
- **E03 series:** Spindle motors with Y-D (star/triangle) connection and 6 accessible terminals.
- **HS3 series:** Spindle motors ready for direct coupling (without belts), hollow shaft for tool cooling and 6 accessible terminals for star/delta connection.

FM9 Series

- **E01 series:** Spindle motors with a vast range of power spectrum and up to 9,000 rpm for the smallest models.
- **E02/E03 series:** 10,000 and 12,000 rpm spindle motors with a limited power range.
- **E04 series:** Spindle motors ready for direct coupling (without belts), solid shaft and 15,000 rpm in the whole range.
- **HS4 series:** Spindle motors ready for direct coupling (without belts), hollow shaft for tool cooling and 15,000 rpm in the whole range.

General characteristics

	FM7 E01 / E02	FM9 E01	FM7 E03 / HS3	FM9 E02 / E03 / E04 / HS4
Thermal protection (according to IEC 60034-6 standard	NTC thermistor	KTY84-130 thermistor	NTC thermistor	Pt1000 thermoresistance
Vibration level (according to IEC 60034-14 standard)	V5 - V10 (standard) V3 - V5 (optional)	V5	V3	V5
Construction type (according to IEC 60034-7 standard)	Horizontal: IM B3, IM B5, IM B35 Vertical: IM V1, IM V5, IM V15	Horizontal: IM B3, IM B5, IM B35 Vertical: IM V1, IM V5, IM V15, IM V3, IM V6, IM V36	Horizontal: IM B5 Vertical: IM V1	Horizontal: IM B3, IM B5, IM B35 Vertical: IM V1, IM V5, IM V15, IM V3, IM V6, IM V36
Insulation class (according to IEC 60034-1 standard)	Class F (155 °C / 311 °F)	Class F (155 °C / 311 °F)	Class F (155 °C / 311 °F)	Class F (155 °C / 311 °F)
Protection degree (according to IEC 60034-5 standard)	IP 44	IP 54	IP 44	IP 54
Feedback	1024 ppt incremental TTL encoder (standard) 1024 ppt sinusoidal 1 Vpp encoder (optional)	1024 ppt sinusoidal 1 Vpp encoder Incremental TTL encoder of 1024 ppt	Incremental TTL encoder of 1024 ppt	Incremental TTL encoder of 1024 ppt

FM7 E01 / FM7 E02 / FM9 E01 / FM9 E02 Series

	Rated power S1 (kW)	Rated power S6-40 % (kW) Y	Rated torque S1 (N·m) Y	Rated current (A) Y	Base speed (rpm) Y	Maximum speed (rpm)		Inertia [kg·cm²]
						E01	E02	
FM7 A037-xxxx-E01/E02	3.7	5.5	23.5	12.4	1,500	9,000	12,000	140
FM7 A055-xxxx-E01/E02	5.5	7.7	35	14.6	1,500	9,000	10,000	210
FM7 A075-xxxx-E01/E02	7.5	11	47.7	19.8	1,500	9,000	10,000	260
FM7 A090-xxxx-E01	9	13	57.4	25.1	1,500	9,000	–	330
FM7 A110-xxxx-E01/E02	11	15.5	70	27.9	1,500	9,000	10,000	690
FM7 A150-xxxx-E01/E02	15	22	95.5	39.3	1,500	8,000	9,000	690
FM7 A185-xxxx-E01	18.5	26	117.8	47.4	1,500	8,000	–	890
FM7 A220-xxxx-E01/E02	22	33	140	61.4	1,500	8,000	9,000	1,080
FM7 A300-xxxx-E01	30	45	191	82.1	1500	6,500	–	2,310
FM7 A370-xxxx-E01	37	56	235	89.9	1,500	6,500	–	2,660
FM7 A510-xxxx-E01/E02	51	71	325	115.1	1,500	5,000	6,000	4,730
FM7 B120-xxxx-E01	12	18.5	114.6	35	1,000	8,000	–	890
FM7 B170-xxxx-E01/E02	17	25	162.3	47.2	1,000	8,000	9,000	1,080
FM7 B220-xxxx-E01	22	33	210	64.9	1,000	6,500	–	2,310
FM7 B280-xxxx-E01	28	42	267.4	78.2	1,000	6,500	–	2,660
FM9-A004-xxxx-E01	3.7	5.5	23.3	12.4	1,500	9,000	–	135
FM9-A006-xxxx-E01	5.5	7.5	24.7	15.9	1,500	9,000	–	245
FM9-A008-xxxx-E01/E02	7.5	11	47.3	21.5	1,500	9,000	10,000	353
FM9-A011-xxxx-E01/E02	11	15	69	27.9	1,500	9,000	10,000	580 / 405
FM9-A015-xxxx-E01	15	22	94.6	39.5	1,500	8,000	–	690
FM9-A019-xxxx-E01	18.5	26	116.7	48.7	1,500	8,000	–	890
FM9-A022-xxxx-E01/E02	22	33	138	57.9	1,500	8,000	10,000	1080
FM9-A030-xxxx-E01	30	45	189	82.1	1,500	6,500	–	2310
FM9-A037-xxxx-E01	37	56	234	101.2	1,500	6,500	–	2660
FM9-A051-xxxx-E01	51	71	321	150	1,500	5,000	–	5000
FM9 A100-xxxx-E01	100	136	636.6	190	1,500	4,500	–	14,790
FM9 A130-xxxx-E01	130	178	827.6	246.9	1,500	4,500	–	19,300
FM9 B037-xxxx-E01	37	45	350	74.7	1,000	5,000	–	3,000
FM9 B055-xxxx-E01-A	55	72	525.2	104.4	1,000	5,000	–	6,900
FM9 B071-xxxx-E01	71	105	678	134.8	1,000	4,500	–	14,790
FM9 B113-xxxx-E01	113	153	1,079	215	1,000	4,500	–	23,260

FM7 EO3 / FM7 HS3 / FM9 E03 / FM9 E04 / FM9 HS4 Series

	Rated power S1 (kW)	Rated power S6-40 % (kW)		Rated torque S1 (N·m)		Rated current (A)		Base speed (rpm)		Maximum speed (rpm)	Inertia [kg·cm²]
		Y	D	Y	D	Y	D	Y	D		
FM7-D055-S1xx-E03	5.5	7.7	10	35	13.1	20.3	20.7	1,500	4,000	15,000	210
FM7-D075-S1xx-E03/HS3	7.5	11	13	47.7	17.9	26.5	25.8	1,500	4,000	15,000	260
FM7-D110-S1xx-E03/HS3	11	15.5	20	70	26.3	38	40	1,500	4,000	12,000	690
FM7-D150-S1xx-E03	15	22	26	95.5	35.8	46.4	45.7	1,500	4,000	12,000	690
FM7-D185-S1xx-E03/HS3	18.5	26	32	117.8	44.2	49.2	49.2	1,500	4,000	12,000	890
FM7-D220-S1xx-HS3	22	33	40	140.1	52.2	62.3	61.7	1,500	4,000	12,000	1,080
FM9-A006-S5C0-E03	5.5	7.5	–	35	–	15.9	–	1,500	–	12,000	245
FM9-A008-S5C0-E03	7.5	11	–	47.8	–	21.5	–	1,500	–	12,000	353
FM9-A011-S5C0-E03	11	15	–	70	–	30	–	1,500	–	12,000	405
FM9-A015-S5C0-E03	15	18.5	–	95.5	–	39.5	–	1,500	–	12,000	650
FM9-A006-S1C0-E04/HS4	5.5	7.5	10	35	13	15.9	16.2	1,500	4,000	15,000	245
FM9-A008-S1C0-E04/HS4	7.5	11	13	47.3	17.7	21.5	21.8	1,500	4,000	15,000	353
FM9-A011-S1C0-E04/HS4	11	15	20	69	26.3	37.2	37.8	1,500	4,000	15,000	580
FM9-A015-S1C0-E04/HS4	15	22	26	94.6	35.5	52.7	54.7	1,500	4,000	15,000	690
FM9-A019-S1C0-E04/HS4	18.5	26	32	116.7	43.7	65	65.5	1,500	4,000	15,000	890
FM9-A022-S1C0-E04/HS4	22	30	37.5	138	52	77.2	77.5	1,500	4,000	15,000	1,080

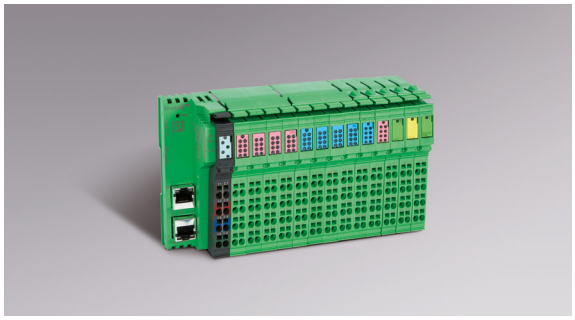
HAND WHEELS, REMOTE MODULES, SENSORS, LINEAR AND ANGULAR FEEDBACK

REMOTE MODULES

Easy-to-install I/O modules.

The Input/Output modules can be strategically placed in the machine tool depending on machine type and configuration.

These modular devices are easily expandable based on the machine configuration. Their small size ensures space savings.



HAND WHEELS

Fagor offers various hand wheels for axes movement and control.

A hand wheel is very useful during machine set up and also while proving the part for the first time.

Besides standard hand wheels, Fagor offers a range of intelligent models with their own screen that allows monitoring and execution of certain machine functions as well. They are available in both wired and wireless version.

FEEDBACK SYSTEMS

Fagor offers a very wide range of precision linear and angular optical encoders for enhanced accuracy and performance.

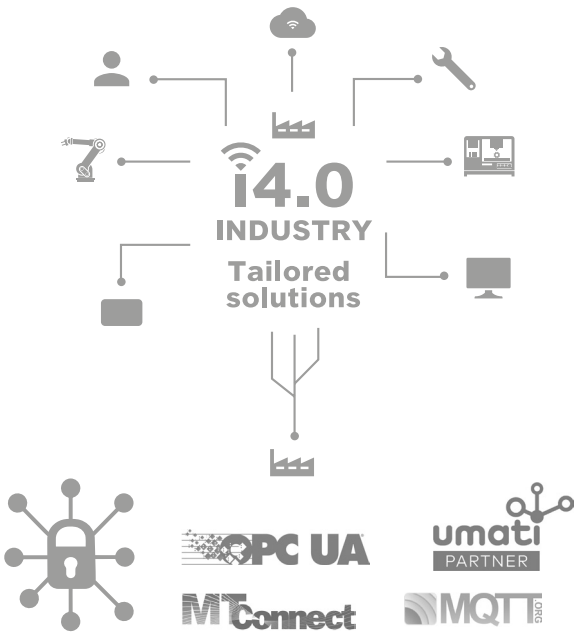
These linear encoders directly mounted on the machine surface ensure superior accuracy and compensate for thermal behavior of the machine and mechanical inaccuracies like lead screw compensation or backlash etc.

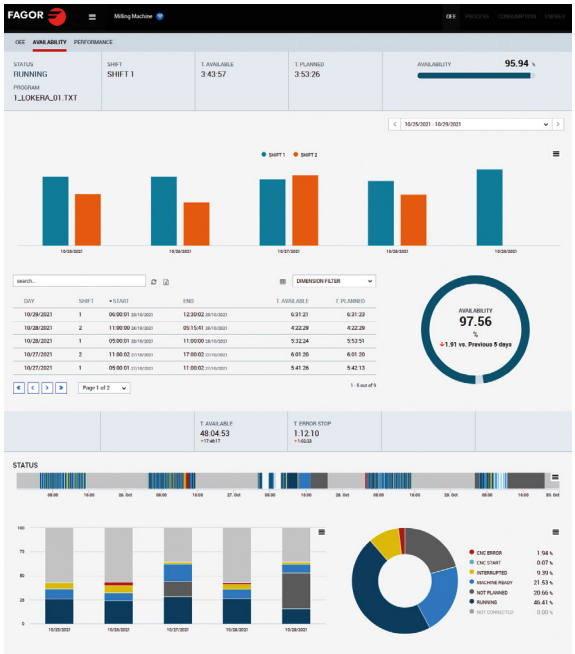
The linear encoders offer incremental or absolute position and are available in measuring lengths from 70 mm to 60 meters, with up to 10 nanometer resolution and 3 µm/m accuracy. They are equipped with Thermal Determined Mounting System which compensates for temperature changes on the machine axis. They can operate at speeds up to 180 m/min.

DIGITALIZATION SOLUTION

INDUSTRY 4.0

Fagor CNC systems are prepared for the complete digitalization of the machines on which they are installed. Fagor CNCs include the most advanced technologies, features, and protocols that facilitate interoperability with other production plants' systems.





FAGOR DIGITAL SUITE is Fagor's digitalization solution that makes it possible to connect the machines with the rest of the production and management systems, capturing all the necessary data and transforming it into valuable information to facilitate decision-making.

Main features:

- **Solution:** Standard or customized to customer needs.
- **Multibrand:** Compatible with the main CNCs in the market.
- **Multiprotocol:** OPCUA, UMATI, MTConnet, MQTT, etc.
- **Interoperability:** Can be connected with the rest of the plant's production systems.
- Standard or customized **HMIs**.
- Fast **implementation,** scalable in equipment, and features and less intrusive.
- **Cybersecurity:** ISO/IEC 15408:2009, ISO/IEC 18045:2008 and Common Criteria.

USER targeted solution

Aimed at users who are looking for indicators to improve the availability and efficiency of their machines, integrating information from the machine, technical office, staff, scheduling, production, etc.

- **MONITORING:** The modules that make up the standard user offer provide valuable information in real-time and can be organized by periods, different profiles, and side-by-side comparisons for key metrics such as availability, efficiency, quality, OEE, electrical, and energy consumption.
- **PLANNER:** The project planning module allows the user to schedule and distribute the jobs on the available machines while taking into account the operations that can be executed by each one of them, their availability, workload, etc.

MANUFACTURER targeted solution

Aimed at manufacturers who want to enhance asset management and release proprietary services. The Fagor Digital Suite provides the machine manufacturer with an intuitive toolkit that enables the creation of new digital products and services:

- All user-oriented services.
- Customized virtual cloud with management of assets, access, users, etc.
- Teleservice and maintenance: Allows remote access and diagnostics, warning, and alarm management, etc.
- The platform enables the remote update of firmware, PLCs, etc.
- Development and administration of applications for the machine tool inventory. Applications can be managed on a global or local level, and can be oriented with new services, maintenance, etc.

Other languages are available in the Downloads section from Fagor Automation's website.

Fagor Automation shall not be held responsible for any printing or transcribing errors in the catalog and reserves the right to make any changes to the characteristics of its products without prior notice.

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

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