

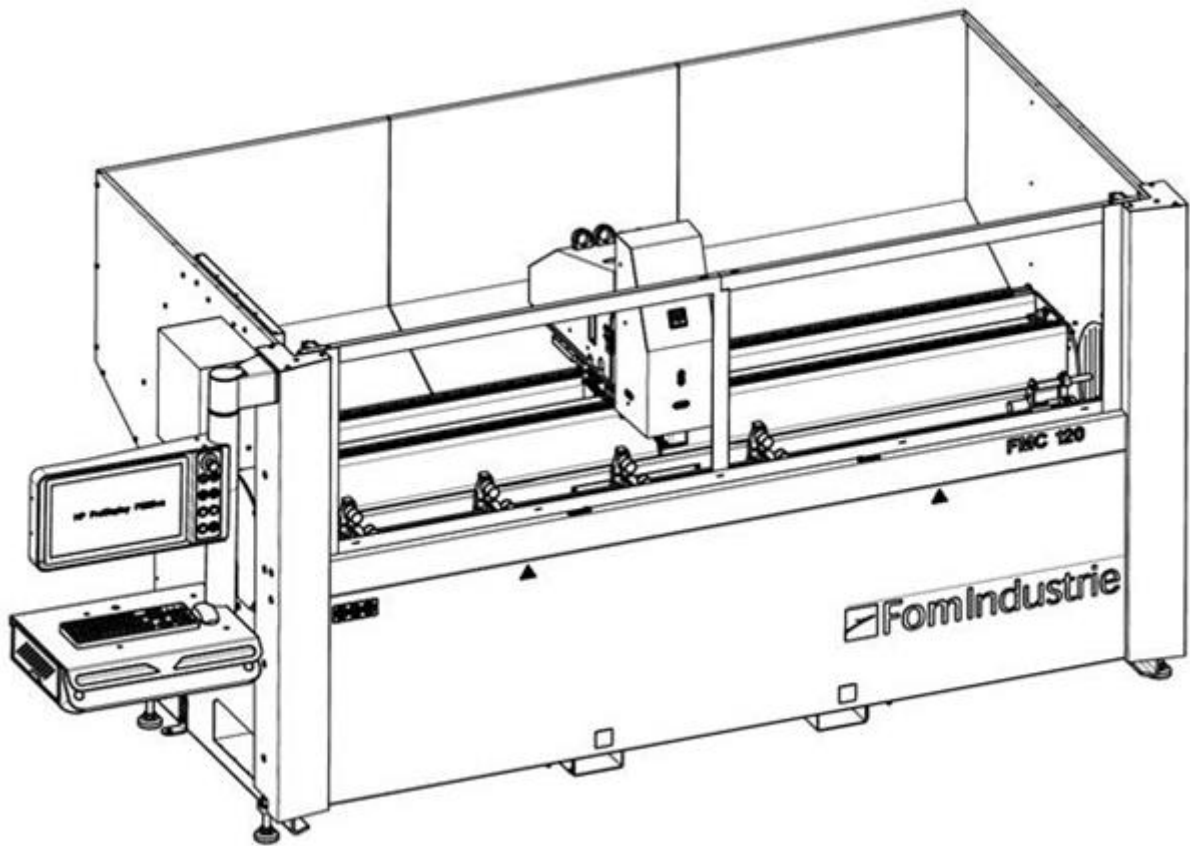
FMC SERIE UNO

CNC Machining Centre with 3 axes and worktable with pneumatic positioning at 0°/90°/180°



The FMC 120 machining centre has been designed to carry out drilling and milling operations on aluminium or steel profiles (max thickness 3 mm)

Overall dimensions and weight



Version	L (mm)	P (mm)	H (mm)	Kg
FMC 120	4200	2000	1900	1400
FMC 120	4580 (with tank for lubrocooling)	2000	1900	1400

Power supply	Total power installed	Air consumption for work cycle	Working pressure
3F - 380÷415 V - 50 Hz	3,5 kW	43 NL/cycle	7 bar



Technical characteristics

Structure

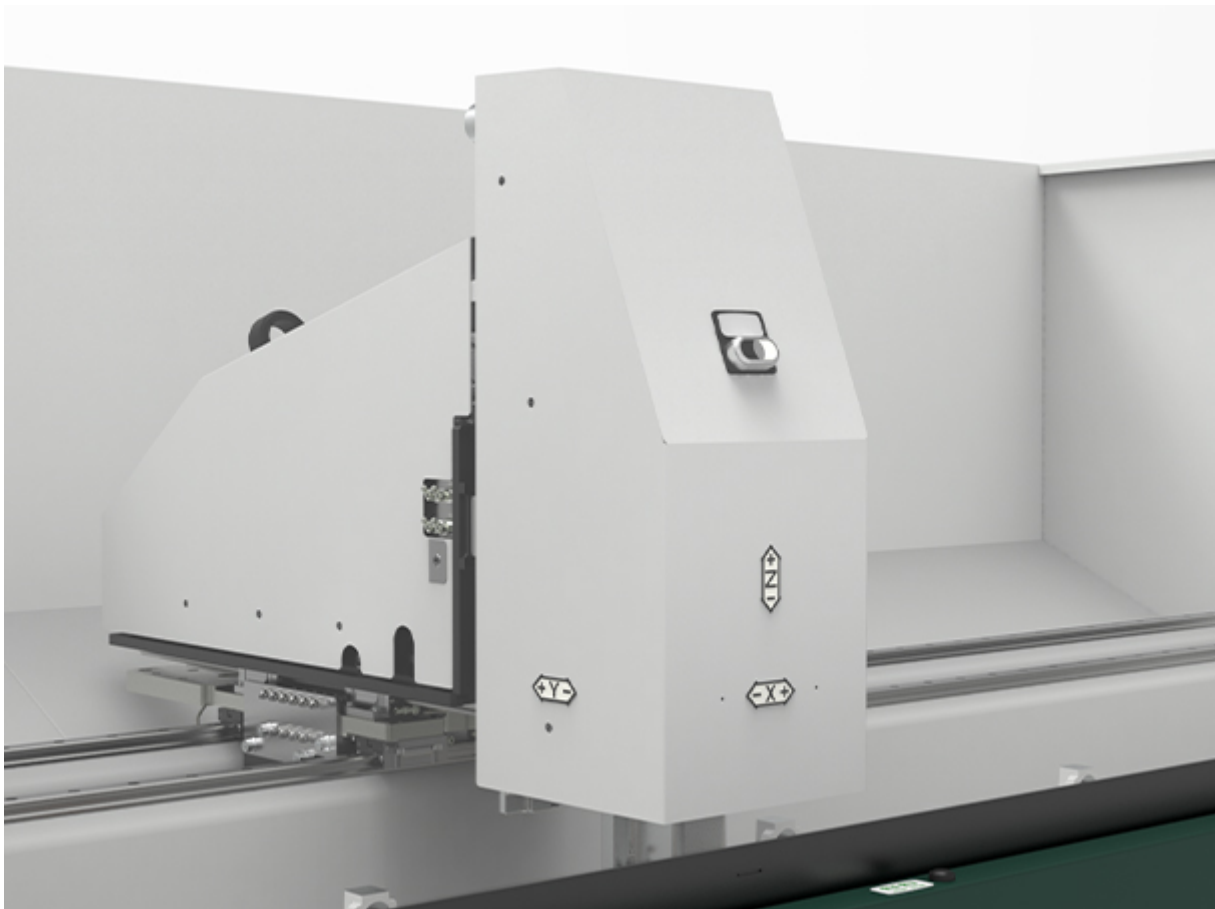
It consists of a machine bed and an upright sized to guarantee great stability and precision during machining operations. The conformation of the machine bed allows machining waste to be collected easily.

Axes movement

The independent axes are controlled by servomotors by means of a high precision, milled recirculating ball screw and preloaded lead screw for the Z axis (vertical) and the Y axis (transversal). Sliding of the X, Y, Z axes is along high precision linear guides. Movement of the X, Y and Z axes is interpolated.

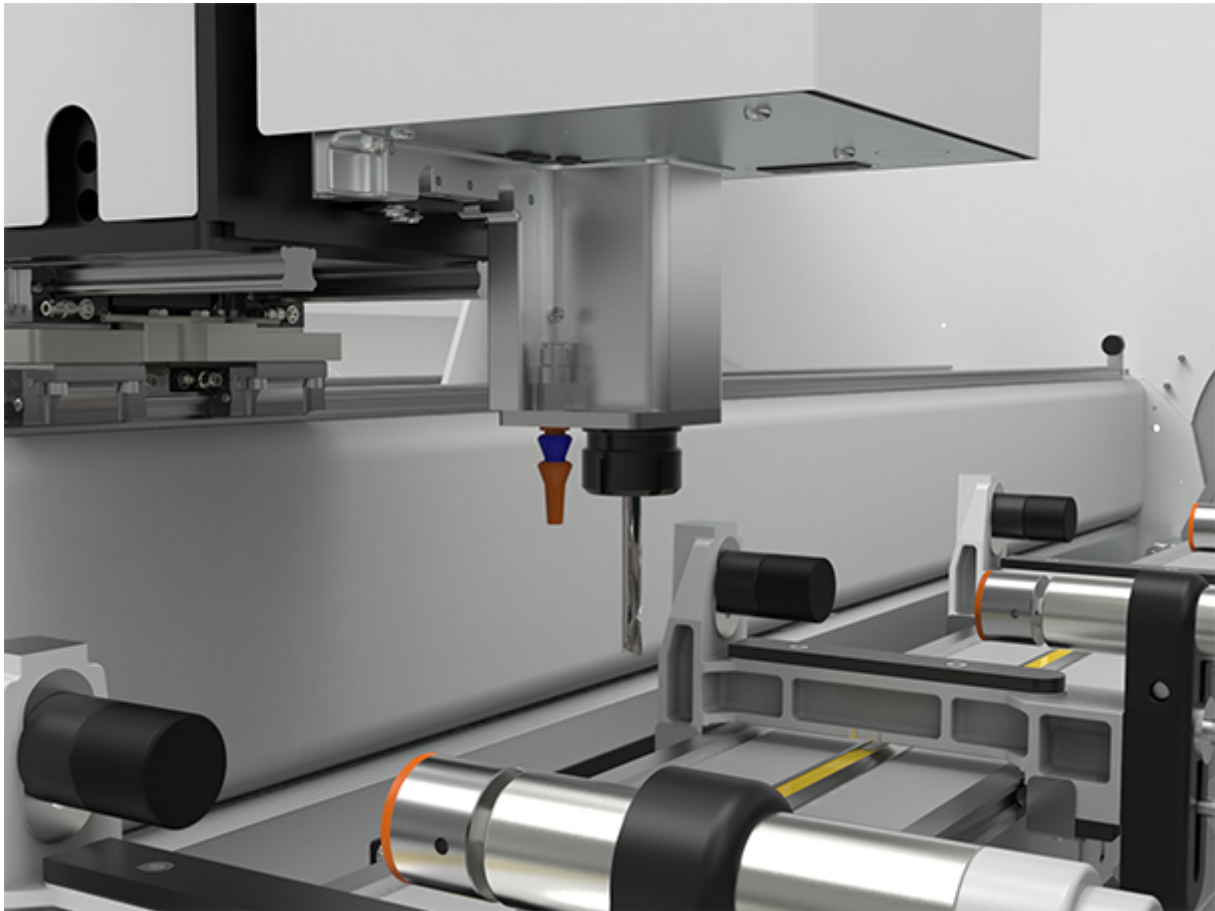
Machining head

This allows machining on 3 sides of the profile and on the 2 ends with the aid of milling disks and blades.



Electrospindle

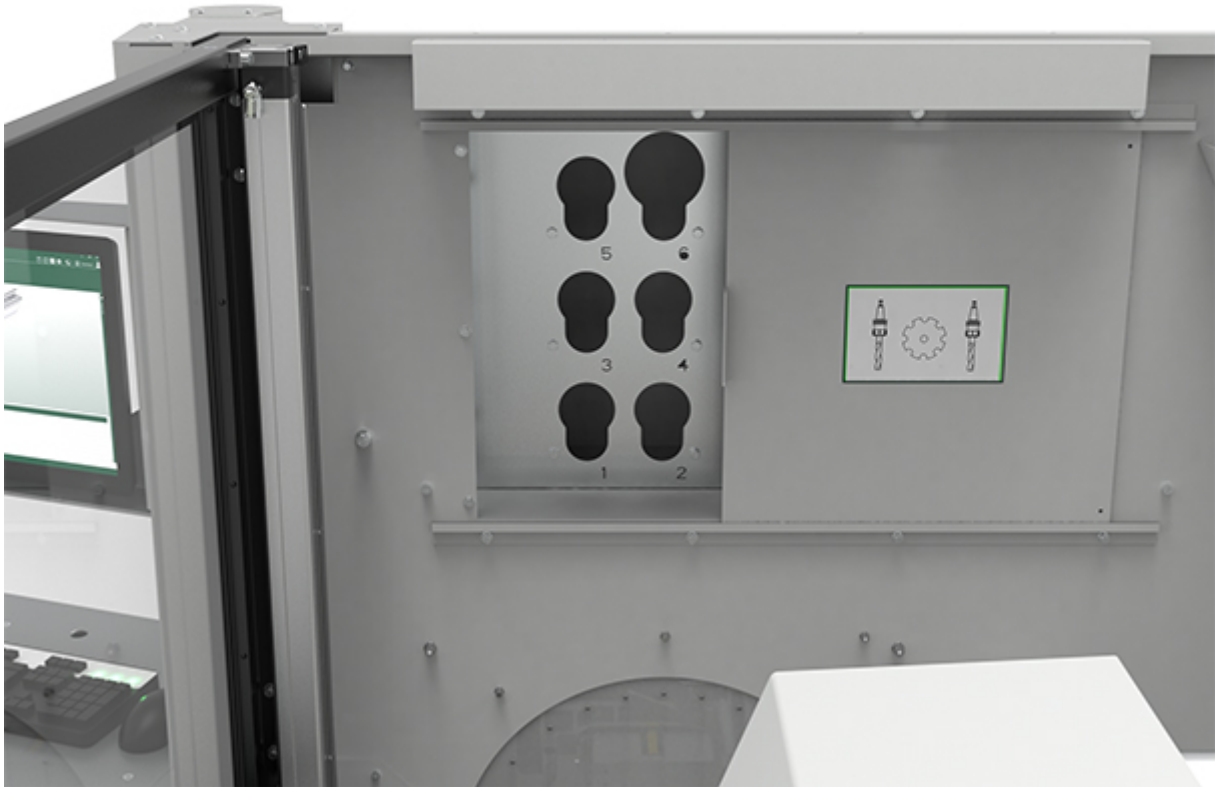
The air cooled 3kW ISO 30 spindle motor provides power and reliability in every working condition. The rigid tapping function can be activated on request. Motor speed adjustable from 1,000 to 17,000 rpm.



Tool magazine

The standard manual tool magazine has 6 locations (PIC. 1). On request, FMC 120 can be equipped with an automatic 5 location tool magazine positioned on the rotating beam. (PIC. 2)

PIC. 1



PIC. 2



Tools lubrication

Minimum lubrication required. The lubricant used is pure oil or, in addition to this if requested, emulsion with a dedicated tank (lubricating coolant).

DRY MACHINING

Tool cooling system with localised flow of cold air associated with the choice of dedicated tools. It allows machining without the use of lubrication, achieving excellent finishes at high speeds. The advantages of dry machining can be summarised as follows:

- piece drying and cleaning phases are eliminated
- cleaning of the working area
- no waste fluid disposal costs
- no fume extraction system costs
- quieter machining operations
- longer tool life

Lubrication of mechanical components

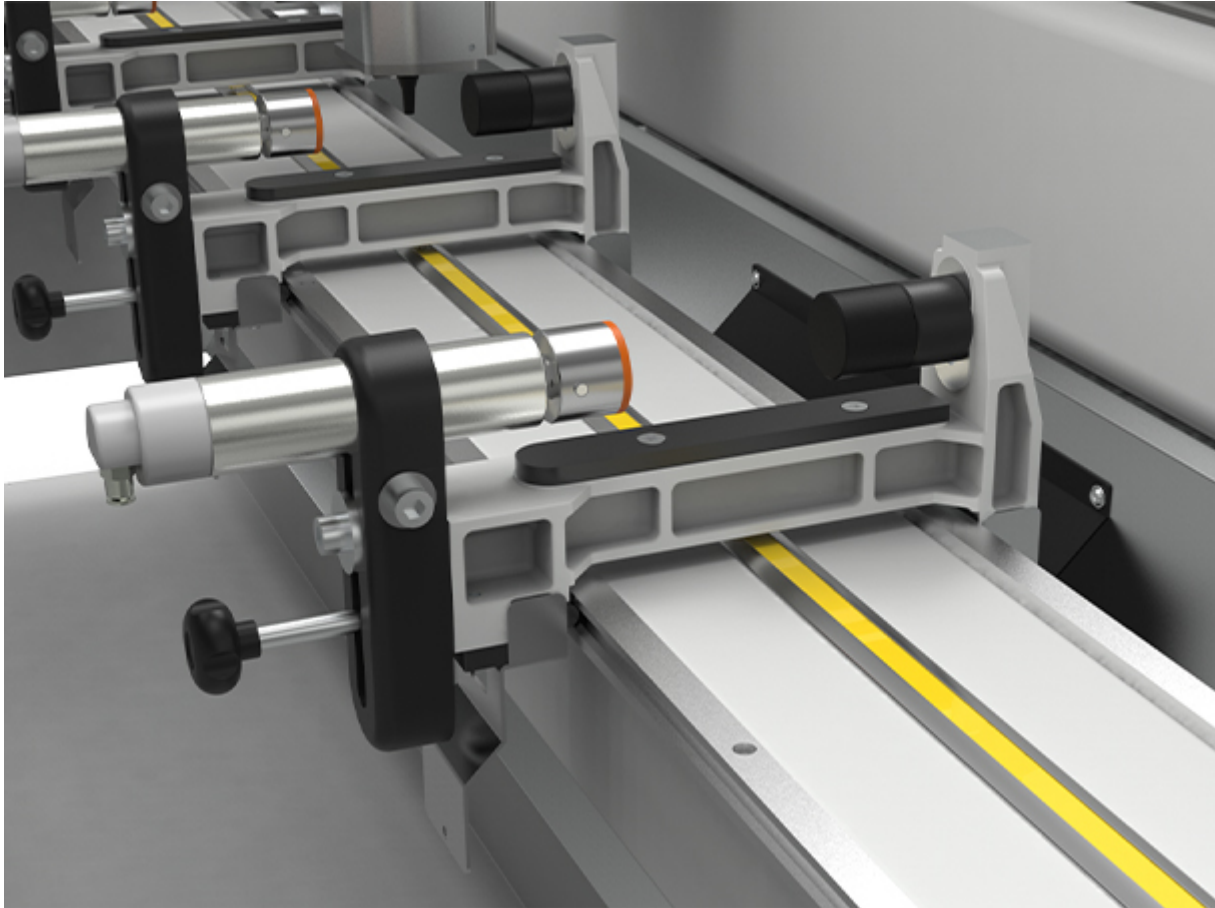
A gun is supplied to carry out manual greasing.

Work area organisation

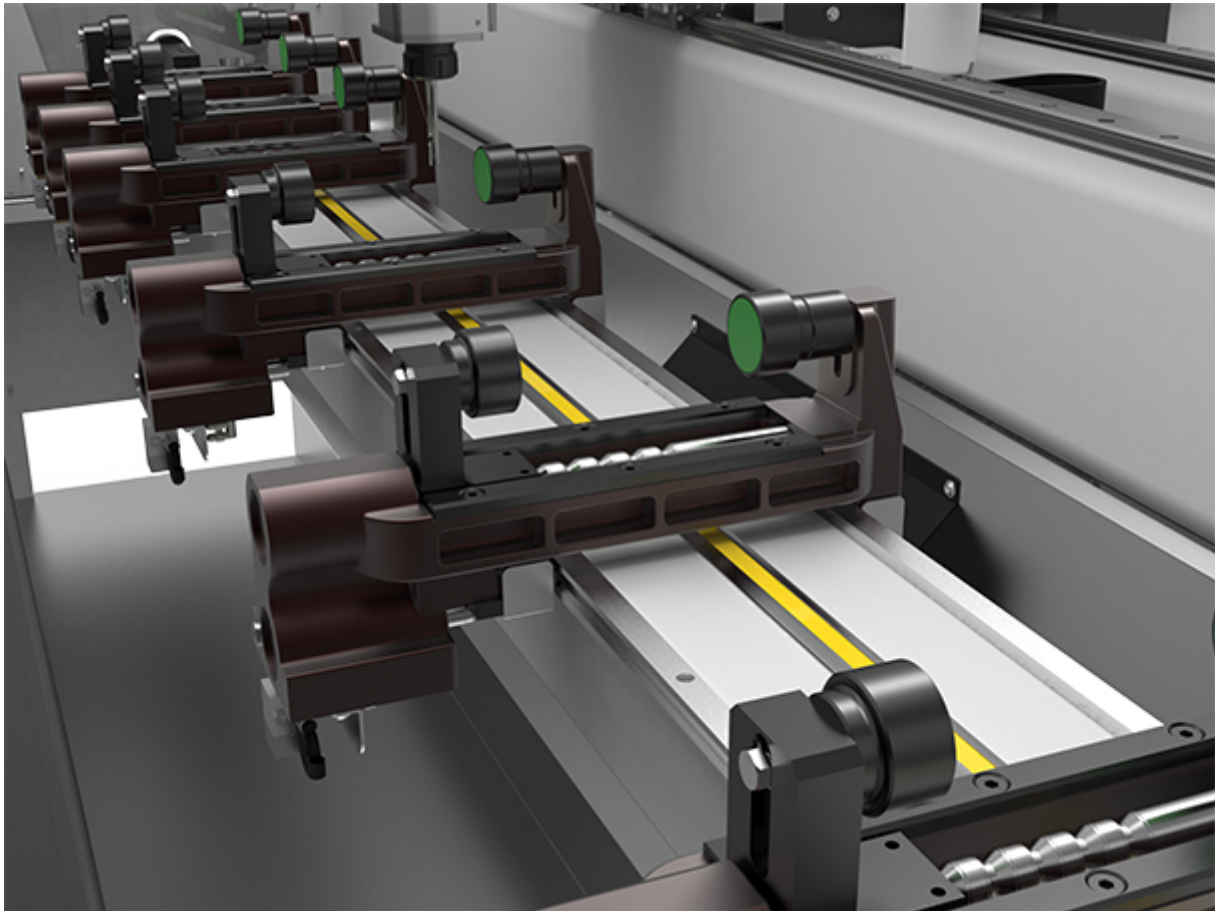
Vices

Supplied as standard with four cast aluminium pneumatic vices (PIC. 1) with dual working pressure (low and high) with manual longitudinal positioning. Their small size reduces the need to reposition the vices and ensures firm locking very close to the machining point. Vertical and transversal adjustment of the presser is quick and does not require the use of tools. Vices with manual positioning and automatic locking of the longitudinal position are also available on request. (PIC. 2)

PIC. 1



PIC. 2



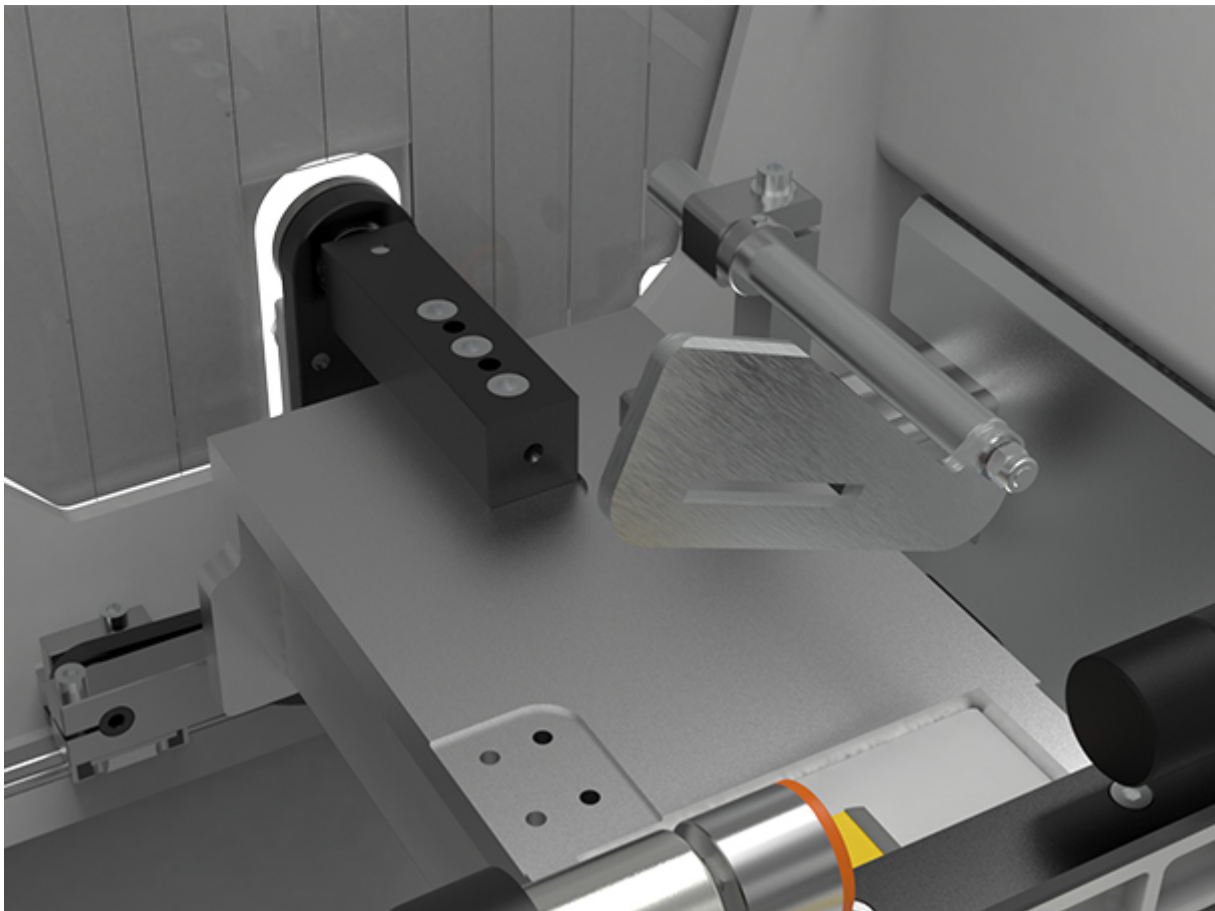
Stops

Comprises two manual stops: one on the right side and one on the left side of the beam, also used for two-phase machining of profiles that are longer than the CNC stroke.

On request the side stops can be moved pneumatically.

EASY TO SET

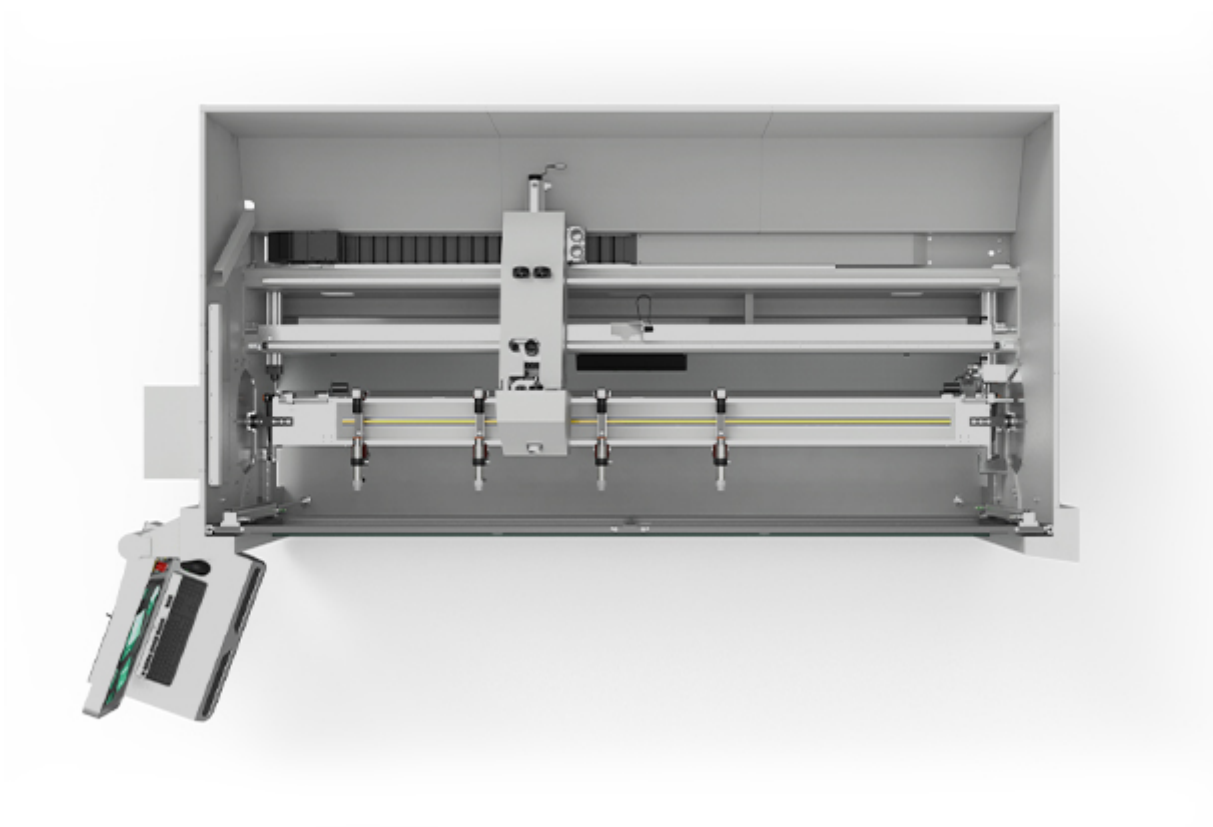
The Easy to set package automates setting operations and minimises manual machining times. This is because the vices position themselves automatically via the upright and the longitudinal position is locked pneumatically. Intervention of the side length stops is commanded pneumatically. The operator only has to position the profile inside the vices and start the machining operation. The Easy to set package can be supplied on a maximum of 6 vices.



Protection and safety devices

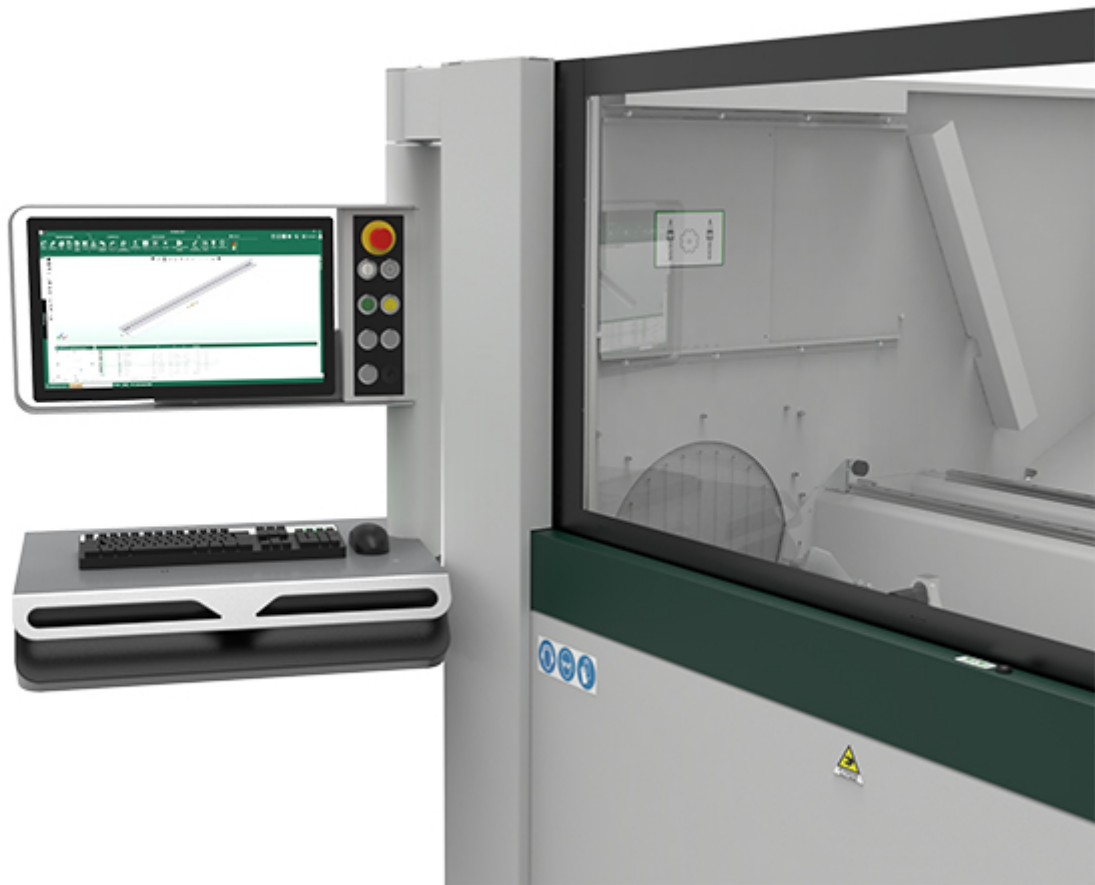
The CNC machining centre bears the CE symbol in compliance with the content of Directive 2006/42/CE (Machine Directive). The design and construction of the FMC 120 machining centre complies with the safety regulations in force in the European Union and in the main industrialised countries (USA, Canada, etc). In particular, for the European Union market the following legal provisions are complied with: Directive 2006/42/CE (Machine Directive), Directive 2006/95/CE (LVD) and Directive 2004/108/CE (EMC). The FMC 120 machining centre is also equipped with special safety devices designed to comply with the relevant product standards and the regulations on health and safety in the workplace.

Perimeter guard system around three sides of the machine and retractable front door ensuring maximum visibility during machining operations and accessibility during maintenance.



Control console

Attached to the protection cabin and used to execute commands and run programs. 24" display



PC comprising of:

128 GB SSD
Gigabit RJ45 network Interface
8 GB RAM
Windows 10 operative system
USB ports
3-year international "on site" warranty

The electrical system has been engineered in compliance with the provisions contained in European Union directives 2006/95/CE (LVD), 2004/108/CE (EMC) and conforming to the applicable standards governing the safety of electrical systems (EN 60204-1, EN 61000-6-2 and EN 61000-6-4). Special care has been given to the provision of emergency cables and to the system for activating and resetting them. If any faults occur, the operator is alerted by light signals and messages on the monitor. In the event of faults or breakdown, the protection devices inside the panel are designed to prevent injury to persons and/or damage to the machining centre itself.

If for any reason the interaction between the CNC machining centre and the environment in which it is installed contravenes any of the above mentioned conditions, it will be essential to agree with the purchaser a comprehensive solution for achieving the necessary safety conditions so that the purchaser can make the area designated for installing the machining centre suitable and safe.

LOLA



LOLA is the cloud based IoT platform created by Fom Industrie for Industry 4.0, with the aim of monitoring and increasing productivity and efficiency.

The LOLA web application can be accessed via browser (Safari, Chrome), on a PC or mobile device.

LOLA receives data from the FOM Industrie machine tool, via internet connection, and generates statistics that can be consulted by the end user, regarding:

- productivity
- efficiency
- diagnostics
- scheduled, periodic and predictive maintenance
- alarms, push notifications and predictive warning

Characteristics

- Developed in responsive technology, which adapts the graphic layout to the device being used.
- Plant Manager for grouped display of your machines and alarms, based on factory or manufacturing department
- Timezone/DayTimeSavingLight Management
- LOLA application users (unlimited, until expiry of the license) with two privilege levels, to define criteria for hierarchical content visibility.
- Various machines can be associated with a single operator, or several operators can be associated with various machines.
- LOLA is now available in 5 languages: Italian, English, French, Spanish, German

LOLA allows control of the following with a single glance:

- machine status and efficiency
- machining statistics
- diagnostics for key machine components (e.g. electrospindles, tools, sensors..)
- alarms and warnings log for the individual machine or the factory (*for FOM LOLA compliant machines)
- push notifications for periodic and predictive maintenance events. Log of operations confirmed in LOLA.

The data indicate every time a key component is coming to the end of its lifecycle, so that it is possible to plan the replacement operation with the FOM service department or independently, thus minimising machine stoppages.

Export of data for integration with MES systems

With the additional Lola Exporter license it is possible to export the data collected by LOLA in CSV format locally, allowing subsequent integration with the most common MES systems

FST CAM 4 graphic interface

Graphic interface based on the Windows operating system for planning the machining operations and the pieces which automatically generates the CNC program that can be executed by the machining centre.

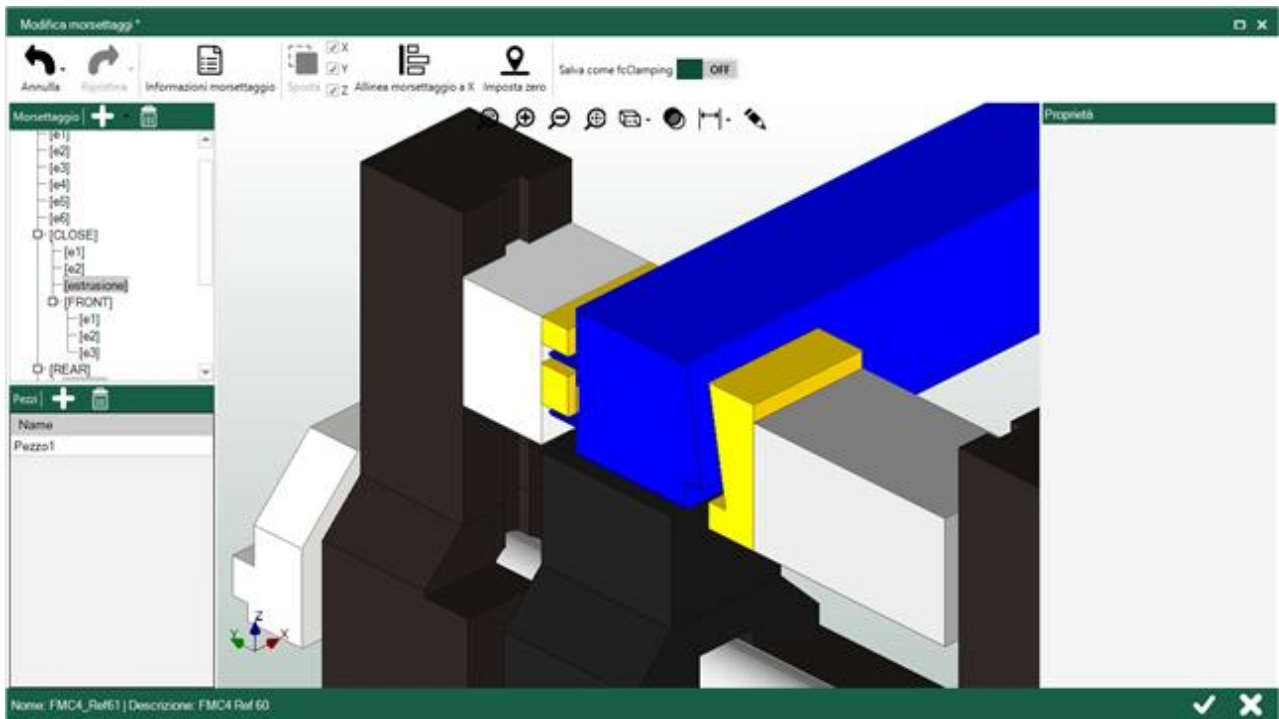
Program features:

- Display of the workpiece and machining operations in a CAD 3D environment
- Profile cross-section display in DXF format
- 3D display of tool archive
- Machining optimizations
- Dynamic display of the machining operations
- Graphic display of the working area
- Simplified management of machining process sequence
- Display of technical features of pieces and tools
- Graphic user interface
- Parametric machining management
- Creation of repeated machining operations
- Automatic calculation of optimal vice positioning
- Machining lists management
- Graphic interface for numeric control management

Optionals:

- Licence for FST CAM 4 program for office
- Additional licence for FST CAM 4 program for office
- "Clock" time calculation module program user license for FST CAM 4
- FSTCAM4 module to design and manage special clamping operations (PIC. 3)
- 2D custom milling Module for FST CAM 4
- SOLID PLUS software licence (3+1 or 4 axis CNC machining centres)
- SOLID PLUS additional software licence (3+1 or 4 axis CNC machining centres)
- Licence for FST STATISTICS C4 program
- SW licence FSTConverter for data import in NCX format
- Module for rigid tapping and chase tapping
- Flow drilling management
- Data import software in accordance to FOM protocol + Wireless optical bar code and QR code reader
- Data conversion driver

PIC. 3



Remote Assistance

Used to check the machine data, the user programmes, the input/output signals and system variables in real time, providing a rapid solution to problems and a drastic reduction in machine stoppage. Thanks to remote assistance it is also possible to install updated software versions. The machining centre is enabled for this type of service. The duration of the service is limited to the machining centre warranty period.

Maintenance equipment

The following are supplied with the machining centre:

Tool holder locking device for insertion/removal of tools
Set of wrenches

Turnkey System

FOM INDUSTRIE not only offers its Clients a machine tool, but also a "turnkey" productive system to solve all of the problems involved in production. The company's experience is at the client's disposition to optimise the relationship between machining centre performance and the technological machining requirements, the service relies on:

A CAD-CAM system for creating a project which provides for piece design, automatic creation of the program and simulation of the machining operations

A vast archive of projects created for companies operating in important industrial sectors (automotive, railways, naval, furniture, transport, aeronautic, textile)

Facilitated contacts with the most important and qualified suppliers of tools and equipment

Documentation

Every machining centre comes with a printed copy of the following documentation: User and maintenance manual, complete with electric and pneumatic diagrams; Control unit user's manual. The manuals are available in Italian and English

Standard configuration:

- Servo-ventilated three-phase spindle motor 3 kW Regulation of spindle rpm by numerical control – inverter (1000/17000 rpm)
- 6 position tool-holder for manual change with pneumatic locking (ISO 30)
- Pneumatic rotation of the work table 0° to 90 to 180°
- Mobile control console with PC, 24" touch screen monitor
- No.4 pneumatic vices with manual positioning and double pressure with safety valves
- MANUALLY ADJUSTABLE Profile reference stops on right and left of work table
- Minimum quantity lubrication (MQL) with pure oil
- Greasing gun
- Chip bin
- Perimeter safety casing on 3 sides and retractable front door
- Licence for FST CAM 4 program
- Movable control console
- 24" Display
- Collective FST CAM 4 training course at FOM Industrie (excluding transfer costs)
- Potentially Industry 4.0 subsidizable asset

Technical specifications:

Working area with direct tool L=100 spindle end		
Axis X	top face only	mm 2660
Axes Y and Z	for machining on 3 faces of profile	mm 180 x 120
Dynamic performance		
Axis X	Speed	m/min 25
Axis Y	Speed	m/min 13
Axis Z	Speed	m/min 11
Axes travel		
Axis X	Longitudinal travel	mm 2690
Y axis	Transversal travel	mm 360
Z axis	Vertical travel	mm 225
Axis X	Milling capacity	mm 2660
Y Axis	Milling capacity	mm 250
Z Axis	Milling capacity	mm 120
Pneumatic rotation of the work table		From 0° to 90° to +180°
Distance between stops		mm 2600
Work table height		mm 850
Profile positioning and locking		
Vices with manual longitudinal positioning		No. 4 supplied as standard
Transformation of standard vices into vices with longitudinal positioning via upright and pneumatic locking of the position		optional
Max number of vices		n. 6
Transformation of standard vices into vices with pneumatic locking of the longitudinal position		optional
Additional vice with manual longitudinal positioning		optional (max 2)
Additional vice with manual longitudinal positioning and pneumatic locking of the longitudinal position		optional (max 2)
Additional vice with longitudinal positioning via upright and pneumatic locking of the position (PATENT PENDING)		optional
Fixed and manually tilted stop		No. 2 standard
Retractable fixed pneumatic stops (N. 2)		optional
Machining of oversized profiles		supplied as standard
Protective tunnel and external stop		optional
Electrospindle		
Max power		kW 3 (S6)*
Max rotation speed		rpm 17000
Tool coupling		ISO 30
Cooling		Air
Tool cooling system with localised flow of cold air		optional
SW Module for rigid tapping		optional

* Sequence of identical operating cycles. Each cycle is made up of an operating time at constant load and an operating time with no load.

Lubrication of mechanical components

Centralised manual lubrication of straight guide slide blocks and recirculating ball screw lead screws		supplied as standard
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Tool magazine

Manual tool change and tool magazine (6 locations)		supplied as standard
Automatic tool change and tool magazine (5 locations)		optional
Maximum blade diameter in the magazine (horizontal)	mm 75	
Maximum tool length in the magazine	mm 130	

Tool lubrication

Minimum quantity lubrication		standard
Lubrocooling with use of water-oil + dedicated tank		optional

Chips, waste and fumes removal

Chip and waste collection in base		standard
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Control and software

Processor		Intel i7
24" screen		standard
USB ports		1 console + 2 in the PC
SSD		128 GB
Memory		8 GB
Wireless bar-code reader		optional
Software		Windows 10 - FST CAM 4
Lola ready		standard

Optionals:

- Transformer for special three-phase 7 KVA power supply (for three-phase voltages other than 380-415 V / 50-60 Hz.)

- Additional charge for electrical version UL-CSA
- Transformer for special single-phase power supply (for single-phase voltages other than 230 V / 50-60 Hz.)
- Electric cabinet cooling plant

Tool cooling system with localised flow of cold air

- Additional charge for EAC (Eurasian Conformity) certification
- Pneumatic vice with manual positioning and locking (maximum 2 supplementary vices)
- Transformation of standard vices into vices with longitudinal positioning via upright and pneumatic locking of the position (maximum 2 supplementary vices)
- Vice transformation with pneumatic block
- Independent vice closing for multi piece management
- 5-position automatic tool magazine (ISO 30)
- External stop with tunnel
- Two retractable pneumatic side stops
- Lubrocooling with recycling of cooling liquid in tank (advisable for iron materials)
- Flowdrill (for steel, not suitable if the profiles are already galvanised)
- Rotation of the work table to intermediate angles with manual stop
- Equipment for machine handling with bridge crane
- UPS (Uninterrupted Power Supply) to allow PC switch-off in the event of a blackout
- TOOL SET ALUMINIUM TYPE 1:

N° 1 hole drill bit HSS single flute \varnothing 3 L=61 mm

N° 1 hole drill bit HSS single flute \varnothing 6/12 L=100 mm

N° 1 MD single flute milling cutter \varnothing 10 covered L=72 mm

N° 1 MD single flute milling cutter \varnothing 6 covered L=60 mm

N° 4 collet holder with ring nut ER 20 H=50 mm

N° 1 collet \varnothing 2/3 ER 20

N° 1 collet \varnothing 5/6 ER 20

N° 1 collet \varnothing 9/10 ER 20

N° 1 collet \varnothing 11/12 ER 20

- TOOL SET IRON TYPE 1:

N° 1 MD single flute milling cutter \varnothing 6 L=56 mm

N° 1 MD single flute milling cutter \varnothing 8 L=67 mm

N° 2 collet holder with ring nut ER 20 H=50 mm

N° 1 collet \varnothing 5/6 ER 20

N° 1 collet \varnothing 7/8 ER 20

- ISO 30 cone with milling cutter \varnothing 75 mm thickness 6 mm
- ISO 30 ER 20 H 50 collet holder
- ISO 30 ER 20 H 70 collet holder
- Lubricating grease for guideways (5 Kg tank)
- Lubricating grease for guideways (1 Kg tank)
- Tank of oil for cooling system by emulsified oil (18,5 lt)
- Tank of oil for Flowdrill (5 l)