Quotation

Date 12th June 2018

Customer

Cms
glass technology

SPEED 13 MB

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MACHINE MODEL "SPEED 13"

SPEED 13 is a work Numerical Control Work Centre with three axes (X, Y, Z) for the processing both thin and thick flat glass sheets. In standard configuration it can perform each type of edge grinding and polishing as well as arising, milling, edging and drilling from the top.

ADVANTAGES

CMS, thinking of its customer's needs, has re-engineered its 3 and 4 (optional) axes multifunctional work centres range, making it even more performing and reliable.

Practicability

- The design of the machine allows, through the user-friendly software, infinite possible processing's;
- Water and energy save, compared to vertical and horizontal multi-spindle edging systems.

Flexibility

- Possibility of working glass sheets of various sizes, in all three dimensions;
- Possibility of working rectangular or shaped glass sheets;
- Possibility to perform every type of grinding, even polished, on glass edge (e.g. OG, triple pencil, bull nose, water fall, etc.)
- Possibility to carry out every milling, drilling from the top and writing (optional);
- Possibility to realise engravings, bevelling's at 5°, diamond disk cutting with the installation of the 4th axis (respective kits and 4th axis optional).

Productivity

- Powerful **13,5 kW (18HP) electro-spindle with rotation speed 0-15.000 rpm** for superior qualitative and quantitative performances;
- Manipulation time reduction compared to vertical multi-spindle edging systems: once loaded, the glass sheet is worked from the machine, and it is unloaded only when the piece is completely finished;
- Tool crib with automatic tool change;
- Tool change time reduction thanks to the high speed of axes with brushless motors.

Quality

- The extremely narrow tolerance limits for all the components of the machine production and assembling, and its rigid and stable structure, allow extremely high precisions on the finished piece;
- Square of rectangular glass sheets (not available with vertical multi-spindle edging systems);
- Production of pieces always identical allow a product standardization and a constant quality offered to the final customers.

Simplicity

- Intuitive programming software with an integrated two-dimensional specific CAD system, allows to complete every type of work desired;
- Possibility of importing .dxf files, makes work with your clients easier;
- Management of the wear on the polishing wheels through a SW function allowing a control on the state of the wheel in use;
- Remote diagnosis, allows visualisation on the state of the machine from any other authorised PC.

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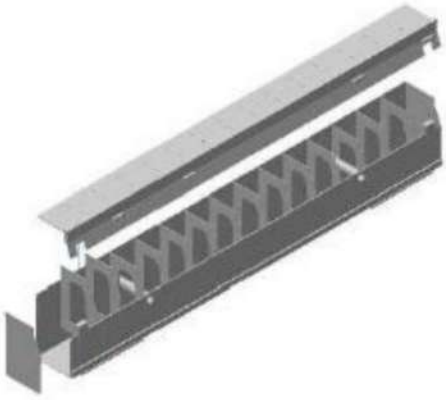
STRUCTURE AND MAIN COMPONENTS

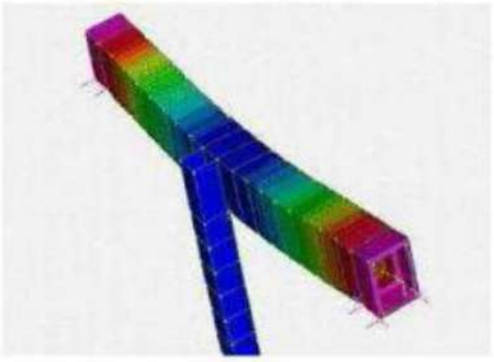
The dimensional structure was realised through a sophisticated programme of Finite Element analysis (FEM), which verifies also the dynamic loads of the components of the machine, allowing CMS to project the structure and chose the movement systems (precision guides and screw ball sliding blocks) which guarantee a high functioning power, geometric precision and work reliability at high speeds, also in the case of heavy works.

To guarantee duration against corrosion the whole frame undergoes an antirust treatment with sanding, and ceramic painting.

MAIN STRUCTURE

The main structure has a wide section "monoblock" base in electro-welded steel, properly stress relieved. The base represents a solid and tough support to the mobile bridge providing the working unit with a well-balanced and rigid support resisting to the greatest working stresses and granting higher performances both in quality and accuracy.
The designing care and attention of the basement run to a production that simplify the operator access and collect the working liquids. In this way allow the immediate connection to the water treatment systems.





MOBILE BRIDGE

Mobile bridge is made with a solid "monoblock" carpentry single-shore, anchored to the basement. It moreover hold the "Z" car on which is installed the electro spindle.

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WORK TABLE

The work table is completely made in high thickness duraluminium, with dimensions 2700 x 1200 h15 mm, and is accurately levelled at the end of machine assemblage in order to guarantee the perfect flatness and the best finishing on the manufacturing.

Main features are:

- 770 mm height from the floor simplify and make less burdensome glass sheets loading and unloading operations;
- Great solidity, strength and stiffness.

The air-vacuum manifolds are positioned on the two sides of the work table, they are used for the connection of suction cups and reference stops to the centralized systems of the machine.

TOOL CRIB

The tool crib is fixed to the structure of the machine on the back. It can house a max. quantity of 16 tool holders and is completely protected by a stainless steel cover, automatically activated though a spring system commanded by the mobile bridge movement at every tool change.

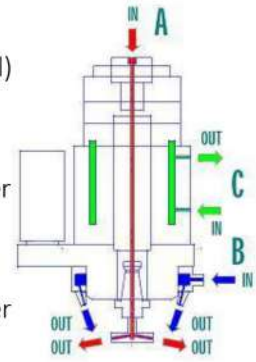
ELECTROSPINDLE AND TOOLS COOLING SYSTEM

The electro spindle is completely cooled through a liquid in order to always guarantee the best use conditions, and so the maximum performance and duration *(see picture)*.

A. Internal water for tool cooling, require clean water and 15 l/min capacity;

B. External water for tool cooling, can use recycled water with the installation of a tank (optional) for working water collecting and 100 l/min capacity;

C. Electro spindle cooling system with forced air and glycol mixed with water heat exchanger through dedicated radiator.



It is recommended a 25 µm water filter if is required the connection to the company water treatment system for all the cooling circuits.

AXES MOVEMENT

The machine is managed by a Numerical Control and equipped with three principal axes, interpolated and brushless motors:

- **X (2800 mm):** left and right movement of the Z axis car, on rectified and tempered guides and 4 contact points recirculating ball bearings. It is actuated by highest precision rack and pinion system.
- **Y-V (1650 mm):** frontward and backward movement of the mobile bridge, on rectified and tempered guides and 4 contact points recirculating ball bearings. The movement is made with two synchronised motors with electronic Gantry system and connection with highest precision rack and pinion.
- **Z (350 mm):** up and down vertical movement of the operating unit, on two rectified and tempered guides and ball bearings. The movement achieved by highest precision rack and pinion.

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VACUUM CENTRALIZED SYSTEM

The machine is equipped with a vacuum system for the management of suction cups. Vacuum is done by a liquid ring pump with the possibility to install a water recycling tank (optional). The liquid ring pump is positioned on the left side of the machine.

COMPRESSED AIR CENTRALIZED SYSTEM

The plant has to be properly dimensioned for at 6 bar air pressure and a capacity of 500 l/min. The compressed air is needed during the tool change, to produce an air cushion between the top of suction cups and the slabs to simplify loading/unloading operations, for the work of pneumatic reference stops and for cleaning operations.

LUBRICATION PLANT

Centralized automatic lubricating plant by forced-injection of *X, Y* and *Z* axes, managed by the Numerical Control at foreseen intervals, without manual intervention and without stopping of the machine. Pressure control and tank minimum level signals.

REMOTE CONTROL

All the main commands are repeated on the remote control. This simplify and speed up all operations necessary to prepare the working table (tooling set up, vacuum cups and reference stops positioning, ect…) allowing the operator to control all the programmed movements.

SAFETY AND PROTECTIONS

The machine is equipped with all safety devices necessary to give the operator maximum protection during the normal running.

D. The electric cables and the water pipes are supported by a cable rack chain.
E. The safety pressure switch stops the machine should the compressed air be in short supply.
F. A vacuum device stop the machine in case of insufficient value of vacuum.
G. A servo-valve stops the water flow when the machine is not working.
H. Axes load limiting device prevent from working beyond the established threshold limits.
I. The coverings in stainless steel and the bellows protect all moving parts against water and dust.
J. The integral cabin, with manual frontal sliding doors prevents access to the working area and reduces the sound level.

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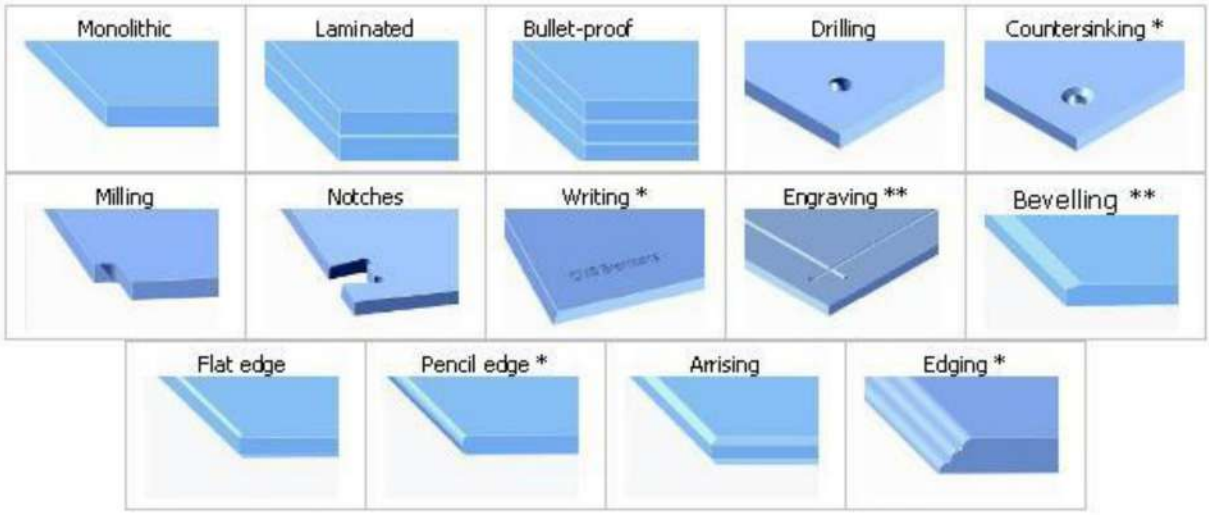
POSSIBLE PROCESSINGS



* For these processing it is required the addition of extra tools.

** For these processing it is requested the installation of the 4th axis and the dedicated kit.

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BASE MACHINE TECHNICAL DATA		
X axis maximum stroke	mm *(inch.)*	2800 *(110)*
Y axis maximum stroke	mm *(inch.)*	1650 *(65)*
Z axis maximum stroke	mm *(inch.)*	350 *(14)*
X work table dimensions	mm *(inch.)*	2700 (106)
Y work table dimensions	mm *(inch.)*	1200 (47)
Type and N° positions of tool crib		Rear - 19
Electro spindle power and rotation speed	kW *(HP)* – giri/min *(rpm)*	13,5 *(18)* – 0÷15000
X axis speed	mm/min *(feet/min)*	0÷54.000 *(0÷177)*
Y axis speed	mm/min *(feet/min)*	0÷54.000 *(0÷177)*
Z axis speed	mm/min *(feet/min)*	0÷7.000 *(0÷23)*
Tools max diameter	mm *(inch.)*	150 *(6)*
Max workable thickness	mm *(inch.)*	50 *(2)*
Tools external water consumption	l/min *(gal/min)*	85 *(22,5)*
Tools internal water consumption	l/min *(gal/min)*	15 *(4)*
Vacuum pump	l/min *(gal/min)*	5 *(1,3)*
Min water pressure	bar *(PSI)*	4 *(60)*
Air consumption	l/min *(gal/min)*	550 *(145)*
Min air pressure	bar *(PSI)*	6 *(90)*
Voltage and frequency	V - Hz	400 - 50
Medium sound level	dB	75

Note: data included in this table refers to the standard of base machine. If included, some optional will modify base data.
The useful axis stroke indicated in the above chart are purely approximate. The machine layout (to be sent back to CMS signed for acceptance) indicates the specific useful stroke of each axis.

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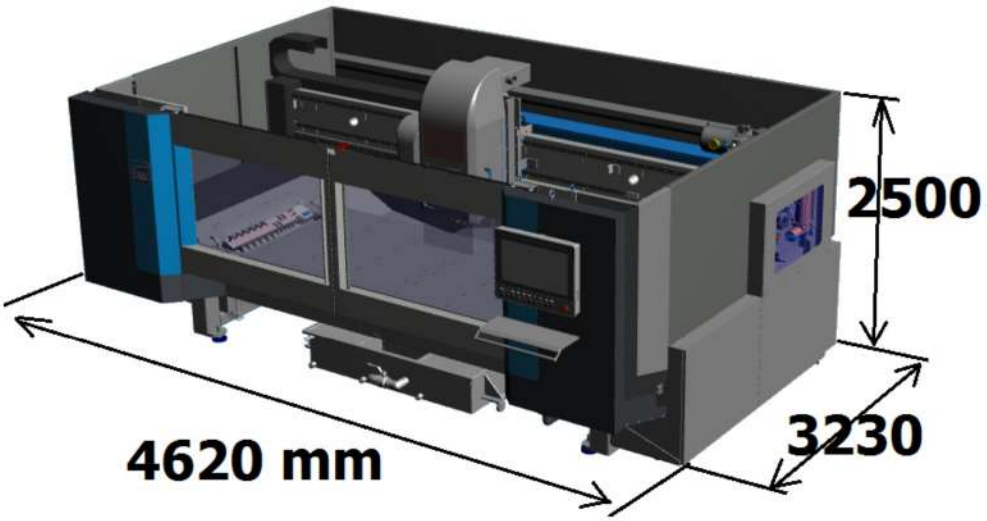
DIMENSIONS OF THE MACHINE



JA.51.44 Electro-Spindle connection ISO40 - Power 13,5 kW (18 Hp) - 15000 rpm N. 1

The operating unit consists of an electro-spindle asynchronous 3 phases - 2 poles, with great power entirely **engineered and produced by CMS**, its main features are:

- Maximum power up to **13,5 KW (18 HP), torque 22,6 Nm at 6000 rpm**;
- Adjustable **rotation speed 0-15.000 rpm** with inverter, left or right rotation can be set through the software program;
- ISO 40 connection for conic tool holders;
- Steady power transmission while working;
- Collet for the tool-holder cones released automatically or manually through controlled oil piston;
- Air blower for the cleaning and to guarantee a perfect clutch of the conic tool holders;

JA.50.38 Vacuum Pump 75 cm/h N. 1

Vacuum system made up of n°1 pump having the following features:
Flow Rate: 75cm/h a 50Hz - *(90cm/h a 60Hz)*
Installed Power: 2.4kW a 50Hz - *(3.5kW a 60Hz)*
Capacity : 0.28cm/h a 50Hz - *(0.34cm/h a 60Hz)*

JA.50.40 Manifold for the vacuum and air circuits N. 2

Manifold fitted with quick connect coupling for handling of the compressed air and vacuum generation circuits. The manifold allows through the outputs of direct vacuum, controlled vacuum and compressed air, the connection of suction cups, reference stops, vices and other fastening systems for blocking in a quick and easy way the work pieces on the work surface.

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JA.51.21 Tank for the Recycle ring of water from the vacuum pump N. 1

Recycling tank in galvanized steel for the recycle ring of water from the vacuum pump of dimensions 3900x700xh470 mm. Can be positioned in the rear inside the basement of the machine on MB models. Capacity of 1000l.

JA.53.18 Tank for recycling working water N. 1

Galvanized steel tank with capacity 600l to be used for collecting and cleaning the working water. It is placed underneath the machine frame and gives the water to the external line of the electro-spindle.

JA.50.33 STANDARD Voltage 400V +10% / -15% N. 1

Electrical cabinet complete with air conditioning system to keep internal temperature below 35°C. Protection level IP54.

Standard voltage = 400 V +10 / -15% – frequency 50+60 Hz ± 1%

All CMS machines adopt the neutral wire connection to avoid any electrocution risk for the operator.

If the customer's network is a TN-C or TN-S type, with a standard voltage ranging within **400 V + 10%/-15% -50+60 Hz +/-1%**, the machine can be connected to the mains electricity with no need for further protection unless against overcurrent.

In case of electrical networks other than TN-C or TN-S type, the customer shall provide a transformer to bring the electrical supply to the requested features.

For the differential protection (not compulsory for CMS machine) CMS suggests to use a delayed-action (selective) device type A, or better type B if available, with adjustable differential current.

JA.50.31 Frequency 50 Hz +/-1% N. 1

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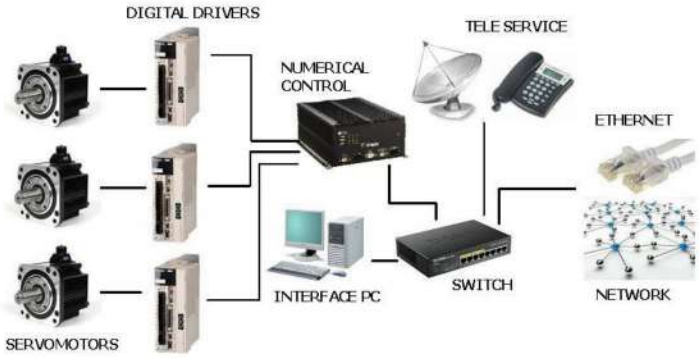
JA.50.42 Numerical Control OSAI N. 1

Electrical Cabinet and Control Panel

All the electric and electronic equipment are fitted in an electrical cabinet positioned on the machine right side. It is equipped with first-choice components available on the market and provided with all safety devices needed for its functioning. The cabinet is cooled by an air conditioner.
Protection level: IP 54.
The control panel, on the mobile trolley, has all the main controls for the machine working. The control unit consists of a **Numerical Control OSAI Open-M with integrated PC** fitted into the electrical cabinet. *The PC make it easier to programme the machine and grant great user-friendliness operating with the NC.* The working cycles can be programmed directly from the PC keyboard and mouse. 15'' TFT colour video (industrial type).



- Digital technology granting quick and safe data transfers.
- Up to 32 axes control, 5 of them interpolated.
- Responsive and uniform axes accelerations and decelerations, reducing tool path errors even in case of high tolerance toolpaths.
- The NC is equipped with industry standard Ethernet card to transmit any amount of data among PC simultaneously.
- The software enables for the dynamic control of the tool radius wear and relevant correction.
- User-friendly interface allowing to install on the PC different software applications.

Numerical Control main features: Osai Open-M, CPU Intel Celeron 2 GHz, 2 GB of RAM memory, user memory 900 MB.

Integrated computer HP

Personal computer integrated in the equipment of the machine with following features: model 4000 Pro SFF, Intel Celeron E3400, 2, 6 GHz, L2 cache 1MB, FSB 800 MHz, 2GB RAM, Hard Disk 250 GB Sata 7200 rpm, DVD Rom, Windows 7 operating system.

JA.02.63 Metric data input N. 1

JA.55.03 Portable keyboard N. 1

Remote control for moving the machine in two different ways:

- Manual, to move the axes in a continuous or increasing way;
- Automatic, to control the starting, the stopping and the axes speed.

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JA.53.39 Software License Easyglass Base N. 1

PROGRAMMING SOFTWARE EASYGLASS BASE LEVEL

It is a CAD/CAM software package installed in a personal computer working in Windows for the generation of work programmes.

Generals Functions

- On line manual with index of research.
- Automatic e-mail setting for request of assistance.

CAD Functions

- Free design of geometrical entities (arcs, bi-arcs, lines, rectangles, squares, ellipses, circles, regular polygons, fillets, chamfers, construction plans, etc.).
- Design from predefined parametric models in library.
- Sensing from drawings or templates by means of measurement (drafting Machines, graphic tablets, measuring arms etc.).
- DXF, ISO, CAL, CSF, BYS, etc. import and export.
- Dimensions.

CAM Functions

- Automatic generation of lead in and lead out paths (drill included) with interactive graphic modification.
- Generation of roughing, drilling, finishing, profiling, polishing, cycles etc.
- Automatic generation of engravings with mill, pockets, notches, countersinking's etc.
- Blade machining: cuts, engravings, bubbles, drops, arrows.
- Control of three interpolated axis with the possibility to add three axis more.
- Machining time estimation.
- Part program generation optimized for CNC.

TOOLS

- Aggregate control.
- Tool store control.
- Definition, modification and saving of the machining kits (tools sequences).
- Water control: Internal, external, both sides

DISPOSITION

- Graphic interactive arrangement of pieces on the machine table (one or more pieces even different each other).
- Graphic interactive arrangement of sub-pieces on the machine table as: vacuums, vices, references, modules, etc.
- Automatic check of the interferences between the machining and the sub-pieces.

POSTPROCESSOR

- Transfer of machining programs via: floppy drive, serial, network

SIMULATION

- Graphic 3D simulation of the machining process: it is done using the CNC machine 3D model which reproduces the table, the motors, the tools, the sub-pieces and the pieces.

JA.03.54	Antivirus	N. 1

Microsoft essentials basic Antivirus, we would advice putting onto the companies Antivirus software.

JA.02.30	Remote diagnostics	N. 1

This diagnostic package permits CMS operators to check and modify on line machine configurations, parameters and programmes, as well as to execute data back up operations, therefore making remote assistance possible.
The link requires an Internet access, which can be done through the Intranet.

JA.53.36	Standard Colour	N. 1

Bearing structure and Mobile bridge colour white, RAL 7035.

JA.00.72	Machine Installation, Use and Maintenance Manual in ENGLISH (provided on CD-ROM)	N. 1
JA.00.82	Programming and Use NC Manual in ENGLISH (provided on CD-ROM)	N. 1
JA.00.87	Operating System in ENGLISH language	N. 1
JA.02.46	NC messages in ENGLISH language	N. 1

Pictographs for electrical control plates.

JA.00.62	Machine COMPLYING WITH CE STANDARDS	N. 1

The machine complies with the applicable parts of the following Directives:
Directive 2006/42/CE
Directive 2004/108/CE

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JA.53.16 Automatic opening of the front safety door N. 1

Automatic opening of the front safety door. It performs the opening/closing of the door by pressing a button.

JA.56.57 Electro-spindle cooling system through heat exchanger with forced air N. 1

Electro-spindle cooling system through heat exchanger with forced air and glycol mixed with water.

JA.54.08 Manual presetting tool of cones ISO 40 N. 1

Manual presetting tools system. It is used for measuring the tools dimensions, in a easy and clear way. It is made out of:

- Digital surface gauge for measuring the tools length
- Caliper for detecting the tools diameter
- Support base for toolholder cones with ISO 40 connection

JA.53.46 Standard supply toolholder cones JR N. 1

The kit is made out of:

- N°13 Toolholder cones ISO40 in stainless steel with pin Ø 22mm, h 38mm used for diamond and polishing peripheral wheels (cod. T0411)

- N°3 Toolholder cones ISO40 cones in stainless steel with ½ gas connection, used for drills and mills (cod. 7988)

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JA.55.33 Standard kit suction cups/references H=100mm for GLASS working N. 1

The kit is made out of:

- N°3 Retracting telescopic references stop in duraluminium. Top point Ø31mm, base Ø 120, h100 mm (cod. T0130)

- N°8 Suction cups in duraluminium. Top Ø 100mm, base Ø 100mm, h 100mm (cod. GRP1001791)

- N°6 Suction cups in duraluminium. Top Ø 150mm, base Ø 200mm, h 100mm (cod. GRP1001797)

- N°4 Suction cups in duraluminium. Top Ø 200mm, base Ø 200mm, h 100mm (cod. GRP1001792)

- N°25 mts of rilsan pipe Ø 8mm, BLUE colour, used for connection of upper suction cups vacuum (cod. 385042)

- N°25 of rilsan pipe Ø 8mm, NEUTRAL colour, used per connection of lower suction cups vacuum (cod. 00L0228544L)

- N°50 mts of rilsan pipe Ø 6mm, BLACK colour, used for opening/closing air of vices and reference cylinders (cod. 385020)

Machine COMPLYING WITH CE STANDARDS, with installation at distributor charge and care. N. 1

The machine complies with the applicable parts of the following Directives:

Directive 2006/42/CE

Directive 2004/108/CE

The responsibility of the installation to be executed complying with the instructions given by the machine manufacturer will be at distributor charge and care.

CMS will send one technician to support during the installation phase at the agent's charge.

The layout and the "MEC0138" are the documents defining the conditions for the machine assembling; distributor will be supplied with these documents as soon as possible.

You are requested to return a signed copy of the installation documents to CMS.