NUMERICALLY CONTROLLED UNIVERSAL BENDING MACHINE WITH ONE BENDING UNIT

WATCH THE VIDEO

It is a numerically controlled universal bending machine, electronically programmable, with one bending unit, capable of bending heating elements on one plane or on several planes in automatic cycle in a great variety of shapes, sizes and bending angles.

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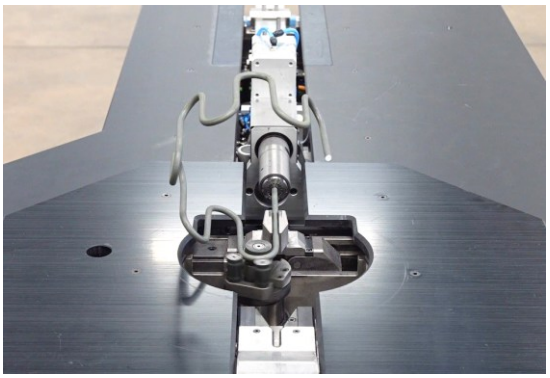
ADVANTAGES

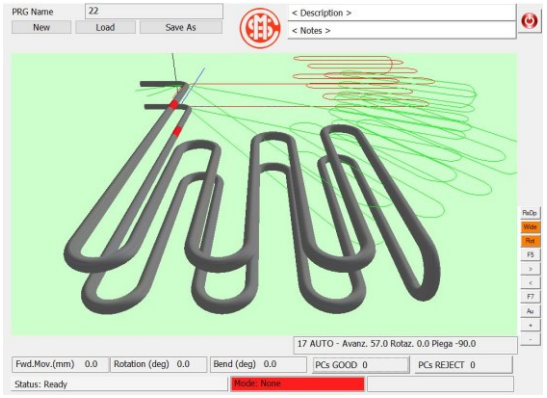
LEAD WITH DIMENSIONAL TOLERANCES RIGHT FROM THE FIRST ELEMENT

Simply enter the standard bending data and the machine will automatically generate the part program after searching for prior bending experience in its database to make sure that it is right from the first part. This capability eliminates the need for manual adjustments.



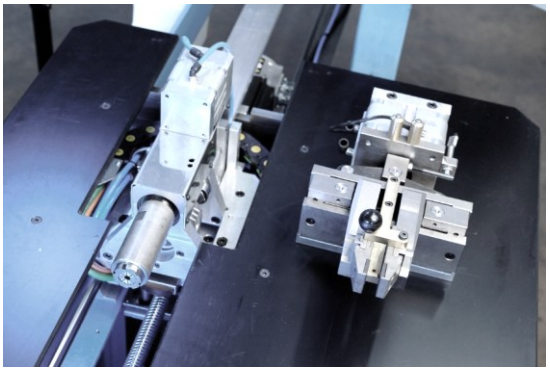
3D-GRAPHIC PROGRAMMING SOFTWARE

The 3D-graphic programming software made by CSM can be used to create and immediately run the machine program simply by entering the geometric data of the heating element.



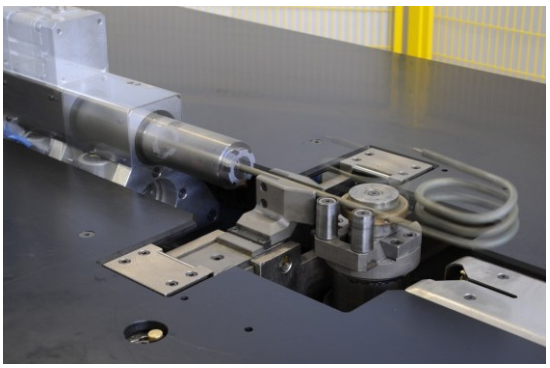
MINIMUM SETUP TIME AND REPEATABLE ACCURACY

The main machine movements are via electric servos. Part bend positions, tooling information, and power parameters are all saved together in the part program. When a job is repeated you simply mount the tools and recall the program. No further mechanical adjustments are needed. This guarantees quick setup and changeover and provides lot to lot repeatability.



LOW MAINTENANCE AND HIGH RELIABILITY

A simplified design has reduced the need for routine maintenance and provides more consistent bending. The obvious advantage is that the machine is easier to maintain, safer to use and more reliable.



MACHINE COMPOSITION

- Frame with horizontal work surface
- Pneumatically activated mobile clamp, displaced by a brushless motor on an endless roller screw (1st numerically controlled axis)
- Electronic device to measure the length of the heating elements
- Pneumatically activated fixed clamp to grip the heating elements during the bending cycle
- Bending unit (2nd numerically controlled axis)
- Pneumatically activated mobile rotational clamp (3nd controlled axis)
- Main cabinet housing computer, touch screen monitor and keyboard, with possibility to display the product in each bending step
- Dedicated safety PLC

CHARACTERISTICS

- Heating elements with different lengths can be bent, with the possibility to **program the tolerances** of each and every heating element branch (with measure - bending of **one heating element at a time**)
- Bending of heating elements with length difference of **±1 mm**, bending of **up to four heating elements** at a time depending on the tube diameter (without measure)
- Curve generation program to obtain **different bending radii**
- Storage of **spring back and bending elongation** factors according to diameter, material type and bending radii etc.
- The machine can be programmed to carry out**, through secondary bending**, also those bends that cannot be carried out in automatic cycle
- Simple and quick machine programming, with the possibility of storing up to 10,000 programs
- 3D display of the various bending phases, up to the display of the fully bent resistance as a check of feasibility and correct programming

When small production batches need to be processed, it is essential to have the possibility to change **quickly and easily the set-up for different heating element diameters and shapes, with the possibility of storing the bending programs**.

This bending machine has been designed and manufactured to allow bending even of only **one heating element with correct dimensions, tolerances and bending angles, thus making bending tests unnecessary.**

The machine can work:

- **With measure** (one heating element per cycle) when elements of different lengths are being bent and there is the need to distribute the differences in length (within defined tolerances) in each section of the element.
- **Without measure** (from 1 to 4 heating elements per cycle depending on the diameter) when are bending heating elements of similar lengths (±1 mm)

The model 170/50 is complete of a bending unit.

TECHNICAL CHARACTERISTICS:

Range of diameters of heat treated heating elements mod 170/50	mm	6,3– 12,5
Tolerance on the diameter (when bending two or more elements at a time)	mm	±0.06
Maximum difference in length of the heating elements	mm	180
Number of heating elements to bend per cycle - with length measuring - without length measuring..... ∅ 6,30-6,50 mm ∅ 8,00-8,50 mm ∅ > 8,50 mm	 : pcs. : pcs.	 1 4 2 1
Minimum length of heating elements		
with measure	: mm.	500
without measure	: mm.	300
Maximum length of heating elements	See available versions	
Maximum length of terminal pin	: mm	40
Number of programmable bends per cycle	: No	80
Bending speed	: °/sec	360
Bending tool (pin/roll) diameter ∅ heating elements 6,3 – 12,5 mm ∅ heating elements 12,5 – 16,0 mm Minimum length for the last straight section of heating element ∅ 6,3 – 12,5 mm ∅ > 12,5 mm	mm mm mm mm	18-60 33-60 45 130
Power supply	V	To be defined
Pneumatic supply	Atm	6
Installed power	See available versions	

The model 170/50 is complete of a bending unit OD=18 mm.
Any other bending unit must be order separately.

AVAILABLE VERSIONS

Models	Max length (mm)	Element Ø (mm)	Power (KVA)
Mod. 170/50.300000	3.000	6,3 – 12,5	3

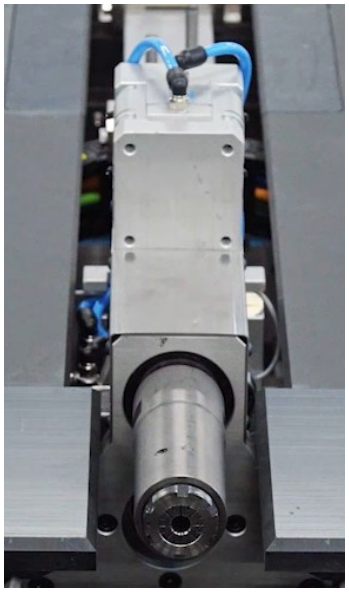
N.B.: for different lengths it is necessary to add extensions, as indicated in the “Optional” section.

OPTIONS

170/50.000R01: ROTATING CLAMP FOR 3D ELEMENTS

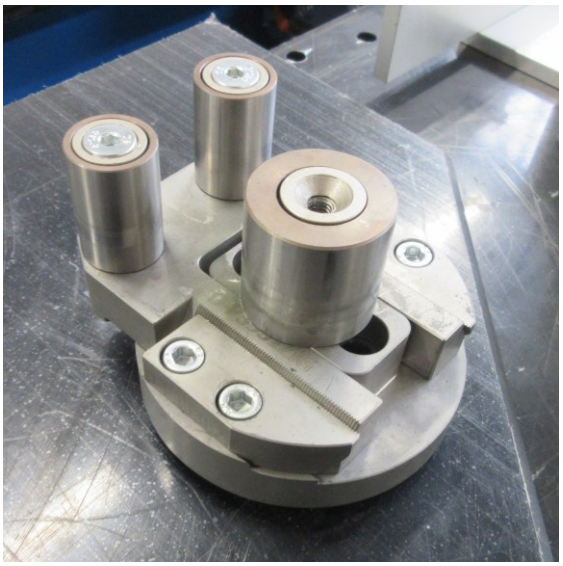
The rotating clamp offers the possibility to produce 3D (multiplane) elements in automatic mode (for elements with a diameter up to 12 mm

The clamp is supplied with a bending roll for 3D elements with OD=18 mm and a clamp for a diameter (to be defined)



171/50.000000: HEAVY DUTY HEAD (up to Ø 16 mm)

Heavy duty head that allow to bend heating elements up to max. Ø 16 mm.



170/50.PRPE00: LASER SCANNER

It offers the possibility to delimit a programmable work area and launch the bending cycle without two-hand control

EXTENSIONS, FOR ELEMENTS HAVING A LENGTH OVER 3000 MM

170/50.PR1000 extension 1000 mm
170/50.PR2000 extension 2000 mm
170/50.PR3000 extension 3000 mm
170/50.PR4000 extension 4000 mm
170/50.PR5000 extension 5000 mm
170/50.PR6000 extension 6000 mm

For example, to allow bending a 7,000 mm element, it will be necessary to add the 4000 mm extension (170/50.PR4000) to the 170/50.300000 model.

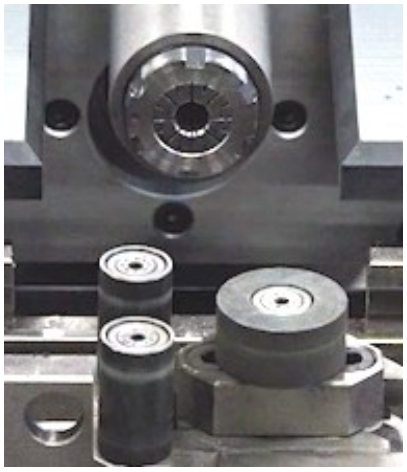
BENDING ROLLS AND CLAMPS

065.08.146-00: Bending roll (for standard head).

PM00001555*0: Bending roll for 3D elements (for standard head with rotating clamp).

P3967*0: Bending roll for Heavy Duty head

PM00001371*0: clamp for rotating unit (in addition to the clamp supplied with the machine).



BENDING HEAD FOR SMALL RADII

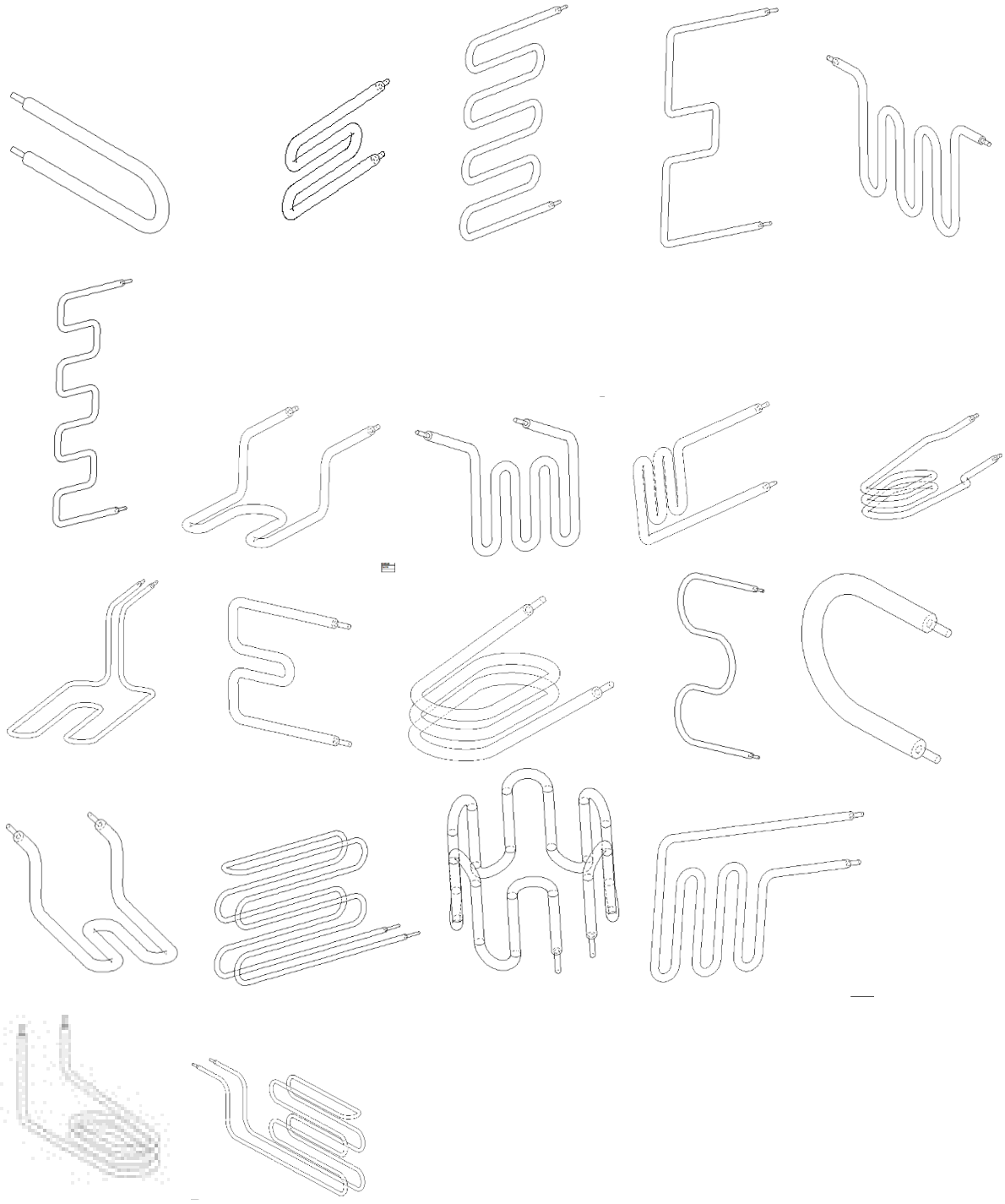
170/52.100S00: Bending head for small radii, adjustable, for bending machine mod. 170/50 e 171/50 (bending roll diameter range 12 ÷ 17 mm).

Max element outer diameter: Ø8,5 mm.

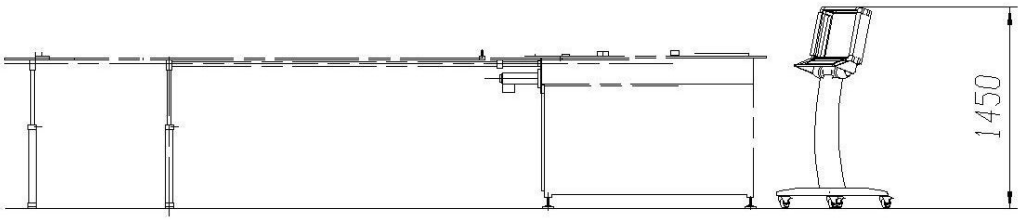
PM00018912*0: Bending roll (for small head).

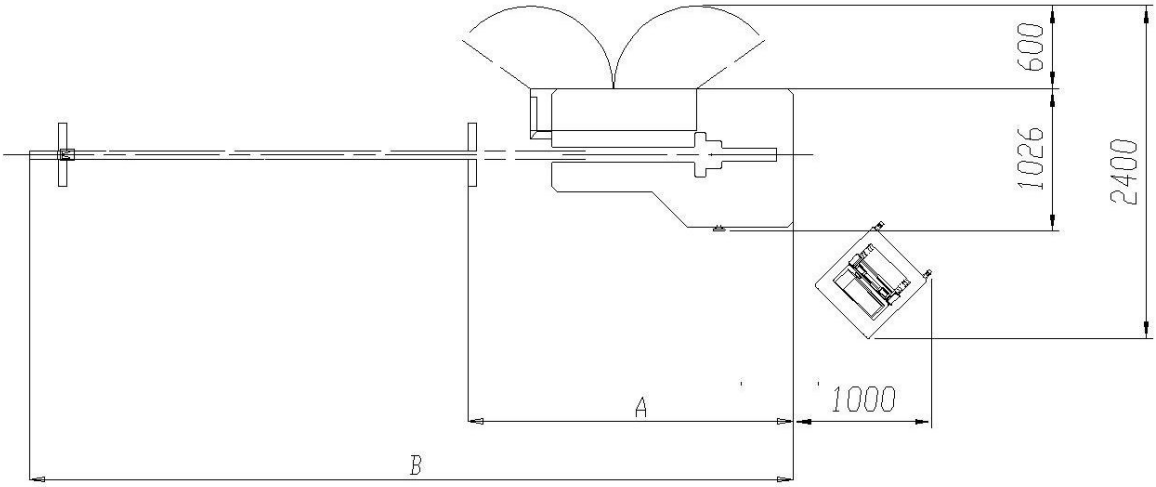
CONNECTION OF THE BENDING MACHINE TO A REMOTE DATABASE, TO ALLOW FOR SAVING AND BACK-UP OF THE BENDING PROGRAMS

EXAMPLES OF HEATING ELEMENTS PRODUCED WITH THE BENDING MACHINE MOD 170/50 171/50



LAYOUT





LUNGHEZZA RESISTENZA HEATING ELEMENT LENGHT	3000	4000	5000	6000	6500
A	4500	/	/	/	/
B	/	5700	6500	7500	8000