

**USE AND MAINTENANCE
INSTRUCTION MANUAL**

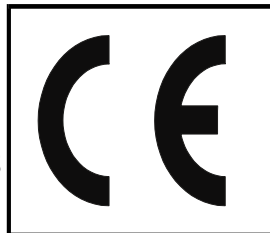
TOP BENDER 050

Electric Metal Bending Machine



This manual was written according to prescriptions of attachment I-1.7.4. of :

EEC DIRECTIVE 89/392
«MACHINERY DIRECTIVE»
MODIFIED BY DIRECTIVE 91/368
RECEIVED BY PRESIDENTIAL
DECREE NR. 459/1996



EEC Directive 89/392 – published on the European Community Official Journal nr. L183 dated June 29, 1989

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We wish to thank you for your excellent choice in purchasing an Ercolina® Top Bender 050. By following these instructions the Top Bender will be a simple and useful working tool.

Remember: after reading this manual, keep it in a safe place for future reference!

⚠!!!WARNING

Any use of the machine which does not strictly conform to the instructions of this manual will immediately invalidate the warranty and free the Manufacturer of any responsibility.

Before using the machine read carefully this instruction manual!



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WARRANTY

Every machine is carefully controlled and tested before shipment. Machine installation is under customer's responsibility, if qualified personnel is required for assistance and training, the cost of the operation will be charged.

WARRANTY CONDITIONS AND RESTRICTIONS

1. Each ERCOLINA bender has a 24 month warranty effective from delivery date, against any component's defect. The company reserves the right to request a copy of the sale invoice.
2. Defects must be notified to us within 2 months from the date the defect has been found.
3. Defects are checked on our premises, so every ERCOLINA® bender must be sent, **FREIGHT PREPAID**, to our address or to authorised service centres. **ANY FREIGHT COLLECT DELIVERY WILL BE REJECTED**. If checking at customer's premises is required, a cost for checking on site will be charged.
4. Warranty includes the defective component's replacement or repair excluding labour cost.
5. Electrical parts are not included in the warranty in case of incompatibility with power supply (caused by overvoltage and / or atmospheric events).
6. Operations performed under warranty do not extend warranty terms.
7. Warranty does not respond to damages caused by wear.
8. The warranty does not apply if damages are a result of incorrect handling or of a use that does not conform with specifications described in this manual.
9. The warranty does not apply if the machine has been modified or tampered with.
10. The warranty certificate **IS INVALID** if dealer stamp with sales date is not included at the bottom of the document and in the attached coupon. Furthermore, the part to be sent to us must be mailed within 8 days following the invoice date.
11. The buyer can not claim compensation for damages in any way.
12. The warranty does not provide a replacement even temporarily of the machine.



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13. The whole warranty declines if:

- The machine has been repaired or maintained by personnel that has not been authorised by **Ercolina®**;
- Not original parts have been used;
- Damages or errors are due to connections not performed according to the using instructions;
- Errors due to the machine wear.












GENERAL SAFETY NORMS

The Ercolina® Top Bender has been manufactured according to state-of-the-art technology and in compliance with safety regulations officially accepted. Nevertheless the machine can be dangerous for the operator or a third person if used in a improper manner. It is important therefore to read the following safety norms.









FORBIDDEN

-  Use the machine only and specifically for the use which it has been manufactured for and with full respect of the general safety norms. The Manufacturer will not be liable for any injury or damage to objects due to an incorrect use of the machine;
-  Do not switch on power supply and use the machine without reading carefully the instruction manual;
-  Do not install and use the machine in environments containing:
 - ❖ flammable gases or liquids;
 - ❖ explosive materials;
-  Do not install and use the machine in humid or wet environments;
-  Do not expose the machine to the rain;
-  Do not touch parts in motion;
-  Do not put hands on the tube during bending;
-  Have not more than one person working on the same machine;
-  Working area should not be restricted to a too limited space in proportion to the tube lengths to be bent;





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-  Do not use the machine beyond the maximum capacities indicated;
-  Non qualified and non authorised personnel should be prohibited from effecting maintenance work or repair on the machine;
-  Do not clean the machine without switching off power supply;
-  Do not tamper with electrical and electronic circuits in any way for safety reasons and in order not to invalidate the warranty conditions;
-  Do not effect transportation of the machine dragging it by the power cable;
-  Do not modify the machine structure.

!!!WARNING: Use only Ercolina® line accessories. Any alterations will cause the invalidation of the warranty. The Manufacturer reserves the right to not supply accessories or replacement parts in case the machine has been altered;

-  Avoid putting fingers between former and machine while mounting the former;
-  Do not leave the machine unattended with power supply switched on.



MANDATORY

! Train adequately the operator in charge of the machine.



Check that the line voltage is always compatible with the power supply for which the machine has been manufactured for;




- ❗ Make sure that only trained personnel operates the machine;
- ❗ Keep the machine in a dry and safe place;
- ❗ Delimit the machine's working area with barriers and / or chains in order to avoid non authorised persons entering the working area of the machine when both in motion and switched off ;
- ❗ Mark the working area with appropriate signals ;
- ❗ Go to a safe place when the machine is in use;
- ❗ Never stand next the machine on the opposite side of the controls;
- ❗ Disconnect main power cable prior to transporting the machine;
- ❗ Verify on a regular basis if formers and counterbending dies are worn out;
- ❗ Wear protective gloves when handling the material;
- ❗ Wear a protective helmet for upward moving or suspended tubes;
- ❗ Wear safety shoes in case of heavy parts falling ;
- ❗ Read carefully the warning labels and plates on the machine.



!!WARNING: other protections can be adopted by the operator or by the person in charge of the machine. Our technical office is at complete disposal for any further advice needed.

PROGRAM PROCEDURES







1. Activate *data entry mode*:

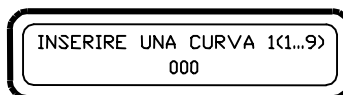
- Switch on power supply (by using main switch) and press set up button ;
- Press the  button ; the display should show as follows:



DATA ENTRY MODE
+=YES ENTER = NO

Program Start

2. Press the  or  keys to continue or not the data entry mode;
3. If you have chosen to insert new data pressing the plus , you will have to choose the block in which you would like to work with using again the  plus button to select a group to work with from P0 to P9.
By pressing minus button  for 4 seconds while the program number is displayed, all the previous stored data will be lost and new data can be memorised.
4. Once the group has been selected and it is ready to be programmed, the display will show as below ; you may now insert the bend angle value and store it with the  button.

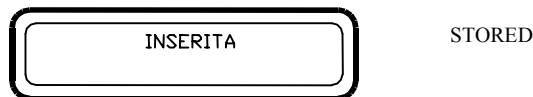


INSERT BEND 1(1...P)
000

Insert bend angle



5. To insert the bend angle values press and buttons to increase or decrease the value of the bend angle values or it will be possible with the use of the , , to insert quick bend angle values such as 135°, 90° e 45°.
6. To store the bend angle values press the button and the following message will appear on the display:



Stored bend angle

7. Once the first bend angle has been inserted, the program will automatically ask for the second bend angle which can be inserted in the same way as the first. The same can be done for the third, the fourth and so on until the ninth of the same group by repeating steps 5 and 6. If instead you wish to end the data entry you must press the button without inserting any angle value the display will show :



End of data storage

8. For programming new groups press button and repeat steps from 3 to 7. To end data storage press .




PROCEDURES FOR BEND MAKING

After the full data entry will be finished the machine will be in stand by mode with the following message :



Stand by mode




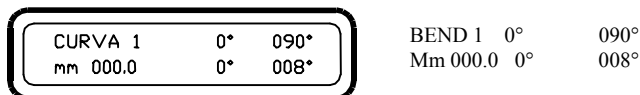
In this position if the bend angles memorised are more than one, with the use of the  button you may scroll through and choose the bend angle you would like to use . Set all tooling on the machine, former and counterbending die of the same size of the material to be bent. Set in position the support bracket and adjust initial pressure on tube against the former. With the use of the keys,  and  you will need to memorize the cursor counterbending die position :




Setting the electronic counterbending die position

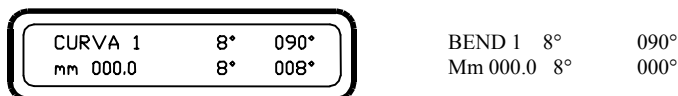
The position of the counterbending die (mm 000.0) is controlled by the microprocessor which enables the machine to carry out the following bends repeating exactly the position of the cursor and counterbending die with a tolerance of $\pm 0.2\text{mm}$.

It will be possible to begin the first bend now by pressing the  button; the tube will begin to move in the tools until it will be possible that it will visibly begin to bend the angle moved will be our spring-back angle. See example in the bottom indicating what the display will show:




Spring back

Press the  button to memorise the spring back angle (see below).



Spring back storage

It will be possible now to bend by continuing to press the  button. Once the bend angle will be achieved, the machine will stop automatically and the yellow light will flash.

Press the  button to bring the machine back to the 0 origin point.



CURVA 1	8°	090°
Mm 000.0	8°	090°



BEND 1	8°	090°
Mm 000.0	8°	090°

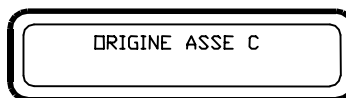
Completed memorised bend

SETTING C AXIS

Should the (0) position of the machine shaft be lost or offset it will be necessary to set the machine in the shaft reset mode to bring the hexagonal shaft (*axis C*) back in its original position.




The shaft reset procedure can be accomplished as follows:


- The machine shaft should be without any kind of tools;
- Keeping the button  or  pressed by turning on the machine simultaneously, you will enter the shaft reset mode.
- When the mode is entered the display should show the following message:



SHAFT RESET MODE

Shaft (axis C) reset mode

In this mode press the  or  pedals, to move the hexagonal shaft base aligned with the  mark, placed on the aluminium body of the machine itself.

- To store the new origin or 0 point, you need to press the  button and the display will show as follows:



SHAFT RESET STORED

New position of the shaft stored (Axis C)





HOW TO CORRECT THE SPRING-BACK ANGLE

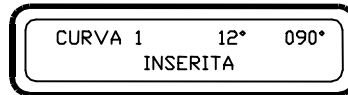
If while working you notice that the required bend angle achieved is not conforming to the desired angle you may adjust the spring-back angle to correct the angle in the machine program.

To correct the bend angle, while working you need to :

- stop the machine from working by releasing all keys;



- press the  button , then a flashing cursor will appear on the spring-back angle value;
- the value of the spring-back angle can be changed with the use of the buttons  and  ;
- The new set value will be stored only after having the  button pressed, the following message will then be displayed :



BEND 1 12° 090° STORED





Spring-back angle change storage

In the example shown in the above picture the new spring-back value (12°) has been stored on the first 90° bend.

- After the new angle has been stored you may proceed continuing the bend until completed.




EDITING THE ACTUAL BEND ANGLE

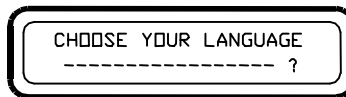
As the spring-back angle you may also modify the bend angle without changing a whole program. To edit a single bend angle you must:

- interrupt bending ;
- press the  button until the flashing cursor is on the bend angle value;
- at this point with the use of the  and  buttons you may add or subtract degrees to your original stored angle;
- Once the bend angle has been changed you will need to store it by pressing the  button.

CHANGING THE LANGUAGE


In order to change the machine language on the display please act as follows:

- Place the machine in the off position and then press the  ,  ,  simultaneously while turning on the machine;
- On the display the following message should be shown:



Language selection

By pressing the  button you may scroll through all the available languages;

- Make your selection then store with the use of the  button.

PRACTICAL USE OF THE MACHINE

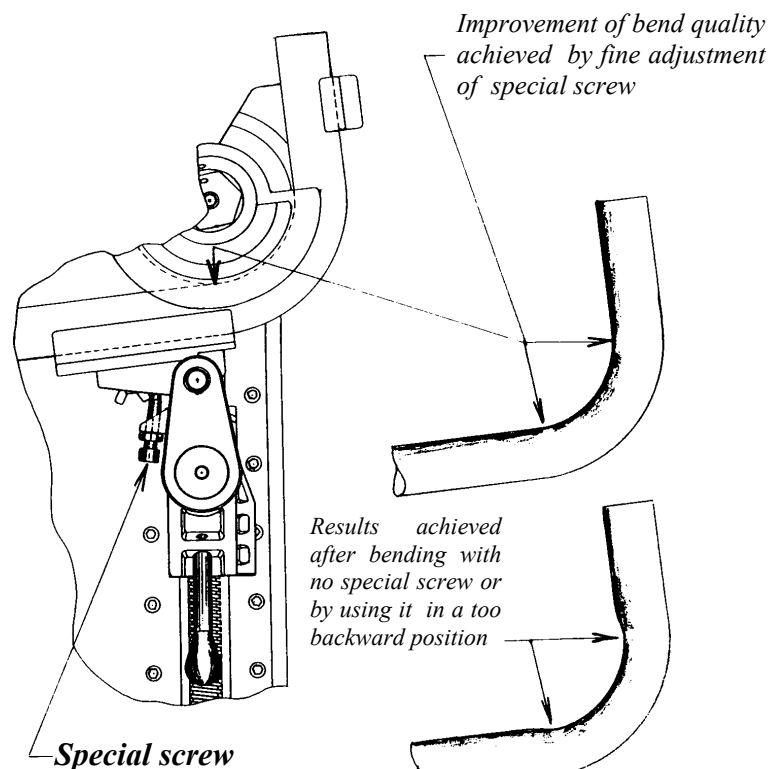
Main points to keep in mind for bending correctly with the Ercolina® system:

- ◆ Before bending make sure that the outside diameter of the tube is of the same size as the one printed on the former and the counterbending die.

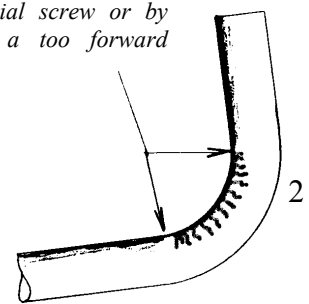
⚠ !!Note: if you measure the former groove with a calibre, do not be surprised to find it a few mm smaller (if the wall thickness of the tube is smaller than 2,5mm) or a decimal part of a mm smaller (if the wall thickness of the tube is greater than 2,5mm) than the actual marked diameter size. It is perfectly normal and it is part of the Ercolina® bending technology.

- ◆ Remember that the **minimum bend radius** depends on the **material to be bent**, the tube **external diameter** and the **wall thickness** of the tube.

- ◆ Correct pressure between former and counterbending die. You must apply just



Results achieved after bending with no special screw or by using it in a too forward position.





enough pressure to avoid wrinkles on the inside bend of the tube.

⚠ **!!Note:** If even with a higher pressure there are still wrinkles in the inside bend use a former with a larger radius.

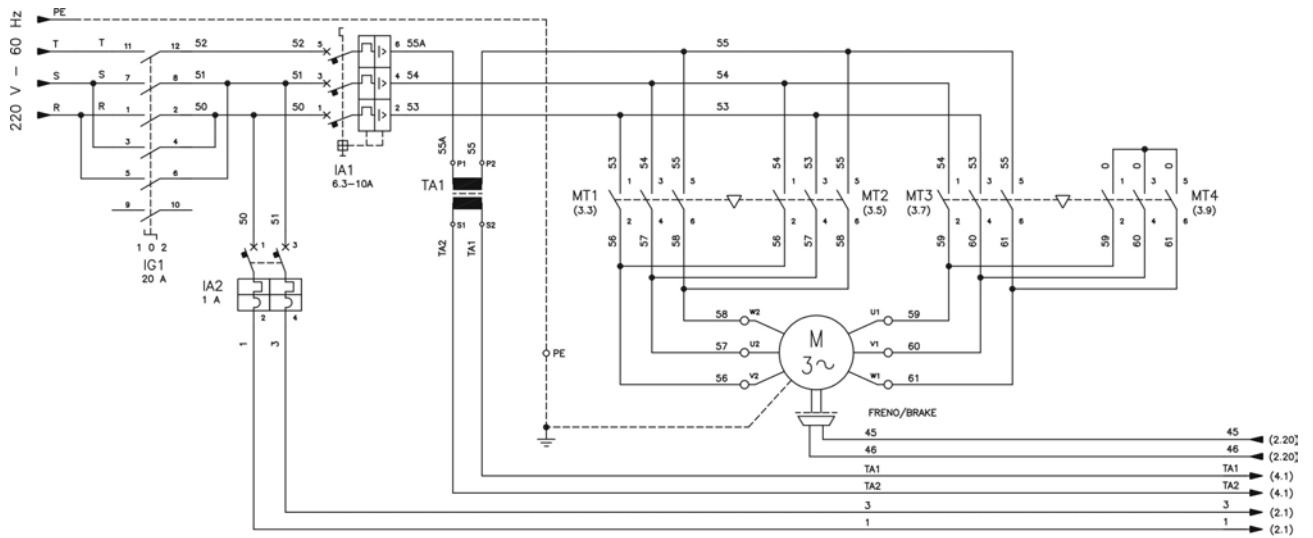
- ◆ In case of excessive constriction of the tube on its inside radius use the special screw on support bracket: as soon as tube starts visibly bending tighten screw so that the screw touches the back of the counterbending support bracket. After this continue the bending process as normal. Fine adjustment of this screw will further improve the bend quality.

⚠ **!!Remember** to adjust the position of this screw for different tube sizes / materials.

- ◆ Former and counterbending die must never touch otherwise the tube may break or have wrinkles on the inside bend and the machine can be damaged.
- ◆ Do not keep tubes in dusty/dirty places, in these conditions the counterbending dies will wear out faster due to increased friction between the dirty tube and counterbending die



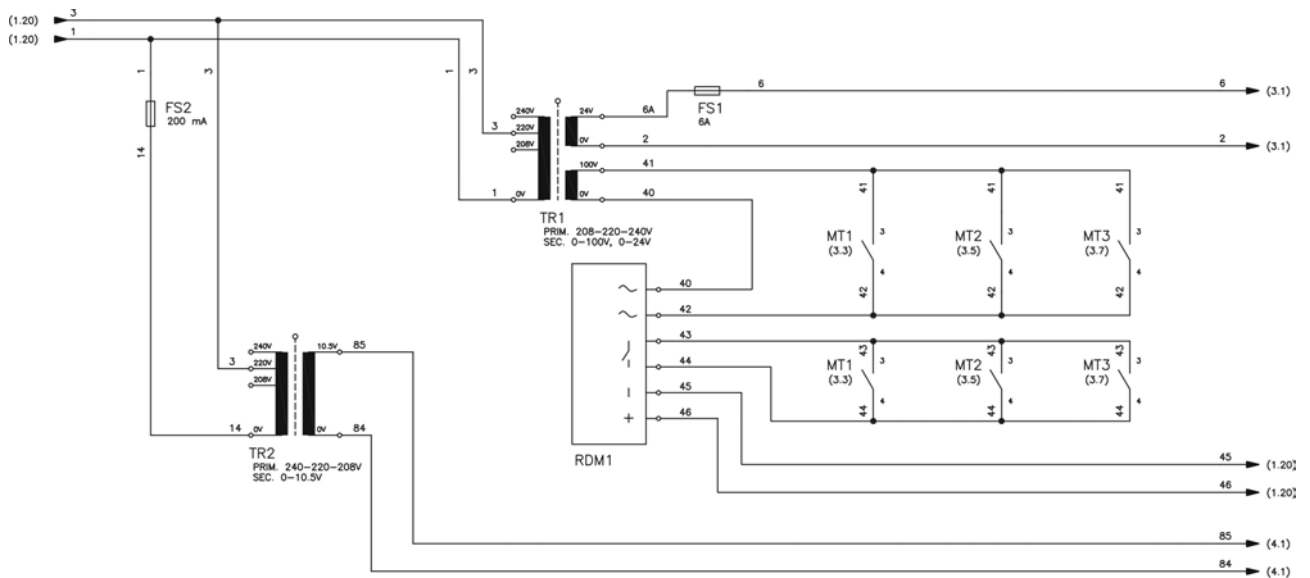
ELECTRICAL DRAWINGS 220V

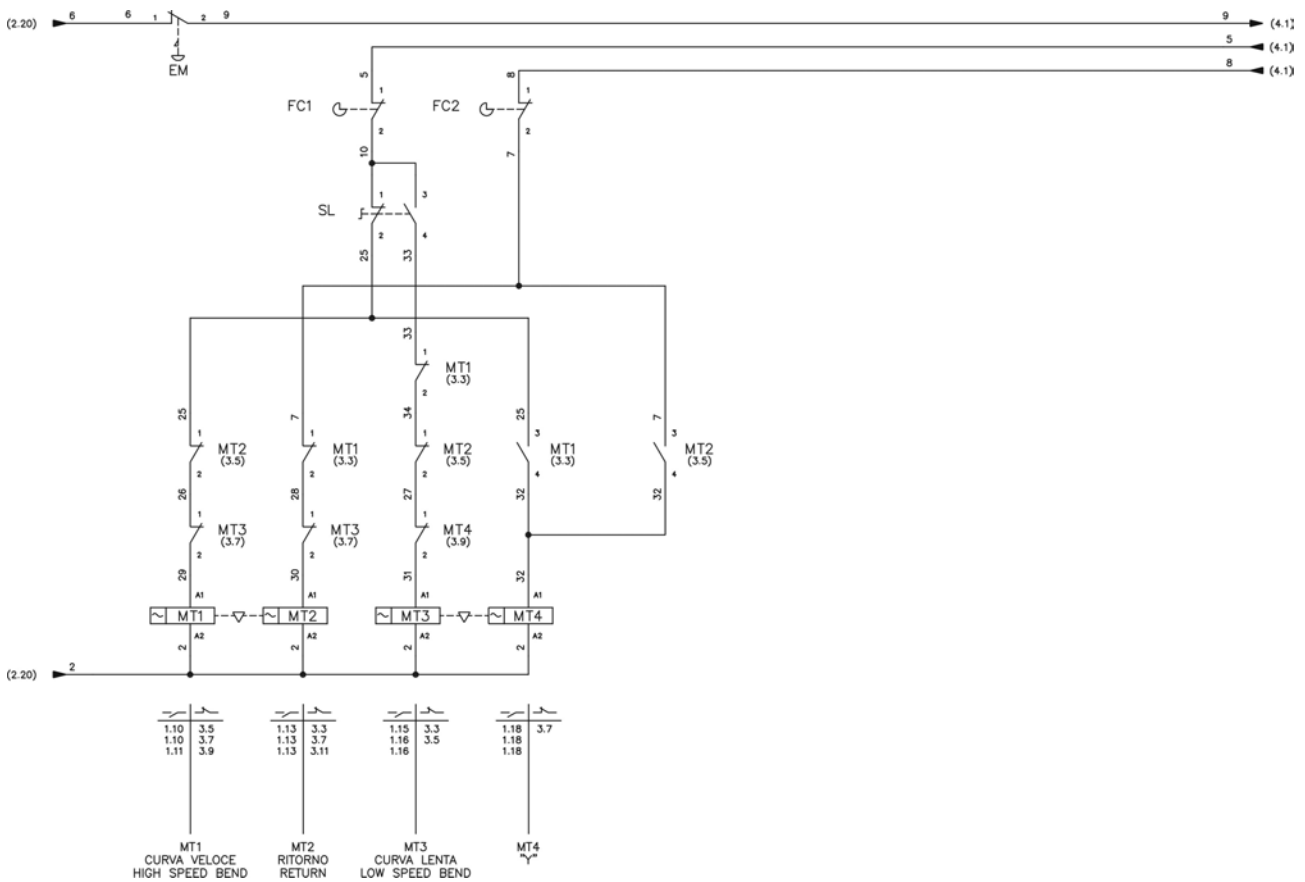
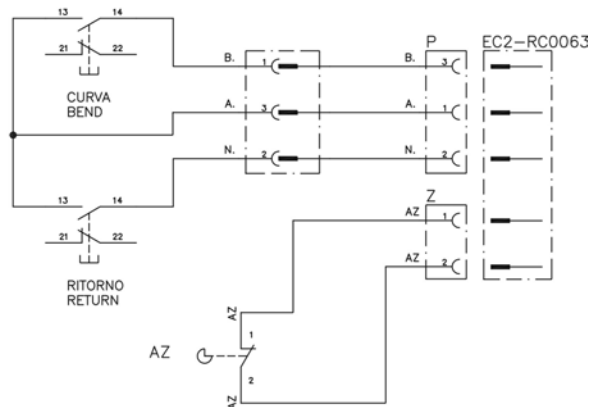
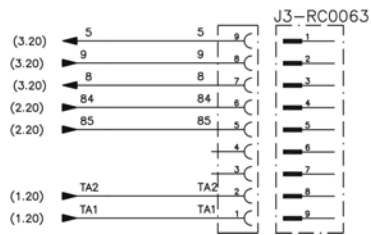
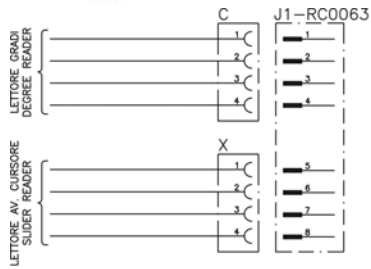


M1
MOTORE CURVATURA
BENDING MOTOR

TARGHETTA MOTORE M1					
Pol.	V	Hz	A	kW	
4	220	60	6	1.1	
2	220	60	7	1.5	

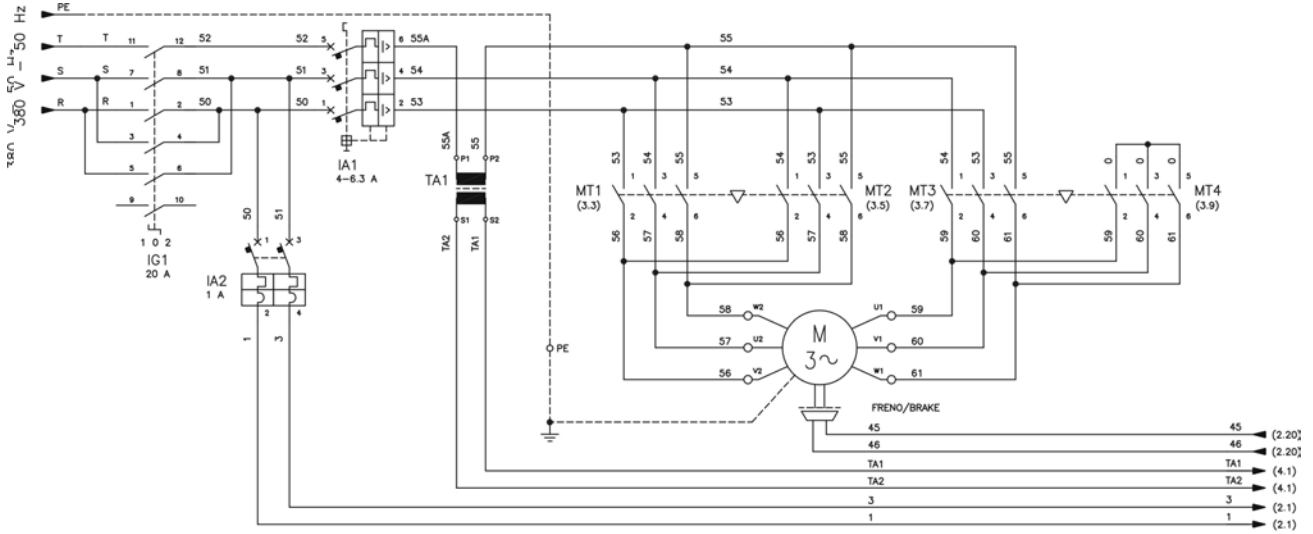
FRENO (BRAKE): 103 V DC





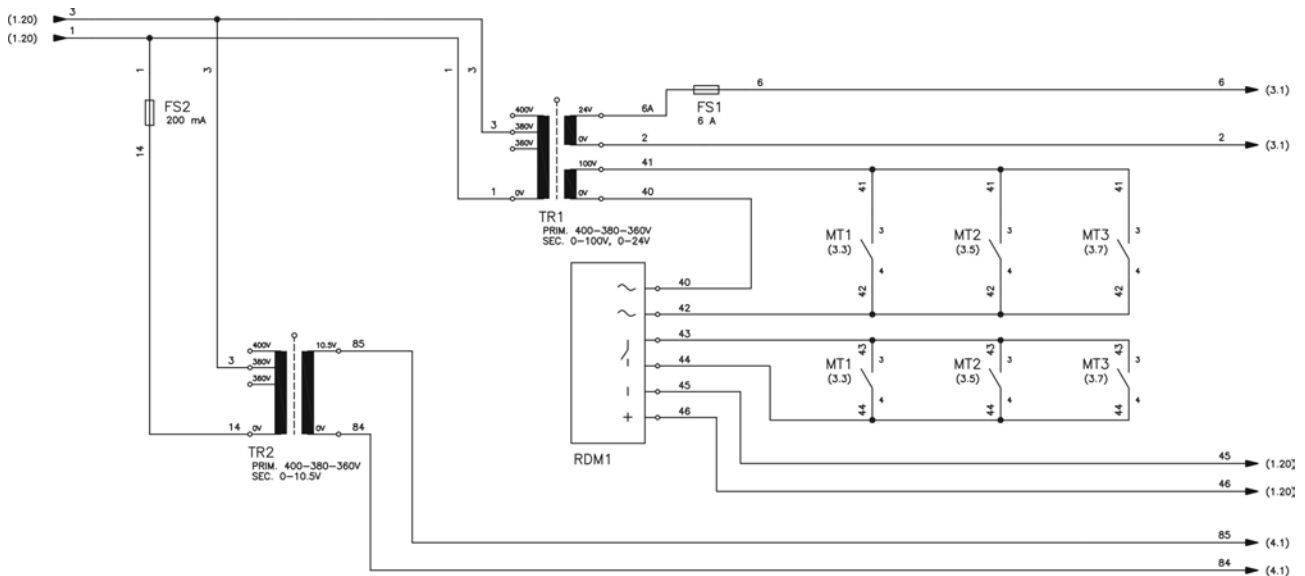


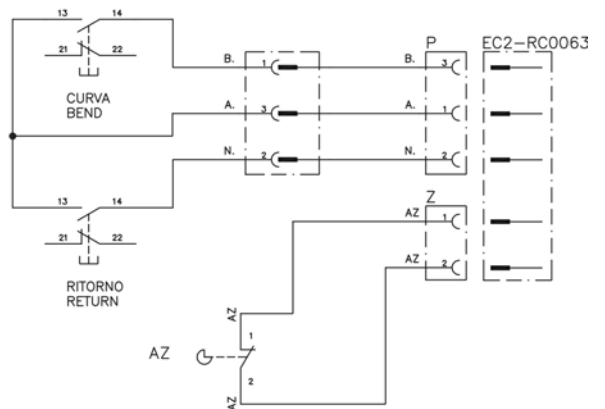
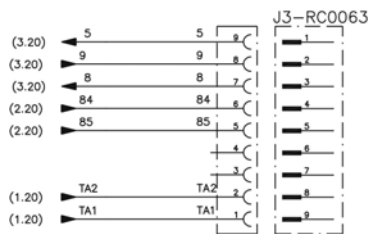
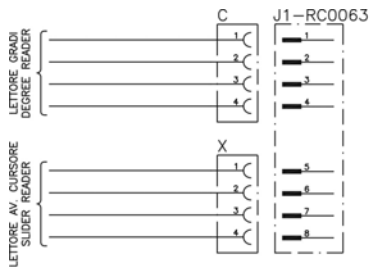
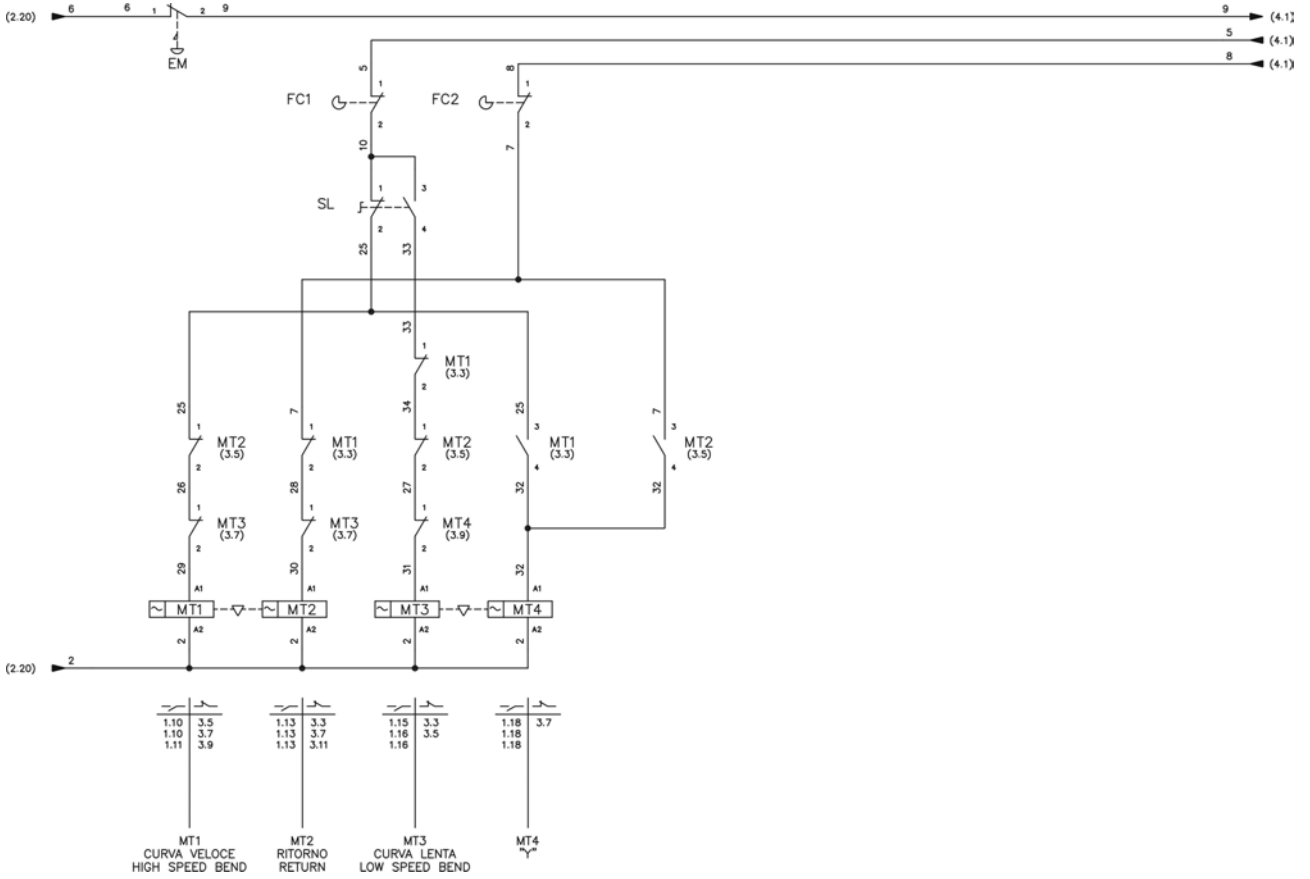
ELECTRICAL DRAWINGS 400V



M1
MOTORE CURVATURA
BENDING MOTOR

TARGHETTA MOTORE M1					
Pol.	V	Hz	A	kW	
4	380	50	3.2	1.1	
2	380	50	3.7	1.5	
FRENO (BRAKE): 103 V DC					
FRENO (BRAKE): 103 V DC					







BENDING FILE

Type of tube	Tube sizes		Bend data		Storage	
	Ø	Wall thickness	Spring back angle	Bending radius	Group N°	Bend N°
1. _____						
2. _____						
3. _____						
4. _____						
5. _____						
6. _____						
7. _____						
8. _____						
9. _____						
10. _____						
11. _____						
12. _____						
13. _____						
14. _____						
15. _____						
16. _____						
17. _____						
18. _____						
19. _____						
20. _____						
21. _____						