



INSTRUCTIONS BOOK

SECTION BENDING MACHINE

CC90CNC

NS: 2025-213



PRADA NARGESA, S.L

Ctra. de Garrigàs a Sant Miquel s/n · 17476 Palau de Santa Eulàlia (Girona) SPAIN

Tel. +34 972568085 · nargesa@nargesa.com · www.nargesa.com

NARGESA CLIENTS

Prada Nargesa has more than 12.200 customers around the world. Some of our clients, those who offer service to third parties with the Nargesa machinery in their workshops, have been pleased to be part of this network that aims to connect them with possible future clients. In this way, all those people or companies that have a need for any part or tool that can be manufactured by using the Nargesa range of machinery, will be able to find a solution in their area to be able to satisfy their production requirements by hiring their services.



We have more than 12.200 customers in 150 different countries around the world

Discover its location on the interactive map on our website!

DO YOU WANT TO PARTICIPATE?

Send an email to nargesa@nargesa.com, include the following information and we will add you to this list.

We want to encourage all those who haven't participated yet in this great comercial network!

1. Company name
2. CIF/Tax Code
3. City
4. Country
5. Machine or machines

PRADA NARGESA

Prada Nargesa S.L. is a family business founded in 1970 located near Barcelona, Spain, with more than 50 years of experience in the sector of manufacturing of industrial machinery, and more than 10.000m² of facilities. Nargesa is a symbol of quality, reliability, warranty and innovation.

Our whole range of machines and accessories is manufactured entirely in Nargesa. We have a constant stock of 400 machines, and we have more than 16.800 machines sold all over the world.



OUR RANGE OF MACHINERY

Ironworker Machines
Ring Roller Bender and Pipe Bender
Non-mandrel Tube and Pipe Bender
Twisting / Scroll Bending Machines
Horizontal Press Brakes
End Wrought Iron Machines
Gas Forges

Iron Embossing Machines
Hydraulic Shear Machines
Hydraulic Press Brakes
Presses for Locks
Broaching Machines
Power Hammers

CERTIFICATES

Prada Nargesa has several certifications that backup both, the design and manufacturing processes, as well as the journey through exporting our products around the world and the quality of the manufacturing components we use for our machines. These facts turn into real advantages for our customers:



AUTHORIZED EXPORTER

- Faster customs procedures
- Reduction of tariff documentation
- Tariff preferences according to geographical location



INNOVATIVE SME

- Development in innovation, design and manufacturing technologies
- Certification and audit of efficiency in product and service
- Ability to foresee customer needs



R+D+I MANAGEMENT

- Manufacturing based on the R+D+I process
- Technological surveillance system

SUCCESS STORIES

At Prada Nargesa we believe that the testimony of our clients is our best guarantee, and that is why we like to expose some of the success stories that we have witnessed around the world:



Discover its location on the interactive map on our website!

DO YOU WANT TO PARTICIPATE?

Send an email to nargesa@nargesa.com including the following information and we will add you to our website:

Company name
Testimonial name
Post in the Company
Country
Descriptive text
Photography with the machine

CONTENTS

1. MACHINE DETAILS	3
1.1. Machine Identification	3
1.2. Dimensions	3
1.3. Description of the Machine	3
1.4. Machine Parts	4
1.5. General Characteristics	5
1.6. Description of the Guards	6
2. TRANSPORT AND STORAGE	7
2.1. Transport	7
2.2. Storage Conditions	7
3. MAINTENANCE	8
3.1. Greasing Moving Parts	8
4. INSTALLATION AND START UP	9
4.1. Machine Location	9
4.2. Dimensions and Work Area	9
4.3. Acceptable External Conditions	9
4.4. Instructions for Electrical Connection	10
5. INSTRUCTIONS FOR USE	11
5.1. Assembling the Roller and Counter-Die	11
5.2. Assembling the Radius Arm	13
5.3. Changing Rotation Direction	14
5.4. Control Panel	16
5.5. Manual Mode	17
5.6. Angle Correction	20
5.7. Radius Arm	20
5.8. Part Counter	21
5.9. Rotation Direction	22
5.10. Adjustment Tables	24
5.11. Automatic Mode	25
5.12. Remote Service	28
5.13. Import/Export Parameters, Materials and Programs	29
5.14. Touchscreen Calibration	31
6. ACCESSORIES	32
6.1. Optional Accessories	32
7. TROUBLESHOOTING	42

1. MACHINE DETAILS

1.1. Machine Identification

Make	Narges
Type	Non-Mandrel Pipe Bender
Model	CC90CNC

1.2. Dimensions

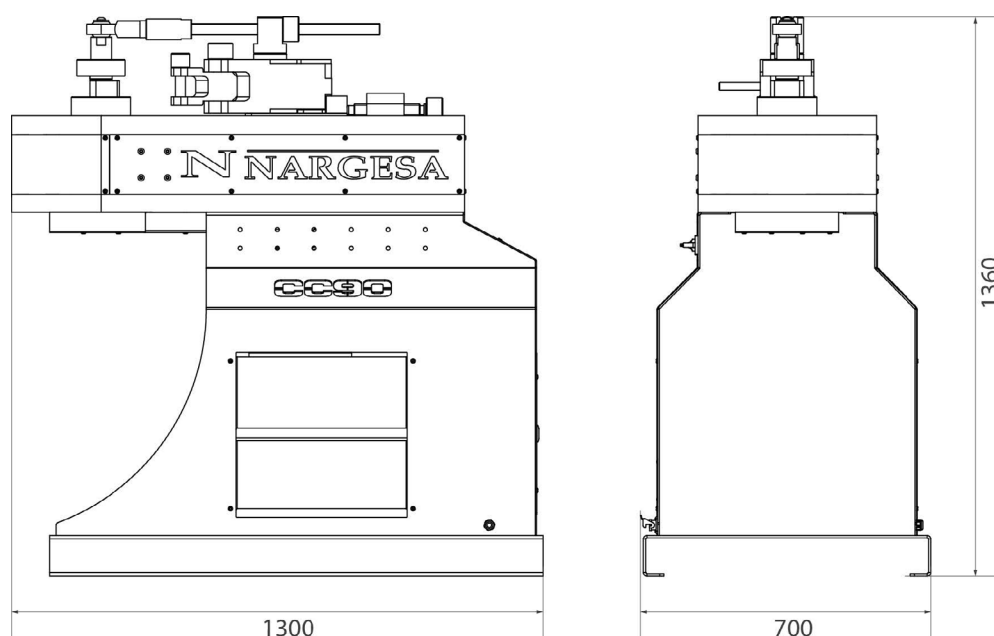


Figure 1. Outside Dimensions of Bender CC90

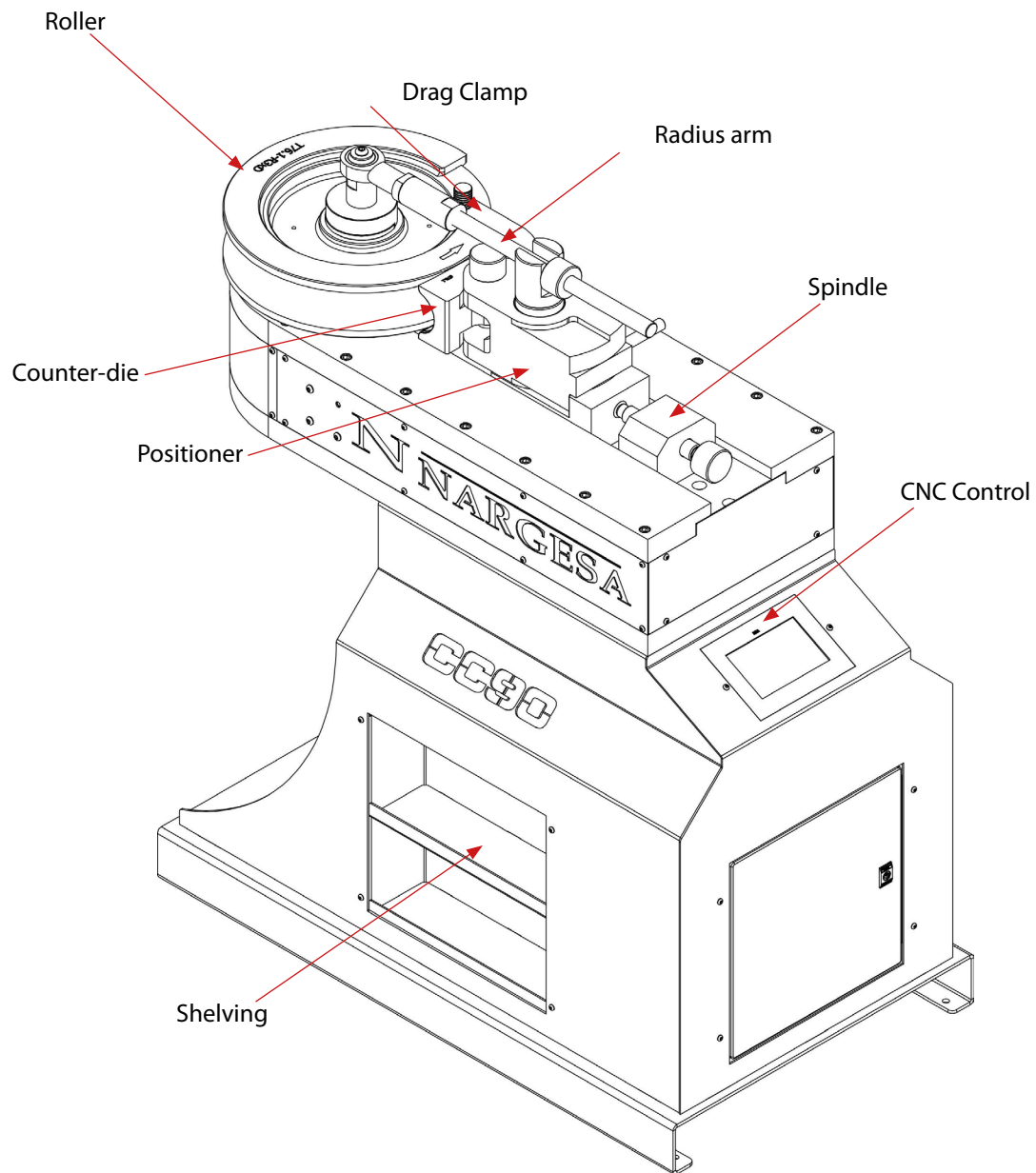
1.3. Description of the Machine

The non-mandrel pipe bender CC90 is a machine specifically designed to bend profiles, mainly metal ones, of different thicknesses and configurations: pipes, solid profiles, T-profiles, angles...

The bender comes standard with a radius arm that must be used to bend thicker pipes of larger diameters. Besides standard rollers, PRADA NARGESA manufactures different types of additional rollers for all types of bending based on the configuration of the material to be worked.

PRADA NARGESA S.L. is not liable for any damages that may be caused due to improper use or a breach of the safety rules by users.

1.4. Machine Parts



		www.nargesa.com			
PRADA NARGESA, S.L. - CTRA. DE GARRIGAS A SANT MIQUEL S/N 17476 PALAU DE STA. EULALIA (GIRONA) SPAIN - TEL.(+34) 972568085					
TRADEMARK NARGESA			MODEL CC90		
YEAR OF MANUFACTURE			SERIAL N°		
DIMENSIONS 700x1300x1360		mm.	WEIGHT 860		Kg.
POWER 2,2	Kw.	INTENSITY 9/5	A.	VOLTAGE	V. Hz 50/60

1.5. General Characteristics

Reference	100-17-02-001
Engine power	2,2 Kw / 3 CV
Three-phased tension	230/400 V 50/60 Hz
Automatic rotation speed	De 0,75 a 2,2 r.p.m.
Intensity	9/5 A
Minimum radius of curvature	3 times the pipe diameter
Maximum radius of curvature	390 mm
Maximum working stroke on round steel pipe	90mm o 3" Schedule-40 o 3" 1/2 x 6mm.
Maximum angle of curvature	180°
Dimensions	700x1300x1360 mm
Weight	860 Kg

1.6. Description of the Guards

The gear box and all the gears enabling the machine to operate are inside the main structure which protects the mechanisms.

Despite the fact the main moving parts are protected by the front cover, special precaution must be taken when bending to prevent entrapment between the die, counter-die and part.

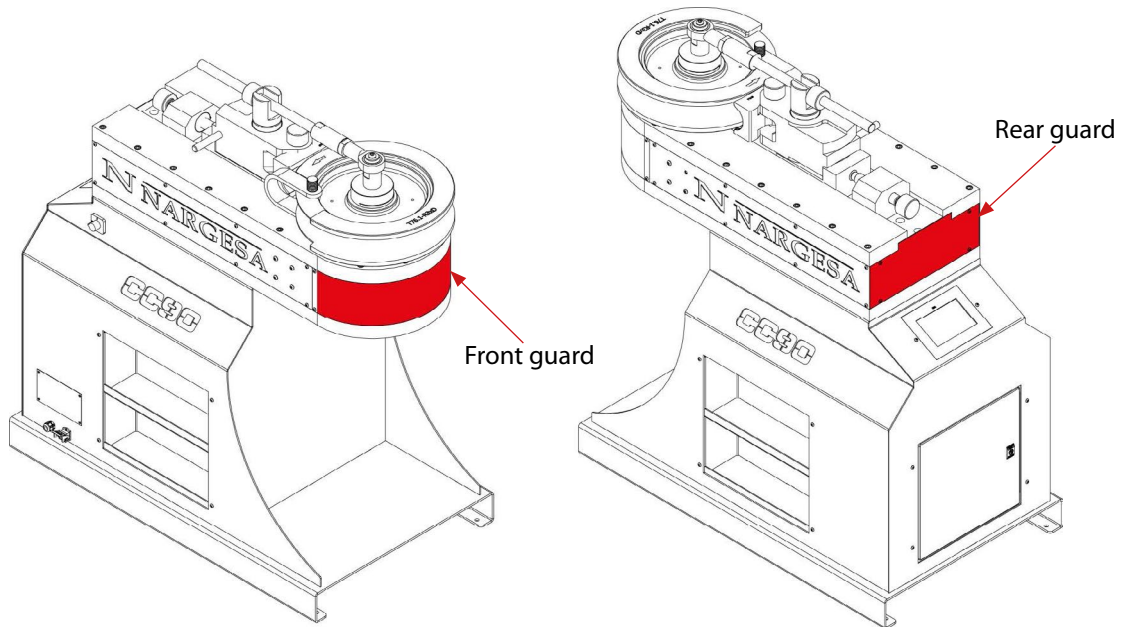


Figure 3. Mechanism Protection Guards

2. TRANSPORT AND STORAGE

2.1. Transport

The machine should be transported as follows:

- Along the bottom at the base of the machine using a forklift or lift truck as indicated in the illustration.

Never raise the machine more than 200 mm off the ground or it may tip over.

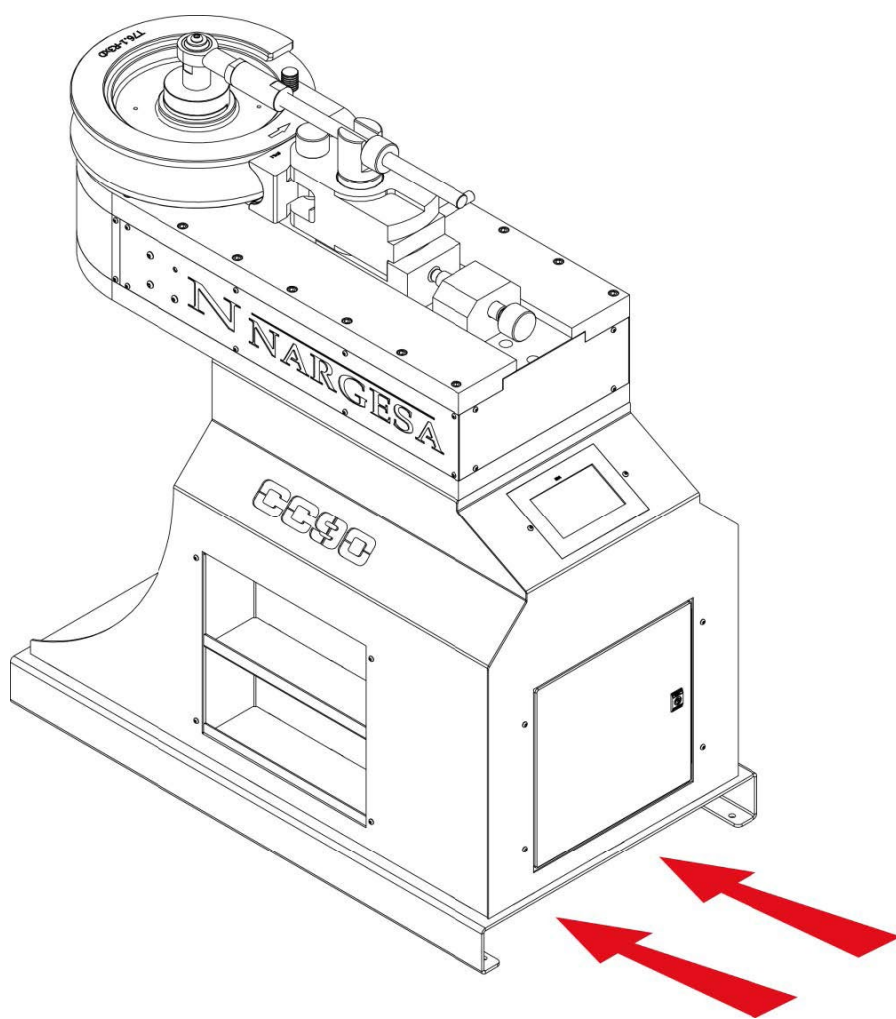


Figure 4. Moving the machine

2.2. Storage Conditions

The pipe bender may not be stored anywhere that does not meet the following requirements:

- Humidity of 30% to 95%
- A temperature of -25°C to 55°C or 75°C over periods not to exceed 24 hours (please remember these temperature are for storage conditions)
- Do not pile machines or place any heavy objects on top
- Do not dismantle for storage

3. MAINTENANCE

3.1. Greasing the Moving Parts

Keeping the moving parts on the machine clean whenever possible is recommended to ensure proper operation and extend the service life.

To grease the pinions on the CC90, do as follows:

- Remove the front guard and rear guard to access the pinions.
- Apply grease to the teeth of the pinions using a brush or spatula.
- Distribute the grease evenly without creating any excess or accumulation.
- Grease the machine periodically depending on the use. Recommended by the manufacturer: once a year.

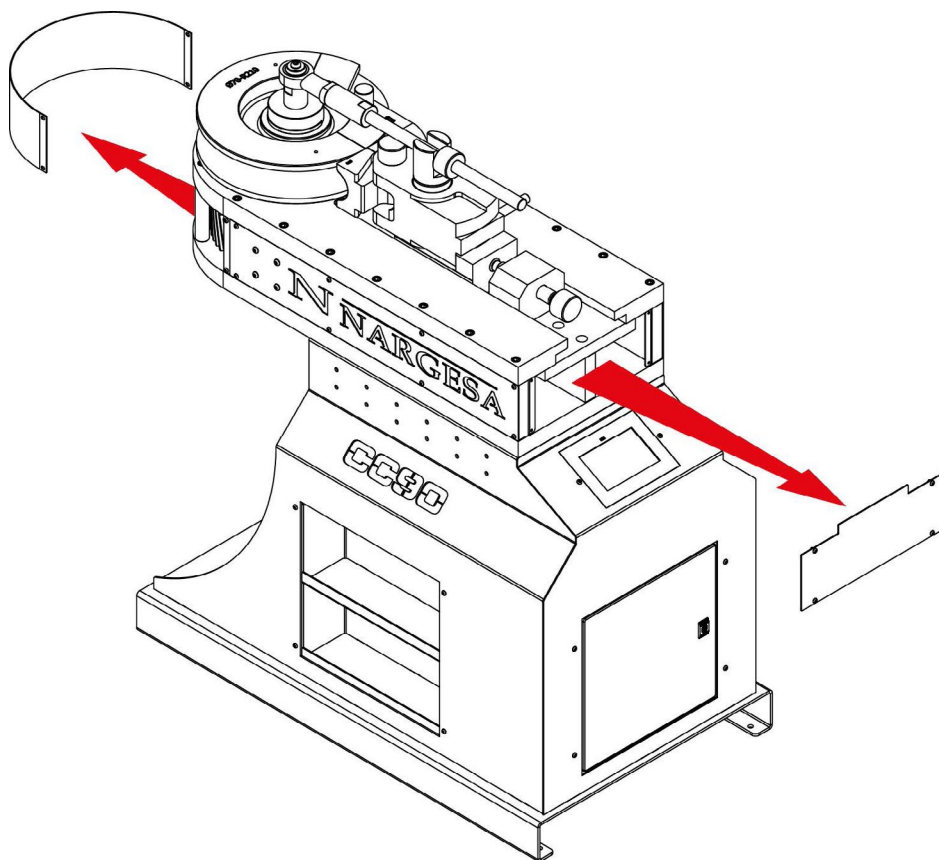


Figure 5. Greasing the Moving Parts

ATTENTION: To grease the machine, you must stop the machine and press the “Emergency Stop” button.

4. INSTALLATION AND START UP

4.1. Machine Location

Try to position the machine in the proper location so that it does not have to be moved; otherwise, following the steps described in the transport section (no. 2). Position over a smooth, level surface to prevent vibrations and movements during bending operations.

The machine can be secured with bolts as it comes with a base or pedestal on the bottom with four holes as shown in the following figure.

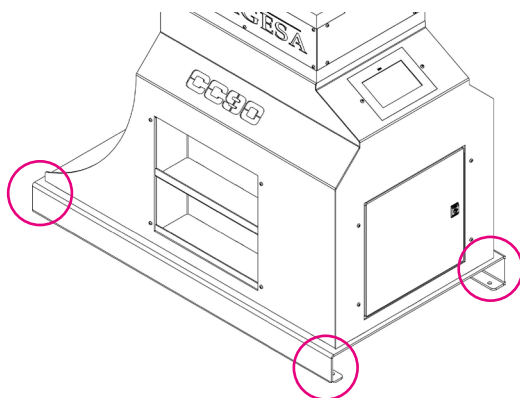


Figure 6. Anchoring points on the machine

4.2. Dimensions and Work Area

Take the dimensions, operator work area and the lengths of any materials to be worked into consideration when positioning the machine. The pipe bender may be used by a single operator who must stand on one of the two sides of the machine to control the materials during processing.

Before starting the bending process, the operator shall adjust the roller and counter-die to the material while the machine is off.

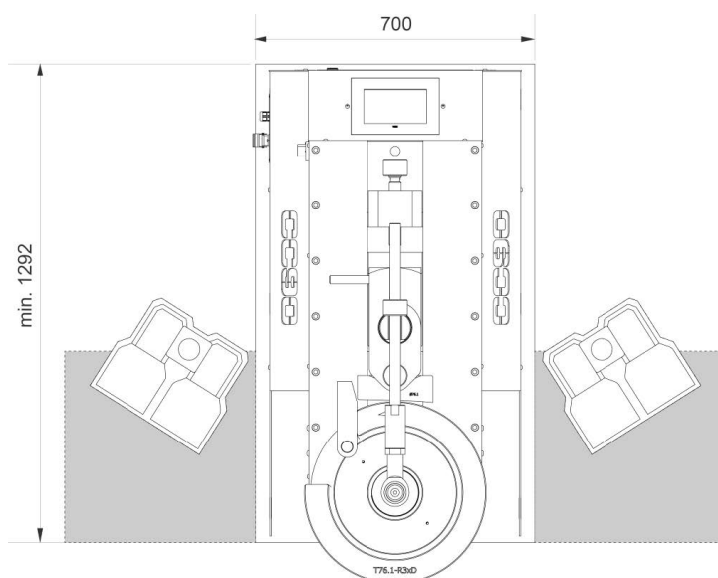


Figure 7. Operator's work area

4.3. Acceptable External Conditions

- A room temperature of between +5 °C and +40 °C without exceeding an average temperature of +35 °C over 24 hours.
- Moisture between 30% and 90% without water condensation.

4.4. Instructions for Electrical Connection

IMPORTANT

This machine must be connected to an earthed socket.

The pipe bender CC90 is equipped with a 230 V 1.1 kw engine for operation with the Roller. The machine must be connected to 220 V compatible supply voltage compliant with the requirements specified.

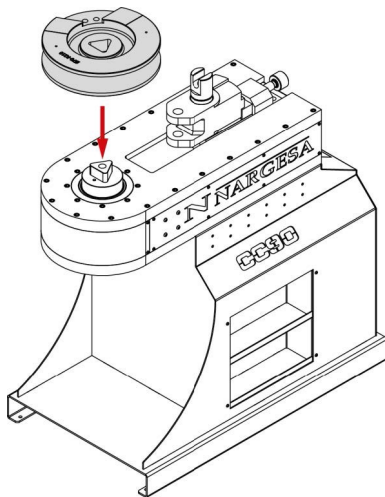
**Before making any change in the wiring or the electric panel,
you need to make sure the machine is not connected to the power supply system.**

5. INSTRUCTIONS FOR USE

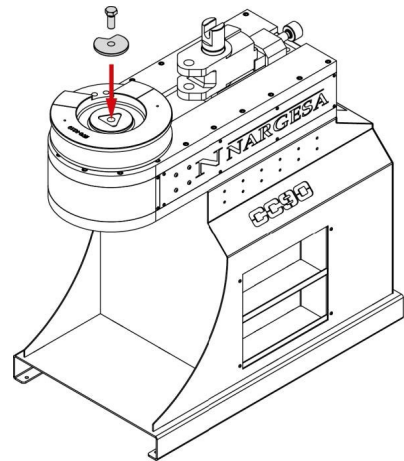
5.1. Assembling the Roller and Counter-Die

The roller shall be assembled as follows:

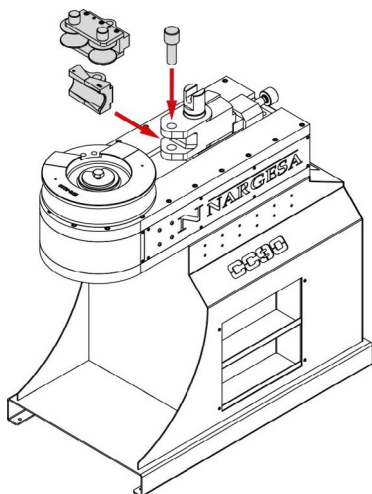
1. Place the roller in the machine axis. The built-in centring pin will prevent an incorrect position.



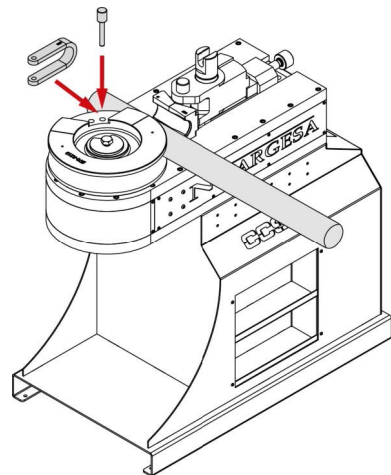
2. Secure the roller with the washer and screw.



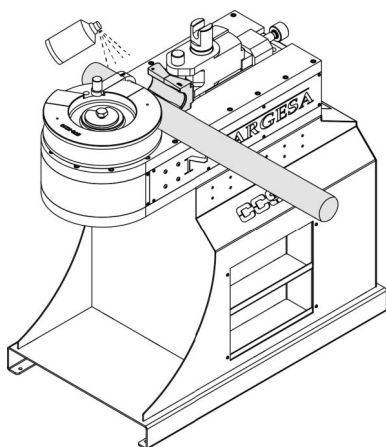
3. Put the counter-die or support rollers in the positioner and secure.



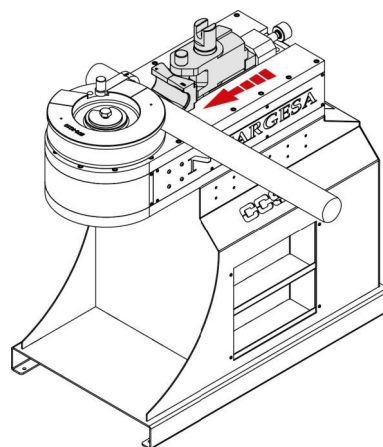
4. Put the material in the roller guide and secure to the drag clamp.



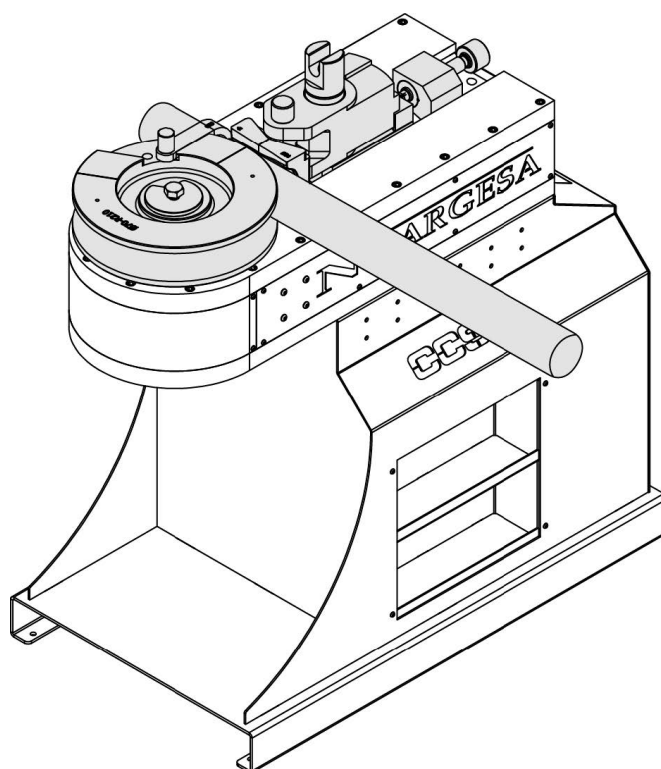
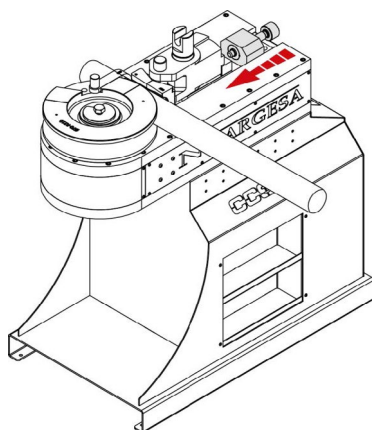
5. Lubricate the pipe and the counter-die with BEND8 spray.



6. Slide the counter-die positioner until adjusted to the material.



7. Secure the positioning spindle with your hands to the machine table.

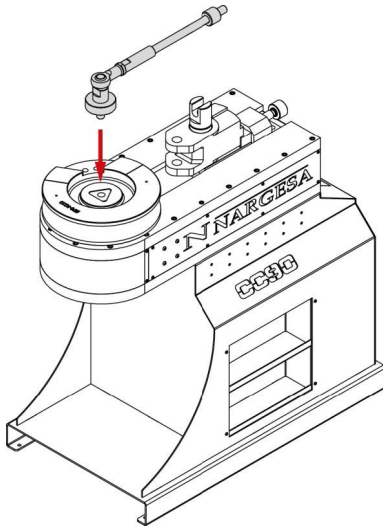


5.2. Assembling the Radius Arm

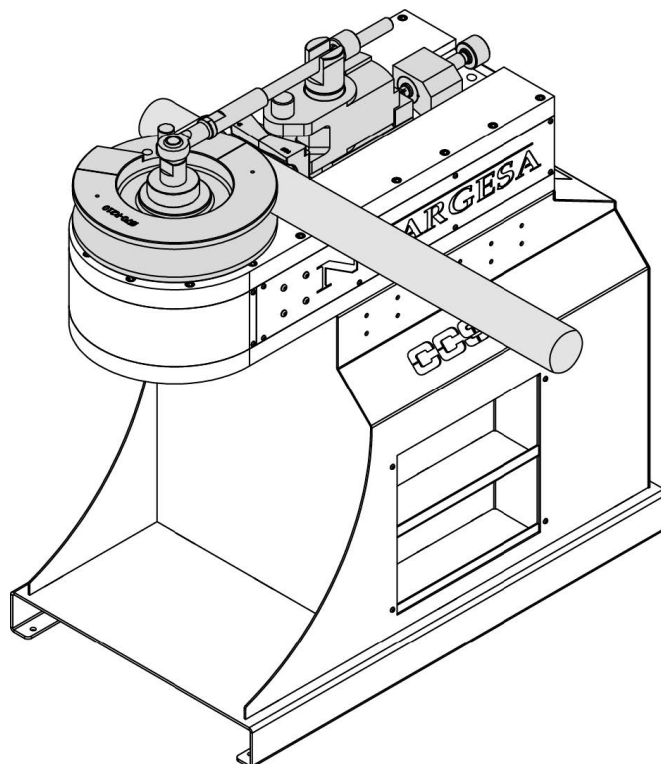
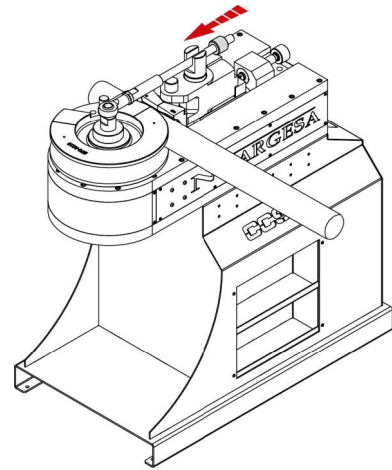
If the radius arm must be used, switch step 2 with 2A as explained below.

And follow step 7 with number 8 as explained below.

2A. Secure the roller with the radius arm.



8. Place the radius arm in the positioner channel and adjust the nut with your hands until secure and fixed.



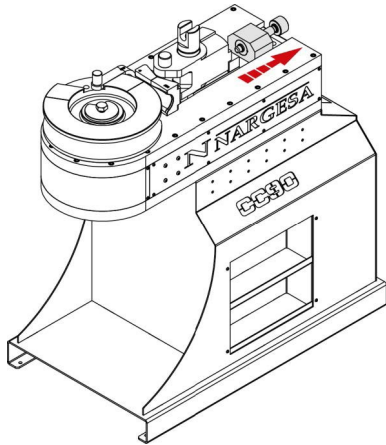
5.3. Changing the Rotation Direction

The non-mandrel pipe bender CC90 is programmed to rotate counter-clockwise. When the rotation direction must be changed, make the following position changes:

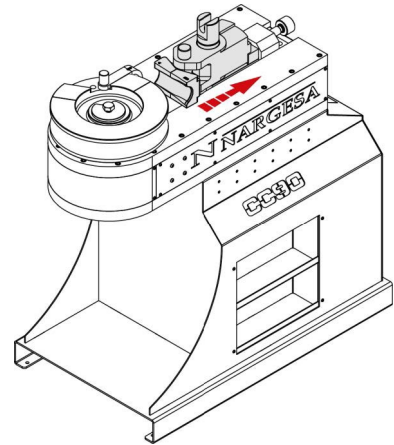
IMPORTANT

Remove the material from the machine to make this change.

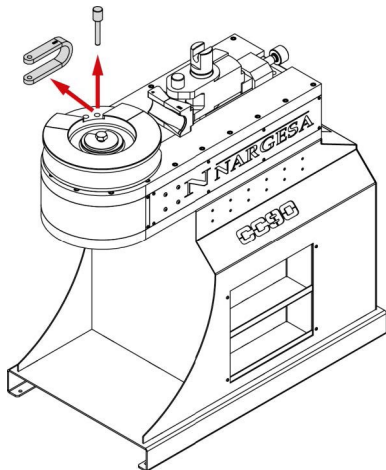
1. Remove the positioning spindle.



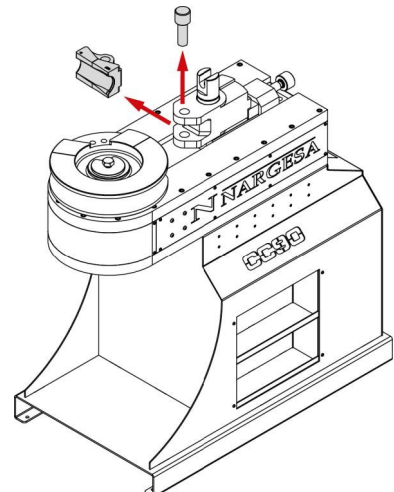
2. Remove the positioner and counter-die.



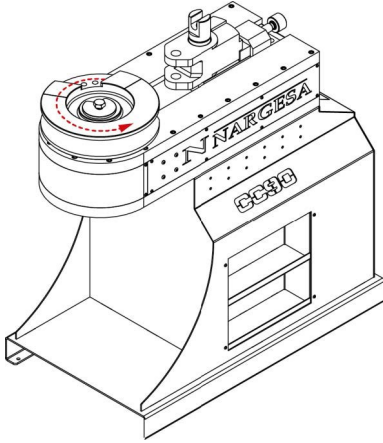
3. Remove the drag clamp.



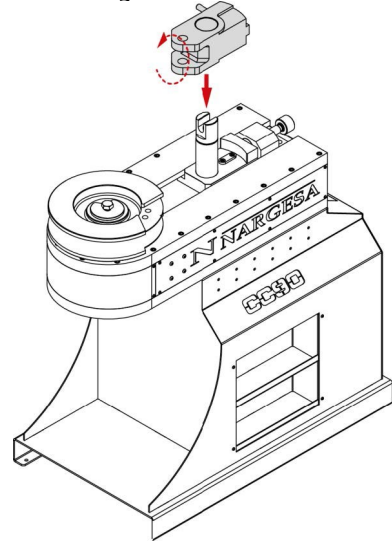
4. Remove the counter-die.



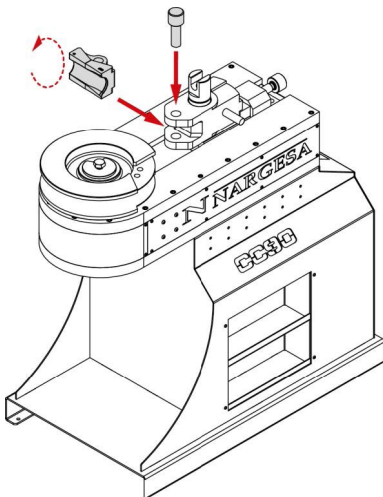
5. Position the roller with the CNC.
See section 5.8. Rotation Direction.



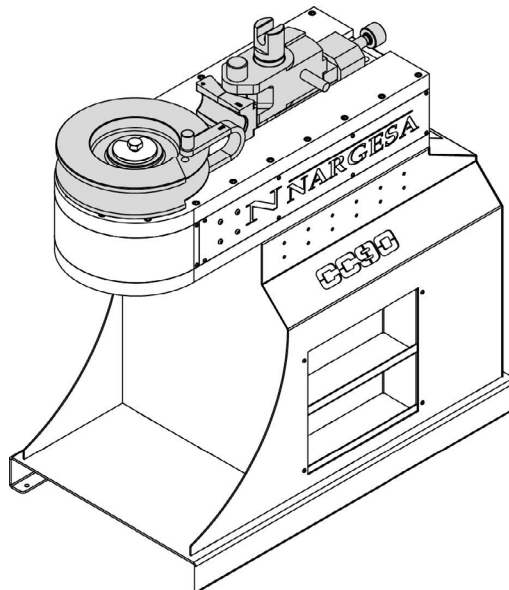
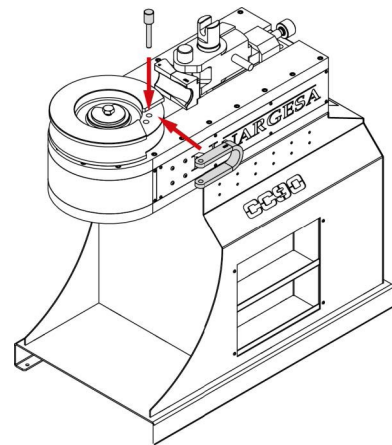
6. Turn the positioner 180° degrees and insert it back in the carriage.



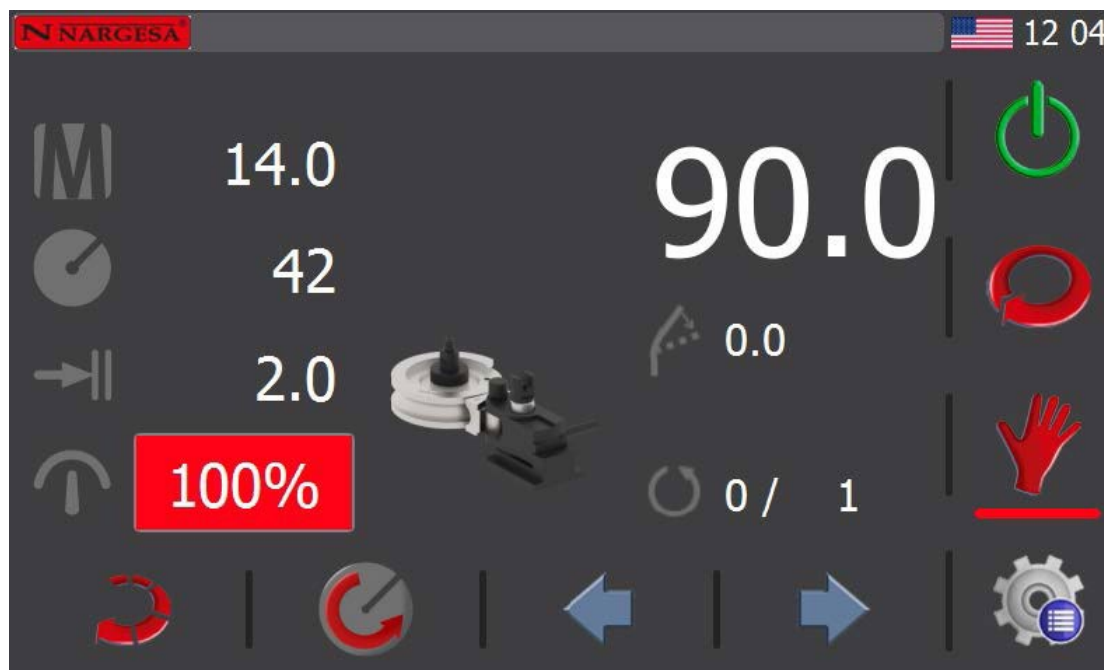
7. Rotate the counter-die 180° and secure with the pin.



8. Put the drag clamp back on.



5.4. Control Panel



On



Automatic



Manual



Menu



Manual rotation to the right



Rotation direction to the left



Rotation direction to the right



Automatic unlocking



Manual rotation to the left



Diameter of the material



Roller Radius



Operating speed



Thickness of the material



Corrector



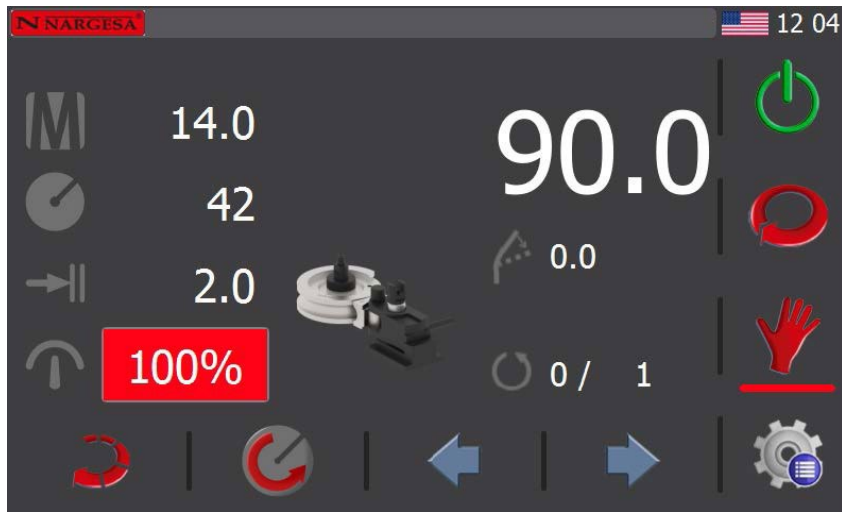
Part counter



Repetitions

5.5. Manual Mode

To turn on the machine, place the Start Switch in the Connected position. The initial interface appears on the screen:




The machine is now in Standby; in other words, the machine is active yet at rest waiting for any operation order.

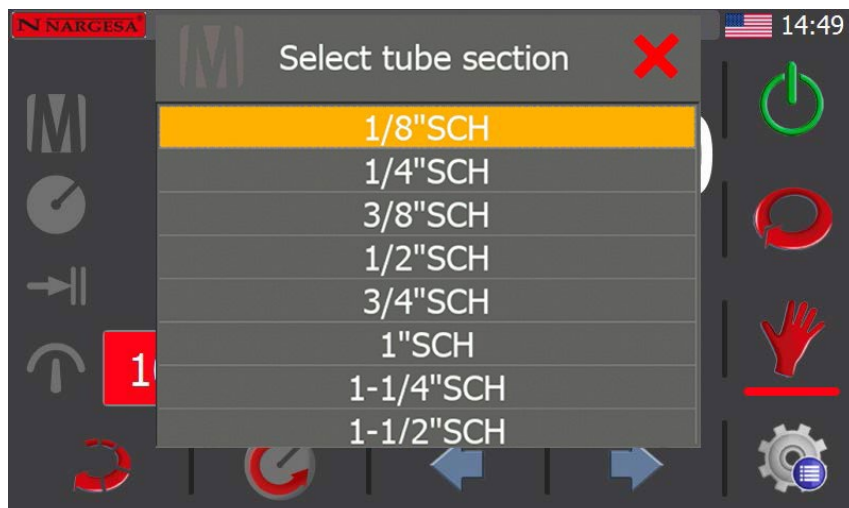
The CC90 is already started and in Standby. To activate it, follow the steps indicated below.


Enter the following operating details:

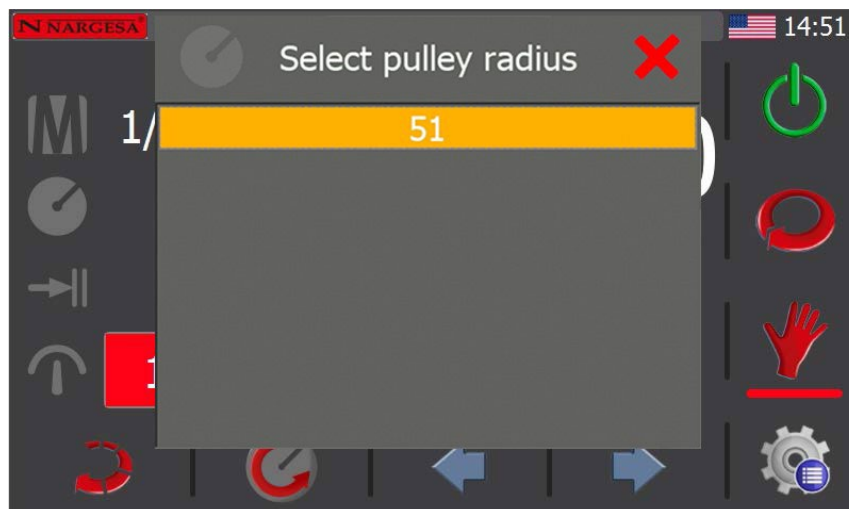
- Diameter of the material
- Roller radius
- Thickness of the material
- Bending angle


Press each of the items on the screen to enter all these parameters.

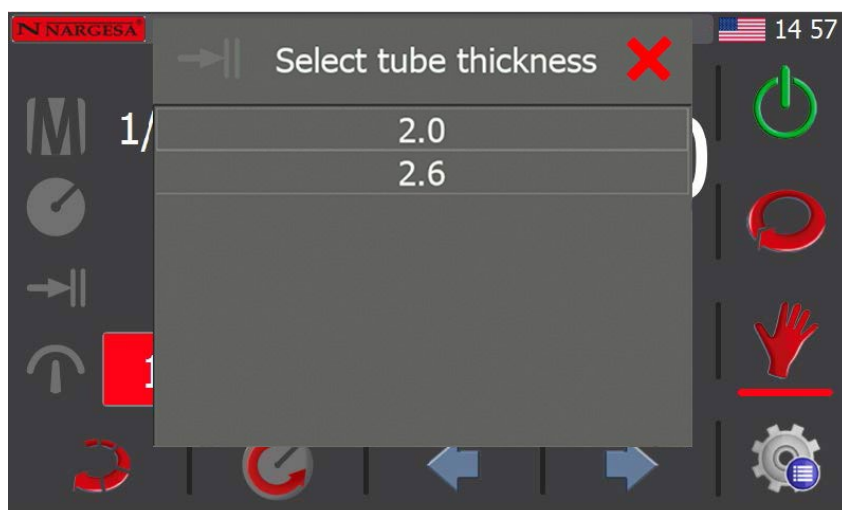
Press the  key to choose the diameter of the material to be curved:





Press  to choose the roller radius.



Press  to choose the thickness of the material:




To determine the bending angle, press the number that appears at the top right of the screen and enter the value; in this case, 90 degrees. Press  to accept and  to start the machine.






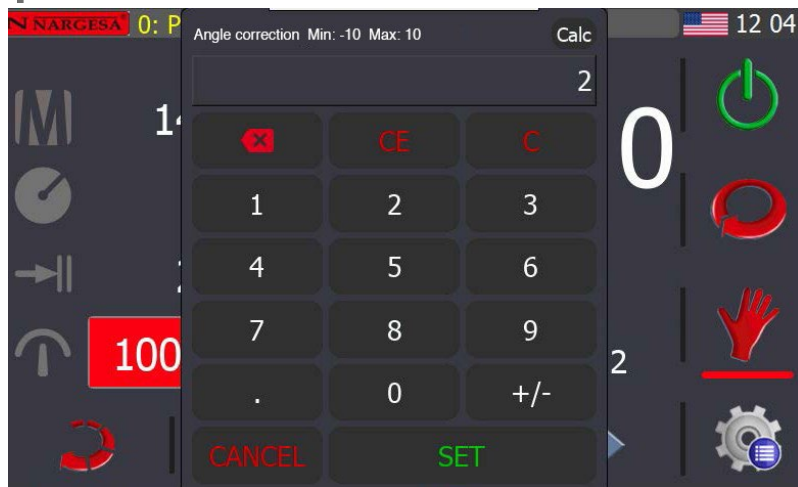
The machine will work at minimum speed based on the parameters entered.


If necessary, enable the automatic unlocking option by pressing the icon . This means the machine will automatically unlock by rotating in the opposite direction of the bending a few degrees to unlock the material. If it is not necessary, disable this icon.



5.6. Angle Correction

If the curving angle needs to be corrected, you must stop the curving process and indicate the necessary correction. Press the icon  and enter the number of degrees required for correction; in this case, 2 degrees.



Confirm by pressing the key **SET** and proceed with another curve. You must press  again to start the cycle.

5.7. Radius Arm

If a large-size pipe is selected, the machine indicates you must install the radius arm. Example:

A pipe with a diameter of 50 mm, a roller radius of 150 and pipe thickness of 2 mm .

If this part must be installed, the icon indicated will appear on the screen:





Install the Radius arm by following the instructions in Section 5.2. **Assembling the Radius Arm.**

IMPORTANT: Whenever the machine indicates the Radius arm is necessary, it must be installed. Not installing it could cause irreparable damages to the machine.

5.8. Part Counter

Another function on the machine is the part counter.

To activate it, press the number that appears to the right of the icon  and add the number of curves you wish to make. In this case, 25.

Confirm by pressing the  key.




The second number in this field indicates the curves already made

If the part counter is not used, enter a 0 for this parameter. The machine will do the same curve an infinite number of times.

5.9. Rotation Direction

Bender CC90 is unique in that it can operate in the two rotation directions. This feature is essential for parts that may collide against the machine.


IMPORTANT: Before making the rotation change, you must remove the Counter-die and Drag Clamp to make sure there is no pipe in the machine.

To proceed with the change in rotation direction, press the rotation direction change key. .



Confirm by pressing . A message appears indicating that you must move the roller to position 0.




Press the  key so the roller rotates to the zero position.



Upon making the rotation change, the machine maintains the same program and the same parameters; it only changes the direction of rotation.

IMPORTANT: once the rotation change is made, the counter-die and drag clamp must be installed for curving. See section *5.3. Rotation Direction Change*.

If you want to reverse the rotation direction, just repeat the process by pressing the  key..



Accept and proceed in the same way by pressing the  key until the machine reaches the zero position.

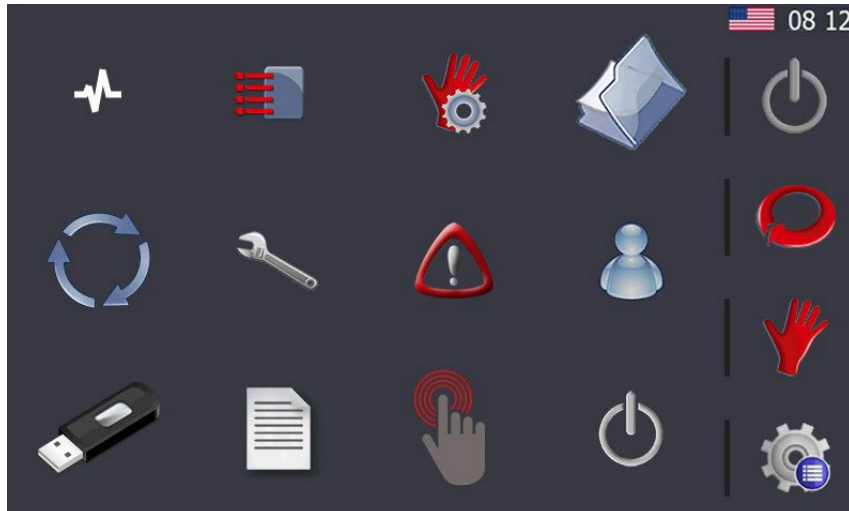
ATTENTION: if you do not complete all the steps in the rotation change process, the machine will continue using the previously set rotation direction.


5.10. Correction Tables

IMPORTANT: Pipes come in different thicknesses and roughnesses depending on the pipe manufacturer and the country where they are manufactured.

Nargesa has added a capability table to the machine which may be edited and updated. This table may be modified by the customer to adjust the correction levels based on the material processed.

To access the corrections table, press the  key. The following screen will appear:

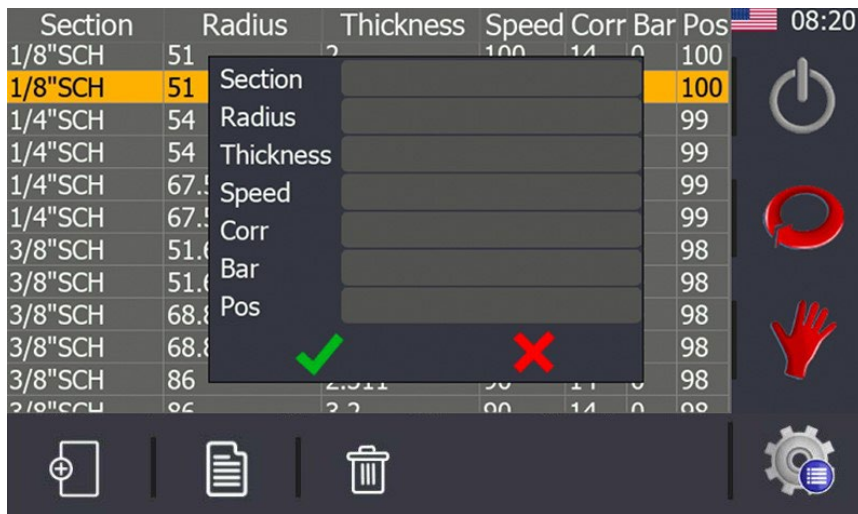


Press the  key to access the corrections menu:

Section	Radius	Thickness	Speed	Corr	Bar	Pos
1/8"SCH	51	2	100	14	0	100
1/8"SCH	51	2.65	100	14	0	100
1/4"SCH	54	2.235	100	14	0	99
1/4"SCH	54	2.9	100	14	0	99
1/4"SCH	67.5	2.235	100	14	0	99
1/4"SCH	67.5	2.9	100	14	0	99
3/8"SCH	51.6	2.311	90	14	0	98
3/8"SCH	51.6	3.2	90	14	0	98
3/8"SCH	68.8	2.311	90	14	0	98
3/8"SCH	68.8	3.2	90	14	0	98
3/8"SCH	86	2.311	90	14	0	98

This screen shows the factory-set parameters: Section, Radius, Thickness, Speed, Corrector, Bar and Position. Pipes can be corrected with these tables.

To add the parameters for a new pipe, press the key  and complete the fields:



Section: refers to the pipe diameter.

Radius: refers to the radius of the roller.

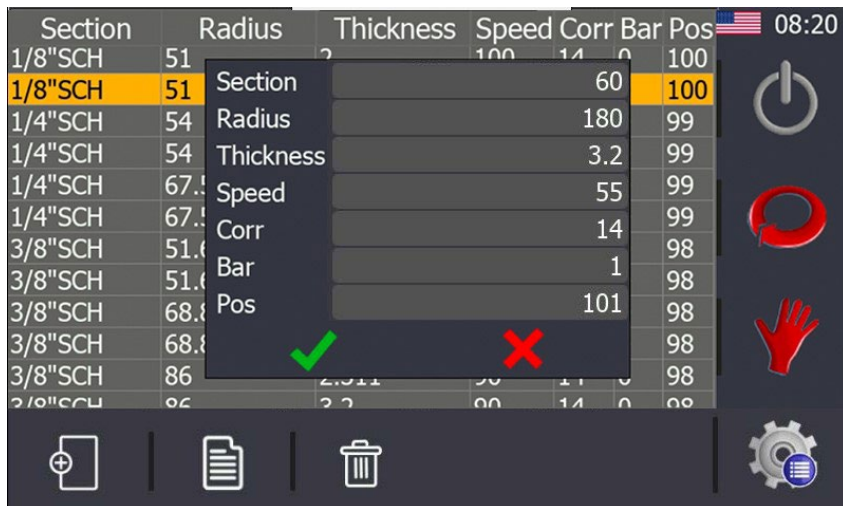
Thickness: refers to the pipe thickness.

Speed: refers to the maximum pipe curving speed.

Corr: refers to the correction required for the roller.

Bar: refers to the need to use the radius arm.

Pos: refers to the position of this new pipe on the list of materials.

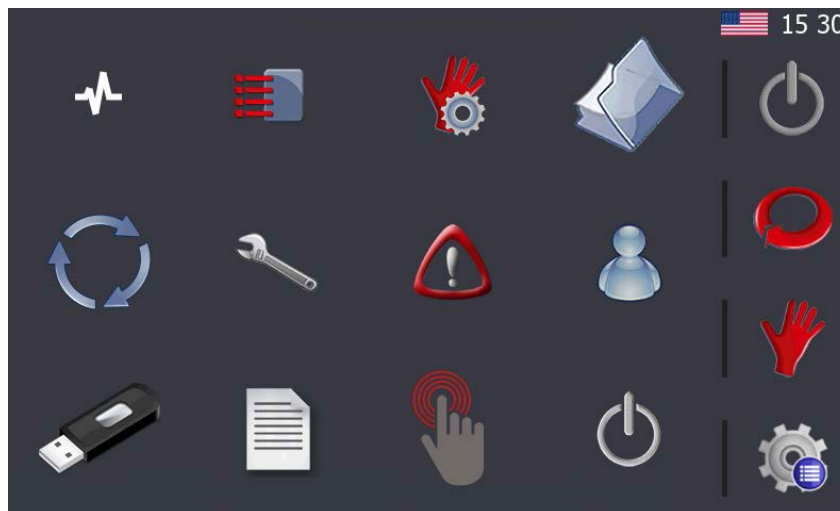



The changes are saved upon accepting and will be effective immediately.

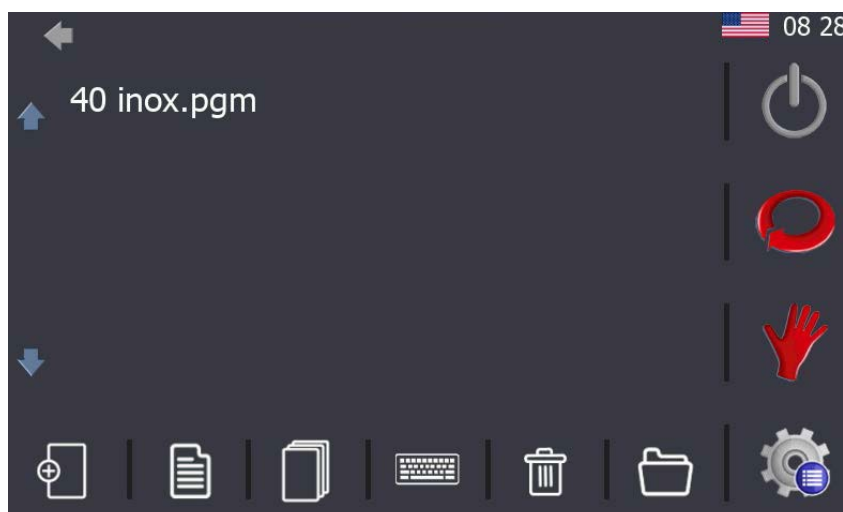
5.11. Automatic Mode

This operating mode makes it possible to make curves with different curve angles on the same piece. This model also enables saving programs in the CNC to be used whenever needed.

To generate a new program, press the  key and this screen will appear:

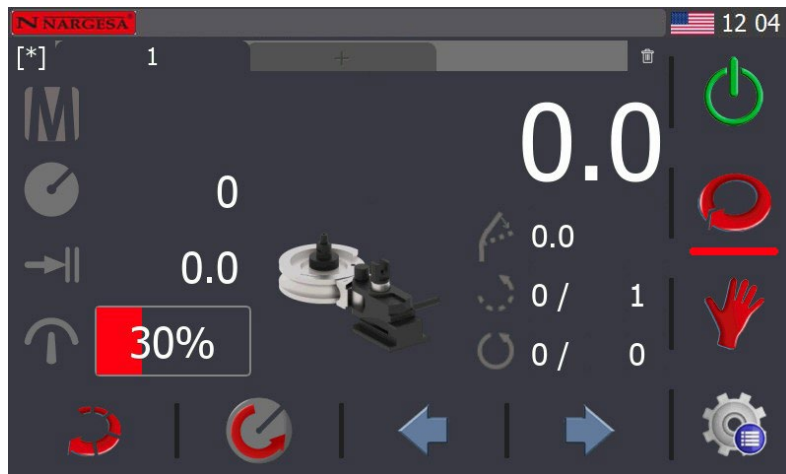


Press the  key and this will appear on the screen:

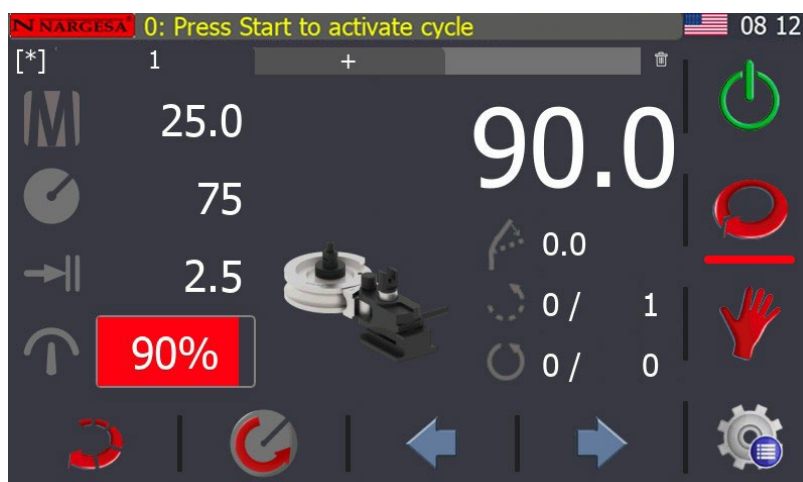


Edit the programs from the interface: generate a new program, modify it, generate new folders or delete them.

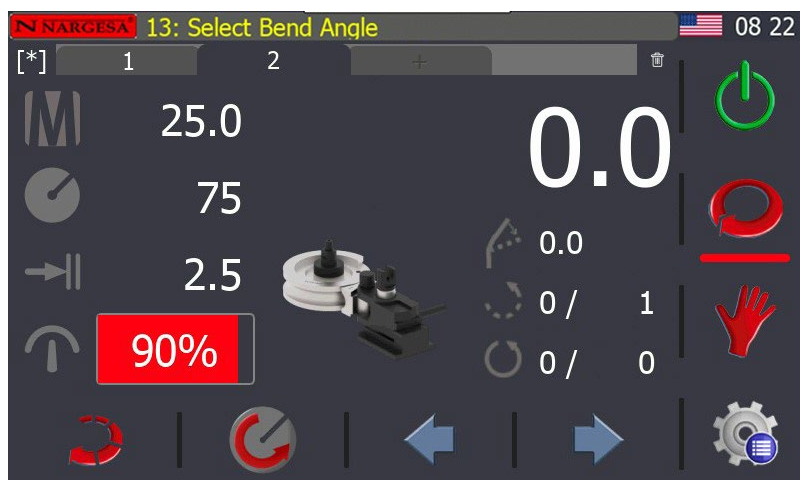
To generate a new program, press the  key. After pressing it, this screen will appear:



Complete the parameters just like in Manual Mode: enter the pipe section, the radius of the roller, the pipe thickness, the number of pieces needed and the curve angle.




Now add a new curve in the same program. To do so, press the + key at the top of the screen.



IMPORTANT: The general data are the same for the entire program; in other words, if they are changed for a specific curve, they will be changed for the entire program.

Enter the angle at which you wish to make the curve in the second operation; in this case, 45 degrees. Now, the program has two curves programmed, the first at 90 degrees and the second at 45 degrees. Add all curves needed by pressing the + key and enter a new radius of curving.



For cases where you must make two curves at the same degrees, a new operation does not need to be added to the program. Use the repetition tool by pressing the  icon and add the number of times this curve should be repeated. In this case, the machine will make 3 curves at 45 degrees as part of the number 2 curving in the program.

Save the program by pressing the [*] icon at the top right of the screen..

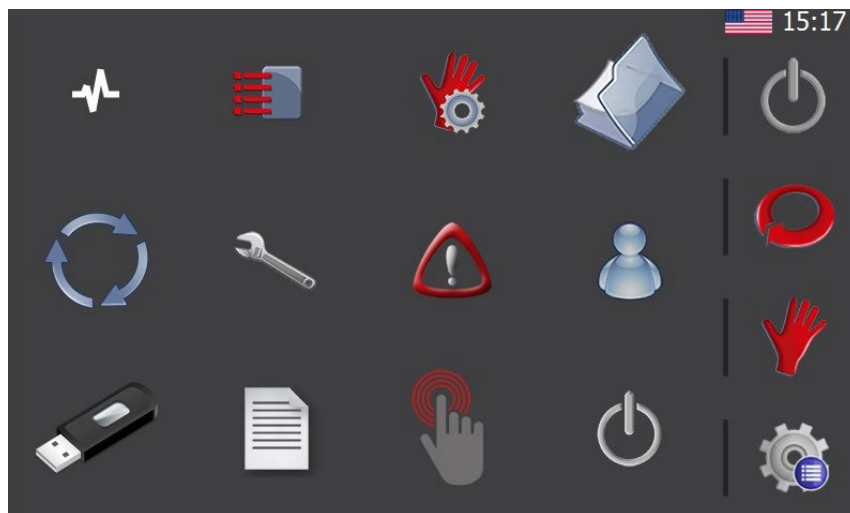



Enter a name for the program and press Enter.

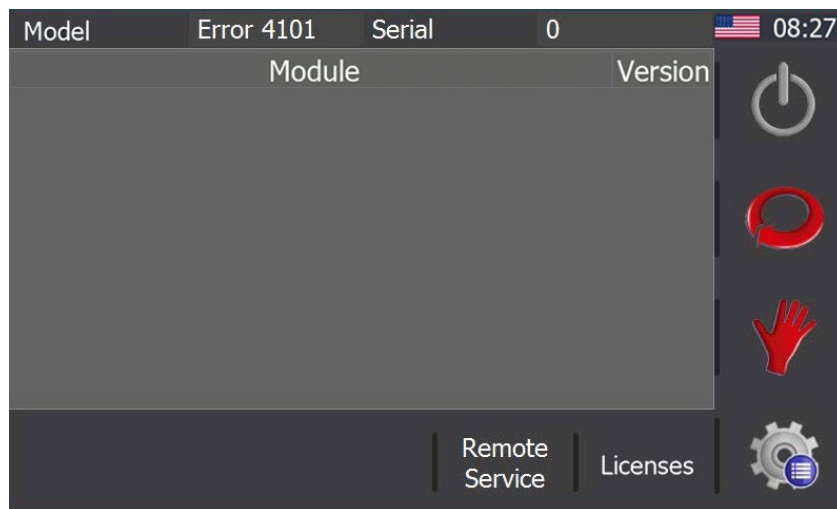
5.12. Remote Service

The bender is ready to be connected to ethernet via the cable supplied for this purpose. The IP address in the local network is 10.10.51.110, which is factory-set. This also makes it possible to configure a remote service for the machine.

This service allows Nargesa, as the bender manufacturer, to connect remotely to the machine to resolve technical incidents and provide the end customer with distance training.



To activate the remote service, press the  key to access the menu window






The information shown in the figure above refers to the model and serial number for the bender control as well as the versions of the different digital libraries used in the user interface.


To activate the remote service so the Nargesa technical assistance department may connect to the machine to resolve incidents and/or provide distance training, you need to press

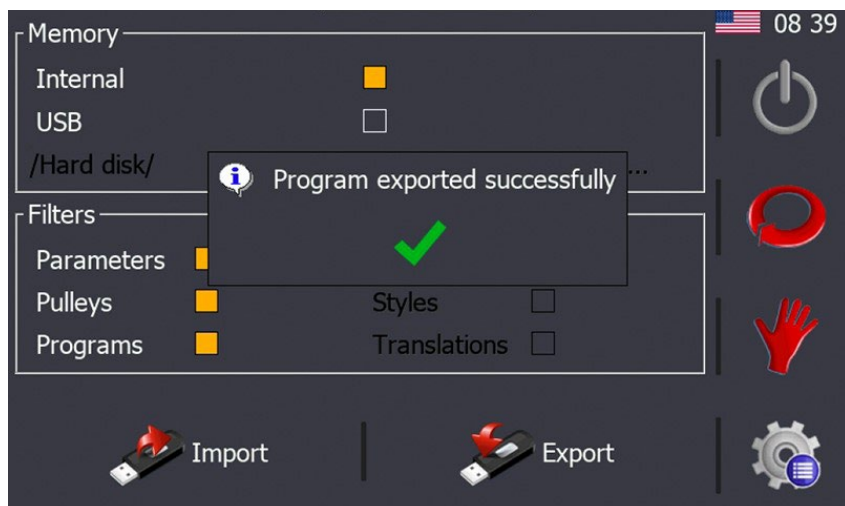
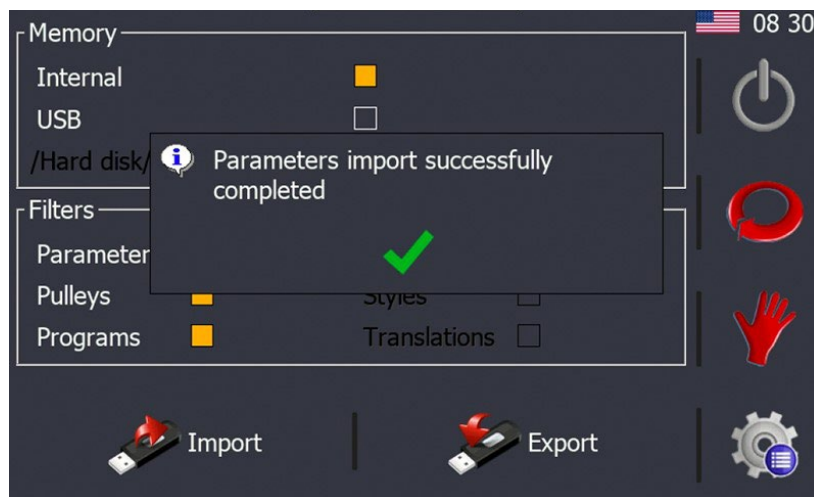
5.13. Import/Export Parameters, Materials and Programs

All the bender configuration parameters as well as the materials defined and programs created can be imported and exported to create backup copies.





To access the window shown in the figure above, you must press the  key. Once you access the menu screen, you must press the key . All filters are activated by default as well as the internal memory option. If you now press , all the parameters, materials and programs will be saved in the internal shear control memory and a backup copy will be made. If you would like to make a backup copy on an external device such as a USB flash drive, you must mark the USB option and press again.

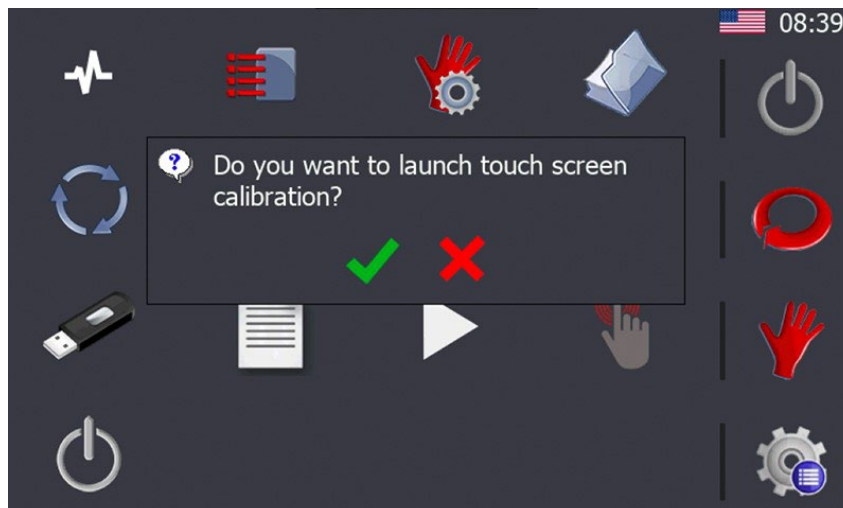
It's important to make backup copies frequently to ensure you have the parameters, materials and programs created saved. If you need to recover all or part of this information at any time, just select the data source (internal memory or USB flash drive) and press . Upon doing so, the sequence of information present on the screen will be as follows




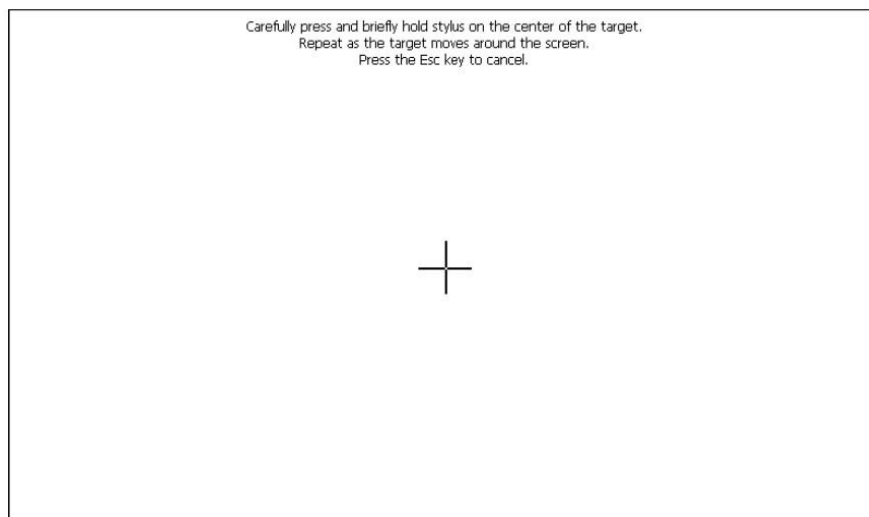
5.14. Calibrating the Touchscreen

The touchscreen is factory-calibrated for use. However, it may need to be calibrated if it does not accurately respond to the actions of the operator using it.

To proceed adequately, first press the key  to access the menu window. Once here, press the key . Upon doing so, the message shown below will appear on the screen:



If you accept by pressing , the touchscreen calibration process begins. The information on the screen will change to this:



There is a cross in the middle of the window which must be pressed for a few seconds until it moves to a new position. This process is repeated at different points on the screen until the touchscreen calibration has finished.

6. ACCESSORIES

6.1. Optional Accessories

Bottle of BEND8 lubricant.

This is a high-additive and low-viscosity aerosol oil. Contains PTFE. Does not contain silicone.



- Enables the finish on the outer bend
- Inhibits roughness and inner marks
- Reduces wear of the tooling
- Especially designed for tubes of small thickness
- Lubricates to reduce friction
- Avoids and dissolves corrosion
- Gives shine and protects
- Cleans up and removes dirt

REF.	Description	Quantity	Weight
060-SPR-00003	400 ml bottle	400ml	0,39Kg
060-SPR-00004	Box of 12 400 ml bottles	12x400ml	4,83Kg

Technical Data Sheet for the product BEND8

A. IDENTIFICATION OF THE SUBSTANCE OR MIXTURE AND COMPANY OR SUPPLIER

A.1. Product identification

BEND8 aerosol

A.2. Relevant identified uses of the substance or mixture and uses advised against

Relevant uses: Lubricant

Uses advised against: Anything not specified in this section or section 7.3.

A.3. Details of the supplier of the Safety Data Sheet

Prada Nargesa, S.L.

Ctra. De Garrigàs a Sant Miquel, s/n

17476 Palau de Santa Eulàlida, Girona, Spain

Tel. +34 972568085

nargesa@nargesa.com

www.nargesa.com

A.4. Emergency telephone number

+34936629911

B. HAZARD IDENTIFICATION

B.1. Classification of the substance or mixture

Regulation EC No. 1272/2008 (CLP)

This product has been classified pursuant to Regulation No. 1272/2008 (CLP).

Aerosol 1: Pressure vessel: It may explode if heated, H229

Aerosol 1: Aerosols, category 1, H222

B.2. Label elements

Regulation No. 1272/2008 (CLP)



Hazard instructions:

Aerosol 1: H229 - Pressure vessel: It may explode if heated

Aerosol 1: H222 - Extremely flammable aerosol

Precautionary statements:

P101: If medical advice is needed, have product container or label at hand

P102: Keep out of reach of children

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking

P211: Do not spray on an open flame or other ignition source.

P251: Do not pierce or burn, even after use.

P410+P412: Protect from sunlight. Do not expose to temperatures exceeding 50°C/122°F

P501: Dispose of contents/container to the local selective waste system.







B.3. Other Hazards

The product does not meet PBT/vPvB criteria

C. COMPOSITION / INFORMATION ON THE COMPONENTS**C.1. Substance**

Not applicable

C.2. Mixtures**Chemical description:** Mixture of mineral oils and additives**Components:** Pursuant to Annex II of Regulation (EC) no. 1907/2006 (point 3), the product contains:

Identificación	Nombre químico/clasificación		Concentración
CAS: 112-34-5 CE: 203-961-6 Index: 603-096-00-8 REACH: 01-2119475104-44-XXXX	2-(2-butoxi)etanol ¹ ATP CLP00		<0,05 %
	Reglamento 1272/2008	Eye Irrit. 2: H319 - Atención 	
CAS: 1330-20-7 CE: 215-535-7 Index: 601-022-00-9 REACH: 01-2119488216-32-XXXX	Xileno ¹ ATP CLP00		<0,05 %
	Reglamento 1272/2008	Acute Tox. 4: H312+H332; Flam. Liq. 3: H226; Skin Irrit. 2: H315 - Atención  	
CAS: 100-41-4 CE: 202-849-4 Index: 601-023-00-4 REACH: 01-2119489370-35-XXXX	Etilbenceno ¹ Autoclificada		<0,05 %
	Reglamento 1272/2008	Acute Tox. 4: H332; Aquatic Chronic 3: H412; Asp. Tox. 1: H304; Flam. Liq. 2: H225; STOT RE 2: H373 - Peligro   	

¹ Substance subject to a workplace exposure limit

For more information on the hazards of the substances, see sections 8, 11, 12, 15 and 16.

D. FIRST AID**D.1. Description of first aid measures**

Symptoms of intoxication may appear long after exposure. When in doubt, seek medical attention and show them the SDS for this product after direct exposure to the chemical product or if discomfort persists.

Inhalation: This product is not classified as an inhalation hazard; however, remove the victim from the exposure site, supply them with clean air and allow them to rest if any intoxication symptoms appear. Seek medical attention if the symptoms persist.

Customers must equip their pipe bender with a specific die to get the desired curving.

The diameter and thickness of the pipe as well as the radius of curvature must be taken into account when choosing a roller.

Part Characteristics:

Main Roller made of highly resistant steel which has been thermally hardened with carbonitriding for 50-54 HRC hardness; this roller guide perfectly adapts to the pipe for excellent results.

Counter-shape designed by the Nargesa R+D department which reduces friction and ensures optimal curving. It's made of a highly resistant aluminum bronze alloy and mechanized in 3D.

Clamp with a fastener to firmly secure the material during the bending process.

Two Support holders made of highly resistant steel which has been thermally treated with carbonitriding for 50-54 HRC hardness; these rollers reduce the surface of contact, therefore, reduces friction.

Accessories for round pipes in millimetres · 12 to 80 mm



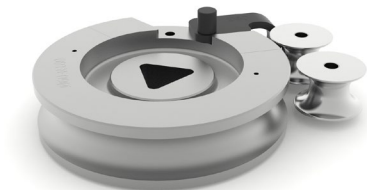
Rollers made of treated Steel. Units suitable for bending all types of round pipes 12 to 80 millimetres.

The following is supplied with the unit: A main roller, a counter-shape, a clamp with a fastener.

Check with the manufacturer for other dimensions.

Ø Ext.	Radius	Min. thickness	Max. thickness	Weight
Set diameter 12mm Radius 60				REF: 140-17-01-10012
12 mm	60 mm	1 mm	5 mm	3,26 Kg
Set diameter 15mm Radius 60				REF: 140-17-01-10001
15 mm	4D=60 mm	1 mm	5 mm	3,18 Kg
Set diameter 18mm Radius 60				REF: 140-17-01-10010
18 mm	60 mm	1 mm	5 mm	3,11 Kg
Set diameter 20mm Radius 60				REF: 140-17-01-10002
20 mm	3D=60 mm	1 mm	5 mm	3,22 Kg
Set diameter 22mm Radius 66				REF: 140-17-01-10014
22 mm	3D=66 mm	1 mm	5 mm	4,10 Kg
Set diameter 25mm Radius 75				REF: 140-17-01-10003
25 mm	3D=75 mm	1,2 mm	5 mm	5,55 Kg
Set diameter 28mm Radius 84				REF: 140-17-01-10011
28 mm	3D=84 mm	1,2 mm	5 mm	7,28 Kg
Set diameter 30mm Radius 90				REF: 140-17-01-10004
30 mm	3D=90 mm	1,2 mm	5 mm	8,29 Kg
Set diameter 32mm Radius 98				REF: 140-17-01-10013
32 mm	3D=98 mm	1,5 mm	5 mm	10,16 Kg
Set diameter 35mm Radius 105				REF: 140-17-01-10005
35 mm	3D=105 mm	1,5 mm	5 mm	12,14 Kg
Set diameter 40mm Radius 120				REF: 140-17-01-10006
40 mm	3D=120 mm	1,5 mm	5 mm	17,11 Kg
Set diameter 50mm Radius 150				REF: 140-17-01-10007
50 mm	3D=150 mm	2 mm	5 mm	31,41 Kg
Set diameter 60mm Radius 180				REF: 140-17-01-10008
60 mm	3D=180 mm	2 mm	5 mm	40,88 Kg
Set diameter 70mm Radius 210				REF: 140-17-02-10001
70 mm	3D=210 mm	3,6 mm	6 mm	72,40 Kg
Set diameter 80mm Radius 240				REF: 140-17-02-10002
80 mm	3D=240 mm	4 mm	5 mm	88,17 Kg

Accessories for 90 millimetres round pipes



Rollers made of treated steel. Suitable kit to bend 90mm tube of 4mm wall thickness or thicker.

The following is supplied with the unit: A main roller, a clamp with a fastener, a support holder.

Check with the manufacturer for other dimensions.

Supporting Roller Kit REF: 140-17-02-00002 is required.

Ø Ext.	Radius	Min. thickness	Max. thickness	Weight
Set diameter 90mm Radius 270				REF: 140-17-02-10003
90 mm	3D=270 mm	4 mm	5 mm	114,36 Kg

* The walls with more thickness to the established one and the materials with more resistance, reduce the capacities of the machine.

Accessories for round pipes 3/8" to 2" 1/2 Schedule



Rollers made of treated Steel. Units suitable for bending all types of round pipes 3/8" to 2" 1/2 Schedule.

The following is supplied with the unit: A main roller, a counter-shape, a clamp with a fastener.

Check with the manufacturer for other dimensions.

Ø Ext.	Ø Ext.	Radius	SCH10	SCH40	SCH80	SCH160	Weight
Set diameter 17,10mm Radius 60mm Diameter 3/8" Schedule						REF: 140-17-01-20001	
3/8"	17,1 mm	60 mm	1,65 mm	2,31 mm	3,20 mm	--	4,22 Kg
Set diameter 21,30mm Radius 63,9mm Diameter 1/2" Schedule						REF: 140-17-01-20002	
1/2"	21,3 mm	3D=63,9 mm	2,11 mm	2,77 mm	3,73 mm	4,78 mm	3,56 Kg
Set diameter 26,90mm Radius 80,1mm Diameter 3/4" Schedule						REF: 140-17-01-20003	
3/4"	26,9 mm	3D=80,1 mm	2,11 mm	2,87 mm	3,91 mm	5,56 mm	6,74 Kg
Set diameter 33,70mm Radius 101,1mm Diameter 1" Schedule						REF: 140-17-01-20004	
1"	33,7 mm	3D=101,1 mm	2,77 mm	3,38 mm	4,55 mm	6,35 mm	11,18 Kg
Set diameter 42,40mm Radius 127,2mm Diameter 1" 1/4 Schedule						REF: 140-17-01-20005	
1" 1/4	42,4 mm	3D=127,2 mm	2,77 mm	3,56 mm	4,85 mm	6,35 mm	18,86 Kg
Set diameter 48,30mm Radius 144,9mm Diameter 1" 1/2 Schedule						REF: 140-17-01-20006	
1" 1/2	48,3 mm	3D=144,9 mm	2,77 mm	3,68 mm	5,08 mm	--	27,05 Kg
Set diameter 60,30mm Radius 180,9mm Diameter 2" Schedule						REF: 140-17-02-20001	
2"	60,30 mm	3D=180,9 mm	2,77 mm	3,91 mm	5,54 mm	--	45,75 Kg
Set diameter 73mm Radius 219mm Diameter 2" 1/2 Schedule						REF: 140-17-02-20002	
2" 1/2	73,0 mm	3D=219 mm	3,05 mm	5,16 mm	7,01 mm	--	72,00 Kg

Accessories for 3" Schedule round pipes



Rollers made of treated steel. Suitable kit to bend 3" Schedule tube of 3,05mm wall thickness or thicker.

The following is supplied with the unit: A main roller, a clamp with a fastener, a support holder.

Check with the manufacturer for other dimensions.

Supporting Roller Kit REF: 140-17-02-00002 is required.

Ø Ext.	Ø Ext.	Radius	SCH10	SCH40	SCH80	SCH160	Weight
Set diameter 88,9mm Radius 266,7mm Diameter 3" Schedule						REF: 140-17-02-30003	
3"	88,9 mm	3D=266,7 mm	3,05 mm	5,49 mm	--	--	110,80 Kg

* All capacities are based on the norm of carbon steel tubes according to ASTM, Standard A-53 grade A with a maximum resistance strength of 330MPa. The walls with more thickness to the established one and the materials with more resistance, reduce the capacities of the machine. Check with your material supplier for the specifications of this one.

Accessories for round pipes in inches · 1/2" to 3" inches



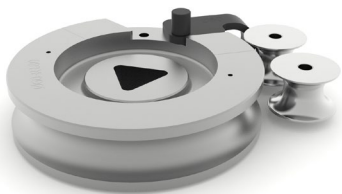
Rollers made of treated Steel. Units suitable for bending all types of round pipes 1/2" to 3" inches.

The following is supplied with the unit: A main roller, a counter-shape, a clamp with a fastener.

Check with the manufacturer for other dimensions.

Ø Ext.	Ø Ext.	Radius	Min. thickness	Max. thickness	Weight
Set diameter 9,52mm Radius 60mm Diameter 3/8" inches					REF: 140-17-01-30012
3/8"	9,52 mm	60 mm	1 mm	4 mm	3,40 Kg
Set diameter 12,7mm Radius 60mm Diameter 1/2" inches					REF: 140-17-01-30011
1/2"	12,7 mm	60 mm	1 mm	4 mm	3,37 Kg
Set diameter 15,88mm Radius 60mm Diameter 5/8" inches					REF: 140-17-01-30001
5/8"	15,88 mm	60 mm	1 mm	4 mm	3,61 Kg
Set diameter 19,05mm Radius 60mm Diameter 3/4" inches					REF: 140-17-01-30002
3/4"	19,05 mm	60 mm	1 mm	4 mm	2,79 Kg
Set diameter 22,22mm Radius 66mm Diameter 7/8" inches					REF: 140-17-01-10014
7/8"	22,22 mm	66 mm	1 mm	5 mm	4,10 Kg
Set diameter 25,40mm Radius 76,20mm Diameter 1" inches					REF: 140-17-01-30003
1"	25,40 mm	3D=76,2 mm	1,2 mm	5 mm	5,72 Kg
Set diameter 28,57mm Radius 85,7mm Diameter 1" 1/8 inches					REF: 140-17-01-30009
1" 1/8	28,57 mm	3D=85,7 mm	1,5 mm	5 mm	7,70 Kg
Set diameter 31,75mm Radius 95,25mm Diameter 1" 1/4 inches					REF: 140-17-01-30004
1" 1/4	31,75 mm	3D=95,25 mm	1,5 mm	6 mm	10,21 Kg
Set diameter 38,10mm Radius 114,30mm Diameter 1" 1/2 inches					REF: 140-17-01-30005
1" 1/2	38,10 mm	3D=114,3 mm	1,5 mm	7 mm	15,69 Kg
Set diameter 44,45mm Radius 133,35mm Diameter 1" 3/4 inches					REF: 140-17-01-30010
1" 3/4	44,45 mm	3D=133,35 mm	2 mm	5 mm	21,86 Kg
Set diameter 50,8mm Radius 152,4mm Diameter 2" inches					REF: 140-17-01-30006
2"	50,80 mm	3D=152,4 mm	2 mm	5 mm	32,24 Kg
Set diameter 57,15mm Radius 171,45mm Diameter 2" 1/4 inches					REF: 140-17-01-30007
2" 1/4	57,15 mm	3D=171,45 mm	2 mm	5 mm	36,13 Kg
Set diameter 63,5mm Radius 190,5mm Diameter 2" 1/2 inches					REF: 140-17-02-30001
2" 1/2	63,50 mm	3D=190,5 mm	3 mm	8,64 mm	40,50 Kg
Set diameter 76,2mm Radius 228,6mm Diameter 3" inches					REF: 140-17-02-30002
3"	76,20 mm	3D=228,6 mm	3 mm	7,21 mm	80,68 Kg

Accessories for 3" 1/2 round pipes



Rollers made of treated Steel. Suitable kit to bend 3" 1/2 tube of 4mm wall thickness or thicker.

The following is supplied with the unit: A main roller, a clamp with a fastener, a support holder.

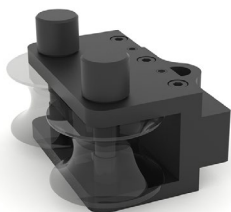
Check with the manufacturer for other dimensions.

Supporting Roller Kit REF: 140-17-02-00002 is required.

Ø Ext.	Ø Ext.	Radius	Min. thickness	Max. thickness	Weight
Set diameter 88,9mm Radius 266,7mm Diameter 3" 1/2 inches					REF: 140-17-02-30003
3" 1/2	88,9 mm	3D=266,7 mm	4 mm	6,05 mm	110,80 Kg

** The walls with more thickness to the established one and the materials with more resistance, reduce the capacities of the machine.*

Supporting Roller Kit CC90



REF: 140-17-02-00002

The CC90 Supporting Roller Kit is used to bend pipes with a diameter equal to or more than 3" Schedule x 3,05mm or 3" 1/2 x 4mm.

This unit is comprised of a **roller holder**: The roller holder is made up of three highly resistant steel pieces that are precision mechanized and treated on the surface. They're fixed and centred with rectified bolts to ensure proper operation.

The coupling axis: The coupling axis is made up of a chrome Ø20 mm Matara axis.

Weight: 24,573 Kg.

Accessories for square pipes in millimetres · 20 to 50 mm



Rollers made of treated Steel. Units suitable for bending all types of square pipes 20 to 50 millimetres.

The following is supplied with the unit: A main roller, a counter-shape, a clamp with a fastener.

Check with the manufacturer for other dimensions.

Section	Radius	Min. thickness	Max. thickness	Weight
Square Tube Die Set 20mm Radius 100mm				REF: 140-17-01-10101
20x20 mm	5D=100 mm	1,5 mm	4 mm	11,1 Kg
Square Tube Die Set 25mm Radius 115mm				REF: 140-17-01-10102
25x25 mm	115 mm	2 mm	4 mm	14,75 Kg
Square Tube Die Set 30mm Radius 135mm				REF: 140-17-01-10103
30x30 mm	135 mm	2 mm	4 mm	22 Kg
Square Tube Die Set 40mm Radius 165mm				REF: 140-17-01-10104
40x40 mm	165 mm	2 mm	5 mm	34,15 Kg
Square Tube Die Set 50mm Radius 180mm				REF: 140-17-02-10101
50x50 mm	180 mm	2,5 mm	5 mm	45,7 Kg

Accessories for square pipes in inches · 3/4" to 2" inches



Rollers made of treated Steel. Units suitable for bending all types of square pipes 3/4" to 2" inches.

The following is supplied with the unit: A main roller, a counter-shape, a clamp with a fastener.

Check with the manufacturer for other dimensions.

Section	Section	Radius	Radius	Min. Thick.	Max. Thick.	Weight
Square Tube Die Set 3/4" (19,05mm) Radius 4" (101,6mm)						REF: 140-17-01-30101
3/4"x3/4"	19,05x19,05mm	4"	101,6mm	1,5 mm	4 mm	11,5 Kg
Square Tube Die Set 1" (25,4mm) Radius 4,5" (114,3mm)						REF: 140-17-01-30102
1"x1"	25,4x25,4mm	4" 1/2	114,3mm	2 mm	4 mm	14,6 Kg
Square Tube Die Set 1" 1/4 (31,75mm) Radius 5,5" (139,7mm)						REF: 140-17-01-30103
1" 1/4x1" 1/4	31,75x31,75mm	5" 1/2	139,7mm	2 mm	4 mm	23,3 Kg
Square Tube Die Set 1" 1/2 (38,1mm) Radius 6,5" (165,1mm)						REF: 140-17-01-30104
1" 1/2x1" 1/2	38,1x38,1mm	6" 1/2	165,1mm	2 mm	5 mm	34,6 Kg
Square Tube Die Set 1" 3/4 (44,45mm) Radius 6,75" (171,45mm)						REF: 140-17-02-30101
1" 3/4x1" 3/4	44,45x44,45mm	6" 3/4	171,45mm	2,5 mm	5 mm	39 Kg
Square Tube Die Set 2" (50,8mm) Radius 7" (177,8mm)						REF: 140-17-02-30102
2"x2"	50,8x50,8mm	7"	177,8mm	2,5 mm	5 mm	44 Kg

CC90 2-axis positioning gauge



The gauge of the CC90 allows to make mass produced parts, much faster, more accurate and repetitively.

- Adjustable longitudinal positioning with 6 positions
- Angular head rotation every 5 degrees
- Four-clamp plate adjustable to round and square tube
- Longitudinal movement with high precision linear guides
- Automatic anti-collision control
- Easy handling and preparation for difficult parts

REF: 140-17-02-50000

Gauge length: 3000 mm.

Maximum capacity: 90 mm, 3" Schedule.

Weight: 137 Kg.

Packaging characteristics

Packages number: 1.

Width: 3130 mm.

Depth: 1250 mm.

Height: 720 mm.

Volume: 2,82 m3.

Net weight: 137 Kg.

Gross weight: 187 Kg.

Other features:

- > The CC90 pipe bender gauge is shipped fully assembled; only the legs need to be attached and secured to the floor.
- > Wooden pallet and wooden box and 3-layer cardboard box suitable for maritime transport.
- > **Optional:** ISPM15 wooden packaging.

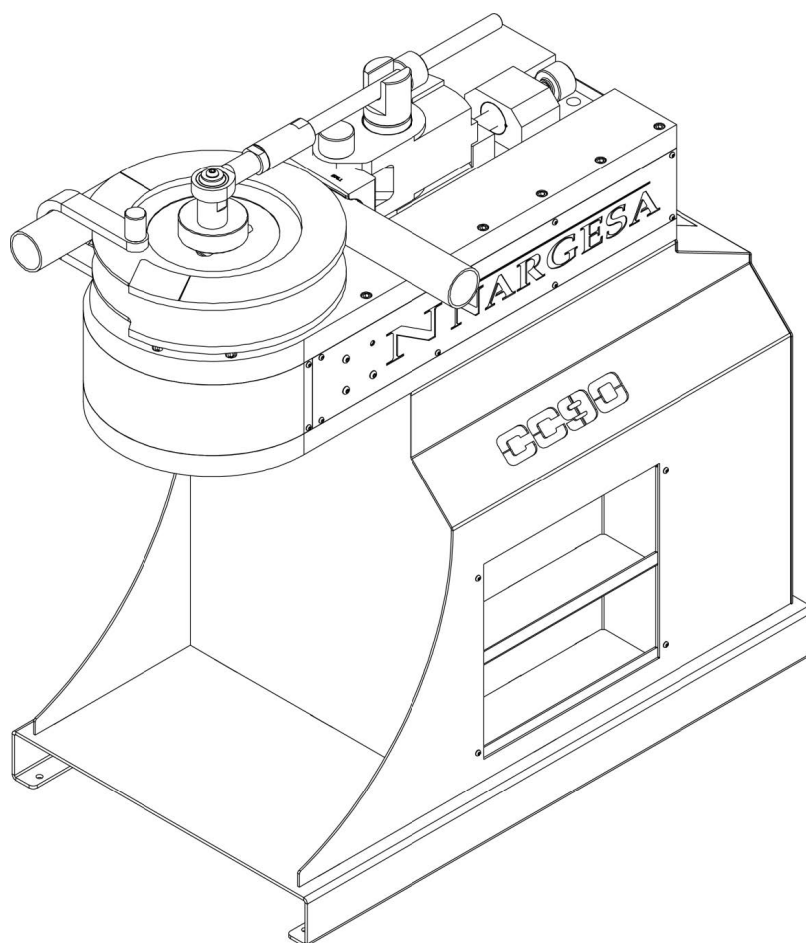
7. TROUBLESHOOTING

PROBLEM	CAUSE	SOLUTION
Internal wrinkle	The pipe moved out of the clamp	Make sure the clamp is in good conditions
Internal wrinkle	Counter-die with low pressure	Apretar más la contra forma
Internal wrinkle	Lack of lubrication	Utilizar Bend 8 u otro lubricante similar
Internal wrinkle	The diameter of the die is too small for the pipe thickness	Increase the pipe thickness a little or buy a die with a diameter of more than 3 times the pipe diameter
Internal wrinkle	Worn counter-die	Buy a new counter-die
Excessive final deformation on the bend	Counter-die with too much pressure	Loosen the counter-die
Flattening on the outside of the bend	Counter-die with too much pressure	Loosen the counter-die
Flattening on the outside of the bend	Pipe not thick enough	Aumentar la pared del tubo
The machine can't bend	The material hardness is much higher than recommended by the manufacturer	Contact the pipe manufacturer
The machine can't bend	Lack of lubrication	Use BEND8 to reduce friction



TECHNICAL ANNEX

Non-mandrel Tube and Pipe Bender CC90CNC



PRADA NARGESA, S.L

Ctra. de Garrigàs a Sant Miquel s/n · 17476 Palau de Santa Eulàlia (Girona) SPAIN

Tel. +34 972568085 · nargesa@nargesa.com · www.nargesa.com

CONTENTS

A1. General Exploded View	5
A2. Upper Ensemble	10
A3. Electrical Cabinet	14
A4. Wiring Diagrams	21



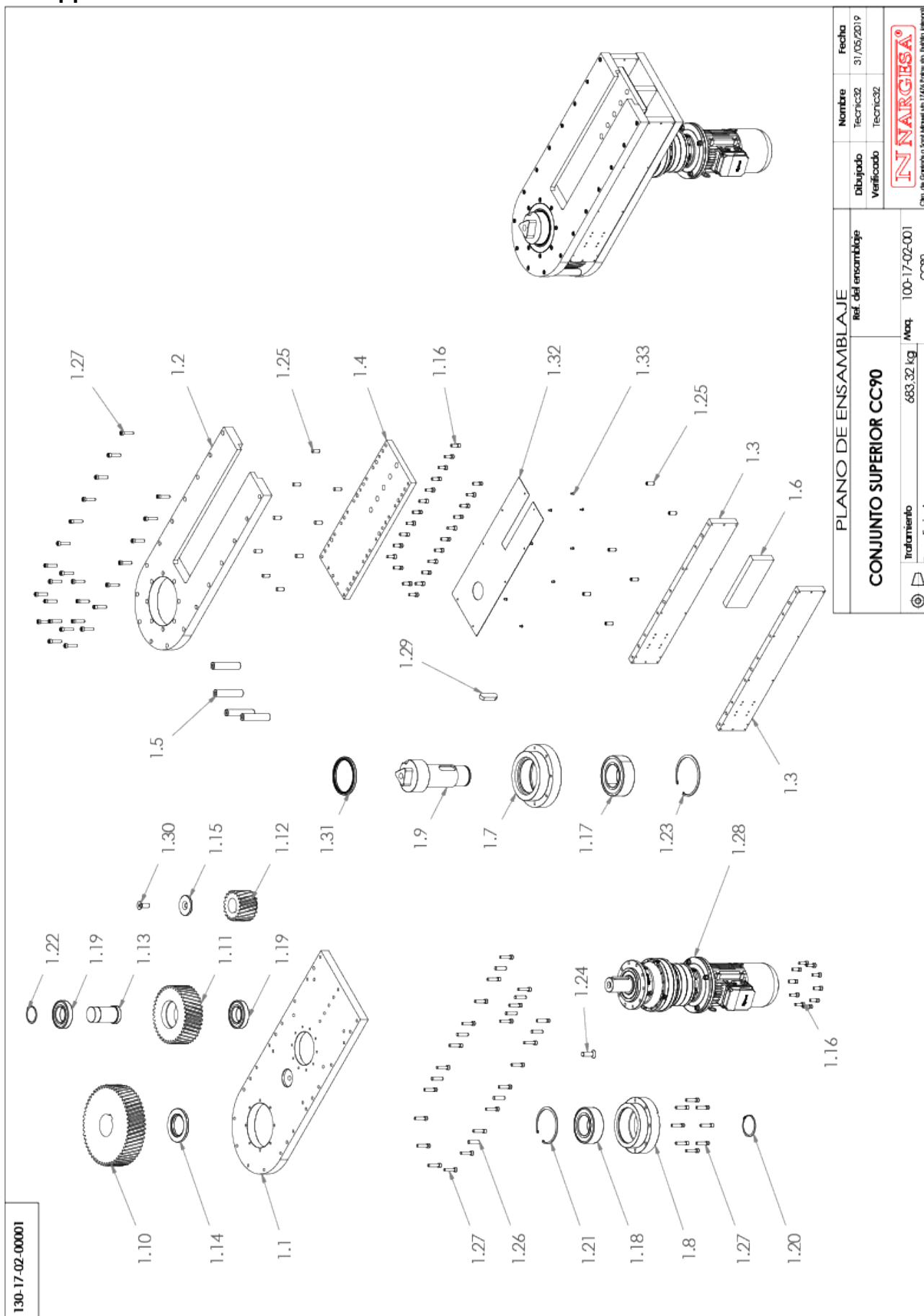
Elemento	Miniatura	Nº de pieza	Descripción	CTDAD
1		130-17-02-00001	CONJUNTO SUPERIOR CC90	1
2		130-17-02-00002	ESTRUCTURA CC90	1
3		120-17-02-00025	SOPORTE CUADRO ELECTRICO CC90	1
4		130-17-02-00003	CONJUNTO ESTANTERIA CC90	2
5		020-I7380-M6X10	Tornillo Allen Abombado ISO 7380 M6X10	48
6		120-17-01-00043	Metacrilato Negro CC60	2
7		130-17-02-00004	CONJUNTO EJE FIJACION PORTAGUIAS CC90	1
8		120-17-02-00029	TORNILLO APRIETE CC90	1
9		120-17-02-00034	ANAGRAMA NARGESA 2 CC90	1
10		120-17-02-00035	ANAGRAMA NARGESA CC90	1
11		120-17-02-00036	ENVOLVENTE DE CHAPA CC90	1
12		120-17-02-00037	ENVOLVENTE POSTERIOR CC90	1
13		120-17-02-00038	SOPORTE ENVOLVENTE TRASERO CC90	2
14		130-17-02-00006	CONJUNTO CARRO PORTAGUIAS CC90	1




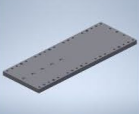

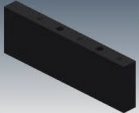
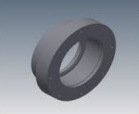
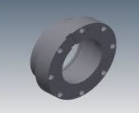
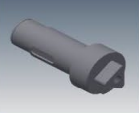
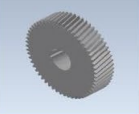


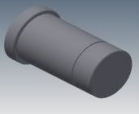
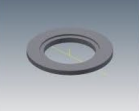
Elemento	Miniatura	Nº de pieza	Descripción	CTDAD
15		130-17-02-00007	CONJUNTO EMPUJE CARRO CC90	1
16		122-CAL-1101-002	Calca MC, CC i NOA	1
17		120-17-02-00063	Soporte Cuadro Eléctrico Lado Puerta CC90	1
18		120-17-02-00039	TAPA ENCODER CC90	1
19		050-CNC-00007	PANTALLA ESA S820	1
20		020-D934-M8	TUERCA HEXAGONALI DIN934 M8	24
21		020-D127-M16	Arandela Glomer DIN 127 Para M16	6
22		020-D912-M16X35	Tornillo Allen DIN 912 M16X35	6
23		050-ENC-00007	ENCODER QR30N	1
24		020-I7380-M6x60	Tornillo Allen Abombado ISO7380 M6X60	2
25		050-KIE-1701-001		1
26		050-IG-00001	Interruptor General Kg10Ak300	1
27		130-17-02-00009	CONJUNTO BRAZO REACCIONCC90	1
28		120-17-02-00049	FIJACIÓN RULINA BRAZO REACCION CC90	1

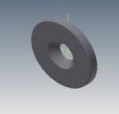

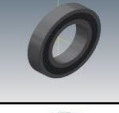
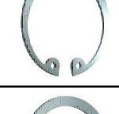

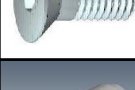

Elemento	Miniatura	Nº de pieza	Descripción	CTDAD
29		130-17-02-00010	CONJUNTO PORTA GUIAS CC90	1
30		120-17-02-00052	TUERCA BRAZO REACCIÓN CC90	1
31		020-D9021-M12	Arandela Ancha DIN9021 Para M12	1
32		020-I7380-M12X20	Tornillo Allen Abombado ISO7380 M12X20	1
33		050-PE-00003	Prensaestopa GFPT 212 50043 M20X150 PG13.5	1
34		020-D7985-M3X10	TORNILLO DIN7985 M3X10 Zincado	2
35		050-BE-00003	Zocalo Recto Ck03I	1
36		120-17-02-00054	FIJACIÓN RULINA CC90	1
37		DIN 933 - M30 x 50	Perno de cabeza-hex	1
38		020-D125B-M4	Arandela Biselada DIN125B Para M4	10
39		020-D125B-M8	Arandela Biselada DIN125B Para M8	24
40		122-PLC-0000-001	Placa Características General	1
41		020-D7337-3X8	Remache De Clavo DIN7337 De Al D3X8	4
42		020-I7380-M8X12	Tornillo Allen Abombado ISO7380 M8X12	24




Elemento	Miniatura	Nº de pieza	Descripción	CTDAD
43		120-17-02-00056	PLACA FIJACION VARIADOR CC90	1
44			DELTA_VFD-E-C1-PD-3D00_CC90	1
45		020-D912-M4X10	TORNILLO ALLEN DIN 912 M4X10	4
46		120-17-02-00055	Suplemento portaguías CC90	1
47		130-17-01-00004	CONJUNTO EJE FIJACION PORTAGUIAS CC60	1
48		020-I7380-M8X20	TORNILLO ALLEN ABOMBADO ISO7380 M8X20	8
49		050-PED-00016	Paro De Emergencia + KIT 32	1
50		120-17-02-00057	CHAPA INFERIOR CC90	1
51		020-I7380-M6X8	Tornillo Allen Abombado ISO7380 M6X8	7
52		020-I7380-M4X10	Tornillo Allen ISO 7380 M4X10	3
53		020-D934-M4	Tuerca Hexagonal DIN934 M4	7
54		120-17-01-00076	Soporte consola variador y conectores	1
55		050-PED-00013	Pedal Doble PX10110+KIT30	1
56		050-TAP-D22	Tapon Obturador Ø22mm - Harmony XB5 - Plástico	1
57		020-I7380-M6X40	Tornillo Allen Abombado ISO7380 M6X40	2
58		120-17-02-00071	Soporte Sujeción pantalla	2

A2. Upper Ensemble



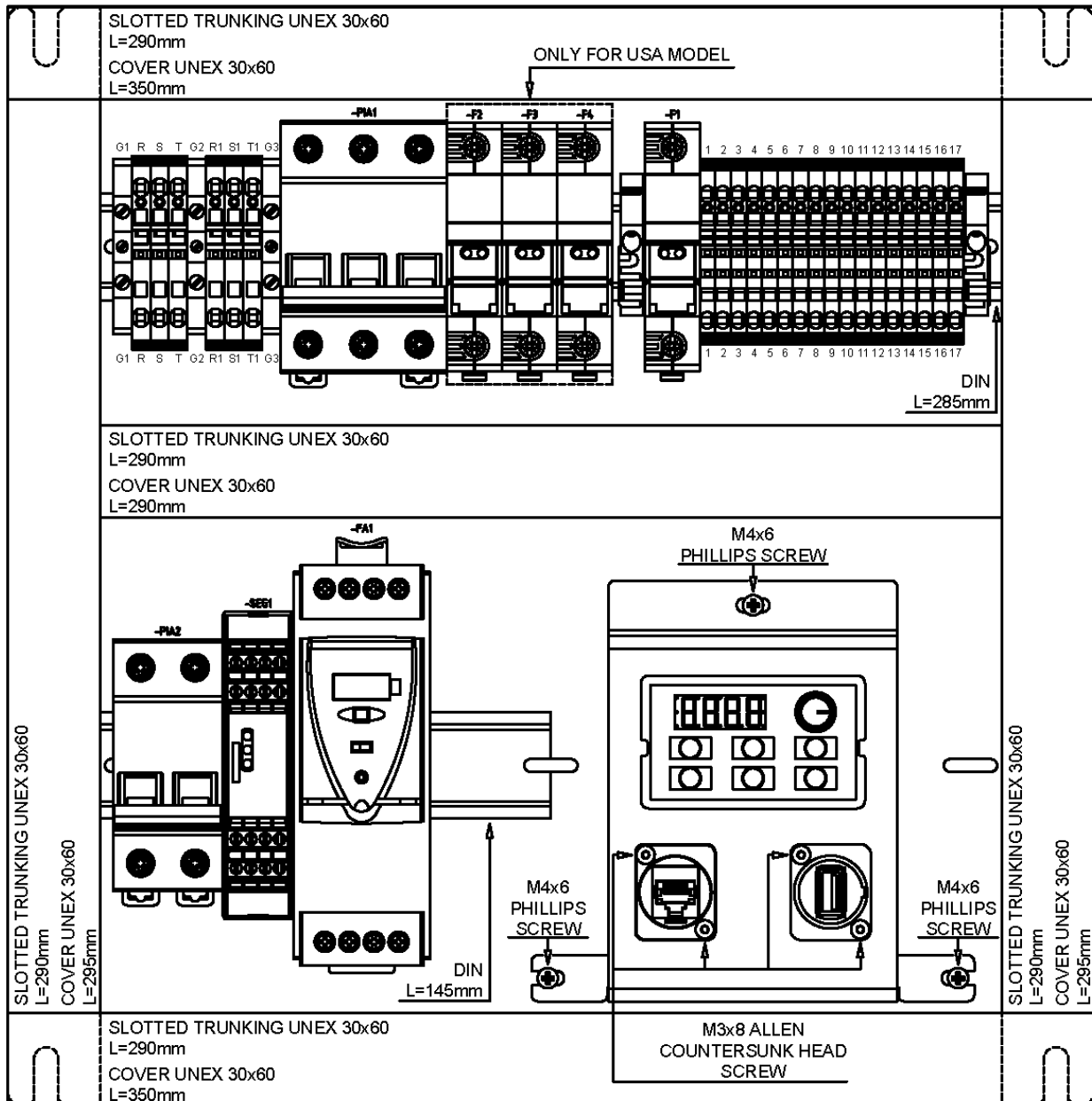
Elemento	Miniatura	Nº de pieza	Descripción	CTDAD
1.1		120-17-02-00001	PLACA BASE CC90	1
1.2		120-17-02-00002	PLACA SUPERIOR CC90	1
1.3		120-17-02-00003	PASAMANO LATERAL REDUCTOR CC90	2
1.4		120-17-02-00004	SOPORTE GUIA INFERIOR CC90	1
1.5		120-17-02-00005	SEPARADOR ESTRUCTURACC90	4
1.6		120-17-02-00006	REFUERZO INTERIOR CC90	1
1.7		120-17-02-00007	CASQUILLO PORTA COJINETE CC90	1
1.8		120-17-02-00008	CASQUILLO PORTA COJINETE INFERIOR CC90	1
1.9		120-17-02-00009	EJE ENGRANAJE Z56 CC90	1
1.10		120-17-02-00010	ENGRANAJE HELICOIDAL Z56 M6 CC90	1
1.11		120-17-02-00011	ENGRANAJE HELICOIDAL Z40 M6 CC90	1
1.12		120-17-02-00012	ENGRANAJE HELICOIDAL Z20 M6 CC90	1
1.13		120-17-02-00013	EJE ENGRANAJE Z40 CC90	1
1.14		120-17-02-00014	SEPARADOR ENGRANAJE Z56 CC90	1

Elemento	Miniatura	Nº de pieza	Descripción	CTDAD
1.15		120-17-02-00015	ARANDELA FIJACIÓN PIÑÓN CC90	1
1.16		020-D912-M12X35	TORNILLO ALLEN DIN 912 M12X35	34
1.17		030-CJ-00034	Rodamiento 3220B 2rs tvh	1
1.18		030-CJ-00035	Rodamiento 3218B 2rs tvh	1
1.19		030-CJ-00036	Rodamiento de bolas 6214 2rs	2
1.20		030-D471-00018	Circlip Eje Din471 D90	1
1.21		030-D472-00021	Circlip Eje Din472 D160	1
1.22		030-D471-00019	Circlip Eje Din471 D70	1
1.23		030-D472-00020	Circlip Agujero Din472 D180	1
1.24		020-D7991-M20X60	Tornillo Allen Avellanado DIN7991 M20X60	1
1.25		030-D7979D-00026	Pasador Cilindrico Con Rosca Int. DIN7979/D D14X40	15
1.26		030-D7979D-00027	Pasador Cilindrico Con Rosca Int. DIN7979/D D14X60	8
1.27		020-D912-M12X55	Tornillo Allen DIN912 M12X55	55
1.28		050-RT-00007	Motor-Reductor planetario EP, R 4EL 006A 452Y C065M1 F30b I28X250 V3, Motor Freno TX (ErP) HBZ 100LA 230.400 - Pn[kW]=2.2	1

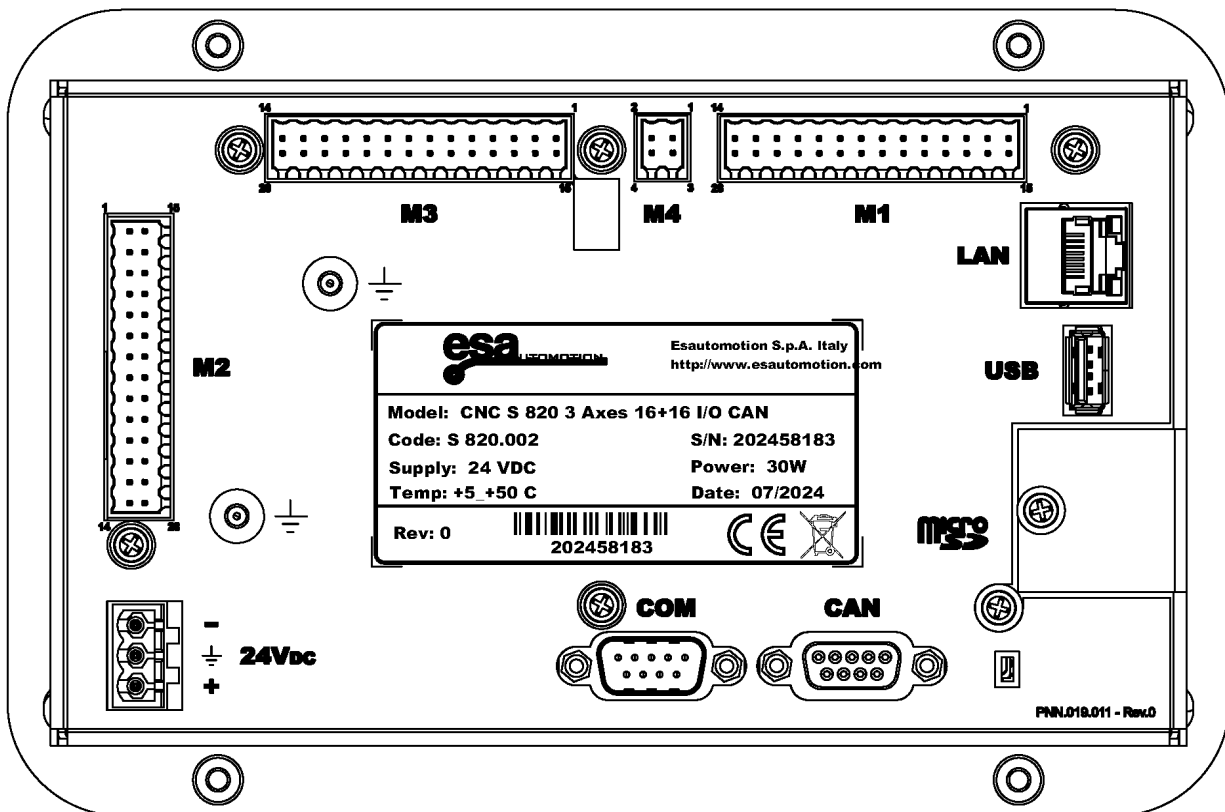
Elemento	Miniatura	Nº de pieza	Descripción	CTDAD
1.29		030-D6885A-00042	Chaveta Paralela Din6885A 28X16X90	1
1.30		020-D7991-M20X50	TORNILLO ALLEN AVELLANADO DIN7991 M20X50	1
1.31		040-RET-00015	Reten D145XD170x13	1
1.32		120-17-02-00064	Chapa anticaida Pasadores CC90	1
1.33		020-I7380-M6X12	Tornillo Allen Abombado ISO7380 M6X12	8

A3. Electrical Cabinet

PLACE THE LABELS ON THE TOP OF THE TERMINALS.
PLACE THE TERMINALS WITH THE OPEN SIDE TO THE LEFT.



-CONTROL1



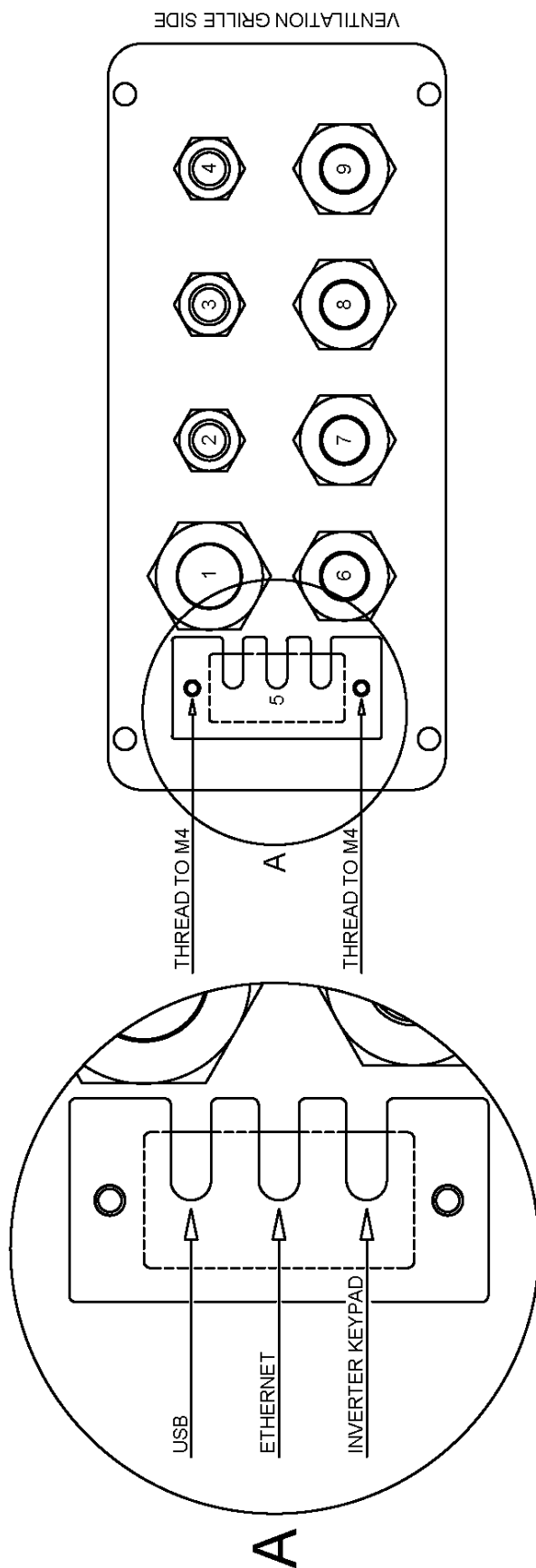
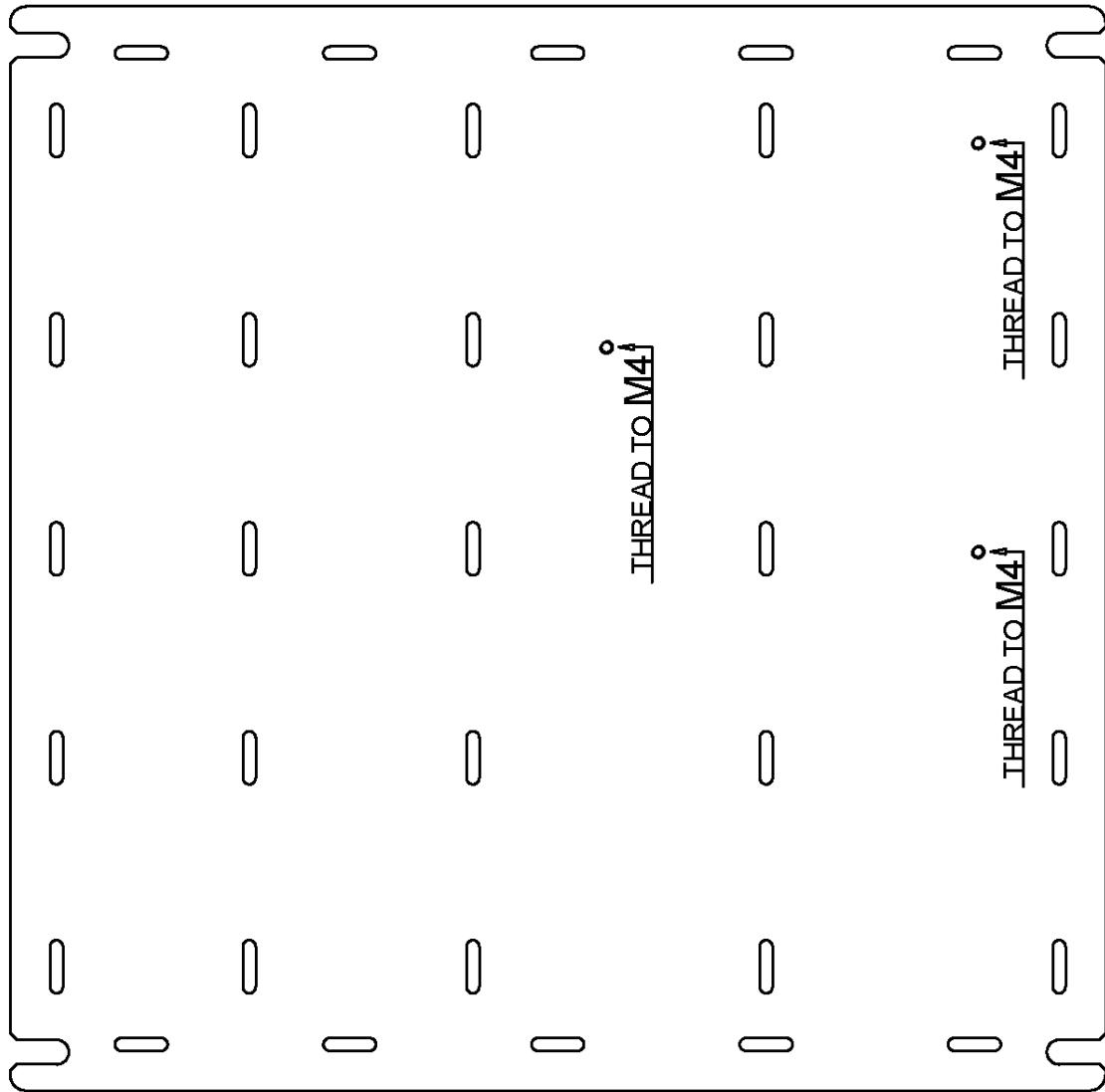
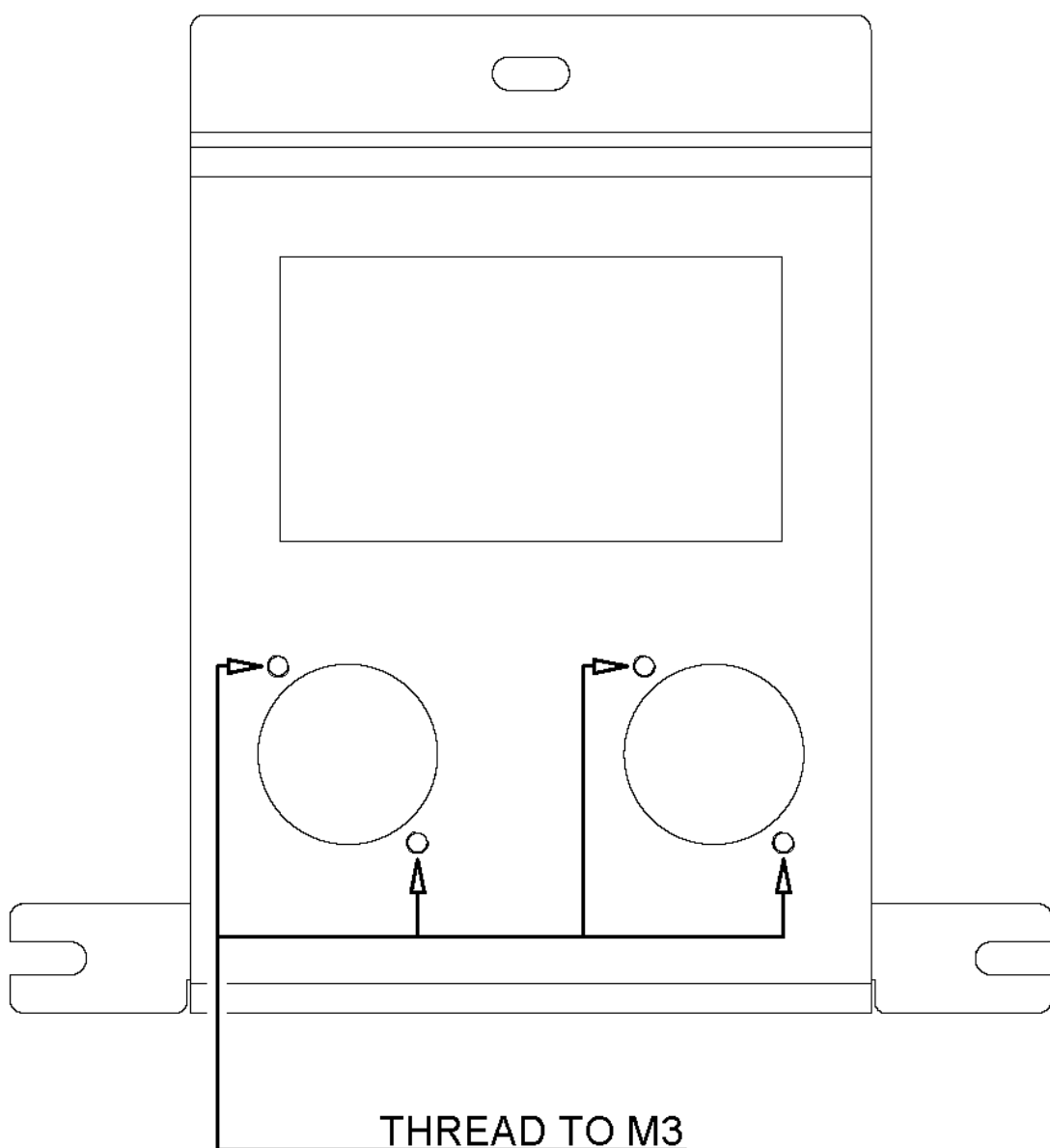
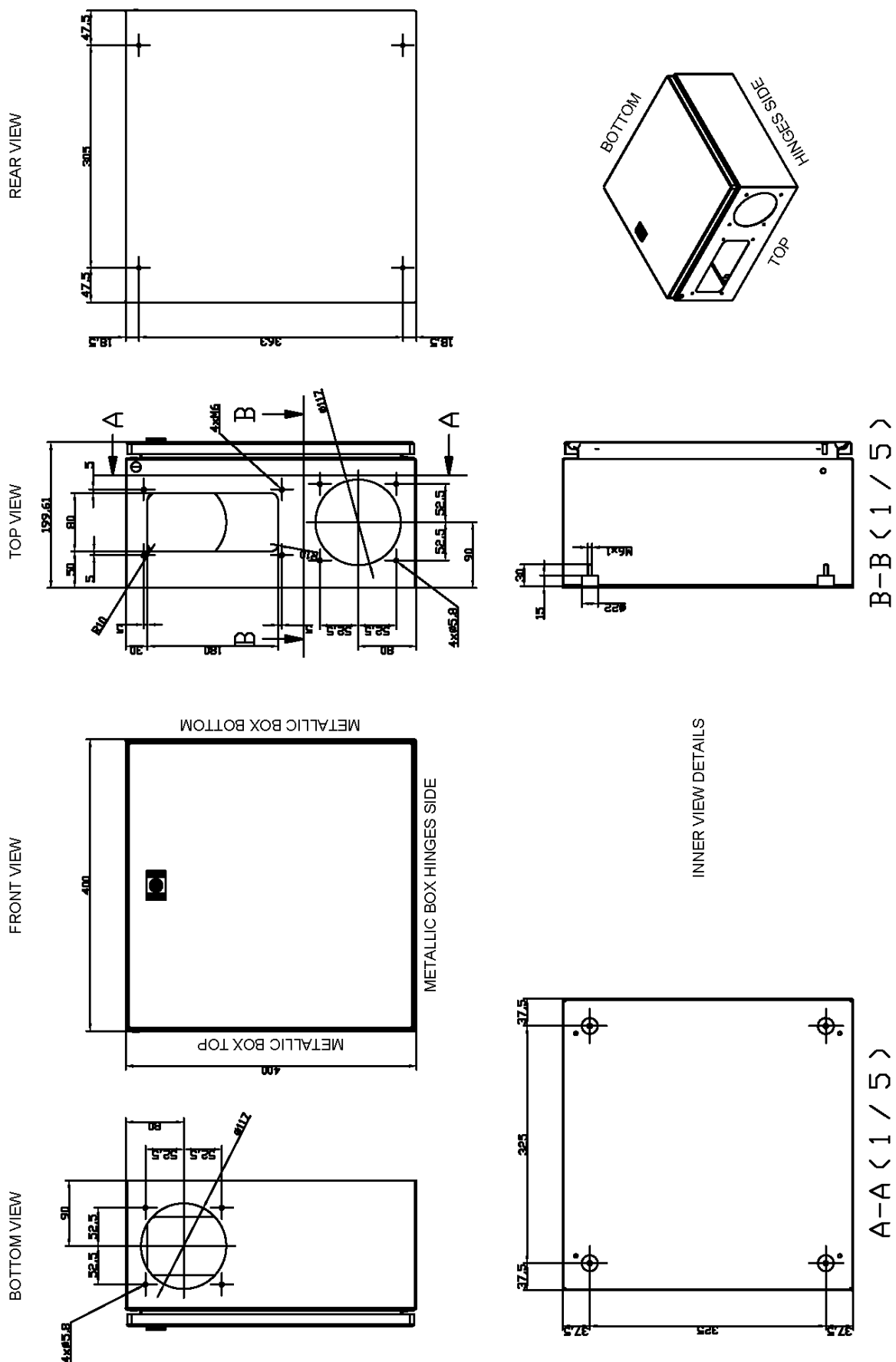
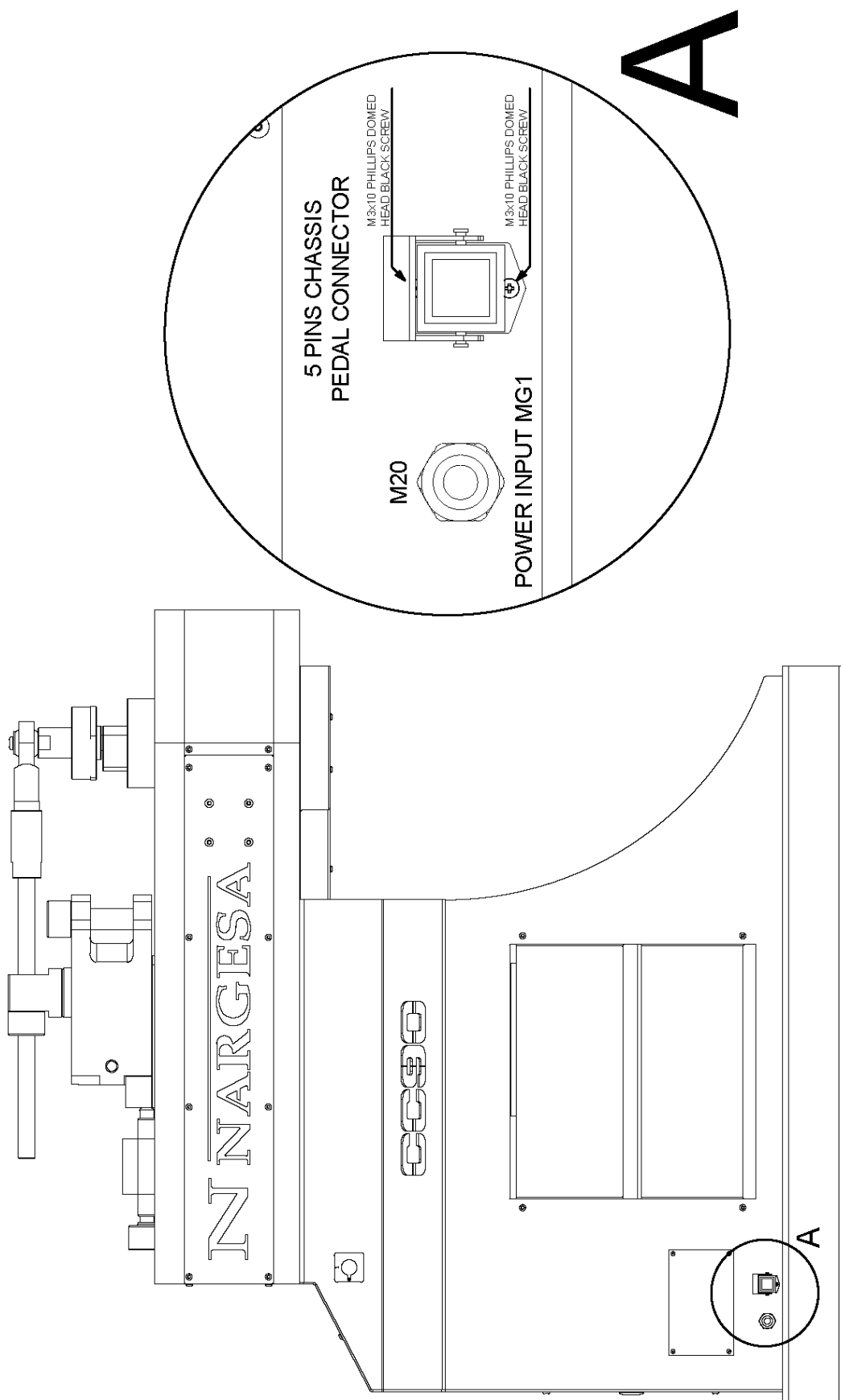


PLATE HOLE NUMBER	PLASTIC CABLE GLAND	ELECTRIC WIRE	DESCRIPTION
1	M25	MULTIPLE	MESH WITH SIGNAL WIRES
2	PG9	UNUSED	--
3	PG9	MG12	INVERTER EMERGENCY
4	PG9	UNUSED	--
5	--	MG14, MG9, --	USB, ETHERNET AND INVERTER KEYPAD
6	M20	MG5	PEDAL
7	M20	UNUSED	--
8	M20	MG11	INVERTER SUPPLY
9	M20	MG2	POWER INPUT AFTER MAIN SWITCH -S1





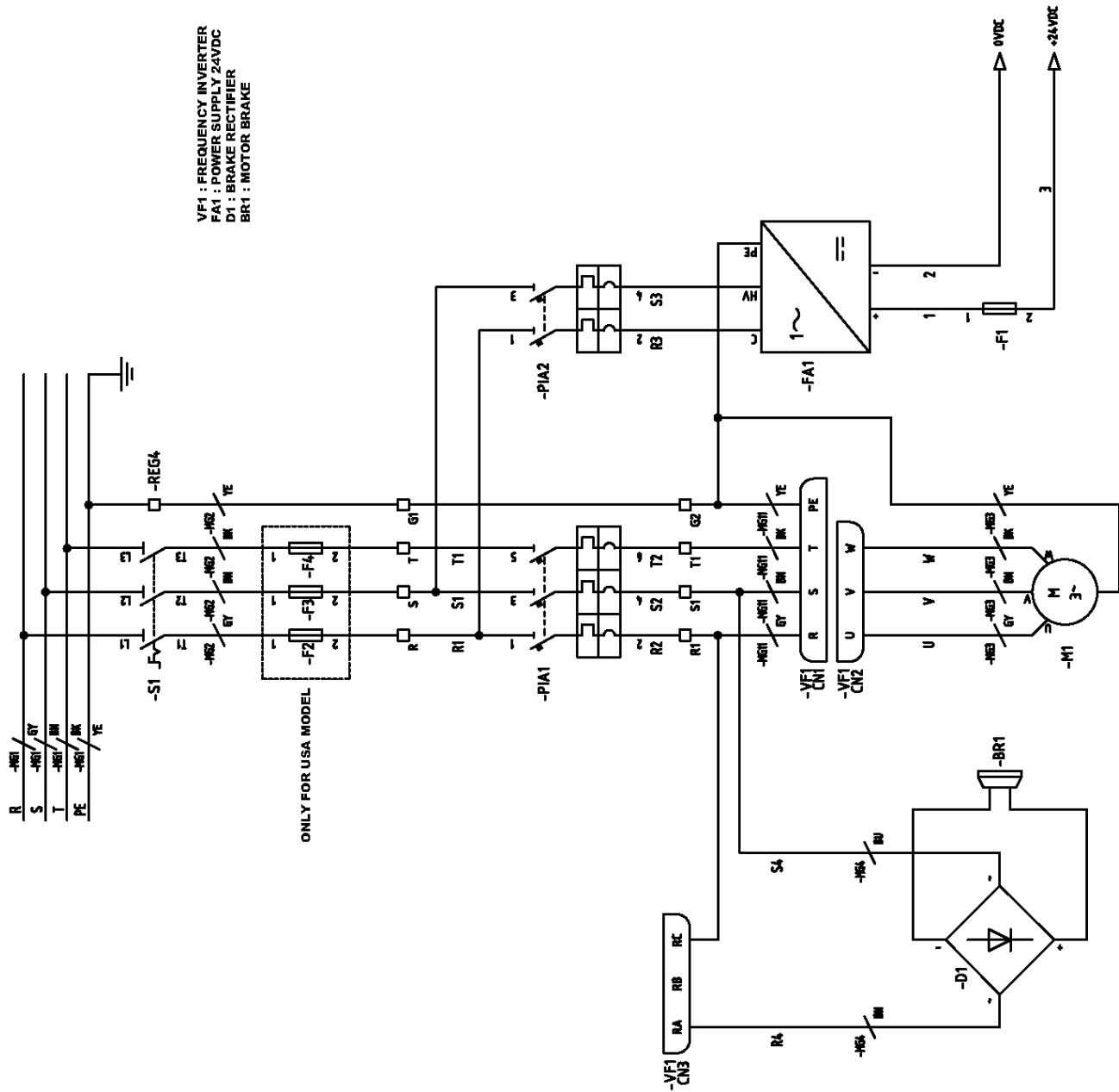




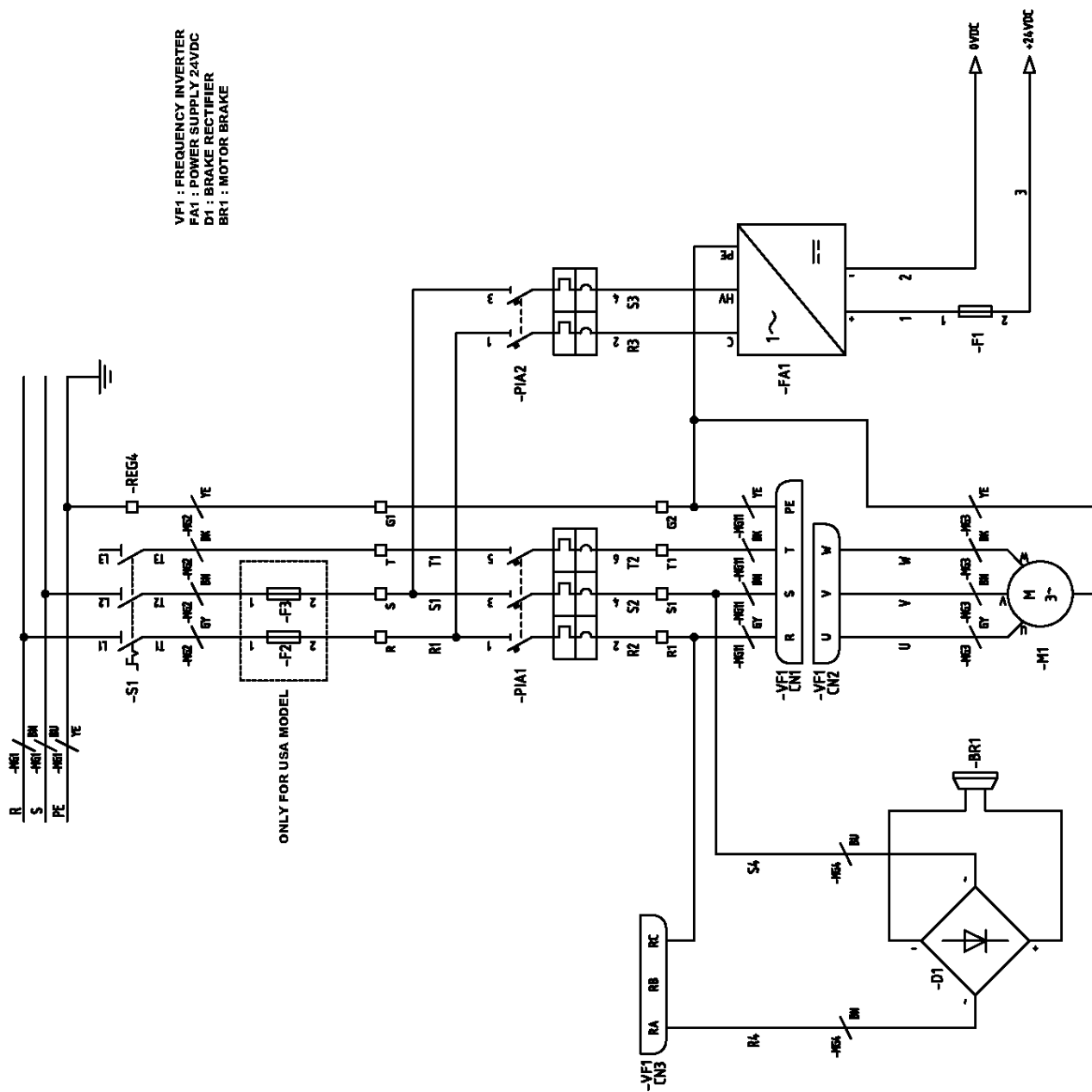
A

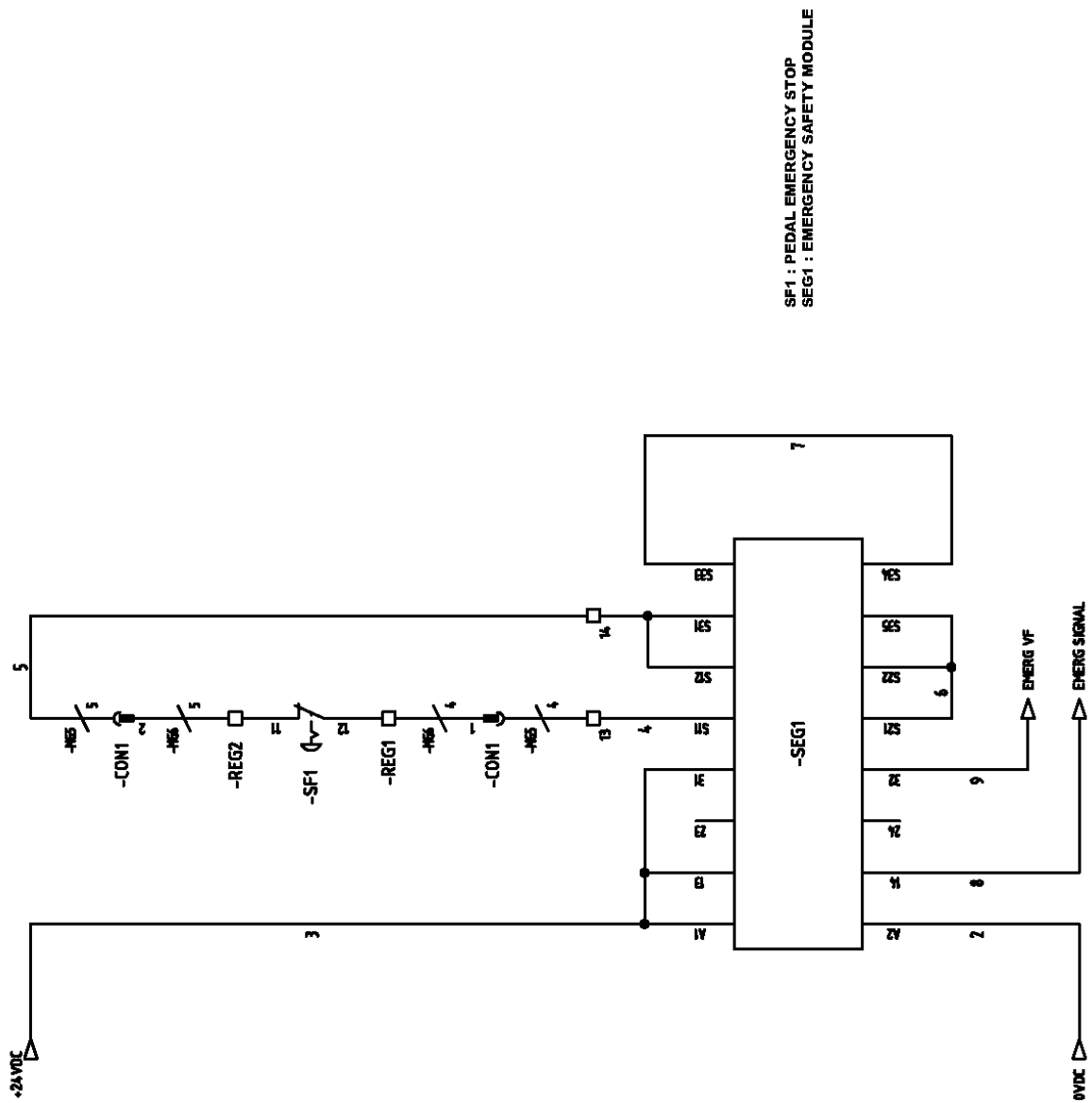
A4. Wiring Diagrams

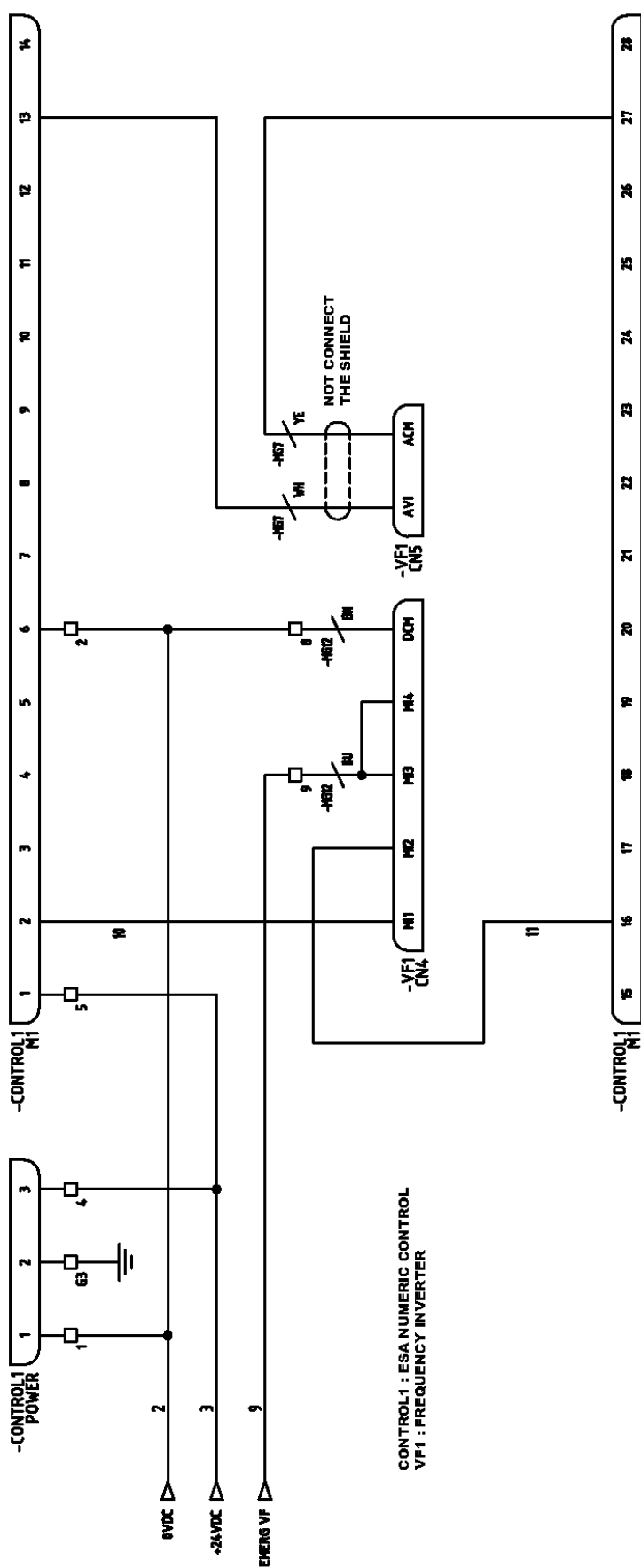
ONLY FOR:
3 PHASE MODEL

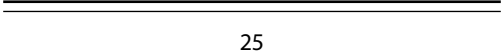


ONLY FOR:
SINGLE PHASE MODEL

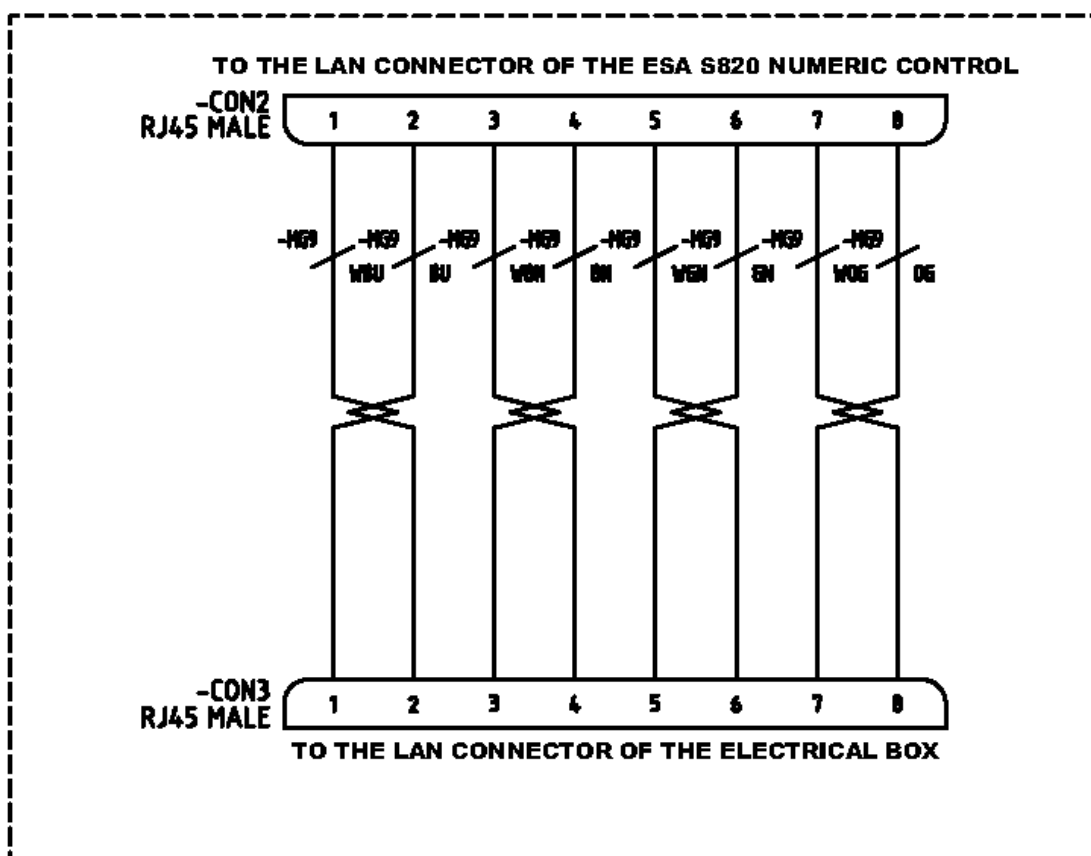








ETHERNET EXTENSION CABLE



OUR RANGE OF MACHINERY



IRON WORKERS



NON-MANDREL PIPE BENDERS



HORIZONTAL PRESS BRAKES



SECTION BENDING MACHINES



CNC PIPE BENDERS



LASER WELDING EQUIPMENTS



TWISTING/SCROLL BENDING
MACHINES



HYDRAULIC PRESS BRAKES



HYDRAULIC SHEAR MACHINES



GAS FORGES



IRON EMBOSSING MACHINES



END WROUGHT IRON MACHINES



BROACHING MACHINES



POWER HAMMERS



BLACKSMITH FORGING PRESS