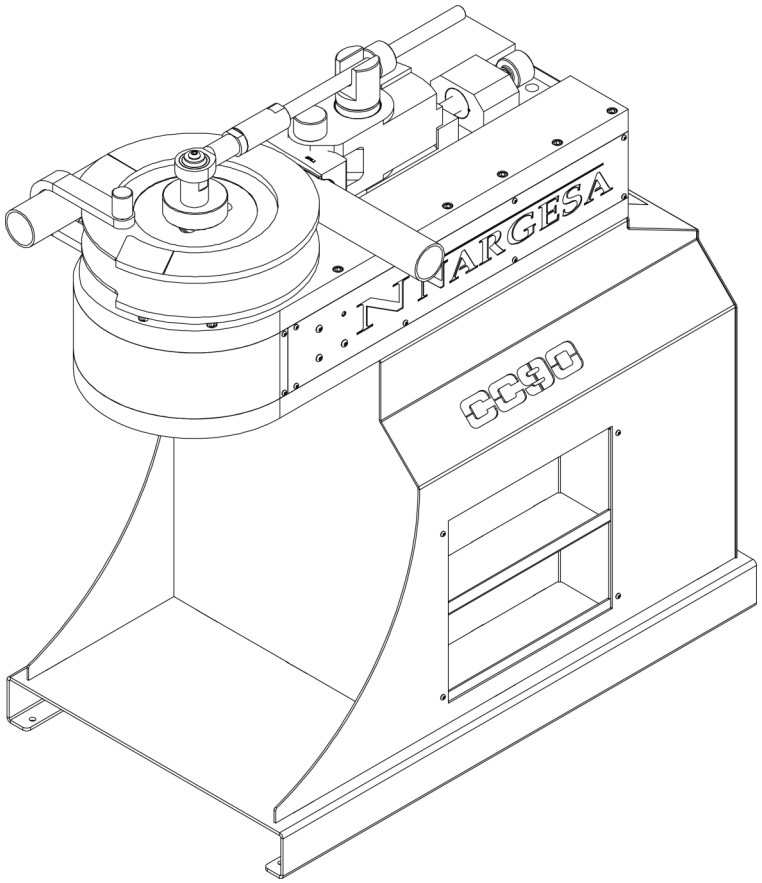
NON-MANDREL TUBE AND PIPE BENDER

CC90

NS: 2022-138/187



INSTRUCTIONS BOOK

PRADA NARGESA, S.L

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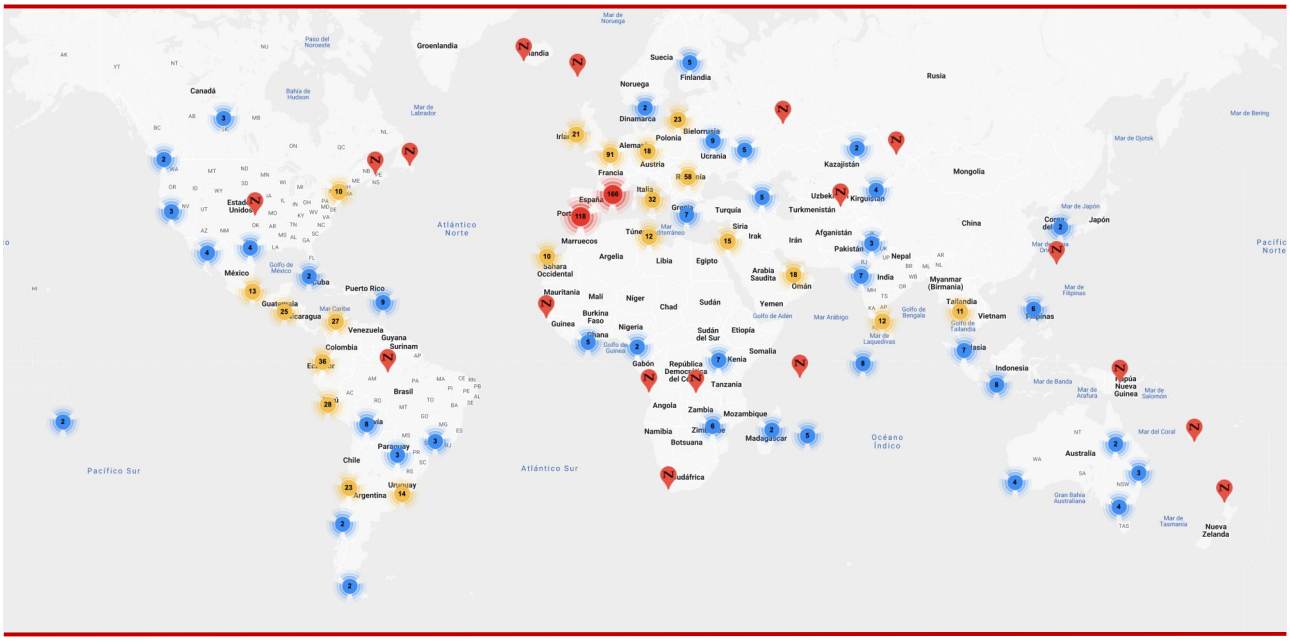
Tel. +34 972568085 · nargesa@nargesa.com · www.nargesa.com

NARGESA CLIENTS

Prada Nargesa has more tan 8.000 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 posible 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 área to be able to satisfy their production requirements by hiring their services.



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!

Company name

CIF/Tax Code

City

Country

Machine or machines

PRADA NARGESA

Prada Nargesa S.L. is a family business fonuded in 1970 located near Barcelona, Spain, with more tan 50 years of experience in the sector of manufacturing of industrial machinery, and more tan 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 tan 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 aduit 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

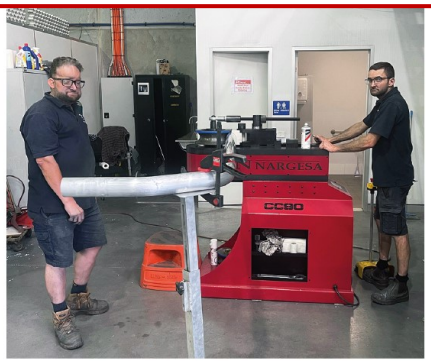
At Prada Nargesa we believe that the testimony of our clients is our best guarantee, and that is why we like to expose some of the success stories that we have witnessed around the world:

PORTUGAL

Capela & Filhos

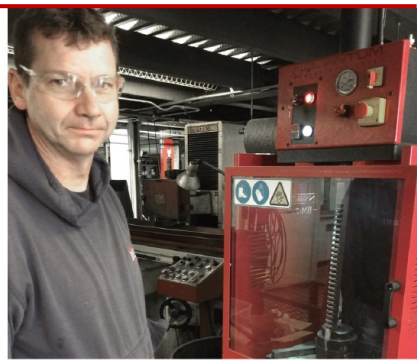
AUSTRALIA

Manufactured Alloy Xtras



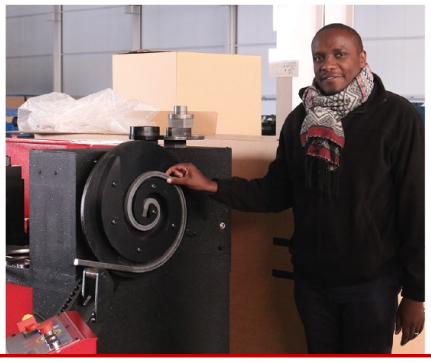
ESTADOS UNIDOS

Madison Environmental Resources



ESPAÑA

CBET Decoración SL



UGANDA

Steel Limited

RUMANIA

Gala Metal & Design SRL

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

1.1. Machine Identification

Make	NARGESA
Type	Non-Mandrel Pipe Bender
Model	CC90

1.2. Dimensions

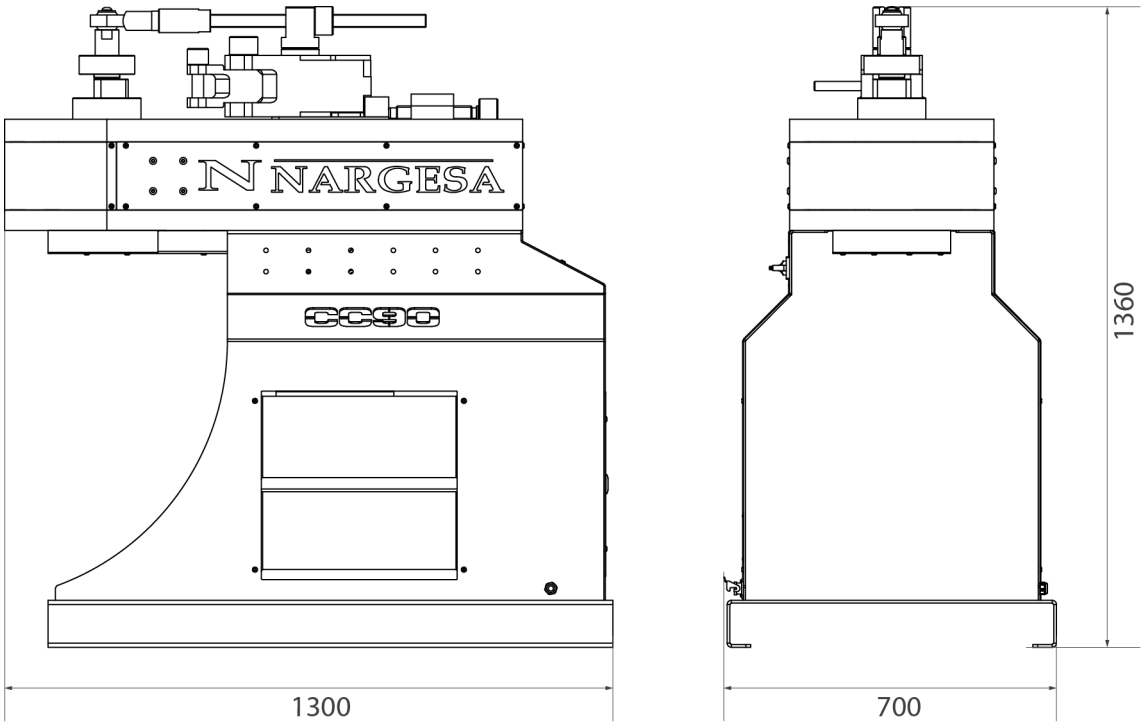


Figure 1. Outside Dimensions of Bender CC90

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

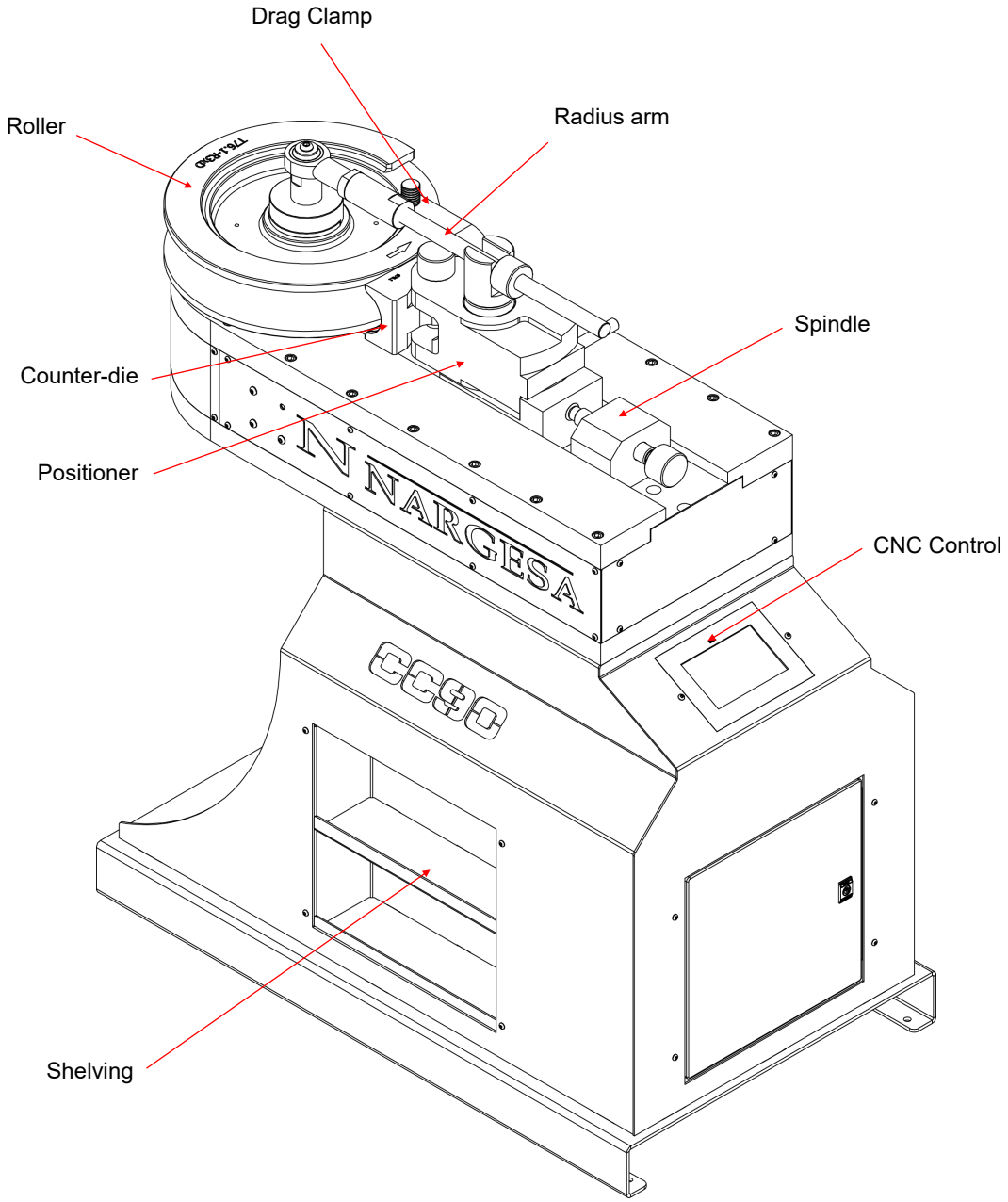


Figure 2. Characteristics plate

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	From 0,75 to 2,2 r.p.m.
Intensity	9/5 A
Minimum radius of curvature	3 times the pipe diameter
Maximum radius of curvature	346 mm
Maximum working stroke on round steel pipe	90mm or 3" Schedule or 3" 1/2 Whitworth or 3" Gas x 6mm.
Maximum angle of curvature	180º
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.

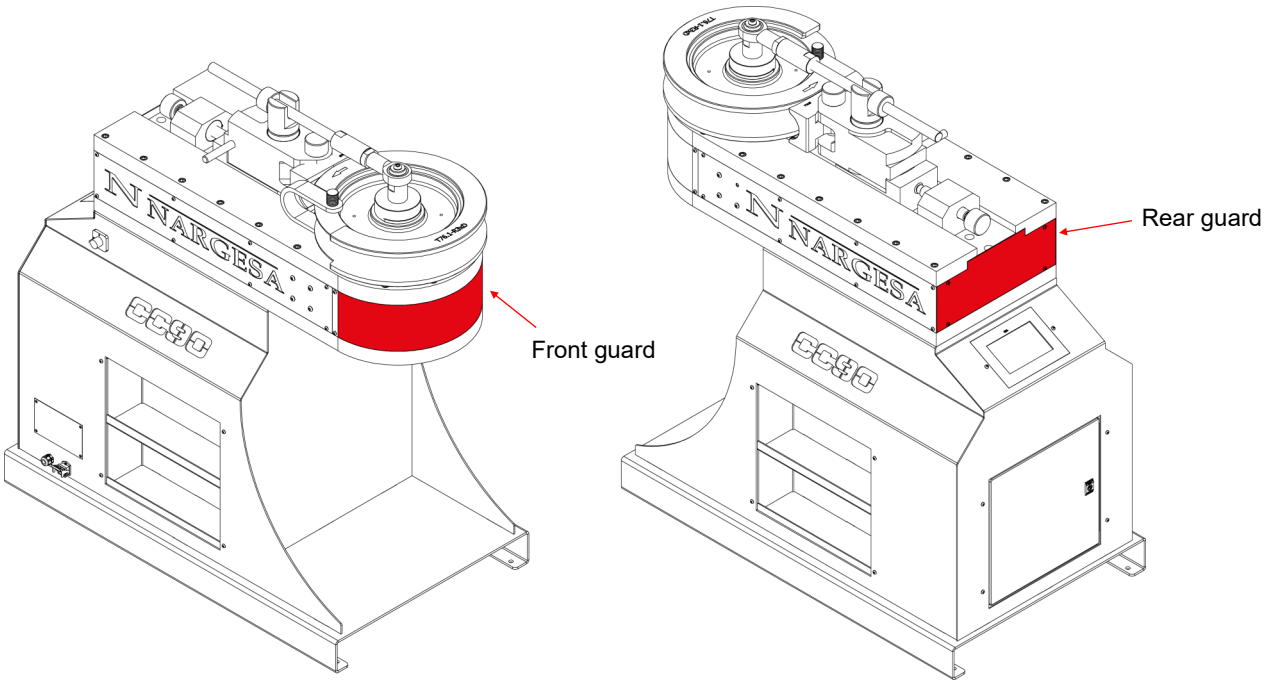


Figure 3. Mechanism Protection Guards

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.

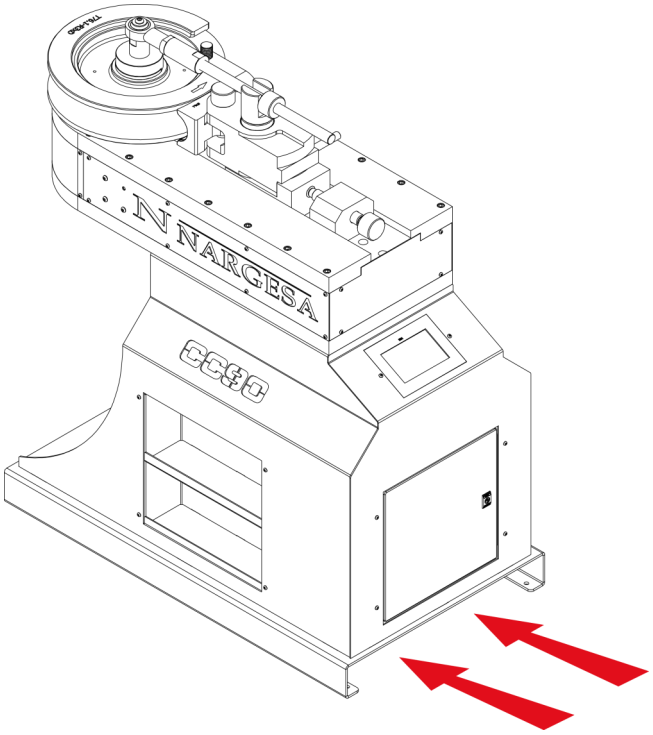


Figure 4. Moving the machine

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 -25ºC to 55ºC or 75ºC 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

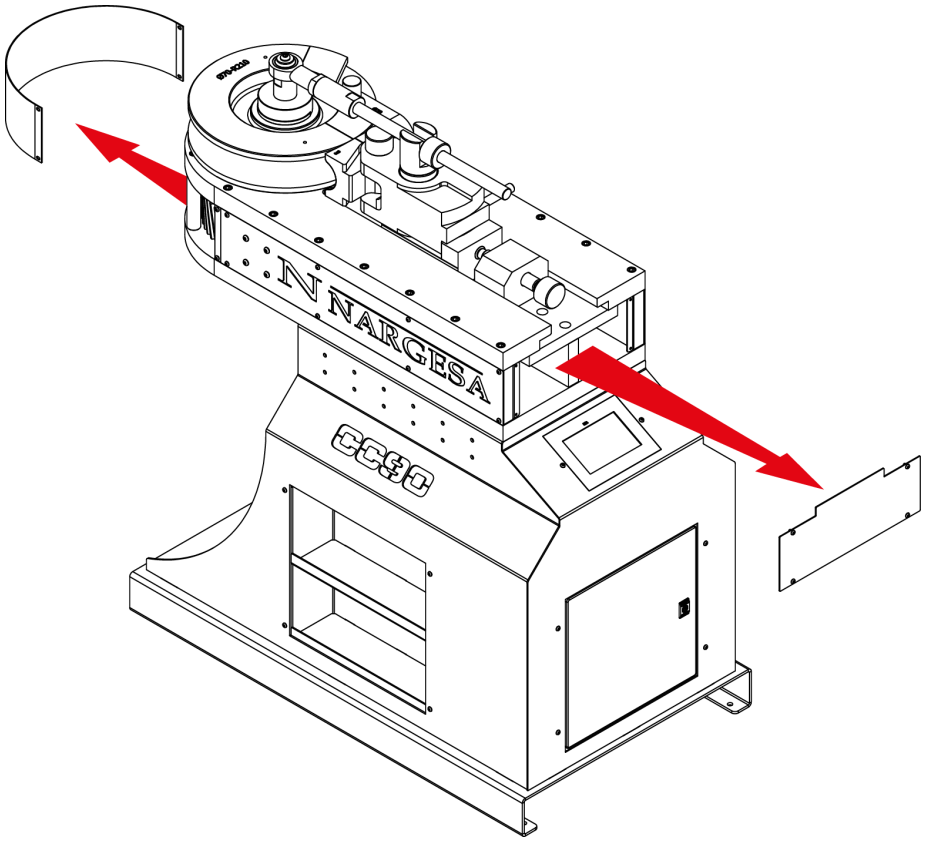
3. MAINTENANCE

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.



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.

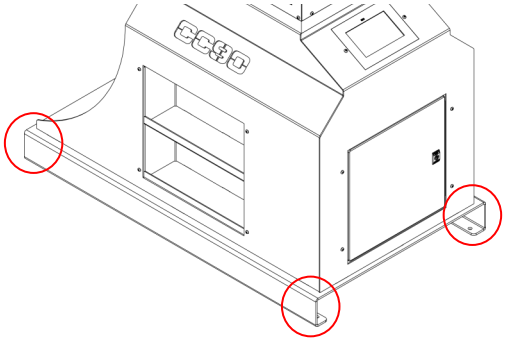


Figure 5. Anchoring points on the machine

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.

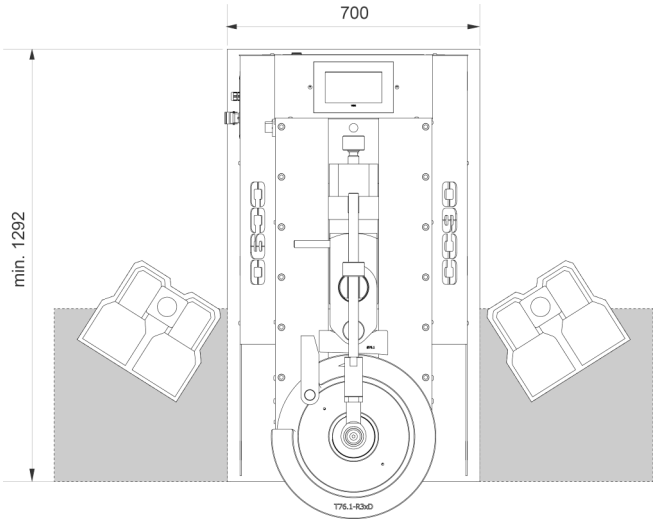


Figure 6. Operator's work area

4.3. Acceptable External Conditions

- A room temperature of between +5 ºC and +40 ºC without exceeding an average temperature of +35 ºC 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.

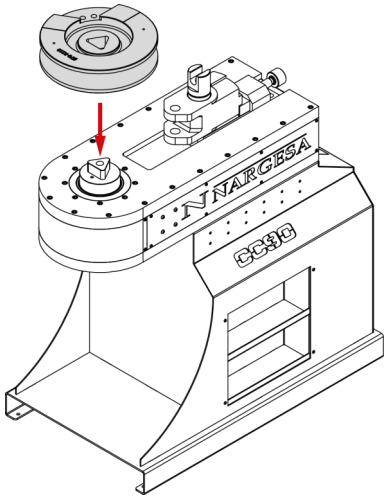
Before making any change in the wiring or the electric panel,
you need to make sure the machine is not connected to the power supply system.

5. INSTRUCTIONS FOR USE

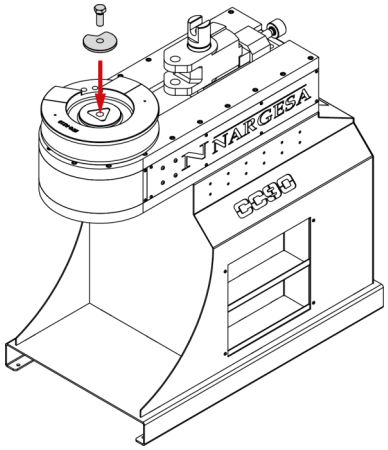
5.1. Assembling the Roller and Counter-Die

The roller shall be assembled as follows:

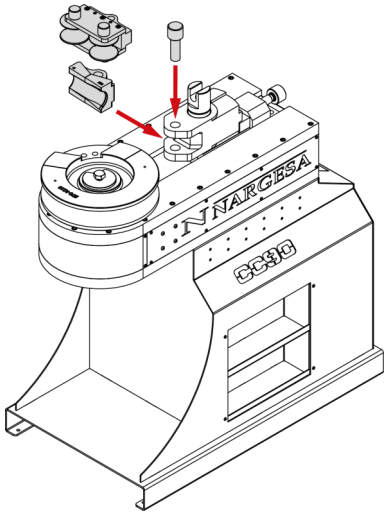
1. Place the roller in the machine axis. The built-in centring pin will prevent an incorrect position.



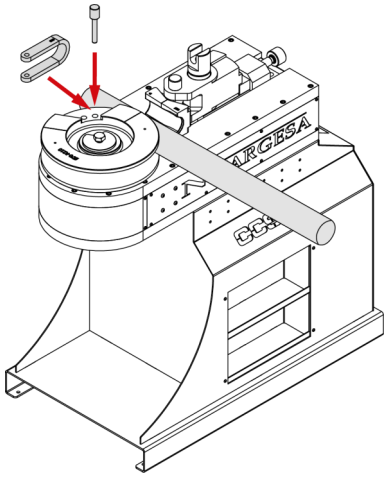
2. Secure the roller with the washer and screw.



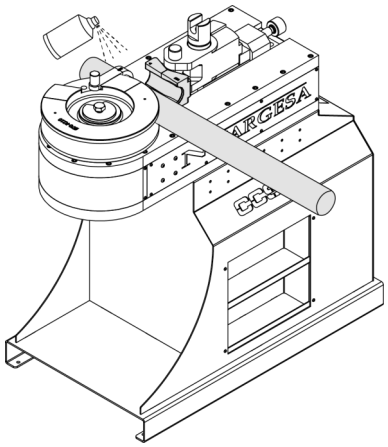
3. Put the counter-die or support rollers in the positioner and secure.



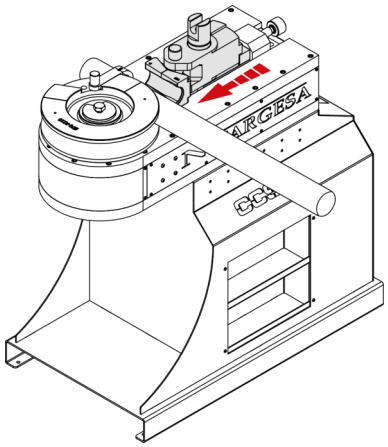
4. Put the material in the roller guide and secure to the drag clamp.



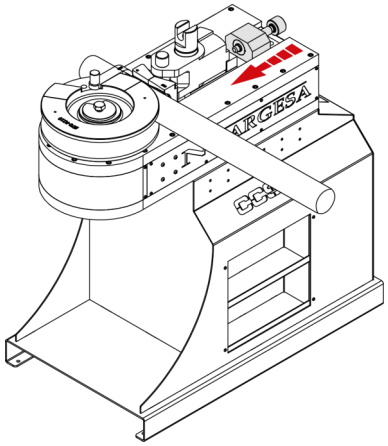
5. Lubricate the pipe and the counter-die with BEND8 spray.

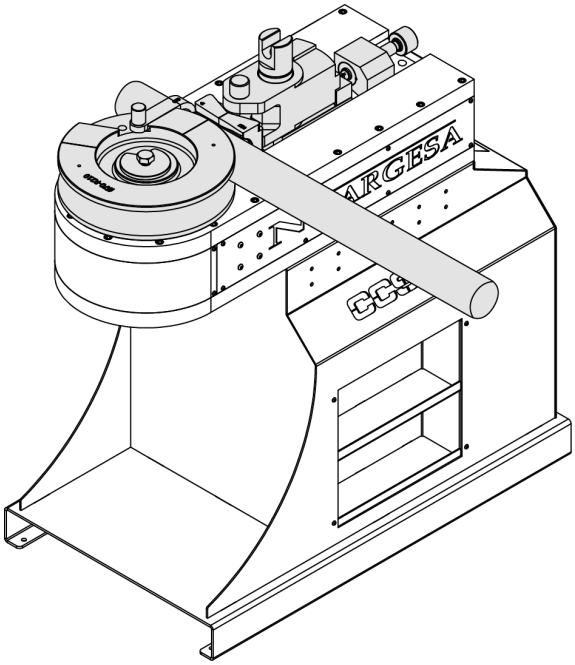


6. Slide the counter-die positioner until adjusted to the material.



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



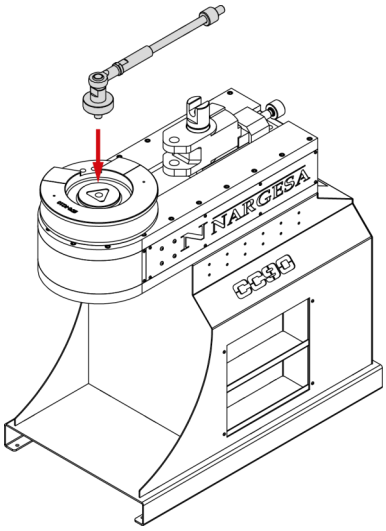


5.2. Assembling the Radius Arm

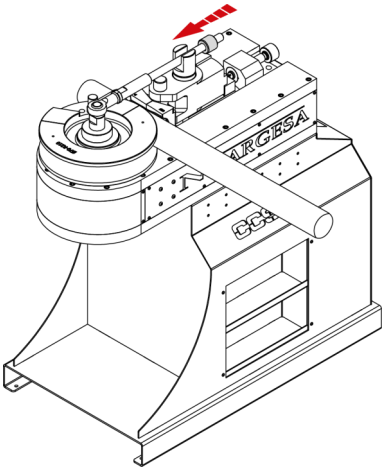
If the radius arm must be used, switch step 2 with 2A as explained below.

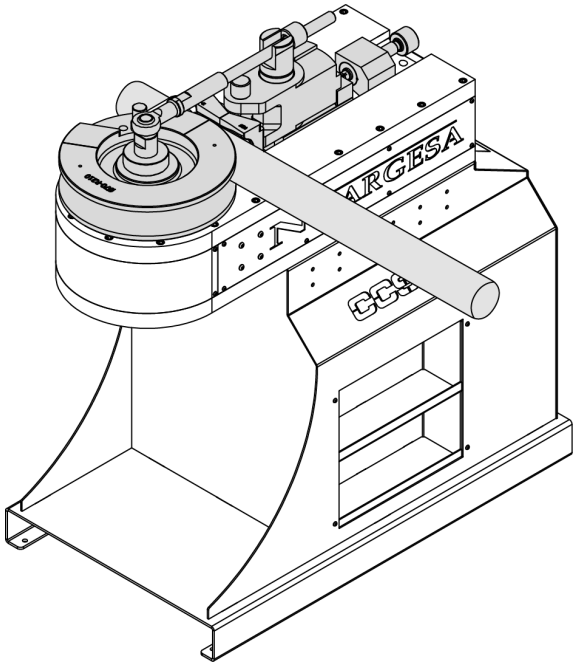
And follow step 7 with number 8 as explained below.

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.





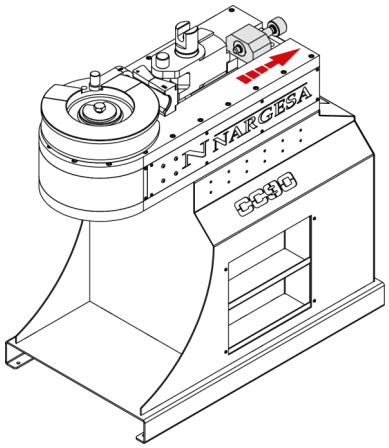
5.3. Changing the Rotation Direction

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

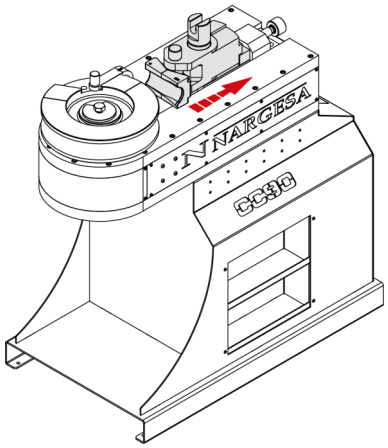
IMPORTANT

Remove the material from the machine to make this change.

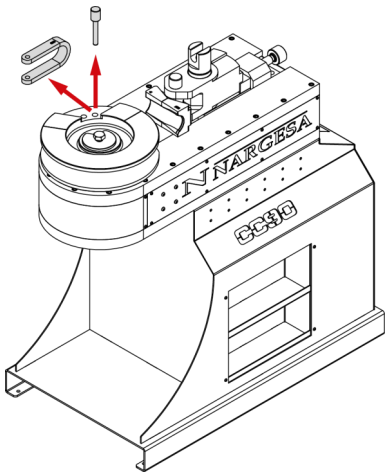
1. Remove the positioning spindle.



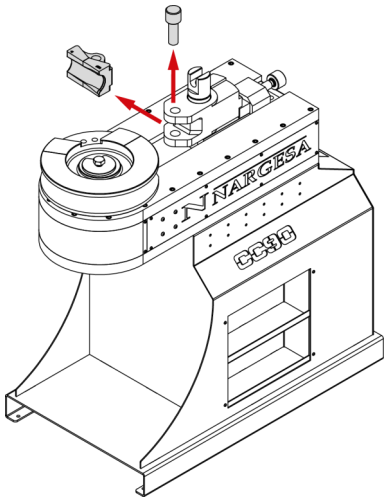
2. Remove the positioner and counter-die.



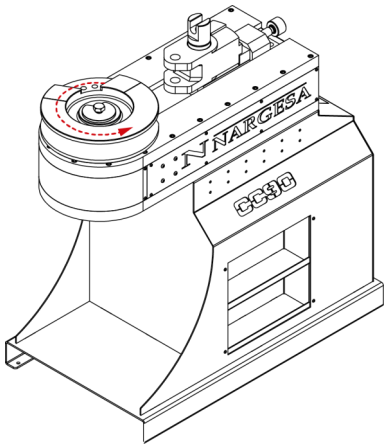
3. Remove the drag clamp.



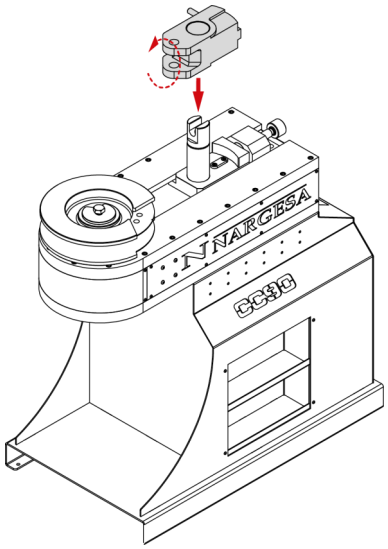
4. Remove the counter-die.



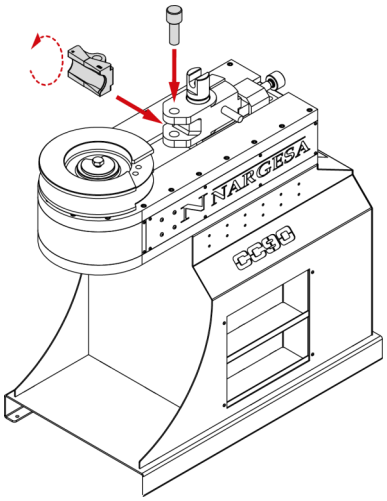
5. Position the roller with the CNC. See section ***5.8. Rotation Direction***.



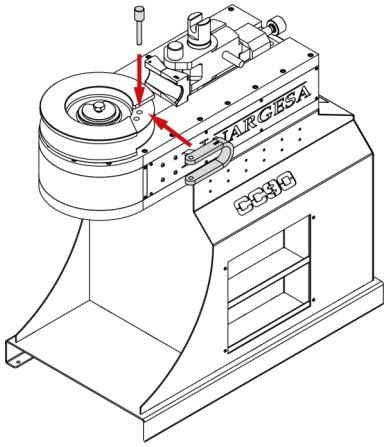
6. Turn the positioner 180º degrees and insert it back in the carriage.

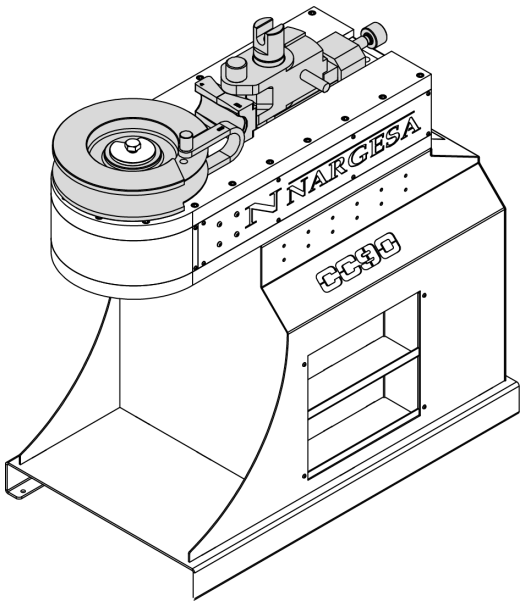


7. Rotate the counter-die 180º and secure with the pin.

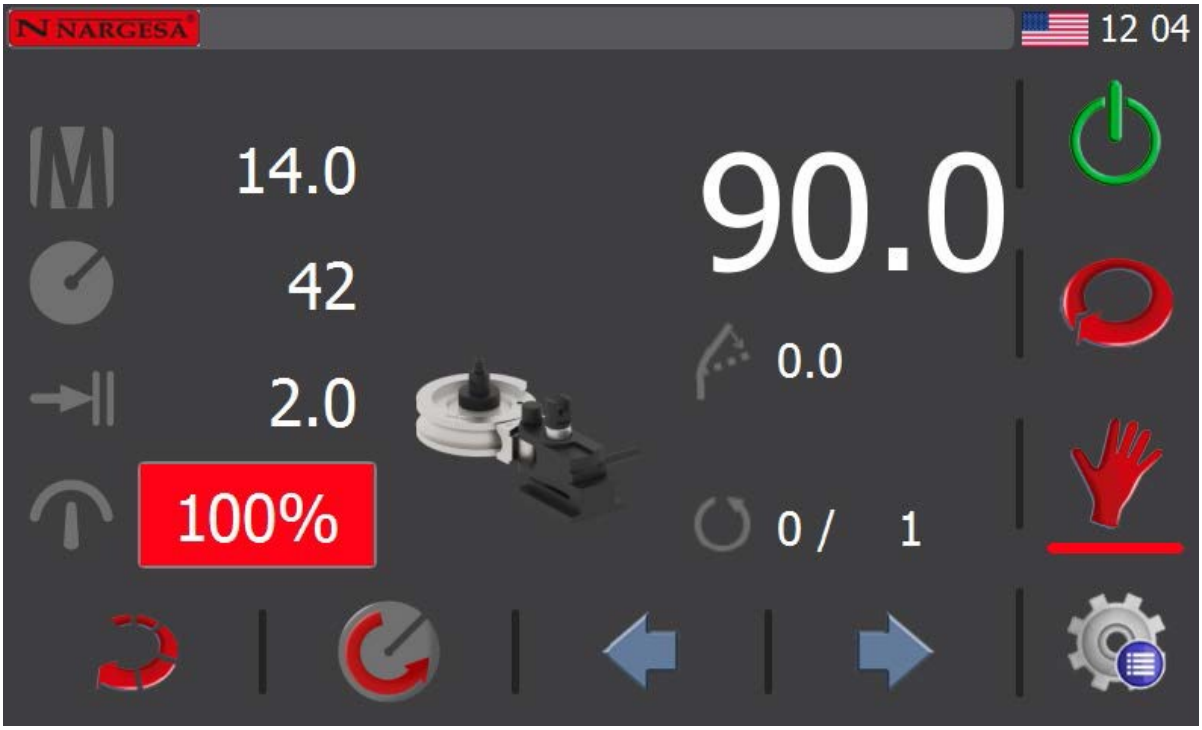


8. Put the drag clamp back on.





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

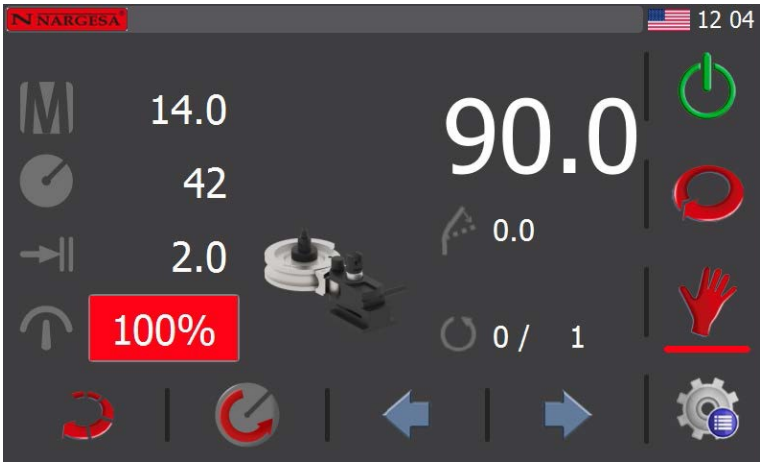
Corrector

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.

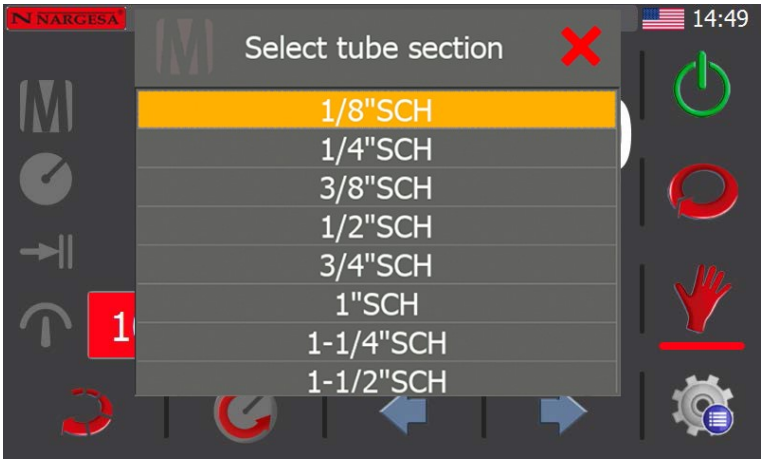
The CC90 is already started and in Standby. To activate it, follow the steps indicated below.

Enter the following operating details:

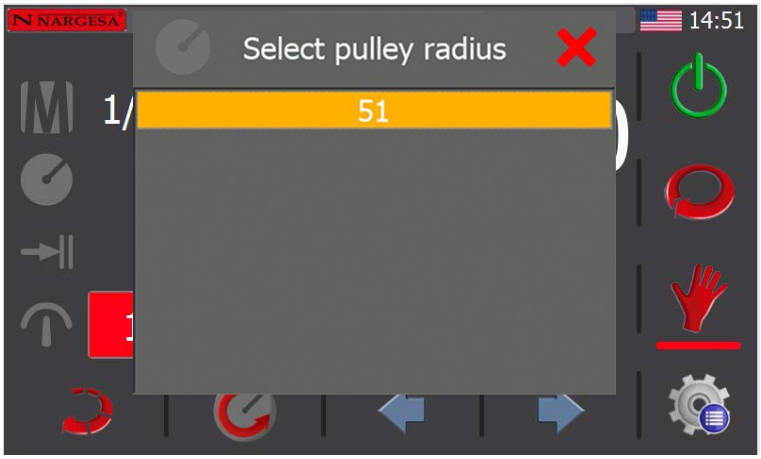
- Diameter of the material
- Roller radius
- Thickness of the material
- Bending angle

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

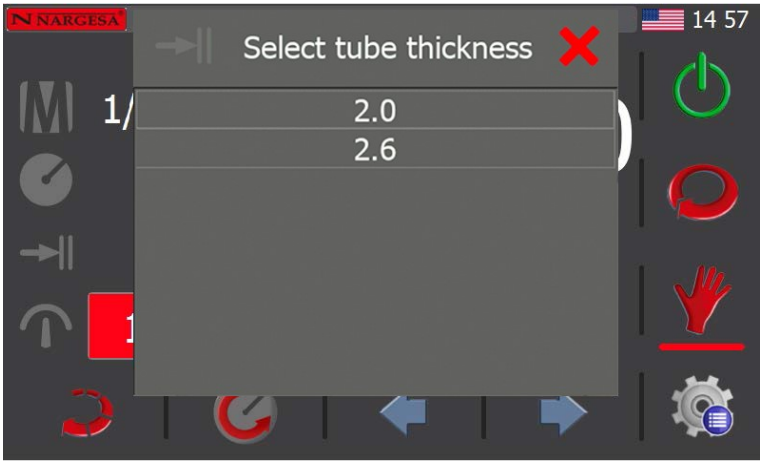
Press the [M] key to choose the diameter of the material to be curved:



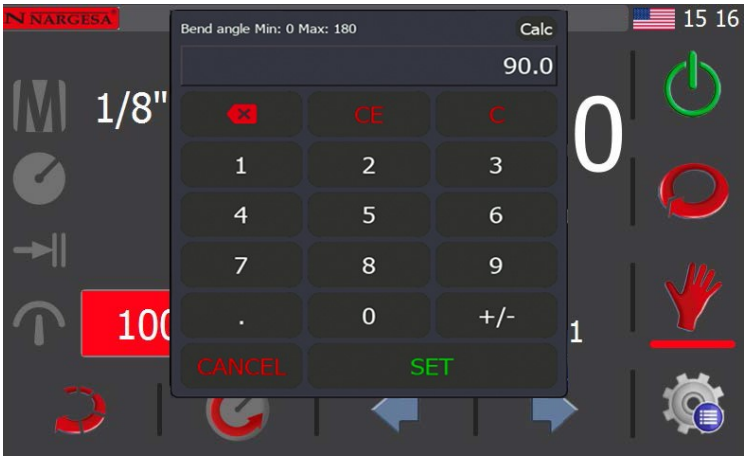
Press to choose the roller radius.



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 SET to accept and to start the machine.

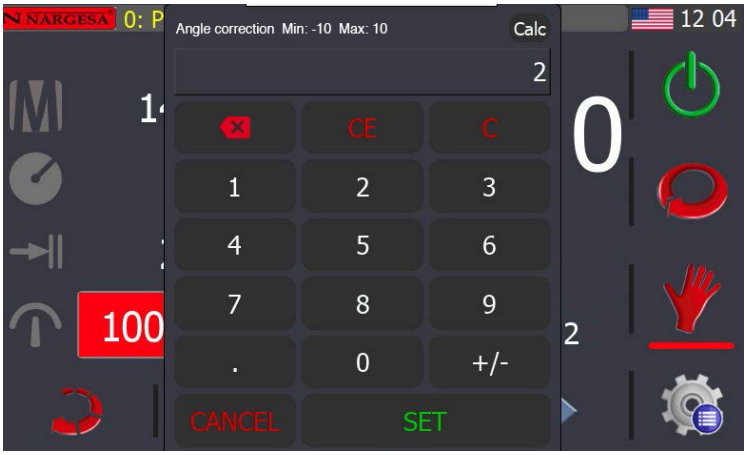


The machine will work at minimum speed based on the parameters entered.

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.



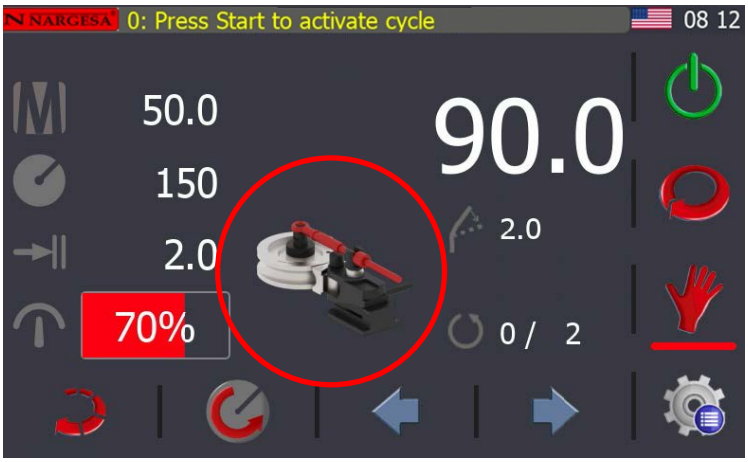
Confirm by pressing the key  and proceed with another curve. You must press  again to start the cycle.

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 SET key.

The second number in this field indicates the curves already made

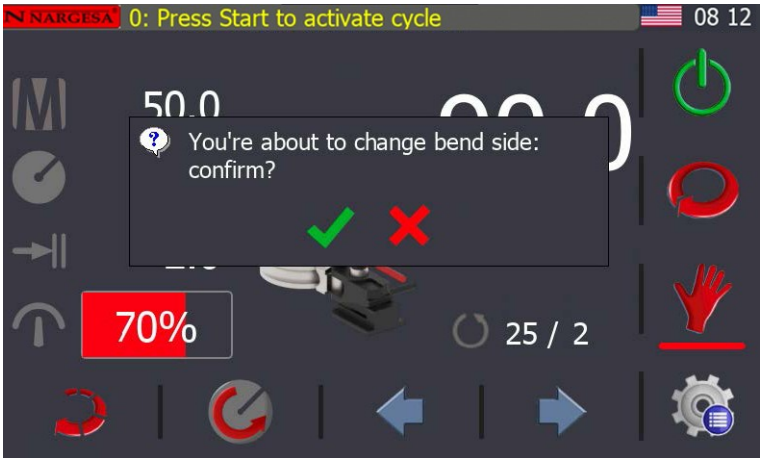
If the part counter is not used, enter a 0 for this parameter. The machine will do the same curve an infinite number of times.

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.



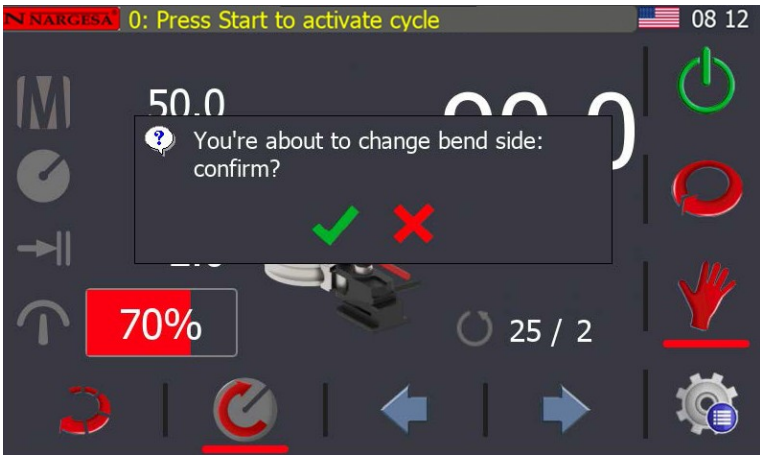
Confirm by pressing ✔. A message appears indicating that you must move the roller to position 0.

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:

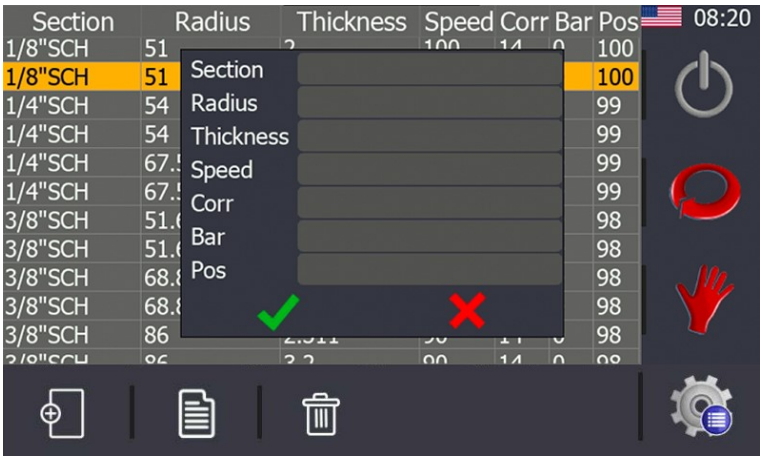
Press the key to access the corrections menu:

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.

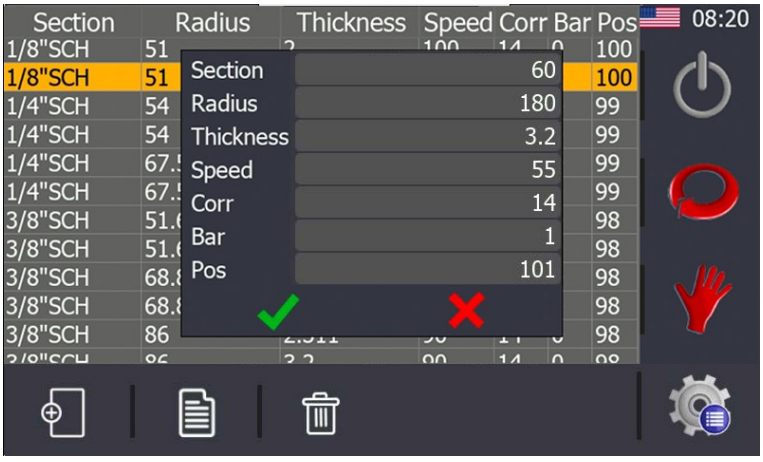
Thickness: refers to the pipe thickness.

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

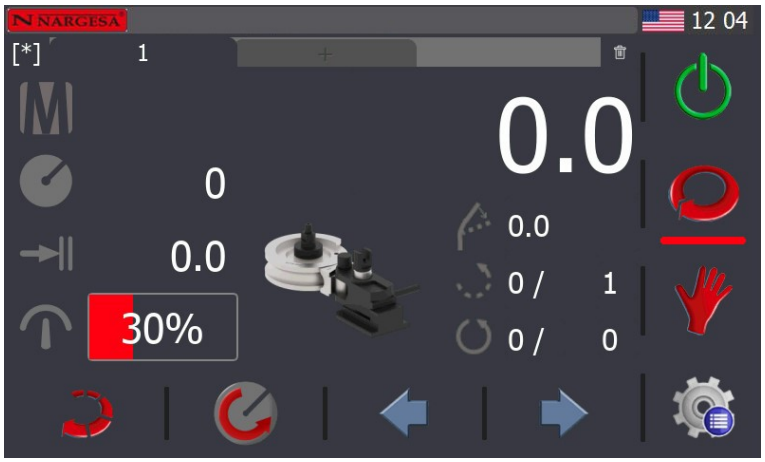
This operating mode makes it possible to make curves with different curve angles on the same piece. This model also enables saving programs in the CNC to be used whenever needed.

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

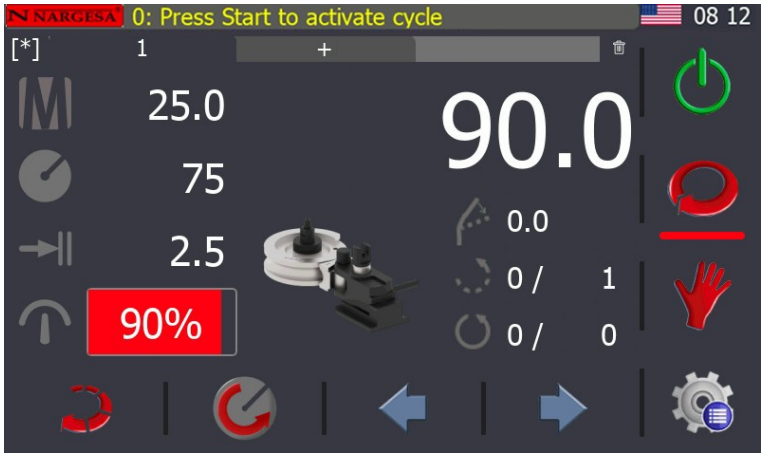
Press the key and this will appear on the screen:

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

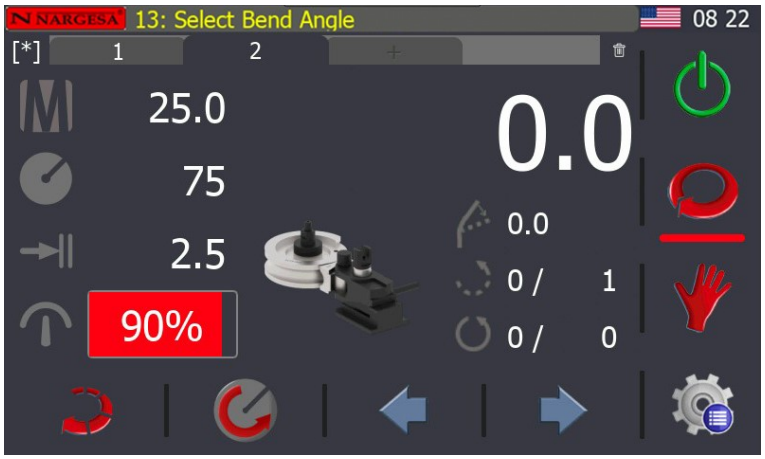
To generate a new program, press the ⊕ key. After pressing it, this screen will appear:



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.

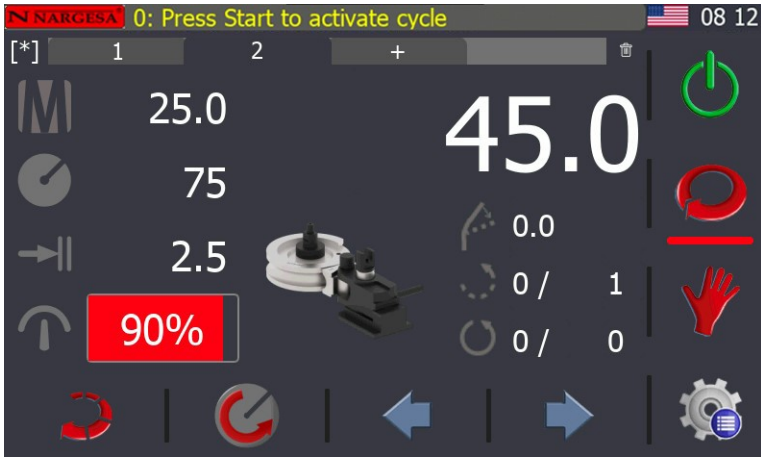


Now add a new curve in the same program. To do so, press the **+** key at the top of the screen.



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.

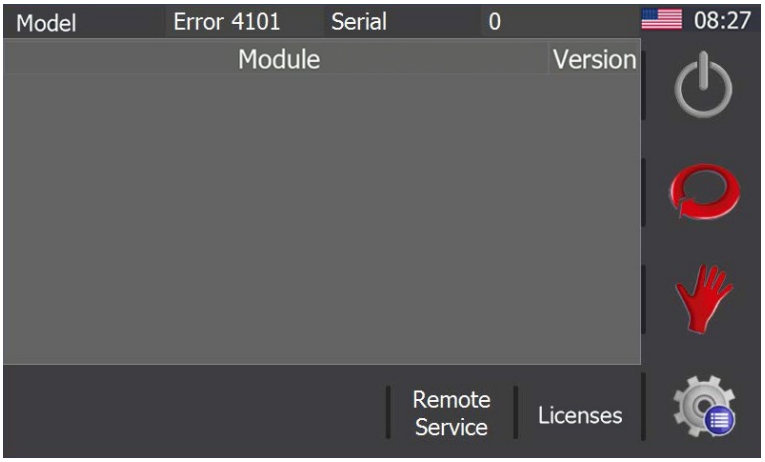
Enter a name for the program and press Enter.

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.

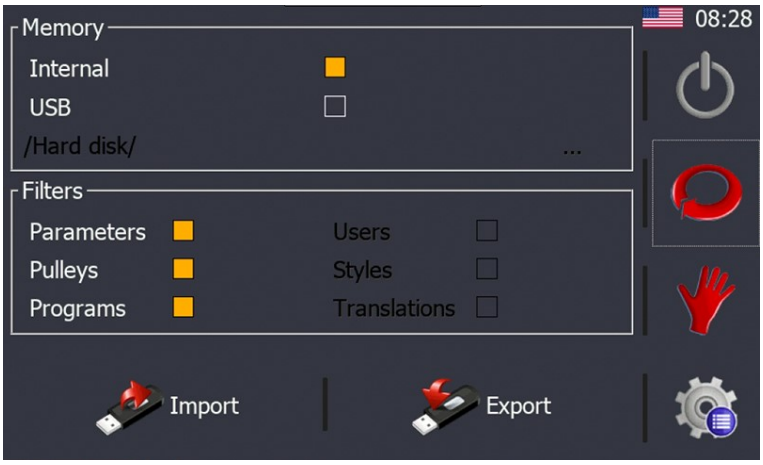


The information shown in the figure above refers to the model and serial number for the bender control as well as the versions of the different digital libraries used in the user interface.

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

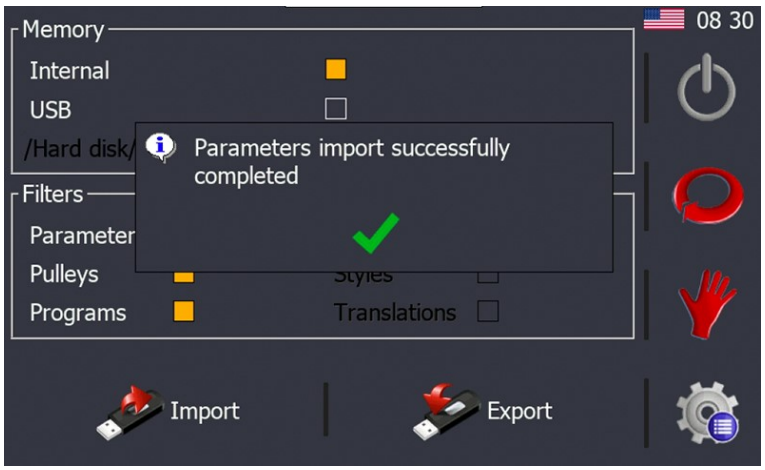
All the bender configuration parameters as well as the materials defined and programs created can be imported and exported to create backup copies.

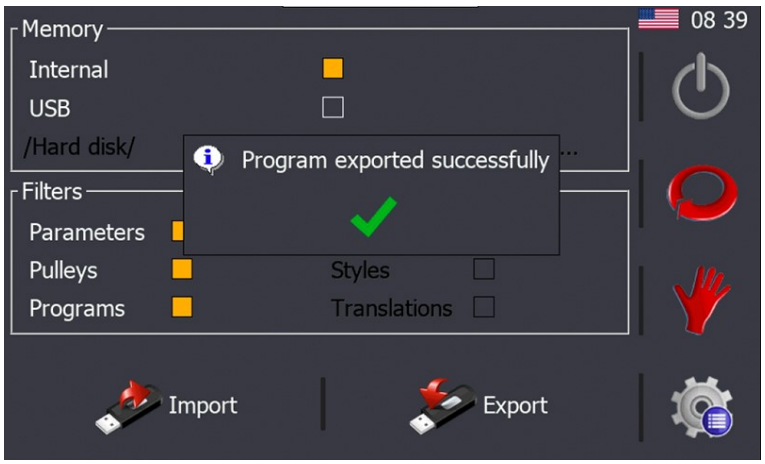


To access the window shown in the figure above, you must press the key. Once you access the menu screen, you must press the key

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:

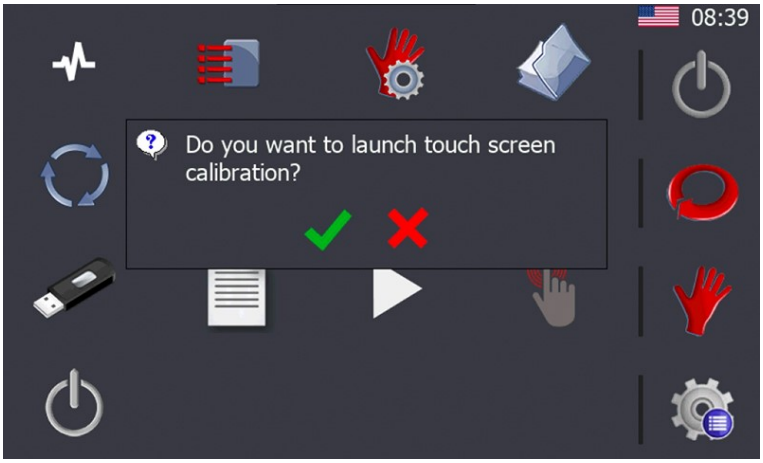




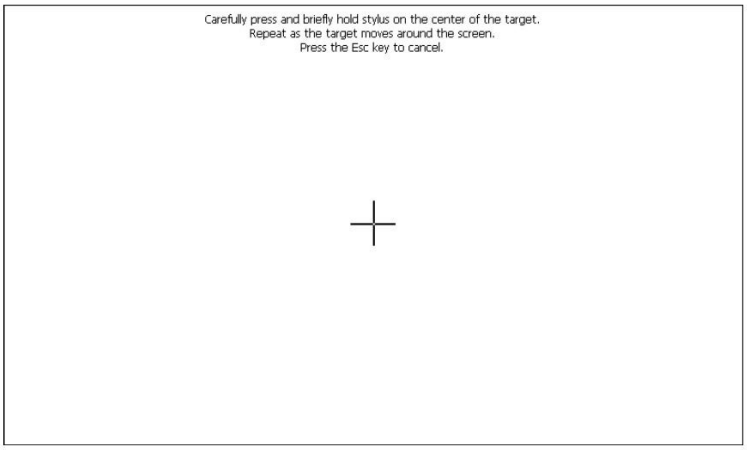
5.14. Calibrating the Touchscreen

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

The CC90 pipe bender comes with a 400 ml 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 disolves 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

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:

Identification	Chemical name/classification		Concentration
CAS: 112-34-5 EC: 203-961-6 Index: 603-096-00-8 REACH: 01-2119475104-44-XXXX	**2-(2-Butoxyethoxy)ethanol**[1]	ATP CLP00	**<0.05 %**
	Regulation 1272/2008	Eye Irrit. 2: H319 - Attention 	
CAS: 1330-20-7 EC: 215-535-7 Index: 601-022-00-9 REACH: 01-2119488216-32-XXXX	**Xylene**[1]	ATP CLP00	**<0.05 %**
	Regulation 1272/2008	Acute Tox. 4: H312+H332; Flam. Liq. 3: H226; Skin Irrit. 2: H315 - Attention 	
CAS: 100-41-4 EC: 202-849-4 Index: 601-023-00-4 REACH: 01-2119489370-35-XXXX	**Ethylbenzene**[1]	Self classification	**<0.05 %**
	Regulation 1272/2008	Acute Tox. 4: H332; Aquatic Chronic 3: H412; Asp. Tox. 1: H304; Flam. Liq. 2: H225; STOT RE 2: H373 - Hazard 	

[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.

6.1. Optional Accessories

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 millimeters · 12 to 80 mm

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

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

► Accessories for 90mm 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

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

** 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

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

► 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

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

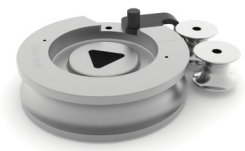
** All capacities are based on the norm of carbon steel tubes according to ASTM, Standard A-53 grade A with a maximum resistance strength of 330MPa. The walls with more thickness to the established one and the materials with more resistance, reduce the capacities of the machine. Check with your material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

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

► 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

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

► Supporting Roller Kit CC90

REF: 140-17-02-00002
The CC90 Supporting Roller Kit is used to bend:
· 90mm tube of 4mm wall thickness or thicker
· 3” Schedule tube of 3,05mm wall thickness or thicker
· 3” 1/2 tube of 4mm wall thickness or thicker.

Weight: 24,573 kg

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

► Accessories for square pipes in millimeters · 20 to 50 mm

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

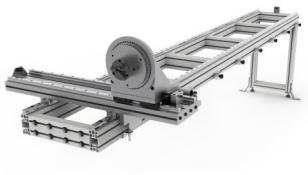
REF.	Section	Radius	Min. thickness	Max. thickness	Weight
Square Tube Die Set 20mm Radius 100mm					
140-17-01-10101	20x20mm	5D=100mm	1,5mm	4mm	11,1Kg
Square Tube Die Set 25mm Radius 115mm					
140-17-01-10102	25x25mm	115mm	2mm	4mm	14,75Kg
Square Tube Die Set 30mm Radius 135mm					
140-17-01-10103	30x30mm	135mm	2mm	4mm	22Kg
Square Tube Die Set 40mm Radius 165mm					
140-17-01-10104	40x40mm	165mm	2mm	5mm	34,15Kg
Square Tube Die Set 50mm Radio 180mm					
140-17-02-10101	50x50mm	180mm	2,5mm	5mm	45,7Kg

► 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

REF.	Section	Section	Radius	Radius	Min. Thick.	Max. Thick.	Weight
Square Tube Die Set ¾” (19,05mm) Radius 4” (101,6mm)							
140-17-01-30101	3/4”x3/4”	19,05x19,05mm	4”	101,6mm	1,5mm	4mm	11,5Kg
Square Tube Die Set 1” (25,4mm) Radius 4,5” (114,3mm)							
140-17-01-30102	1”x1”	25,4x25,4mm	4” 1/2	114,3mm	2mm	4mm	14,6Kg
Square Tube Die Set 1” 1/4 (31,75mm) Radius 5,5” (139,7mm)							
140-17-01-30103	1” 1/4x1”1/4	31,75x31,75mm	5” 1/2	139,7mm	2mm	4mm	23,3Kg
Square Tube Die Set 1” 1/2 (38,1mm) Radius 6,5” (165,1mm)							
140-17-01-30104	1” 1/2x1”1/2	38,1x38,1mm	6” 1/2	165,1mm	2mm	5mm	34,6Kg
Square Tube Die Set 1” 3/4 (44,45mm) Radius 6,75” (171,45mm)							
140-17-02-30101	1” 3/4x1”3/4	44,45x44,45mm	6” 3/4	171,45mm	2,5mm	5mm	39Kg
Square Tube Die Set 2” (50,8mm) Radius 7” (177,8mm)							
140-17-02-30102	2”x2”	50,8x50,8mm	7”	177,8mm	2,5mm	5mm	44Kg

► 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.	Gauge length	Maximum capacity	Weight
140-17-02-50000	3000mm	90 mm, 3” Schedule	135Kg

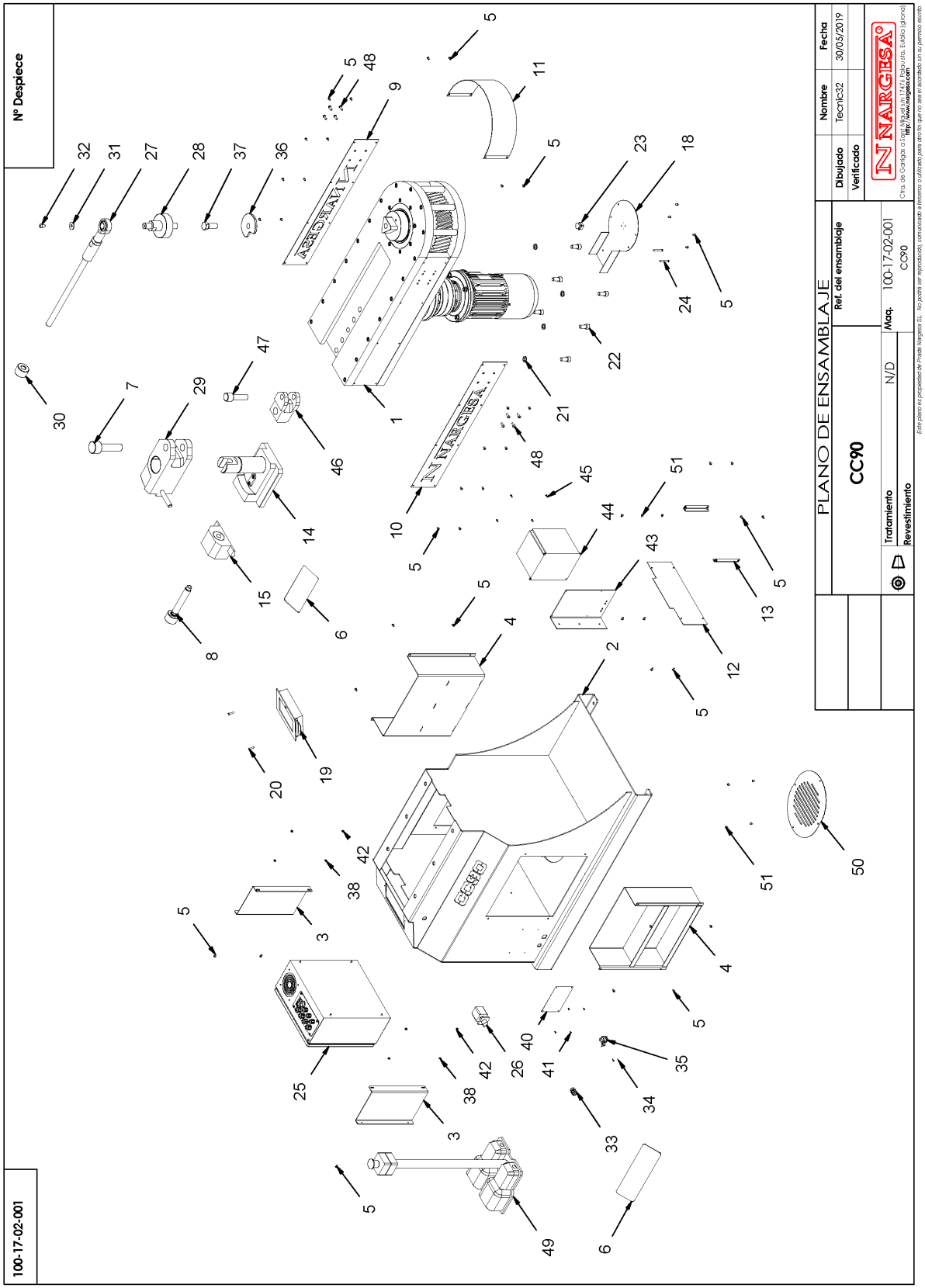
7. TROUBLESHOOTING

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	Tighten the counter-die
Internal wrinkle	Lack of lubrication	Use BEND8 or another similar lubricant
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	Increase the pipe wall
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 CC90 CNC

General Exploded View

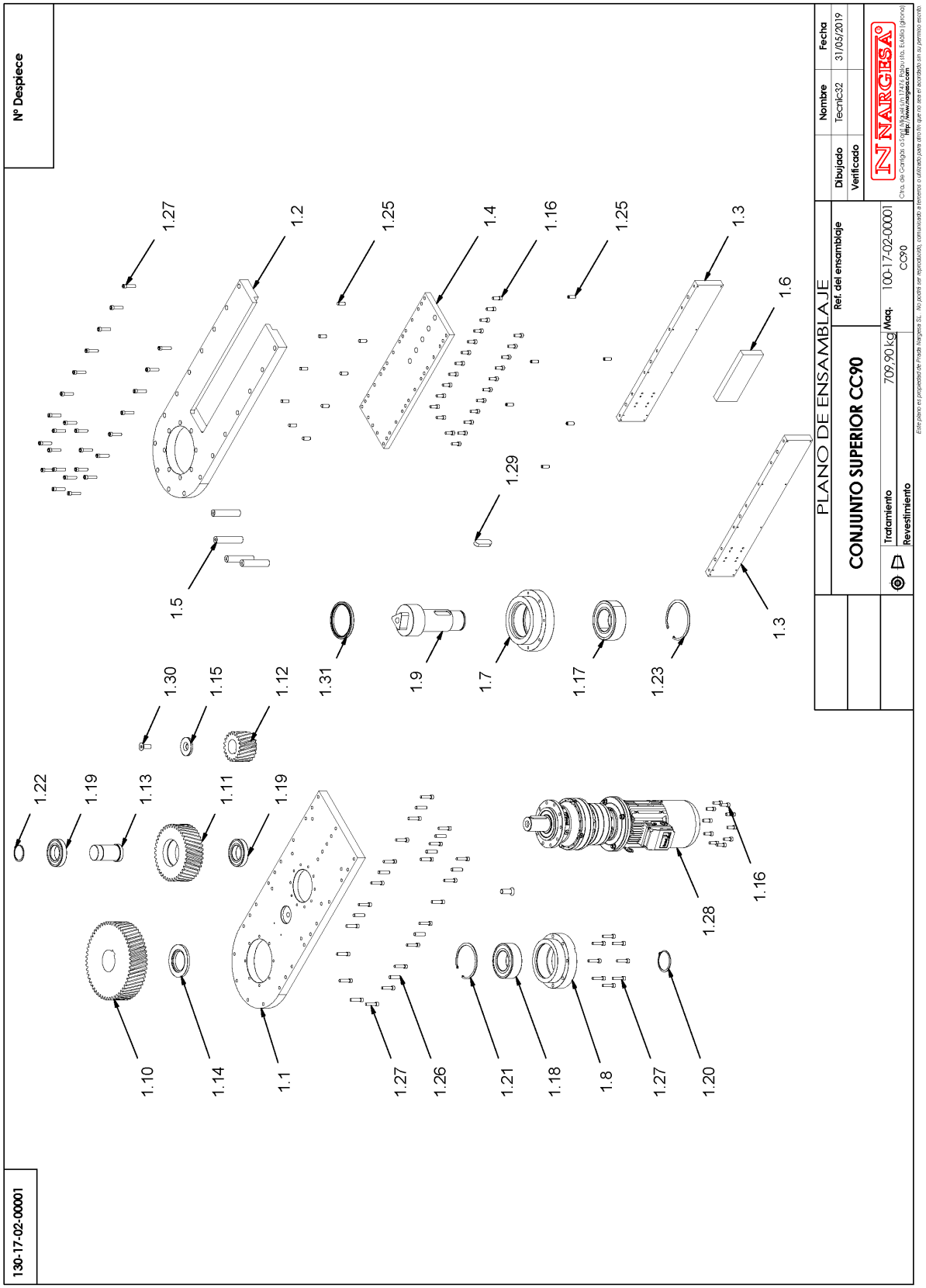


Nº ORDEN	DIBUJO	DESCRIPCION	Nº PLANO	PIEZAS POR MAQUINA
1		CONJUNTO SUPERIOR CC90	130-17-02-00001	1
2		ESTRUCTURA CC90	130-17-02-00002	1
3		SOPORTE CUADRO ELECTRICO CC90	120-17-02-00025	2
4		CONJUNTO ESTANTERIA CC90	130-17-02-00003	2
5		TORNILLO ALLEN ABOMBADO ISO7380 M6X10	020-I7380-M6X10	44
6		METACRILAT CC60	120-17-01-00043	2
7		CONJUNO EJE FIJACION PORTAGUIAS CC90	130-17-02-00004	1
8		TORNILLO APRIETE CC90	120-17-02-00029	1
9		ANAGRAMA NARGESA 2 CC90	120-17-02-00034	1
10		ANAGRAMA NARGESA CC90	120-17-02-00035	1
11		ENVOLVENTE DE CHAPA CC90	120-17-02-00036	1
12		ENVOLVENTE POSTERIOR CC90	120-17-02-00037	1
13		SOPORTE ENVOLVENTE TRASERO CC90	120-17-02-00038	2
14		CONJUNTO CARRO PORTAGUIAS CC90	130-17-02-00006	1
15		CONJUNTO EMPUJE CARRO CC90	130-17-02-00007	1
18		TAPA ENCODER CC90	120-17-02-00039	1
19		CONJUNTO PANTALLA CC60	130-17-01-00008	1
20		TORNILLO ALLEN ABOMBADO ISO7380 M6X25	020-I7380-M6X25	2

Nº ORDEN	DIBUJO	DESCRIPCION	Nº PLANO	PIEZAS POR MAQUINA
21		ARANDELA GLOWER DIN 127 PARA M16	020-D127-M16	6
22		TORNILLO ALLEN DIN 912 M16X35	020-D912-M16X35	6
23		ENCODER QR30N	050-ENC-00007	1
24		TORNILLO ALLEN ABOMBADO ISO7380 M6X50	020-I7380-M6X50	2
25		KIT INSTALACION ELECTRICA	050-KIE-1701-001	1
26		INTERRUPTOR GENERAL KG10AK300	050-IG-00001	1
27		CONJUNTO BRAZO REACCIONCC90	130-17-02-00009	1
28		FIJACIÓN RULINA BRAZO REACCION CC90	120-17-02-00049	1
29		CONJUNTO PORTA GUIAS CC90	130-17-02-00010	1
30		TUERCA BRAZO REACCIÓN CC90	120-17-02-00052	1
31		ARANDELA ANCHA DIN9021 PARA M12	020-D9021-M12	1
32		TORNILLO ALLEN ABOMBADO ISO7380 M12X20	020-I7380-M12X20	1
33		PRENSAESTOPA PG13.5	050-PE-00003	1
34		TORNILLO DIN7985 M3X10 ZINCADO	020-D7985-M3X10	2
35		ZOCALO RECTO CK03I	050-BE-00003	1
36		FIJACIÓN RULINA CC90	120-17-02-00054	1
37		TORNILLO HEXAGONAL DIN933 M30X50	020-D933-M30X50	1
38		ARANDELA BISELADA DIN125B PARA M6	020-D125B-M6	4

Nº ORDEN	DIBUJO	DESCRIPCION	Nº PLANO	PIEZAS POR MAQUINA
40		PLACA CARACTERISTICAS GENERAL	122-PLC-0000-001	1
41		REMACHE DE CLAVO DIN 7337 DE AL Ø3X8	020-D7337-3X8	4
42		TUERCA DIN 934 M6	020-D934-M6	4
43		PLACA FIJACION VARIADOR CC90	120-17-02-00056	1
44		VARIADOR FRECUENCIA SV055IG5A-4	050-VF-00010	1
45		TORNILLO ALLEN DIN 912 M4X10	020-D912-M4X10	4
46		SUPLEMENTO PORTAGUIAS CC90	120-17-02-00055	1
47		CONJUNO EJE FIJACION PORTAGUIAS CC60	130-17-01-00004	1
48		TORNILLO ALLEN ISO 7380 M8X20	020-I7380-M8X20	8
49		PEDAL DOBLE CON PARO DE EMERGENCIA	050-PED-00002	1
50		CHAPA INFERIOR CC90	120-17-02-00057	1
51		TORNILLO ALLEN ISO 7380 M6X8	020-I7380-M6X8	7

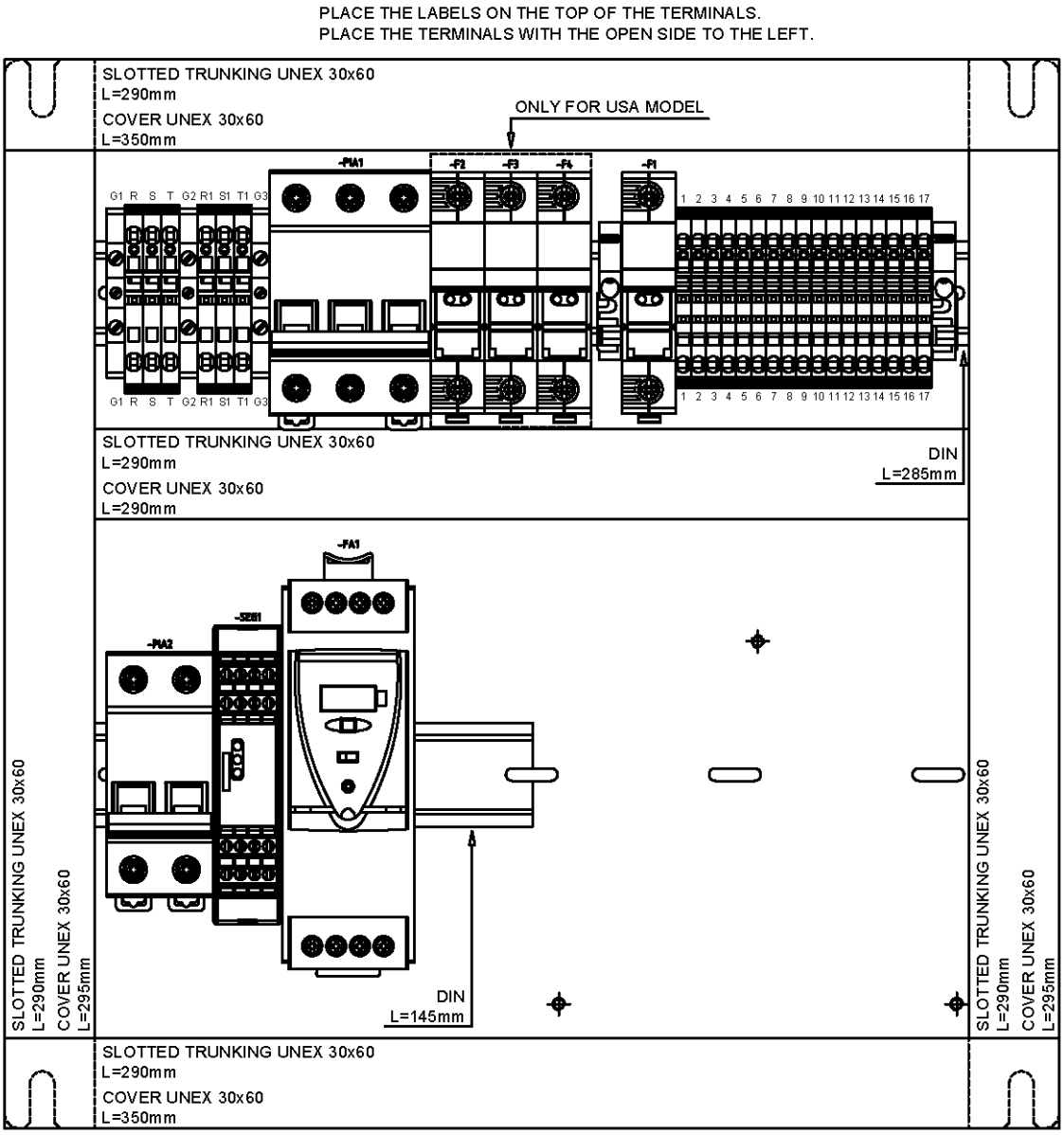
Upper Ensemble



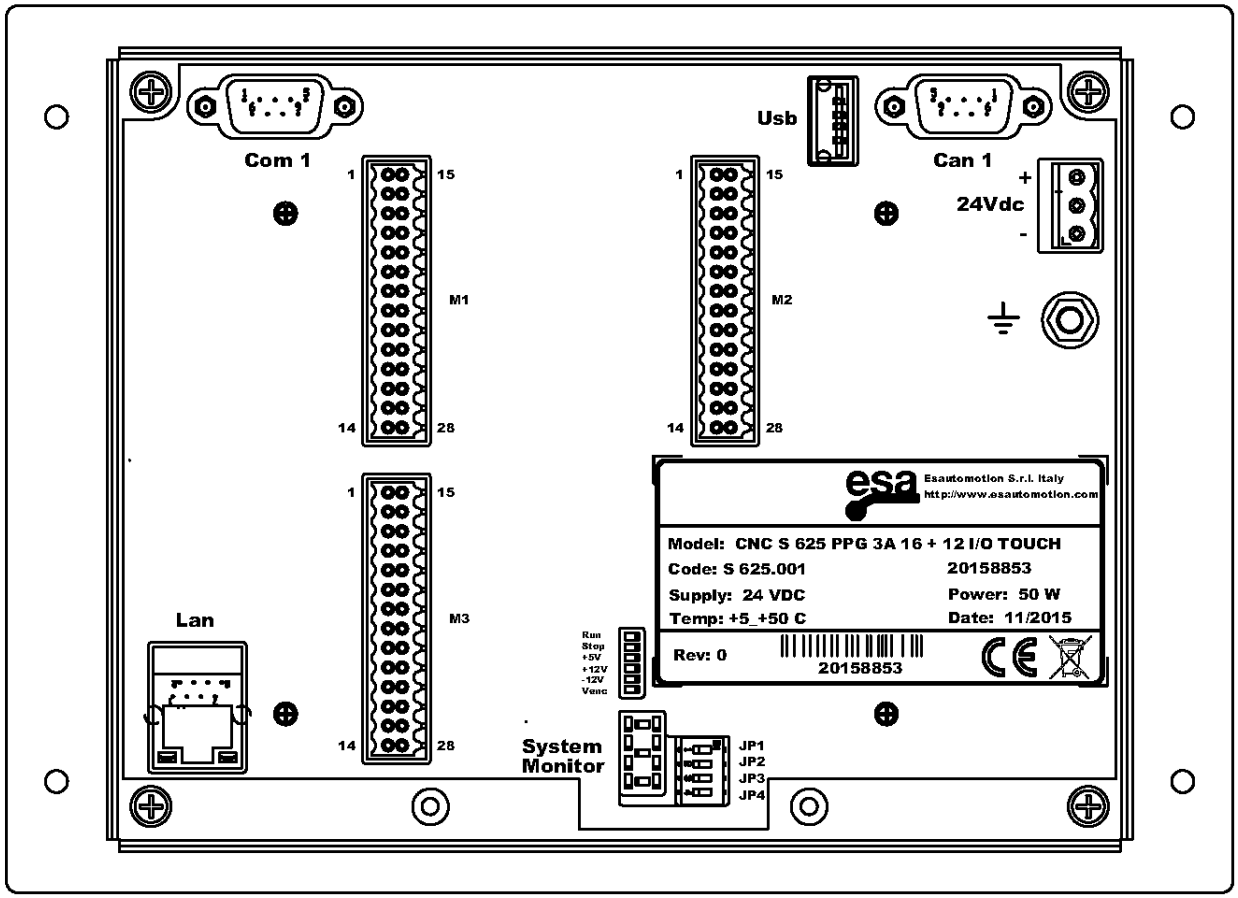
Nº ORDEN	DIBUJO	DESCRIPCION	Nº PLANO	PIEZAS POR MAQUINA
1.1		PLACA BASE CC90	120-17-02-00001	1
1.2		PLACA SUPERIOR CC90	120-17-02-00002	1
1.3		PASAMANO LATERAL REDUCTOR CC90	120-17-02-00003	2
1.4		SOPORTE GUIA INFERIOR CC90	120-17-02-00004	1
1.5		SEPARADOR ESTRUCTURACC90	120-17-02-00005	4
1.6		REFUERZO INTERIOR CC90	120-17-02-00006	1
1.7		CASQUILLO PORTA COJINETE CC90	120-17-02-00007	1
1.8		CASQUILLO PORTA COJINETE INFERIOR CC90	120-17-02-00008	1
1.9		EJE ENGRANAJE Z56 CC90	120-17-02-00009	1
1.10		ENGRANAJE HELICOIDAL Z56 M6 CC90	120-17-02-00010	1
1.11		ENGRANAJE HELICOIDAL Z40 M6 CC90	120-17-02-00011	1
1.12		ENGRANAJE HELICOIDAL Z20 M6 CC90	120-17-02-00012	1
1.13		EJE ENGRANAJE Z40 CC90	120-17-02-00013	1
1.14		SEPARADOR ENGRANAJE Z56 CC90	120-17-02-00014	1
1.15		ARANDELA FIJACIÓN PIÑÓN CC90	120-17-02-00015	1
1.16		TORNILLO ALLEN DIN 912 M12X35	020-D912-M12X35	34
1.17		RODAMIENTO 3220B 2RS TVH	030-CJ-00034	1
1.18		RODAMIENTO 3218B 2RS TVH	030-CJ-00035	1

Nº ORDEN	DIBUJO	DESCRIPCION	Nº PLANO	PIEZAS POR MAQUINA
1.19		RODAMIENTO DE BOLAS 6214 2RS	030-CJ-00036	2
1.20		CIRCLIP EJE DIN471 D90	030-D471-00018	1
1.21		CIRCLIP EJE DIN472 D160	030-D472-00021	1
1.22		CIRCLIP EJE DIN471 D70	030-D471-00019	1
1.23		CIRCLIP AGUJERO DIN472 D180	030-D472-00020	1
1.24		TORNILLO ALLEN AVELLANADO DIN7991 M20X60	020-D7991-M20X60	1
1.25		PASADOR CILINDRICO CON ROSCA INT. DIN7979/D D14X40	030-D7979D-00026	15
1.26		PASADOR CILINDRICO CON ROSCA INT. DIN7979/D D14X60	030-D7979D-00027	8
1.27		TORNILLO ALLEN DIN912 M12X55	020-D912-M12X55	55
1.28		MOTOR REDUCTOR ROSSI R 4EL 006A 207Y C065M1 F30B I28X250 V3 HBZ 112M 4 230.400-50 B5	050-RT-00006	1
1.29		CHAVETA PARALELA DIN6885A 28X16X90	030-D6885A-00042	1
1.30		TORNILLO ALLEN AVELLANADO DIN7991 M20X50	020-D7991-M20X50	1
1.31		RETEN D145XD170X13	040-RET-00015	1

Electrical Cabinet



-CONTROL1


Com 1
Usb
Can 1
24Vdc
+
-
1
15
14
28
M1
M2
M3
Lan
esa
Esautomotion S.r.l. Italy
http://www.esautomotion.com
Model: CNC S 625 PPG 3A 16 + 12 I/O TOUCH
Code: S 625.001
20158853
Supply: 24 VDC
Power: 50 W
Temp: +5_+50 C
Date: 11/2015
Rev: 0
20158853
Run
Stop
+5V
+12V
-12V
Venc
System
Monitor
JP1
JP2
JP3
JP4

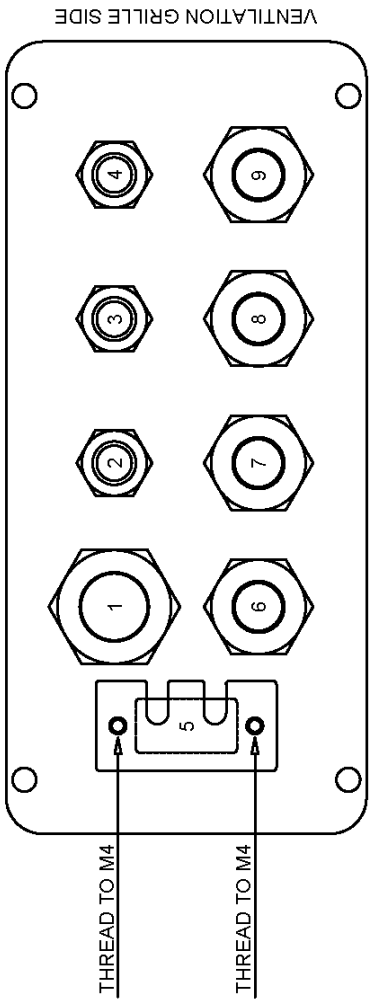
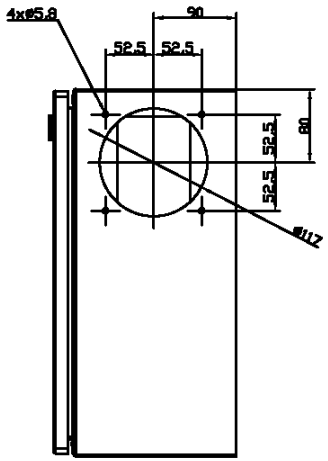
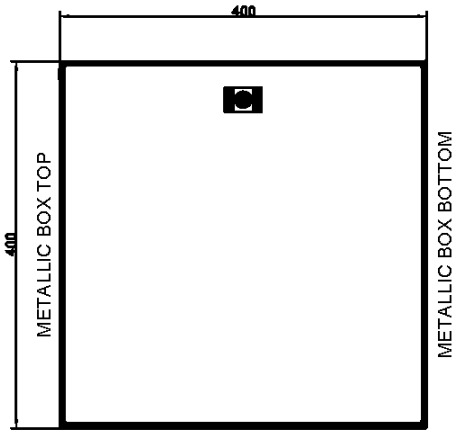


PLATE HOLE NUMBER	PLASTIC CABLE GLAND	ELECTRIC WIRE	DESCRIPTION
1	M25	MULTIPLE	MESH WITH SIGNAL WIRES
2	PG9	UNUSED	---
3	PG9	MG12	INVERTER EMERGENCY
4	PG9	UNUSED	---
5	---	MG9	ETHERNET
6	M20	MG5	PEDAL
7	M20	UNUSED	---
8	M20	MG11	INVERTER SUPPLY
9	M20	MG2	POWER INPUT AFTER MAIN SWITCH -S1

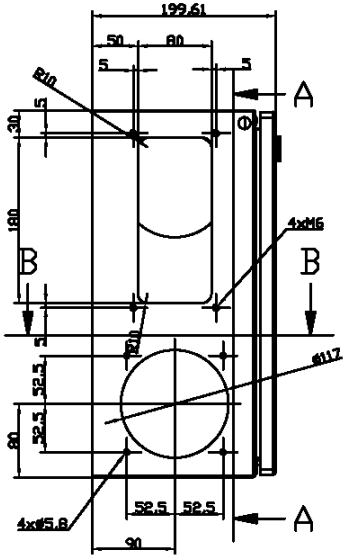
BOTTOM VIEW



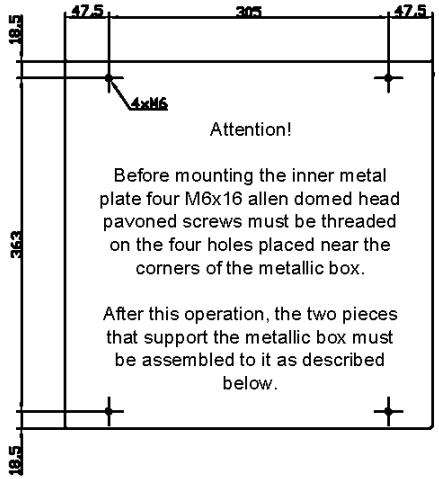
FRONT VIEW



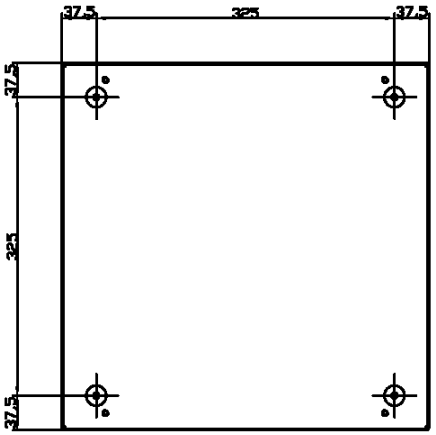
TOP VIEW



REAR VIEW

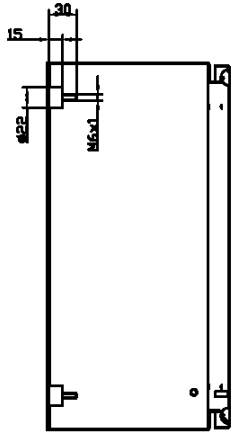


INNER VIEW DETAILS

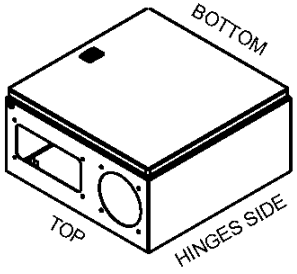


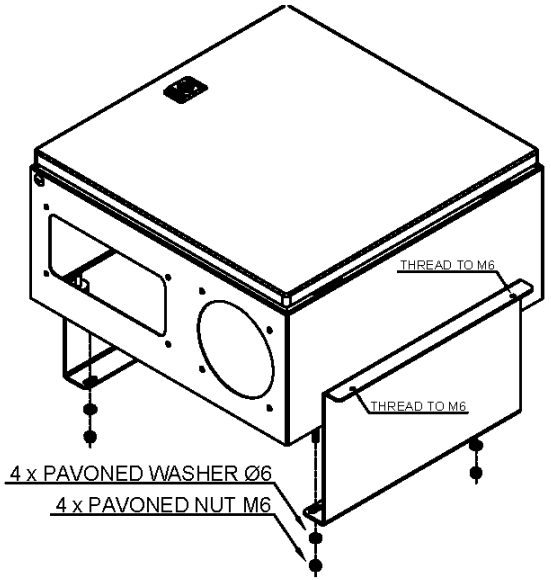
A-A (1 / 5)

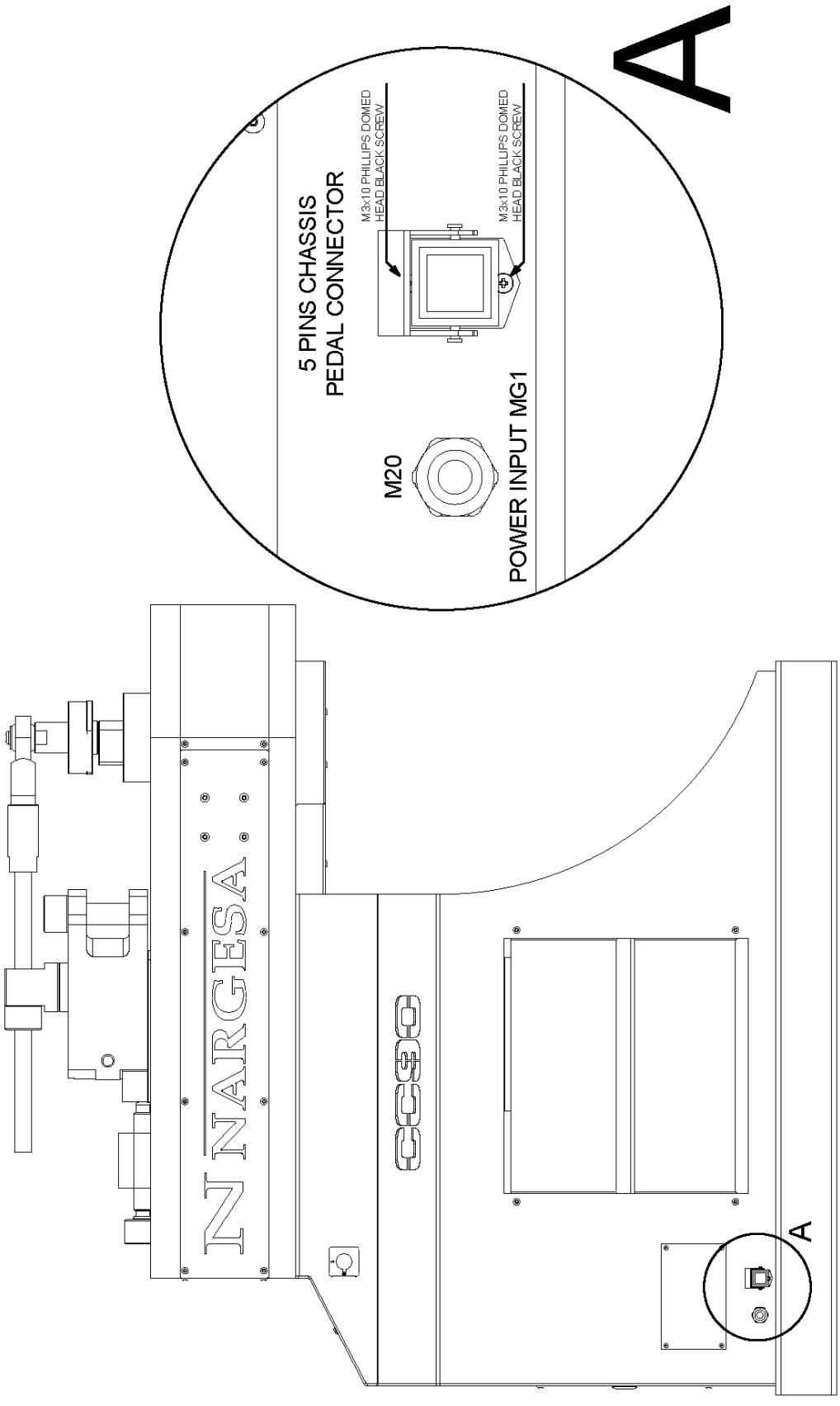
INNER VIEW DETAILS



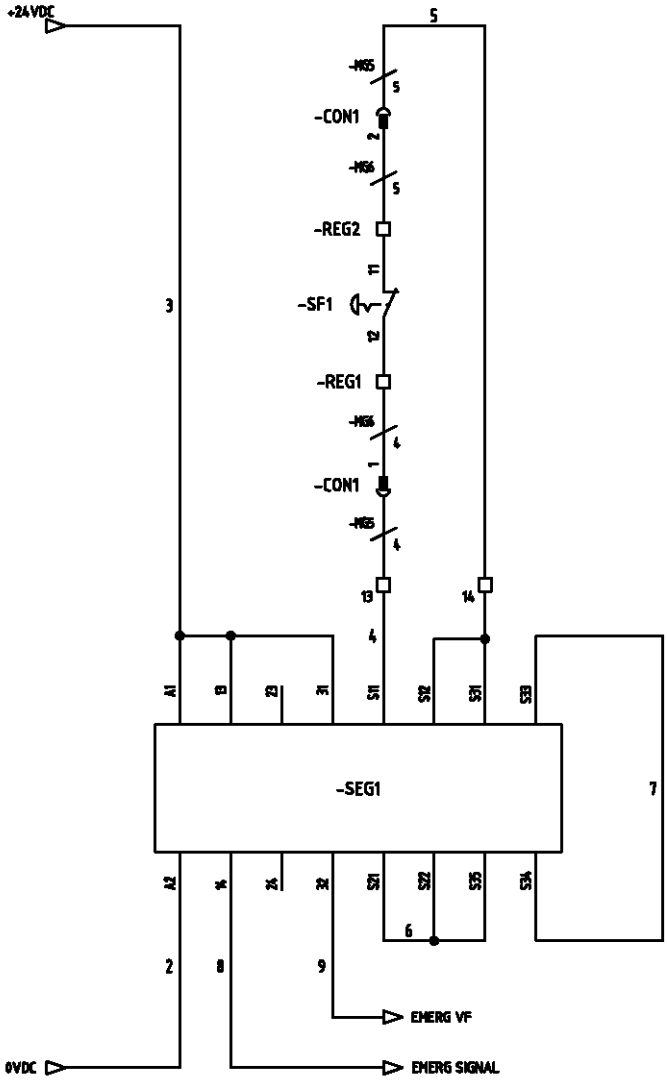
B-B (1 / 5)



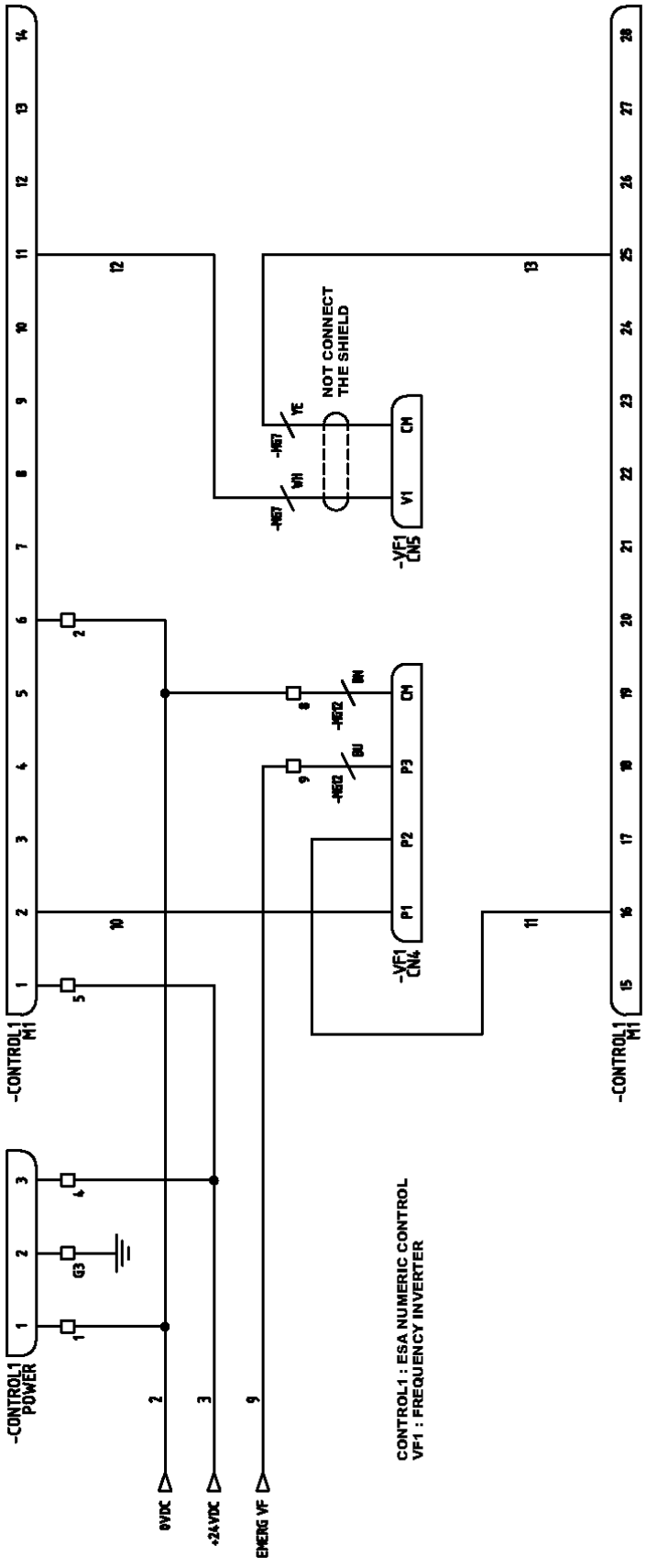


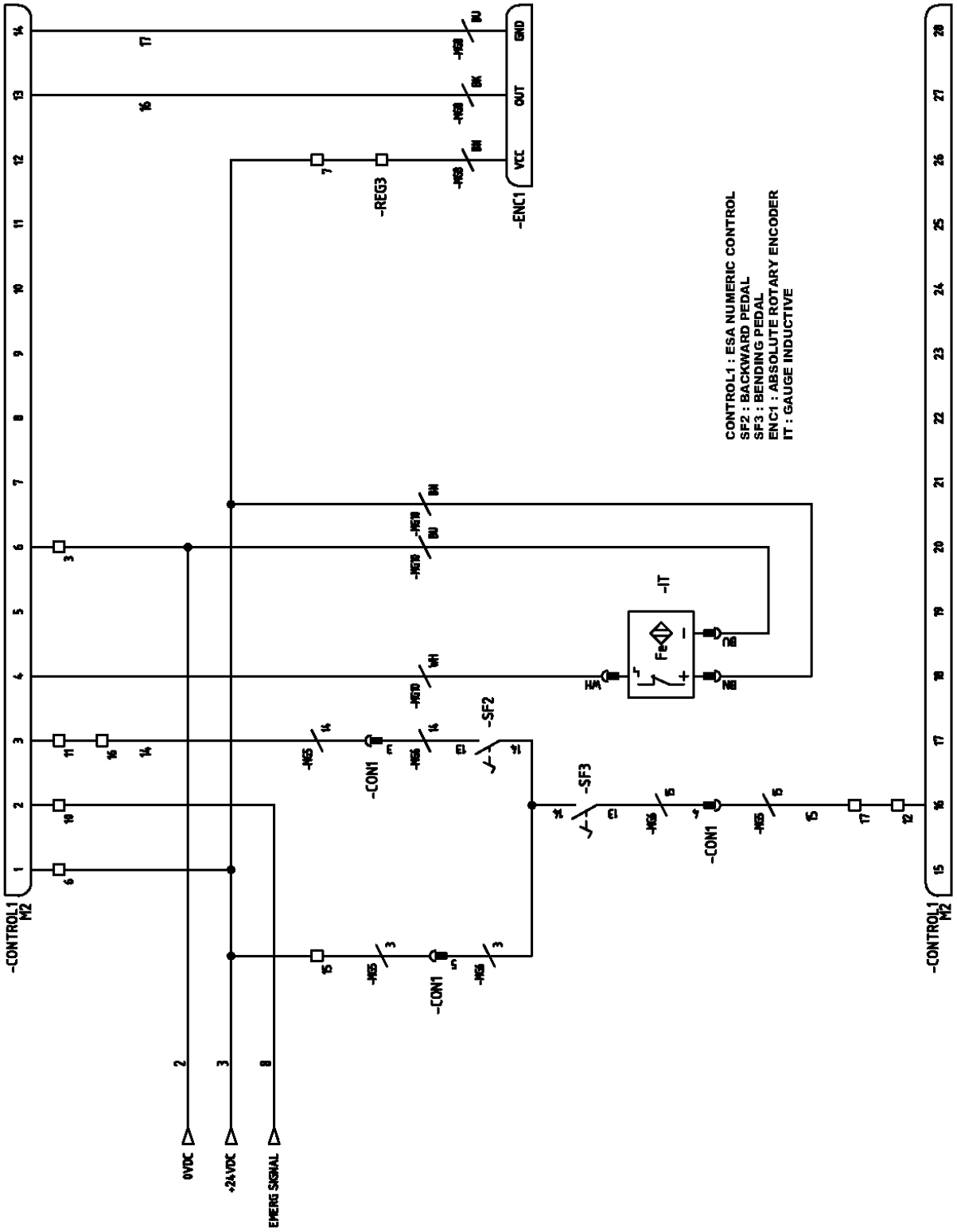

A
5 PINS CHASSIS
PEDAL CONNECTOR
M3x10 PHILLIPS DOMED
HEAD BLACK SCREW
M3x10 PHILLIPS DOMED
HEAD BLACK SCREW
M20
POWER INPUT MG1
NARGESA
CC90
A

Wiring Diagrams

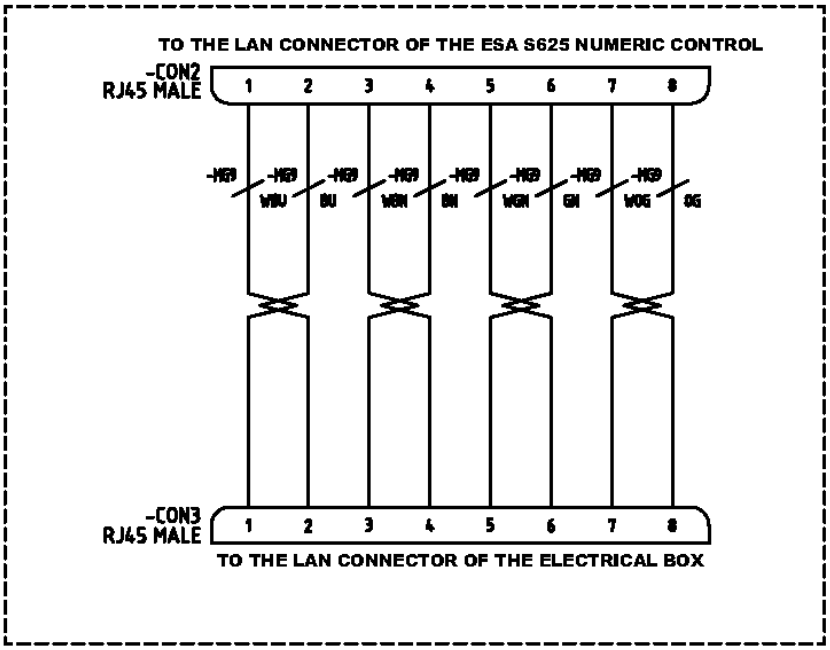


SF1 : PEDAL EMERGENCY STOP
SEG1 : EMERGENCY SAFETY MODULE

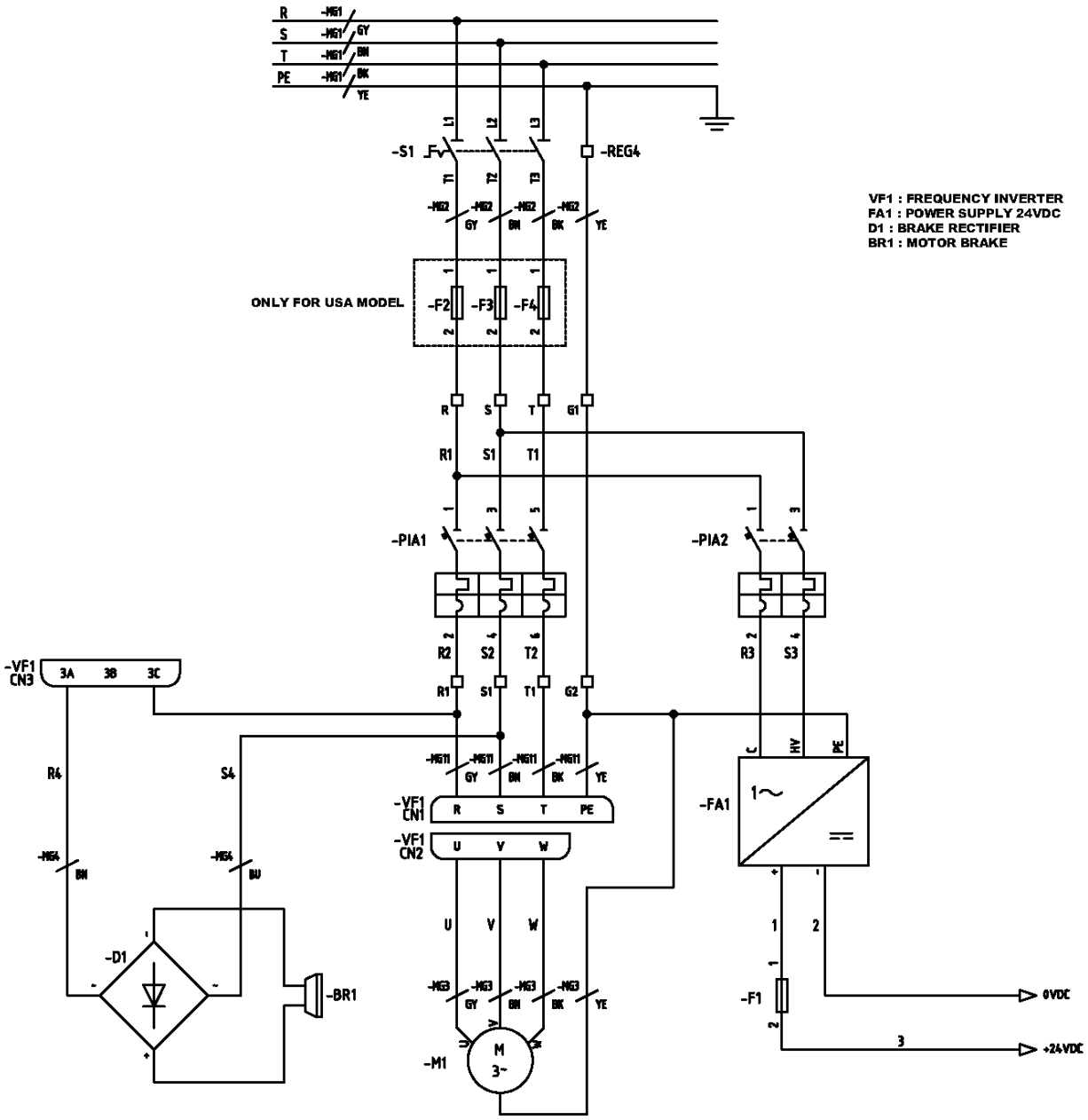

-CONTROL1 POWER
-CONTROL1 M1
-VF1 CN4
-VF1 CN5
NOT CONNECT THE SHIELD
0VDC
+24VDC
EMERG VF
CONTROL1 : ESA NUMERIC CONTROL
VF1 : FREQUENCY INVERTER


CONTROL1 : ESA NUMERIC CONTROL
SF2 : BACKWARD PEDAL
SF3 : BENDING PEDAL
ENC1 : ABSOLUTE ROTARY ENCODER
IT : GAUGE INDUCTIVE
-CONTROL1
M2
-ENC1
-REG3
-IT
-SF2
-SF3
-CON1
0VDC
+24VDC
EMERG SIGNAL

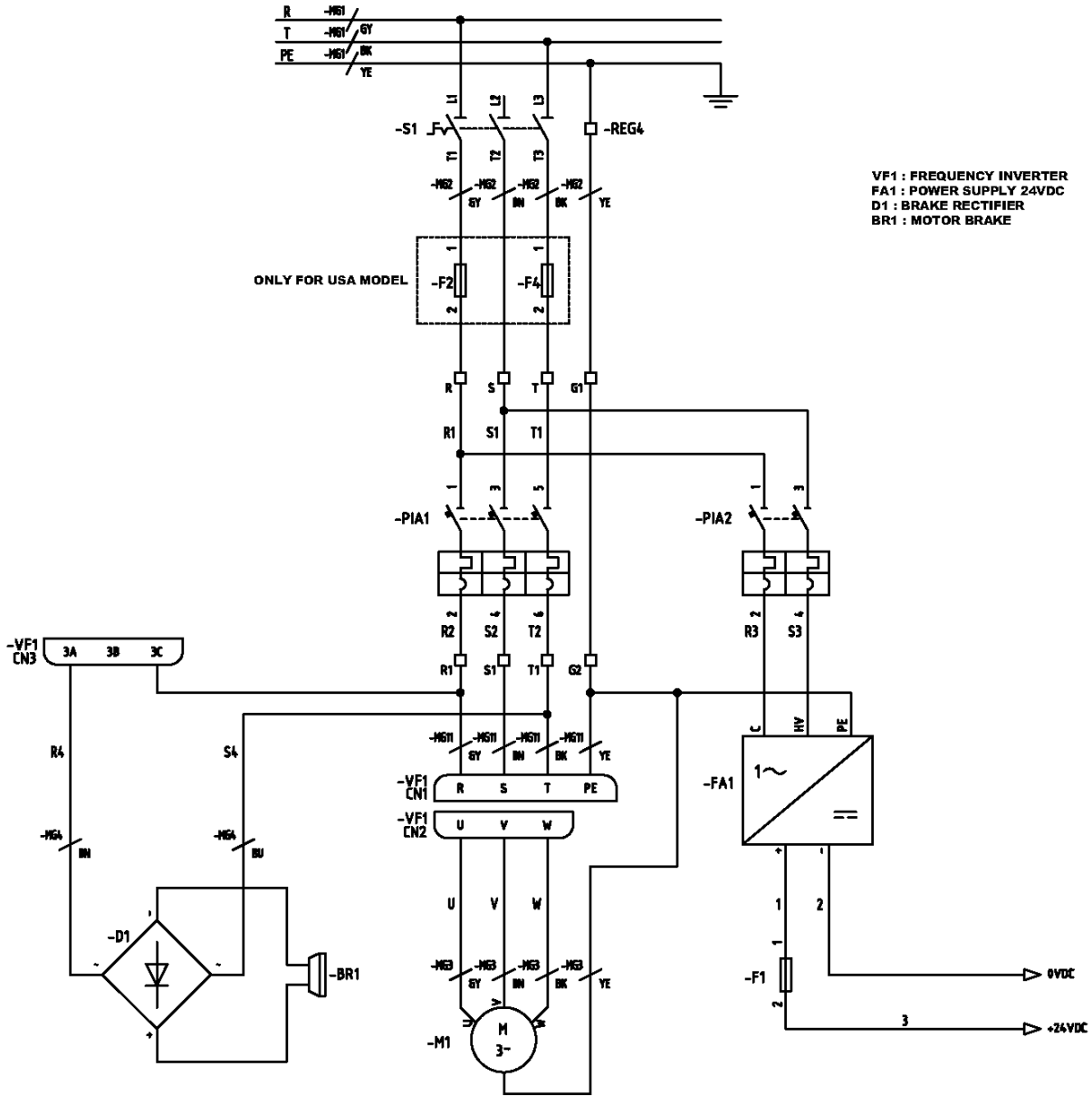
ETHERNET EXTENSION CABLE



Wiring Diagram · THREE PHASE MACHINE



Wiring Diagram · SINGLE PHASE MACHINE



OUR RANGE OF MACHINERY

IRON WORKERS

SECTION BENDING MACHINES

NON-MANDREL PIPE BENDER

HORIZONTAL PRESS BRAKE

TWISTING/SCROLL BENDING MACHINES

HYDRAULIC PRESS BRAKES

HYDRAULIC SHEAR MACHINES

GAS FORGES

IRON EMBOSSING MACHINES

END WROUGHT IRON MACHINES

BROACHING MACHINES

POWER HAMMERS

PRESSES FOR LOCKS