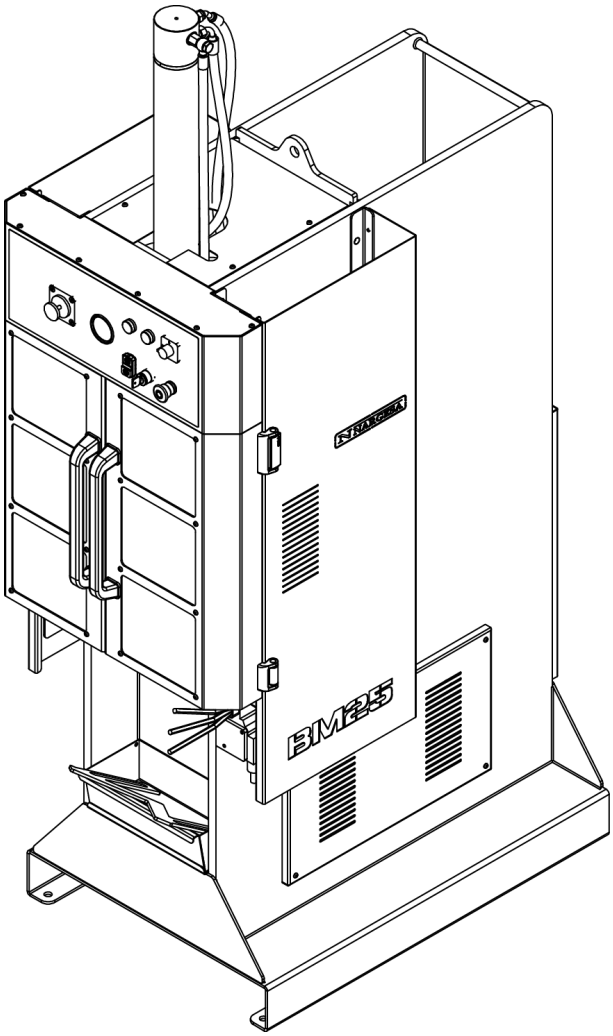
VERTICAL BROACHER

BM25

NS: 2022-304

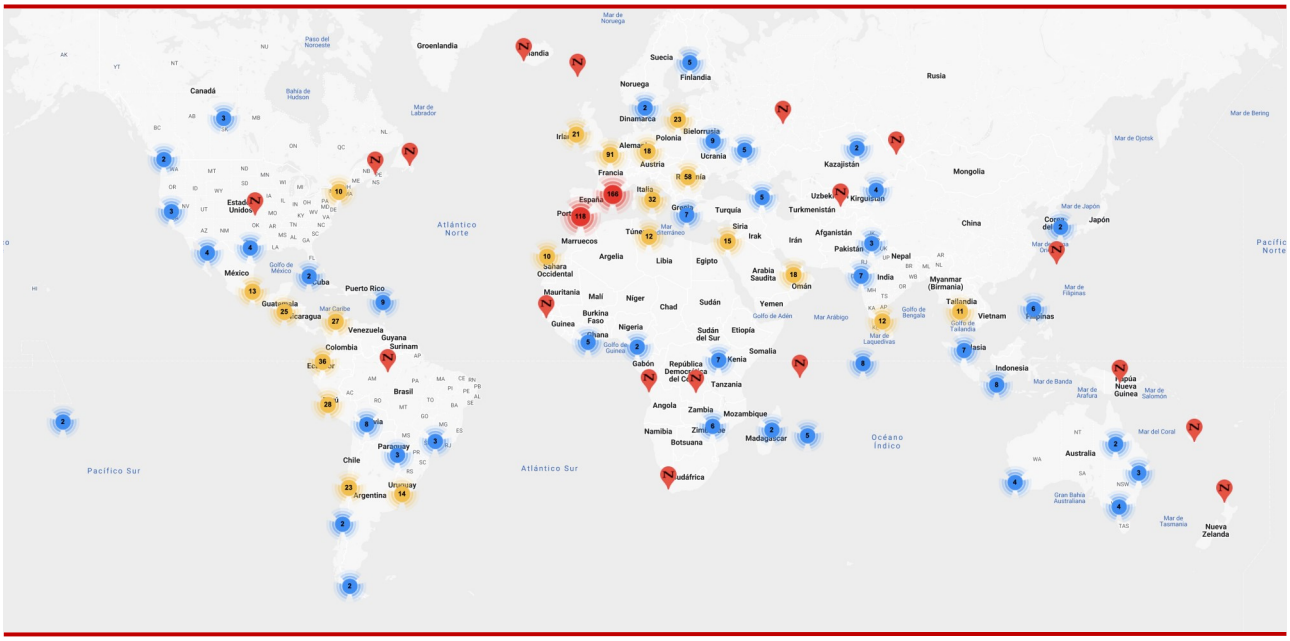


INSTRUCTIONS BOOK

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 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:

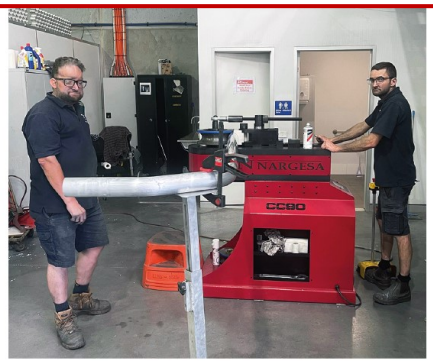
PORTUGAL

Capela & Filhos



AUSTRALIA

Manufactured Alloy Xtras



ESTADOS UNIDOS

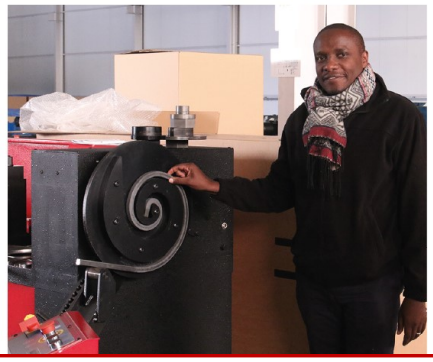
Madison Environmental Resources





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

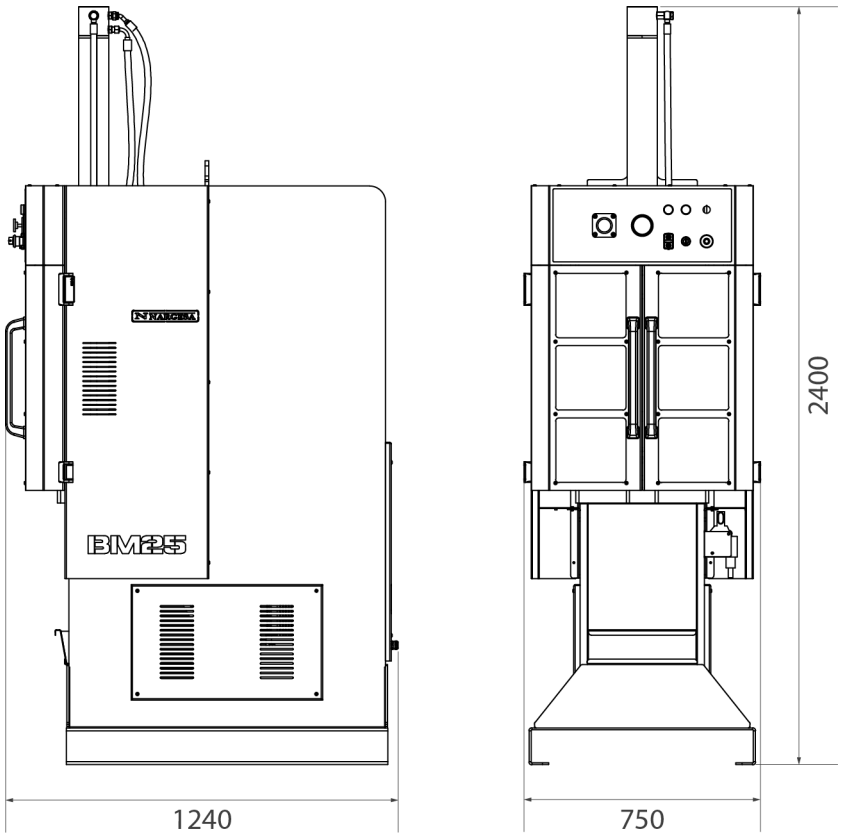
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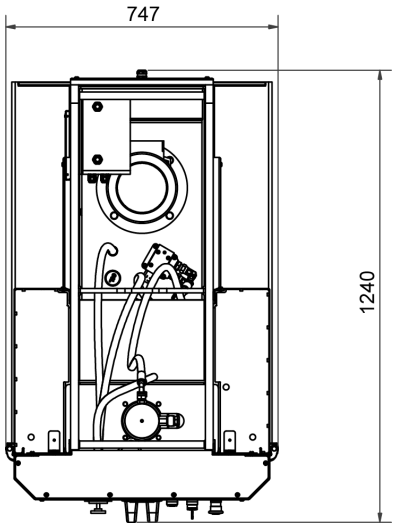
ANEXO TÉCNICO

1. GENERAL INFORMATION

1.1. General dimensions



1.2. Layout



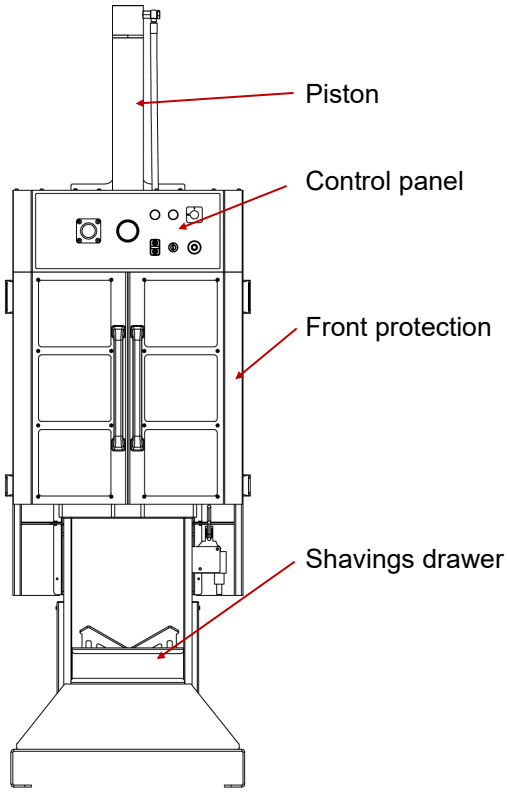
1.3. Description of the machine

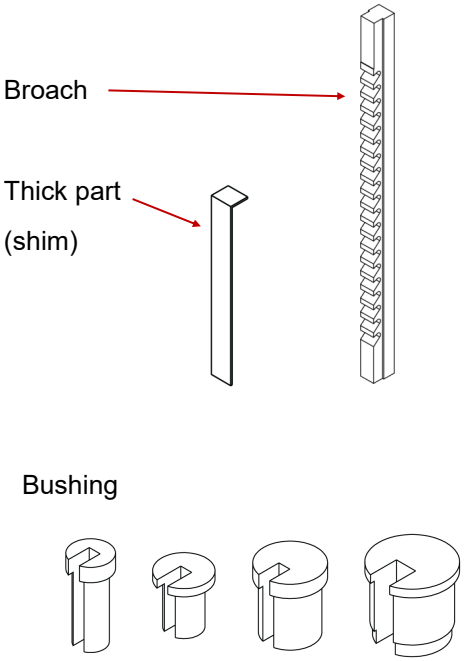
Hydraulic Broaching machine BM25 NARGESA has been fabricated in a welded and mechanized steel monoblock. It's a machine useful for making notches and keyways in all kinds of pieces: sprockets, pulleys, gears, etc...

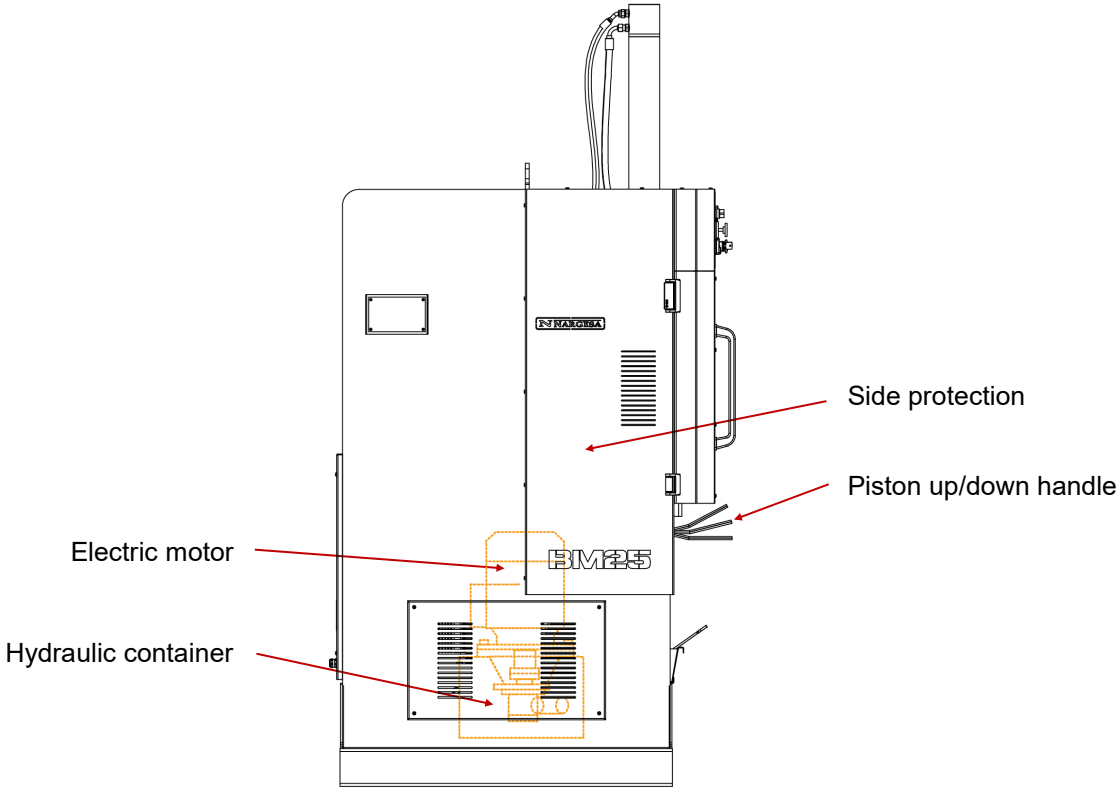
It is also used like a press to unbolt oxidated parts, assembling and dismantling bearings, etc...

BM25 is made according to the European regulations for the manufacturing of industrial machinery

1.4. Identification of the machine







1.5. General characteristics

Motor power	2,2 KW / 3 HP
Tensión	230/400V Three-Phase 50/60 Hz
Hydraulic power	10 Tm
Hydraulic pressure	210 Kg/cm^2 (21 MPa)
Working speed	24 mm/s
Return speed	54 mm/s
Pump Flow	7,5 L
Shank displacement	600 mm
Goosneck	300 mm
Maximum diameter of the piece	600 mm*
Bench dimensions	420x420 mm
Dimensions	750x1240x2400 mm
Weight	850 Kg
** For different sizes, please ask the manufacturer*	

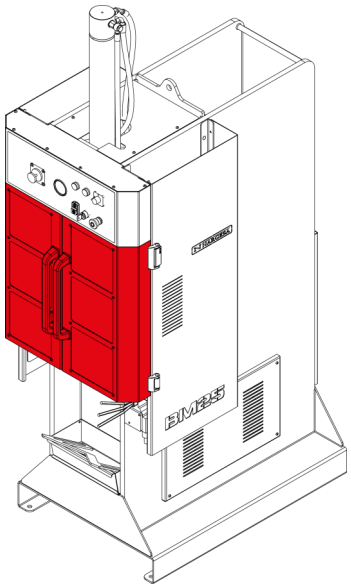
The machine has got an identification plate on one of the sides where it is printed the information about the manufacturer and the main characteristics of the machine. The plate has got the information detailed below:



1.6. Description of safety devices

The safety devices the broaching machine has got are the ones listed below:

- The door is located at the front part of the machine to prevent from any projected part could injure the operator. This door has a safety system which only allows any movement of the machine when the door is closed. Likewise, the machine has a key that activates a Danger light sign when turned and cancels this device; this option could be used in exceptional cases and under the operator's responsibility.



1.7. Contraindications for the machine usage

Never fit elements that are not reccomended by the manufacturer.

1.8. Noise caused by the machine

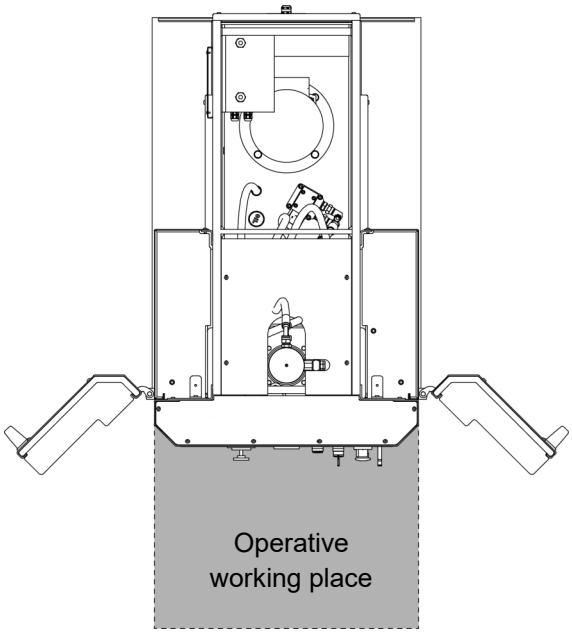
In this machine noise could be considered non-existent, the noise is almost non-existent under a normal working system. The pump is inside the container which is at the time inside the box that serves as the stand for the machine. All this minimizes noise and vibrations so the machine has a steady acoustic pressure level lower than 70dB at the working site.

1.9. Vibrations

Vibrations are almost non-existent, as it has been stated before. The hydraulic pump which is the element that could have a bit higher level of vibrations, is submerged inside an oil container so vibrations are minimized. At the same time the oil container is located on silent rubber blocks that produce a higher muffling of vibrations.

1.10. Operative working place

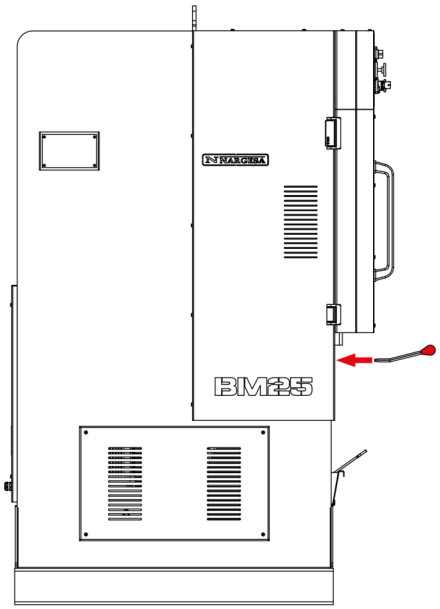
The broaching machine will only be used by an operative at the time who will be placed in front of the machine, never at a lateral of it because he ought to control the whole set of the machine. Moreover the machine main protection devices are thought for the frontal use of the machine.



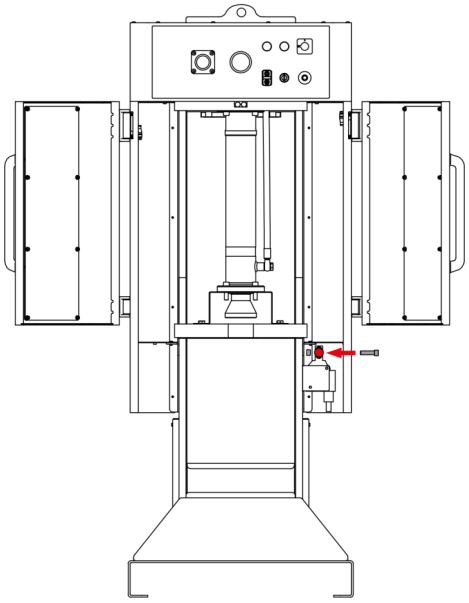
1.11. Assembly of the lever and piston

Before starting to work, it is necessary to set up the activation lever and place the piston in its working position.

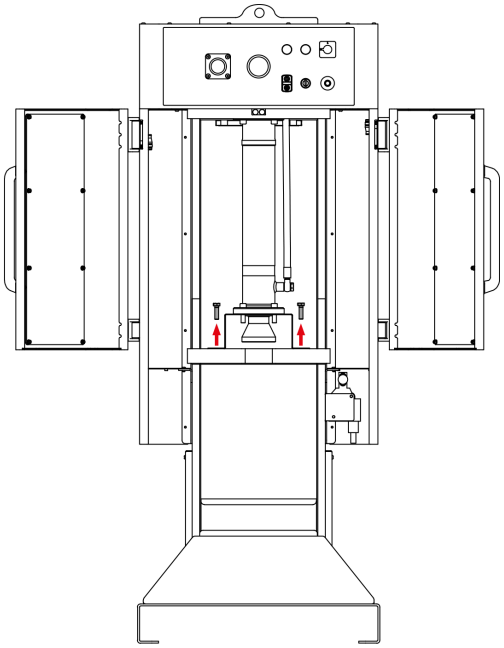
1. Place the drive lever in its slot and fix it.



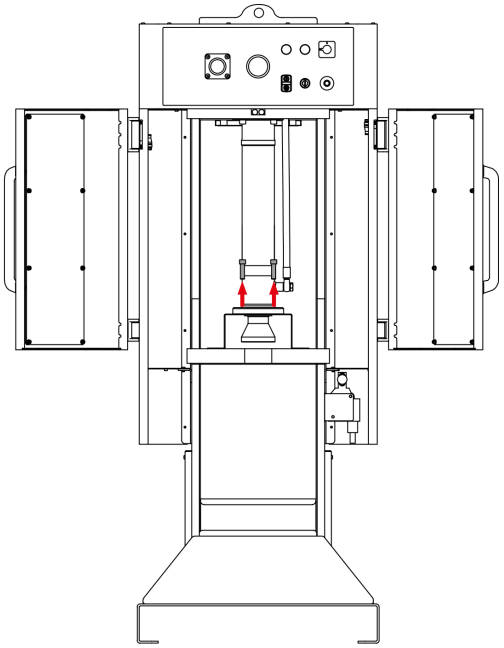
2. We fix it with the bolts and the nut.



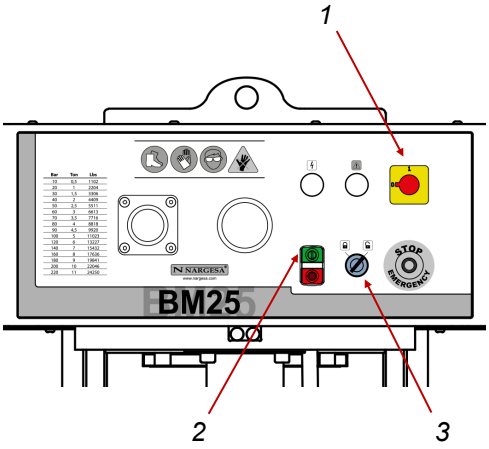
3. Remove the bolts of the support



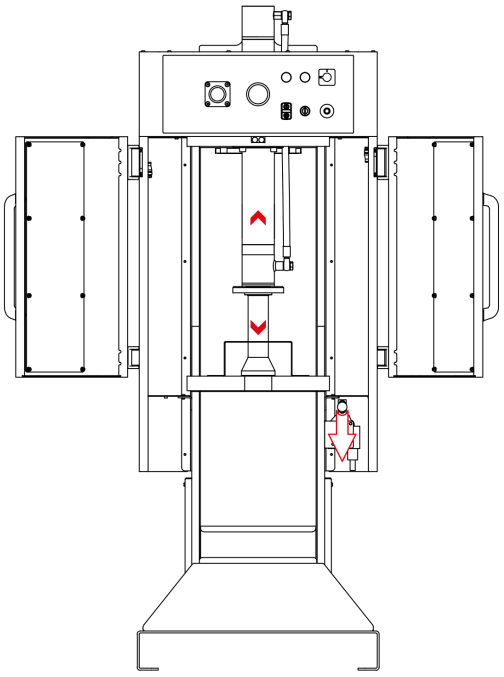
4. Remove the bolts that fix the piston to the stand



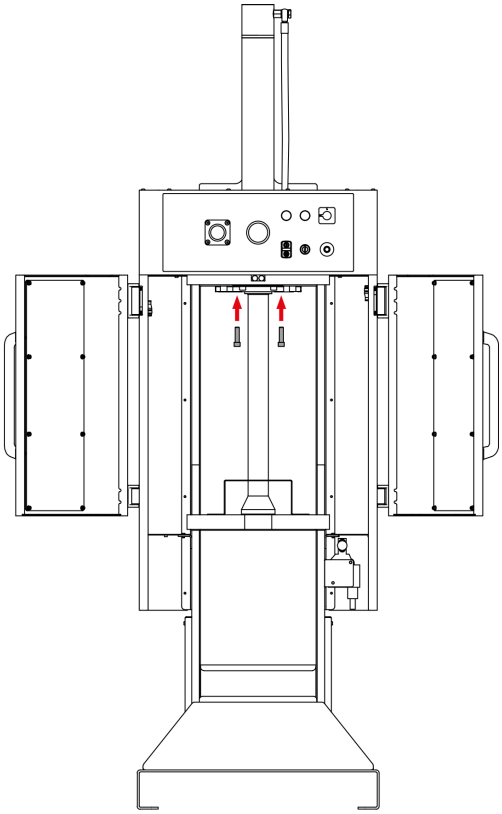
5. We start the machine with the main switch (1), the pump with the green button (2) and cancel the safety with the key (3).



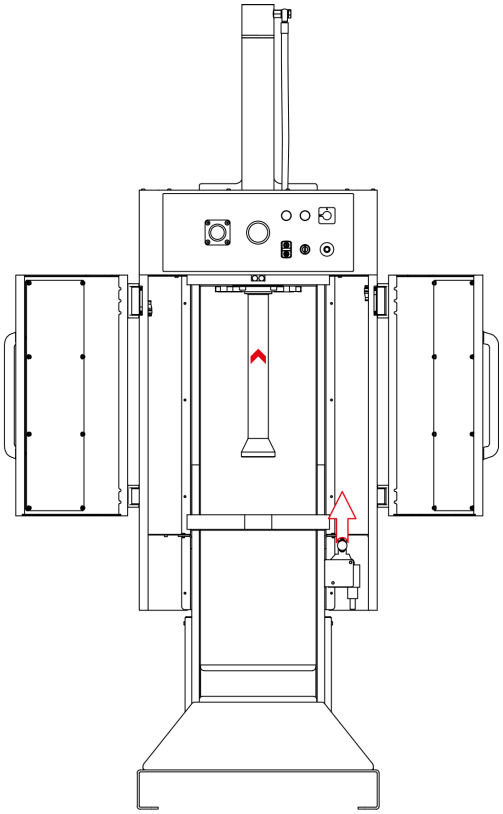
6. We carefully press the lever down so that the rod makes pressure on the table and the piston get risen. It is necessary to guide the piston with the hands so that it rises perpendicularly to the table.



7. When the piston is in its highest position, we fasten the upper fixing bolts



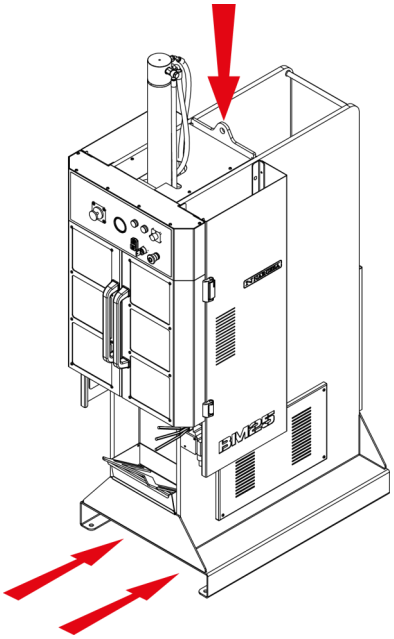
8. With the activation lever we put the piston up until we can remove the support



2. TRANSPORT AND STORAGE

2.1. Transport

Transport without lifting will be carried out by a forklift truck. Lifting will be carried out by a crane using the clamping spots for it.



2.2. Storage conditions

The broaching machine could never be stored in a place that does not fulfil the following requirements:

* Humidity between 30% and 95% without water condensation.
* Temperature from -25ºC to 55ºC or 75ºC for periods of time no longer than 24h (Bear in mind that this temperatures are just for storage conditions. Performance temperatures are described in chapter 4.3)
* Do not pile up machines or heavy objects above.
* Do not dismantle for its storage.

3. MAINTENANCE

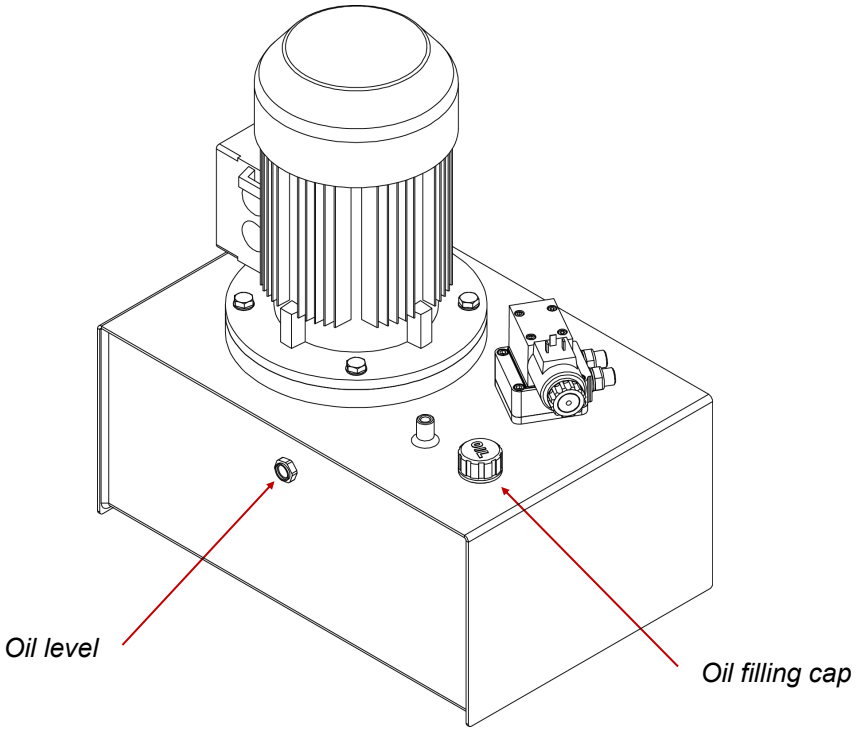
3.1. General maintenance

- Every 500 hours of use, check the oil level in the tank.

In the front of tank is oil level. In the absence of oil, fill until the level cap show 3/4 full.

- Replace every 2000 hours or every 3 years the hydraulic oil tank

Type: CEPSA HIDRAULICO HM 68



4. INSTALMENT AND STARTING UP

4.1 Instructions to fix it

When the machine is put down by a crane it is necessary to place it down correctly so it doesn't have to be moved once it is on the floor. In case it is not possible, then a moveable base must be placed below aways caring for its inclination to avoid any possible turn over.

4.2 Assembling to reduce noise and vibrations

The machine will be fixed on the floor due to its own weight, therefore it needs to be located in a flat and leveled surface so any possible vibration could be also reduced.

4.3. Admissible outer conditions

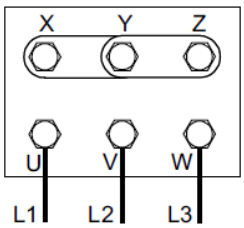
* Environment temperature: between +5ºC and +40ºC without exceeding +35ºC as average temperature within 24 hours.
* Humidity: Between 30% and 90% without water condensation.

4.4. Connection to power supply

In order to cary out the electrical connections of the machine, first make sure it is not plugged to the electrical supply and that there is no tension in any of its pieces.The machine should be connected to only one source as well as to a proper ground socket to avoid possible accident and keep the equipment saved from any possible power leaking.

The standard machine is prepared to be connected to a 400V three phased system. In case the supply three phase tension was 230V a change must be carried out in the connections inside tha machine to adapt it to that tension.

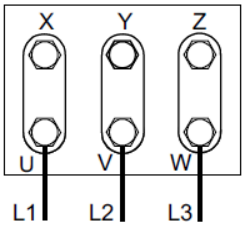
The machine has a 230/400V three-phased engine that comes star like connected. If the three phase line tension is 230V it must be connected triangularly. The engine is inside the box that serves as stand for the machine. The lateral of the machine must be opened and the cover of the engine connection box must be removed. The engine bobins will be accessible then and it will be possible to carry out the change from triangle to star connections as it is indicated in the following pictures:



Star picture

(preset)

For tension 400V



Triangle picture

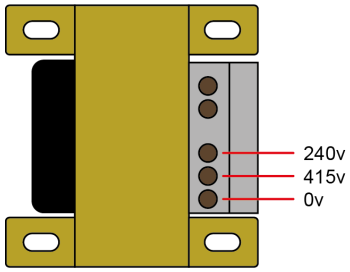
For tension 230V

Once the engine bobins connection is finished, the cover of the box connections must be closed as well as the lateral door by fastening the screws.

4.4.1. Changing connection of the converter primary

Depending on the voltage available at the outlet it will be also required to change the connection of the converter primary which is fixed to the electrical panel inside the the machine box.

If the machine is connected to a 400V three-phased power supply it is necessary that the power connection of the transformer primary is made between terminals labeled "0V" and "415V". In case of having a230V outlet drive, then disconnect the power cord from the terminal "415V" of the transformer primary using a screwdriver and connect it to terminal "230", right afterwards tighten the clamping screw with the screwdriver.



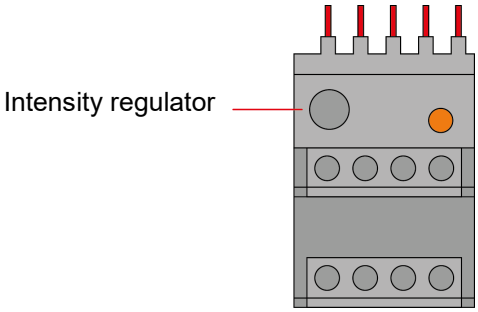
4.4.2. Adjusting Intensity of engine-keeper

Depending on the line voltage the current consumption varies the of the machine. It is therefore necessary to adjust the labor intensity of thermal motor protection. The rangers engine is fixed to the electrical panel inside the cabinet of the machine.

To adjust the intensity of the engine-keeper simply turn the knob located on the front, using a Phillip screwdriver, positioning the indicator arrow at the correct intensity.

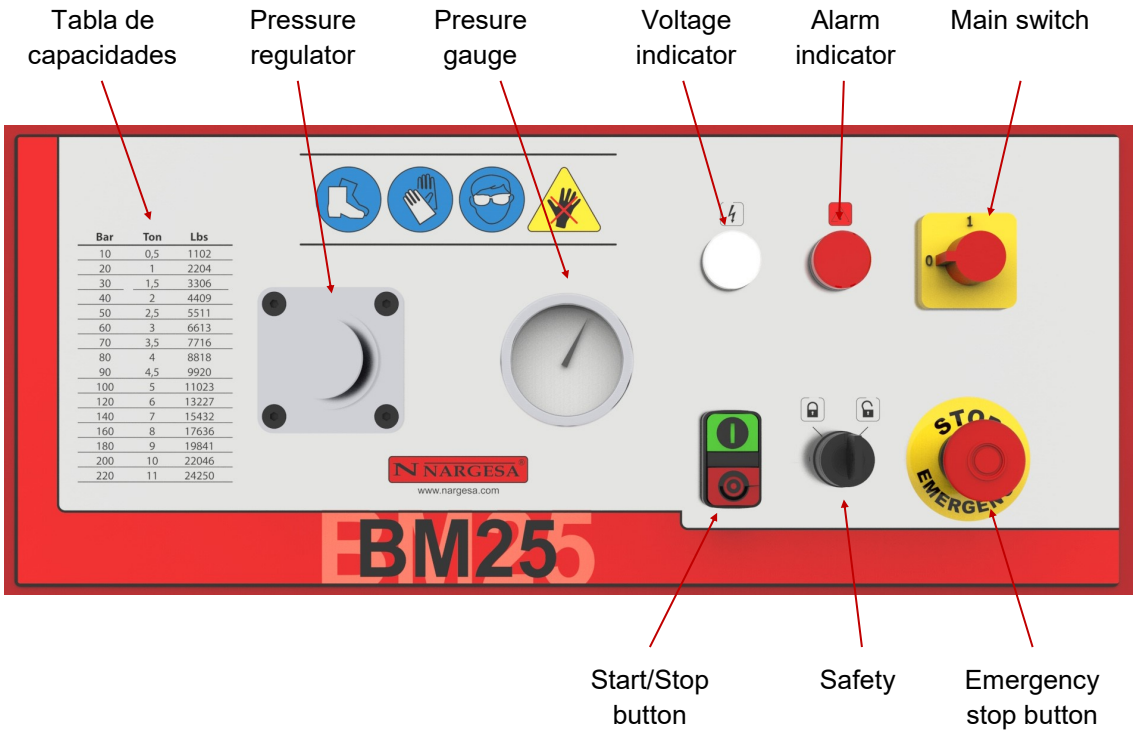
In case of having a three-phased outlet 400V drive the engine-keeper must be set at an intensity of "2.6A". On the contrary, in case of having a three-phased outlet 230V drive the engine-keeper at an intensity of "5A".

If the engine-keeper installed can not be adjusted to the required intensity, it must be replaced by one with a higher amperage.



5. OPERATION MANUAL

5.1. Control panel



5.2. Methods and stop systems of the machine

Pump stop: In order to stop only the pump, press the red button “PARO”. With the pump stopped, the piston movement is cancelled.

Emergency stop: The machine is provided with an EMERGENCIA stop, located in the frontal part. All functions are neutralized by pressing the EMERGENCY button and so the machine is stopped as well.

Main switch: All functions are neutralized and so the machine is stopped as well.

5.3. Samples to make a correct broaching operation

1 - Place the piece in the middle of the table.

2 - Insert the bushing.

3 - Place the broach in the bushing, lubricate abundantly in order to achieve a perfect broaching opeartion, especially during the first operation.

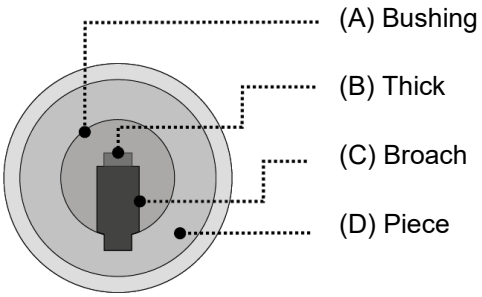
4 - Get the piston down from 20 to 40 mm until having the broach inserted in the bushing, then slightly raise up the piston so the broach recovers its vertical position and then repeat the same procedure 2 or 3 times until the broach overtakes the piece and it could be taken by the down part of the piece.

5 - It will be necessary to gradually insert 1, 2 or 3 thick parts depending on the broachsince these are the ones that give the exact depth.

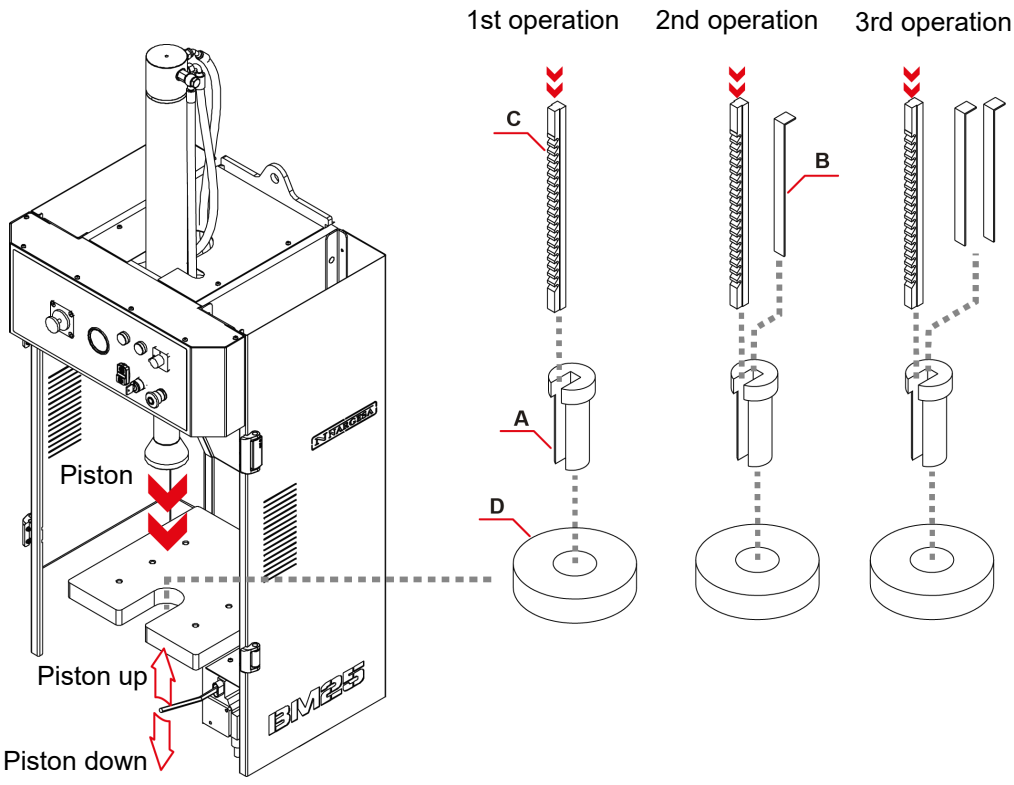
6 - Clean up all steel wool from the broach once the broaching operation is finished (it is very important for the broach not to be broken).

7 - Causes of an incorrect broaching.

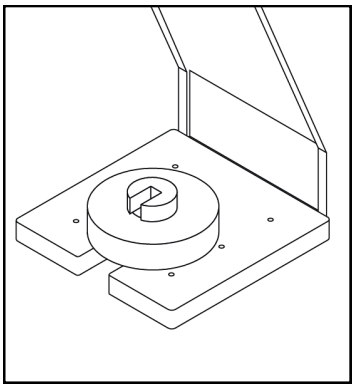
- The use of oil in bad conditions.
- Do not place the broach in vertical position.
- Do not intercalate the piston thrust.



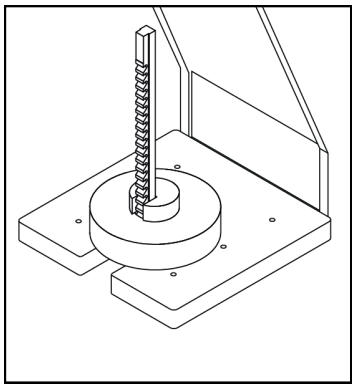
Depending on the carve depth, request 6. TABLE OF CHARACTERISTICS OF BRUSHES



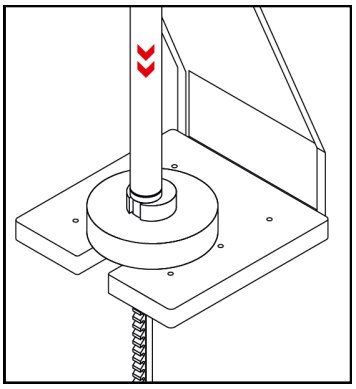
5.4. Samples to make cotter slots



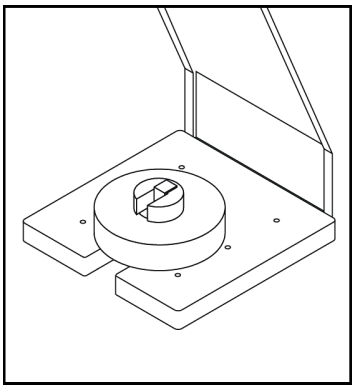
1. Place the bushing on the part



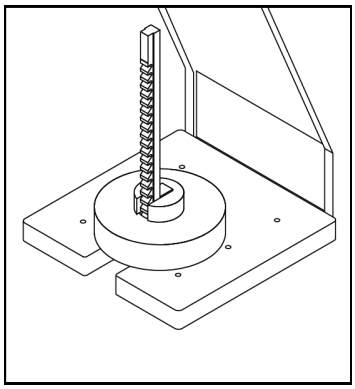
2. Place the broach. First pass With just the broach



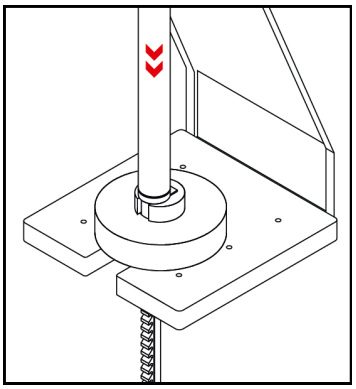
3. Get the piston down



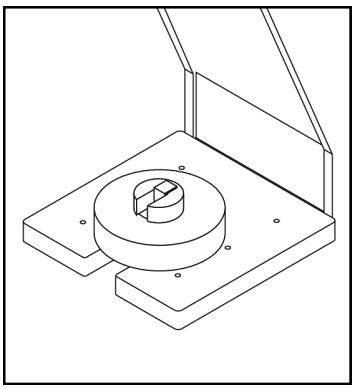
4. Place the thick part



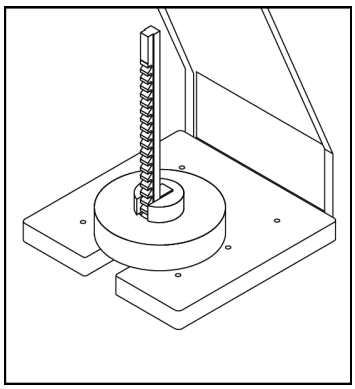
5. Place the broach



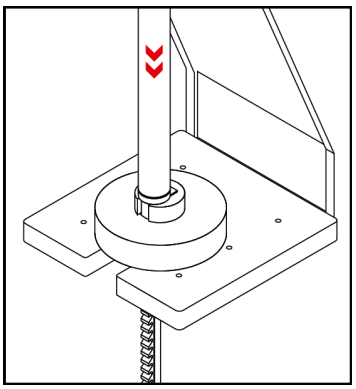
6. Get the piston down



7. Place the thick part



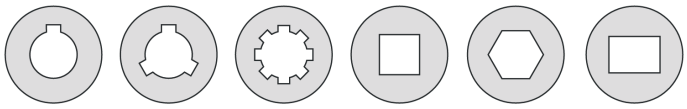
8. Place the broach

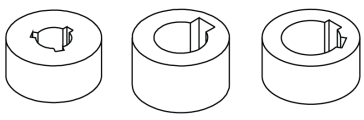


9. Get the piston down

Follow the steps 7, 8 and 9 until achieving the Desired size for the slot.

Examples of works





6. TABLE OF CHARACTERISTICS OF BRUSHES

6.1. Millimeter keyway broaches

MILLIMETER KEYWAY BROACHES											SHIMS		BUSHINGS	
Model	Broach	Tolerance (mm)	Tolerance (mm)	Sizes (mm)	Pins (mm)	Nº Shims	Min.cutting lenght (mm)	Max.cutting lenght (mm)	Required pressure (lbs)	Required pressure (kg)	Shims	Thickness (mm)	Diameter (mm)	Longth (mm)
A	2 mm	1,986 · 2,009	-0,014 + 0,009	3,175 x 127	2 x 2	0	5,159	28,575	720	326,58	-	-	6	28,575
	3 mm	2,987 · 3,009	-0,013 + 0,009	3,175 x 127	3 x 3	1	5,159	28,575	650	294,83	3 mm	0,787	8	28,575
													10	28,575
													12	28,575
													15	28,575
B1	4 mm	3,985 · 4,01	-0,015 + 0,01	6,35x171,45	4 x 4	1	7,54	42,862	1140	517,09	4 mm	0,965	12	42,862
	5 mm	4,986 · 5,008	-0,014 + 0,008	6,35x171,45	5 x 5	1	7,54	42,862	1860	843,68	5 mm	1,27	14	42,862
													15	42,862
													16	42,862
													17	42,862
													18	42,862
													19	42,862
C	5 mm	4,986 · 5,008	-0,014 + 0,008	9,525 x 298,45	5 x 5	1	9,921	63,5	1470	666,78	5 mm	1,193	18	63,5
	6 mm	5,984 · 6,009	-0,016 + 0,009	9,525 x 298,45	6 x 6	1	9,921	63,5	2100	952,54	6 mm	1,587	19	63,5
	7 mm	6,982 · 7,018	-0,018 + 0,018	9,525 x 298,45	7 x 6	1	9,921	63,5	2900	1315,41	7 mm	1,587	20	63,5
	8 mm	7,983 · 8,013	-0,017 + 0,013	9,525 x 298,45	8 x 7	2	9,921	63,5	3680	1669,22	8 mm	1,27	22	63,5
													24	63,5
													25	63,5
													26	63,5
													28	63,5
													30	63,5
													32	63,5
													34	63,5
													35	63,5
													36	63,5
D	10 mm	9,982 · 10,012	-0,018 + 0,012	14,287 x 352,42	10 x 8	2	25,4	152,4	6500	2948,35	10 mm	1,422	32	101,6
	12 mm	11,978 · 12,014	-0,022 + 0,014	14,287 x 352,42	12 x 8	2	25,4	152,4	8400	3810,17	12 mm	1,422	34	101,6
	14 mm	13,977 · 14,013	-0,023 + 0,013	14,287 x 352,42	14 x 9	2	25,4	152,4	11100	5034,87	14 mm	1,587	35	101,6
													36	101,6
													38	101,6
													40	101,6
													42	101,6
													44	101,6
													45	127
													46	127
													48	127
													50	127
													52	127
													54	127
													56	127
E	16 mm	15,976 · 16,012	-0,024 + 0,012	19,05 x 393,7	16 x 10	3	25,4	152,4	9400	4263,76	16 mm	1,422	52	127
	18 mm	17,978 · 18,013	-0,022 + 0,013	19,05 x 393,7	18 x 11	3	25,4	152,4	10600	4808,07	18 mm	1,422	54	127
													55	127
													56	127
													58	127
													60	152,4
													62	152,4
													63	152,4
													64	152,4
													65	152,4
													66	152,4
													68	152,4
													70	152,4
													72	152,4
F	20 mm	19,974 · 20,015	-0,026 + 0,015	25,4 x 514,35	20 x 12	3	25,4	152,4	8800	3991,61	20 mm	1,587	75	152,4
	22 mm	21,973 · 22,014	-0,027 + 0,014	25,4 x 514,35	22 x 14	4	25,4	152,4	9400	4263,76	22 mm	1,422	80	152,4
	24 mm	23,975 · 24,015	-0,025 + 0,015	25,4 x 514,35	24 x 14	4	25,4	152,4	10600	4808,07	24 mm	1,587	85	152,4
	25 mm	24,973 · 25,013	-0,027+0,013	25,4 x 514,35	25 x 14	4	25,4	152,4	12300	5579,18	25 mm	1,422	90	152,4
													95	152,4
													100	152,4
													105	152,4
													110	152,4
													115	152,4
													120	152,4

6.2. Inches keyway broaches

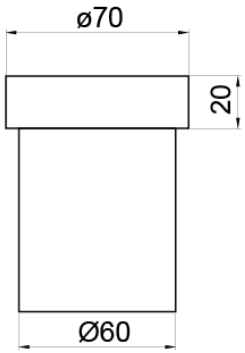
MILLIMETER KEYWAY BROACHES								SHIMS		BUSHINGS	
Model	Broach	Tolerance (inches)	Sizes (inches)	Nº Shims	Min.cutting lenght (inches)	Max.cutting lenght (inches)	Required pressure (lbs)	Shims	Thickness (inches)	Diameter (inches)	Longth (inches)
A	1/16	0,0625 · 0,0635	1/8 x 5	0	13/64	1 1/8	390	-	-	1/4	1 1/8
	3/32	0,0938 · 0,0948	1/8 x 5	0	13/64	1 1/8	780	-	-	5/16	1 1/8
	1/8	0,1252 · 0,1262	1/8 x 5	1	13/64	1 1/8	650	1/8	0,0310	3/8	1 1/8
										7/16	1 1/8
										1/2	1 1/8
B	3/32	0,0938 · 0,0948	3/16 x 6 3/4	0	19/64	1 11/16	930	-	-	1/2	1 11/16
	1/8	0,1252 · 0,1262	3/16 x 6 3/4	1	19/64	1 11/16	720	1/8	0,0310	9/16	1 11/16
	5/32	0,1564 · 0,1574	3/16 x 6 3/4	1	19/64	1 11/16	1320	5/32	0,0420	5/8	1 11/16
	3/16	0,1877 · 0,1887	3/16 x 6 3/4	1	19/64	1 11/16	1860	3/16	0,0500	11/16	1 11/16
										3/4	1 11/16
										13/16	1 11/16
										7/8	1 11/16
C	3/16	0,1877 · 0,1887	3/8 x 11 3/4	1	25/64	2 1/2	1540	3/16	0,0500	3/4	2 1/2
	1/4	0,2502 · 0,2512	3/8 x 11 3/4	1	25/64	2 1/2	2520	1/4	0,0625	13/16	2 1/2
	5/16	0,3127 · 0,3137	3/8 x 11 3/4	2	25/64	2 1/2	3960	5/16	0,0550	7/8	2 1/2
	3/8	0,3755 · 0,3765	3/8 x 11 3/4	2	25/64	2 1/2	4340	3/8	0,0625	15/16	2 1/2
										1	2 1/2
										1 1/16	2 1/2
										1 1/8	2 1/2
										1 3/16	2 1/2
										1 1/4	2 1/2
										1 5/16	2 1/2
										1 3/8	2 1/2
										1 7/16	2 1/2
										1 1/2	2 1/2
										1 9/16	2 1/2
D	5/16	0,3127 · 0,3137	9/16 x 13 7/8	2	1	6	8000	5/16	0,0560	1 7/16	4
	3/8	0,3755 · 0,3765	9/16 x 13 7/8	2	1	6	7000	3/18	0,0625	1 1/2	4
	7/16	0,4380 · 0,4390	9/16 x 13 7/8	3	1	6	9400	7/16	0,0560	1 9/16	4
	1/2	0,5006 · 0,5016	9/16 x 13 7/8	3	1	6	9800	1/2	0,0625	1 5/8	4
	9/16	0,5631 · 0,5641	9/16 x 13 7/8	4	1	6	8900	9/16	0,0560	1 11/16	4
										1 3/4	4
										1 13/16	5
										1 7/8	5
										1 15/16	5
										2	5
										2 1/16	5
										2 1/8	5
										2 3/16	5
										2 1/4	5
										2 5/16	5
										2 3/8	6
										2 7/16	6
										2 1/2	6
										2 9/16	6
										2 5/8	6
										2 11/16	6
										2 3/4	6
										2 13/16	6
										2 7/8	6
										2 15/16	6
										3	6

MILLIMETER KEYWAY BROACHES								SHIMS		BUSHINGS	
Model	Broach	Tolerance (inches)	Sizes (inches)	Nº Shims	Min.cutting lenght (inches)	Max.cutting lenght (inches)	Required pressure (lbs)	Shims	Thickness (inches)	Diameter (inches)	Longth (inches)
E	5/8	0,6260 · 0,6270	3/4 x 15 1/2	4	1	6	9600	5/8	0,0625	2 5/16	6
	3/4	0,7515 · 0,7525	3/4 x 15 1/2	5	1	6	11900	3/4	0,0625	2 3/8	6
										2 7/16	6
										2 1/2	6
										2 9/16	6
										2 5/8	6
										2 11/16	6
										2 3/4	6
										2 13/16	6
										2 7/8	6
										2 15/16	6
										3	6
										3 1/16	6
										3 1/8	6
										3 3/16	6
										3 1/4	6
										3 5/16	6
										3 3/8	6
										3 7/16	6
										3 1/2	6
										3 9/16	6
										3 5/8	6
										3 11/16	6
										3 3/4	6
										3 13/16	6
										3 7/8	6
										3 15/16	6
										4	6
F	7/8	0,8765 · 0,8775	1 x 20 1/4	6	1	6	9800	7/8	0,0625	3 1/16	6
	1	1,0015 · 1,0025	1 x 20 1/4	7	1	6	11100	1	0,0625	3 1/8	6
										3 3/16	6
										3 1/4	6
										3 5/16	6
										3 3/8	6
										3 7/16	6
										3 1/2	6
										3 9/16	6
										3 5/8	6
										3 11/16	6
										3 3/4	6
										3 13/16	6
										3 7/8	6
										3 15/16	6
										4	6
										4 1/16	6
										4 1/8	6
										4 3/16	6
										4 1/4	6
										4 5/16	6
										4 3/8	6
										4 7/16	6
										4 1/2	6
										7 9/16	6
										4 5/8	6
										4 11/16	6
										4 3/4	6
										4 13/16	6
										4 7/8	6
										4 15/16	6
										5	6

7. FORMULES FOR BROACHING

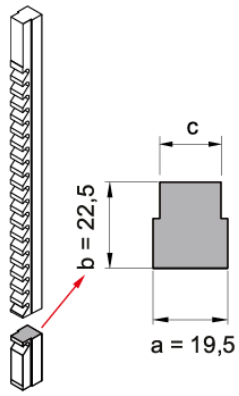
Picture 1

Bushing Ø60



Picture 2

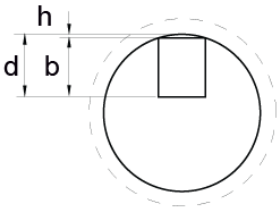
Broach 18mm



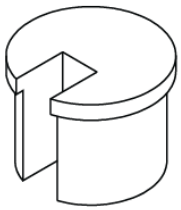
Picture 3

Height to mill

d = b + h

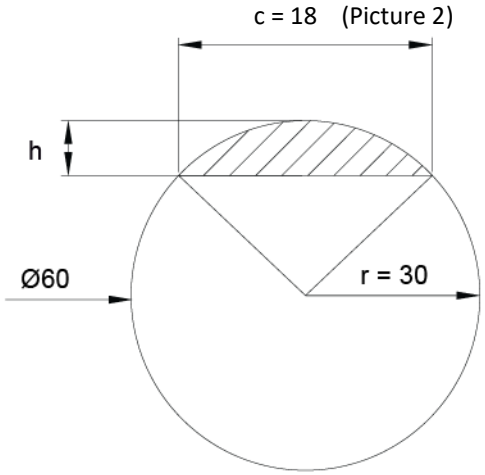


Finished part



1. Mechanize bushing (Picture 1)
2. Take the measurement of the tooth bottom of the brush. In this case the 18mm broach. (Picture 2)
3. Next step: to reduce the bushing in the milling center. Milling height “d”will be obtained from summing up the constante “h” and “b” (Picture 3)
4. The milling cutter to use in this case is the constante “a”,that is to say, 19,5 mm (Picture 2)

Height “h” will be obtained from applying the following formula



$$h = r - \tfrac{1}{2}\sqrt{4r^2 - c^2}$$

$$h = 30 - \tfrac{1}{2}\sqrt{4x30^2 - 18^2}$$

$$h = 30 - \tfrac{1}{2}\sqrt{3600 - 324}$$

$$h = 30 - 0{,}5\sqrt{3276} = 57{,}236$$

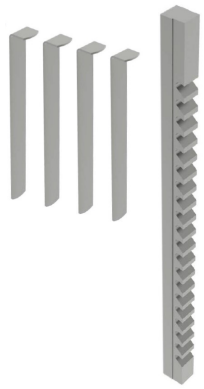
$$h = 0{,}5 \times 57{,}236 = 28{,}618$$

$$h = 30 - 28{,}618 = 1{,}381$$

$$\boxed{h = 1{,}38}$$

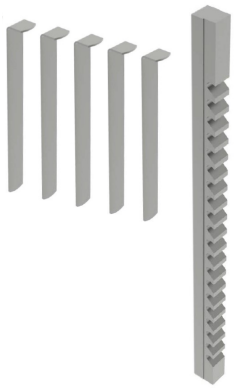
8. ACCESSOIRES

Millimeter keyway broaches



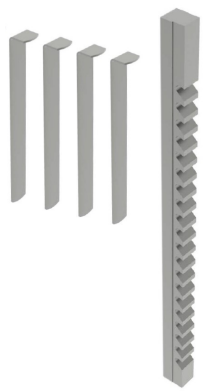
Broaching time
5:00 min.

Keyway broaches 25mm	REF: 125-09-01-BR-00017
Tolerance	JS9 (-0,027 +0,013)
Model	F
Broach dimensions	25,40 x 514,35mm
Standard keys	25 x 14mm
Min./Max. Cutting length	25,4mm / 152,4mm
Required pressure	12.300lbs / 5.579,18Kg
Required shims/ Nr of passes	4 shims / 5 passes
Thickness	1,422mm
Bushing diameter	75, 80, 85, 90, 95, 100, 105, 110, 115 and 120mm
Bushing length	152,4mm
Weight	3,5 Kg. Approx.



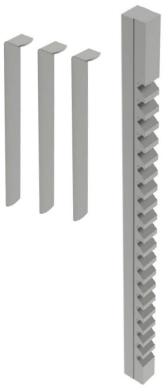
Broaching time
5:00 min.

Keyway broaches 24mm	REF: 125-09-01-BR-00016
Tolerance	JS9 (-0,025 +0,015)
Model	F
Broach dimensions	25,40 x 514,35mm
Standard keys	24 x 14mm
Min./Max. Cutting length	25,4mm / 152,4mm
Required pressure	10.600lbs / 4.808,07Kg
Required shims/ Nr of passes	5 shims / 6 passes
Thickness	1,587mm
Bushing diameter	75, 80, 85, 90, 95, 100, 105, 110, 115 and 120mm
Bushing length	152,4mm
Weight	3,5 Kg. Approx.



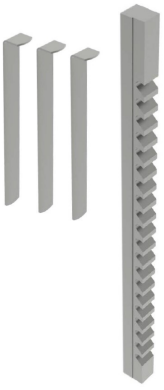
Broaching time
5:00 min.

Keyway broaches 22mm	REF: 125-09-01-BR-00015
Tolerance	JS9 (-0,027 +0,014)
Model	F
Broach dimensions	25,40 x 514,35mm
Standard keys	22 x 14mm
Min./Max. Cutting length	25,4mm / 152,4mm
Required pressure	9.400lbs / 4.263,76Kg
Required shims/ Nr of passes	4 shims / 5 passes
Thickness	1,422mm
Bushing diameter	75, 80, 85, 90, 95, 100, 105, 110, 115 and 120mm
Bushing length	152,4mm
Weight	3,5 Kg. Approx.



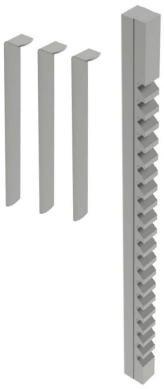
Broaching time
4:20 min.

Keyway broaches 20mm	REF: 125-09-01-BR-00014
Tolerance	JS9 (-0,026 +0,015)
Model	F
Broach dimensions	25,40 x 514,35mm
Standard keys	20 x 12mm
Min./Max. Cutting length	25,4mm / 152,4mm
Required pressure	8.800lbs / 3.991,61Kg
Required shims/ Nr of passes	3 shims / 4 passes
Thickness	1,587mm
Bushing diameter	75, 80, 85, 90, 95, 100, 105, 110, 115 and 120mm
Bushing length	152,4mm
Weight	3,5 Kg. Approx.



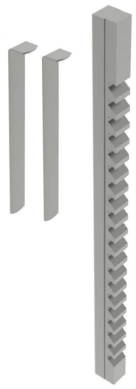
Broaching time
3:40 min.

Keyway broaches 18mm	REF: 125-09-01-BR-00013
Tolerance	JS9 (-0,022 +0,013)
Model	E
Broach dimensions	19,05 x 393,7mm
Standard keys	18 x 11mm
Min./Max. Cutting length	25,4mm / 152,4mm
Required pressure	10.600lbs / 4.808,07Kg
Required shims/ Nr of passes	3 shims / 4 passes
Thickness	1,422mm
Bushing diameter	52, 54, 55, 56, 58, 60, 62, 63, 64, 65, 66, 68, 70 and 72mm
Bushing length	127 and 152,4mm
Weight	1,5 Kg. Approx.



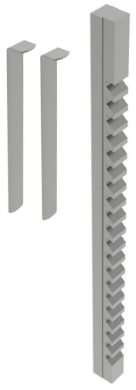
Broaching time
3:40 min.

Keyway broaches 16mm	REF: 125-09-01-BR-00012
Tolerance	JS9 (-0,024 +0,012)
Model	E
Broach dimensions	19,05 x 393,7mm
Standard keys	16 x 10mm
Min./Max. Cutting length	25,4mm / 152,4mm
Required pressure	9.400lbs / 4.263,76Kg
Required shims/ Nr of passes	3 shims / 4 passes
Thickness	1,422mm
Bushing diameter	52, 54, 55, 56, 58, 60, 62, 63, 64, 65, 66, 68, 70 and 72mm
Bushing length	127 and152,4mm
Weight	1,5 Kg. Approx.



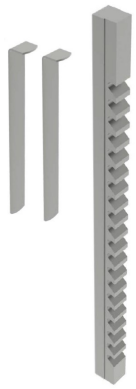
Broaching time
2:30 min.

Keyway broaches 14mm	REF: 125-09-01-BR-00011
Tolerance	JS9 (-0,023 +0,013)
Model	D
Broach dimensions	14,28 x 352,42mm
Standard keys	14 x 9mm
Min./Max. Cutting length	25,4mm / 152,4mm
Required pressure	11.100lbs / 5.034,87Kg
Required shims/ Nr of passes	2 shims / 3 passes
Thickness	1,587mm
Bushing diameter	32, 34, 35, 36, 38, 40, 42, 44, 45, 46, 48, 50, 52, 54 and 56mm
Bushing length	101,6 and 127mm
Weight	1 Kg. Approx.



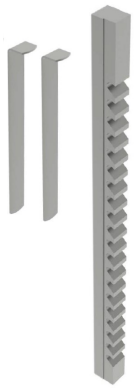
Broaching time
2:30 min.

Keyway broaches 12mm	REF: 125-09-01-BR-00010
Tolerance	JS9 (-0,022 +0,014)
Model	D
Broach dimensions	14,28 x 352,42mm
Standard keys	12 x 8mm
Min./Max. Cutting length	25,4mm / 152,4mm
Required pressure	8.400lbs / 3.810,17Kg
Required shims/ Nr of passes	2 shims / 3 passes
Thickness	1,422mm
Bushing diameter	32, 34, 35, 36, 38, 40, 42, 44, 45, 46, 48, 50, 52, 54 and 56mm
Bushing length	101,6 and 127mm
Weight	1 Kg. Approx.



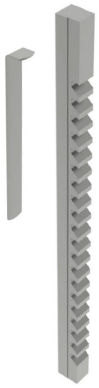
Broaching time
2:30 min.

Keyway broaches 10mm	REF: 125-09-01-BR-00009
Tolerance	JS9 (-0,018 +0,012)
Model	D
Broach dimensions	14,28 x 352,42mm
Standard keys	10 x 8mm
Min./Max. Cutting length	25,4mm / 152,4mm
Required pressure	6.500lbs / 2.948,35Kg
Required shims/ Nr of passes	2 shims / 3 passes
Thickness	1,422mm
Bushing diameter	32, 34, 35, 36, 38, 40, 42, 44, 45, 46, 48, 50, 52, 54 and 56mm
Bushing length	101,6 and 127mm
Weight	1 Kg. Approx.



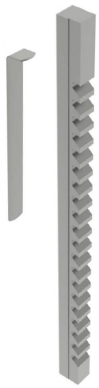
Broaching time
2:30 min.

Keyway broaches 8mm	REF: 125-09-01-BR-00008
Tolerance	JS9 (-0,017 +0,013)
Model	C
Broach dimensions	9,52 x 298,45mm
Standard keys	8 x 7mm
Min./Max. Cutting length	9,921mm / 63,5mm
Required pressure	3.680lbs / 1.669,22Kg
Required shims/ Nr of passes	2 shims / 3 passes
Thickness	1,27mm
Bushing diameter	18, 19, 20, 22, 24, 25, 26, 28, 30, 32, 34, 35 and 36mm
Bushing length	63,5mm
Weight	0,350 Kg. Approx.



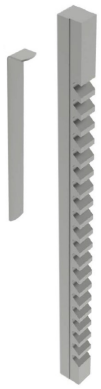
Broaching time
1:20 min.

Keyway broaches 6mm	REF: 125-09-01-BR-00006
Tolerance	JS9 (-0,016 +0,009)
Model	C
Broach dimensions	9,52 x 298,45mm
Standard keys	6 x 6mm
Min./Max. Cutting length	9,921mm / 63,5mm
Required pressure	2.100lbs / 952,54Kg
Required shims/ Nr of passes	1 shim / 2 passes
Thickness	1,587mm
Bushing diameter	18, 19, 20, 22, 24, 25, 26, 28, 30, 32, 34, 35 and 36mm
Bushing length	63,5mm
Weight	0,350 Kg. Approx.



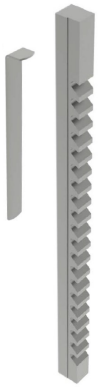
Broaching time
1:20 min.

Keyway broaches 5mm	REF: 125-09-01-BR-00005
Tolerance	JS9 (-0,014 +0,008)
Model	C
Broach dimensions	9,52 x 298,45mm
Standard keys	5 x 5mm
Min./Max. Cutting length	9,921mm / 63,5mm
Required pressure	1.470lbs / 666,78Kg
Required shims/ Nr of passes	1 shim / 2 passes
Thickness	1,193mm
Bushing diameter	18, 19, 20, 22, 24, 25, 26, 28, 30, 32, 34, 35 and 36mm
Bushing length	63,5mm
Weight	0,350 Kg. Approx.



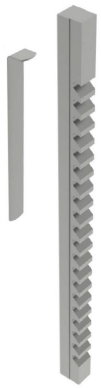
Broaching time
1:00 min.

Keyway broaches 5mm	REF: 125-09-01-BR-00004
Tolerance	JS9 (-0,014 +0,008)
Model	B1
Broach dimensions	6,35 x 171,45mm
Standard keys	5 x 5mm
Min./Max. Cutting length	7,54mm / 42,862mm
Required pressure	1.860lbs / 843,68Kg
Required shims/ Nr of passes	1 shim / 2 passes
Thickness	1,27mm
Bushing diameter	12, 14, 15, 16, 17, 18 and 19mm
Bushing length	42,862mm
Weight	0,100 Kg. Approx.



Broaching time
1:00 min.

Keyway broaches 4mm	REF: 125-09-01-BR-00003
Tolerance	JS9 (-0,015 +0,01)
Model	B1
Broach dimensions	6,35 x 171,45mm
Standard keys	4 x 4mm
Min./Max. Cutting length	7,54mm / 42,862mm
Required pressure	1.140lbs / 517,09Kg
Required shims/ Nr of passes	1 shim/ 2 passes
Thickness	0,965mm
Bushing diameter	12, 14, 15, 16, 17, 18 and 19mm
Bushing length	42,862mm
Weight	0,100 Kg. Approx.



Broaching time
0:45 min.

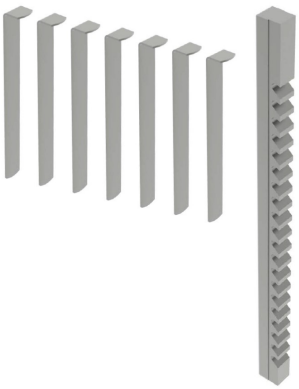
Keyway broaches 3mm	REF: 125-09-01-BR-00002
Tolerance	JS9 (-0,013 +0,009)
Model	A
Broach dimensions	3,175 x 127mm
Standard keys	3 x 3mm
Min./Max. Cutting length	5,159mm / 28,575mm
Required pressure	650lbs / 294,83Kg
Required shims/ Nr of passes	1 shim / 2 passes
Thickness	0,787mm
Bushing diameter	6, 8, 10, 12 and 15mm
Bushing length	28,575mm
Weight	0,020 Kg. Approx.



Broaching time
0:30 min.

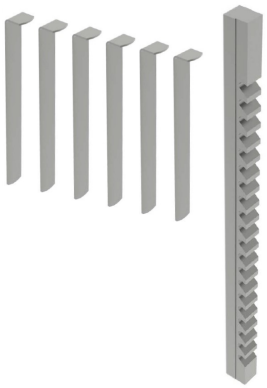
Keyway broaches 2mm	REF: 125-09-01-BR-00001
Tolerance	JS9 (-0,014 +0,009)
Model	A
Broach dimensions	3,175 x 127mm
Standard keys	2 x 2mm
Min./Max. Cutting length	5,159mm / 28,575mm
Required pressure	720lbs / 326,58Kg
Required shims/ Nr of passes	0 shims / 1 pass
Bushing diameter	6, 8, 10, 12 and 15mm
Bushing length	28,575mm
Weight	0,020 Kg. Approx.

Inches keyway broaches



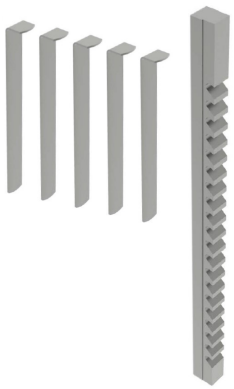
Broaching time
8:00 min.

Keyway broaches 1 inch	REF: 125-09-01-BRP-00020
Tolerance	JS9 (1,0015 · 1,0025)
Model	F
Broach dimensions	1 x 20 1/4 inches
Min./Max. Cutting length	1 inch / 6 inches
Required pressure	11.100lbs
Required shims/ Nr of passes	7 shims / 8 passes
Thickness	0,0625 inches
Bushing diameter	3 1/16, 3 1/8, 3 3/16, 3 1/4, 3 5/16, 3 3/8, 3 7/16, 3 1/2, 3 9/16, 3 5/8, 3 11/16, 3 3/4, 3 13/16, 3 7/8, 3 15/16, 4, 4 1/16, 4 1/8, 4 3/16, 4 1/4, 4 5/16, 4 3/8, 4 7/16, 4 1/2, 7 9/16, 4 5/8, 4 11/16, 4 3/4, 4 13/16, 4 7/8, 4 15/16 and 5 inches
Bushing length	6 inches
Weight	3,500 Kg. Approx.



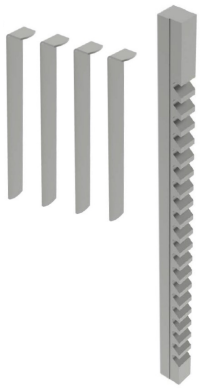
Broaching time
6:00 min.

Keyway broaches 7/8 inch	REF: 125-09-01-BRP-00019
Tolerance	JS9 (0,8765 · 0,8775)
Model	F
Broach dimensions	1 x 20 1/4 inches
Min./Max. Cutting length	1 inch / 6 inches
Required pressure	9.800lbs
Required shims/ Nr of passes	6 shims / 7 passes
Thickness	0,0625 inches
Bushing diameter	3 1/16, 3 1/8, 3 3/16, 3 1/4, 3 5/16, 3 3/8, 3 7/16, 3 1/2, 3 9/16, 3 5/8, 3 11/16, 3 3/4, 3 13/16, 3 7/8, 3 15/16, 4, 4 1/16, 4 1/8, 4 3/16, 4 1/4, 4 5/16, 4 3/8, 4 7/16, 4 1/2, 7 9/16, 4 5/8, 4 11/16, 4 3/4, 4 13/16, 4 7/8, 4 15/16 and 5 inches
Bushing length	6 inches
Weight	3,500 Kg. Approx.



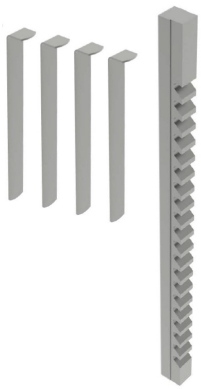
Broaching time
5:00 min.

Keyway broaches 3/4 inch	REF: 125-09-01-BRP-00018
Tolerance	JS9 (0,7515 · 0,7525)
Model	E
Broach dimensions	3/4 x 15 1/2 inches
Min./Max. Cutting length	1 pulgada / 6 inches
Required pressure	11.900lbs
Required shims/ Nr of passes	5 shims / 6 passes
Thickness	0,0625 inches
Bushing diameter	2 5/16, 2 3/8, 2 7/16, 2 1/2, 2 9/16, 2 5/8, 2 11/16, 2 3/4, 2 13/16, 2 7/8, 2 15/16, 3, 3 1/16, 3 1/8, 3 3/16, 3 1/4, 3 5/16, 3 3/8, 3 7/16, 3 1/2, 3 9/16, 3 5/8, 3 11/16, 3 3/4, 3 13/16, 3 7/8, 3 15/16 and 4 inches
Bushing length	6 inches
Weight	1,500 Kg. Approx.



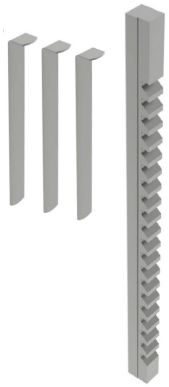
Broaching time
4:00 min.

Keyway broaches 5/8 inch	REF: 125-09-01-BRP-00017
Tolerance	JS9 (0,6260 · 0,6270)
Model	E
Broach dimensions	3/4 x 15 1/2 inches
Min./Max. Cutting length	1 inch / 6 inches
Required pressure	9.600lbs
Required shims/ Nr of passes	4 shims / 5 passes
Thickness	0,0625 inches
Bushing diameter	2 5/16, 2 3/8, 2 7/16, 2 1/2, 2 9/16, 2 5/8, 2 11/16, 2 3/4, 2 13/16, 2 7/8, 2 15/16, 3, 3 1/16, 3 1/8, 3 3/16, 3 1/4, 3 5/16, 3 3/8, 3 7/16, 3 1/2, 3 9/16, 3 5/8, 3 11/16, 3 3/4, 3 13/16, 3 7/8, 3 15/16 and 4 inches
Bushing length	6 inches
Weight	1,500 Kg. Approx.



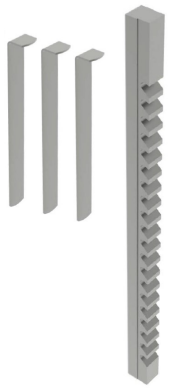
Broaching time
3:40 min.

Keyway broaches 9/16 inch	REF: 125-09-01-BRP-00016
Tolerance	JS9 (0,5631 · 0,5641)
Model	D
Broach dimensions	9/16 x 13 7/8 inches
Min./Max. Cutting length	1 inch / 6 inches
Required pressure	8.900lbs
Required shims/ Nr of passes	4 shims / 5 passes
Thickness	0,0560 inches
Bushing diameter	1 7/16, 1 1/2, 1 9/16, 1 5/8, 1 11/16, 1 3/4, 1 13/16, 1 7/8, 1 15/16, 2, 2 1/16, 2 1/8, 2 3/16, 2 1/4, 2 5/16, 2 3/8, 2 7/16, 2 1/2, 2 9/16, 2 5/8, 2 11/16, 2 3/4, 2 13/16, 2 7/8, 2 15/16 and 3 inches
Bushing length	6 inches
Weight	1,00 Kg. Approx.



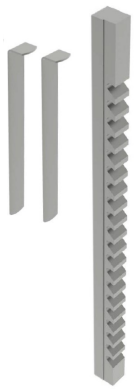
Broaching time
3:00 min.

Keyway broaches 1/2 inch	REF: 125-09-01-BRP-00015
Tolerance	JS9 (0,5006 · 0,5016)
Model	D
Broach dimensions	9/16 x 13 7/8 inches
Min./Max. Cutting length	1 inch / 6 pulgadas
Required pressure	9.800lbs
Required shims/ Nr of passes	3 shims / 4 passes
Thickness	0,0625 inches
Bushing diameter	1 7/16, 1 1/2, 1 9/16, 1 5/8, 1 11/16, 1 3/4, 1 13/16, 1 7/8, 1 15/16, 2, 2 1/16, 2 1/8, 2 3/16, 2 1/4, 2 5/16, 2 3/8, 2 7/16, 2 1/2, 2 9/16, 2 5/8, 2 11/16, 2 3/4, 2 13/16, 2 7/8, 2 15/16 and 3 inches
Bushing length	4 inches
Weight	1,00 Kg. Approx.



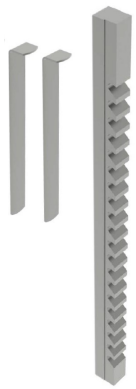
Broaching time
3:00 min.

Keyway broaches 7/16 inch	REF: 125-09-01-BRP-00014
Tolerance	JS9 (0,4380 · 0,4390)
Model	D
Broach dimensions	9/16 x 13 7/8 inches
Min./Max. Cutting length	1 inch / 6 inches
Required pressure	9.400lbs
Required shims/ Nr of passes	3 shims / 4 passes
Thickness	0,0560 inches
Bushing diameter	1 7/16, 1 1/2, 1 9/16, 1 5/8, 1 11/16, 1 3/4, 1 13/16, 1 7/8, 1 15/16, 2, 2 1/16, 2 1/8, 2 3/16, 2 1/4, 2 5/16, 2 3/8, 2 7/16, 2 1/2, 2 9/16, 2 5/8, 2 11/16, 2 3/4, 2 13/16, 2 7/8, 2 15/16 and 3 inches
Bushing length	4 inches
Weight	1,00 Kg. Approx.



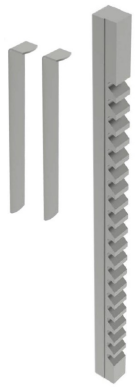
Broaching time
2:30 min.

Keyway broaches 3/8 inch	REF: 125-09-01-BRP-00013
Tolerance	JS9 (0,3755 · 0,3765)
Model	D
Broach dimensions	9/16 x 13 7/8 inches
Min./Max. Cutting length	1 inch / 6 inches
Required pressure	7.000lbs
Required shims/ Nr of passes	2 shims / 3 passes
Thickness	0,0625 inches
Bushing diameter	1 7/16, 1 1/2, 1 9/16, 1 5/8, 1 11/16, 1 3/4, 1 13/16, 1 7/8, 1 15/16, 2, 2 1/16, 2 1/8, 2 3/16, 2 1/4, 2 5/16, 2 3/8, 2 7/16, 2 1/2, 2 9/16, 2 5/8, 2 11/16, 2 3/4, 2 13/16, 2 7/8, 2 15/16 and 3 inches
Bushing length	4 inches
Weight	1,00 Kg. Approx.



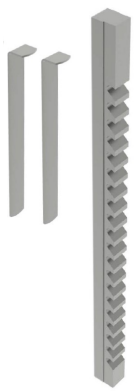
Broaching time
2:30 min.

Keyway broaches 5/16 inch	REF: 125-09-01-BRP-00012
Tolerance	JS9 (0,3127 · 0,3137)
Model	D
Broach dimensions	9/16 x 13 7/8 inches
Min./Max. Cutting length	1 inch / 6 inches
Required pressure	8.000lbs
Required shims/ Nr of passes	2 shims / 3 passes
Thickness	0,0560 inches
Bushing diameter	1 7/16, 1 1/2, 1 9/16, 1 5/8, 1 11/16, 1 3/4, 1 13/16, 1 7/8, 1 15/16, 2, 2 1/16, 2 1/8, 2 3/16, 2 1/4, 2 5/16, 2 3/8, 2 7/16, 2 1/2, 2 9/16, 2 5/8, 2 11/16, 2 3/4, 2 13/16, 2 7/8, 2 15/16 and 3 inches
Bushing length	4 inches
Weight	1,00 Kg. Approx.



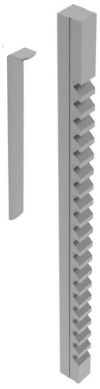
Broaching time
2:30 min.

Keyway broaches 3/8 inch	REF: 125-09-01-BRP-00011
Tolerance	JS9 (0,3755 · 0,3765)
Model	C
Broach dimensions	3/8 x 11 3/4 inches
Min./Max. Cutting length	25/64 inch / 2 1/2 inches
Required pressure	4.340lbs
Required shims/ Nr of passes	2 shims / 3 passes
Thickness	0,0625 inches
Bushing diameter	3/4, 13/16, 7/8, 15/16, 1, 1 1/16, 1 1/8, 1 3/16, 1 1/4, 1 5/16, 1 3/8, 1 7/16, 1 1/2 and 1 9/16 inches
Bushing length	2 1/2 inches
Weight	0,350 Kg. Approx.



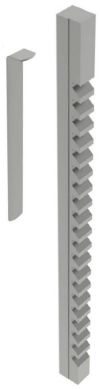
Broaching time
2:30 min.

Keyway broaches 5/16 inch	REF: 125-09-01-BRP-00010
Tolerance	JS9 (0,3127 · 0,3137)
Model	C
Broach dimensions	3/8 x 11 3/4 inches
Min./Max. Cutting length	25/64 inch / 2 1/2 inches
Required pressure	3.960lbs
Required shims/ Nr of passes	2 shims / 3 passes
Thickness	0,0550 inches
Bushing diameter	3/4, 13/16, 7/8, 15/16, 1, 1 1/16, 1 1/8, 1 3/16, 1 1/4, 1 5/16, 1 3/8, 1 7/16, 1 1/2 and 1 9/16 inches
Bushing length	2 1/2 inches
Weight	0,350 Kg. Approx.



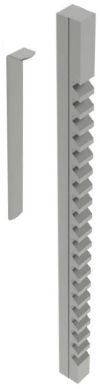
Broaching time
1:20 min.

Keyway broaches 1/4 inch	REF: 125-09-01-BRP-00009
Tolerance	JS9 (0,2502 · 0,2512)
Model	C
Broach dimensions	3/8 x 11 3/4 inches
Min./Max. Cutting length	25/64 inch / 2 1/2 inches
Required pressure	2.520lbs
Required shims/ Nr of passes	1 shim / 2 passes
Thickness	0,0625 inches
Bushing diameter	3/4, 13/16, 7/8, 15/16, 1, 1 1/16, 1 1/8, 1 3/16, 1 1/4, 1 5/16, 1 3/8, 1 7/16, 1 1/2 and 1 9/16 inches
Bushing length	2 1/2 inches
Weight	0,350 Kg. Approx.



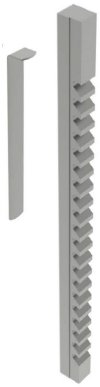
Broaching time
1:20 min.

Keyway broaches 3/16 inch	REF: 125-09-01-BRP-00008
Tolerance	JS9 (0,1877 · 0,1887)
Model	C
Broach dimensions	3/8 x 11 3/4 inches
Min./Max. Cutting length	25/64 inch / 2 1/2 inches
Required pressure	1.540lbs
Required shims/ Nr of passes	1 shim / 2 passes
Thickness	0,0500 inches
Bushing diameter	3/4, 13/16, 7/8, 15/16, 1, 1 1/16, 1 1/8, 1 3/16, 1 1/4, 1 5/16, 1 3/8, 1 7/16, 1 1/2 and 1 9/16 inches
Bushing length	2 1/2 inches
Weight	0,350 Kg. Approx.



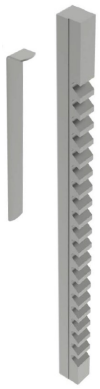
Broaching time
1:00 min.

Keyway broaches 3/16 inch	REF: 125-09-01-BRP-00007
Tolerance	JS9 (0,1877 · 0,1887)
Model	B
Broach dimensions	3/16 x 6 3/4 inches
Min./Max. Cutting length	19/64 inch / 1 11/16 inches
Required pressure	1.860lbs
Required shims/ Nr of passes	1 shim / 2 passes
Thickness	0,0500 inches
Bushing diameter	1/2, 9/16, 5/8, 11/16, 3/4, 13/16 and 7/8 inch
Bushing length	1 11/16 inches
Weight	0,100 Kg. Approx.



Broaching time
1:00 min.

Keyway broaches 5/32 inch	REF: 125-09-01-BRP-00006
Tolerance	JS9 (0,1564 · 0,1574)
Model	B
Broach dimensions	3/16 x 6 3/4 inches
Min./Max. Cutting length	19/64 inch / 1 11/16 inches
Required pressure	1.320lbs
Required shims/ Nr of passes	1 shim / 2 passes
Thickness	0,0420 inches
Bushing diameter	1/2, 9/16, 5/8, 11/16, 3/4, 13/16 and 7/8 inch
Bushing length	1 11/16 inches
Weight	0,100 Kg. Approx.



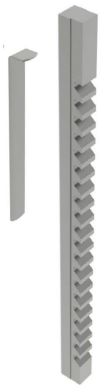
Broaching time
1:00 min.

Keyway broaches 1/8 inch	REF: 125-09-01-BRP-00005
Tolerance	JS9 (0,1252 · 0,1262)
Model	B
Broach dimensions	3/16 x 6 3/4 inches
Min./Max. Cutting length	19/64 inch / 1 11/16 inches
Required pressure	720lbs
Required shims/ Nr of passes	1 shim / 2 passes
Thickness	0,0310 inches
Bushing diameter	1/2, 9/16, 5/8, 11/16, 3/4, 13/16 and 7/8 inches
Bushing length	1 11/16 inches
Weight	0,100 Kg. Approx.



Broaching time
0:40 min.

Keyway broaches 3/32 inch	REF: 125-09-01-BRP-00004
Tolerance	JS9 (0,0938 · 0,0948)
Model	B
Broach dimensions	3/16 x 6 3/4 inches
Min./Max. Cutting length	19/64 inch / 1 11/16 inches
Required pressure	930lbs
Required shims/ Nr of passes	0 shims / 1 pass
Bushing diameter	1/2, 9/16, 5/8, 11/16, 3/4, 13/16 and 7/8 inch
Bushing length	1 11/16 inches
Weight	0,100 Kg. Approx.



Broaching time
0:45 min.

Keyway broaches 1/8 inch	REF: 125-09-01-BRP-00003
Tolerance	JS9 (0,1252 · 0,1262)
Model	A
Broach dimensions	1/8 x 5 inches
Min./Max. Cutting length	13/64 inch / 1 1/8 inches
Required pressure	650lbs
Required shims/ Nr of passes	1 shim / 2 passes
Thickness	0,0310 inches
Bushing diameter	1/4, 5/16, 3/8, 7/16 and 1/2 inch
Bushing length	1 1/8 inches
Weight	0,020 Kg. Approx.



Broaching time
0:30 min.

Keyway broaches 3/32 inch	REF: 125-09-01-BRP-00002
Tolerance	JS9 (0,0938 · 0,0948)
Model	A
Broach dimensions	1/8 x 5 inches
Min./Max. Cutting length	13/64 inch / 1 1/8 inches
Required pressure	780lbs
Required shims/ Nr of passes	0 shims / 1 pass
Bushing diameter	1/4, 5/16, 3/8, 7/16 and 1/2 inch
Bushing length	1 1/8 inches
Weight	0,020 Kg. Approx.



Broaching time
0:30 min.

Keyway broaches 1/16 inch	REF: 125-09-01-BRP-00001
Tolerance	JS9 (0,0625 · 0,0635)
Model	A
Broach dimensions	1/8 x 5 inches
Min./Max. Cutting length	13/64 inch / 1 1/8 inches
Required pressure	390lbs
Required shims/ Nr of passes	0 shims / 1 pass
Bushing diameter	1/4, 5/16, 3/8, 7/16 and 1/2 inch
Bushing length	1 1/8 inches
Weight	0,020 Kg. Approx.

Bushings



F114 steel guide bushes in H8 diameter tolerance to optimize the perfect finish of the part.

For other dimensions, request the manufacturer.

Reference	Model	Diameter	Length	Tolerance	Broaches
125-09-01-CBR-00002	A	10 mm	32 mm	J9	2 - 3 mm
125-09-01-CBR-00004	B	12 mm	46 mm	J9	4 - 5C mm
125-09-01-CBR-00005	B	14 mm	46 mm	J9	4 - 5C mm
125-09-01-CBR-00006	B	16 mm	46 mm	J9	4 - 5C mm
125-09-01-CBR-00007	B	17 mm	46 mm	J9	4 - 5C mm
125-09-01-CBR-00008	C	18 mm	65 mm	J9	5 - 6 - 8 mm
125-09-01-CBR-00009	C	19 mm	65 mm	J9	5 - 6 - 8 mm
125-09-01-CBR-00010	C	20 mm	65 mm	J9	5 - 6 - 8 mm
125-09-01-CBR-00011	C	22 mm	65 mm	J9	5 - 6 - 8 mm
125-09-01-CBR-00012	C	24 mm	65 mm	J9	5 - 6 - 8 mm
125-09-01-CBR-00013	C	25 mm	65 mm	J9	5 - 6 - 8 mm
125-09-01-CBR-00014	C	28 mm	65 mm	J9	5 - 6 - 8 mm
125-09-01-CBR-00015	C	30 mm	65 mm	J9	5 - 6 - 8 mm
125-09-01-CBR-00016	D	32 mm	102 mm	J9	10 - 12 - 14 mm
125-09-01-CBR-00017	D	35 mm	102 mm	J9	10 - 12 - 14 mm
125-09-01-CBR-00018	D	38 mm	102 mm	J9	10 - 12 - 14 mm
125-09-01-CBR-00020	D	40 mm	102 mm	J9	10 - 12 - 14 mm
125-09-01-CBR-00021	D	42 mm	102 mm	J9	10 - 12 - 14 mm
125-09-01-CBR-00022	D	45 mm	127 mm	J9	10 - 12 - 14 mm
125-09-01-CBR-00023	D	48 mm	127 mm	J9	10 - 12 - 14 mm
125-09-01-CBR-00024	D	50 mm	127 mm	J9	10 - 12 - 14 mm
125-09-01-CBR-00025	E	55 mm	127 mm	J9	16 - 18 mm
125-09-01-CBR-00026	E	60 mm	154 mm	J9	16 - 18 mm
125-09-01-CBR-00027	E	65 mm	154 mm	J9	16 - 18 mm
125-09-01-CBR-00028	F	70 mm	154 mm	J9	20 - 22 - 24 - 25 mm
125-09-01-CBR-00029	F	75 mm	154 mm	J9	20 - 22 - 24 - 25 mm
125-09-01-CBR-00030	F	80 mm	154 mm	J9	20 - 22 - 24 - 25 mm
125-09-01-CBR-00031	F	85 mm	154 mm	J9	20 - 22 - 24 - 25 mm
125-09-01-CBR-00032	F	90 mm	154 mm	J9	20 - 22 - 24 - 25 mm
125-09-01-CBR-00033	F	95 mm	154 mm	J9	20 - 22 - 24 - 25 mm

Technical annex

Vertical broacher BM25

List of parts

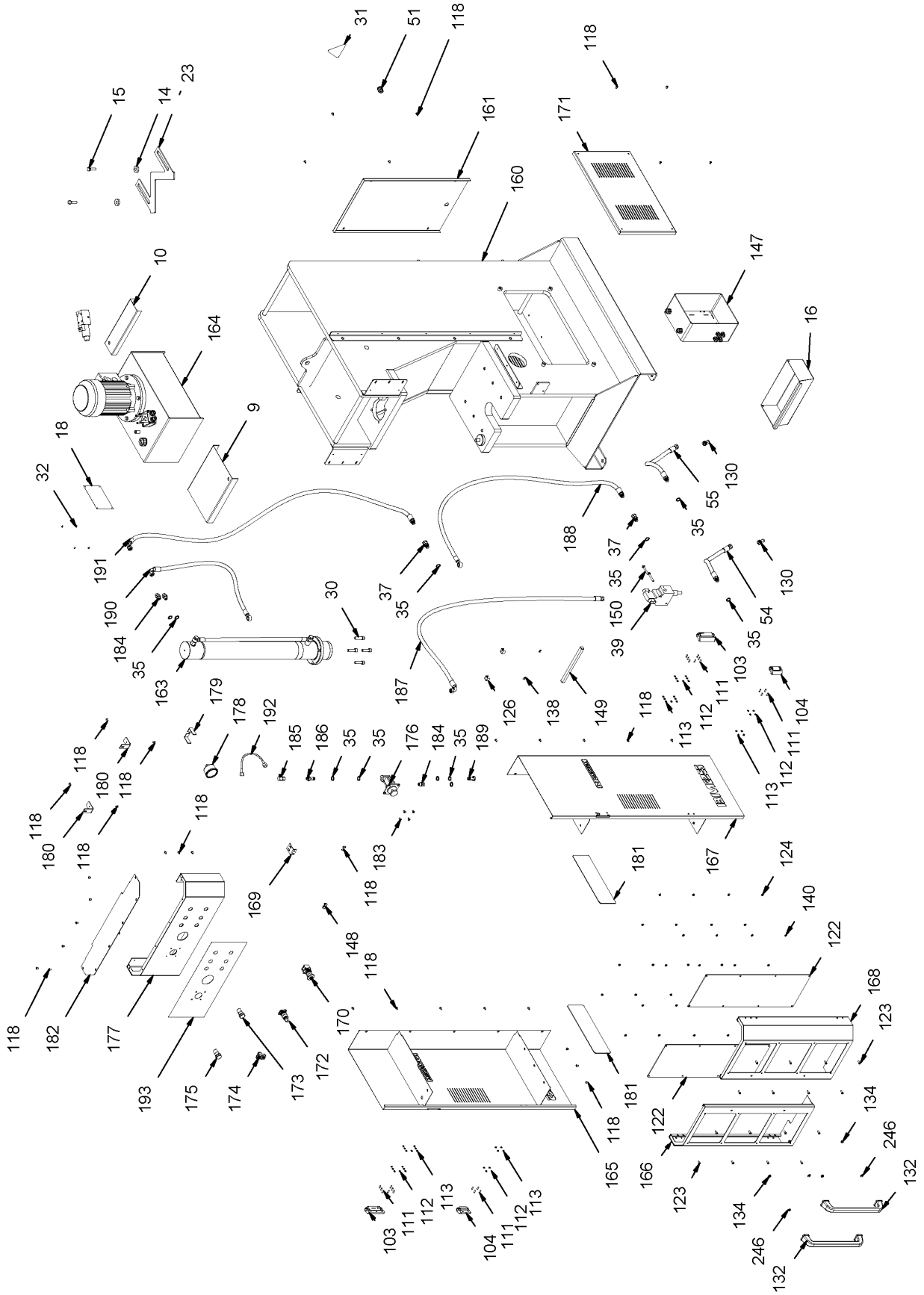
Piston assembly

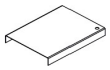
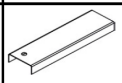
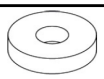
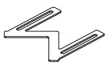
Hydraulic group

Electric map

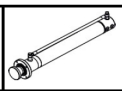
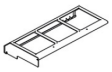
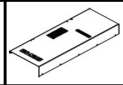
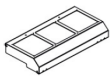
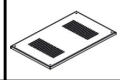
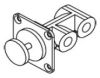
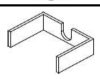
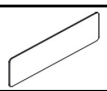
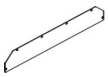
Hydraulic map

A1. List of parts



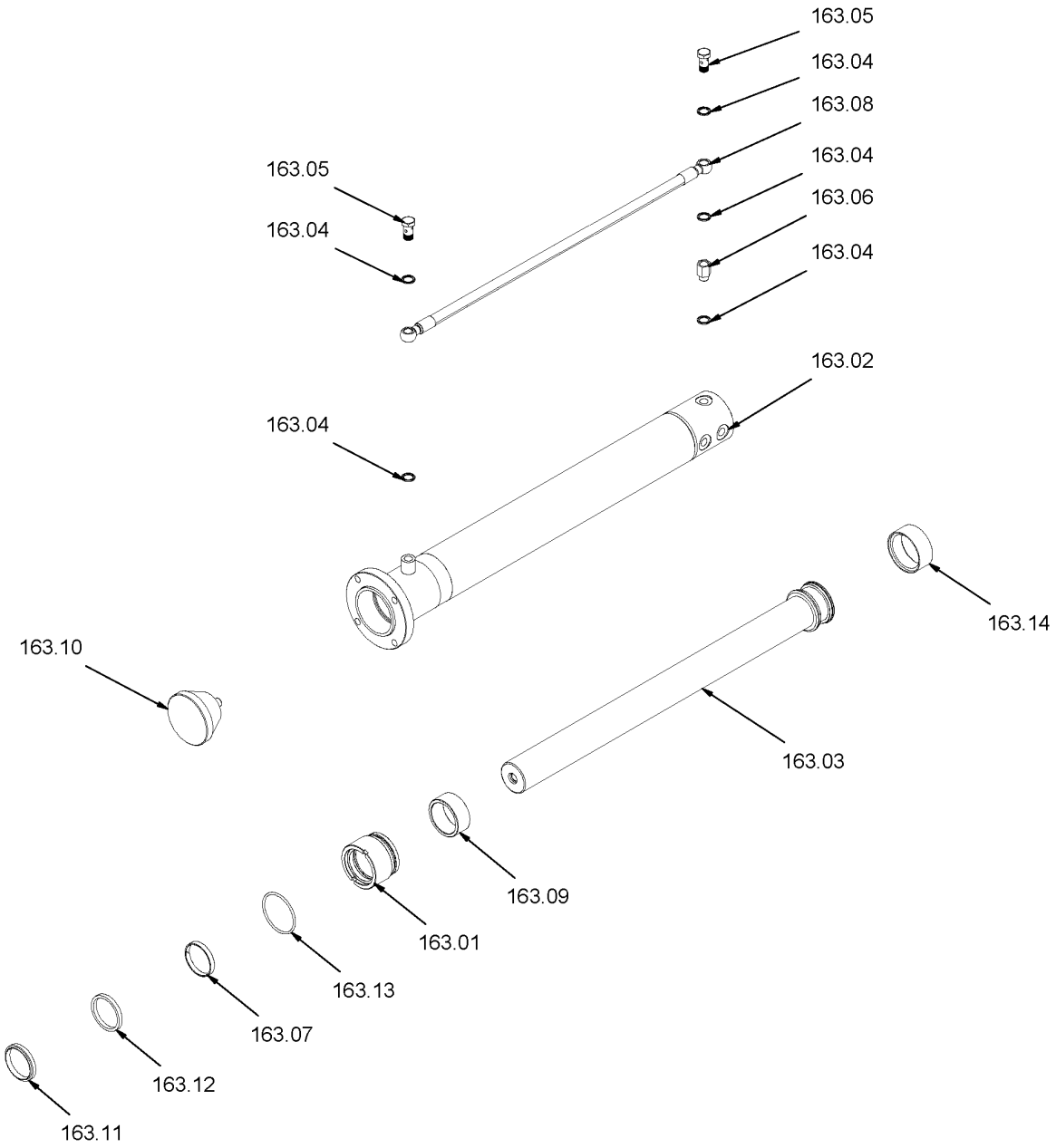
Nº ORDEN	DIBUJO	DESCRIPCION	Nº PLANO	UDS.
9		SEPARADOR DEPOSITO	120-09-01-00136	1
10		SEPARADOR DEPOSITO POSTERIOR	120-09-01-00137	1
14		Arandela Utillaje	120-09-01-00113	2
15		TORNILLO HEXAGONAL DIN 933 M12x40	020-D933-M12X40	2
16		Conjunto Soldado Cajón	130-09-01-00082	1
18		Placa Caracteristicas General	122-PLC-0000-001	1
23		Utillaje M	120-09-01-00114	1
30		TORNILLO ALLEN DIN912 M12X45	020-D912-M12X45	4
31		Adhesivo Triangulo 400Vac De 100 Mm	122-ADH-00003	1
32		REMACHE DE CLAVO DIN 7337 De Al Ø3x8	020-D7337-3X8	4
35		JUNTA METAL GOMA 3/8"	040-JMG-00004	11
37		RACOR GIRATORIO MACHO HEMBRA 3/8"	040-RG-00003	2
39		DISTRIBUIDOR MANUAL 102N1PA12D	040-DISM-00001	1
51		PRENSAESTOPA M20x1.5	050-PE-00006	1
54		MANGUERA 3/8" - TG 3/8" - MACHO 3/8" L=750 mm	120-09-01-00130	1
55		MANGUERA 3/8" - TG 3/8" - MACHO 3/8" L=750 mm	120-09-01-00131	1
63		INTERRUPTOR GENERAL KG10AK300	050-IG-00001	1
103		BISAGRA DE SEGURIDAD	050-BIS-00001	2
104		BISAGRA	050-BIS-00002	2

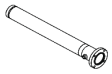
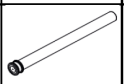
111		ESPARRAGO ALLEN DIN 913 M5X16	020-D913-M5X16	22
112		ARANDELA DIN 125 B M5	020-D125B-M5	22
113		TUERCA DIN 934 M5	020-D934-M5	22
118		TORNILLO ISO 7380 M6X10	020-I7380-M6X10	50
122		POLICARBONATO PUERTAS BM25	120-09-01-00152	2
123		TORNILLO ISO 7380 M6X16	020-I7380-M6X16	16
124		TUERCA DIN 934 M6	020-D934-M6	16
126		Soporte Perfil Led	050-GEN-00022	2
130		CODO 90º MACHO HEMBRA 3/8"	040-CMH-00002	2
132		Asa puente 342	031-APM-00004	2
133		ARANDELA DIN 125 B M8	020-D125B-M8	4
134		TUERCA DIN 934 M8	020-D934-M8	4
138		TORNILLO ALLEN DIN 7991 M3X8	020-D7991-M3x8	4
140		ARANDELA DIN 125 B M6	020-D125B-M6	16
147		0	050-KIE-09-01-002	1
148		Base Magnetica D16 Espiga M6	031-BM-00005	2
149		Tira led 250mm	120-09-01-00157	1
150		Tornillo Cabeza Hexagonal DIN 933 M8x55	020-D933-M8X55	2
160		Conjunto Soldado Estructura	130-09-01-00148	1
161		Puerta Trasera	120-09-01-00200	1

163		Conjunto Pistón	130-09-01-00146	1
164		Grupo Hidraulico BM25	130-09-01-00155	1
165		CONJUNTO TAPA LATERAL IZQUIERDA BM25	130-09-01-00152	1
166		CONJUNTO PUERTA IZQUIERDA BM25	130-09-01-00153	1
167		CONJUNTO TAPA LATERAL DERECHA BM25	130-09-01-00151	1
168		CONJUNTO PUERTA DERECHA BM25	130-09-01-00154	1
169		REGULACION CIERRE PUERTAS BM25	120-09-01-00192	1
170		PARO EMERGENCIA Ø22	050-PEM-22	1
171		Tapa Ventilación	120-09-01-00172	2
172		SELECTOR DE LLAVE 2 POSICIONES Ø22	050-SLL-00001	1
173		PILOTO SEÑALIZACION ROJO Ø22	050-PL-00009	1
174		Pulsador Paro Marcha Con Led D22	050-PUL-00003	1
175		Piloto De D22 mm 24Vac Blanco	050-PL-00002	1
176		Valvula Limitadora Presion Sgrdp03- 1/G23	040-VLP-00005	1
177		CONJUNTO FRONTAL BM25	130-09-01-00149	1
178		Manometro 0-300 Bars D63 Empotrable Toma 1/4' Trasera	040-MAN-00002	1
179		Fijacion Trasera Manometro Empotrar D63	040-FIM-00001	1
180		Angulo soporte chapa lateral	120-09-01-00185	2
181		Policarbonato lateral BM25	120-09-01-00188	2
182		Tapa superior frontal BM25	120-09-01-00189	1

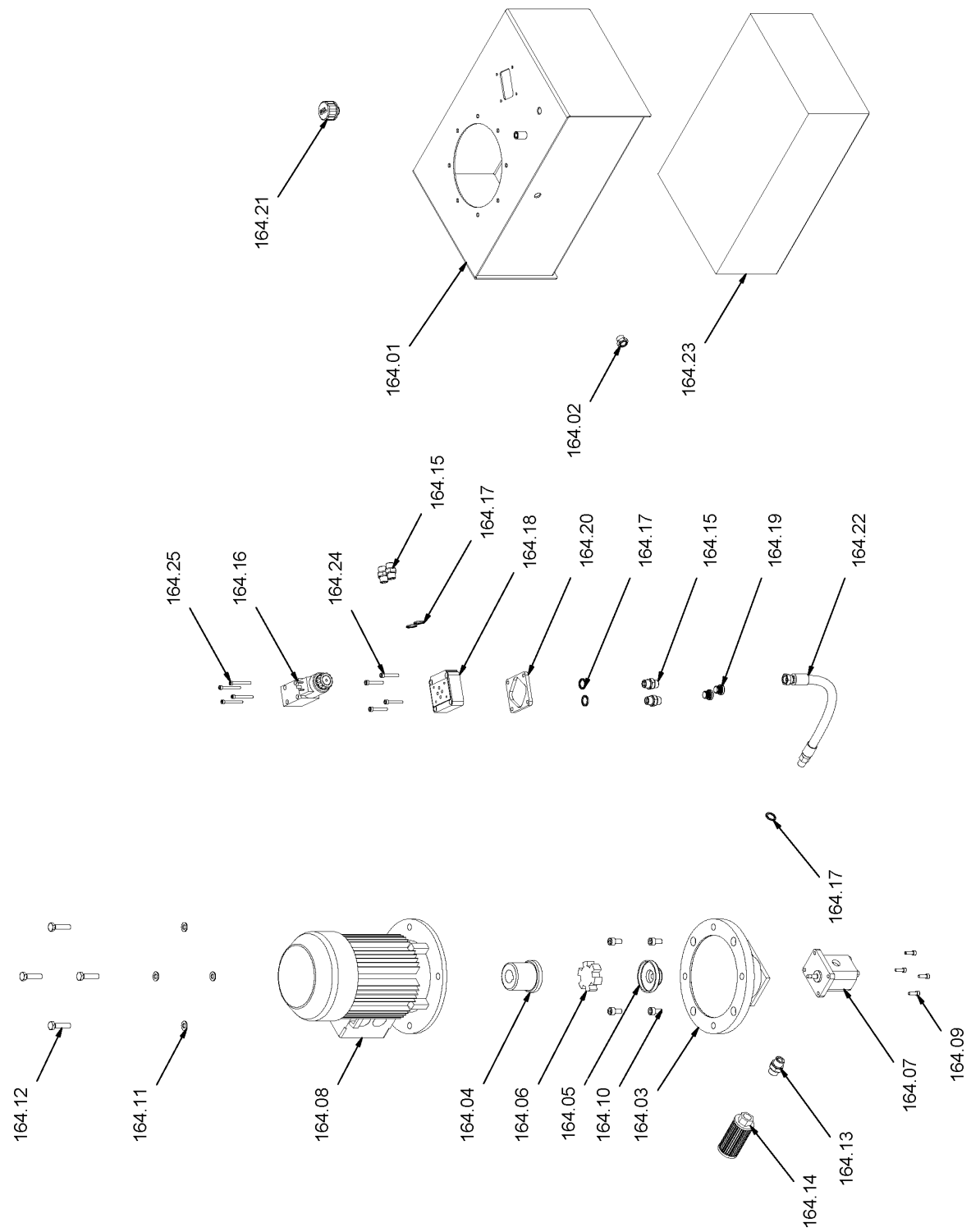
183		TORNILLO ALLEN DIN 7991 M6x12	020-D7991-M6X12	4
184		RACOR MACHO MACHO 3/8"	040-RMM-00003	3
185		CODO GIRATORIO MACHO HEMBRA 1/4"	040-CGMH-00001	1
186		Tornillo Para Esfera De 3/8' Con Prolongacion 1/4'	040-TESP-00002	1
187		MANGUERA 3/8" - CODO TG 3/8" - TG 3/8" L=1800 mm	120-09-01-00199	1
188		MANGUERA 3/8" - MACHO 3/8" - ESFERA 3/8" L=1750 mm	120-09-01-00195	1
189		Tornillo Para Esfera De 3/8	040-TES-00003	1
190		MANGUERA 3/8" - CODO TG 3/8" - ESFERA 3/8" L=880 mm	120-09-01-00197	1
191		MANGUERA 3/8" - CODO 45º TG 3/8" - MACHO 3/8" L=2125 mm	120-09-01-00198	1
192		Manguera Minimex Manometro 1/4- Tg 1/4 L=300 Presion de Trabajo 250 Bars	120-09-01-00196	1
193		Calca de mandos BM25	122-CAL-0901-004	1
194		PRENSAESTOPA M12	050-PE-00001	3

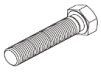
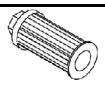
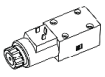
A2. Piston assembly

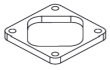
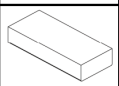


Nº ORDEN	DIBUJO	DESCRIPCION	Nº PLANO	PIEZAS POR MAQUINA
163.01		Dolla Bronce	120-09-01-00162	1
163.02		Conjunto Soldado Pistón	130-09-01-00147	1
163.03		Vástago Pistón	130-09-01-00034	1
163.04		JUNTA METAL GOMA 3/8"	040-JMG-00004	5
163.05		Tornillo Para Esfera De 3/8	040-TES-00003	2
163.06		SUPLEMENTO MACHO HEMBRA 3/8 "	040-SMH-00003	1
163.07		GUIA SF D65xD60x9,5	040-GSF-00002	1
163.08		MANGUERA 3/8" - ESFERA 3/8" - ESFERA 3/8" L=745 mm	120-09-01-00165	1
163.09		Arandela Separadora Pistón	120-09-01-00035	1
163.10		Suplemento Vástago	120-09-01-00201	1
163.11		RASCADOR 60x70x7/10	040-RAS-00010	1
163.12		JUNTA COLLARIN BA D60XD70X7.3	040-BA-00017	1
163.13		JUNTA TORICA D73X4 90 Shore	040-JT-00031	1
163.14		JUNTA DPS 80X66X16X32	040-DPS-00006	1

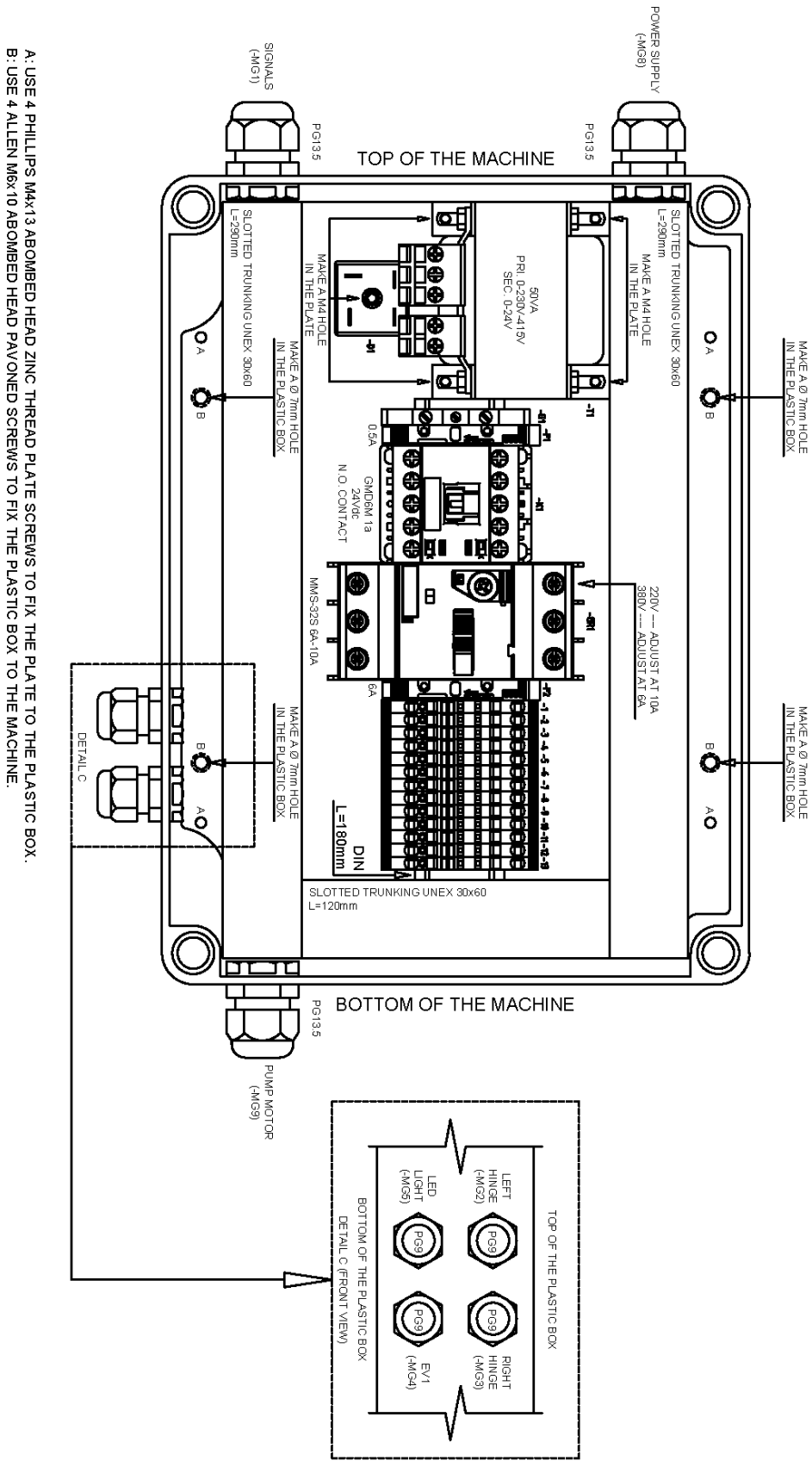
A3. Hydraulic group

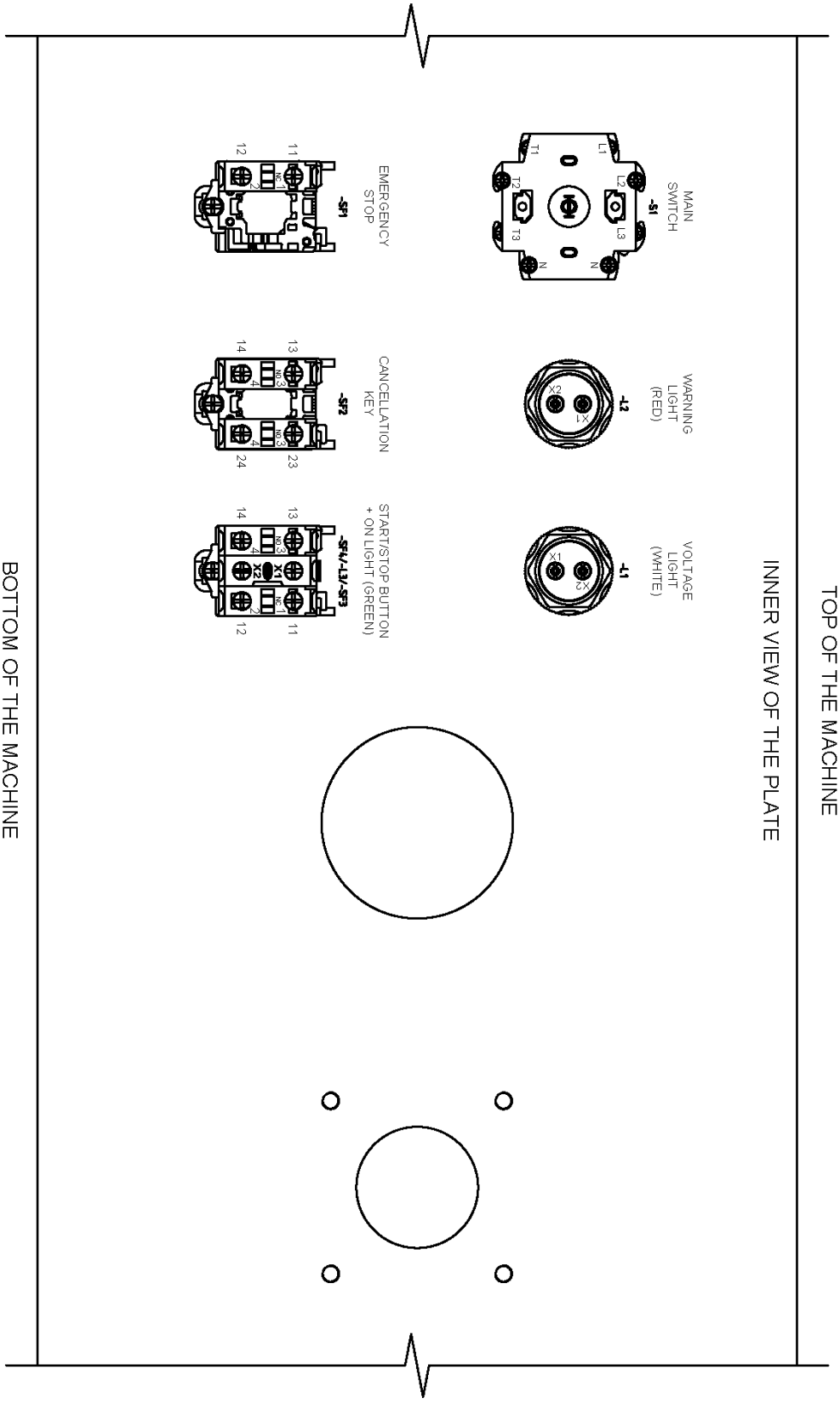


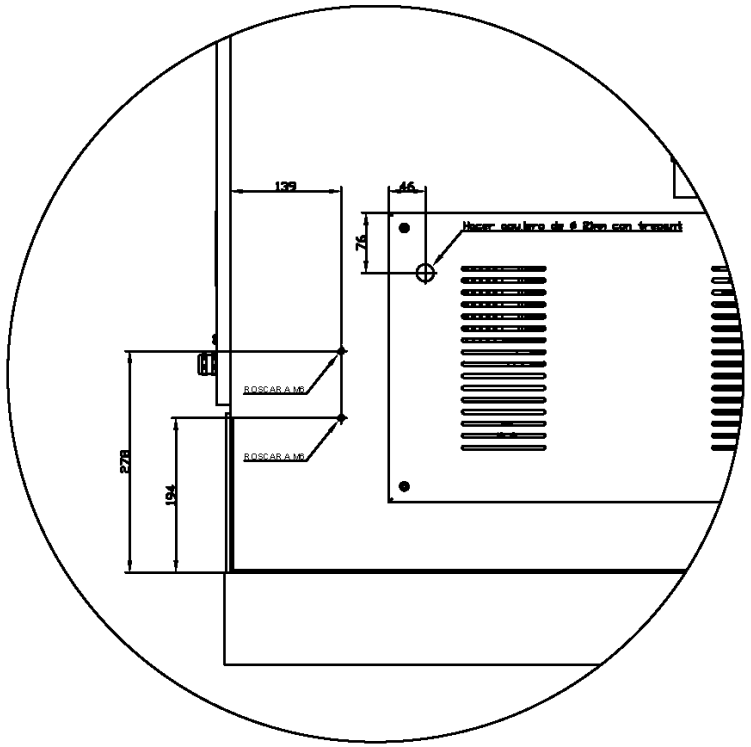
Nº ORDEN	DIBUJO	DESCRIPCION	Nº PLANO	PIEZAS POR MAQUINA
164.01		Conjunto Soldado Deposito BM25	130-09-01-00156	1
164.02		NIVEL DE ACEITE 3/8"	040-NA-00001	1
164.03		Campana Acoplamiento Bomba Tipo Lo Motor 3/4/5.5 C.V.	040-CA-00002	1
164.04		Acoplamiento Lado Motor 3/4 / 5.5Cv	040-AE-00007	1
164.05		Acoplamiento Lado Bomba Lo Para Motor 3/4 / 5.5 Cv	040-AE-00008	1
164.06		Estrella Acoplamiento Para Motor 3/4 / 5.5 Cv	040-AE-00009	1
164.07		Bomba Hidraulica De Aluminio De 7.5 L 1LO7.5DE10R	040-BH-00002	1
164.08		Motor Electrico 2.2Kw 1500Rpm 50-60Hz B5 220/380V	050-ME-00003	1
164.09		TORNILLO ALLEN DIN 912 M6X20	020-D912-M6X20	4
164.10		Tornillo Allen DIN 912 M10X20	020-D912-M10X20	4
164.11		ARANDELA DIN 125 B M10	020-D125B-M10	4
164.12		TORNILLO HEXAGONAL DIN 933 M10X45	020-D933-M10X45	4
164.13		RACOR MACHO MACHO 1/2"	040-RMM-00004	1
164.14		Filtro De Aspiracion 1/2' REF 2FA15R125N		1
164.15		RACOR MACHO MACHO 3/8"	040-RMM-00003	4
164.16		Electrovalvula 5EVP12D4C02D24 NAG4	040-ELV-00007	1
164.17		JUNTA METAL GOMA 3/8"	040-JMG-00004	5

Nº ORDEN	DIBUJO	DESCRIPCION	Nº PLANO	PIEZAS POR MAQUINA
164.18		BASE ELECTROVALVULA ROQUET REF. 321002	040-BAS-00002	1
164.19		TAPON DE VACIADO ALLEN 3/8" GAS	040-TVA-00004	2
164.20		CHAPA GRUESO BASE ELECTROVALVULA	120-09-01-00125	1
164.21		Tapon Llenado De 1/2' Doble Respiradero Y Filtro	040-TLL-00003	1
164.22		Manguera Flexible 3/8" TL3/8-MF3/8 L=400 mm Presion 250 Bars	120-09-01-00128	1
164.23		ACEITE HIDRAULICO HM-68 25 LITROS	ACEITE BM25	1
164.24		TORNILLO ALLEN DIN 912 M6X40	020-D912-M6X40	4
164.25		TORNILLO ALLEN DIN 912 M5x50	020-D912-M5X50	4

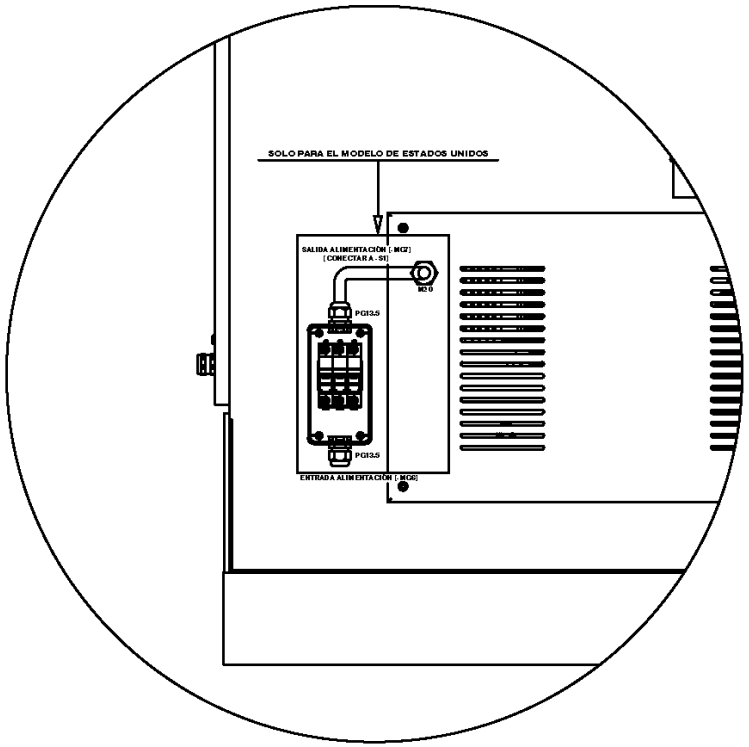
A4. Electric box




TOP OF THE MACHINE
INNER VIEW OF THE PLATE
BOTTOM OF THE MACHINE
MAIN SWITCH -S1
T1
L1
T2
L2
T3
L3
N
N
EMERGENCY STOP -SF1
11
12
NC
NC
WARNING LIGHT (RED) -L2
X2
X1
CANCELLATION KEY -SF2
13
14
23
24
NO
NO
START/STOP BUTTON + ON LIGHT (GREEN) -SF4/-L3/-SF3
X2
X1
VOLTAGE LIGHT (WHITE) -L1
X2
X1

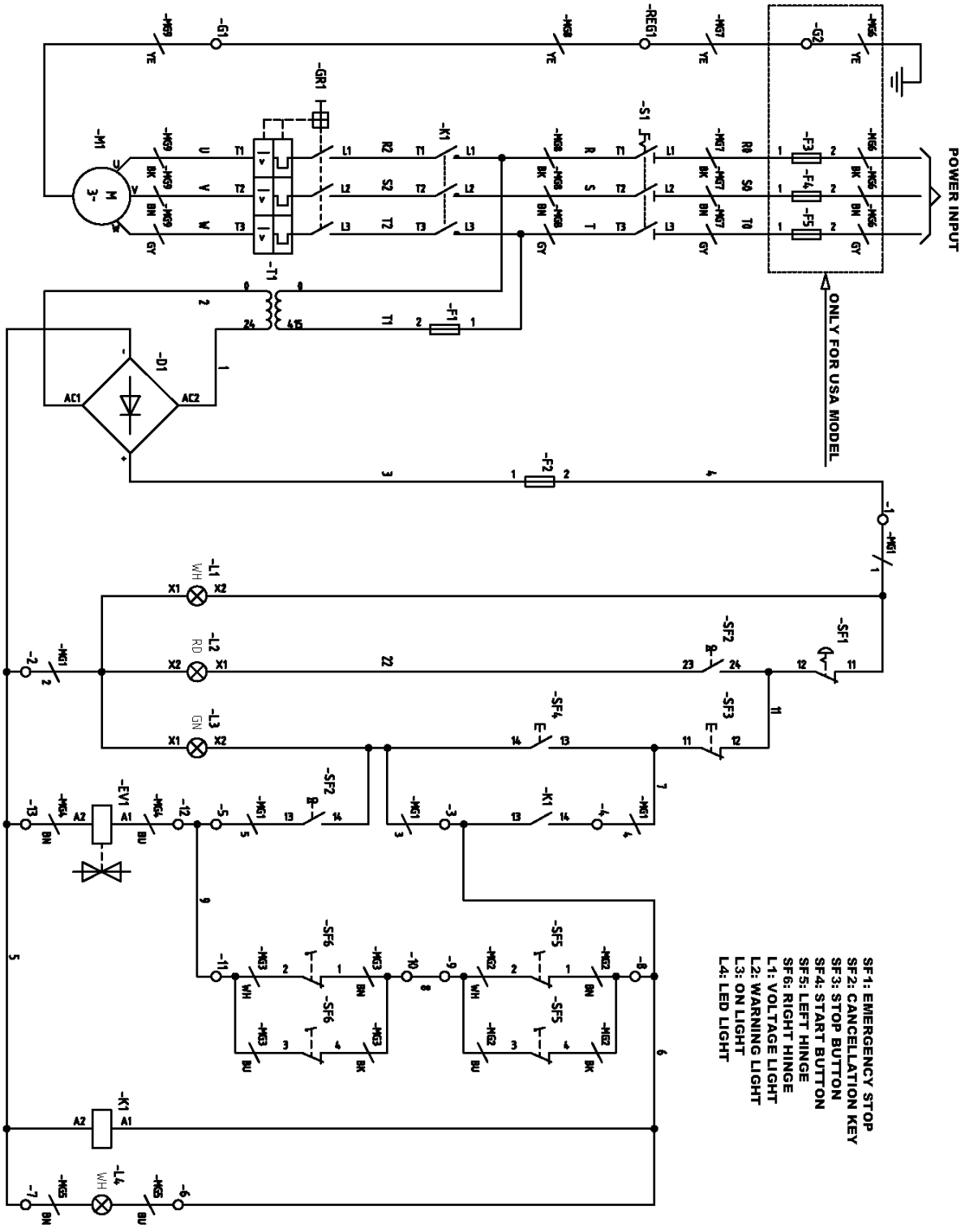


DETALLE AGUJEROS
MODELO ESTADOS UNIDOS

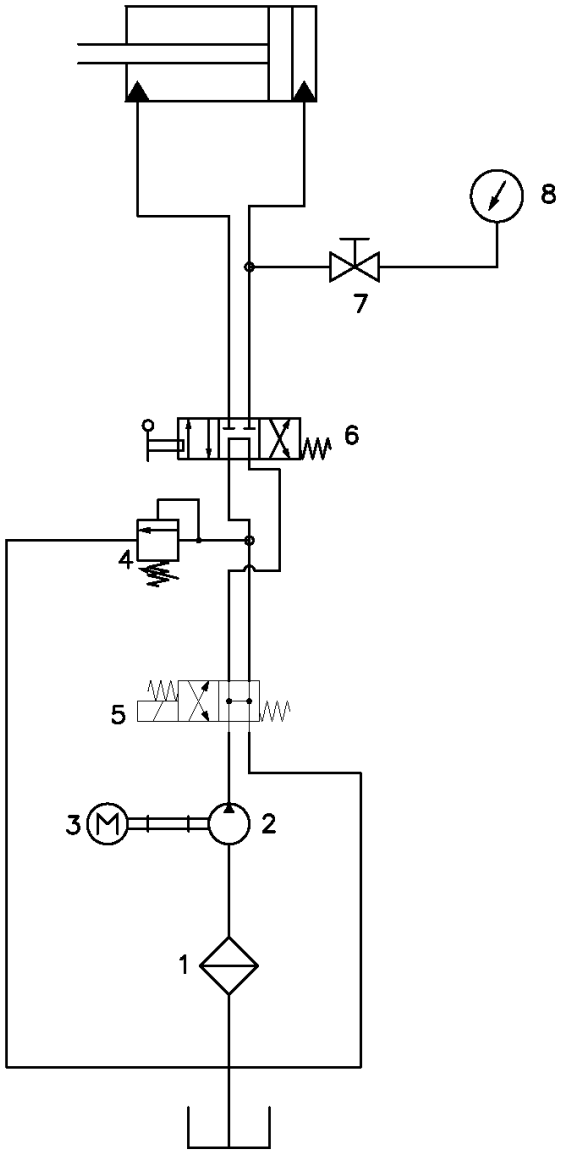


DETALLE MONTAJE MINICOFRET
MODELO ESTADOS UNIDOS

A5. Electric map



A5. Hydraulic map



1. Filter
2. Hydraulic Pump
3. Electric motor
4. Pressure Control (regulator)
5. Solenoid “Bending”
6. Main Manual Distributor
7. Manometer valve
8. Manometer

OUR RANGE OF MACHINERY



IRON WORKERS



SECTION BENDING MACHINES



NON-MANDREL PIPE BENDER



HORIZONTAL PRESS BRAKE



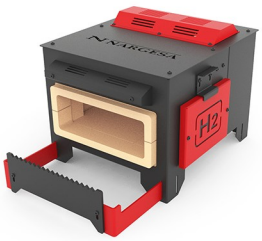
TWISTING/SCROLL BENDING MACHINES



HYDRAULIC PRESS



HYDRAULIC SHEAR MACHINES



GAS FORGES



IRON EMBOSSING MACHINES



END WROUGHT IRON MACHINES



BROACHING MACHINES



POWER HAMMERS



PRESSES FOR LOCKS