Thank you for choosing our machines
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Anexo Técnico
IMPORTANT

This manual offers all performance and technical instructions required for the proper knowledge of the safety systems of the machine and for its correct use, keeping in mind the operative safety.

Therefore it is very important to read and understand carefully the instructions contained in this book before starting up and work with the machine.

SAFETY

Broaching machines BM25, have been designed and manufactured according to the applicable European regulations, adding up the following safety devices:

* Fixed safety devices for which opening it is necessary the use of a tooling for them to be open just by authorized staff for any repair or maintenance task.
* Risk signs warning.
* Emergency button in the control electrical box.
* Connection and disconnection button in the electrical box to regulate the supply energy.

All these safety devices are integrated in the machine as a part of it. Modification, removal or lack of maintenance of any device on the machine will raise up the risk of breakdown and accident at the same time that it transgresses the Usage Regulation 89/655/CEE.

The manufacturer will not take any responsibility out of the damage caused by the use of the machine with any kind of modification, removal or lack of maintenance of any of its components, carried out without any previous and expressed authorization by the manufacturer.
1. GENERAL INFORMATION

1.1. General dimensions

1.2. 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
1.3. Identification of the machine

- Piston
- Control panel
- Front protection
- Shavings drawer
- Broach
- Thick part (shim)
- Bushing
- Electric motor
- Hydraulic container
- Side protection
- Piston up/down handle
## 1.4. General characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Motor power</strong></td>
<td>2.2 KW / 3 HP</td>
</tr>
<tr>
<td>3-phased tensión</td>
<td>230 / 400 V</td>
</tr>
<tr>
<td><strong>Hydraulic power</strong></td>
<td>10 Tm</td>
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<tr>
<td><strong>Working speed</strong></td>
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<tr>
<td><strong>Return speed</strong></td>
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<tr>
<td><strong>Pump Flow</strong></td>
<td>7.5 L</td>
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<td><strong>Shank displacement</strong></td>
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<td><strong>Goosneck</strong></td>
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<tr>
<td><strong>Maximum diameter of the piece</strong></td>
<td>600 mm*</td>
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<tr>
<td><strong>Bench dimensions</strong></td>
<td>420x420 mm</td>
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<tr>
<td><strong>Dimensions</strong></td>
<td>747x1240x2400 mm</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>790 Kg</td>
</tr>
</tbody>
</table>

*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:

```
NARGESA

PRADA NARGESA, S.L. - CTRA. DE GARRIGAS A SANT MIQUEL S/N
17476 PALLAS DE STA. EULALIA (GIRONA) SPAIN - TEL. (+34) 972568085

TRADEMARK: NARGESA
MODEL: BM25

YEAR OF MANUFACTURE: SERIAL N°

DIMENSIONS: 1260x800x2430 mm, WEIGHT: 850 Kg

POWER 2.2 Kw, INTENSITY 9/5 A, HZ 50/60 rpm 1400 VOLTAGE 230/400V
POWER Kw, INTENSITY A, HZ 50/60 rpm VOLTAGE 230/400V
Pmax=220Bar

www.nargesa.com
```
1.5. 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.

1.6. Contraindications for the machine usage
Never fit elements that are not recommended by the manufacturer.

1.7. 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.

1.8. 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.
1.9. Operative working place
The broaching machine will only be used by an operative at the time who will be placed in front of the ma-
chine, never at a lateral of it because he ought to control the whole set of the machine. Moreover the ma-
chine main protection devices are thought for the frontal use of the machine.

1.10. 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 posi-
tion.

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 -25°C to 55°C or 75°C 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 always 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 carry 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 the 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 a 230V 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

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 operation, 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 broach since 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).
   - 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

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<thead>
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<th>Millimeter Keyway Broaches</th>
<th>Brushes</th>
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<td><strong>BRUSHES</strong></td>
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<td>4 mm</td>
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<td>6 mm</td>
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<td>10 mm</td>
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6.2. Inches keyway broaches

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<th>Sizes (inches)</th>
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<th>Required pressure (lbs)</th>
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<td>0.0060 ± 0.0006</td>
<td>15/64 x 1/4</td>
<td>4</td>
<td>1/84</td>
<td>2/12</td>
<td>2000</td>
<td>3/16</td>
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<td>3/16</td>
<td>2/12</td>
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<td>0.0065 ± 0.0006</td>
<td>19/64 x 1/4</td>
<td>4</td>
<td>1/84</td>
<td>2/12</td>
<td>2000</td>
<td>3/16</td>
<td>0.050</td>
<td>3/16</td>
<td>2/12</td>
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<tr>
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<td>0.750</td>
<td>0.0070 ± 0.0007</td>
<td>23/64 x 1/4</td>
<td>4</td>
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<td>2/12</td>
<td>2000</td>
<td>3/16</td>
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<td>2/12</td>
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<td>2000</td>
<td>3/16</td>
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<td>2/12</td>
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INSTRUCTIONS BOOK OF VERTICAL BROACHER BM25
<table>
<thead>
<tr>
<th>Model</th>
<th>Broach</th>
<th>Tolerance (inches)</th>
<th>Sizes (inches)</th>
<th>Nr Shims</th>
<th>Min. cutting length (inches)</th>
<th>Max. cutting length (inches)</th>
<th>Required pressure (bar)</th>
<th>Shims</th>
<th>Thickness (inches)</th>
<th>Diameter (inches)</th>
<th>Length (inches)</th>
</tr>
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<tbody>
<tr>
<td>E</td>
<td>7/8</td>
<td>0.0795 - 0.0775</td>
<td>1 x 20.14</td>
<td>6</td>
<td>1</td>
<td>6</td>
<td>9900</td>
<td>T/8</td>
<td>0.0065</td>
<td>3 1/16</td>
<td>6</td>
</tr>
<tr>
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<td>1</td>
<td>0.085 - 0.0825</td>
<td>1 x 20.14</td>
<td>7</td>
<td>1</td>
<td>6</td>
<td>11100</td>
<td>1</td>
<td>0.0065</td>
<td>3 1/16</td>
<td>6</td>
</tr>
<tr>
<td>F</td>
<td>3/4</td>
<td>0.0795 - 0.0775</td>
<td>1 x 20.14</td>
<td>6</td>
<td>1</td>
<td>6</td>
<td>9900</td>
<td>3/4</td>
<td>0.0065</td>
<td>3 1/16</td>
<td>6</td>
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<td>1</td>
<td>0.085 - 0.0825</td>
<td>1 x 20.14</td>
<td>7</td>
<td>1</td>
<td>6</td>
<td>11100</td>
<td>4</td>
<td>0.0065</td>
<td>3 1/16</td>
<td>6</td>
</tr>
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<td>5/8</td>
<td>0.0795 - 0.0775</td>
<td>1 x 20.14</td>
<td>6</td>
<td>1</td>
<td>6</td>
<td>9900</td>
<td>4 1/6</td>
<td>0.0065</td>
<td>3 1/16</td>
<td>6</td>
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<td>1</td>
<td>0.085 - 0.0825</td>
<td>1 x 20.14</td>
<td>7</td>
<td>1</td>
<td>6</td>
<td>11100</td>
<td>4 1/2</td>
<td>0.0065</td>
<td>3 1/16</td>
<td>6</td>
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</table>
7. FORMULES FOR BROACHING

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 constant “h” and “b” (Picture 3)
4. The milling cutter to use in this case is the constant “a”, that is to say, 19.5 mm (Picture 2)

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

\[ h = r - \frac{c}{2} \sqrt{\frac{4}{r^2} - c^2} \]

\[ h = 30 - \frac{c}{2} \sqrt{4 \times 30^2 - 18^2} \]

\[ h = 30 - \frac{c}{2} \sqrt{3600 - 324} \]

\[ h = 30 - 0.5 \sqrt{3276} = 57.236 \]

\[ h = 0.5 \times 57.236 = 28.618 \]

\[ h = 30 - 28.618 = 1.381 \]

\[ h = 1.38 \]
### 8. ACCESSOIRES

#### Millimeter keyway broaches

<table>
<thead>
<tr>
<th>Keyway broaches 25mm</th>
<th>REF: 125-09-01-BR-00017</th>
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</thead>
<tbody>
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<td><strong>Tolerance</strong></td>
<td>JS9 (-0,027 +0,013)</td>
</tr>
<tr>
<td><strong>Model</strong></td>
<td>F</td>
</tr>
<tr>
<td><strong>Broach dimensions</strong></td>
<td>25,40 x 514,35mm</td>
</tr>
<tr>
<td><strong>Standard keys</strong></td>
<td>25 x 14mm</td>
</tr>
<tr>
<td><strong>Min./Max. Cutting length</strong></td>
<td>25,4mm / 152,4mm</td>
</tr>
<tr>
<td><strong>Required pressure</strong></td>
<td>12.300lbs / 5.579,18Kg</td>
</tr>
<tr>
<td><strong>Required shims/ Nr of passes</strong></td>
<td>4 shims / 5 passes</td>
</tr>
<tr>
<td><strong>Thickness</strong></td>
<td>1,422mm</td>
</tr>
<tr>
<td><strong>Bushing diameter</strong></td>
<td>75, 80, 85, 90, 95, 100, 105, 110, 115 and 120mm</td>
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<tr>
<td><strong>Bushing length</strong></td>
<td>152,4mm</td>
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<tr>
<td><strong>Weight</strong></td>
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<td><strong>Model</strong></td>
<td>F</td>
</tr>
<tr>
<td><strong>Broach dimensions</strong></td>
<td>25,40 x 514,35mm</td>
</tr>
<tr>
<td><strong>Standard keys</strong></td>
<td>24 x 14mm</td>
</tr>
<tr>
<td><strong>Min./Max. Cutting length</strong></td>
<td>25,4mm / 152,4mm</td>
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<tr>
<td><strong>Required pressure</strong></td>
<td>10.600lbs / 4.808,07Kg</td>
</tr>
<tr>
<td><strong>Required shims/ Nr of passes</strong></td>
<td>5 shims / 6 passes</td>
</tr>
<tr>
<td><strong>Thickness</strong></td>
<td>1,587mm</td>
</tr>
<tr>
<td><strong>Bushing diameter</strong></td>
<td>75, 80, 85, 90, 95, 100, 105, 110, 115 and 120mm</td>
</tr>
<tr>
<td><strong>Bushing length</strong></td>
<td>152,4mm</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>3,5 Kg. Approx.</td>
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</tr>
<tr>
<td><strong>Model</strong></td>
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</tr>
<tr>
<td><strong>Broach dimensions</strong></td>
<td>25,40 x 514,35mm</td>
</tr>
<tr>
<td><strong>Standard keys</strong></td>
<td>22 x 14mm</td>
</tr>
<tr>
<td><strong>Min./Max. Cutting length</strong></td>
<td>25,4mm / 152,4mm</td>
</tr>
<tr>
<td><strong>Required pressure</strong></td>
<td>9.400lbs / 4.263,76Kg</td>
</tr>
<tr>
<td><strong>Required shims/ Nr of passes</strong></td>
<td>4 shims / 5 passes</td>
</tr>
<tr>
<td><strong>Thickness</strong></td>
<td>1,422mm</td>
</tr>
<tr>
<td><strong>Bushing diameter</strong></td>
<td>75, 80, 85, 90, 95, 100, 105, 110, 115 and 120mm</td>
</tr>
<tr>
<td><strong>Bushing length</strong></td>
<td>152,4mm</td>
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<tr>
<td><strong>Weight</strong></td>
<td>3,5 Kg. Approx.</td>
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### Keyway broaches 20mm

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<td>F</td>
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<tr>
<td>Broach dimensions</td>
<td>25.40 x 514.35mm</td>
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<tr>
<td>Standard keys</td>
<td>20 x 12mm</td>
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<tr>
<td>Min./Max. Cutting length</td>
<td>25.4mm / 152.4mm</td>
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<td>Required pressure</td>
<td>8.800lbs / 3.991,61Kg</td>
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<tr>
<td>Required shims/ Nr of passes</td>
<td>3 shims / 4 passes</td>
</tr>
<tr>
<td>Thickness</td>
<td>1.587mm</td>
</tr>
<tr>
<td>Bushing diameter</td>
<td>75, 80, 85, 90, 95, 100, 105, 110, 115 and 120mm</td>
</tr>
<tr>
<td>Bushing length</td>
<td>152.4mm</td>
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<td>Weight</td>
<td>3.5 Kg. Approx.</td>
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### Keyway broaches 18mm

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<td>Broach dimensions</td>
<td>19.05 x 393.7mm</td>
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<tr>
<td>Standard keys</td>
<td>18 x 11mm</td>
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<tr>
<td>Min./Max. Cutting length</td>
<td>25.4mm / 152.4mm</td>
</tr>
<tr>
<td>Required pressure</td>
<td>10.600lbs / 4.808,07Kg</td>
</tr>
<tr>
<td>Required shims/ Nr of passes</td>
<td>3 shims / 4 passes</td>
</tr>
<tr>
<td>Thickness</td>
<td>1.422mm</td>
</tr>
<tr>
<td>Bushing diameter</td>
<td>52, 54, 55, 56, 58, 60, 62, 63, 64, 65, 66, 68, 70 and 72mm</td>
</tr>
<tr>
<td>Bushing length</td>
<td>127 and 152.4mm</td>
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<td>Weight</td>
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### Keyway broaches 16mm

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<td>Standard keys</td>
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<td>25.4mm / 152.4mm</td>
</tr>
<tr>
<td>Required pressure</td>
<td>9.400lbs / 4.263,76Kg</td>
</tr>
<tr>
<td>Required shims/ Nr of passes</td>
<td>3 shims / 4 passes</td>
</tr>
<tr>
<td>Thickness</td>
<td>1.422mm</td>
</tr>
<tr>
<td>Bushing diameter</td>
<td>52, 54, 55, 56, 58, 60, 62, 63, 64, 65, 66, 68, 70 and 72mm</td>
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<tr>
<td>Bushing length</td>
<td>127 and 152.4mm</td>
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## Keyway broaches 14mm

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<tr>
<td><strong>Model</strong></td>
<td>D</td>
</tr>
<tr>
<td><strong>Broach dimensions</strong></td>
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<tr>
<td><strong>Standard keys</strong></td>
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<td><strong>Min./Max. Cutting length</strong></td>
<td>25,4mm / 152,4mm</td>
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</tr>
<tr>
<td><strong>Required shims/ Nr of passes</strong></td>
<td>2 shims / 3 passes</td>
</tr>
<tr>
<td><strong>Thickness</strong></td>
<td>1,587mm</td>
</tr>
<tr>
<td><strong>Bushing diameter</strong></td>
<td>32, 34, 35, 36, 38, 40, 42, 44, 45, 46, 48, 50, 52, 54 and 56mm</td>
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<tr>
<td><strong>Bushing length</strong></td>
<td>101,6 and 127mm</td>
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## Keyway broaches 12mm

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<tr>
<td><strong>Broach dimensions</strong></td>
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<tr>
<td><strong>Standard keys</strong></td>
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<td>25,4mm / 152,4mm</td>
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<tr>
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</tr>
<tr>
<td><strong>Required shims/ Nr of passes</strong></td>
<td>2 shims / 3 passes</td>
</tr>
<tr>
<td><strong>Thickness</strong></td>
<td>1,422mm</td>
</tr>
<tr>
<td><strong>Bushing diameter</strong></td>
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<tr>
<td><strong>Bushing length</strong></td>
<td>101,6 and 127mm</td>
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<td><strong>Weight</strong></td>
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## Keyway broaches 10mm

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<td><strong>Broach dimensions</strong></td>
<td>14,28 x 352,42mm</td>
</tr>
<tr>
<td><strong>Standard keys</strong></td>
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</tr>
<tr>
<td><strong>Min./Max. Cutting length</strong></td>
<td>25,4mm / 152,4mm</td>
</tr>
<tr>
<td><strong>Required pressure</strong></td>
<td>6.500lbs / 2.948,35Kg</td>
</tr>
<tr>
<td><strong>Required shims/ Nr of passes</strong></td>
<td>2 shims / 3 passes</td>
</tr>
<tr>
<td><strong>Thickness</strong></td>
<td>1,422mm</td>
</tr>
<tr>
<td><strong>Bushing diameter</strong></td>
<td>32, 34, 35, 36, 38, 40, 42, 44, 45, 46, 48, 50, 52, 54 and 56mm</td>
</tr>
<tr>
<td><strong>Bushing length</strong></td>
<td>101,6 and 127mm</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
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</table>
### Keyway broaches 8mm

**REF:** 125-09-01-BR-00008

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<tbody>
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<td><strong>Tolerance</strong></td>
<td>JS9 (-0,017 +0,013)</td>
</tr>
<tr>
<td><strong>Model</strong></td>
<td>C</td>
</tr>
<tr>
<td><strong>Broach dimensions</strong></td>
<td>9,52 x 298,45mm</td>
</tr>
<tr>
<td><strong>Standard keys</strong></td>
<td>8 x 7mm</td>
</tr>
<tr>
<td><strong>Min./Max. Cutting length</strong></td>
<td>9,921mm / 63,5mm</td>
</tr>
<tr>
<td><strong>Required pressure</strong></td>
<td>3.680lbs / 1.669,22Kg</td>
</tr>
<tr>
<td><strong>Required shims/ Nr of passes</strong></td>
<td>2 shims / 3 passes</td>
</tr>
<tr>
<td><strong>Thickness</strong></td>
<td>1,27mm</td>
</tr>
<tr>
<td><strong>Bushing diameter</strong></td>
<td>18, 19, 20, 22, 24, 25, 26, 28, 30, 32, 34, 35 and 36mm</td>
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<tr>
<td><strong>Bushing length</strong></td>
<td>63,5mm</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
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### Keyway broaches 6mm

**REF:** 125-09-01-BR-00006

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<tr>
<td><strong>Model</strong></td>
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<td><strong>Broach dimensions</strong></td>
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</tr>
<tr>
<td><strong>Standard keys</strong></td>
<td>6 x 6mm</td>
</tr>
<tr>
<td><strong>Min./Max. Cutting length</strong></td>
<td>9,921mm / 63,5mm</td>
</tr>
<tr>
<td><strong>Required pressure</strong></td>
<td>2.100lbs / 952,54Kg</td>
</tr>
<tr>
<td><strong>Required shims/ Nr of passes</strong></td>
<td>1 shim / 2 passes</td>
</tr>
<tr>
<td><strong>Thickness</strong></td>
<td>1,587mm</td>
</tr>
<tr>
<td><strong>Bushing diameter</strong></td>
<td>18, 19, 20, 22, 24, 25, 26, 28, 30, 32, 34, 35 and 36mm</td>
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<tr>
<td><strong>Bushing length</strong></td>
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<td><strong>Weight</strong></td>
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### Keyway broaches 5mm

**REF:** 125-09-01-BR-00005

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<td><strong>Model</strong></td>
<td>C</td>
</tr>
<tr>
<td><strong>Broach dimensions</strong></td>
<td>9,52 x 298,45mm</td>
</tr>
<tr>
<td><strong>Standard keys</strong></td>
<td>5 x 5mm</td>
</tr>
<tr>
<td><strong>Min./Max. Cutting length</strong></td>
<td>9,921mm / 63,5mm</td>
</tr>
<tr>
<td><strong>Required pressure</strong></td>
<td>1.470lbs / 666,78Kg</td>
</tr>
<tr>
<td><strong>Required shims/ Nr of passes</strong></td>
<td>1 shim / 2 passes</td>
</tr>
<tr>
<td><strong>Thickness</strong></td>
<td>1,193mm</td>
</tr>
<tr>
<td><strong>Bushing diameter</strong></td>
<td>18, 19, 20, 22, 24, 25, 26, 28, 30, 32, 34, 35 and 36mm</td>
</tr>
<tr>
<td><strong>Bushing length</strong></td>
<td>63,5mm</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
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</tbody>
</table>
### Keyway broaches 5mm
**REF: 125-09-01-BR-00004**

<table>
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<tr>
<td><strong>Model</strong></td>
<td>B1</td>
</tr>
<tr>
<td><strong>Broach dimensions</strong></td>
<td>6,35 x 171,45mm</td>
</tr>
<tr>
<td><strong>Standard keys</strong></td>
<td>5 x 5mm</td>
</tr>
<tr>
<td><strong>Min./Max. Cutting length</strong></td>
<td>7,54mm / 42,862mm</td>
</tr>
<tr>
<td><strong>Required pressure</strong></td>
<td>1.860lbs / 843,68Kg</td>
</tr>
<tr>
<td><strong>Required shims/ Nr of passes</strong></td>
<td>1 shim / 2 passes</td>
</tr>
<tr>
<td><strong>Thickness</strong></td>
<td>1,27mm</td>
</tr>
<tr>
<td><strong>Bushing diameter</strong></td>
<td>12, 14, 15, 16, 17, 18 and 19mm</td>
</tr>
<tr>
<td><strong>Bushing length</strong></td>
<td>42,862mm</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>0,100 Kg. Approx.</td>
</tr>
</tbody>
</table>

### Keyway broaches 4mm
**REF: 125-09-01-BR-00003**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tolerance</strong></td>
<td>JS9 (-0,015 +0,01)</td>
</tr>
<tr>
<td><strong>Model</strong></td>
<td>B1</td>
</tr>
<tr>
<td><strong>Broach dimensions</strong></td>
<td>6,35 x 171,45mm</td>
</tr>
<tr>
<td><strong>Standard keys</strong></td>
<td>4 x 4mm</td>
</tr>
<tr>
<td><strong>Min./Max. Cutting length</strong></td>
<td>7,54mm / 42,862mm</td>
</tr>
<tr>
<td><strong>Required pressure</strong></td>
<td>1.140lbs / 517,09Kg</td>
</tr>
<tr>
<td><strong>Required shims/ Nr of passes</strong></td>
<td>1 shim / 2 passes</td>
</tr>
<tr>
<td><strong>Thickness</strong></td>
<td>0,965mm</td>
</tr>
<tr>
<td><strong>Bushing diameter</strong></td>
<td>12, 14, 15, 16, 17, 18 and 19mm</td>
</tr>
<tr>
<td><strong>Bushing length</strong></td>
<td>42,862mm</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>0,100 Kg. Approx.</td>
</tr>
</tbody>
</table>

### Keyway broaches 3mm
**REF: 125-09-01-BR-00002**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tolerance</strong></td>
<td>JS9 (-0,013 +0,009)</td>
</tr>
<tr>
<td><strong>Model</strong></td>
<td>A</td>
</tr>
<tr>
<td><strong>Broach dimensions</strong></td>
<td>3,175 x 127mm</td>
</tr>
<tr>
<td><strong>Standard keys</strong></td>
<td>3 x 3mm</td>
</tr>
<tr>
<td><strong>Min./Max. Cutting length</strong></td>
<td>5,159mm / 28,575mm</td>
</tr>
<tr>
<td><strong>Required pressure</strong></td>
<td>650lbs / 294,83Kg</td>
</tr>
<tr>
<td><strong>Required shims/ Nr of passes</strong></td>
<td>1 shim / 2 passes</td>
</tr>
<tr>
<td><strong>Thickness</strong></td>
<td>0,787mm</td>
</tr>
<tr>
<td><strong>Bushing diameter</strong></td>
<td>6, 8, 10, 12 and 15mm</td>
</tr>
<tr>
<td><strong>Bushing length</strong></td>
<td>28,575mm</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>0,020 Kg. Approx.</td>
</tr>
</tbody>
</table>
### Keyway Broaches 2mm

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Tolerance</td>
<td>JS9 (-0.014 +0.009)</td>
</tr>
<tr>
<td>Model</td>
<td>A</td>
</tr>
<tr>
<td>Broach dimensions</td>
<td>3.175 x 127mm</td>
</tr>
<tr>
<td>Standard keys</td>
<td>2 x 2mm</td>
</tr>
<tr>
<td>Min./Max. Cutting length</td>
<td>5.159mm / 28.575mm</td>
</tr>
<tr>
<td>Required pressure</td>
<td>720lbs / 326.58Kg</td>
</tr>
<tr>
<td>Required shims/ Nr of passes</td>
<td>0 shims / 1 pass</td>
</tr>
<tr>
<td>Bushing diameter</td>
<td>6, 8, 10, 12 and 15mm</td>
</tr>
<tr>
<td>Bushing length</td>
<td>28.575mm</td>
</tr>
<tr>
<td>Weight</td>
<td>0.020 Kg. Approx.</td>
</tr>
</tbody>
</table>

### Keyway Broaches 1 Inch

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tolerance</td>
<td>JS9 (1.0015 · 1.0025)</td>
</tr>
<tr>
<td>Model</td>
<td>F</td>
</tr>
<tr>
<td>Broach dimensions</td>
<td>1 x 20 1/4 inches</td>
</tr>
<tr>
<td>Min./Max. Cutting length</td>
<td>1 inch / 6 inches</td>
</tr>
<tr>
<td>Required pressure</td>
<td>11.100lbs</td>
</tr>
<tr>
<td>Required shims/ Nr of passes</td>
<td>7 shims / 8 passes</td>
</tr>
<tr>
<td>Thickness</td>
<td>0.0625 inches</td>
</tr>
<tr>
<td>Bushing diameter</td>
<td>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</td>
</tr>
<tr>
<td>Bushing length</td>
<td>6 inches</td>
</tr>
<tr>
<td>Weight</td>
<td>3,500 Kg. Approx.</td>
</tr>
</tbody>
</table>

### Keyway Broaches 7/8 Inch

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tolerance</td>
<td>JS9 (0.8765 · 0.8775)</td>
</tr>
<tr>
<td>Model</td>
<td>F</td>
</tr>
<tr>
<td>Broach dimensions</td>
<td>1 x 20 1/4 inches</td>
</tr>
<tr>
<td>Min./Max. Cutting length</td>
<td>1 inch / 6 inches</td>
</tr>
<tr>
<td>Required pressure</td>
<td>9.800lbs</td>
</tr>
<tr>
<td>Required shims/ Nr of passes</td>
<td>6 shims / 7 passes</td>
</tr>
<tr>
<td>Thickness</td>
<td>0.0625 inches</td>
</tr>
<tr>
<td>Bushing diameter</td>
<td>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</td>
</tr>
<tr>
<td>Bushing length</td>
<td>6 inches</td>
</tr>
<tr>
<td>Weight</td>
<td>3,500 Kg. Approx.</td>
</tr>
<tr>
<td>Keyway broaches 3/4 inch</td>
<td>REF: 125-09-01-BRP-00018</td>
</tr>
<tr>
<td>-------------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td><strong>Tolerance</strong></td>
<td>JS9 (0.7515 · 0.7525)</td>
</tr>
<tr>
<td><strong>Model</strong></td>
<td>E</td>
</tr>
<tr>
<td><strong>Broach dimensions</strong></td>
<td>3/4 x 15 1/2 inches</td>
</tr>
<tr>
<td><strong>Min./Max. Cutting length</strong></td>
<td>1 pulgada / 6 inches</td>
</tr>
<tr>
<td><strong>Required pressure</strong></td>
<td>11.900Ibs</td>
</tr>
<tr>
<td><strong>Required shims/ Nr of passes</strong></td>
<td>5 shims / 6 passes</td>
</tr>
<tr>
<td><strong>Thickness</strong></td>
<td>0.0625 inches</td>
</tr>
<tr>
<td><strong>Bushing diameter</strong></td>
<td>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</td>
</tr>
<tr>
<td><strong>Bushing length</strong></td>
<td>6 inches</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>1,500 Kg. Approx.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Keyway broaches 5/8 inch</th>
<th>REF: 125-09-01-BRP-00017</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tolerance</strong></td>
<td>JS9 (0.6260 · 0.6270)</td>
</tr>
<tr>
<td><strong>Model</strong></td>
<td>E</td>
</tr>
<tr>
<td><strong>Broach dimensions</strong></td>
<td>3/4 x 15 1/2 inches</td>
</tr>
<tr>
<td><strong>Min./Max. Cutting length</strong></td>
<td>1 inch / 6 inches</td>
</tr>
<tr>
<td><strong>Required pressure</strong></td>
<td>9.600lbs</td>
</tr>
<tr>
<td><strong>Required shims/ Nr of passes</strong></td>
<td>4 shims / 5 passes</td>
</tr>
<tr>
<td><strong>Thickness</strong></td>
<td>0.0625 inches</td>
</tr>
<tr>
<td><strong>Bushing diameter</strong></td>
<td>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</td>
</tr>
<tr>
<td><strong>Bushing length</strong></td>
<td>6 inches</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>1,500 Kg. Approx.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Keyway broaches 9/16 inch</th>
<th>REF: 125-09-01-BRP-00016</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tolerance</strong></td>
<td>JS9 (0.5631 · 0.5641)</td>
</tr>
<tr>
<td><strong>Model</strong></td>
<td>D</td>
</tr>
<tr>
<td><strong>Broach dimensions</strong></td>
<td>9/16 x 13 7/8 inches</td>
</tr>
<tr>
<td><strong>Min./Max. Cutting length</strong></td>
<td>1 inch / 6 inches</td>
</tr>
<tr>
<td><strong>Required pressure</strong></td>
<td>8.900lbs</td>
</tr>
<tr>
<td><strong>Required shims/ Nr of passes</strong></td>
<td>4 shims / 5 passes</td>
</tr>
<tr>
<td><strong>Thickness</strong></td>
<td>0.0560 inches</td>
</tr>
<tr>
<td><strong>Bushing diameter</strong></td>
<td>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</td>
</tr>
<tr>
<td><strong>Bushing length</strong></td>
<td>6 inches</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>1.00 Kg. Approx.</td>
</tr>
</tbody>
</table>
### 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 inches
- **Required pressure:** 9.800Ibs
- **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:** 9.400Ibs
- **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:** 3:00 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:** 9.400Ibs
- **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:** 2:30 min.
### Keyway broaches 5/16 inch

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference</td>
<td>125-09-01-BRP-00012</td>
</tr>
<tr>
<td>Tolerance</td>
<td>JS9 (0.3127 · 0.3137)</td>
</tr>
<tr>
<td>Model</td>
<td>D</td>
</tr>
<tr>
<td>Broach dimensions</td>
<td>9/16 x 13 7/8 inches</td>
</tr>
<tr>
<td>Min./Max. Cutting length</td>
<td>1 inch / 6 inches</td>
</tr>
<tr>
<td>Required pressure</td>
<td>8.000lbs</td>
</tr>
<tr>
<td>Required shims/ Nr of passes</td>
<td>2 shims / 3 passes</td>
</tr>
<tr>
<td>Thickness</td>
<td>0.0560 inches</td>
</tr>
<tr>
<td>Bushing diameter</td>
<td>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 3/4, 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</td>
</tr>
<tr>
<td>Bushing length</td>
<td>4 inches</td>
</tr>
<tr>
<td>Weight</td>
<td>1.00 Kg. Approx.</td>
</tr>
</tbody>
</table>

### Keyway broaches 3/8 inch

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference</td>
<td>125-09-01-BRP-00011</td>
</tr>
<tr>
<td>Tolerance</td>
<td>JS9 (0.3755 · 0.3765)</td>
</tr>
<tr>
<td>Model</td>
<td>C</td>
</tr>
<tr>
<td>Broach dimensions</td>
<td>3/8 x 11 3/4 inches</td>
</tr>
<tr>
<td>Min./Max. Cutting length</td>
<td>25/64 inch / 2 1/2 inches</td>
</tr>
<tr>
<td>Required pressure</td>
<td>4.340lbs</td>
</tr>
<tr>
<td>Required shims/ Nr of passes</td>
<td>2 shims / 3 passes</td>
</tr>
<tr>
<td>Thickness</td>
<td>0.0625 inches</td>
</tr>
<tr>
<td>Bushing diameter</td>
<td>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</td>
</tr>
<tr>
<td>Bushing length</td>
<td>2 1/2 inches</td>
</tr>
<tr>
<td>Weight</td>
<td>0.350 Kg. Approx.</td>
</tr>
</tbody>
</table>

### Keyway broaches 5/16 inch

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference</td>
<td>125-09-01-BRP-00010</td>
</tr>
<tr>
<td>Tolerance</td>
<td>JS9 (0.3127 · 0.3137)</td>
</tr>
<tr>
<td>Model</td>
<td>C</td>
</tr>
<tr>
<td>Broach dimensions</td>
<td>3/8 x 11 3/4 inches</td>
</tr>
<tr>
<td>Min./Max. Cutting length</td>
<td>25/64 inch / 2 1/2 inches</td>
</tr>
<tr>
<td>Required pressure</td>
<td>3.960lbs</td>
</tr>
<tr>
<td>Required shims/ Nr of passes</td>
<td>2 shims / 3 passes</td>
</tr>
<tr>
<td>Thickness</td>
<td>0.0550 inches</td>
</tr>
<tr>
<td>Bushing diameter</td>
<td>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</td>
</tr>
<tr>
<td>Bushing length</td>
<td>2 1/2 inches</td>
</tr>
<tr>
<td>Weight</td>
<td>0.350 Kg. Approx.</td>
</tr>
</tbody>
</table>
### Keyway broaches 1/4 inch

**REF:** 125-09-01-BRP-00009

<table>
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<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tolerance</strong></td>
<td>JS9 (0.2502 · 0.2512)</td>
</tr>
<tr>
<td><strong>Model</strong></td>
<td>C</td>
</tr>
<tr>
<td><strong>Broach dimensions</strong></td>
<td>3/8 x 11 3/4 inches</td>
</tr>
<tr>
<td><strong>Min./Max. Cutting length</strong></td>
<td>25/64 inch / 2 1/2 inches</td>
</tr>
<tr>
<td><strong>Required pressure</strong></td>
<td>2.520 lbs</td>
</tr>
<tr>
<td><strong>Required shims/ Nr of passes</strong></td>
<td>1 shim / 2 passes</td>
</tr>
<tr>
<td><strong>Thickness</strong></td>
<td>0.0625 inches</td>
</tr>
<tr>
<td><strong>Bushing diameter</strong></td>
<td>3/4, 13/16, 7/8, 15/16, 1, 1 1/16, 1 1/8, 1 3/16, 1 5/16, 1 3/8, 1 7/16, 1 1/2 and 1 9/16 inches</td>
</tr>
<tr>
<td><strong>Bushing length</strong></td>
<td>2 1/2 inches</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>0.350 Kg. Approx.</td>
</tr>
<tr>
<td><strong>Broaching time</strong></td>
<td>1:20 min.</td>
</tr>
</tbody>
</table>

### Keyway broaches 3/16 inch

**REF:** 125-09-01-BRP-00008

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tolerance</strong></td>
<td>JS9 (0.1877 · 0.1887)</td>
</tr>
<tr>
<td><strong>Model</strong></td>
<td>C</td>
</tr>
<tr>
<td><strong>Broach dimensions</strong></td>
<td>3/8 x 11 3/4 inches</td>
</tr>
<tr>
<td><strong>Min./Max. Cutting length</strong></td>
<td>25/64 inch / 2 1/2 inches</td>
</tr>
<tr>
<td><strong>Required pressure</strong></td>
<td>1.540 lbs</td>
</tr>
<tr>
<td><strong>Required shims/ Nr of passes</strong></td>
<td>1 shim / 2 passes</td>
</tr>
<tr>
<td><strong>Thickness</strong></td>
<td>0.0500 inches</td>
</tr>
<tr>
<td><strong>Bushing diameter</strong></td>
<td>3/4, 13/16, 7/8, 15/16, 1, 1 1/16, 1 3/16, 1 5/16, 1 3/8, 1 7/16, 1 1/2 and 1 9/16 inches</td>
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<tr>
<td><strong>Bushing length</strong></td>
<td>2 1/2 inches</td>
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<tr>
<td><strong>Weight</strong></td>
<td>0.350 Kg. Approx.</td>
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<tr>
<td><strong>Broaching time</strong></td>
<td>1:20 min.</td>
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### Keyway broaches 3/16 inch

**REF:** 125-09-01-BRP-00007

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<td><strong>Broach dimensions</strong></td>
<td>3/16 x 6 3/4 inches</td>
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<tr>
<td><strong>Min./Max. Cutting length</strong></td>
<td>19/64 inch / 1 11/16 inches</td>
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<tr>
<td><strong>Required pressure</strong></td>
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<tr>
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<td>1/2, 9/16, 5/8, 11/16, 3/4, 13/16 and 7/8 inch</td>
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<tr>
<td><strong>Bushing length</strong></td>
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<tr>
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### Keyway broaches 5/32 inch

**Ref:** 125-09-01-BRP-00006

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<tr>
<td>Min./Max. Cutting length</td>
<td>19/64 inch / 1 11/16 inches</td>
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<tr>
<td>Required pressure</td>
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<td>0.0420 inches</td>
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<td>Bushing diameter</td>
<td>1/2, 9/16, 5/8, 11/16, 3/4, 13/16 and 7/8 inch</td>
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<tr>
<td>Bushing length</td>
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### Keyway broaches 1/8 inch

**Ref:** 125-09-01-BRP-00005

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<tr>
<td>Min./Max. Cutting length</td>
<td>19/64 inch / 1 11/16 inches</td>
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<tr>
<td>Required pressure</td>
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<td>Bushing length</td>
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### Keyway broaches 3/32 inch

**Ref:** 125-09-01-BRP-00004

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### Keyway Broaches 1/8 inch

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<td><strong>Min./Max. Cutting length</strong></td>
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<tr>
<td><strong>Required pressure</strong></td>
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<td><strong>Required shims/ Nr of passes</strong></td>
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<tr>
<td><strong>Thickness</strong></td>
<td>0,0310 inches</td>
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<tr>
<td><strong>Bushing diameter</strong></td>
<td>1/4, 5/16, 3/8, 7/16 and 1/2 inch</td>
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### Keyway Broaches 3/32 inch

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<td><strong>Broach dimensions</strong></td>
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<td><strong>Min./Max. Cutting length</strong></td>
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<td><strong>Required pressure</strong></td>
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<td>1/4, 5/16, 3/8, 7/16 and 1/2 inch</td>
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<td><strong>Bushing length</strong></td>
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### Keyway Broaches 1/16 inch

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<td><strong>Min./Max. Cutting length</strong></td>
<td>13/64 inch / 1 1/8 inches</td>
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<tr>
<td><strong>Required pressure</strong></td>
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</tr>
<tr>
<td><strong>Required shims/ Nr of passes</strong></td>
<td>1 shim / 2 passes</td>
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<tr>
<td><strong>Thickness</strong></td>
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<tr>
<td><strong>Bushing diameter</strong></td>
<td>1/4, 5/16, 3/8, 7/16 and 1/2 inch</td>
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<td><strong>Bushing length</strong></td>
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<td><strong>Weight</strong></td>
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Technical annex
Vertical broacher BM25

List of parts
Piston assembly
Hydraulic group
Electric map
Hydraulic map
A1. List of parts
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<td>CONJUNTO FRONTAL BM25</td>
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<td>Manometro 0-300 Bars D63 Empotrable Toma 1/4 Trasera</td>
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<td>Policarbonato lateral BM25</td>
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<td>Tapa superior frontal BM25</td>
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<td>TORNILLO ALLEN DIN 7991 M6x12</td>
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<td>RACOR MACHO MACHO 3/8&quot;</td>
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<td>CODO GIRATORIO MACHO HEMBRA 1/4&quot;</td>
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<td>MANGUERA 3/8&quot; - MACHO 3/8&quot; - ESFERA 3/8 L=1750 mm</td>
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<td>MANGUERA 3/8&quot; - CODO TG 3/8&quot; - ESFERA 3/8&quot; L=880 mm</td>
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<td>Calca de mandos BM25</td>
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<td>PRENSAESTOPA M12</td>
<td>050-PE-00001</td>
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A2. Piston assembly
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<td>Dolla Bronce</td>
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<td>Conjunto Soldado Pistón</td>
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<td>Vástago Pistón</td>
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<td>040-JMG-00004</td>
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<td>163.05</td>
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<td>Tornillo Para Esfera De 3/8</td>
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<td>SUPLEMENTO MACHO HEMBRA 3/8&quot;</td>
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<td>JUNTA TORICA D73X4 90 Shore</td>
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<td>JUNTA DPS 80X66X16X32</td>
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A3. Hydraulic group
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<td>![Image](443x794 to 557x815)</td>
<td>Conjunto Soldado Deposito BM25</td>
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<td>![Image](85x130 to 510x698)</td>
<td>NIVEL DE ACEITE 3/8”</td>
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<td>Campana Acoplamiento Bomba Tipo Lo Motor 3/4/5.5 C.V.</td>
<td>040-CA-00002</td>
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<td>164.04</td>
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<td>Motor Electrico 2.2Kw 1500Rpm 50-60Hz B5 220/380V</td>
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<td>ARANDELA DIN 125 B M10</td>
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A: Use 4 Phillips Mx13 Abomed head zinc thread plate screws to fix the plate to the plastic box.
B: Use 4 Allen Mx10 Abomed head pan head screws to fix the plastic box to the machine.
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
WARRANTY REGISTRATION

1. Among www.nargesa.com on our site
2. Select the menu Warranty Registration

3. Complete the form with your details and press Submit

4. Message Sent: confirms your data has been successfully sent to Prada Nargesa SL. Your machine has been registered and has a warranty of three years in total.

Your request has been sent correctly. We will contact you right away to confirm that your warranty has been extended up to three years.