



poliangolar®

broaching slotting tothing

TECHNICAL MANUAL



WORKING PARAMETERS

- **Number of revolutions:** depending on the Poliangular broaching holder used

Internal broaching tool holders:

| Model | MICRO | 0100N | 0200N | 0500N | 1100N 1100S | 2100N 2100S | 3100N 3100S | 4100XS |
|-------|-------|-------|-------|-------|----------------|-------------|----------------|--------|
| RPM | 2.000 | 1.500 | 1.500 | 1.500 | 1.200 | 1.000 | 800 | 800 |

External broaching tool holders:

| Model | 0200E | 0500E | 5100E | 7100E | 8100E | 9100E |
|-------|-------|-------|-------|-------|-------|-------|
| RPM | 1.500 | 1.500 | 1.200 | 1.000 | 800 | 600 |

- **Standard feeds for internal slots.** [For external slots use halve feeds].

| WORKING MATERIAL: | FEED IN mm/revolution FOR HEXAGONS [for squares, torx and specials, halve feeds] |
|--|--|
| Soft steel up to 1,000 kg/mm ² (AVP, C40...) | 0,10 |
| Hard steel over 1,000 kg/mm ² (K100, K720...) | 0,06 |
| Stainless steel | 0,07 |
| Cast iron | 0,10 |
| Aluminium | 0,15 |
| Brass | 0,15 |
| Bronze | 0,10 |
| Titanium | 0,05 |

Pre-hole for hexagons: MUST be as the inscribed diameter, but recommended 5% larger
Pre-drilling for squares or other: MUST be as the inscribed diameter, but recommended 10% larger

**Rotary broaching, thanks to stripping grades obtained by Poliangular products,
reduces by 70% the effort that would be required if the same work were to be carried out by press.**

- **Operation Instructions**

The data refers to a rigid and precise machine tool.

After mounting the broaching holder on the machine tool, it is necessary to ensure its concentricity with the axis of the workpiece only, as the tool is already perfectly aligned with the Poliangular unit.

Lubrication must be adequate: it is best to use cutting oil, especially for toothed profiles, but we can achieve the same good results with emulsifiable oil. The lubricant has a great influence on the degree of finish of the profile.

The workpiece must be well clamped and machining must be done as close as possible to the grip of the workpiece. In the case of tothing, a vertical machine, rather than horizontal, should always be preferred.



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ORIENTATION LEVER



Whenever possible, it is always recommended to use the orientation lever, which is supplied with the machine, as it solves a number of problems during machining.

It serves to:

- position the tool in order to orient the sides or the edge with respect to a particular reference;
- avoid, particularly when machining deep recesses, the screwing of the tool and therefore of the recess itself, caused by the various frictions that occur during machining;
- avoid exposing the tool to unnecessary initial stress as, since the tool is inclined with respect to the cutting plane, it would cause the machining process to skip, thus jeopardising both the machining process itself and the finish of the workpiece and, consequently, the tool's life.

ROTARY BROACHING ON CNC LATHE WITHOUT ORIENTATION LEVER



When machining on a CNC lathe, in most cases it is not possible to use the drive lever (unless you are using a 'motorised' one) as there are usually other machining operations before or after using the Poliangular unit. In this case, broaching can still be carried out by starting machining in another way:

Start the spindle at approx. 50 rpm, lean the tool against the workpiece and enter for approx. 1 mm with a feed of F0.1 so that all the edges of the tool are entered and, only when this depth has been reached, start with the speed and feed values most suitable for the machining.

An example of programming on a numerical control is shown below:

G0 = rapid speed / G1 = working speed / M3 = clockwise rotation / M4 = counterclockwise rotation /
F = feed rate mm/revolution / S = rotation rpm

N1 G0 X0 Z1 S50 (Poliangular positioned 1mm from workpiece zero)

N2 G1 Z-1 F0.1 (Punch creates sufficient impression for dragging)

N3 S1200 (Example of optimum rotation)

N4 G1 Z-21 F0.05 (example of end of machining with optimum feed)

N5 G1 Z1 F3 (Return with fast but not rapid feed)