
# Instructions for operating and programming

Dear customer

Thank you for purchasing the ***gravostar*** and the trust you put in our product.
Although the marking tool excels through its smooth handling, we would like to ask you to carefully read the following indications and safety regulations!

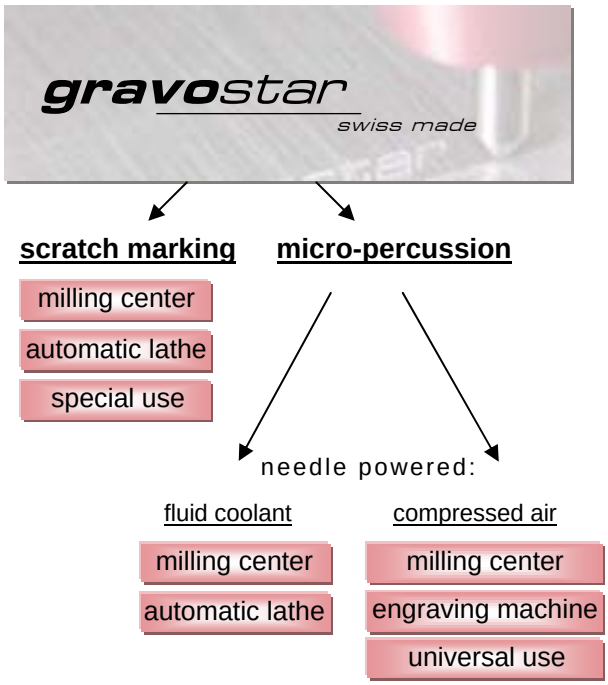
## A: Operational features

- **very high marking speed (up to more than 5.000 mm/min possible)**
- **no spindle speed required**
- **no material removal, therefore no notch as a result of the marking**
- **absolutely minimum surface pressure, since individual marking dots are created consecutively**
- **practically abrasion-free operation of the marking needle (needle point can be re sharpened if required)**
- **suitable for all materials (also hardened materials up to 62 HRC)**
- **integrated space compensations function: micro-percussing approx. 0.5 or 5.0 mm / scratching approx. 8 mm (inscription of shafts, uneven surfaces or as dimensional tolerance compensation)**
- **marking can be completely integrated in process**

## B: Applications

The ***gravostar*** can be used as inscribing tool in a large variety of machine tools. The desired marking contour is then driven by the machine. With the exception of the idle spindle, the sequence of motions is that of engraving.

# C: Functional description




micro-percussing

Contrary to engraving the micro-percussing process has no material waste or consumption – but a fine punctual compaction of the material, caused by the vertical oscillation of the marking needle.

All functional elements of the impulse steering system are integrated in the micro-percussion tool. As soon as the compressed air flow or the internal cooling fluid is switched on, the needle begins to oscillate with a frequency of approx. 300 Hz/sec. Based upon the high swinging frequency of the needle, the marking dots are so closely lined up, that they are not recognizable as single dots and therefore a continuous line results.

Scratching

Unlike micro-percussing, type R-20 does not require a drive unit. The scratch marking is made by the pressure-loaded scratch needle running over the workpiece area to be marked. The charging pressure and therefore the depth of the marking can be adjusted on the sleeve.

As in micro-percussing, the marking contour is driven by the machine. Very well suited for fine markings, the scratching process creates clearly visible marking contours.

# D: Handling of micro-percussing

**Powered by compressed air:** range of use approx. 4 – 8 bar (types H-20 / HV-20)

The swing-out of the needle depends on the present pressure. This means that pressure fluctuations may be lead to changes in the typeface. It is therefore urgently recommended to insert a separate pressure control valve when using an air-driven micro-percussing tool!

Adjusting the marking position:
When air supply switched on, guide towards to the work piece until the needle point touches the area to be marked. For an optimal marking position, a lining of approx. 0.2-0.5 mm should be provided afterwards.

**Note:** in tool presetting it should be taken into consideration that the tool length will set approx. 2-3 mm longer! This is necessary, because during operation the marking needle protracts by this length after the compressed air is switched on.

**Cooling fluid water:** range of use approx. 10 – 50 bar (types W-20 / WS-20)
**Cooling fluid oil:** range of use approx. 10 – 50 bar (type WS-20)
For the different pressure of the coolant fluid the suitable carrying sleeve with corresponding springs are obtainable: 10 bar / 20-30 bar / 40 bar

Important: for the avoidance of malfunctions doe to into the marking tool arriving splitters the machine must be provided with an appropriate fluid cooling filtering unit!

**Note:** tool presetting **Type W-20**: tool length **+ 4 mm**
**Type WS-20:** tool length **+ 6 mm**
This measure corresponds to the maximally attainable tool length when the needle is completely driven out. With accurately adjusted coolant pressure the needle however never swings out so far.

Adjusting the marking position: (depending on coolant pressure and output)
With first start-up the internal cooling system should be switched on and be examined the pressure at the manometer of the cooling fluid pump with assigned ***gravostar***.

1.) The marking cycle may be turned on with the internal cooling switched off in order to check the marking position. In case the position is correct, the distance between needle and the area to be marked is now 4 or 6 mm respectively.
2.) The sequence must be programmed in such a way that the internal cooling switches on when the tool is at least 10 mm still in front of the area to be marked.
3.) Start marking program first with internal cooling switched on. In case of correlation of coolant pressure and carrying sleeve of the ***gravostar*** , no marking must be visible in this position!
4.) Shorten tool length or adjust penetration depth by at first 0.5 mm.
Run marking program a second time with the new adjustment.
5.) If there is still no marking visible on the work piece, adjust by another 0.5 mm and run marking cycle another time.
6.) Repeat until the satisfactory marking is obtained.
**Attention**: only the following maximum adjustments must be made –
**type W-20: 4 mm / type WS-20: 6 mm**

Adjustment of the frequency of oscillation with the type WS-20

If necessary, the frequency of oscillation can be adjusted with the WS-20. This adjustment takes place via twist of the gold coloured setting shim:

1.) Disassembly of the carrying sleeve by removing the two M4 screws.
2.) The setting shim is moveable now by hand on the desired position.

In this way four attitudes are possible. If a slower frequency of oscillation is aimed at, the disk is to be turned in such a way that the bleed bore which is under it is more covered. In the supplied basic adjustment is those silver face of the setting shim on the position of the half covered bleed bore.

Rate of feed:

The rate of feed can be selected as desired. If the rate of feed is more than 3.000 mm / min there is no continous line but the individual embossing dots will be visible. Rate of feed up to approx. 500 mm / min the marking depth can increase, because several dots are practically embossed at the same position.

## E: Inscription software

With certain software types can occur it that with ***gravostar*** the inscription does not appear clear. The reason is that the individual letters and numbers are driven off not in an expiration, but built up from small lines.
With the occurrence of this problem please contact us. For most controllers this can be repaired with a simple auxiliary program, which can be installed for minimum costs.

## F: Scratch marking

Depending on the scratch marking depth required, the spring pretension acting on the marking needle can be adjusted on the sleeve.
For adjustment of the marking position towards the work piece until the needle point touches the area to be marked. An adjustment by some tenths of a millimetre, the marking needle is pressed back and the needle pretension increased at the same time.

Rate of feed:

Up to approx. 5'000 mm / min; reduce the rate if required when marking uneven surfaces.

## G: Needle replacement

Micro-percussion tool operated by internal cooling system:
Remove carrying sleeve by unscrewing the two M4 screws. The needle can then be removed manually from the carrying sleeve.

Micro-percussion tool operated by compressed air:
Manually unscrewing carrying sleeve from the adaptor. Slightly press out the needle from behind, secure against springing back with pincers or in bench vise. By removing of the o-ring, the needle can be drawn from the carrying sleeve. (Caution: spring is loaded)
**Note: Type PP** (needle diameter 5 mm) push on carrying sleeve while unscrewing; spring is loaded against adaptor!

Scratch marking tool:
Manually unscrew carrying sleeve from the adaptor and draw from the carrying sleeve.

## H: Maintenance

Because the simple construction of the marking tools, periodic maintenance is not required. With longer non usage however the marking needle and/or the control valve can stick together with the W-20 / WS-20 somewhat. This is repaired, as by the inlet drilling of the cooling fluid at the clamping shank something lubrication spray is squirted. Afterwards the perfect rotation of the valve should be tested by short injecting of compressed air by the inlet drilling. (With correctly function a well audible, turbine-like noise rings out)

Likewise for problems with stuck together needle this can be repaired with lubrication spray and following easy pulling out (ev. pliers to assistance to take).
Doe to the high degree of hardness (92 HRC) of the marking needle, can be proceeded from a practically wear-free enterprise. If the needle should have itself after several hours of application nevertheless once somewhat worn out, can be sharpened the point.
(when re sharpen the needle note that that this will provide at the point a small radius – approx. R 0.2)

## I: Safety instructions

Before unscrewing the carrying sleeve or compressed air feed please ensure the compressed air supply or coolant supply is interrupted. When the tool is attached to machine tools, this has to be taken into account, adhering to the following safety instructions:

1. With inserted marking tool with lateral compressed air:
   **Never have the tool spindle running!**
2. Keep your hands off the marking tool range when machine feed is switched on.
   **Coolant fluid:** Range approx. 10 – 50 bar (types W-20 / WS-20)

## K: Warranty

We grant one year warranty on material and workmanship, provided that no improper use occurred and the guidelines of this operating instruction were adhered to.

## L: Patent protection

The micro-percussion tool, there is international patent pending at the patent office. The relevant examinations are currently carried out.

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