

## Operating Manual

# Multi - Marker

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# *Multi-Marker*



Dear Customer,

With your purchase of the *Multi-Marker*, you have opted for one of the best marking systems on the market.

This operating manual aims to help you to produce outstanding, professional marking results on your product, in next-to-no time. Starting with the standard parameters, you will soon find the ideal setting for your own parameters so that you can use the Marker to produce excellent lettering and make full use of the possibilities of this product.

The Marker featured in this manual complies with valid safety regulations. As long as it is operated according to this manual, the *Multi-Marker* poses absolutely no risk to the operator or to the workpiece.

Technical modifications on the basis of new research and technology may be introduced without prior announcement.

We now wish you lots of fun and every success in using the *Multi-Marker*.

Your SCHILLING-Team

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## Important Safety Instructions

Read the instructions for installation of the device. This can prevent possible damage to the device.

1. The device must only be operated with the supplied cables and leads.
2. Do not place anything on the cables and connections.
3. Position the device and connections in such a way that no one can step on them, drive over them or stumble over them.
4. The device requires no maintenance. The device can be damaged if the covers are opened or removed.
5. Damage to the security seal makes all guarantee and warranty claims null and void.
6. Study the operating manual thoroughly before changing any parameters and settings.
7. Use dry, dust-free and oil-free compressed air. Otherwise damage can be caused to the solenoid valves, producing incorrect marking results.

### Contact our technical maintenance staff if..

- the mains cable is worn through or the mains connector / adapter is damaged;
- the transfer cable is worn through or the connector is damaged;
- liquid has been split on the device;
- the device has been exposed to rain or water;
- the device has been dropped or damaged;
- the output of the device or the marking quality changes clearly.

Incorrect connections or settings can cause damage which then has to be corrected in a difficult, complicated procedure by a qualified technician to make sure that the device works properly again.

### Information on the operating manual:

General statements are made in black print.

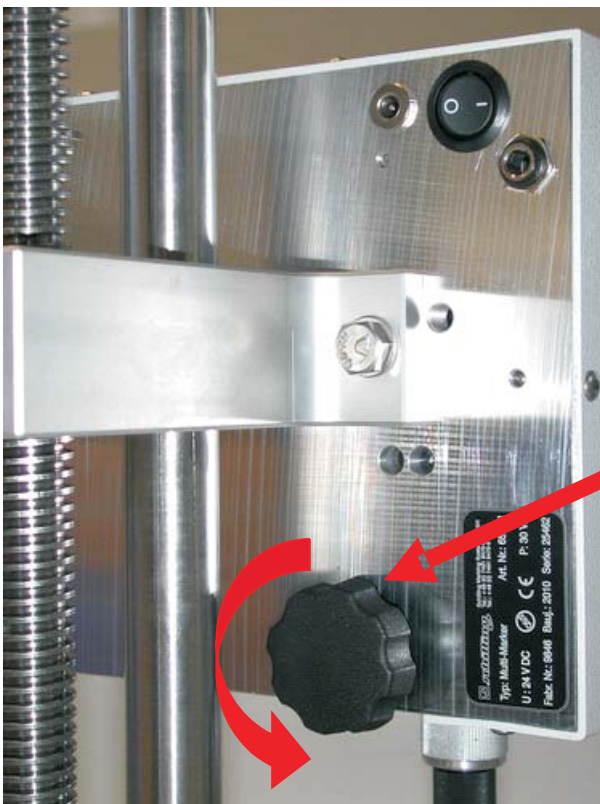
Red print refers to safety instructions or important information.

Blue print gives you instructions to be carried out.

Please let us know if certain passages are confusing or even incomprehensible. We are always glad to receive your suggestions.



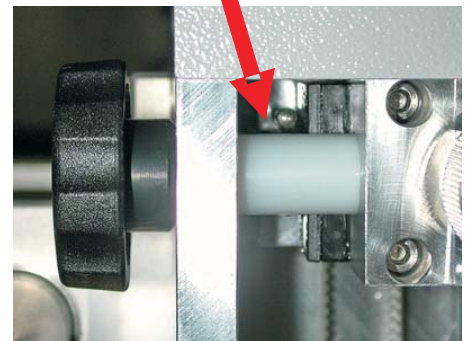
# ! Achtung ! ! Attention !



**DE:** Vor Inbetriebnahme bitte die Transportsicherung entfernen.

**GB:** Remove the transport bracket before starting.

**FR:** Enlever le dispositif de transport avant la mise en service



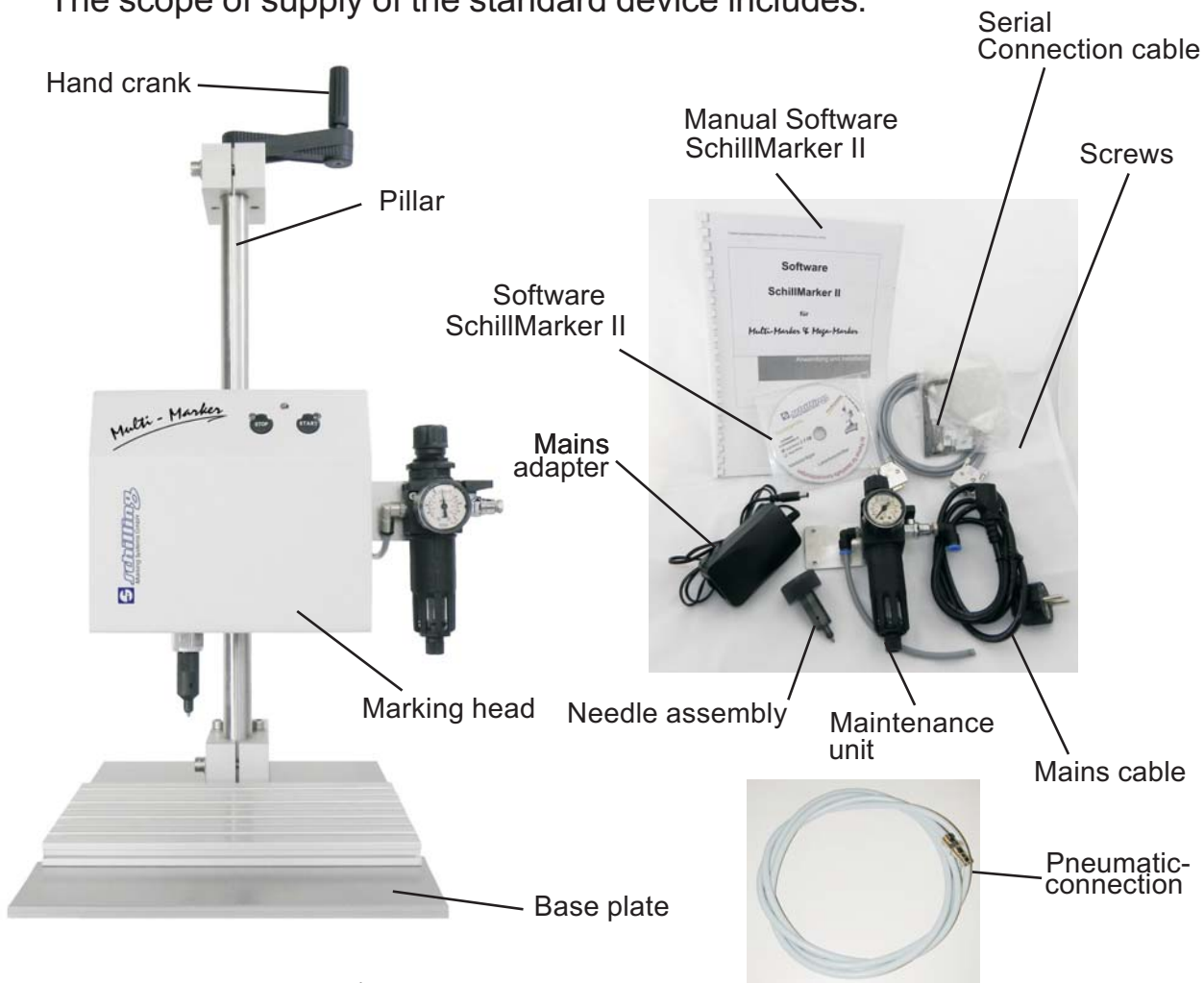
**DE:** Bitte bewahren sie die 2 Teile im Fall eines späteren Transports auf.

**GB:** Please retain the two parts in case you need to reship the Multi-Marker.

**FR:** Conserver ces deux pièces au cas où vous auriez à réexpédier le Multi-Marker

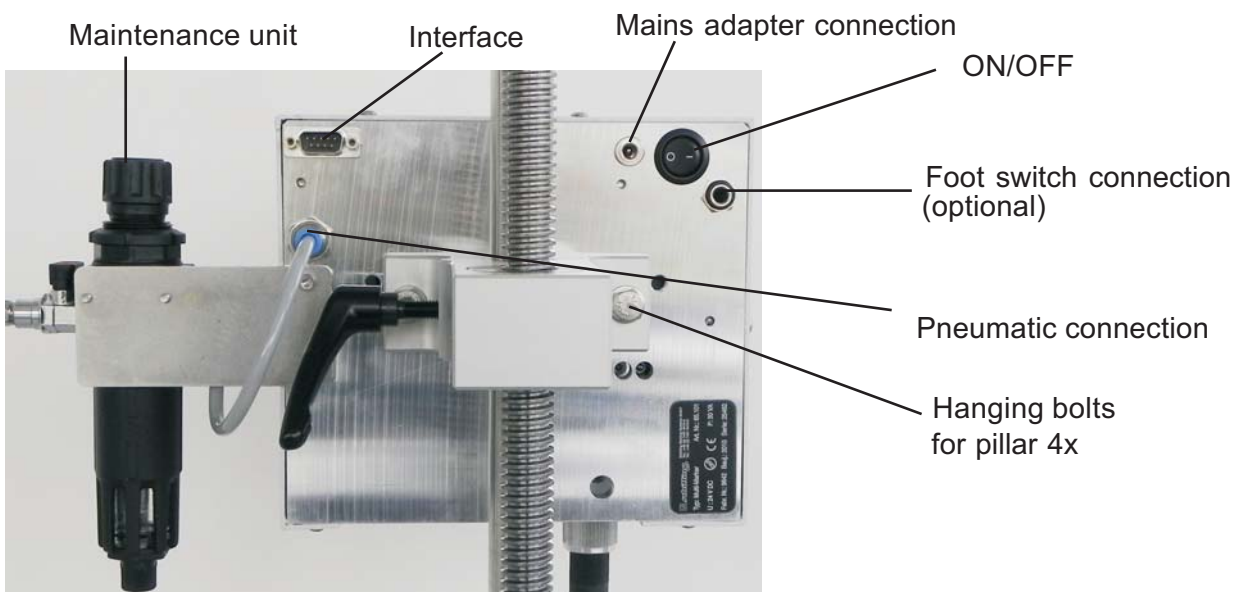
## Scope of delivery and installation of the *Multi-Marker*

The scope of supply of the standard device includes:



Scope of supply  
*Multi-Marker*

### The rearp of the *Multi-Marker*



## Installation of the *Multi-Marker*

Mount the crank handle to the pillar and the maintenance unit to the back right of the marking head.

### Power supply:

Please ensure that the mains switch is set to „OFF“ (O).  
Connect the mains adapter to the marking head (connection back left of the marking head).  
Connect the mains cable to the mains adapter. Connect the mains cable to a suitably fused socket.

### Pneumatic supply:

Connect the short pneumatic hose with the inlet on the back right of the marking head and with the outlet on the maintenance unit (left). Then connect the pneumatic supply hose in the inlet of the maintenance unit, and then in the pneumatic supply network.

Proceed in the correct order!

**Caution!** Use dry, dust-free and oil-free compressed air.  
Otherwise the solenoid valves can be damaged.

### Needle assembly:

Loosen the fixing screw on the right of the pillar and crank the marking head upwards so that you can fit the needle component easily.

Check the needle component!

It consists of the needle holder housing, a plain washer 6 mm inner diameter, spring and needle with piston.

Proceed with assembly as follows.

First place the washer in the cylinder, then the spring on the washer, and then insert the needle!

When fitting the device, do not tighten the needle holder too tight because otherwise the O-ring can get crushed.



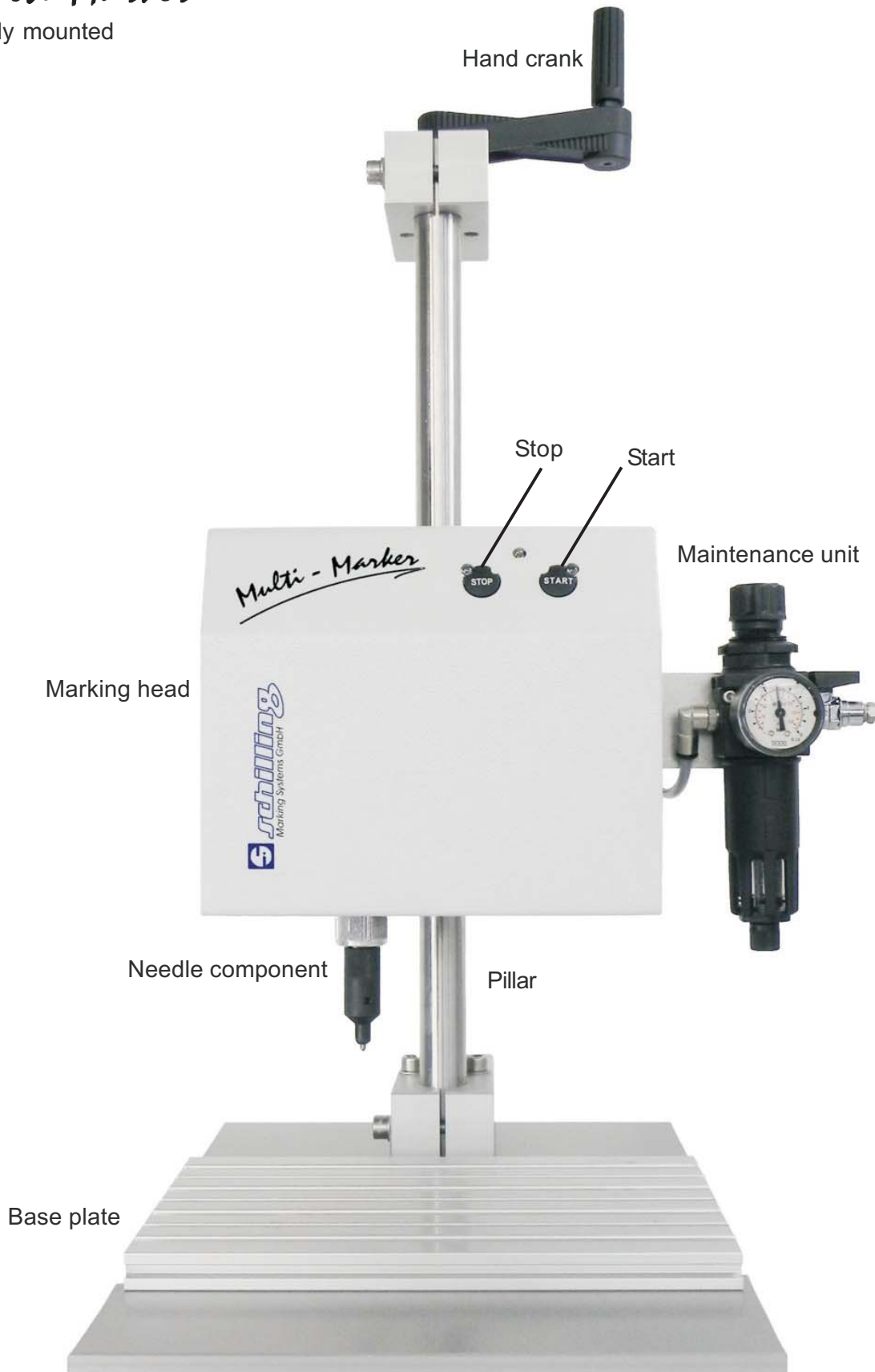
Now open the shut-off valve at the maintenance unit and adjust the pressure initially to approx. 2.5 bar. If the marking is too fine, increase the pressure as required.

### Spacing the needle to the workpiece:

After mounting a workpiece adapter or similar and inserting a workpiece, turn the marking head down until the needle tip is approx. 1 to 1.5 mm from the workpiece. Fix the marking head in this position with the fixing screw.

# Multi-Marker

ready mounted



## Optional accessories:

### Foot switch

The foot switch is connected to the back of the *Multi-Markers* and makes it easier to start the marking process if the workpiece is being held under the marking needle with both hands

### Needles

3 mm needle, light with soft spring

3 mm needle, medium heavy with hard spring

All needles available in 60°, 90° and 118° angles.

Special needle and needle holder lengths available on request.

### Workpiece adapters

On request we can also gladly supply workpiece adapters produced especially to your needs, or we can help you to procure fixing aids. It goes without saying that we will gladly provide advice and support here.

## Introduction to marking technology

The marking procedure **displaces material**, and does not remove it. This means the material is compacted at the point where the needle penetrates the material surface. At the same time the material is displaced, producing a warp of material at the side and in front of the needle puncture point.

The deeper the needle penetrates the material, the higher the material warp.

### Penetration depth:

Is defined by the needle weight, the spacing of the needle to the workpiece and the pressure applied to the needle, together with the geometry of the needle tip.

Regardless of the needle type and geometry, as a basic rule it always applies that:

the larger the spacing of the needle to the workpiece, the higher the pressure setting at the maintenance unit, the deeper the marking.

The **penetration depth** defines the marking quality!

Fine lettering – slight depth

Keep the needle spacing to the workpiece as small as possible (approx. 0.5 mm).  
Reduce the pressure at the pressure valve accordingly (approx. 1,5 -1,8 bar).

Uses:

- for very thin material
- for very small lettering (e.g. 0,5 mm lettering height)
- to avoid material warping at the displacement point

Normal lettering - medium depth - light needle component

Needle spacing approx. 1 mm to 1,5 mm above the material surface.  
Pressure approx.. 2,5 bar (depends on the material).

Uses:

- for the most common marking types with character height > 1 mm



## Needle frequency

*Needle frequency* in Hertz (Hz) indicates how often the needle is extended per second.

Examples:

10 Hz, the needle is extended 10 times per second (very slow).

50 Hz, the needle is extended 50 times per second (medium).

100 Hz, the needle is extended 100 times per second (fast).

The lower the Hertz number, the fewer dots are marked! If you also increase the marking speed, even fewer dots are marked. This produces “stress-free” marking for the material. Vice-versa, the higher the Hertz number, the more dots are marked. Reducing the speed results in even more dots, producing a very high quality marking.

Standard lettering with the *Multi-Marker* is produced with 80 Hz.

## Speeds

The speeds are stated in millimetres per second (mm/s).

The **marking speed** is the time in which the needle moves during the marking procedure.

A speed of 10 mm/s is sufficient for standard lettering.

The **fast speed** is the distance between the zero point to the start of the lettering, between the individual vectors within a character and between the characters. The fast speed should be identical with the marking speed, but can be increased. The maximum fast speed should not exceed a speed of 60 mm/s.

The **reference run** describes moving the needle to the reference position and should not exceed a speed of 40 mm/s.

## Pulses

The pulses are the times in which the valve opens and closes. These times are stated in milliseconds (ms).

The **first pulse** gives the needle enough air to penetrate the workpiece deep enough at the first point, starting from its rest point. If the time setting is too high, the first puncture is clearly visible. In standard lettering, the time of the first pulse should be clearly less than the following pulses or be suppressed completely (1 ms).

For the **following pulses**, the needle is already moving so it does not need so much air as for the first time. For standard lettering the time should be 2.9 ms.



## Waiting Time Start

Here you can adjust whether the needle should move straight away or wait briefly. The standard setting is 1 ms. This function is only important for very special marking tasks, e.g. for the 2D matrix code.

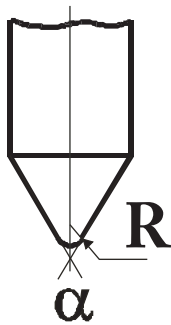
## Waiting Time Stop

Similarly to the waiting time start, here the needle waits after the moved vector. The setting for standard lettering is 1 ms.

## Needle

The standard scope of supply includes a soft spring with a light needle with a 118° tip. Many tests have revealed that this generally produces the best results. However, it is not possible to generalise here because the marking results depend on the material of the workpiece being marked, and on the character size. The needles are made of carbide and can be reground using a diamond wheel if necessary.

Our needles are available with a tip geometry of 60°, 90° and 118° - depending on application. We can produce other tips on request.



Needle	Geometry	Radius
3 mm	60°	R = 0,3 mm
3 mm	90°	R = 0,5 mm
3 mm	118°	R = 0,5 mm