

OEG MR-200 Micro Diamond Scriber



Technical Data

	MR100	MR200
Air pressure connection	6 bar	
Power Supply	220 V AC, 150W	
Wafer chuck diameter	100mm	200mm
Fine adjustment	x,y: ± 40 mm/0,01mm; ϕ : $\pm 2^\circ$	
Stroke for cutting movement	210mm	
Weight	Approx. 15kg	Approx. 16kg
Scribing power	30g – 250g*; 1,8...3bar **	
Microscope magnification	$\Gamma'=8...40x$	
Mechanical dimensions	Height: 500mm, Width: 410mm, Depth: 580mm	

* - using spring system;

** - using pneumatic system

Our system is the MR-200, with one 200mm diameter and one 100mm diameter chucks, and a spring system capable of applying forces ranging from 30g to 250g.

Installation

See OEG manual.

How to use the Scriber

Start up

Start the vacuum pump. Switch on the LED controller and the power brick, and finally press the power button of the system. DO NOT press the footswitch before adjusting the level of the diamond tip. Power up the LED controller.

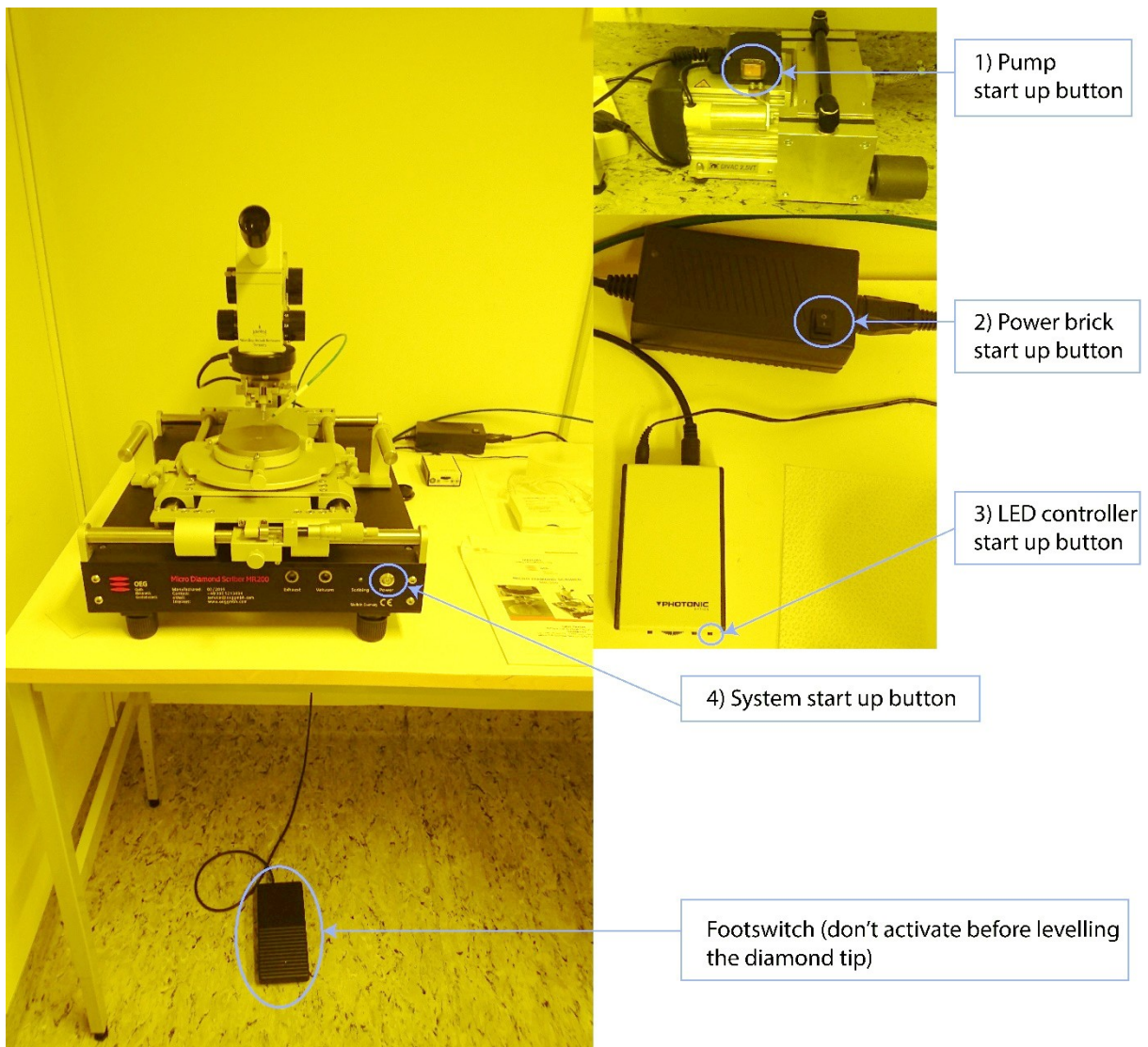


Figure 1: Start up

Placing the sample.

If the chuck is not placed at the position closest to the user, unscrew the Y-axis fixing knob, and pull the chuck towards the user. Block the stage again by screwing the knob back. We have two samples holders, accommodating up to 100mm and 200mm wafers. In case you want to change the holder, make sure to NOT touch the diamond tip while removing and replacing the holders.

Place your sample above the vacuum recess, adjust the angle by rotating the chuck, and fix its position by activating the vacuum switch button. Once placed, the sample can be precisely oriented using the Orientation micro-screw. When scribing a full wafer, it is recommended to align the flat side with the cross of the eyepiece in order to scribe following the crystal orientation. By pulling the big spring knob, 2 pre-defined positions with a 90° angle are easily accessible.

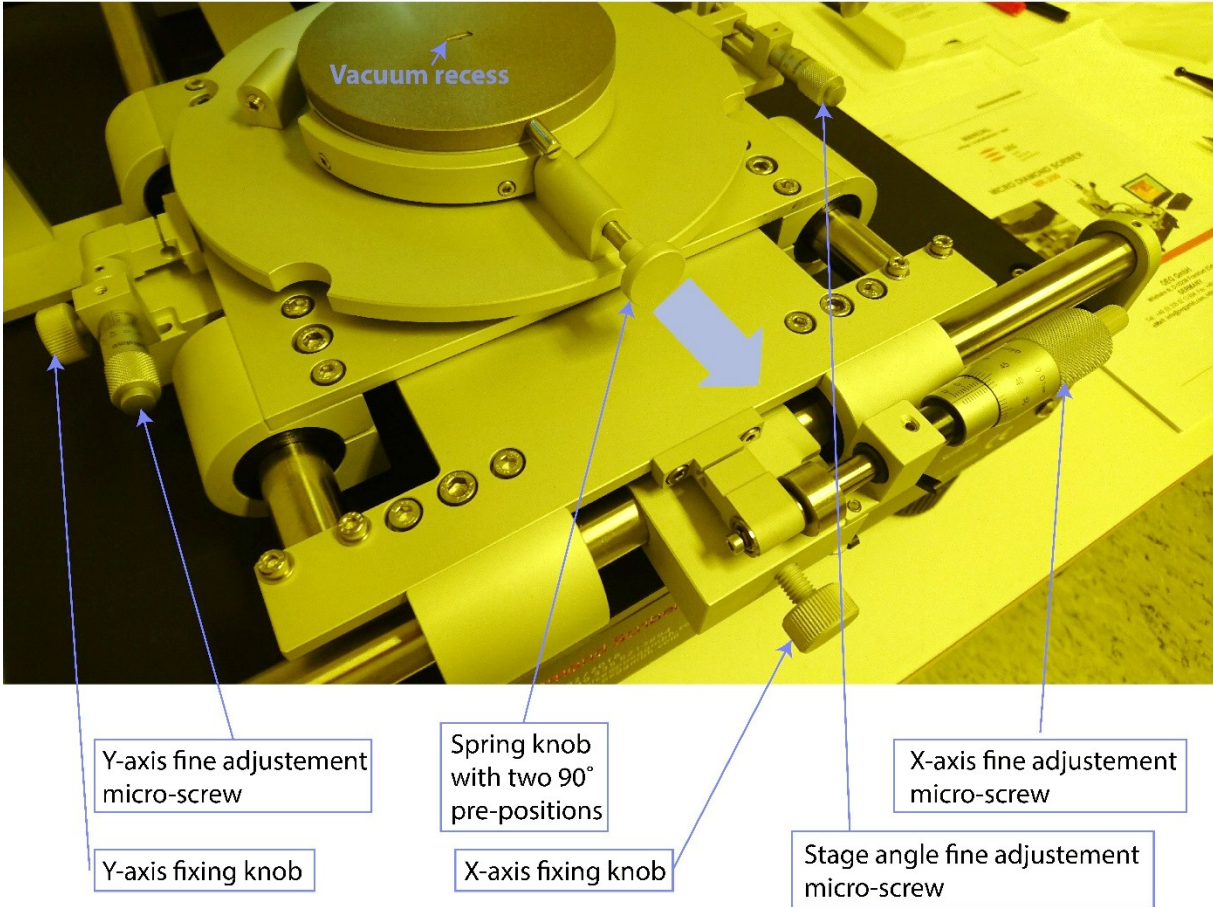


Figure 2: Stage positioning

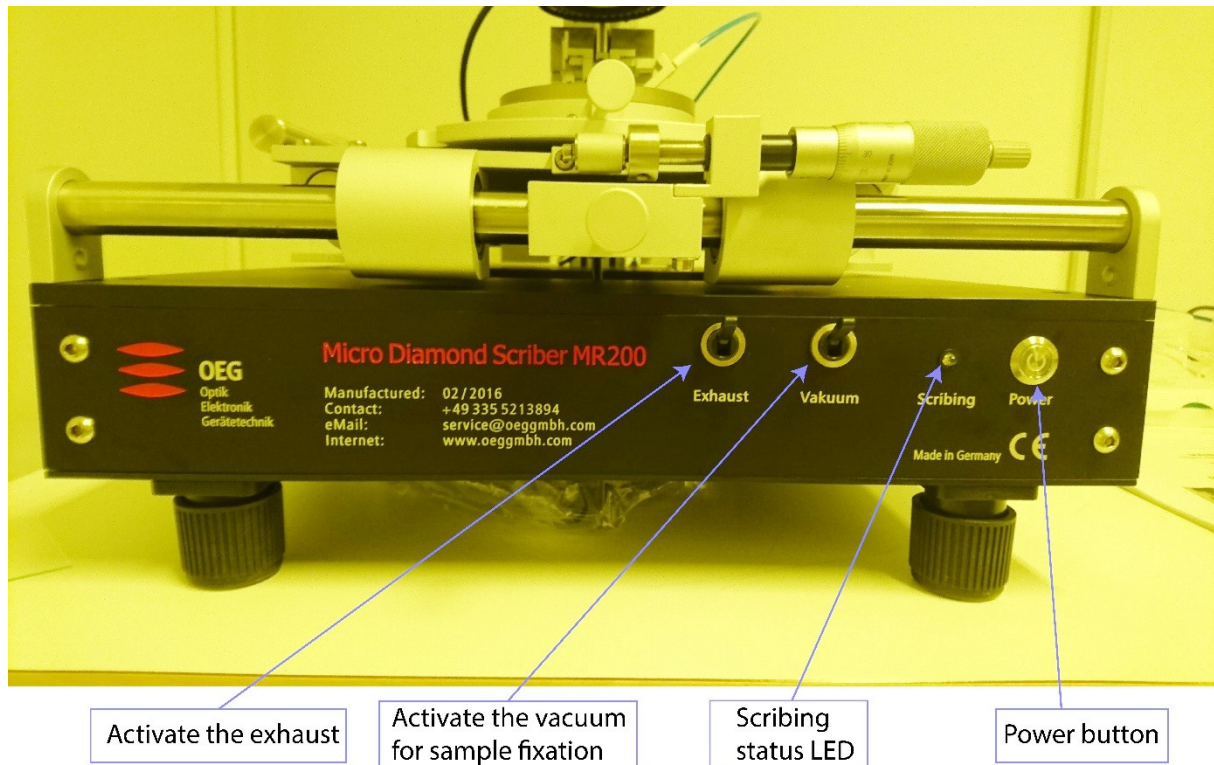


Figure 3: Main panel

In order to set the level of the tip, bring the stage close to the diamond tip but NOT directly below it. Two micrometric screws allow to set the height of the tip when not scribing (i.e. when not pressing the scribing footswitch), and when scribing.

- When not scribing, the tip should be above the sample to be scribed, and about 1-2mm above the chuck.
- When scribing (footswitch activated), the tip should remain above the level of the chuck, about 0.5mm.

Once these adjustments are made, bring the sample below the tip and align the desired scribing line using the eyepiece hair cross. For precious samples it is recommended to use first a test wafer and make sure the scribing parameters give a good result. Adjust the focus and zoom level of the microscope using the proper knobs. Place the tip right above the lower edge of the sample (the hair cross shows quite precisely where the tip will get in contact with the sample). Always scribe by PULLING the stage towards yourself (remember to block the X axis and unblock the Y axis of the stage by screwing and unscrewing the fixing screws): the diamond tip is placed with a determined angle with respect to the stage plan. It is set for a pulling movement only. The scribing course will follow the vertical line of the hair cross.

Adjusting the scribing force

The force applied with the tip on the wafer can be adjusted by screwing and unscrewing the spring holder. When the holder is fully screwed in the force will be maximum. Be careful when unscrewing the holder as the compressed springs might jump out!

Additionally, 1 to 3 springs can be loaded at the same time, resulting in lower (1 spring) or higher (3 springs) forces.

Microscope

The microscope features a zoom possibility.

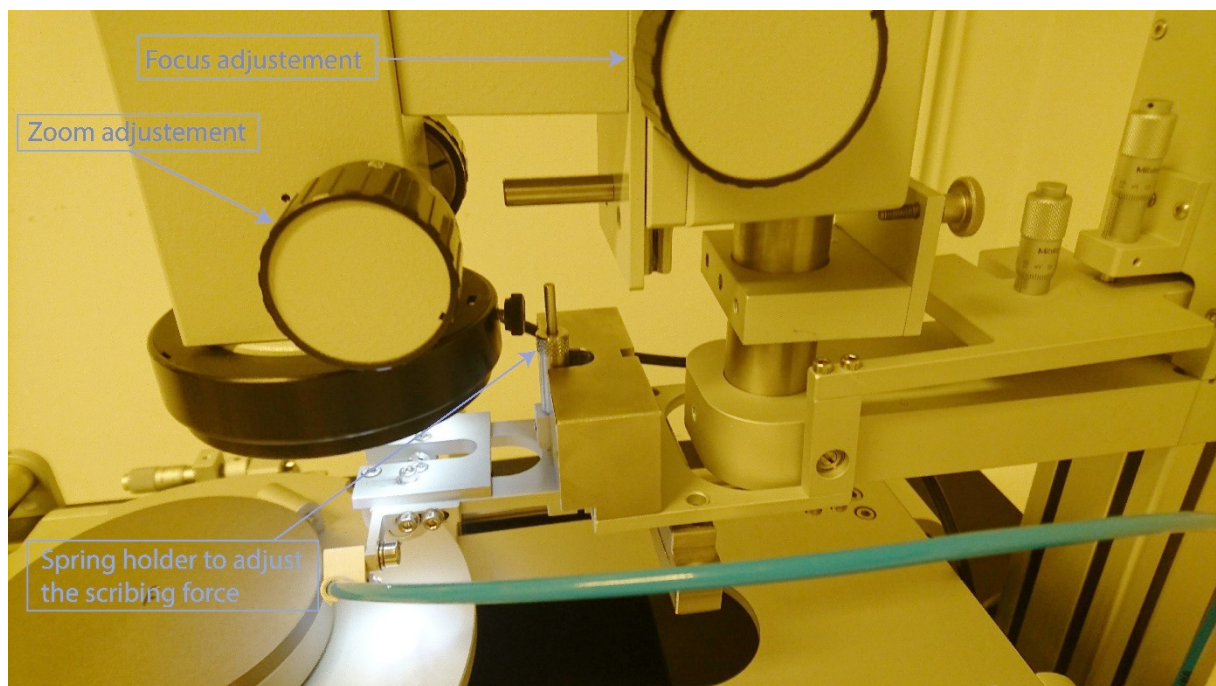


Figure 4: Microscope and spring force

LED controller

The microscope is equipped with a LED ring for illumination. Since there are 2 objects in the field of view (the diamond tip and the exhaust tube), the LED can be lit up with different patterns, as shown on Fig 5. The luminosity level can also be controlled. The rotation pattern can be rotated (this won't be shown by the status LED though).

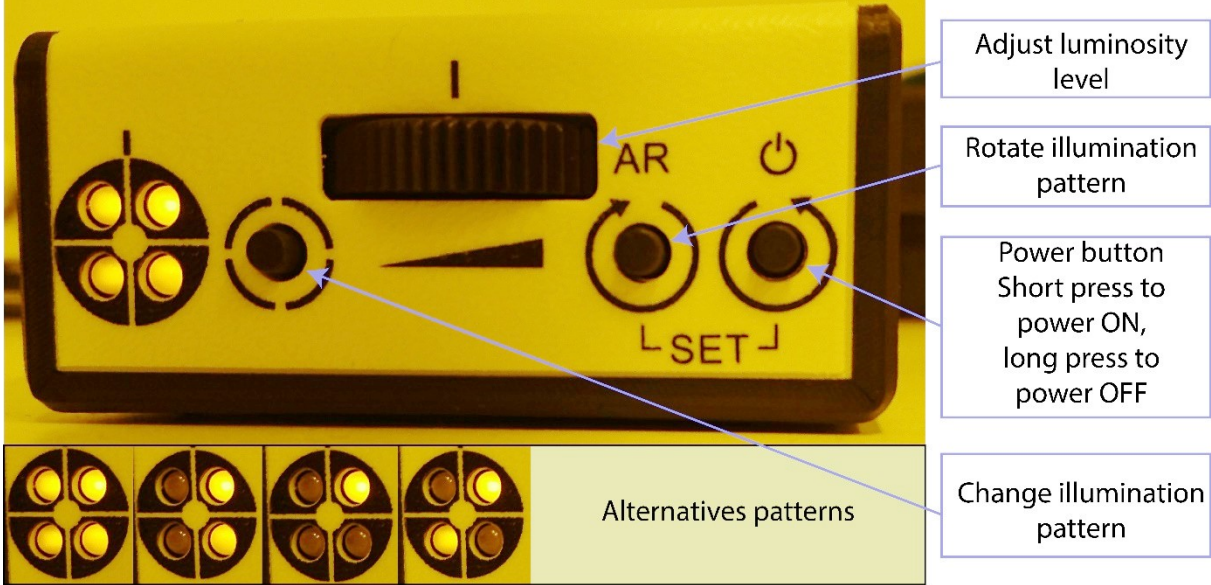


Figure 5: LED controller