Guidelines of High-Power Pulsed Laser Cleaning Machine

The operation interface provides 9 cleaning modes, which can be switched by clicking the scanning mode option on the interface (circular switching): Linear Mode, Rectangular 1 Mode, Rectangular 2 Mode, Circular Mode, Sine Mode, Helix Mode, Free Mode ,Ring and rotate.

The database number can be selected on the operation interface of each mode, and the laser cleaning parameters can be displayed and set, including: laser power, laser frequency, pulse width (valid for pulsed laser) or duty cycle (valid for continuous laser), scanning mode, scanning speed , the number of scans and the scan range (width, height).

（1）Straight line mode

In this mode, the scanning mode is straight line,

- Serial number: Select the database number and call out the process data stored in the corresponding serial number, the default number is 0;change the password: 123;
- Laser power: setting the average output power of the laser, ranging from 10% to 100%;
- Frequency: laser pulse repetition frequency setting, range 1~4000kHz;
- Scanning speed: the moving speed of the spot where the laser is focused on the surface of the workpiece, and the upper limit of the scanning speed is related to the scanning width;

Scan width（mm）	Scanning speed mm/s （upper limit）
Over 50	30000
40-49	18000
30-39	14000
20-29	12000
10-19	6000
5-9	3000

3-5	2000
1-3	1000

- Scanning width: set the linear scanning width, the range is 5mm~Mx (the value of Mx is related to the size of the field lens/focusing lens);

Field lens type	Scanning range Mx(mm)
F160	105
F210	140
F254	160
F330	185
F420	300

- Scanning times: used in special circumstances, you can set a specified number of scanning times, stop light after reaching the number of times, and always emit light by default 0;
- Enable: After the parameter setting is completed, click the enable button, the system and the laser are in the light-emitting ready state;
- Pulse width: set according to the actual needs of the site, the range is 1~1000ns;
- Edge coefficient: edge extinction, eliminating the strong points at both ends of the laser, the default is 0, the maximum can be set to 2000, it can be set appropriately according to the actual needs of the site, it is recommended to set 500 when using this function;

Extinction delay: cooperate with the edge coefficient to effectively eliminate the strong points on both sides, the default is 0, it is recommended to set 0.5 when using this function;

（2）Rectangle one pattern(single axis cleaning system does not have this mode)

In this mode, the scan mode is a rectangle, and the interface is shown in Figure 3.4. The definitions of power, frequency, pulse width (duty cycle), scan speed, scan

width, and scan times are the same as the range and linear mode, and will not be repeated here (the same below) .

- Filling distance: Set the laser filling distance in the rectangle, the range is 0.01~1mm, which affects the spot overlap rate in the Y-axis direction, and the default is 0.1;
- Scanning height: Set the scanning height of the rectangle, the range is 1mm~My (the Mx value is related to the field lens coefficient);

Field lens type	Scanning range Mx(mm)
F160	105
F210	140
F254	160
F330	185
F420	300

（3）Rectangular two pattern(single axis cleaning system does not have this mode)

The rectangle 2 mode is roughly the same as the rectangle 1, that is, the horizontal cleaning mode is added on the basis of the vertical cleaning of the rectangle

（4）Circular mode(single axis cleaning system does not have this mode)

In this mode, the scan shape is a circle , and the scan range is only set to the circle diameter and filling spacing;

（5）Sine mode(single axis cleaning system does not have this mode)

In sine mode, the sweep waveform is a sine curve, In the sine mode, the sine cycle needs to be set: the cycle of the sine waveform in the X-axis direction, the smaller the number, the greater the waveform fluctuation frequency, the range is 1mm-100mm;

（6）Helix pattern(single axis cleaning system does not have this mode)

In helix mode, the scanning waveform is a double helix curve, The parameter setting is consistent with the sine mode.

Series: Number of waveforms in spiral mode, ranging from 1 to 16;

（7）Free mode(single axis cleaning system does not have this mode)

In free mode, the width and frequency of the X-axis and Y-axis motors can be freely set within the range. In this mode, the scanning speed is not constant or even cannot be calculated accurately. There are many possibilities for the scanning waveform, which can be used as a supplement to the above five modes to adapt to more application scenarios.

- X\Y frequency: less than 300Hz;
- Scanning height: set the scanning height of free mode, the range is 1mm~50mm;

（8）Ring(single axis cleaning system does not have this mode)

This mode is a mode in which the ring gradually shrinks inward, where the filling distance is the speed at which the ring shrinks.