CLAIMS

WHAT IS CLAIMED IS:

1. A method of controlling a pressure in a process chamber of a semiconductor heat treatment device, comprising:

obtaining an actual pressure value in the process chamber;

determining a first valve opening value for controlling opening an exhaust valve according to a difference between the actual pressure value and a preset target pressure value;

determining a first valve opening change value according to the first valve opening value and a current valve opening value;

determining whether the first valve opening change value is within a preset fluctuation range of a valve opening change value corresponding to a current process stage; and

in response to the first valve opening change value being within the fluctuation range, adjusting opening of the exhaust valve according to the first valve opening value.

2. The control method according to claim 1, further comprising:

in response to the first valve opening change value being outside the fluctuation range, obtaining the actual pressure value in the process chamber again;

determining a second valve opening value for controlling the opening of the exhaust valve according to a difference between the obtained again actual pressure value and the preset target pressure value;

determining a second valve opening change value according to the second valve opening value and the current valve opening value;

determining whether the second valve opening change value is withing the fluctuation range; and

in response to the second valve opening change value being outside the fluctuation range, adjusting the opening of the exhaust valve according to the second valve opening value.

3. The control method according to claim 2, further comprising:

in response to the second valve opening change value being within the fluctuation range, abandoning the second valve opening value and returning to obtaining the actual pressure value in the process chamber.

4. The control method according to claim 2, further comprising:

in response to the first valve opening change value being outside the fluctuation range, after waiting for a preset time period, obtaining again the actual pressure value in the process chamber.

5. The control method according to claim 4, further comprising:

the preset time period is shorter than a delay time of a pressure alarm of the semiconductor heat treatment device.

6. The control method according to claim 1, wherein:

the number of process stages is multiple, multiple fluctuation ranges are preset according to each process stage, and each fluctuation range corresponds to each process stage in a one-to-one correspondence.

7. A semiconductor heat treatment device, comprising a process chamber (100), an exhaust valve (200), a pressure sensor, and a control unit (300), wherein:

the exhaust valve (200) is disposed at an exhaust pipeline in the process chamber (100);

the pressure sensor is configured to obtain an actual pressure value in the process chamber (100); and

the control unit (300) is configured to determine a first valve opening value for controlling opening an exhaust valve according to a difference between the actual pressure value and a preset target pressure value; determine a first valve opening change value according to the first valve opening value and a current valve opening value; determine whether the first valve opening change value is within a preset fluctuation range of a valve opening change value corresponding to a current process stage; and in response to the first valve opening change value being within the fluctuation range, adjust opening of the exhaust valve according to the first valve opening value.

8. The semiconductor heat treatment device according to claim 7, wherein:

the control unit (300) includes a first controller (310) and a second controller (320);

the first controller (310) is used to determine the first valve opening value for controlling the opening of the exhaust valve according to the difference between the actual pressure value and the preset target pressure value; and

the second controller (320) is used to determine the first valve opening change value according to the first valve opening value and the current valve opening value, determine whether the first valve opening change value is within the preset fluctuation range of the valve opening change value corresponding to the current process stage, and in response to the first valve opening change value being within the fluctuation range, adjust the opening of the exhaust valve according to the first valve opening value.

9. The semiconductor heat treatment device according to claim 8, wherein:

the first controller (310) is also used to obtain the actual pressure value in the process chamber obtained by the pressure sensor again when the first valve opening change value is outside the fluctuation range, and determine a second valve opening value for controlling the opening of the exhaust valve according to the difference between the actual pressure value obtained again and the preset target pressure value; and

the second controller (320) is also configured to determine a second valve opening change value based on the second valve opening value and the current valve opening value, determine whether the second valve opening change value is within the fluctuation range, and in response to the second valve opening change value being outside the fluctuation range, adjust the opening of the exhaust valve according to the second valve opening value.

10. The semiconductor heat treatment device according to claim 9, wherein:

the second controller (320) is also used to abandon the second valve opening value in response to the second valve opening change value being outside the fluctuation range; and

the first controller (310) is also used to reobtain the actual pressure value in the process chamber obtained by the pressure sensor after the second controller (320) abandons the second valve opening value.