CLAIMS

1. A semiconductor process chamber, comprising:

a cavity (10) having a first space (102) and a second space (103), a calibration mechanism (20), and a substrate support (30), a carrier (40) and a shutter disk (50), which are disposed in the interior volume of the cavity (10), wherein the first space (102) is located laterally to the second space (103) and is in communication with the second space (103), the calibration mechanism (20) is arranged on the cavity (10), the substrate support (30) is disposed within the second space (103), and the calibration mechanism (20) comprises a calibration rod (21) movably arranged on the cavity (10);

wherein when the shutter disk (50) is supported by the carrier (40), the shutter disk (50) switches between a first position and a second position along with the carrier (40);

wherein when the shutter disk (50) is at the first position, the shutter disk (50) is away from the substrate support (30) and is located within the first space (102), the calibration rod (21) is located below the shutter disk (50) and the calibration rod (21) adjusts the shutter disk (50) to a preset position on the carrier (40);

wherein when the shutter disk (50) is located at the preset position on the carrier (40), and the carrier (40) drives the shutter disk (50) to move to the second position, the shutter disk (50) is located within the second space (103) and is disposed above the substrate support (30), one end of the calibration rod (21) is located within the first space (102), and a spacing between a first central axis of the shutter disk (50) and a second central axis of the substrate support (30) is less than or equal to a first preset distance.

2. The semiconductor process chamber according to claim 1, wherein a top end of the calibration rod (21) comprises a conical protrusion (211), and a bottom surface of the shutter disk (50) facing the carrier (40) comprises a conical groove (51);

wherein when the shutter disk (50) is located at the first position, the calibration rod (21) is configured to drive the conical protrusion (211) to pass through the carrier (40) and extend into the conical groove (51), so as to lift the shutter disk (50); and

during the process of the shutter disk (50) being lifted, an inner wall of the conical groove (51) slides relative to an outer wall of the conical protrusion (211) under the gravity of the shutter disk (50), to guide the shutter disk (50) to move to the preset position on the carrier (40).

3. The semiconductor process chamber according to claim 2, wherein the calibration mechanism (20) further comprises a pressure sensor (22), the conical protrusion (211) is provided with an accommodating recess (212), the pressure sensor (22) is mounted in the accommodating recess (212), and the pressure sensor (22) is flush with or lower than an opening of the accommodating recess (212), wherein a bottom wall of the conical groove (51) is provided with a sensor trigger protrusion (52); and

wherein when the conical protrusion (211) extends into the conical groove (51), the sensor trigger protrusion (52) enters the accommodating recess (212) and presses the pressure sensor (22).

4. The semiconductor process chamber according to claim 3, wherein the process chamber further comprises an alarm, wherein the alarm is connected to the pressure sensor (22), and is configured to trigger a fault alarm in response to a condition in which the shutter disk (50) is lifted and the pressure sensor (22) fails to output a pressure signal.

5. The semiconductor process chamber according to claim 3, wherein the sensor

trigger protrusion (52) is a conical structure, and when the conical protrusion (211) extends into the conical groove (51), a smaller end of the sensor trigger protrusion (52) enters the accommodating recess (212) and presses the pressure sensor (22).

6. The semiconductor process chamber according to claim 3, wherein the pressure sensor (22) is an elastic structural member, the bottom wall of the conical groove (51) is configured as a first plane, and a top surface of the conical protrusion (211) is configured as a second plane, wherein when the conical protrusion (211) extends into the conical groove (51), the sensor trigger protrusion (52) enters the accommodating recess (212) and presses the pressure sensor (22) to a contracted state, and the first plane comes into contact with the second plane.

7. The semiconductor process chamber according to claim 2, wherein the calibration mechanism (20) further comprises a first cylindrical telescopic member (23) located outside the cavity (10), the cavity (10) is provided with a first avoidance hole (101), and a bottom end of the calibration rod (21) passes through the first avoidance hole (101) and is located outside the cavity (10), wherein a first end of the first cylindrical telescopic member (23) is sealed and engaged with the first avoidance hole (101), the first cylindrical telescopic member (23) is sleeved around the calibration rod (21), a second end of the first cylindrical telescopic member (23) is in sealing fit with the calibration rod (21), and the first cylindrical telescopic member (23) is configured to expand and contract in response to a vertical movement of the calibration rod (21).

8. The semiconductor process chamber according to claim 7, wherein the calibration mechanism (20) further comprises a first driving mechanism (24), the first driving mechanism (24) is located outside the cavity (10) and is connected to the bottom end

of the calibration rod (21), and the first driving mechanism (24) is configured to drive the calibration rod (21) to ascend or descend to lift the shutter disk (50) or separate from the shutter disk (50).

9. The semiconductor process chamber according to claim 2, wherein the carrier (40) is provided with a second avoidance hole (41), and the calibration rod (21) is configured to drive the conical protrusion (211) to pass through the second avoidance hole (41) and extend into the conical groove (51).

10. The semiconductor process chamber according to claim 1, wherein a top surface of the carrier (40) facing the shutter disk (50) is provided with one or more limiting protrusions (42), a bottom surface of the shutter disk (50) facing the carrier (40) is provided with a first limiting groove (53), and one of the limiting protrusions (42) extends into the first limiting groove (53) and cooperates with the first limiting groove (53) in a limiting fit within a plane parallel to a bearing surface of the substrate support (30).

11. The semiconductor process chamber according to claim 10, wherein the one or more limiting protrusions (42) is one annular protrusion, or multiple limiting protrusions (42) circumferentially arranged on the top surface of the carrier (40).

12. The semiconductor process chamber according to claim 10, wherein the process chamber further comprises pins (62), wherein the bottom surface of the shutter disk (50) facing the carrier (40) is further provided with a second limiting groove (54), and the first limiting groove (53) is arranged on a bottom wall of the second limiting groove

(54), wherein the pins (62) extend into the second limiting groove (54) and cooperate with the second limiting groove (54) in a limiting fit within the plane parallel to the bearing surface of the substrate support (30).

13. A semiconductor process device comprising the semiconductor process chamber according to any one of claims 1 to 12.