WHAT IS CLAIMED IS:

1. A system comprising:

a process chamber in which a processing object is processed;

an exhauster including a casing in which a rotating body is installed;

a gas supplier configured to supply an inert gas to the exhauster without passing through the process chamber; and

a controller configured to be capable of controlling a supply amount of the inert gas supplied into the casing by the gas supplier based on a relationship between a time during which the processing object is not being processed in the process chamber and a temperature drop of the rotating body .

2. The system of Claim 1, further comprising: a heater, which is controlled by the controller, configured to heat the casing.

3. The system of Claim 2, wherein the controller is configured to be capable of predicting the temperature drop of the rotating body based on a set temperature of the heater.

4. The system of Claim 2, wherein the relationship between the time and the temperature drop of the rotating body is maintained according to a set temperature of the heater.

5. The system of Claim 1, further comprising: a pressure adjustment valve installed between the process chamber and the exhauster and configured to adjust a pressure of the process chamber,

wherein the controller controls the gas supplier to stop the supply of the inert gas when the pressure adjustment valve is operating.

6. The system of Claim 5, further comprising: an exhaust pipe configured to exhaust a gas

exhausted from the process chamber,

wherein the gas supplier is connected to the exhaust pipe at a downstream of the pressure adjustment valve.

7. The system of Claim 1, wherein the gas supplier is configured to supply a heated inert gas.

8. The system of Claim 1, wherein the controller stops the supply of the inert gas in a state where the processing object is being processed in the process chamber.

9. The system of Claim 1, wherein the controller is configured to compare a temperature of the rotating body in a state where the processing object is being processed with a target temperature, and

wherein the controller is configured not to supply the inert gas if the temperature of the rotating body is equal to or higher than the target temperature, and is configured to supply the inert gas if the temperature of the rotating body is lower than the target temperature.

10. The system of Claim 1, wherein the controller is configured to supply the inert gas such that a temperature of the rotating body when the processing object becomes a state of being processed becomes equal to or higher than a target temperature.

11. The system of Claim 1, wherein the controller is configured to supply the inert gas in a state where a temperature of the rotating body is higher than a predetermined temperature and the temperature of the rotating body decreases.

12. The system of Claim 1, further comprising: a pump configured to exhaust a gas used in the process chamber,

wherein the exhauster is arranged between the process chamber and the pump, and

wherein the controller is configured to control the gas supplier to control a supply amount of the inert gas, based on an exhaust speed of the pump in a state where the processing object is not being processed.

13. The system of Claim 1, wherein the controller determines a flow rate of the inert gas according to a flow rate of a gas supplied to the process chamber in a state where the processing object is being processed.

14. The system of Claim 1, wherein the inert gas is any one rare gas of a nitrogen gas, an argon gas, a helium gas, a neon gas, and a xenon gas.

15. A substrate processing apparatus comprising:

a process chamber in which a processing object is processed;

an exhauster including a casing in which a rotating body is installed;

a gas supplier configured to supply an inert gas to the exhauster without passing through the process chamber; and

a controller configured to be capable of controlling a supply amount of the inert gas supplied into the casing by the gas supplier based on a relationship between a time during which the processing object is not being processed in the process chamber and a temperature drop of the rotating body.

16. A method of manufacturing a semiconductor device, comprising:

processing a substrate; and

supplying, by a system comprising at least an exhauster including a casing in which a rotating body is installed and a gas supplier configured to supply an inert gas to the exhauster without passing through a process chamber, the inert gas supplied into the casing based on a relationship between a time during which the substrate is not being processed in the process

chamber and a temperature drop of the rotating body.

17. A program executed in a substrate processing apparatus including: a process chamber in which a processing object is processed, an exhauster including a casing in which a rotating body is installed, a gas supplier configured to supply an inert gas to the exhauster without passing through the process chamber, and a controller, the program causing the controller to perform a process, the process comprising:

supplying the inert gas into the casing based on relationship between a time during which the processing object is not being processed in the process chamber and a temperature drop of the rotating body.