



Semiconductors

Gas flow rate control

N2 flow rate control for chemical spray nozzle

More uniform application of wafer cleaning chemicals!



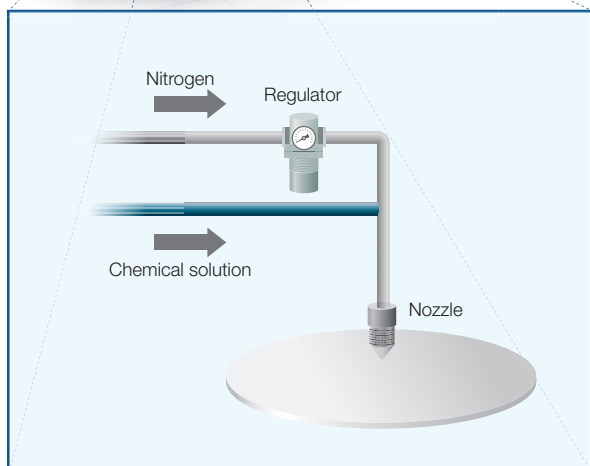
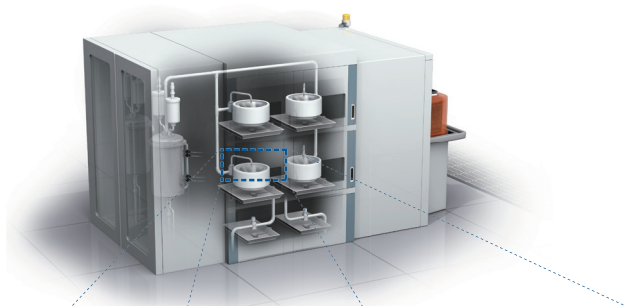
Product name **Process sensor**
Digital mass flow controller

Model No. MQV_ _ _ _

Process and equipment name **Front-end process, single wafer cleaning equipment**

Current Situation

- The nitrogen flow rate for chemical spray nozzles is controlled by adjusting the regulator pressure.
- Due to miniaturization, the chemical flow rate must be minutely adjusted for each type of product or process.



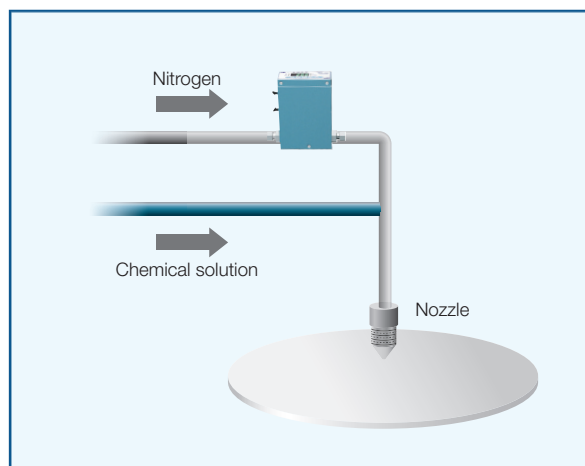
Current Issues

Problem 1

When the relationship of pressure and flow rate changes due to clogging, etc., the amount of chemical changes, affecting the quality of cleaning.

Problem 2

For existing regulators, it is difficult to make fine changes in settings from a control device.



Solution 1

High-performance digital mass flow controller (model MQV_ _ _ _)

Because the flow rate is directly controlled, it is not affected by clogging or other factors, affording greater stability and better cleaning quality.

Solution 2

Various ways to change the settings from a host device

With the MQV_ _ _ _ , you can change the flow rate settings using an external input switch, analog signal, or RS-485 communication.

Solution 3

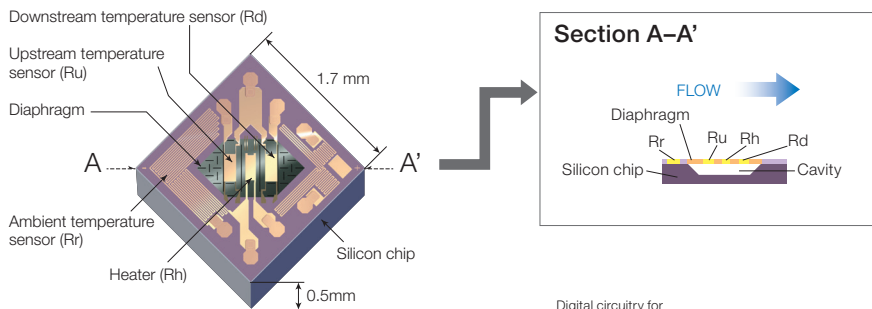
Ultra-fast micro thermal flow sensor, combined with advanced actuator control technology

Achieves both high speed control of 300ms and low differential pressure operation. Other features: freely selectable control range, power circuit isolation (an industry first), and emphasis on ease of use.

Solution 1

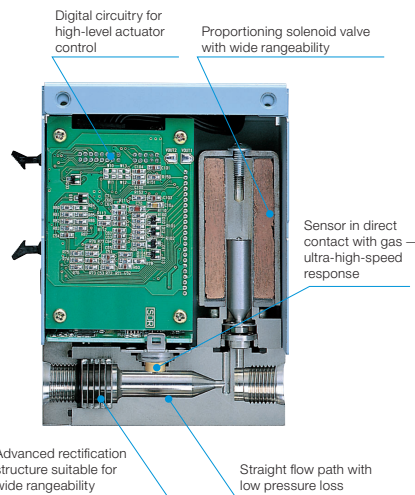
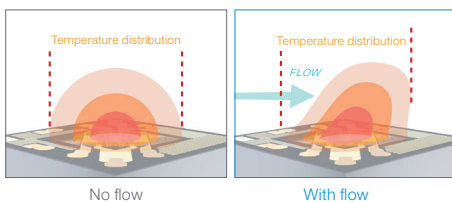
Solution 3

Structure and features of the micro thermal flow sensor



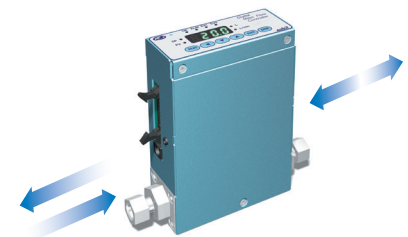
Principle of measurement

When there is no flow, the temperature distribution around the heater is symmetrical. When there is a flow, the temperature distribution becomes asymmetrical, dropping upstream and rising downstream. This temperature difference is reflected in the resistance of the platinum film temperature sensor, allowing the mass flow rate (flow speed × density) to be calculated.



Solution 2

A variety of ways to change the flow rate setting



- Analog signals (0–5 V, 1–5 V, 0–20 mA, 4–20 mA)
- RS-485 communication
- External contact input (switching of up to 8 set points)

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