■ESC Monitoring Unit (Capacitive Sensor)

Connects between the electrostatic chuck (ESC) and the control power supply to continuously monitor the status of the ESC and the workpiece.

●Applications

- Detect workpieces via changes in capacitance
- Identify materials based on capacitance values
- Distinguish top and bottom sides by differences in capacitance values
- Continuously monitor the status of the ESC

●Appearance

ESC Monitoring Unit

●Key Features

- Detects capacitance between the ESC and the workpiece, enabling real-time monitoring of process abnormalities and workpiece status.
- Adds sensor functionality without requiring modifications to the ESC or its control power supply.
- Equipped with digital (2ch) and analog output I/O for seamless communication with production equipment.
- Up to six workpieces can be preset, enabling automatic adjustment and measurement for each.

●Connection Diagram

●Specification

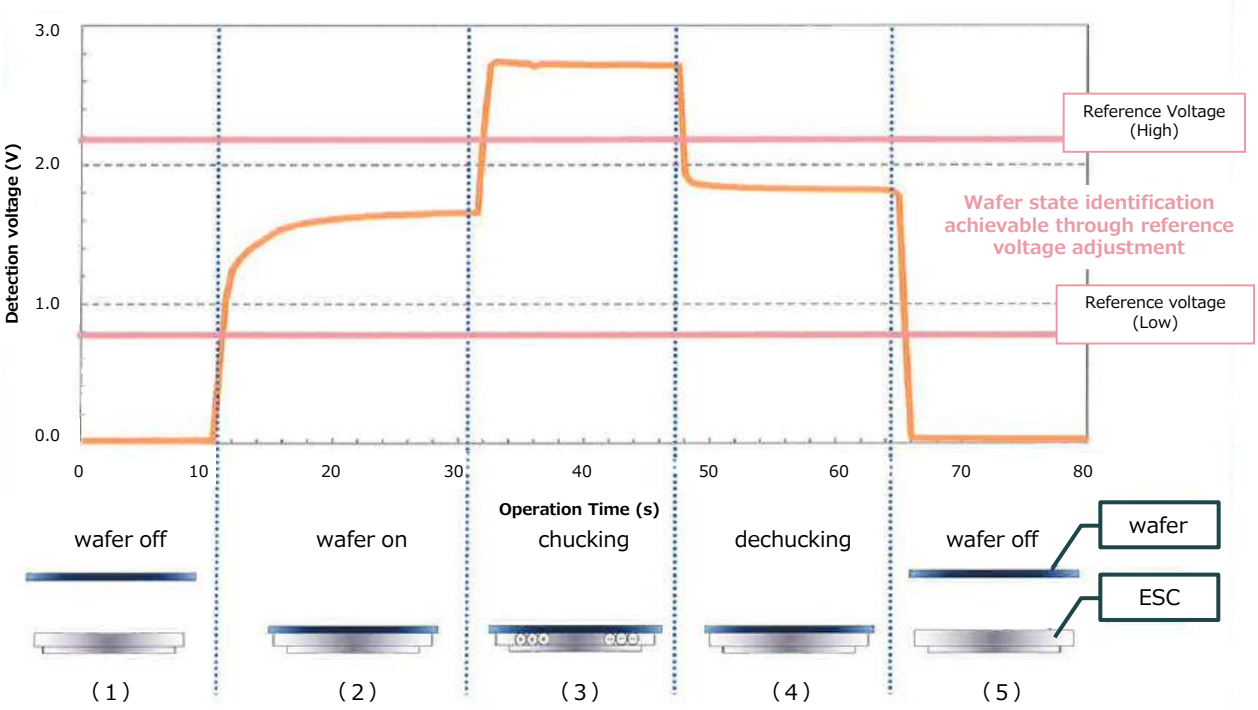
Dimensions	W430×H44×D260 (mm) Excluding protrusions	Power Consumption	2W (typical)
Weight	Approx. 2,900g	Operating Temperature	0 to 50℃ (non-condensing)
Detection Objects	Si-wafer, metal foils, various conductive films	Detection Load Capacitance Range	Up to 10,000pF
Input Voltage	DC 24V to 48V / 3A	I/O Connector	High-Voltage Tolerant (SHV Type)
Withstand Voltage	DC±5.0kV	Cable Type	-

●Notes

Follow our recommended usage methods for proper operation.
Carefully read the instruction manual before using this product.
Do not use this product for any purpose other than its intended use.

●Reference Data: Example of Loading Detection

- Capacitive sensors monitor changes in the detection electrode (ESC internal electrode) and its surrounding environment as variations in capacitance.
- The capacitance values measured by the detection unit are converted into voltage signals.
- By setting a reference voltage and comparing it to the detection voltage, it is possible to identify specific modes or detect unexpected defects.
- Below are the results of detecting various states of a silicon wafer placed on an ESC using an ESC Monitoring Unit.



- Equipment Used
  - ・Workpiece: Φ300mm silicon wafer
  - ・ESC: Φ300mm ceramic bipolar ESC
  - ・Control Power Supply: Our ESC control power supply (Model: CTPS-3KV2AF)
  - ・Detection Unit: Our ESC Monitoring Unit

- Capacitance changes in each state are converted into electrical signals as follows:
  (1) Wafer off: The state where no silicon wafer is present on the ESC, set as the reference (0 V).
  (2) Wafer on: The state where the silicon wafer is placed on the ESC.
  (3) Chucking: The state where the silicon wafer is gripped by turning on the control power supply.
  (4) Dechucking: The state where the control power supply is turned off.
  (5) Wafer off: The state where the silicon wafer is removed from the ESC.

【Notes】
- ・The detection results shown above are for reference only and must be verified with your specific ESC, control power supply, and workpiece.
- ・Validation under actual connection methods and operating environments is required prior to use.

Please contact us

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