

N₂ PURGE SYSTEM

SPECIFICATION

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3-5. N₂ PURGE SYSTEM SPECIFICATIONS.

1. Scope of application.

- * These specifications are applied to the N₂ Purge system.
and what is not specified in these specifications, it conforms to the main unit specifications.

2. Features.

- * The loading area is enclosed with the N₂ box, which enables to prevent wafers from the natural formation of the oxide film and to control the atmosphere.

3. Outline of the specification.

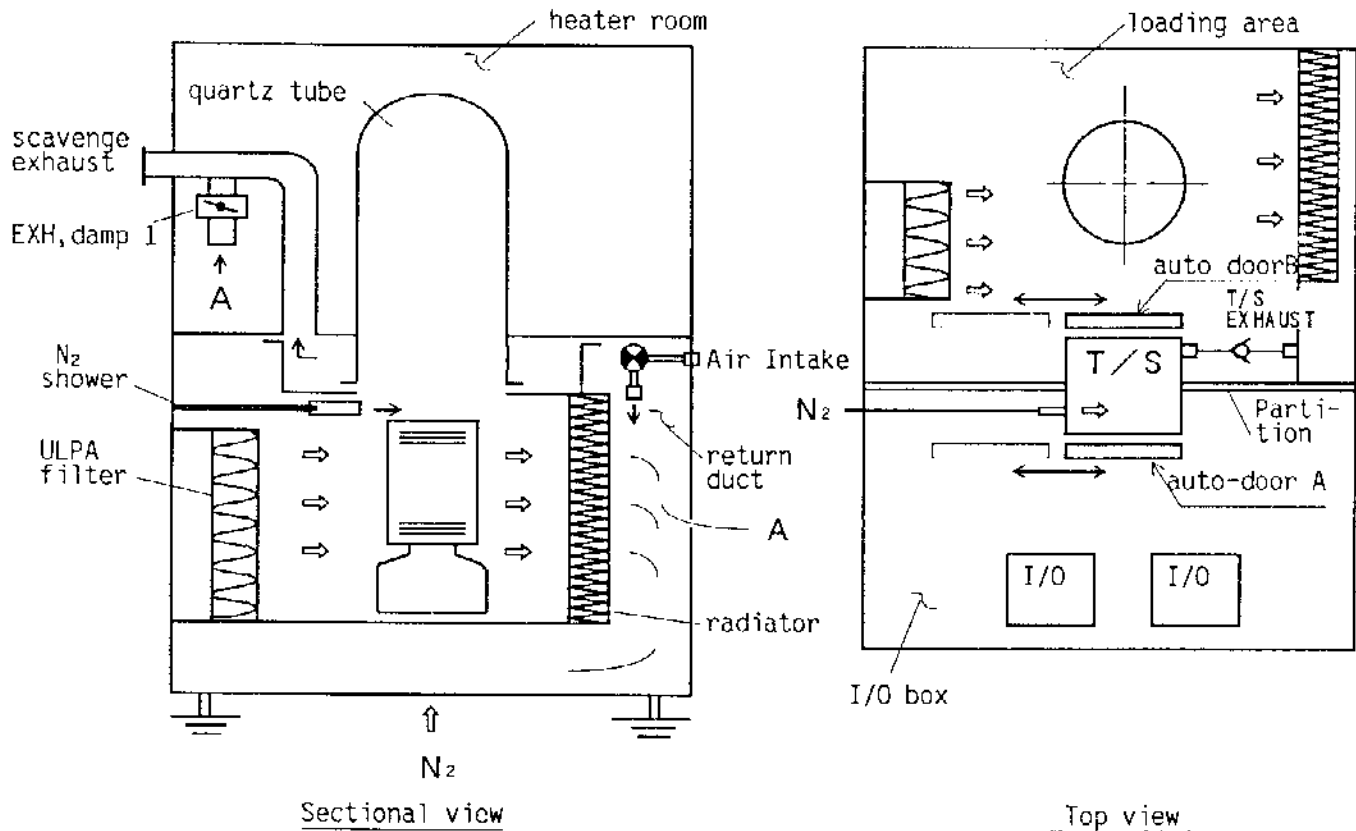
- (1) Furnace unit ----- ALPHA-8S-Z.
- (2) O₂ concentration ----- < 30ppm at the lower side of the scavenger.
- (3) Substitution time ----- 45 minutes or less.
- (4) N₂ flow method ----- 1) laminarflow.
2) N₂ flow rate switch function(large or small)
- (5) N₂ consumption ----- at initial substitution 620 ℓ/min at the maximum.
- (6) Safety measures ----- Each door of the furnace unit shall have a lock.
(Monitors the O₂ concentration by an O₂ concentration sensor)

4. Specifications of each unit.

(1) Furnace unit.

* The furnace unit is so structured as to achieve the higher gastightness and constant temperature, and stable laminarflow at the loading area.

1) Outline of structure



(2) Basic specifications:

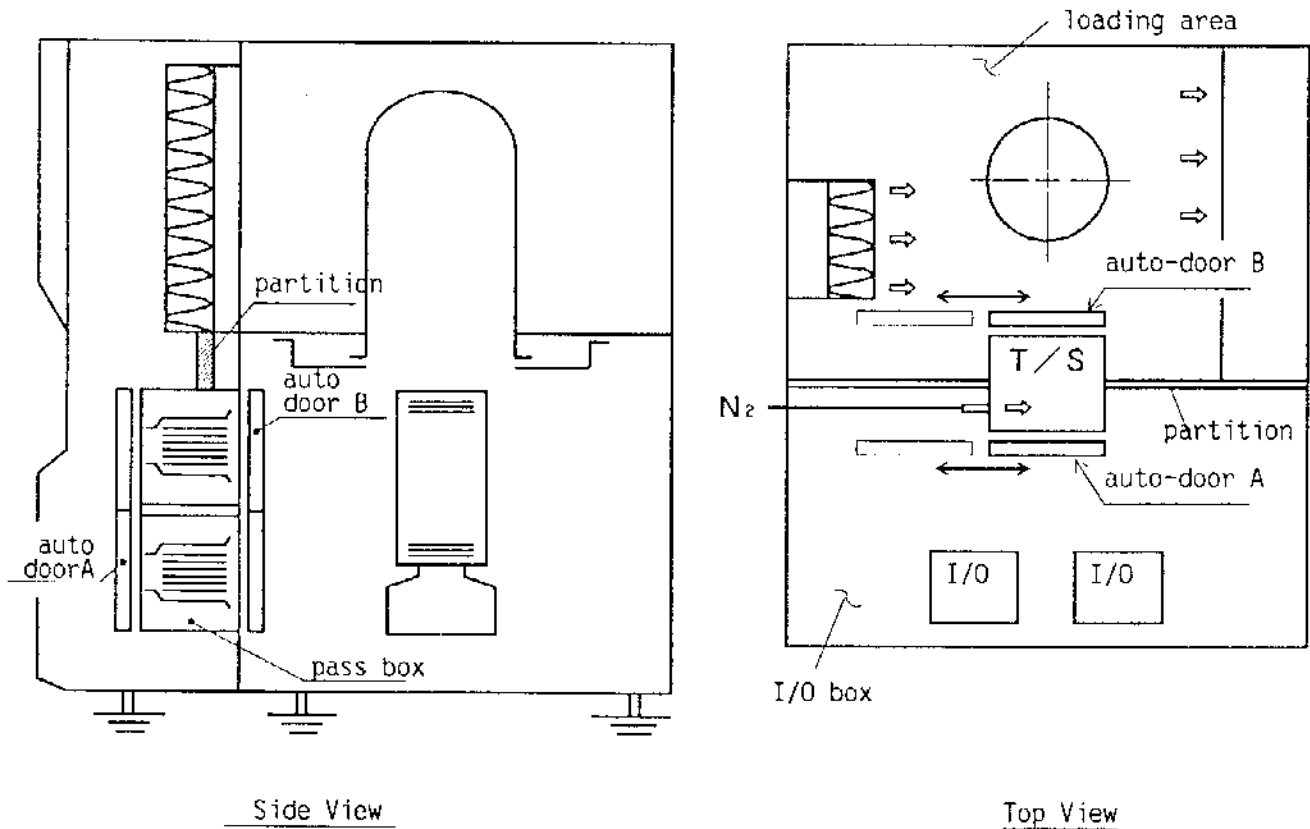
- 1) The loading area shall have a high gastightness, and reduce N₂ leak to the maintenance room is allowed.
- 2) The N₂ gas flow shall be the laminar flow type to keep the cleanliness. The absolute filter of ULPA or equivalent grade is used for developing the laminarflow.
- 3) For the N₂ gas circulation method a radiator shall be provided to cool down the gas temperature against the rising temperature of the atmosphere as a result of heat leakage by opening the furnace end or by loading/unloading the boat.

- 4) The lower scavenger of the furnace opening shall have the N₂ shower piping, which is used for removing the oxygen among the wafers at load/unload.
- 5) The rear and side doors shall have a lock to prevent the personal injury. The door is opened/closed automatically by the O₂ concentration sensor, and enabled to open only at the O₂ atmosphere of 18.5%.

5. Auto-mechanism.

- * By using the wafer transfer stage as a reserved chamber structured as a pass box, it is enabled to keep to the loading area atmosphere and reduce the N_2 consumption.

(1) Outline of the structure.



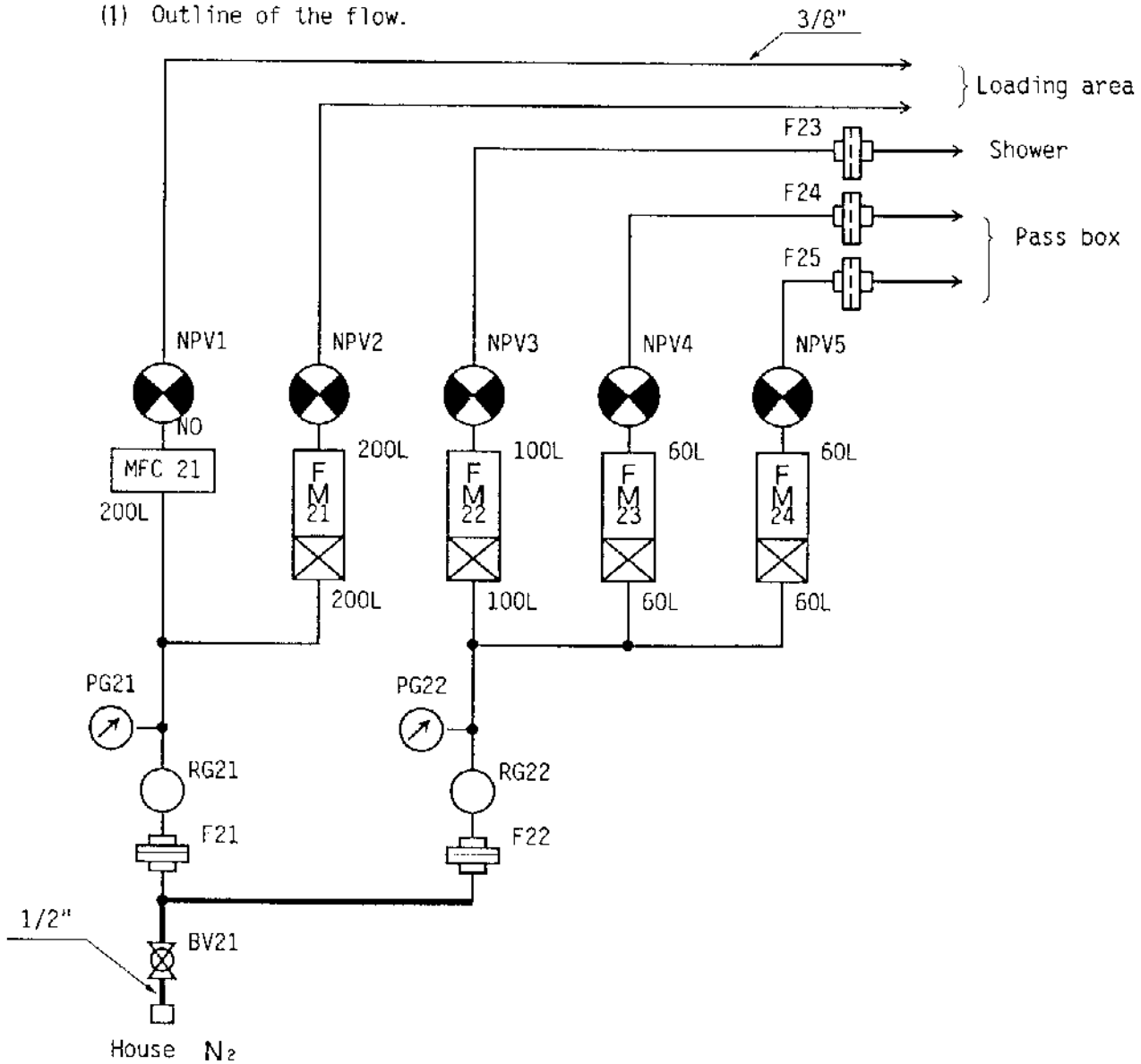
(2) Basic Specifications.

- 1) The pass box shall have a high gastightness and no N_2 leak to the loading area or I/O box is allowed.
- 2) The auto-door A and B shall be single-door type, enabled to be driven independently.
- 3) The auto-door is opened/closed by the air cylinder.
- 4) The contact surfaces of the auto-doors A and B with the pass box shall be sealed by the packing made by Viton.
- 5) The auto-door A and B shall be provided with the lock mechanisms used at closing. The lock shall be an air-cylinder method.
- 6) The pass box shall have the N_2 gas inlet port.

6. Gas system.

* The systems shall be supplied for loading area, pass box, and N₂ box.

(1) Outline of the flow.



(2) Basic specification

- 1) Piping material is Electrical polished (EP pipe).
- 2) A label identifying the gas name and flow direction shall be placed on each component and piping.
- 3) Pipes are automatically welded.
- 4) The pipes shall be laid by bending. (below 90°)

(3) N₂ Purge system interlock list.

V No.	NORMAL	GAS/ PURPOSE	CONDITIONS
NPV1	NC	N ₂	* Close when S26(PBF2, PBB2, CLOSE)OFF or S29(PBF1, PBB1, CLOSE)OFF. * Able to open when S26(PBF2, PBB2, CLOSE)ON and S29(PBF1, PBB1, CLOSE)ON.
NPV2	NC	N ₂	* Close when S26(PBF2, PBB2, CLOSE)OFF or S29(PBF1, PBB1, CLOSE)OFF. * Able to open when S26(PBF2, PBB2, CLOSE)ON and S29(PBF1, PBB1, CLOSE)ON.
NPV4	NC	N ₂ PASS BOX 1	* Close when S29(PBF1, PBB1, CLOSE)OFF or S30(PB,V1)OFF. * Open when S29(PBF1, PBB1, CLOSE)ON and S30(PB,V1)ON.
NPV5	NC	N ₂ PASS BOX 2	* Close when S26(PBF2, PBB2, CLOSE)OFF or S27(PB,V2)OFF. * Open when S26(PBF2, PBB2, CLOSE)ON and S27(PB,V2)ON.
LOAD V	NC	N ₂ BOX	* ON when NPV1(OPEN) or NPV2(OPEN) * OFF when NPV1(CLOSE) and NPV2(CLOSE)

7. Control mechanism.

* An automatic control is provided using the recipes for auto-door, auto-damper, and O₂ concentration controls.

(1) Outline of the specifications

1) Controlled items:

- A) Exhaust damper
- B) N₂ purge gas system
- C) auto-door A and B
- D) O₂ concentration
- E) interlock

(2) Basic Specification

- 1) As a rule, the loading area shall not accommodate the motor driver or printed circuit board, etc.
- 2) The cables, etc. laid inside the loading area shall be high temperature resistant type.
- 3) The interlock system software controls the following.
- 4) Control the auto-doors.
 - A) Each door is enabled to be opened/closed independently.
 - B) When the auto-door B is opened, the auto-door A is disabled to open.
 - C) When the auto-door B is closed, the wafer transfer unit is disabled to operate.
 - D) The carrier is replaced in a unit of 2-carrier.
 - E) The auto-door B shall be opened on condition that the O₂ concentration is sensed and input. (using condition)
 - F) When the auto-door A is closed, the carrier transfer is disabled to operate the carrier IN motion.