N_2 PURGE SYSTEM

SPECIFICATION

3-5. N_2 PURGE SYSTEM SPECIFICATIONS.

1. Scope of application.

   * These specifications are applied to the N_2 Purge system. and what is not specified in these specifications, it conforms to the main unit specifications.

2. Features.

   * Ihe loading area is enclosed with the N_2 box, which enables to prevent wafers from the natural formation of the oxide film and to conrol the atmosphere.

3. Outline of the specification.

   (1) Furnace unit ------- ALPHA-8S-Z.

   (2) O_2 concentration ----- < 30ppm at the lower side of the scavenger.

   (3) Substitution time ---- 45 minutes or less.

   (4) N_2 flow method ------- 1) laminerflow.
   2) N_2 flow rate switch function(large or small)

   (5) N_2 consumption ------- at initial substitution 620 ℓ/min at the maximum.

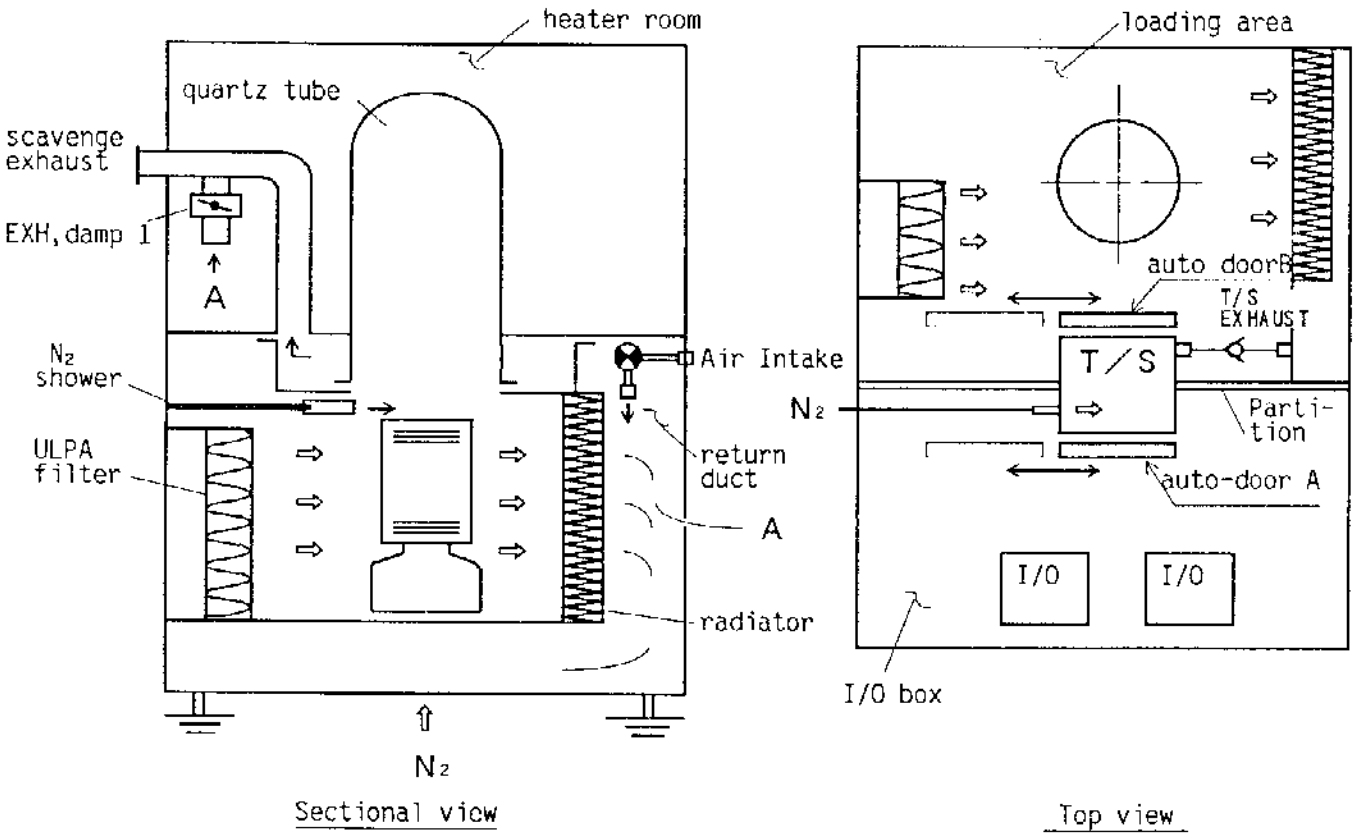
   (6) Safety measures ------ Each door of the furnace unit shall have a lock. (Monitors the O_2 concentration by an O_2 concentration sensor)

4. Specifications of each unit.

(1) Furnace unit.

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

1) Outline of structure



(2) Basic specifications:

1) The loading area shall have a high gastightness, and reduce N_2 leak to the maintenance room is allowed.
2) The N_2 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 N_2 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.

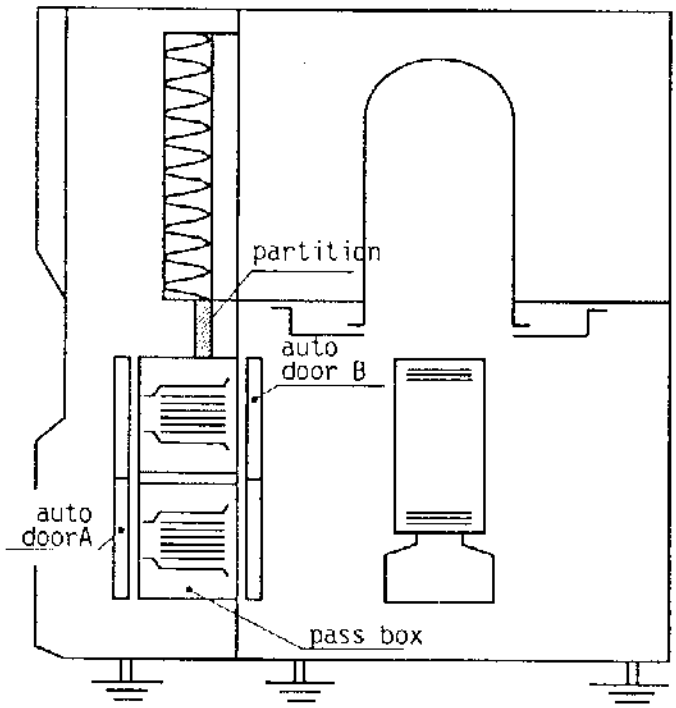
4) The lower scavenger of the furnace opening shall have the N_2 shower piping, which is used for removing the oxgen among the wafers at load/unload.

5) The rear and side doors shall have a lock to prevent the personal injury. The door is opened/closed automatically by the O_2 concentration sensor, and enabled to open only at the O_2 atmosphere of 18.5%.

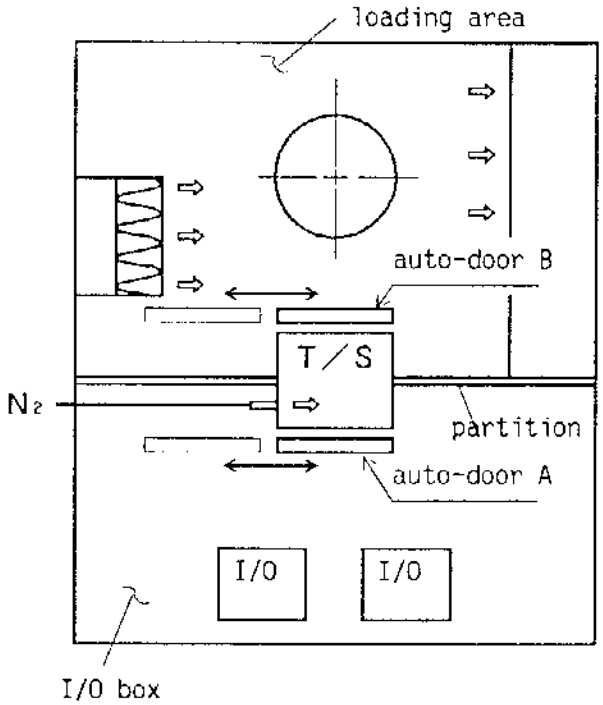
5. Auto-mechanism.

* 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.



Side View



Top View

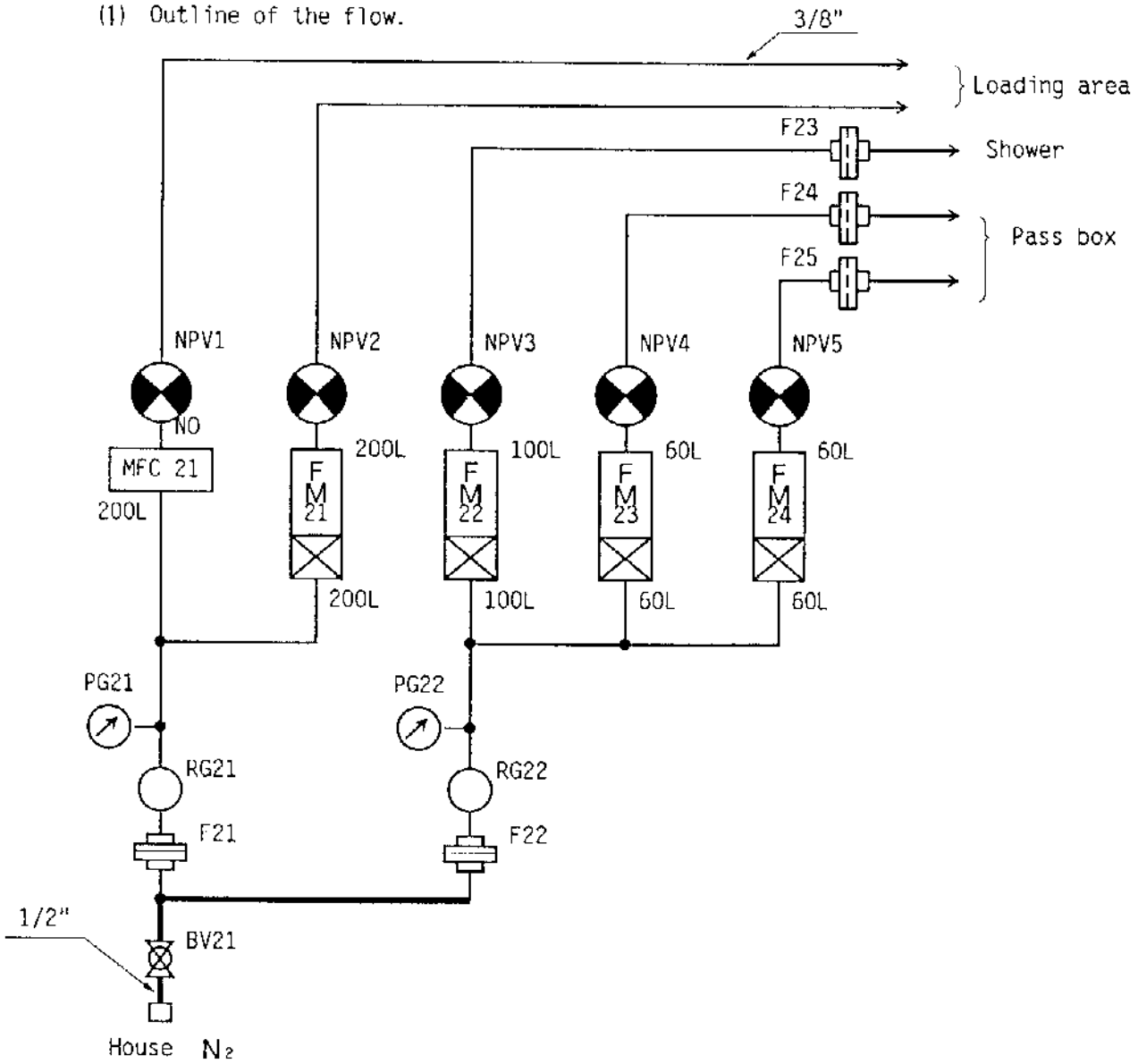
(2) Basic Specifications.

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 an 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 N_2 box.

(1) Outline of the flow.



(2) Basic supecification

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

(3) N_2 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 O_2 concentration controls.

(1) Outline of the specifications

1) Controled items:

A) Exhaust damper

B) N_2 purge gas system

C) auto-door A and B

D) O_2 concentration

E) interlock

(2) Basic Specification

1) As a rule, the loading area shall not accommodate the motor driver or printed circuitbord, etc.

2) The cables, etc. laid insid the loading area shall be high temperaturc 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 desabled to open.

C) When the auto-door B is closed, the wafer transfer unit is desabled 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 O_2 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.