

HyperVap™
Automated Evaporation Concentrator

Operation Manual

Model: HV-300

Version : 2.1

Contents

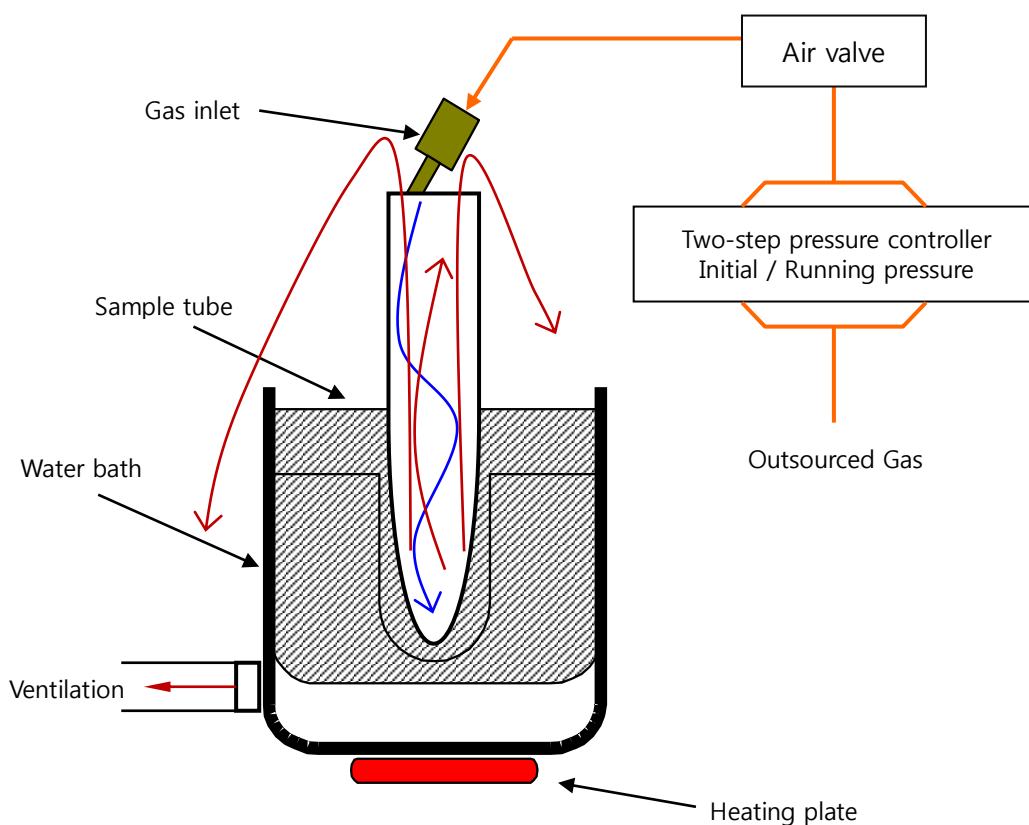
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1. Introduction

The HyperVap™ concentrator is the system that achieves efficient sample concentration by injecting inert gas into sample tubes and heating surrounding water. Whole processes are automatically controlled by the amount and speed of gas flow, temperature and time duration. Structurally, four independent conditions can be set up in the instrument and run simultaneously.

Diagram of Air/Gas Flow

- Air or N₂ gas at set pressure reaches into each nozzle through valve and corresponding gas lines.
- Air or N₂ gas blows down from the nozzle to the bottom of the sample tube and forces the evaporation of sample solvent.
- The evaporated solvents are evacuated by the fan in backside of the instrument.



2. Safety Precautions

- ✓ Read the manual carefully for safe and efficient usage of HyperVap™.
- ✓ The required voltage is AC 220V/50-60HZ (110V optional). The energy consumption is about 1.5kW/h.
- ✓ The HyperVap™ is recommended to set up and operate in a chemical fume hood. Otherwise, the ventilation hole should be connected to a duct to release the evaporated vapors or

gases.

- ✓ Before turning the instrument on, always check if water is enough in the bath. If it is short or out of water, efficient temperature control will not be formed surrounding the sample tubes. Sometimes, it causes overheating or damages of the instrument. It is recommended to fill the water up to the sample height or at least the half of the water bath.
- ✓ When the instrument is not in use, water should be removed from the bath in order to prevent rusting or corrosion.
- ✓ Start operation with a gas valve off and gradually increase it to avoid abrupt gas injection. Otherwise, samples might be bumped off from the tube.
- ✓ Do not move the instrument during operation.

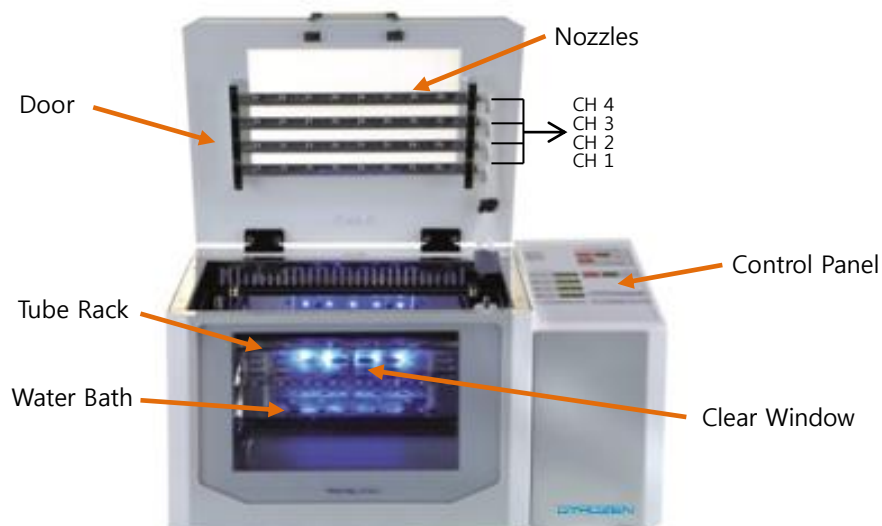
3. Features and Specifications

3-1. Technical Specification

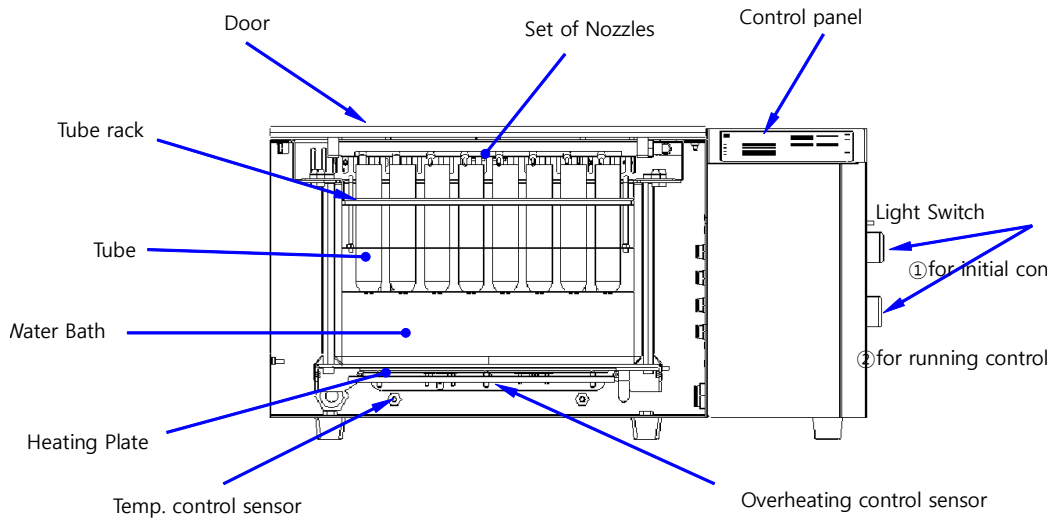
Sample Capacity	
Number of samples	6 ~ 32
Sample volume	5mℓ ~ 300mℓ
Pressure	
Operating gas pressure	15 ~ 50 psi
Pressure Control	Automated 2 step control (initial & operating pressure)
Time length of initial pressure	~ 99 min
Gas	
Time control	Compressed air, Nitrogen, etc.
Water bath temperature	~ 99°C
Forced evacuation of vapor gas	Yes (by fan)
Power	
Dimension (mm)	AC 220V, 800 VA (110V optional)
Weight	590(w) x 340(d) x 320(h)
	26.5 kg

3-2. Parts and Descriptions

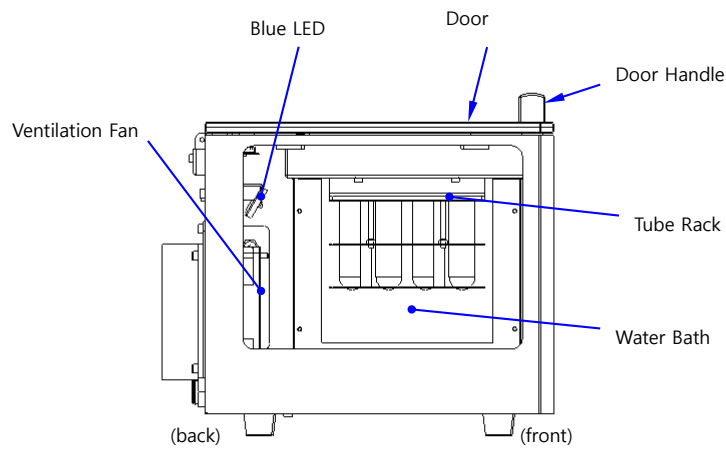
- ✓ Outlook 3D Figures



✓ Front & Side

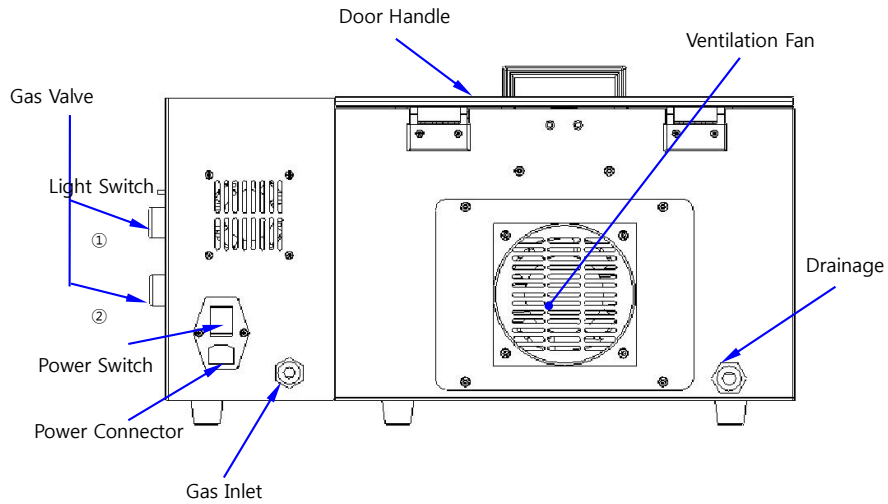


[Front View]

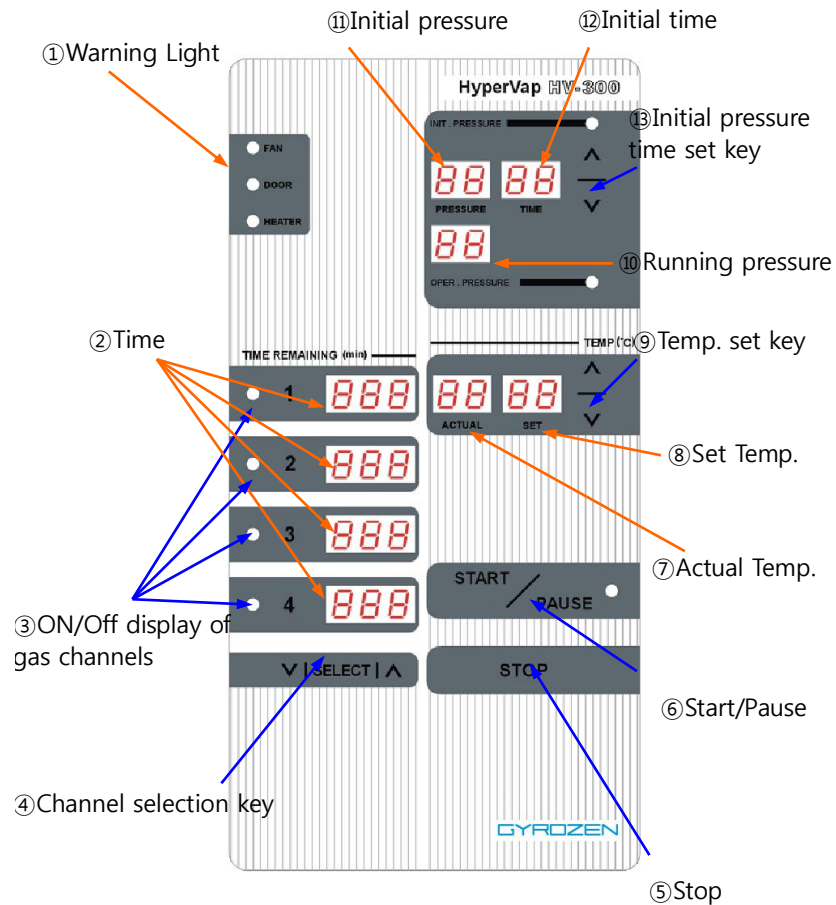


[Side View]

✓ Rear Part



3-3. Control Panel and Functions



- ① Warning Light: It shows the status of ventilation fan, door and heater. When everything is perfectly running, green lights are shown. If something is wrong, the corresponding light turns on red.
- ② Timer: It shows the remaining time of each channel.
- ③ On/Off display of gas channel: When it is on, corresponding gas channel light green.
- ④ Select: This is for time setting of each channel.
- ⑤ Stop: This is for abrupt or emergency stop.
- ⑥ Start/Pause
- ⑦ Actual Temperature
- ⑧ Set Temperature
- ⑨ Temperature set key
- ⑩ Running pressure
- ⑪ Initial pressure
- ⑫ Initial time
- ⑬ Initial pressure time set key

3-4. Delivery Check List

- ✓ Main System, 1ea
- ✓ Tube Rack, 1ea
- ✓ Nozzel cap, 8/pk
- ✓ Water Drain Valve, 1ea
- ✓ Water Drain Tube $\Phi 8$, 1ea
- ✓ Air Connection Tube $\Phi 5$, 1ea
- ✓ 8.0 mm fitting for gas connecting, 1ea
- ✓ Power Cable 220V (110V), 1ea
- ✓ Operation Manual, 1ea

4. Installation

4-1. Connection of Power Cable: Connect power cable into the power connector at the rear part of the instrument.

4-2. Connection of Gas Inlet

- ✓ Connect 8.0 mm diameter gas inlet tube into the Gas Inlet at the rear part.
- ✓ Appropriate gas pressure ranges 15-50 psi.
- ✓ Adjust the pressure with gas valves on the right flank of the instrument.
- ✓ Compressed air and N_2 can be used. Oil-less air compressor with moisture dryer is recommended to ensure the purity of concentrated samples.

4-3. Connection of Drainage: Connect the drainage valve and the supplied hose into the Water Drain

Connector Port at the rear part.

4-4. Filling of Water Bath

- ✓ The bath must be filled with clean water before turning on the instrument. (i.e. distilled water)
- ✓ Fill the bath to the level at 2/3 of bath depth keeping initial level to be equal or higher than sample level for performance.
- ✓ After each cycle of concentration, check the water level and replenish with clean water if needed.

4-5. Installation of Duct (Optional): Round foil duct (125mm i.d.) is recommended to be connected to the ventilation part at the back.

5. Operation

5-1. Setting Up Functional Parameters of Pressure, Temperature & Time

Before setting up parameters, load tubes on the tube rack, and place the rack in the bath. Check if water level is appropriate with a consideration of sample height. Close the gas valves and door before the operation.

- ✓ Turn on the instrument and the system initialized with beep sound.
- ✓ The control panel shows the initial temperature, time, and pressure.
- ✓ Set up temperature with arrow buttons at the temperature set key.
One stroke of the arrow button changes temperature by a degree whereas continuous pressing comes to rapid changes..
- ✓ Set up initial and running pressure using the gas valves.
- ✓ Set up duration of initial pressure using arrow buttons at the initial pressure time set key.
One stroke of the arrow button changes time by a minute whereas continuous pressing comes to rapid changes.
Setting the time of initial pressure '0' means no initial smoothing before running.
- ✓ Set up the time duration of gas flow with channel selection key.
One stroke of the arrow button changes time by a minute whereas continuous pressing comes to rapid changes.
Press SELECT to move to other channel. (Timer of chosen channel blinks.)
The each set time is up, the gas flow of relevant channel stops automatically.
- ✓ Chose channels of necessity using On/Off key. Gas blows down only from the turned on channels.
Green LED's besides number 1, 2, 3, 4 on the control panel are on, indicating relevant channels are in operation.
- ✓ The instrument is ready to start running by the Start/Pause button.

5-2. Operation

- ✓ When the concentration process starts, the lamp at the Start/Pause is lit on and time is displayed.
- ✓ PID control controls the water temperature in the bath automatically.
- ✓ Temperature and time can be changed during the process.
- ✓ If you press the Start/Pause while the process is on, all functions including gas flow and the ventilation fan stop and the Start/Pause lamp blinks.
- ✓ Pressing the Start/Pause again resumes the process till the set time is elapsed.
- ✓ If you open the door during the process, only the gas flow and the ventilation fan stop and the lamp at the Door is lit on.
- ✓ When the set time ended, operation stops with beep sound and the system is ready for next cycle of operation.
- ✓ In any cases, pressing the Stop immediately stops the system with storing latest entries of parameters.

5-3. Control of Gas Flow

- ✓ Turn knob for the initial pressure and the operation pressure of the gas valve to adjust the gas flow.
- ✓ Pull the knob and turn it clockwise to increase gas flow. To decrease gas flow, turn the knob counterclockwise.
- ✓ If you turn the knob clockwise to the end, gas flow stops.
- ✓ Fix the knob by pushing it back after setting up the pressure.