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Hap 1510ST

Semi-auto PSR Exposure System

With

Filmmask Scaling

Specifications

Contents

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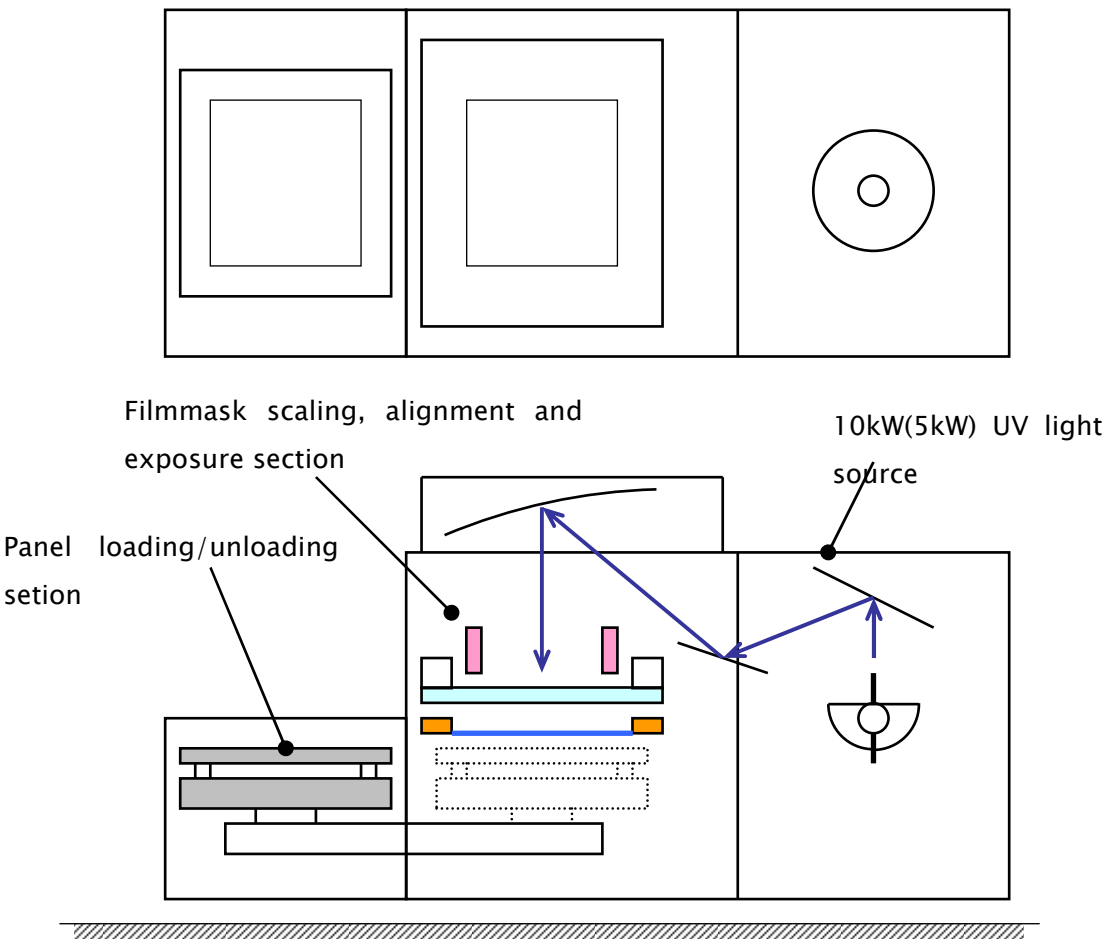
1. System Outline

1. System

- Panel loading/unloading section
  - After set a panel on the shuttle, operator can push buttons with both hands to load/unload a panel to/from the exposure section before/after exposre.
  - Operator can also set or replace a filmmask on this section.
- Filmmask scaling, alignment and exposure section
- 10kW(5kW) UV light source
  Provides UV colimated light for exposure.



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2. Panel and Filmmask

1. Panel size

Min. : 250 X 300 mm

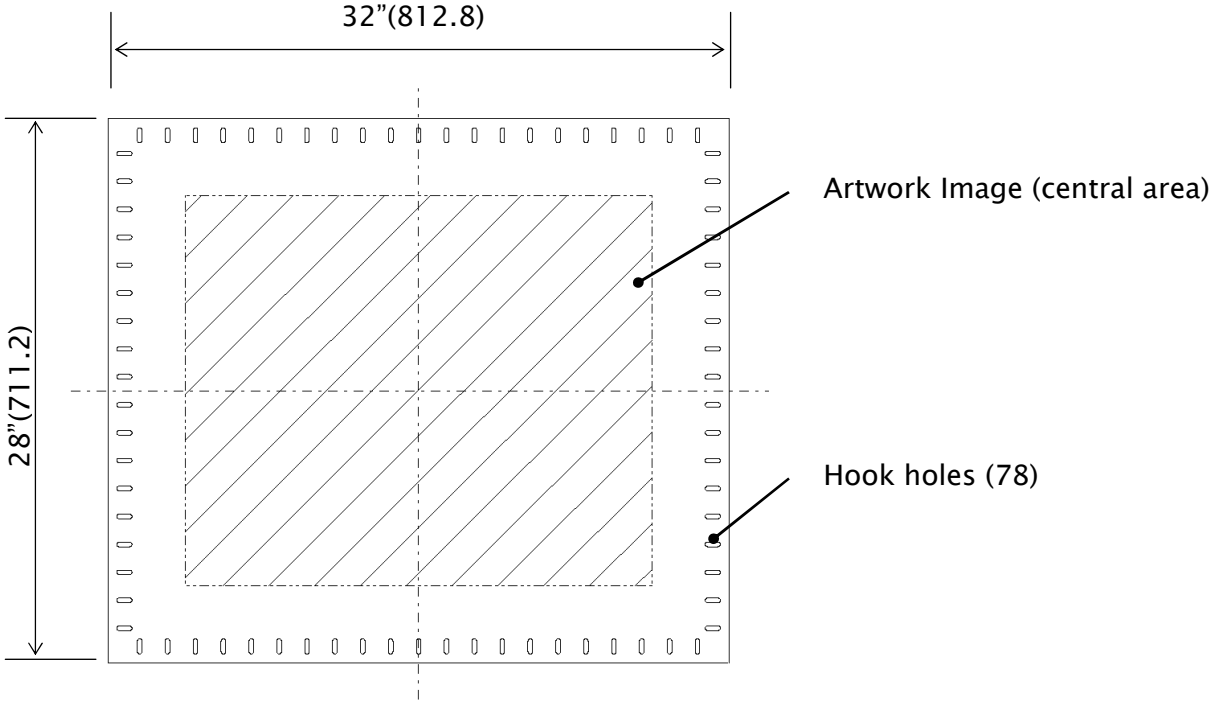
Max. : 510 X 610 mm

Panel thickness :0.1～5.0mm

2. Filmmask

- To be scaled down to 99.95% to 99.97%.
- To have punched holes for hook by the accessory puncher.
- Panel loading/unloading shuttle automatically installs/uninstalls filmmask.

Filmmask details



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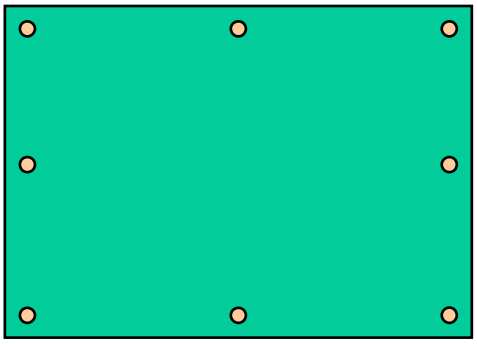
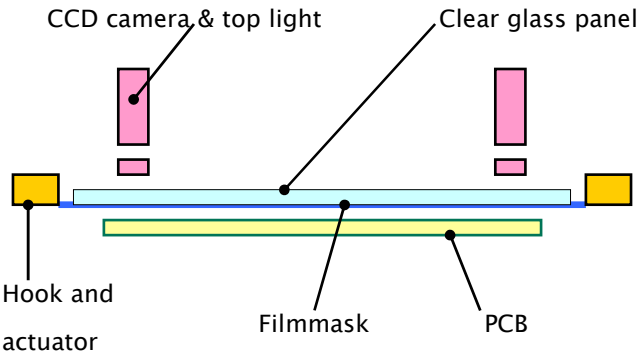
3. Filmmask Scaling and Alignment

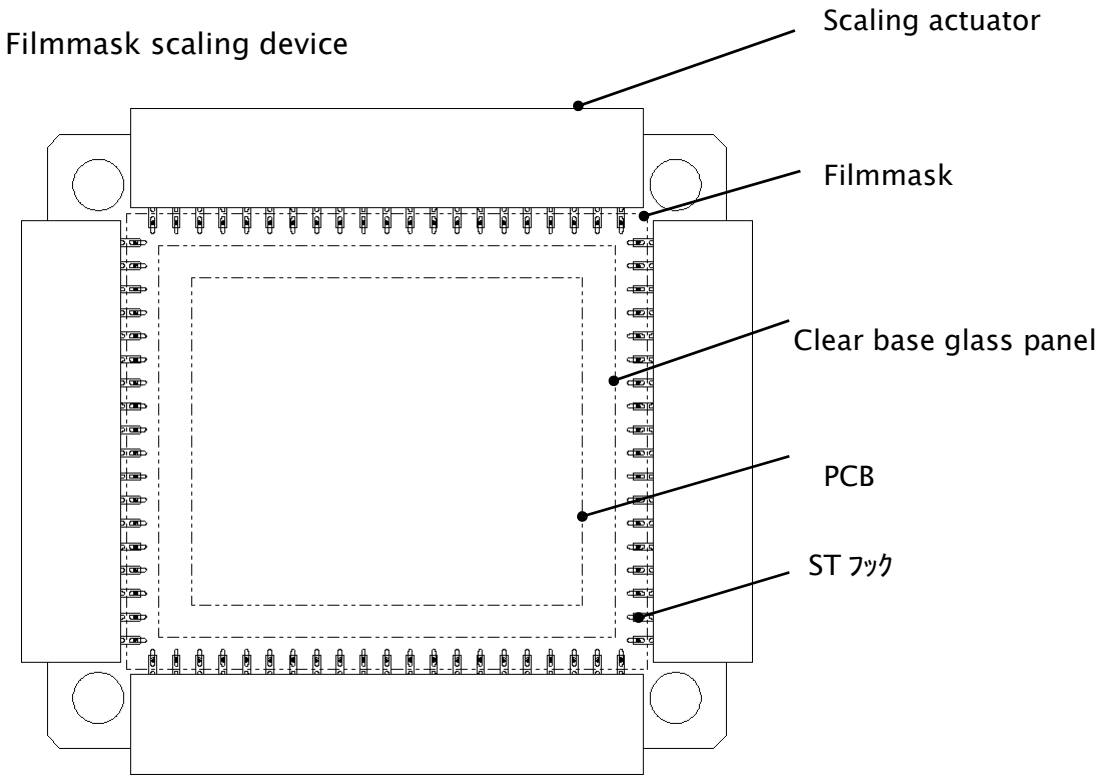
1. Scaling and alignment method

1. CCD cameras recognize eight copper pads on the edge of panel through target dot on the edge of the filmmask.





2. System makes X-Y-Θ alignment between panel and filmmask with target mark on the four corners.
3. System calculates scaling value according to the deviation at the eight targets.
4. System makes filmmask scaling by the actuators.
5. After confirm that the scaling is within the permissible range, system finishes scaling and the filmmask is fixed on the clear base glass panel by vacuuming.
6. After vacuum contact, system makes usual alignment and re-check if required.



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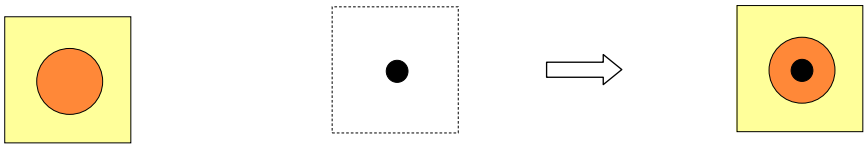
2. Main specifications of scaling/alignment

Image processing	Template method
CCD camera	1/2" CCD camera (4)
Top light	LED ring lighting
Alignment dot (on the filmmask)	ϕ0.8 – 2.0mm (recommended:1.2mm) or, ring mark (larger than copper pad on the panel)
Alignment mark (on the panel)	ϕ2.3 – 5.0mm copper pad (recommended: 3.0mm)
Number of alignment target	4, 8, 16 targets (recommended: 8 targets)
Mechanical resolution	0.1um/pulse (X,Y,Θ actuator)
Alignment Repeatability	10um (3σ)
Scaling accuracy	20um
Recipe storage	300 recipes with: Panel size/thickness, alignment parameters (target coordinate points, number of target, target diameters, permissible range), exposure energy

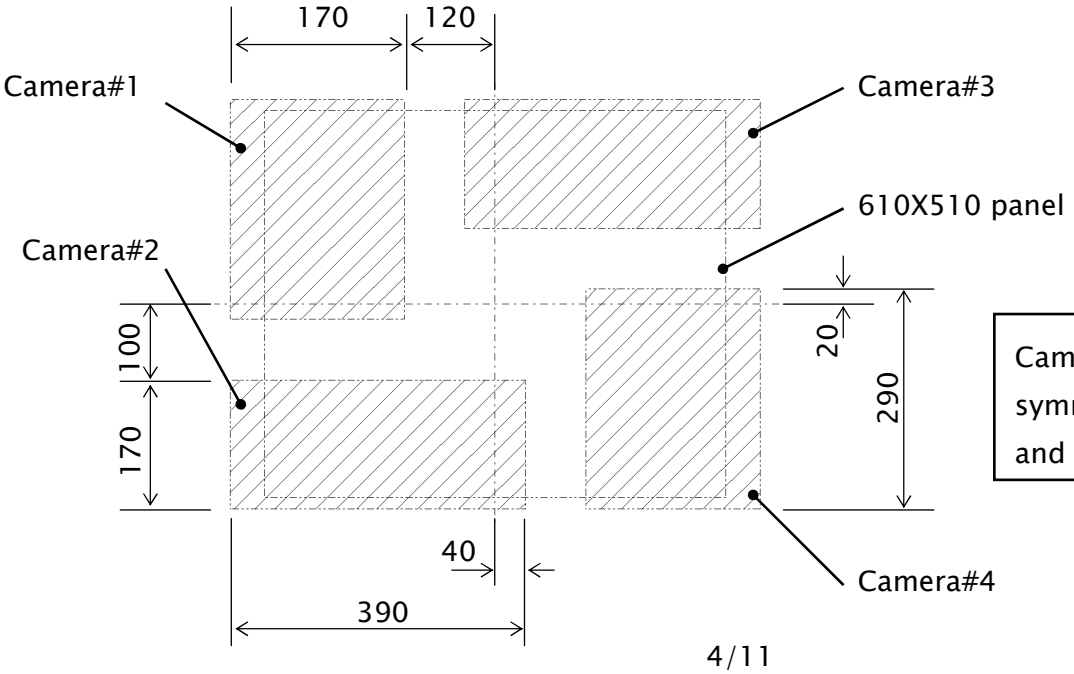
Alignment target sample



Panel
copper pad
Φ2.3~5mm
(recommended: 3mm)

Filmmask
dot
Φ0.8~2.0mm
(recommended: 1.2mm)

CCD camera access area



Camera#1 and #2 have symmetric area to #4 and #3.

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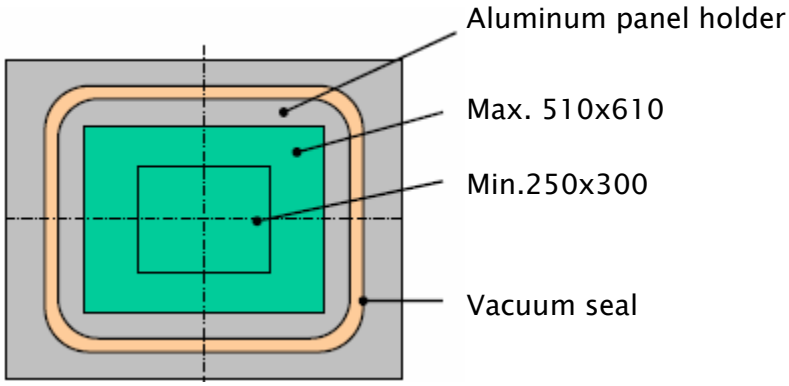
4. Panel Holder and Vacuum Contact

1. Panel holder



- Includes panel cooling device.
- One panel holder shuttles between loading/unloading section and alignment/exposure section.
- Panel loading/unloading shuttle automatically installs/uninstalls filmmask.
- Soft contact exposure

  400W blower (1)、

  When low vacuum contact such as 8kPa is applied, shimming spacers may not be necessary according to exposure test.

Note: Solder resist needs to test in advance to confirm if oxygen is obstructive (make its surface white or clouded) to the resist or not.

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5. UV Light Source

1. UV Bulb

- 10kW or 5kW High pressure short arc mercury lamp with continuous lighting.
- Exposure energy controlled by shutter system.

2. UV Specifications

Effective area	510x610 mm
Collimation half angle	<2.0 °(10kW) <1.5 ° (5kW)
Declination	<1.0 °
Intensity	>70 mW/cm² (10kW) >40 mW/cm² (5kW)
Illumination uniformity	>90%
Peak wave length	365 nm
Lamp cooling	Force air cooling
Lamp life time	700 hours or 100 times
Exposure energy control	Integrated exposure energy controller Sensing wave length:365 nm +/-approx.50 nm

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6. Productivity

1. Thru-put

22 sec. + exposure time (sec.)

Conditions;

Number of scaling and alignment target	8 targets
Vacuuming time	4 sec.
Number of scaling	2 times
Re-check	without Re-check

Processing time details:

1	start: shuttle to exposure section	2 sec.		
2	Panel holder goes up	1		
3	Calculate 8 targets	2		
4	First scaling	1		
5	Calculate 8 targets	2		
6	Second scaling	1		
7	Calculate 8 targets and judge deviation	2		
8	Filmmask vacuum fixing	1		
9	PCB vacuum contact	1		
10	Vacuuming hold time (and Re-check)	4		
11	Exposure 300mJ/70mW(10kW)	5	300mJ/40mW(5KW)	8
12	Release vacuuming	2		
13	Panel holder goes down	1		
	Give operator a chime for permission of shuttle moving.			
14	Shuttle moves to unloading section	2		

Total thru-put:

10kW: 27 sec/panel (exposure 5 sec)

5kW: 31 sec/panel (exposure 8 sec)

7. Climate Control

1. Fan-HEPA Unit

Takes clean room air into the exposure section through HEPA filter.

2. Ionizer

Eliminates static electricity.

8. Anti-Contamination

1. Blower rack

Vacuum pump and UV lamp cooling blower are located in the light source section, preventing exposure section from dust contamination.

2. Bottom floor

With through holes for dust prevention.

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9. Console

1. Operation switches and indications

By a 10.4" color LCD touch panel and LED button switches.

2. Alignment monitor

12.1" TFT color LCD monitor

3. Data input

By touch panel

4. Controllers

(1) PLC Mitsubishi Q-series
(2) Alignment processor
(3) Template image processor
(4) Integrated exposure energy controller (in the touch panel)

10. Utilities and Dimensions

1. Utilities

Power source	3-phases, 200V-50/60Hz、220V-60Hz 17kW(10kW lamp) 10kW(5kW lamp)
Pneumatic supply	150 NL/min, 0.5Mpa 1/2" pressure resistant hose
Exhaust air	ϕ 200 mm exhaust duct 12 m^3/min, Max. approx.60℃
Outer dimensions	3600W x 1550D x 2200H mm
Conveyor height	800 mm
Weight	Approx. 1,500 kg
Section dimensions	Loading/Unloading section: 2500x1550xH1800mm Alignment/Exposure section: 1100x1550xH1800mm

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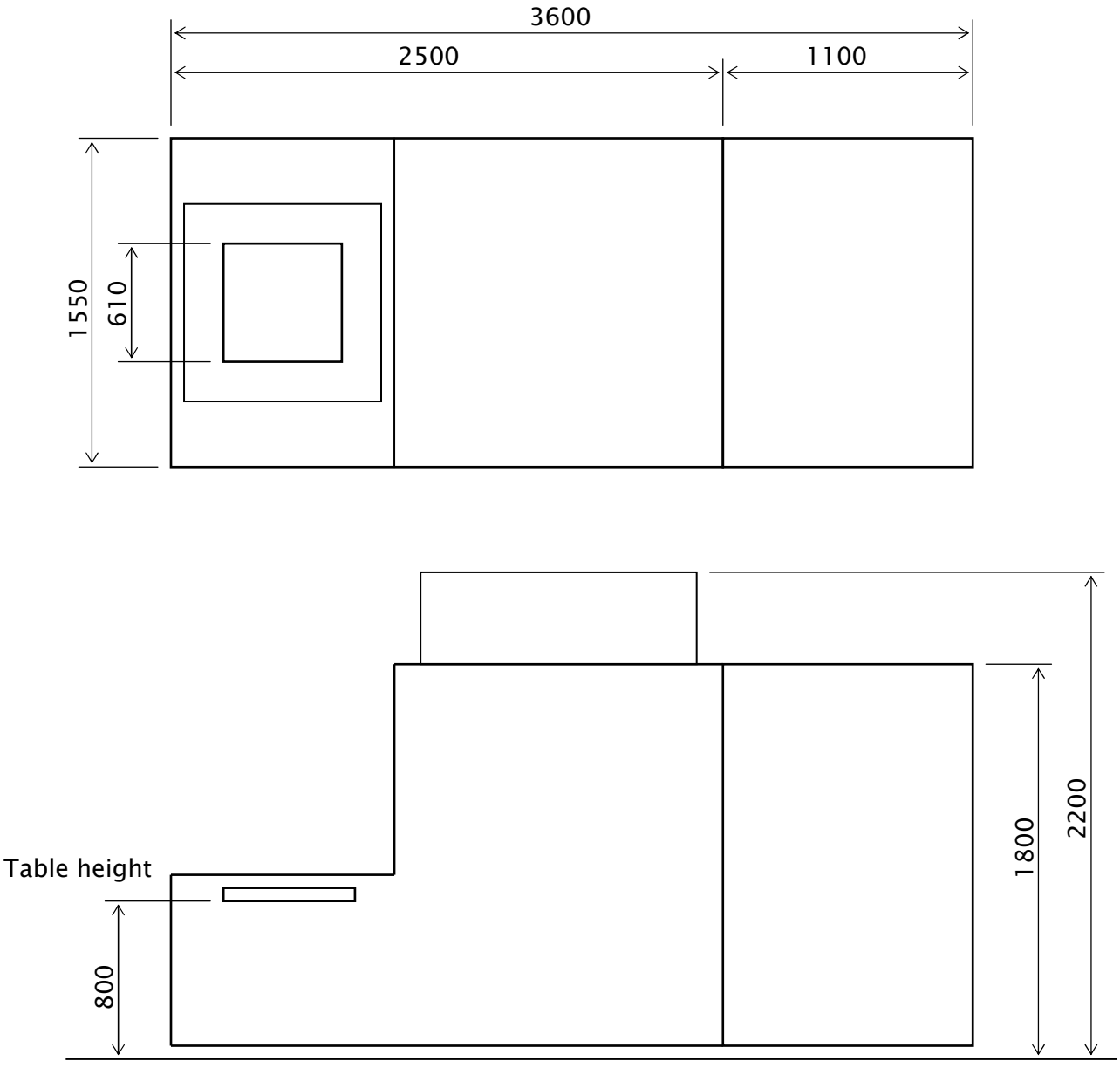
2. Foot Print



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11. Options

1. Temperature/Humidity Controller

Specifications and Utilities

Set temperature range	22℃ – 25℃
Temperature control accuracy	±2℃ (when set at room temperature)
Set humidity range	45%RH～55%RH
Humidity control accuracy	±5%RH (when set at room humidity)
Primary power supply	3 phases、200V、50/60Hz、220V、60Hz,10kw
Primary cooling water supply Volume	>9.0L/min (at 15℃) >13.0L/min (at 20℃) >30.0L/min (at 32℃)
Primary cooling water supply pressure	Input: 0.2 – 0.6Mpa Note: Input pressure must be more than 0.1Mpa higher than the output pressure.
Humidifying water supply	3.9L/h (pure water or distilled water
Humidifying water pressure	0.1～0.5Mpa
Air blowing	Pre-filter: HEPA filter (at ceiling of exposure section) Fan: 0.75kW (1) Duct: ϕ150mm insulation duct
Outer dimensions	900W x 650D x 2060H mm
Weight	Approx. 300Kg