Plant Growth Room
MBDW Walk In Room

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Product Overview/Applications

The MBDW series walk-in chamber is based on a modular platform available in increments of 40ft2 (3.7m2). These units offer a precise chamber environment typical of research involving C4 high-light plants grown to maturity. Unique is the top-down airflow pattern which ensures consistent plant canopy temperatures throughout the chamber. Spectral aluminum on the interior walls produces unparalleled light uniformity, while the discreet lamp loft area uses a separate cooling system to mitigate heat produced by the lighting system.

Lighting

The standard lighting package for the MBDW series chamber generates moderate to high level light intensity and incorporates metal halide and tungsten incandescent lamps. The result is a broad based light spectrum ideally suited for plant growth. The optional lighting packages available include higher intensities as well as programmable closed-loop lighting control.

Airflow

Utilizing an innovative design, a top-down airflow pattern uniformly disperses conditioned air from the top of each plenum and returns the air through conditioning coils located at the bottom of the chamber area. Using an independent ventilation and conditioning system for the lamp loft helps to reduce heat transfer to the chamber area. Filtered and adjustable fresh air intake and exhaust openings enable researchers to manage exchange air to the chamber.

Refrigeration

Cooling for the MBDW series is provided by a self contained water-cooled condensing unit with hot gas bypass for continuous compressor operation. An electronic modulating valve provides tight temperature control while ensuring quiet operation. Pressure transducers are included for monitoring the status of the refrigeration system. Alternative refrigeration methods are available depending on site-specific and/or user defined requirements. Consult the factory for heat rejection information and other refrigeration options.

Experiment Protection

User programmable “set and forget” alarms track the chamber’s operation versus user-defined set points. This allows for exceptionally accurate monitoring without the need for adjustment every time the set point is redefined. Backup “high/low” alarms provide a further level of protection while visual and audible notification is provided when any alarm is activated. Contacts for connection to a building management system are also included.

Key Product Attributes

- High light availability with unparalleled light uniformity
- Discrete lamp loft mitigates heat transfer to chamber area
- Top down airflow for uniform plant canopy temperatures
- Extended height for growth of large plants to maturity
- Modular design to accommodate larger sizes
- Product certifications/markings : CE

Performance Data

	Temperature Range (°C)	Interior Capacity	Growth Area	Growth Height	Exterior Dimensions (WxDxH)	Light Intensities (6in. from lamp)	Electrical Service	Weight
MBDW40	-2°C to +40°C Lights Off	316 ft³	40 ft²	95”	120” x 70” x 114.25”	1100 µmoles/m2/s	120-1Ø-60Hz	2485 lb
	+5°C to +45°C Lights On	8920 L	3.7 m²	2415 mm	3050 x 1780 x 2900 (mm)	@ 25ºC	220-1Ø-50Hz	1127kg
MBDW80	-2°C to +40°C Lights Off	640 ft³	80.9 ft²	95”	120” x 132.25” x 114.25”	1100 µmoles/m2/s	120-1Ø-60Hz	3860 lb
	+5°C to +45°C Lights On	18075 L	7.5 m²	2415 mm	3050 x 3385 x 2900 (mm)	@ 25ºC	220-1Ø-50Hz	1751kg
MBDW120	-2°C to +40°C Lights Off	964 ft³	121.7 ft²	95”	120” x 196.25” x 114.25”	1100 µmoles/m2/s	120-1Ø-60Hz	5240lb
	+5°C to +45°C Lights On	27130 L	11.3 m²	2415 mm	3050 x 4991 x 2900 (mm)	@ 25ºC	220-1Ø-50Hz	2377kg

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1.0 Control System: 7” Meditech touch screen controller

MBDW40

2.0 Construction:(Note: All dimensions are nominal.)

2.1 Exterior Dimensions:	10’0”W x 5’10”D x 9’6.25”H (3050mmW x 1780mmD x 2900mmH)
2.2 Interior Dimensions:	7’9”W x 5’2”D x 7’11”H (2360mmW x 1575mmD x 2415mmH)
2.3 Growth Area:	40.0ft² (3.7m²)
2.4 Growth Capacity:	316ft³ (8,920 liters)
2.5 Growth Height:	95” (2415mm) from floor to underside of barrier.
2.6 Exterior Finish:	White enamel baked on stucco 26ga. galvanized steel.
2.7 Interior Finish:	White enamel baked on smooth 24ga. galvanized steel with specular aluminum to 48” (1220mm) below lamp barrier.
2.8 Cabinet Construction:	Wall panels of bonded panelling construction with 4” (100mm) of foamed-in-place CFC free polyurethane insulation.
2.9 Door:	One (1) infitting door 34” x 78” (865mm x 1980mm) with inside safety release latch and cam-type self-closing hinges. Door has positive closer device, thermal plastic gasket with magnetic core, and door stop.
2.10 Observation Window:	Dual pane with light tight cover 14”x 14” (355mm x 355mm).
2.11 Control Panel:	Left hand (right hand model optional)
2.12 Instrument Ports:	Two ports, 2” (50mm) diameter with light tight cap.

3.0 Lighting:

3.1 Intensity1:	1,100 micromoles/m²/s (Higher light intensities are optional)
3.2 Programming and Control:	Independent, 3 level programming of each lamp type.
3.3 Lamps:	Balanced spectrum for plant growth using metal halide and tungsten incandescent lamps.
3.4 Lamp Fixture:	Separated from the growth area by a transparent barrier. Barriers are hinged for easy lamp access from inside the growth area.
3.5 Lamp Heat:	Removed by a dedicated water cooling coil (water or glycol supply must be 24°C (75°F) or cooler. If water is warmer, select refrigeration cooled DXLL or air-cooled ACLL option).
3.6 Ballasts:	High efficiency electronic and easily accessible.
3.7 Light Meter:	Quantum light meter for display and recording of light output.

4.0 Temperature Control: (Maximum design ambient temperature is +35°C)

4.1 Range:	+4°C to +40°C lights OFF, 10°C to 40°C lights ON
4.2 Control2:	± 0.5°C at the control point.
4.3 Lamp Loft Control:	Sensor located in lamp loft air stream, shielded from direct radiant heat.

1 Average light measurement at 39” (1000mm) from lamp barrier on a 6-inch grid, ambient temperature of 25°C. Light intensities are nominal values measured at the rated chamber supply voltage.
2 Measured by Precision Thermistors, measured without test materials or optional accessories.

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4.4 Temperature Safety Limits:

Primary: A programmable min and max temperature limit alarm or a limit tracking alarm that automatically follows the programmed set point.

Secondary: An independent factory-set high and low temperature limit is also provided for increased assurance.

An audible alarm is standard for both limits. Activation of temperature safety limit set points turns off power to the chamber.

4.5 All components utilized for temperature control such as heaters and proportional valve are energized and de-energized by solid state devices. No electro-mechanical relays or contactors.

4.6 Aspirator: Sensors are located in a self-contained, portable aspirator. This allows accurate measuring and recording by sensing at plant location.

5.0 Cooling System:

5.1 Condensing Unit: Cabinet is supplied with a water-cooled hermetically sealed condensing unit with hot gas bypass system for continuous compressor operation, extended compressor life and close temperature control. Condensing unit is located in the machine compartment, and includes a 3-way water modulating valve and hand operated shut off bypass valve. Maximum pressure drop across the condenser and water valve not to exceed 10pis (0.7 bar).

5.2 Valve: Electronic modulating valve that smoothly regulates the heating and cooling functions of the chamber.

5.3 Heat Exchanger Coil(s): Copper-tubed construction/aluminum fin.

5.4 Refrigerant: Refrigeration system is charged with CFC-free refrigerant.

5.5 Monitoring: a) Refrigeration system operation is monitored by the control system, including visual and audible alarm.

b) Pressure transducers allow for real-time diagnostics for preventative maintenance & repair.

6.0 Air Flow:

6.1 Vertical: Downward from perforated diffusers surrounding each lamp canopy, located just below the lamp barrier.

6.2 Fresh Air: Filtered inlet, 50 cfm (24 liters/second).

6.3 Plenums: Dual side wall air handlers with integral heat exchangers.

7.0 Humidity Control:(Optional)

7.1 Range: No control on basic unit. (Refer to Humidity under Optional Accessories)

8.0 Carbon Dioxide Additive Control: (Optional)

8.1 Range: No control on basic unit. (Refer to Carbon Dioxide Additive Control under Optional Accessories)

9.0 Utility Requirements3: (Rating increases with some options.)

9.1 Electrical Service: : 60Hz: 50Hz

(Alternative services available, consult factory)

1. Control Panel: 120/208-3Ø-60Hz-4 wire, plus ground
2. Condensing Unit: 208-230-3Ø-60Hz-3 wire, plus ground separate service
1. Control Panel: & Condensing Unit: 220/380-3Ø-50Hz-4 wire, plus ground

9.2 Drain: Floor drain must be provided within footprint of room.

10.0 Installation: (Optional)

10.1 Not Included, to be performed by customer. Installation is available upon request, please consult factory.

10.2 Should installation or technical support be required thorough Meditech Technical Service group, additional charges may apply.

PROGRAMMING	Can be modified according to customers requirements	
UPS	Uninterrupted Power Supply	Surge protection and uninterrupted power supply, on controller only, for continuous operation of the controller during power interruptions, duration of the UPS is approx. 15 minutes. (Consult factory for increased duration, if required.)
LIGHTING		
HID	High Intensity Discharge Lighting	High intensity discharge lighting using 400 watt metal halide and 400 watt high pressure sodium lamps with a light intensity of 1100 micromoles/m²/s at a distance of 1 meter from the barrier. Upon start-up, lamps experience a 5 to 10 minute warm up period before full light intensity is achieved. Please contact the factory for other lighting possibilities including electronic ballast and dimming control.

HUMIDITY (Based on +21°C and 50% RH ambient condition)

DHS	Dry Humidity Sensor	Dry Electronic Sensor that directly measures and displays relative humidity in %RH by means of constant display (Not required if ordering additive humidity control option.)
ASNH	Air Mist Humidification	Range: Up to 90% RH lights OFF and 80% RH lights ON, limited by a 29°C maximum dew point. Additive humidity provided by siphon fed, air assisted atomizing spray nozzles. Programming: See Control System documentation. Control: ±3% RH. System uses a dry humidity sensor to directly measure humidity in %RH (no wet sock). System requires a clean water to the following specification; pH = 7.0 ± 0.5, filtration <2 microns (0.00008 in) and resistivity between 0.5 and 1.0 Meg Ohms. Maximum water usage to maintain specified levels is 2.7 liters/hr per nozzle. System also requires oil-less, pressurized air supply of 1 CFM (0.5 liters/second) per nozzle at 50 PSI (3.5 bar) pressure. Contact factory for total consumption.
BDH	Bypass Dehumidification	A precisely controlled volume of chamber air bypasses the heat exchanger by means of a proportionally controlled air damper. Using excess capacity in the refrigeration system, moisture is removed from the remaining air by cooling and reheating. Amp draw increases, please consult factory. Note 1. Amp draw increases, please consult factory. 2. Must be ordered with additive humidity control option.

Carbon Dioxide Additive Control

CO2	Carbon Dioxide	Package includes gas analyzer, control valve, and injection system. Additive Control CO2 tank not included.
CONSTRUCTION		
GH83	Growth Height Extension	Reduced growth height by 12" (305mm). Exterior height becomes 8'6.25"H (2600mm).
GH112	Growth Height Extension	Extended growth height by an additional 17" (430mm). Exterior height becomes 10'11.25"H (3335mm).
GH143	Growth Height Extension	Extended growth height by an additional 48" (406mm). Exterior height becomes 13'6.25"H (4120mm).
RHC	Right-Hand Control Panel	Right-hand control compartment gives you the convenience and flexibility to arrange your chambers in a compact orderly fashion, back to back and end to end, or to facilitate its location in any appropriate space.
HB	Hose Bib	Interior hose connection for watering within growth area.
RECP	Receptacle	Wall mounted 2 amp convenience electrical receptacle within growth area (consult factory for additional amperage, if required).
MAN	Manual	Additional Operator's Manual. (One supplied with basic unit.)
REFRIGERATION		
DXLL	Lamp Loft Cooling by DX	Lamp heat removed by dedicated refrigeration cooling coil connected to chamber system (separate refrigeration condensing unit for BDW120). Independent temperature control to ensure maximum intensity from lamps. Sensor located in lamp loft air stream, shielded from direct radiant heat.
ACLL	Lamp Loft Cooling by AC	Lamp heat removed by proportional forced ventilation to surrounding space. Cooling air filtered by high capacity pleated filter. Independent temperature control to ensure maximum intensity from lamps. Sensor located in lamp loft air stream, shielded from direct radiant heat. Recommended to minimize refrigeration system size and operating cost if suitable room ventilation is available. Contact factory for heat rejection.

Carbon Dioxide Additive Control

RAC	Remote Outdoor Air-Cooled Condenser	Remote outdoor air-cooled condenser complete with all weather housing, low ambient operation controls and low noise level operation. Remote location (up to 50' [15m] combined horizontal and vertical distance) of condenser only - compressor, receiver and other refrigeration components remain in cabinet machine compartment. Order "RACH" for climates with ambient temperatures from +35°C to +45°C for extended periods. Electrical: 60Hz - 208-230-1Ø-60Hz-3 wire plus ground, 50Hz - 220-1Ø-50Hz-2 wire plus ground. Consult factory for either amperages or other voltages available. Notes: 1. Inter-connecting refrigeration and electrical lines are not included and must be provided by others. 2. RAC and RACH require a separate electrical service. 3. For remote location distances over 50' (15m) please consult factory.
OACU	Outdoor Air-Cooled Condensing Unit	Outdoor air-cooled condensing unit containing condenser, compressor, receiver, suction accumulator, control and pressure regulating valves and electrical disconnect. The OACU comes complete with weatherized hood and crankcase heater for low ambient conditions. Inter-connecting refrigeration and electrical lines are not included and must be provided by others. OACU requires a separate electrical service. Electrical: 60Hz - 208-3Ø 60Hz-3wire plus ground, 50Hz - 400-3Ø-50Hz-3wire plus ground. Consult factory for either amperages or other voltages available.
GLY	Glycol	Glycol heating/cooling designed to work with a central chiller refrigeration system. Includes proportional valve control.
FMU	Floor Mounted	Where ceiling space above cabinet does not allow roof top location, unit is placed on fl oor adjacent to cabinet. All refrigeration and electrical interconnecting piping and wiring is supplied, providing condensing unit is no more than 5 feet from cabinet.
ESSENTIAL SPARE PARTS		
ESP	Essential Spare Parts	Consult factory.
SLS	Spare Lighting Set	Consult factory.

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FOLLOWING ARE THE DIFFERENCES BETWEEN THE "MBDW SERIES" CHAMBERS

MBDW80

2.1 Exterior Dimensions: 10'0"W x 11'1.25"D x 9'6.25"H (3050mmW x 3385mmD x 2900mmH)
2.2 Interior Dimensions: 7'9"W x 10'5"D x 7'11"H (2360mmW x 3180mmD x 2410mmH)
2.3 Growth Area: 80.9ft2 (7.5m2)
2.4 Growth Capacity: 640ft³ (18,075 liters)
6.2 Fresh Air: Filtered inlet 100 cfm (48 liters/second).

MBDW120

2.1 Exterior Dimensions: Cabinet - 10'0"W x 16'4.5"D x 9'6.25"H (3050mmW x 4991mmD x 2900mmH)
2.2 Interior Dimensions: 7'9"W x 15'8"D x 7'11"H (2360mmW x 4790mmD x 2410mmH)
2.3 Growth Area: 121.7ft2 (11.3m2)
2.4 Growth Capacity: 964ft2 (27,130 liters)
6.2 Fresh Air: Filtered inlet 150 cfm (72 liters per second).

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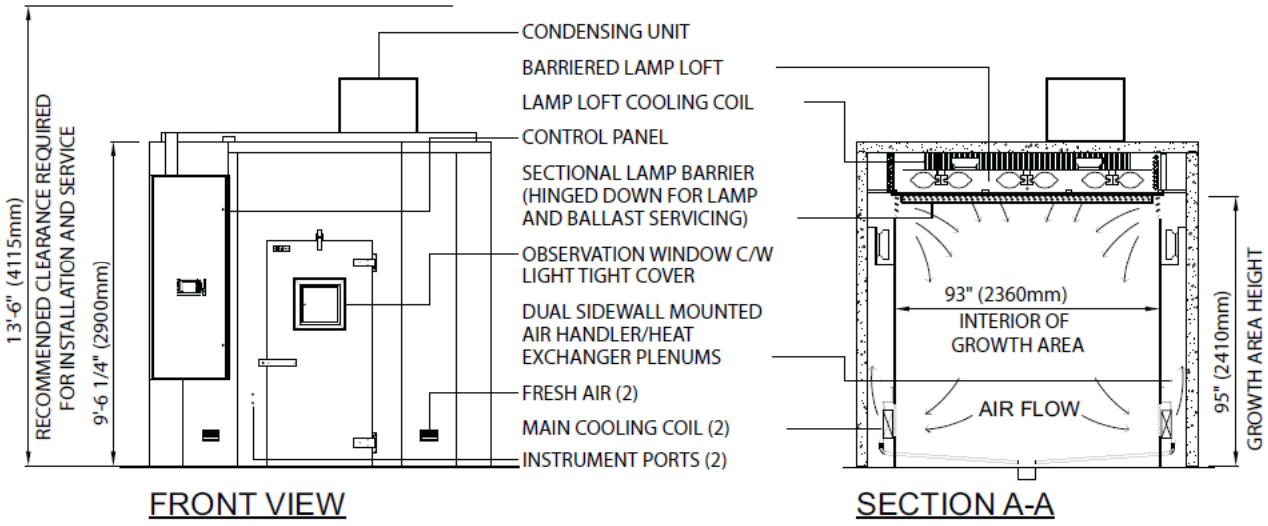
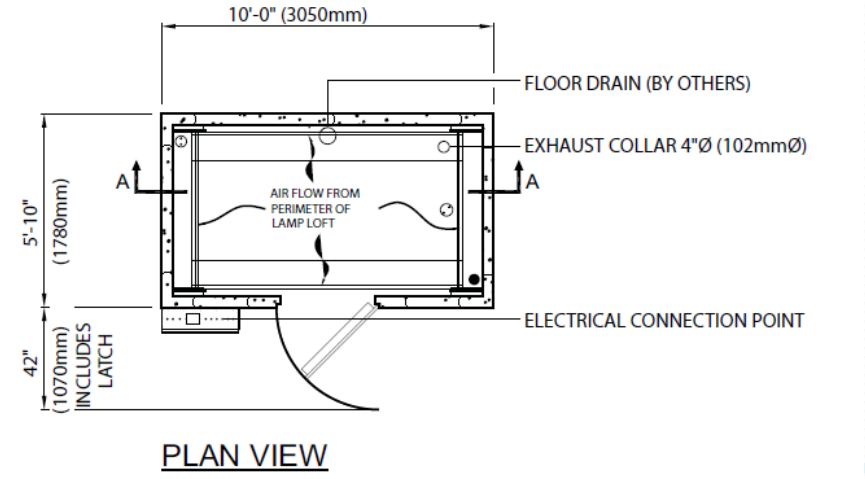
MBDW40 PLANT GROWTH CHAMBER

NOTES:
1. STANDARD REFRIGERATION SYSTEM IS WATER COOLED (3/4"Ø (19mmØ) CONNECTION).
2. DEPTH DIMENSION IS CHAMBER SIZE ONLY. DIMENSION DOES NOT INCLUDE DOOR LATCH.
3. LENGTH AND WIDTH DIMENSIONS ±1/4 (6mm). HEIGHT DIMENSION ±1" (25mm).





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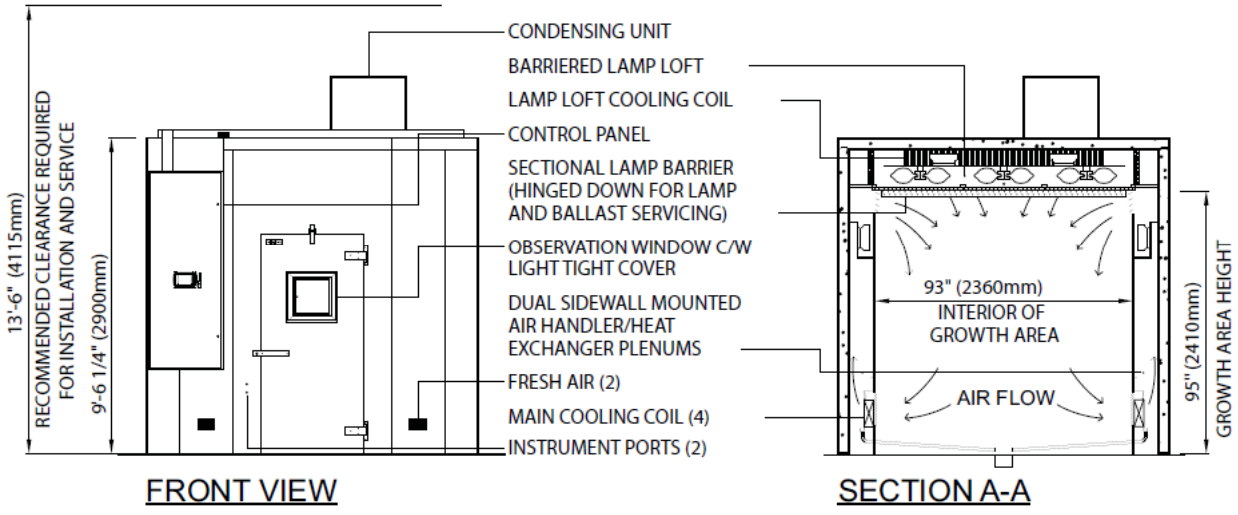
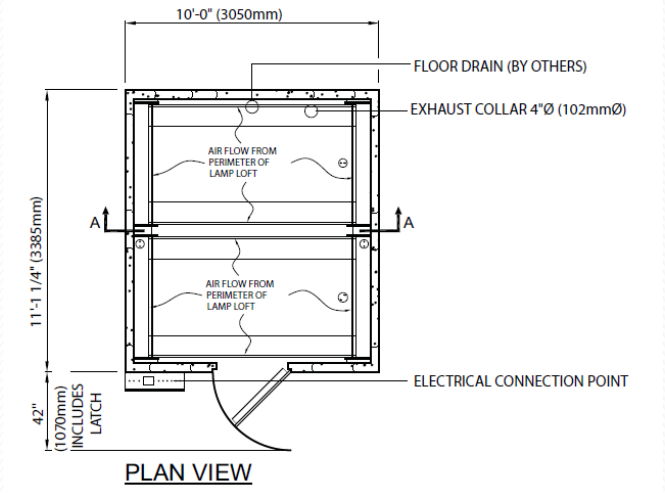
BDW80 PLANT GROWTH CHAMBER

NOTES:
1. STANDARD REFRIGERATION SYSTEM IS WATER COOLED (3/4"Ø (19mmØ) CONNECTION).
2. CONDENSING UNIT REQUIRES SEPERATE ELECTRICAL SERVICE (60HZ APPLICATION ONLY).
3. DEPTH DIMENSION IS CHAMBER SIZE ONLY. DIMENSION DOES NOT INCLUDE DOOR LATCH.
4. LENGTH AND WIDTH DIMENSIONS ±1/4 (6mm). HEIGHT DIMENSION ±1" (25mm).





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BDW120 PLANT GROWTH CHAMBER

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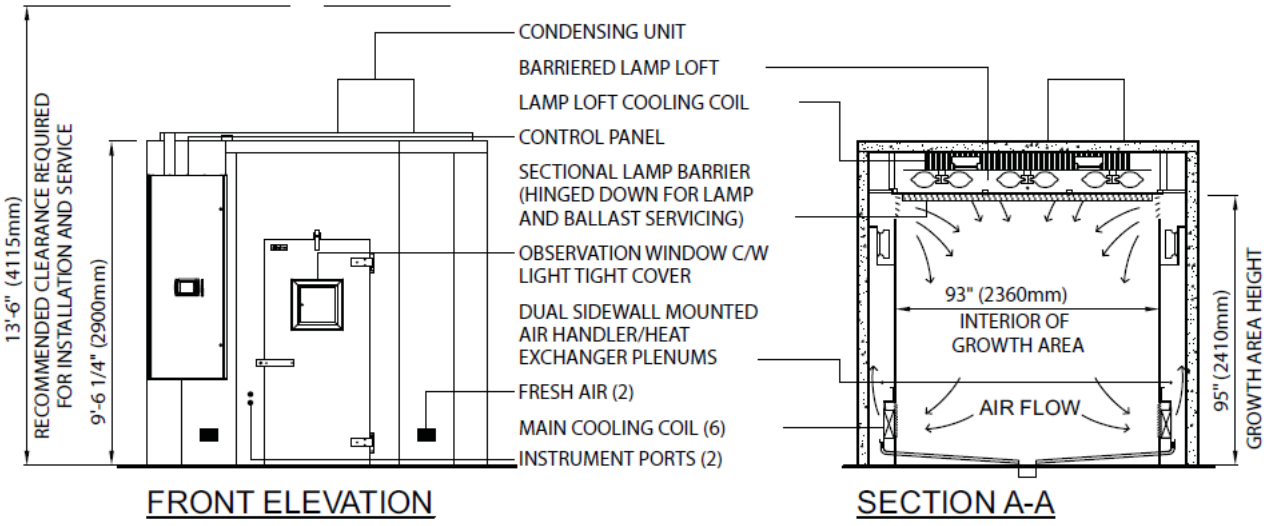
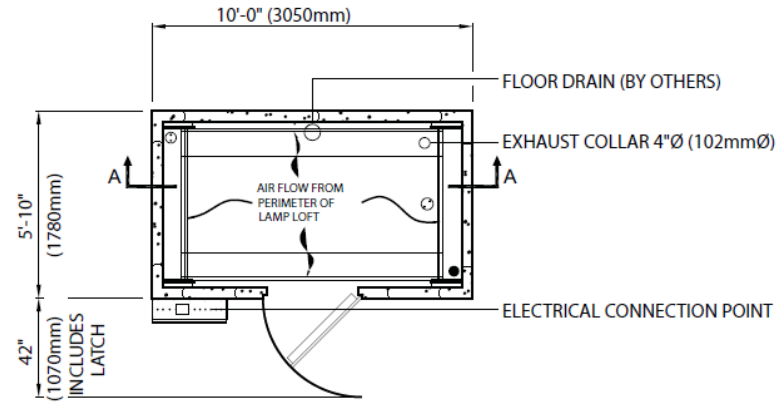
3. DEPTH DIMENSION IS CHAMBER SIZE ONLY. DIMENSION DOES NOT INCLUDE DOOR LATCH.
4. LENGTH AND WIDTH DIMENSIONS ±1/4 (6mm). HEIGHT DIMENSION ±1" (25mm).



FRONT ELEVATION

SECTION A-A



PLAN VIEW

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