

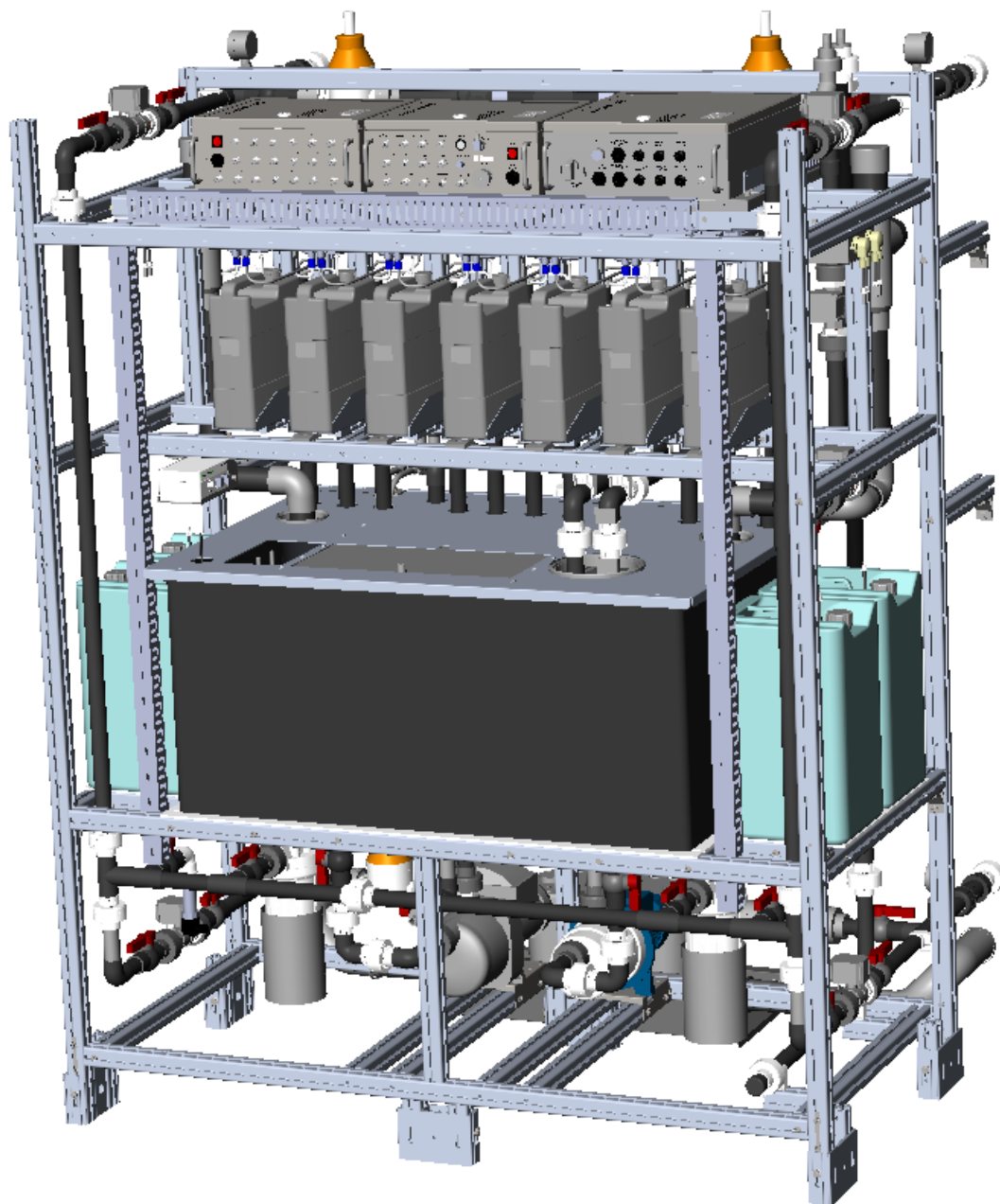


Ætrium Dosing Unit

Data Sheet 06/2020

Aetrium Dosing Unit (ADU) Components

The Aetrium Dosing Unit (**ADU**) is a fully integrated automated dosing system. It can dose volumetrically or via sensor feedback control. Using our Guardian Grow Manager (GGM) as its main interface, it can automatically dose up to 11 fertilizer solutions (typically 9 fertilizers and pH up and down) to 8 distinct zones. The GGM software can optionally control all aspects of a controlled environment.



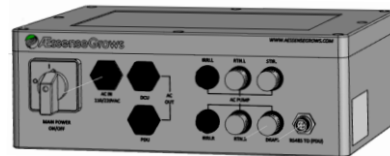
Power Distribution Unit (PDU)

The **PDU** links the Atrium Dosing Unit (ADU) either wirelessly via an Access Point or via an ethernet connection to the server that runs the Guardian™ Grow Manager. It directly controls the Dosing Module, the ACU, the DCU, the WSE, the ASD, and the SPDUs in the Growth Space.



AC Relay Controller (ACU)

The **ACU** contains all AC relays that enable the Irrigation Pumps.



DC Relay Controller (DCU)

The **DCU** contains all DC relays that enable the 24V Valves.



Irrigation Pumps

The two Irrigation Pumps move water from the Reservoir through the pipes to the growth space. They alternate their duty cycle and provide complete redundancy in case of failure. Each pump has a Sediment Filter attached to it.

Dosing Module

Driven by Guardian™ Grow Manager the Dosing Module adds a programmed ratio of fertilizer and amendments to the water in the Reservoir. It consists of Dosing Bottles and Peristaltic Doser Pumps controlled by Stepper Motor (doser) Controllers (**SMC**).

Reservoir

The Reservoir is the storage tank for nutrient rich water circulated through the growth space.

Optional Reservoir Chilling

An optional stainless steel loop of chilled liquid is available (part number 300-00188-01, including stainless steel cooling loop, solenoid valve and connections). Chilling can be controlled by the Guardian Grow Manager.

Valves

The automatically controlled 24 volt DC valves enable individual irrigation patterns for up to 8 different growth spaces. The Pressure Relief Valves (PRV) are manually adjustable diaphragm valves for fine tuning pressure. The Manual Valves can be used to shut off water to certain parts of the growth space during servicing.

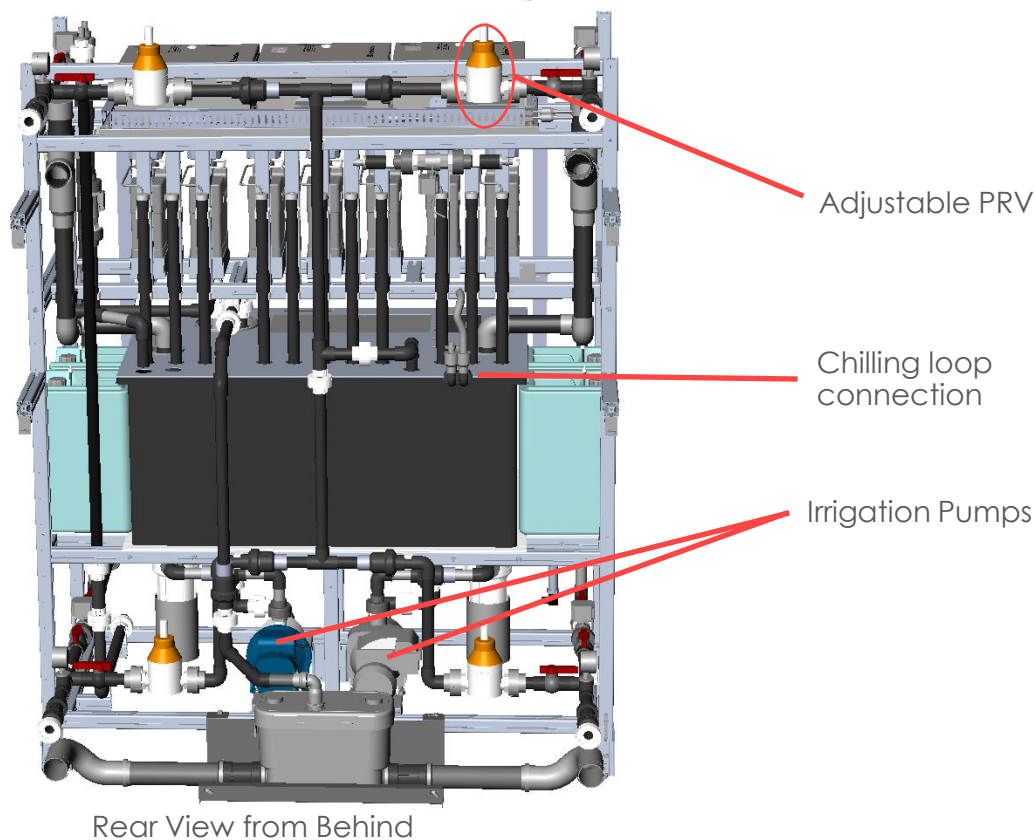
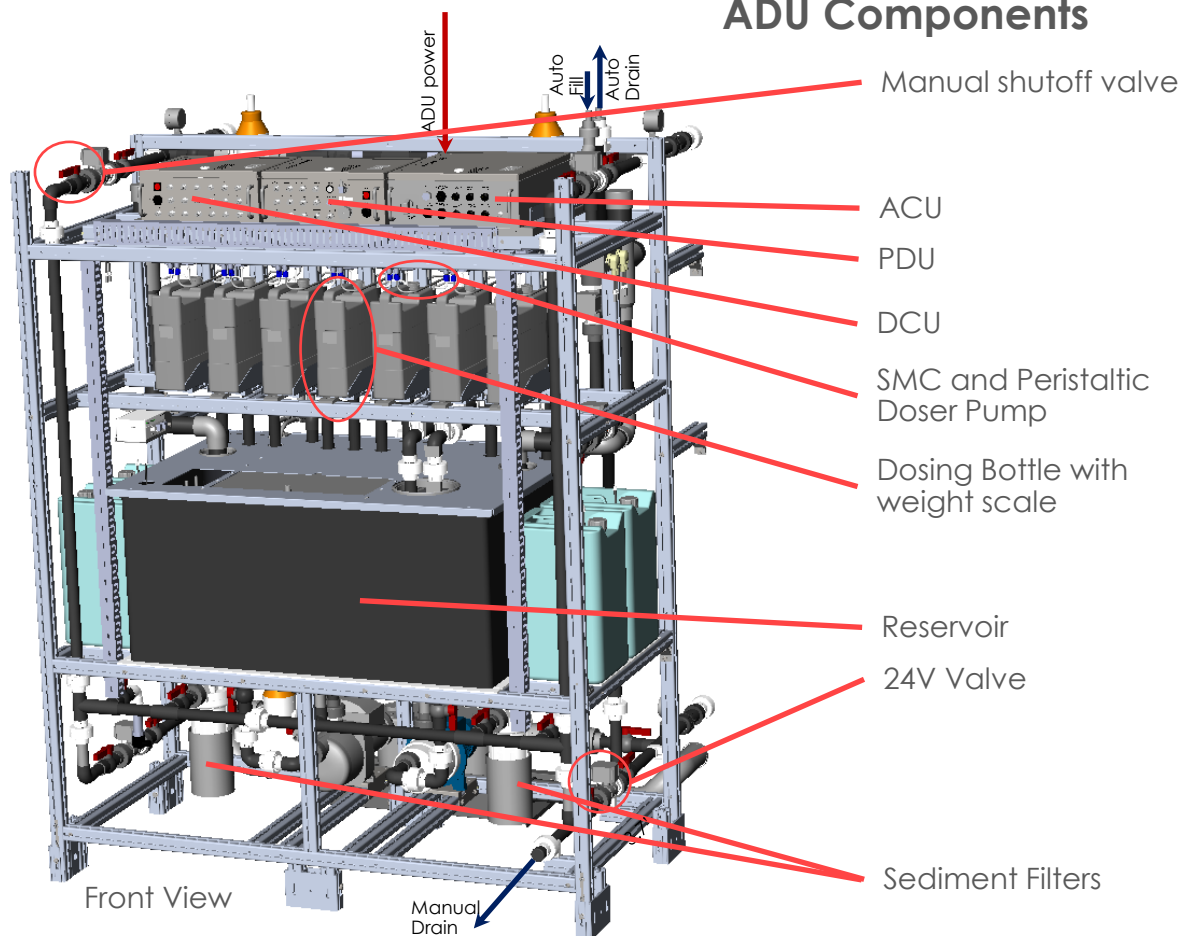
Sensors

The Water Pressure Sensors (**WTP**), the Water Sensing Module (**WSE**) provide accurate feedback to the Guardian™ Grow Manager on water pressure, level, pH, water temperature, electrical conductivity. Each nutrient bottle has a scale under it to provide real-time feedback of how much nutrient is left in the bottle. Air temperature, relative humidity, CO₂ level, and light intensity (ON/OFF) can also be controlled as an option.

Backup Power

In areas where one could suffer from loss of mains power it is highly recommended that the ADU be supplied with power from a backup source to assure that the plants continue to get fertigated. The control network, and its components, should also be on backup power.

ADU Components



ADU Specifications

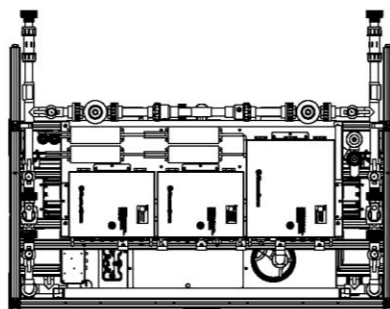
Description	Min	Typical	Max
ADU input voltage	220 V _{AC}	–	240 V _{AC}
ADU input frequency	47 Hz	–	63 Hz
ADU power draw	–	1400W	–
Operating temperature	34 °F (1 °C)	–	104 °F (40 °C)
Storage temperature (assumes all water is removed)	-22 °F (-30 °C)	–	176 °F (80 °C)
UL/CSA Certification	reference E491725		
CE Certificate Number	8227170919		

Description	Value
Water temperature	Range: 32-122°F (0-50°C) Resolution: 1°F (0.1°C)
Water pH	Range: 0-14 pH Resolution: 0.01 pH
Water Electrical Conductivity (EC)	Range: 2–20,000 µS/cm
Supplied water (EC)	<250µS/cm ¹
Irrigation Pump max flow rate	15.8 gal/min (60 lpm)
# of Irrigation Pumps	2
# of Dosing Pumps	11
Dosing rate	8cc/min for 1 gal. bottles 50cc/min for 5 gal. bottles
Sediment Filters (2)	
Material	Polypropylene frame 304 Stainless mesh
Size	80 mesh (0.18mm)
Sediment Filter dimensions (L x W x H)	7.1" x 7.1" x 32.3" (180 mm x 180 mm x 820 mm)

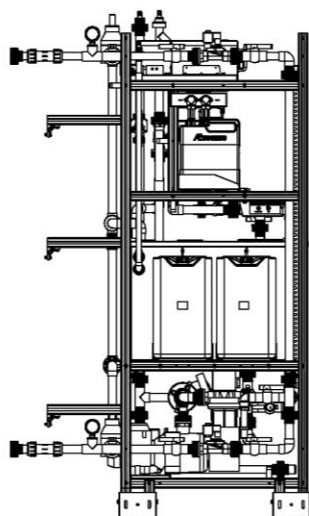
Description	Value
Automatic Drain pump: the ADU can automatically complete a change out of the fertigation solution	
Max. drain pumping height	14.7' (4.5 m)
Flow rate	
Connection Hose Barb (uses 5/8" garden hose)	5/8" OD (16mm OD)
Automatic Water Fill: the ADU automatically senses water level and will add water using a provided solenoid when water levels slip below allowable levels	
Input Flow/pressure	30-50psi @2.2gpm (2-3bar, 8.3lpm)
Connection Hose Barb (uses 5/8" garden hose)	5/8" OD (16mm OD)
Reservoir Capacity	80 gal (302 L)
Optional Reservoir Cooling Coil: user must supplied chilled liquid	
Coil Material	304 Stainless Steel
Coil Length	25' (7600mm)
Coil Diameter	10" (250mm)
Coil Connection Hose Barb	5/8" OD (16mm OD)
Dosing Bottle capacity	7x 1.06 gal (4 L) 4x 5 gal (20 L)
# of Dosing Bottles	11
# of 24V Valves	8
# of Pressure Relief Valves	4
# of Manual Valves	20
ADU dimensions (L x W x H)	41.9"x61.5"x81.8" (1062 mm x 1560 mm x 2077 mm)
ADU dry weight	574 lbs (260 kg)

1. It is highly recommended that one do a complete analysis of the supplied water prior to commencing cultivation. One may need to condition the water to reduce the conductivity of it for best cultivation results.

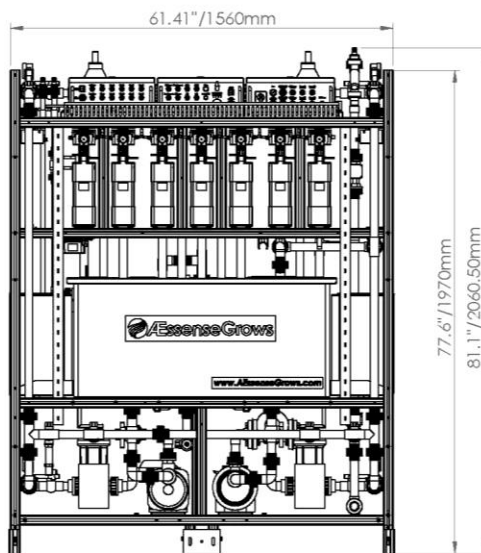
ADU Mechanical Design



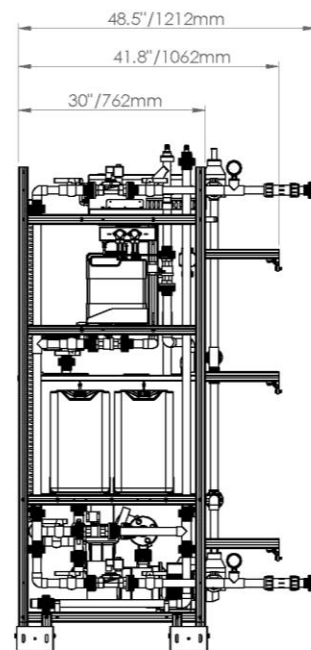
Top view



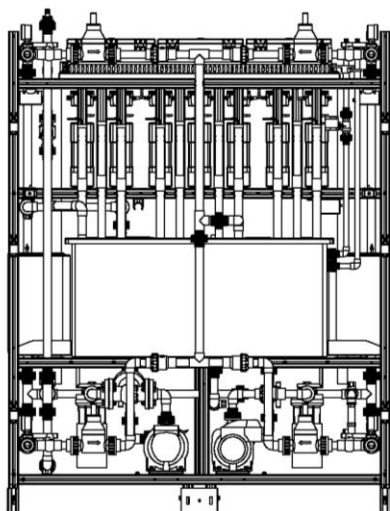
Left view



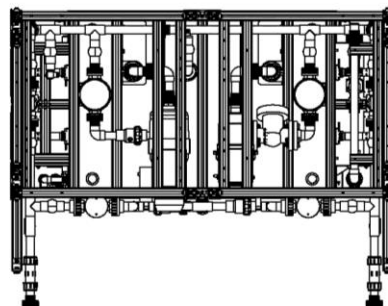
Front view



Right view

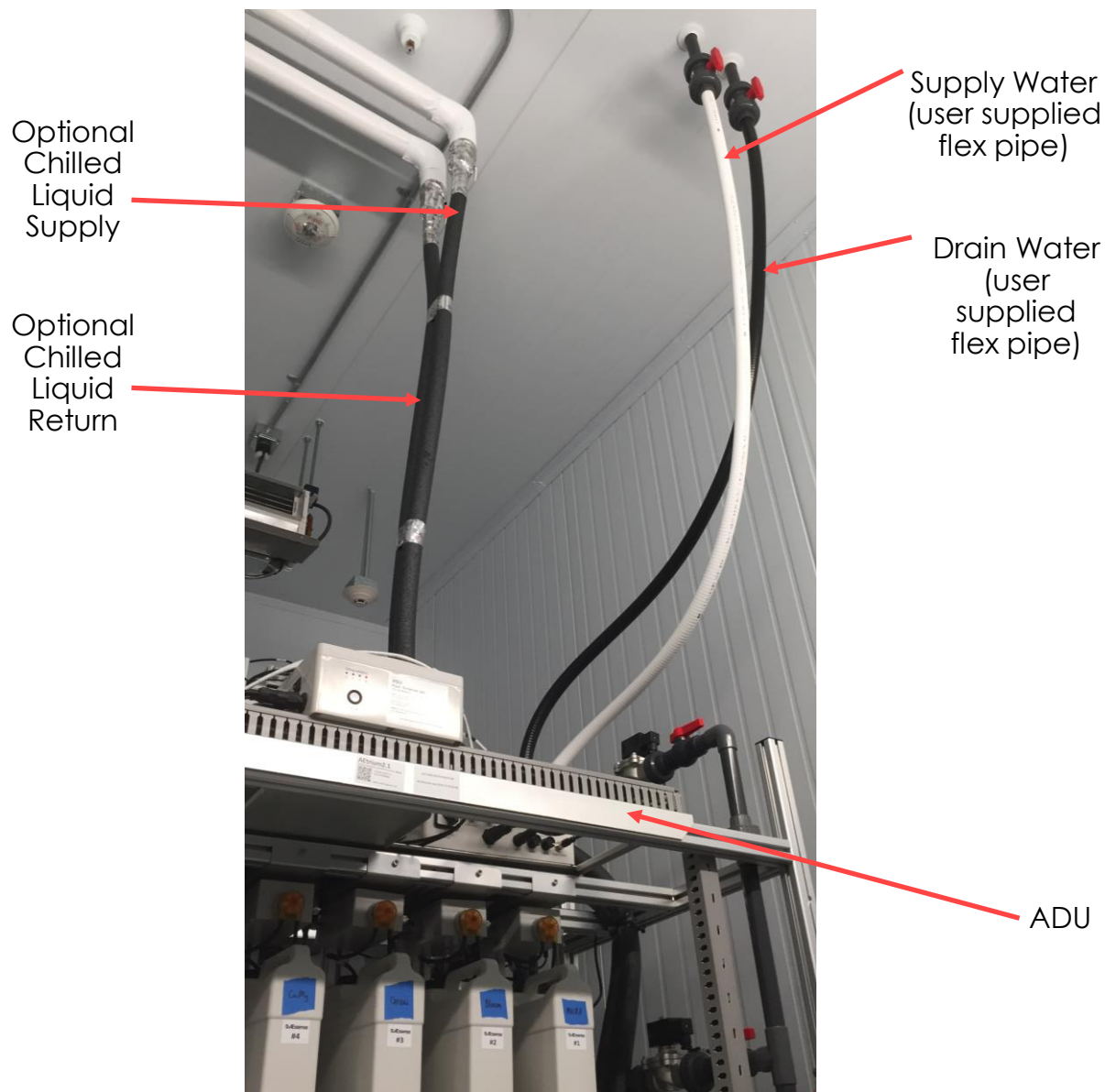


Rear view



Bottom view

ADU Liquid Line Connections



- Flexible lines allow the ADU to move if necessary

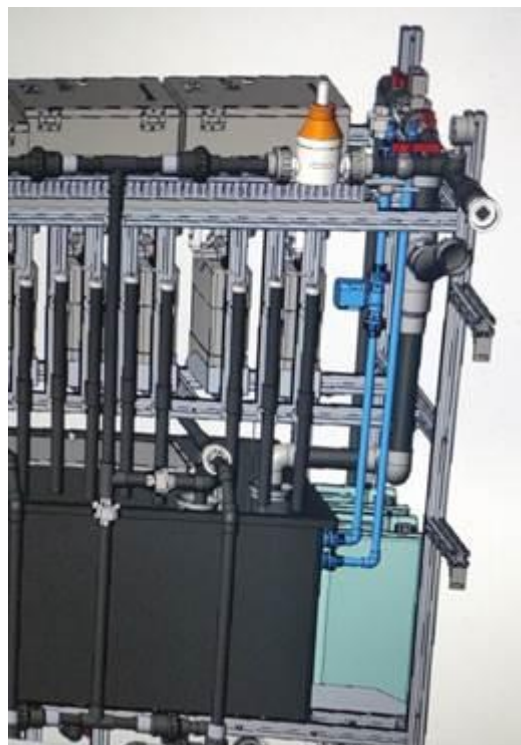


Stainless
Steel
Cooling Coil
installed in
reservoir

Cooling Coil Piping Detail



Rear View of Reservoir



Typical ADU Shipping Configuration

Major Ætrium Dosing Unit components	Dimensions (L x W x H)	Weight
ADU on pallet	64.5" x 31.25" x 83.5" (1638 x 794 x 2121mm)	573 lbs (260 kg)
ADU off of pallet (shipping configuration)	64.5" x 31.25" x 77.5" (1638 x 794 x 1969mm)	
Wood Crate of Parts on pallet	50" x 36" x 54" (1270 x 914 x 1372mm)	655 lbs (297 kg)

ADU Shipping and installation

The ADU ships on a pallet. It is recommended to unload the ADU components from its pallet using a forklift. Once unloaded from the pallets the ADU on pre-installed casters.

- **Door size for installation:** Grow room doors are recommended to be at least 84" x 36" (2286 x 914mm) to accommodate moving in the ADU when it is depalletized.



ADU on pallet



Wood crate of parts

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