

# UNICOOL Wall Packaged Units

AIRSYS Variable Speed Precision Cooling with VFD Technology, 7 - 28kW

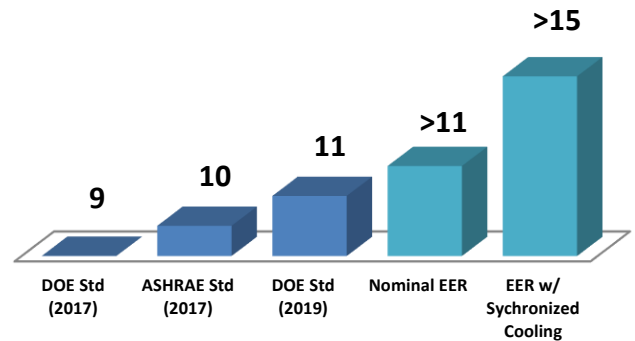
- Designed specifically for computer/equipment environments; cooling capacity heavily shifted toward sensible heat removal
- Features integrated free cooling (economizer) with seamless changeover and optional partial free cooling
- New Adaptive Free Cooling feature optimizes free cooling for each building by learning and adapting to each building's heat load and layout



## Infinite Step Variable Capacity Cooling

- Variable Frequency Drive (VFD) technology rated for 11-12 EER (depending on model) at nominal capacity and 14-16 EER at less than 50% capacity.
- New Synchronized Cooling Mode allows any building with redundant units to achieve 14-16 EER year-round while maintaining full redundancy.
- Soft Start feature eliminates spike voltage at compressor start up (smaller generator required) and reduces stress on compressors at every compressor turn on.

## EER Comparisons



## Feature Highlights

### Variable Capacity Compressor

Variable Frequency Drive technology allows the compressor to precisely match the internal load to minimize stress from ON/OFF cycles.

### Integrated Free Cooling Economizer

Standard on all units, the highly configurable economizer features seamless transitions and a variable capacity up to 100% rated supply fan air volume.

### Dual Air Flow Configurations

Bottom Supply configuration optimizes efficiency while Top Supply means simpler installation.

### Electrically Commutated (EC) Supply Fan

Quieter, more efficient variable speed EC fans are standard on all models providing a highly favorable energy efficiency curve when compared to conventional AC fans.

### Dual Layer Exterior Protection

Galvanized steel exterior coated with an additional layer of thermoset polymer, provides two layers of protection against corrosion.

### Extreme Operating Temperature Range

Designed for operation between -30°F and 127°F ambient temperature.

### Power Monitoring

Power monitoring feature includes instantaneous kW as well as 1hr, 24hr and 30-day average power monitoring that can be used for predictive maintenance.

### Fully Functional Standalone Mode

If communication is lost between unit and controller, the HVAC can still operate all functions including free cooling, mechanical cooling and heating.



**AIRSYS**  
Balance the Environment

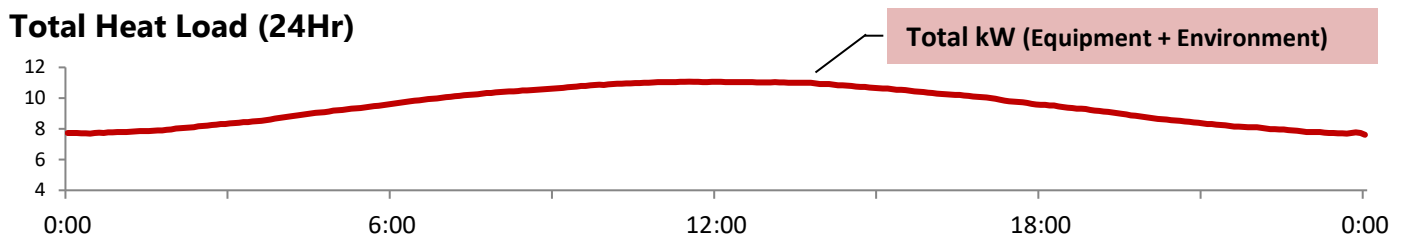
## STANDARD FEATURES

### Precise Heat Load Match

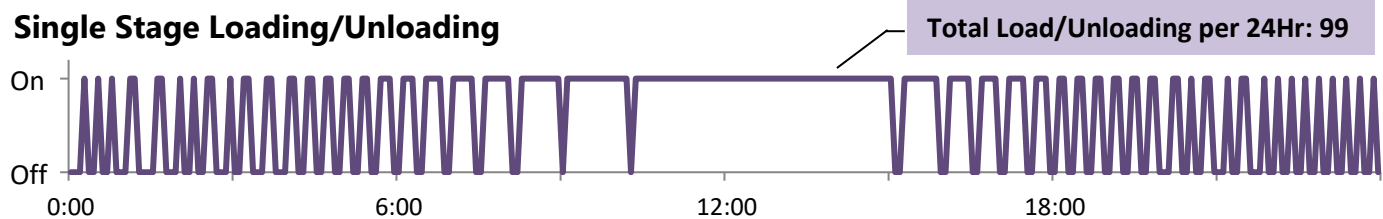
Just like an airplane experiences most of its stress during takeoff and landing, the various cycles of cooling create most of the mechanical stress on the compressor. The turn on of a fixed compressor wears down contactors and the resulting inrush current wears down other electronics.

Even for properly sized units and properly set minimum compressor run/stop timer, the loading and unloading can reach one hundred times a day which would be greater than 30,000 times per year. By precisely matching the heat load at all times, the variable speed units minimize sudden loading and unloading of the compressor, vastly extending the life and reliability of the entire cooling system.

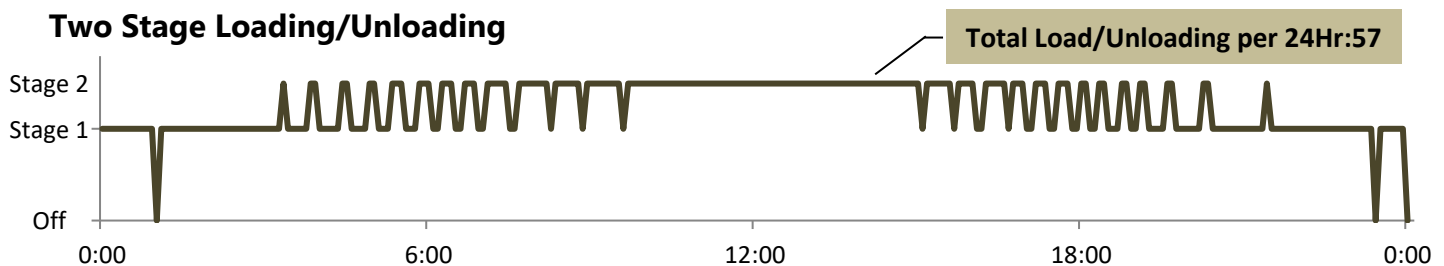
#### Total Heat Load (24Hr)



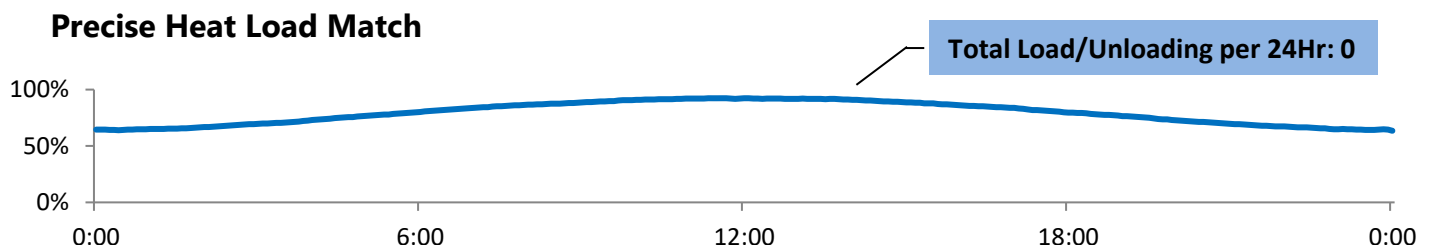
#### Single Stage Loading/Unloading



#### Two Stage Loading/Unloading



#### Precise Heat Load Match

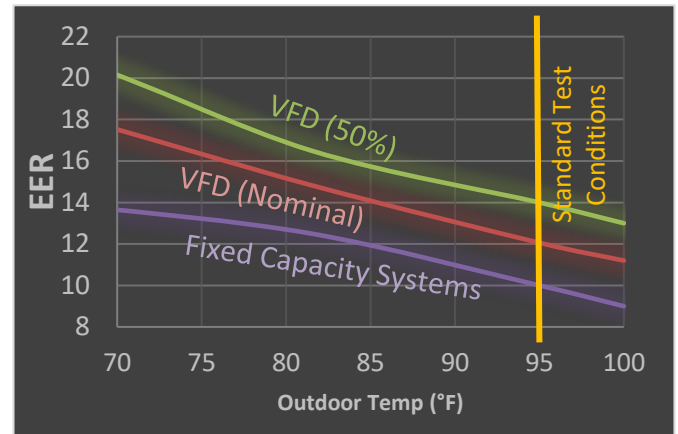


## STANDARD FEATURES

### Synchronized Cooling Mode

With the Variable Capacity systems, buildings with one or more redundant HVAC can use Synchronized Cooling Mode. This mode runs all available units at low speed instead of having lead units take the entire load.

For a building with 2 units in lead/lag configuration, instead of running 90% capacity on the lead unit, synchronized cooling mode would run both units at 45% capacity. At half the load, efficiency will be much higher and stress and noise from the compressor will be reduced to one fourth. Redundancy is unaffected since if one unit has a mechanical cooling failure the other unit will ramp back to full capacity to maintain site temperature. This mode allows any building with redundant units to perpetually achieve 14-16 EER except during emergency situations.



### Turbo Boost Mode

In some situations, such as extreme high outdoor temperature or increased equipment load, the heat load of the building may exceed the nominal cooling capacity of the HVAC system. When this happens, Turbo Boost Mode can be engaged automatically to deliver up to 125% of the nominal cooling capacity at the expense of slightly lower efficiency.

### Quiet Mode

Quiet Mode reduces noise by 10-14 dBA by limiting the maximum frequency the compressor may run at. Maximum cooling capacity will be reduced by 15% and Turbo Boost will be disabled when quiet mode is enabled.

### Soft Start

Instead of sudden and numerous starts and stops, the variable compressor will ramp up capacity at startup and continuously modulate capacity to match the load of the shelter. Soft start has the following advantages:

- Minimize mechanical stress on compressor start up.
- Eliminate spike voltage on start up. This means generators no longer need to be sized to Locked Rotor Amps and a smaller generator and transfer switch system can be used.
- Reduced noise from sudden compressor loading

## Standard Features

### Multi-Unit Controller

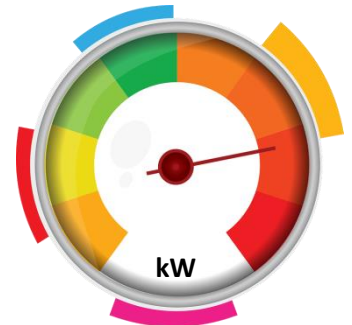
The Variable Capacity WPU is designed to operate with AIRSYS Multi-Unit Controller (ASMUC) which can control up to 6 units at a time and up to 16 with an extension module. The controller can set up to 4 distinct control zones, each with their own temperature settings.

The ASMUC has an overview page that will give users immediate status of any connected HVAC. Detailed status of every temperature and pressure reading is available right at the controller for monitoring and troubleshooting. All parameters are available remotely through IP/SNMP for monitoring and setpoints and other critical control parameters can be changed remotely. A micro-USB port is also available for on-site software update and alarm log downloading to a personal computer.



### Power monitoring

All variable capacity systems come with power monitoring tools that are displayed locally in addition to being available via remote access. This measurement includes instantaneous power consumption as well as 1hr, 24hr and 30-day average power consumption for each of the HVAC units. Power monitoring can be used to measure efficiencies across systems, regions, and networks and can be used to for predictive maintenance.



### Adaptive Free Cooling

Traditional Wall Packaged Unit controls provide a fixed outdoor temperature where free cooling starts based on indoor setpoint. Depending on the heat load of the site, this may not be optimal. With adaptive free cooling, the system will automatically learn and remember the optimal temperatures where free cooling can take over. Adaptive free cooling will continuously optimize toward free cooling hours with no human adjustment required. This is particularly valuable whenever the site heat load changes, the system will also adapt to find the new optimal free cooling setpoints.

## Standard Features

### Condenser Heat Exchange Meter

The ability to remove heat via the condenser coil is a critical element of HVAC performance. Monitoring heat exchange efficiency from the condenser coil facilitates intelligent maintenance decisions. Whether it is small leaves and sticks blocking airflow or grime collecting on the fins of the coil, the precision cooling units will tell the end user or maintenance technician exactly how much of that heat exchange efficiency has been lost.

### Fully Functional Standalone Mode

The system can operate in fully functional Standalone Mode when communication is lost between HVAC and controller. This includes including free cooling, mechanical cooling, dehumidification, and heating. This eliminates the controller as a potential single point of failure for the HVAC system.

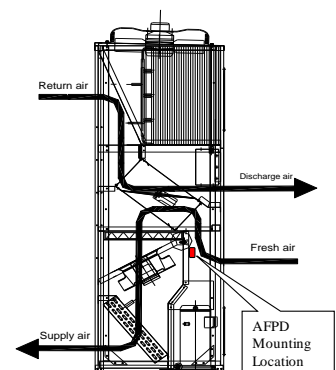
### Performance Parameter Readout

The system provides real-time performance parameter readings to the controller display as well as remote monitoring. This feature gives experienced technicians at-a-glance overview of the system performance which can save significant time during maintenance. When coupled with remote monitoring, this feature can further enable predictive maintenance to save maintenance cost as well as improve system reliability. Some of the parameter readout includes:

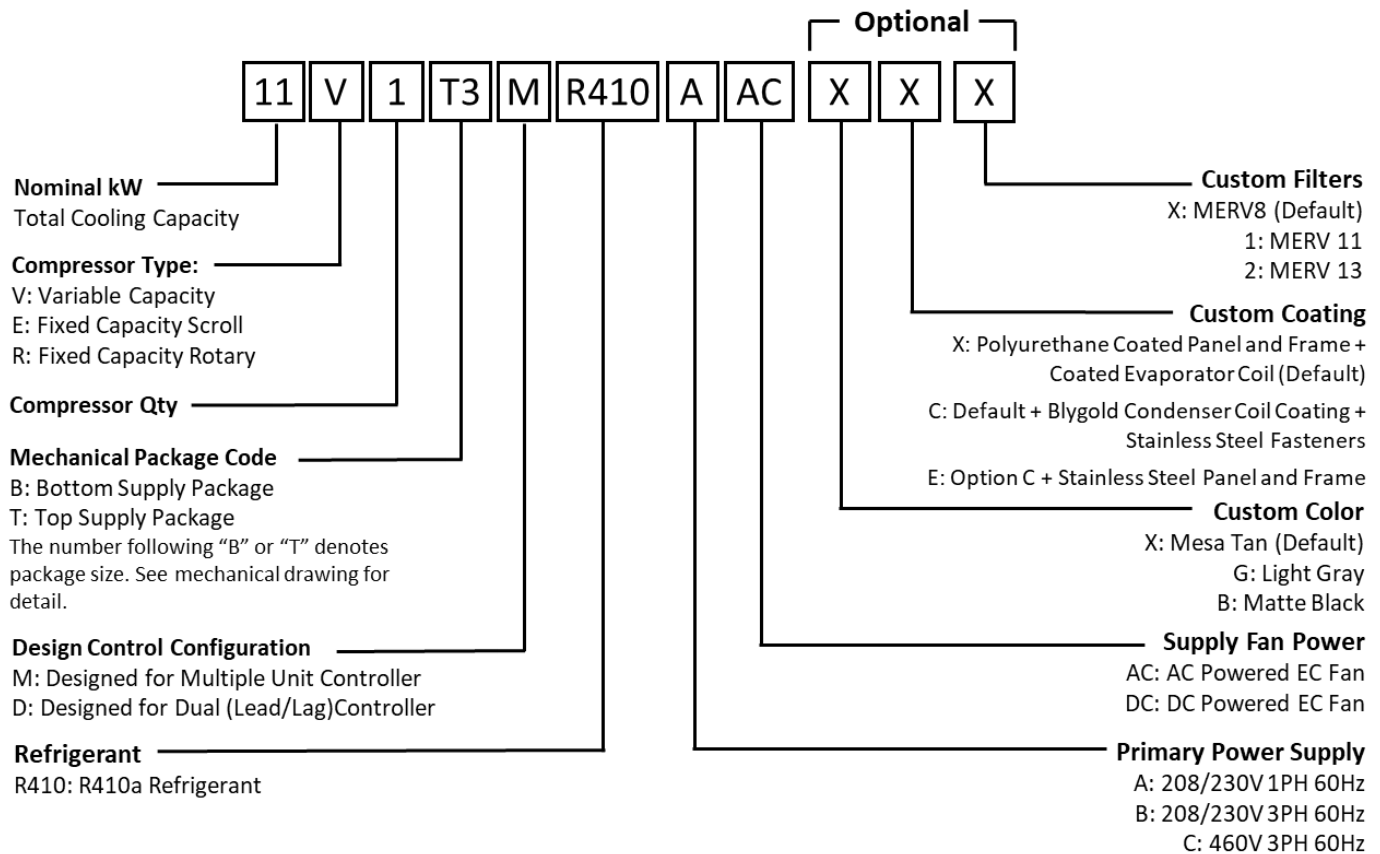
- Superheat
- Sub cooling
- EEV Status
- Variable Compressor Capacity
- Discharge Pressure (High Pressure)
- Discharge Temperature
- Suction Pressure (Low Pressure)
- Suction Temperature

### Air Filter Protection Device

The patented AIRSYS AFPD (Air Filter Protection Device) is field proven and engineered to protect air filters from dust and debris. In many locations, such as sites near, dirt roads, freeways, farmlands, and any source of airborne particulates, the AFPD will optimize Free Cooling during periods when the air is clean thereby extending the life of the primary air filter. This has the dual impact of optimizing efficiency while reducing maintenance costs.



## MODEL NUMBER NOMENCLATURE



## NOMINAL COOLING PERFORMANCE (AHRI 390)

Model	Nominal Tonnage	Nominal Total Capacity	EER (Standard)	EER (90% Part Load)	EER (60% Part Load)	IPLV
7V1B2MR410AAC	1 - 2.5 Ton Variable	7.2 kW / 24,600 BTUH	11.5	16.5	17.0	16.5
11V1B3MR410AAC	2 - 4 Ton Variable	10.3 kW / 35,200 BTUH	11.5	16.5	17.0	16.0
11V1T3MR410AAC	2 - 4 Ton Variable	10.2 kW / 34,800 BTUH	11.5	16.0	16.5	15.2
15V1B4MR410AAC	3 - 6 Ton Variable	15.1 kW / 51,500 BTUH	11.5	16.3	17.0	15.8
15V1T4MR410AAC	3 - 6 Ton Variable	14.8 kW / 50,500 BTUH	11.0	16.3	17.0	15.8
15V1B4MR410BAC	3 - 6 Ton Variable	15.1 kW / 51,500 BTUH	11.5	16.3	17.0	16.8
15V1B4MR410CAC	3 - 6 Ton Variable	15.4 kW / 50,500 BTUH	11.4	16.3	17.0	16.2
28V2B5MR410AAC	3 - 10 Ton Variable	28.1 kW / 96,000 BTUH	10.3	14.8	15.5	14.2
28V1B5MR410BAC	4 - 10 Ton Variable	28.1 kW / 96,000 BTUH	11.5	16.5	17.0	16.0
28V1B5MR410CAC	4 - 10 Ton Variable	28.1 kW / 96,000 BTUH	11.0	16.5	17.0	15.9

**NOTE:** All Capacities, EER, and IPLV certified to AHRI 390 testing standard.

## VARIABLE SPEED COMPRESSOR CAPACITY DATA

Model	Return Temp. (DB/WB)	Min Total Capacity (kW/BTUH)	Max Total Capacity (kW/BTUH)	Min Sensible Capacity (kW/BTUH)	Max Sensible Capacity (kW/BTUH)
7V1B2MR410AAC	80/67°F	3.6 / 12,200	8.9 / 30,400	2.6 / 8,800	7.4 / 25,400
	86/69°F	3.7 / 12,600	9.2 / 31,400	2.6 / 9,000	8.5 / 29,100
	95/72°F	3.9 / 13,300	9.7 / 33,300	3 / 10,200	9.7 / 33,000
11V1B3MR410AAC	80/67°F	7.5 / 25,600	14.1 / 48,000	6.4 / 22,000	10.8 / 37,000
	86/69°F	7.7 / 26,400	14.5 / 49,500	6.6 / 22,500	12.4 / 42,400
	95/72°F	8.2 / 28,000	15.4 / 52,500	7.5 / 25,600	14.1 / 48,000
11V1T3MR410AAC	80/67°F	7.0 / 24,000	14.1 / 48,000	6.7 / 22,800	10.9 / 37,200
	86/69°F	7.3 / 24,800	14.5 / 49,500	6.3 / 21,500	12.5 / 42,700
	95/72°F	7.7 / 26,300	15.4 / 52,500	7.1 / 24,200	14.2 / 48,300
15V1B4MR410AAC	80/67°F	10.6 / 36,100	17.7 / 60,500	9.2 / 31,300	15.2 / 52,000
	86/69°F	10.8 / 36,900	18.1 / 61,700	9.4 / 32,100	15.8 / 53,800
	95/72°F	11.2 / 38,200	19.1 / 65,200	10.8 / 36,800	18.5 / 63,000
15V1T4MR410AAC	80/67°F	10.0 / 34,200	17.0 / 58,000	8.7 / 29,700	14.5 / 49,500
	86/69°F	10.3 / 35,000	17.4 / 59,200	8.9 / 30,400	15.1 / 51,500
	95/72°F	10.6 / 36,200	18.3 / 62,500	10.3 / 35,100	17.7 / 60,400
15V1B4MR410BAC	80/67°F	10.6 / 36,100	17.7 / 60,500	9.2 / 31,300	15.2 / 52,000
	86/69°F	10.8 / 36,900	18.1 / 61,700	9.4 / 32,100	15.8 / 53,800
	95/72°F	11.2 / 38,200	19.1 / 65,200	10.8 / 36,800	18.5 / 63,000
15V1B4MR410CAC	80/67°F	10.4 / 35,600	17.7 / 60,400	9.1 / 30,900	15.1 / 51,500
	86/69°F	10.7 / 36,400	18.1 / 61,600	9.3 / 31,600	15.7 / 53,600
	95/72°F	11.0 / 37,700	19.1 / 65,000	10.7 / 36,500	18.4 / 62,800
28V2B5MR410AAC	80/67°F	9.5 / 32,400	33.1 / 113,000	8.3 / 30,800	28.0 / 96,000
	86/69°F	9.8 / 33,600	34.3 / 117,000	8.5 / 29,000	29.9 / 102,000
	95/72°F	10.3 / 35,300	36.2 / 124,000	9.7 / 33,100	34.2 / 117,000
28V1B5MR410BAC	80/67°F	16.4 / 56,000	39.0 / 133,000	12.5 / 42,500	29.9 / 102,000
	86/69°F	17.0 / 58,100	40.4 / 138,000	14.4 / 49,100	34.2 / 117,000
	95/72°F	17.9 / 61,000	42.6 / 145,000	16.3 / 55,600	38.9 / 133,000
28V1B5MR410CAC	80/67°F	16.3 / 55,500	37.2 / 127,000	14.1 / 48,000	28.5 / 97,300
	86/69°F	16.9 / 57,600	38.5 / 131,000	14.3 / 48,800	32.6 / 111,000
	95/72°F	17.7 / 60,500	40.7 / 139,000	16.2 / 55,300	37.2 / 127,000

- All Data given at 95°F outdoor temperature.
- For capacity rating at higher than 95°F outdoor temperature, de-rate capacity by 4% for every 5°F above 95°F, up to 120°F.
- For high altitude installation, de-rate capacity by 1% for every 1000ft above 1000ft. System not designed for operation above 6500ft.

## NOMINAL COOLING PERFORMANCE (ASHRAE 127)

Model	Nominal Sensible Capacity	SCOP
7V1B2MR410AAC	7.8 kW / 26,600 BTUH	3.70
11V1B3MR410AAC	11.3 kW / 38,500 BTUH	3.66
11V1T3MR410AAC	11.2 kW / 38,300 BTUH	3.62
15V1B4MR410AAC	15.2 kW / 52,000 BTUH	3.47
15V1T4MR410AAC	15.0 kW / 51,000 BTUH	3.42
15V1B4MR410BAC	15.2 kW / 52,000 BTUH	3.47
15V1B4MR410CAC	15.4 kW / 52,500 BTUH	3.49
28V2B5MR410AAC	28.4 kW / 96,800 BTUH	3.41
28V1B5MR410BAC	28.2 kW / 96,200 BTUH	3.40
28V1B5MR410CAC	28.3 kW / 96,500 BTUH	3.41

- Capacities and SCOP rated to ASHRAE 127-2012 standard for air cooled horizontal flow units



## FREE COOLING CAPACITY

Model	$\Delta T = 5^{\circ}\text{F}$ (kW/BTUH)	$\Delta T = 10^{\circ}\text{F}$ (kW/BTUH)	$\Delta T = 15^{\circ}\text{F}$ (kW/BTUH)	$\Delta T = 20^{\circ}\text{F}$ (kW/BTUH)
7V1B2MR410AAC	1.6 / 5600	3.3 / 11300	4.9 / 16900	6.6 / 22500
11V1B3MR410AAC	2.2 / 7500	4.4 / 15000	6.6 / 22400	8.8 / 29900
11V1T3MR410AAC	2.1 / 7100	4.2 / 14200	6.2 / 21300	8.3 / 28400
15V1B4MR410AAC	3.4 / 11600	6.8 / 23200	10.2 / 34800	13.7 / 46700
15V1T4MR410AAC	3.2 / 10900	6.4 / 21800	9.6 / 32700	12.8 / 43700
15V1B4MR410BAC	3.4 / 11600	6.8 / 23200	10.2 / 34800	13.7 / 46700
15V1B4MR410CAC	3.4 / 11600	6.8 / 23200	10.2 / 34800	13.7 / 46700
28V2B5MR410AAC	6.8 / 23200	13.6 / 46400	20.4 / 69600	27.2 / 92800
28V1B5MR410BAC	6.8 / 23200	13.6 / 46400	20.4 / 69600	27.2 / 92800
28V1B5MR410CAC	6.8 / 23200	13.6 / 46400	20.4 / 69600	27.2 / 92800

## TECHNICAL DETAILS

Model	Compressor	Evaporator Fan		Condenser Fan		Electric Heater		Refrigerant	Noise (2)	
	Running Current (A)	Current (A)	Air Volume (CFM) (3)	Current (A)	Air Volume (CFM)	kW	Current (A)	lbs.	Nominal	Quiet Mode
7V1B2MR410AAC	7.7	1.2	1230	0.9	1880	5	21.7	6.8	63	54
11V1B3MR410AAC	11.8	2.1	1470	2.7	3825	5	21.7	8.1	65	56
11V1T3MR410AAC	10.3	2.1	1640	2.2	3700	5	21.7	11.7	66	56
15V1B4MR410AAC	15.3	6.0	2290	3.5	4500	5	21.7	10.1	65	56
15V1T4MR410AAC	14.6	5.2	2580	3.5	4500	5	21.7	12.3	66	57
15V1B4MR410BAC	9.1	2.7	2350	1.8	4580	5	12.6	10.1	65	56
15V1B4MR410CAC	4.7	1.5	2410	1.0	1940	5	6.3	10.1	65	56
28V2B5MR410AAC	22.4 / 15.5	6.5	4410	6.5	7650	5	21.7	13 / 11.7	68	62
28V1B5MR410BAC	26.4	6.5	4410	6.5	7650	5	12.6	33.0	67	57
28V1B5MR410CAC	14.1	3.3	5470	2.5	7650	5	6.3	33.0	67	57

(1) All electric current values given at max capacity/speed

(2) Ambient Temperature = 95°F, 6.5ft away from unit in open space

(3) With standard pleated filter

## AIRFLOW RATINGS

Model	CFM (Wet Coil/Dry Coil)			
	0.0 in. wc. (0Pa)	0.1 in. wc. (25Pa)	0.2 in. wc. (50Pa)	0.3 in. wc. (75Pa)
7V1B2MR410AAC	1230 / 1255	1170 / 1200	1120 / 1150	1060 / 1100
11V1B3MR410AAC	1470 / 1495	1400 / 1430	1340 / 1370	1270 / 1320
11V1T3MR410AAC	1640 / 1665	1570 / 1600	1500 / 1540	1440 / 1490
15V1B4MR410AAC	2290 / 2320	2220 / 2350	2145 / 2180	2040 / 2090
15V1T4MR410AAC	2580 / 2510	2410 / 2540	2335 / 2370	2230 / 2280
15V1B4MR410BAC	2350 / 2380	2280 / 2410	2210 / 2260	2100 / 2150
15V1B4MR410CAC	2410 / 2440	2340 / 2470	2270 / 2330	2160 / 2210
28V2B5MR410AAC	4410 / 4460	4160 / 4230	3940 / 4030	3740 / 3800
28V1B5MR410BAC	4410 / 4460	4160 / 4230	3940 / 4030	3740 / 3800
28V1B5MR410CAC	5470 / 5320	5020 / 5090	4800 / 4870	4600 / 4660



## ELECTRICAL RATINGS

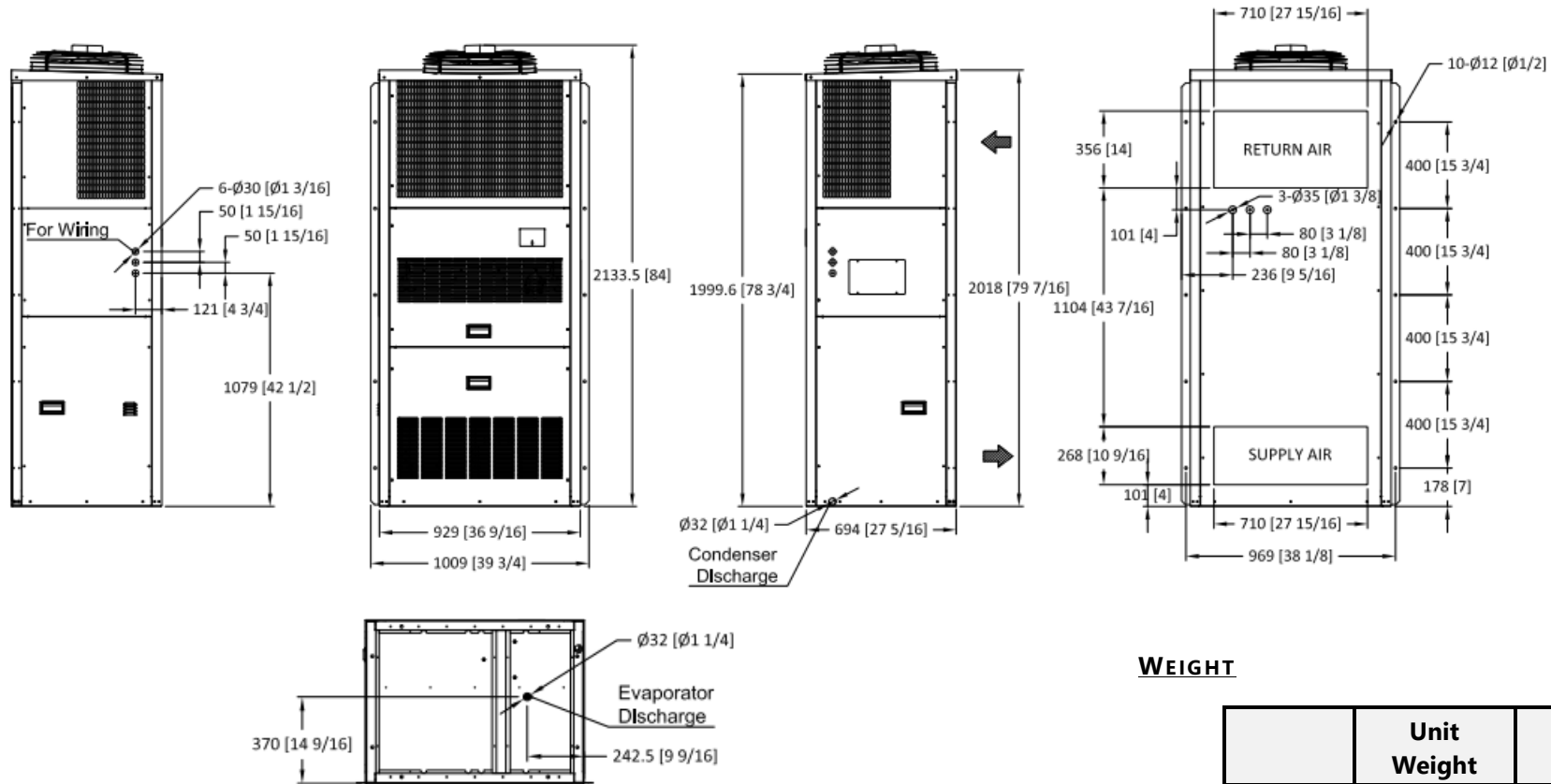
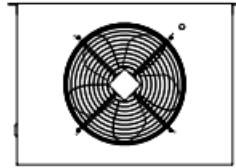
Model	Circuit #1				Circuit #2			
	AC		48VDC		AC		48VDC	
	MCA	MFS	MCA	MFS	MCA	MFS	MCA	MFS
7V1B2MR410AAC	29	30	--	--	--	--	--	--
11V1B3MR410AAC	29	40	--	--	--	--	--	--
11V1T3MR410AAC	29	40	--	--	--	--	--	--
15V1B4MR410AAC	33	50	--	--	--	--	--	--
15V1T4MR410AAC	35	50	--	--	--	--	--	--
15V1B4MR410BAC	22	30	--	--	--	--	--	--
15V1B4MR410CAC	13	15	--	--	--	--	--	--
28V2B5MR410AAC	36	50	--	--	29	40	--	--
28V1B5MR410BAC	24	30	--	--	40	60	--	--
28V1B5MR410CAC	25	35	--	--	--	--	--	--
MCA = Minimum Circuit Ampacity								
MFS = Maximum Fuse (or HACR Breaker) Size								

## FILTER SIZES

Model	Filter Quantity	Nominal Size (in)	Exact Size (in)
7V1B2MR410AAC	1	18 x 25 x 2	17-1/2 x 24-1/2 x 1-3/4
11V1B3MR410AAC	2	16 x 16 x 2	15-1/2 x 15-1/2 x 1-3/4
11V1T3MR410AAC	2	16 x 16 x 4	15-7/8 x 15-7/8 x 3-3/4
15V1B4MR410AAC	2	18 x 20 x 2	17-1/2 x 19-1/2 x 1-3/4
15V1T4MR410AAC	2	18 x 20 x 4	17-7/8 x 19-7/8 x 3-3/4
15V1B4MR410BAC	2	18 x 20 x 2	17-1/2 x 19-1/2 x 1-3/4
15V1B4MR410CAC	2	18 x 20 x 2	17-1/2 x 19-1/2 x 1-3/4
28V2B5MR410AAC	2	24 x 24 x 4	23-3/8 x 23-3/8 x 3-3/4
28V1B5MR410BAC	2	24 x 24 x 4	23-3/8 x 23-3/8 x 3-3/4
28V1B5MR410CAC	2	24 x 24 x 4	23-3/8 x 23-3/8 x 3-3/4

# DIMENSIONS

**MODEL: 7V1B2**

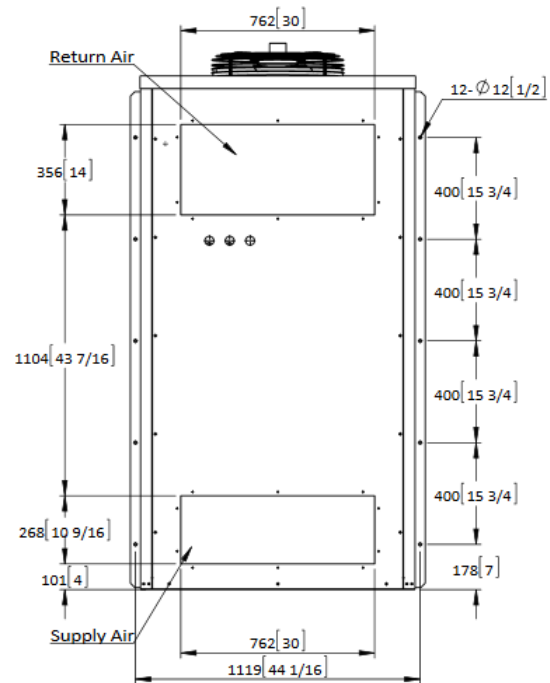
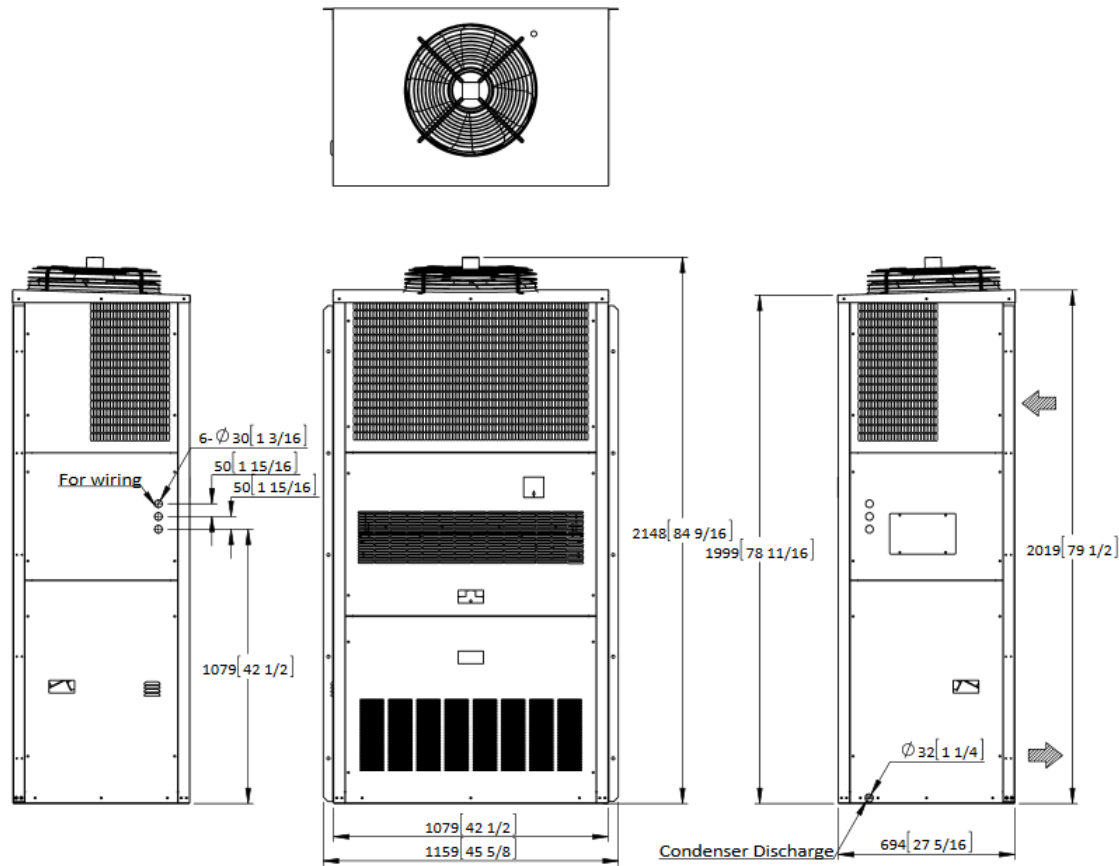


## WEIGHT

	Unit Weight	Ship Weight
<b>lbs.</b>	504	558
<b>kg</b>	229	253

# DIMENSIONS

MODEL: 11V1B3

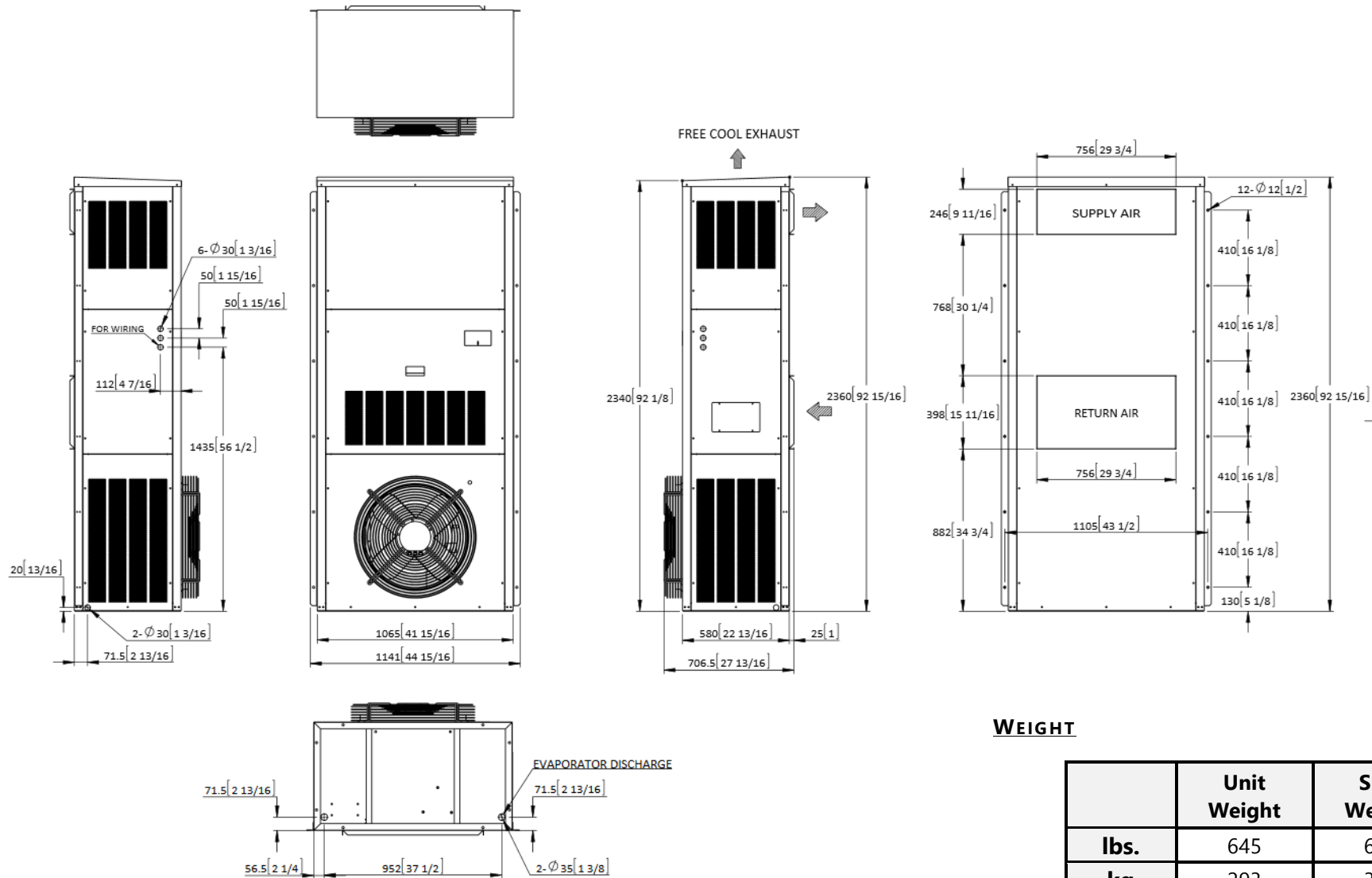


## WEIGHT

	Unit Weight	Ship Weight
<b>lbs.</b>	633	686
<b>kg</b>	287	311

# DIMENSIONS

**MODEL: 11V1T3**

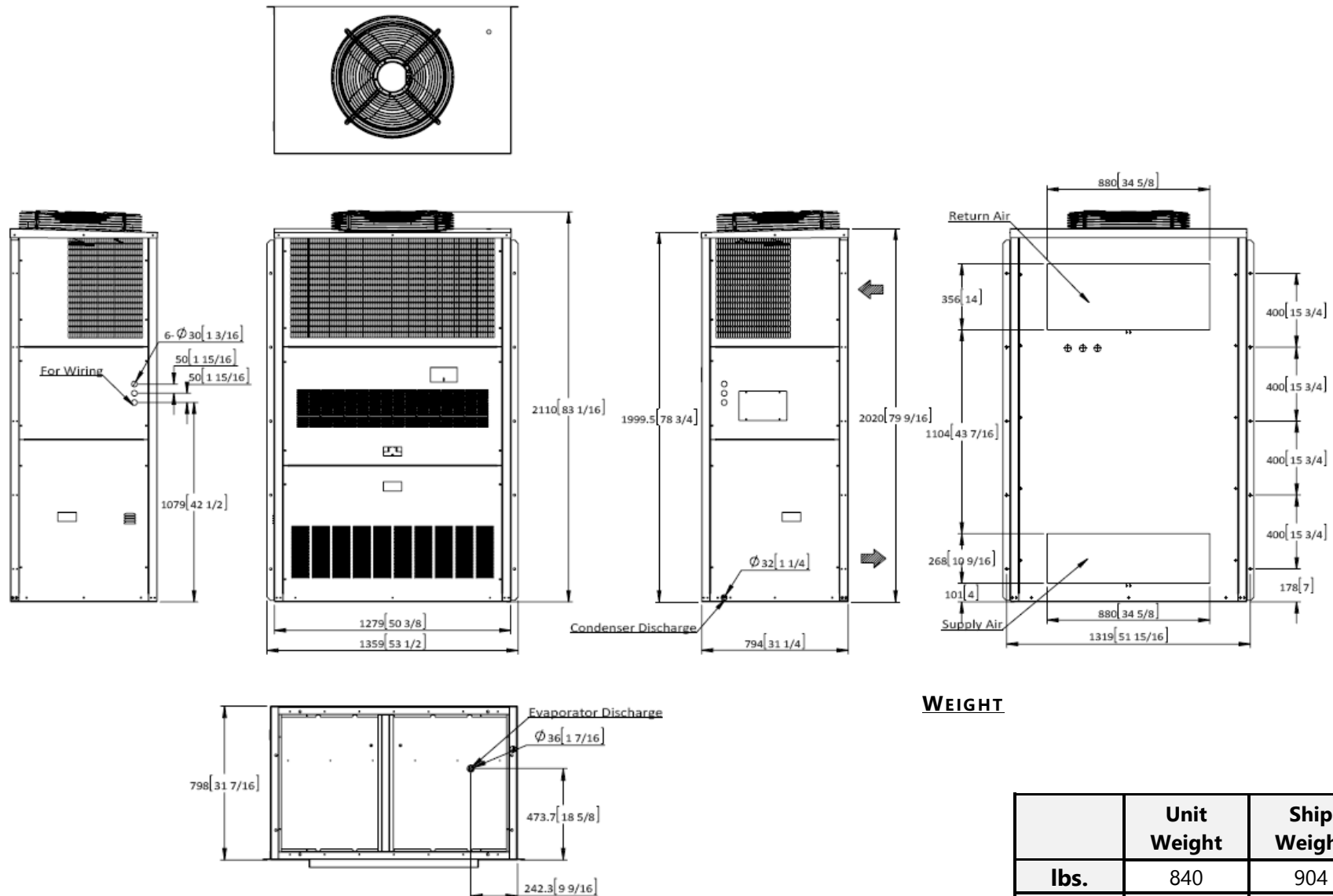


## WEIGHT

	Unit Weight	Ship Weight
<b>lbs.</b>	645	690
<b>kg</b>	293	313

# DIMENSIONS

**MODEL: 15V1B4**

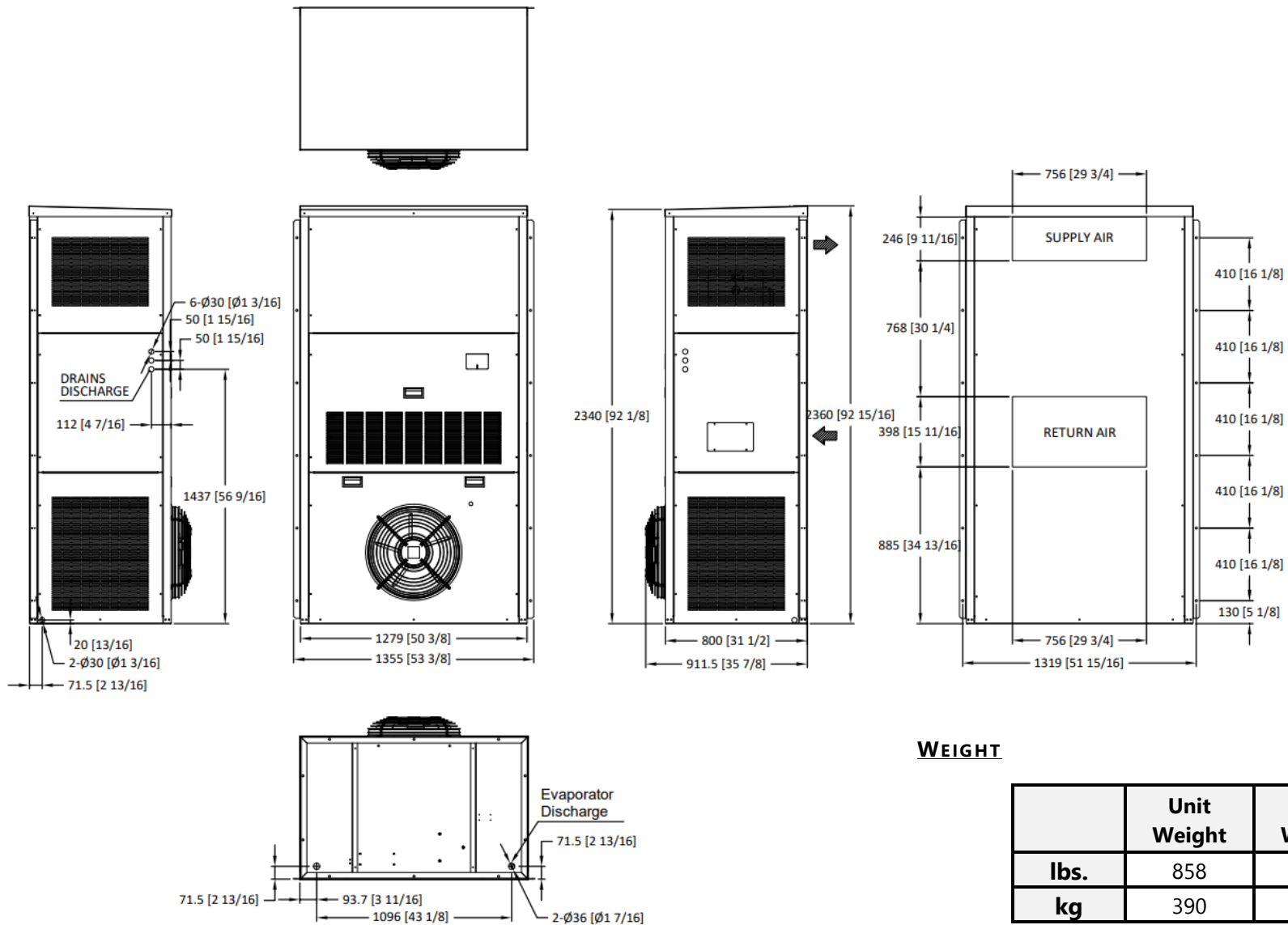


## WEIGHT

	Unit Weight	Ship Weight
lbs.	840	904
kg	380	410

# DIMENSIONS

## MODEL: 15V1T4

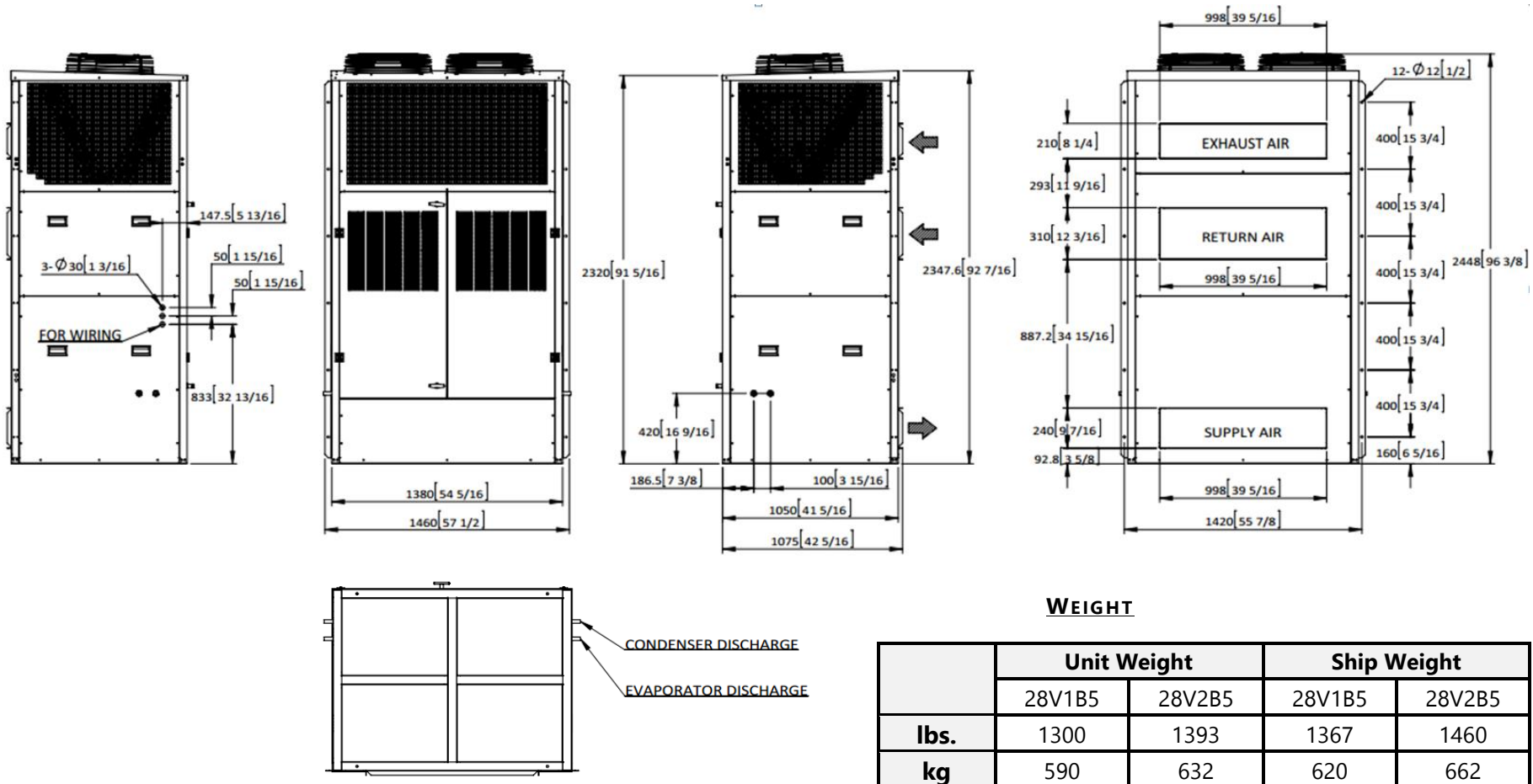


## WEIGHT

	Unit Weight	Ship Weight
lbs.	858	924
kg	390	420

# DIMENSIONS

**MODEL: 28V1B5/28V2B5**



## WEIGHT

	Unit Weight		Ship Weight	
	28V1B5	28V2B5	28V1B5	28V2B5
<b>lbs.</b>	1300	1393	1367	1460
<b>kg</b>	590	632	620	662



## DIMENSIONS

### 28V1B5/28V2B5 ADJUSTABLE STAND

