

MAINSTREAM ENGINEERING CORPORATION

Enhanced Environmental Control Units (E2CUs)

3-ton_R



5-ton_R



Mainstream's Enhanced Environmental Control Units (E2CUs) represent the latest in ultra-efficient, ducted unitary heat pump systems. They are designed to provide cooling, heating and ventilation, and include energy saving features such as compressor soft start, variable speed indoor blower, and microprocessor-based

embedded diagnostics and fault prediction. These units were designed to replace the FDECU, LECU and the IECU while providing better performance, reduced weight, improved power factor, simplified maintenance and increased reliability.

- ▶ Designed for harsh environments
- ▶ Heat pump with backup electric resistance heat
- ▶ Smart Grid ready with built in communication port
- ▶ Compatible with Hand-Held Prognostic Tool
- ▶ Simple to operate; easy to maintain
- ▶ No training required for basic operation
- ▶ Remote provides control of unit from up to 30 feet away
- ▶ Large internal storage area for easy packing and shipping

- ▶ Designed for maintenance or repair with common tools
- ▶ System pressures and temperatures can be read with a standard DC voltmeter
- ▶ Mean Time Between Failure (MTBF) of 4600 hours
- ▶ 20-year storage life without performance degradation
- ▶ Composite pallet eliminates corrosion or degradation in any environment
- ▶ Lift/tie down provisions for stacking



E2CU Value-Added Features

Total Unit Modularity

Modular design allows plug and play replacement with common tools. No brazing, soldering or wire splicing is required.

Component Access and Component Storage

After disengaging the latches, the hinged top can be opened for full access to the condenser section. When the E2CU is not operating, the empty space in the condenser section serves as a storage compartment for the flexible ducts, duct insulating sleeves, duct adapters, power cable, remote controller and condensate drain hose. The large storage volume provides easy access to components for maintenance and repair while simplifying coil cleaning.

Smart Electronics

The E2CU is equipped with a microprocessor-based control board that monitors system vitals such as high and low pressure, failed sensors, and motor faults. Troubleshooting has been made simple with the use of LED indicators that tell the user exactly what is wrong. In addition, the external diagnostic port has serial communication for connecting to a smart grid system, allowing full control from a central computer, as well as fault communication. The diagnostic port can be read with a DC voltmeter or Mainstream's Hand Held Prognostic Tool (EPT-1000). The electrical box and all wire harness

connections are watertight to improve reliability and simplify cleaning. The entire unit can be hosed off to remove dirt and other contaminants.

Energy Saving Features

The E2CU has a built in compressor soft starter allowing for the use of smaller generators. Maximum power draw is the same for cooling and heating modes, which further simplifies generator sizing. The use of optional insulating sleeves on the ducts improves efficiency by 14% vs uninsulated ducts. The insulating sleeves fit in the storage compartment with the rest of the equipment. The patented control algorithm modulates fan and blower operation based on operating mode and ambient conditions to maximize performance.

Flexible Duct

The return and supply air passages are equipped with duct rings to attach the 16-inch diameter (60k) or 12-inch diameter (36k) flexible ducts.

Air Filter and Mist Eliminator

A heavy duty washable aluminum air filter is provided with the E2CU. The outlet side of the evaporator coil is fitted with a washable aluminum mesh mist eliminator to prevent condensation from exiting the E2CU during humid operations.

E2CU Specifications

Physical	36k	60k	
Width	42 in (center of gravity 24 in)	42 in (center of gravity 24 in)	
Depth	52 in (center of gravity 22 in)	52 in (center of gravity 22 in)	
Height	33 in (center of gravity 15 in)	33 in (center of gravity 15 in)	
Volume	43.8 ft ³	43.8 ft ³	
Weight	555 lbs	622 lbs	
Refrigerant Type	R-410A	R-410A	
Refrigerant Charge	6 lbs	8.7 lbs	
Electrical	36k	60k	
Voltage	208 VAC, 60 Hz, 3ph (no neutral required)	208 VAC, 60 Hz, 3ph (no neutral required)	
Max Power	<7 kW (all modes of operation, all conditions)	<10 kW (all modes of operation, all conditions)	
Max Amperage	<20 amps (all modes of operation, all conditions)	<30 amps (all modes of operation, all conditions)	
Max Inrush Current	<33 amps (all modes of operation, all conditions)	<43 amps (all modes of operation, all conditions)	
Performance		36k	60k
Cooling Performance	@ 125°F Dry-bulb Outdoor 90°F Dry-bulb Indoor 75°F Wet-bulb Indoor	40,027 BTU/hr	54,250 BTU/hr
	@ 95°F Dry-bulb Outdoor 80°F Dry-bulb Indoor 67°F Wet-bulb Indoor	44,053 BTU/hr	62,049 BTU/hr
Heat Pump Heating Performance	@ 47°F Dry-bulb Outdoor 43°F Dry-bulb Outdoor 73°F Wet-bulb Indoor	28,797 BTU/hr	57,786 BTU/hr
Electric Resistance	Heating	21,160 BTU/hr	30,717 BTU/hr

Protected by U.S. Patents 9,168,315, 9,207,001, 9,417,000, 9,417,005, 9,424,519, 9,435,576, 9,881,428, 10,048,024; and additional U.S. Patents pending.

**Hand-Held
Prognostic Tool
(EPT-1000)**



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