

# ENVIRO-TEMP™

*Commercial Heat Recovery Systems*

Turbotec Products, Inc.

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## Technical Specifications

**Commercial / Industrial Heat Recovery Units**



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# **ENVIRO-TEMP™ Heat Recovery Commercial/ Industrial Specification**

Specification: Contractor shall furnish and install, where indicated, in accordance with manufacture's instructions and in compliance with all rules and regulations of authorities having jurisdiction:

## **A. General**

### **A.1. Standards and Specifications.**

- A.1.a** The heat exchanger in the Enviro-Temp shall be UL, CSA listed and approved to UL Standard 1995 for use with refrigeration or air conditioning systems from 10 to 200 tons capacity and for indoor or outdoor use.
- A.1.b** The Enviro-Temp heat exchanger shall be of tube in tube design with vented double wall configuration for use with potable hot water systems and shall be UL listed for R-22, R-507, R-134a, R-402B, R-404A, R-407C and R-410a applications.
- A.1.c** The Enviro-Temp heat recovery hot water maker shall be equipped with a bronze pump as an add-on accessory, unless otherwise specified, suitable for potable hot water mounted and wired to circulate hot water for potable use.

### **A.2 Function**

**A.2.a** The Enviro-Temp shall be specifically designed to:

- A.2.a.1** Supply domestic hot water from the heat of rejection of a refrigeration or air conditioning system.
- A.2.a.2** Limit water temperature to 155 degrees Fahrenheit to prevent scalding.
- A.2.a.3.** Operate as a water heater independent of domestic electric or gas hot water tanks but recirculating water to the potable hot water tank or a pre-heat tank.

### **A.3 User Interface**

**A.3.a** The Enviro-Temp shall contain (inside the unit) an adjustable Aquastat (water temperature thermostat) high limit.

## **B. Electrical**

### **B.1 Inputs**

- B.1.a** Power to the Enviro-Temp shall be provided through an external source of 208/220 VAC , single phase, 60 Hz.
- B.1.b** Electrical connections shall be made from the compressor contactor.
- B.1.c** Power input shall be provided through a conduit opening in the side of the enclosure and use a fused disconnect (an inline cartridge fuse).
- B.1.d** All wiring must be done in accordance with applicable codes.

### **B.2 Controls**

- B.2.a** The water pump will operate when the power to the unit's main circuit is closed which can be linked with compressor contacts.
- B.2.b** The limit control will turn water pump off when water temperature is above set temperature of adjustable thermostat and on when below same temperature to prevent scalding due to excessive water temperature.

## **C. Physical**

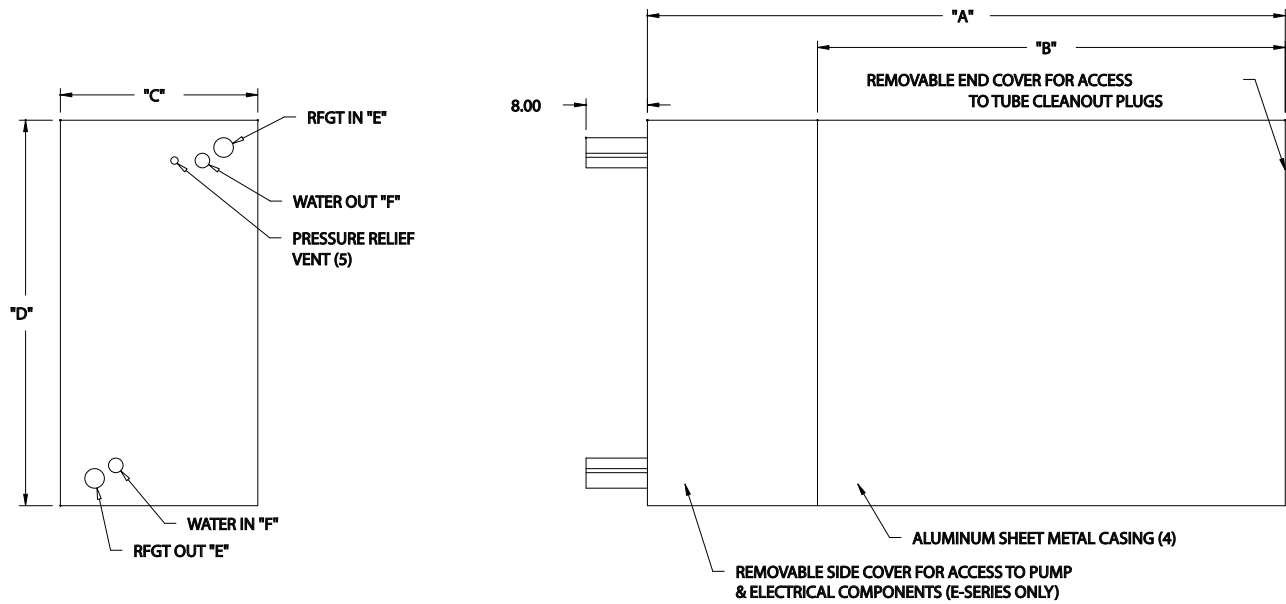
### **C.1 Enclosure**

- C.1.a** The enclosure shall have .040" stainless steel or Aluminum (18 Ga. ) chassis.
- C.1.b** The enclosure shall be corrosion resistant
- C.1.c** The enclosure shall be supplied with a mechanical fasteners to retain the enclosure cover.

### **C.2 Dimensions, Water and Ref. Connection Performance**

(Please refer to E-Temp Technical Specifications pages 3-9)

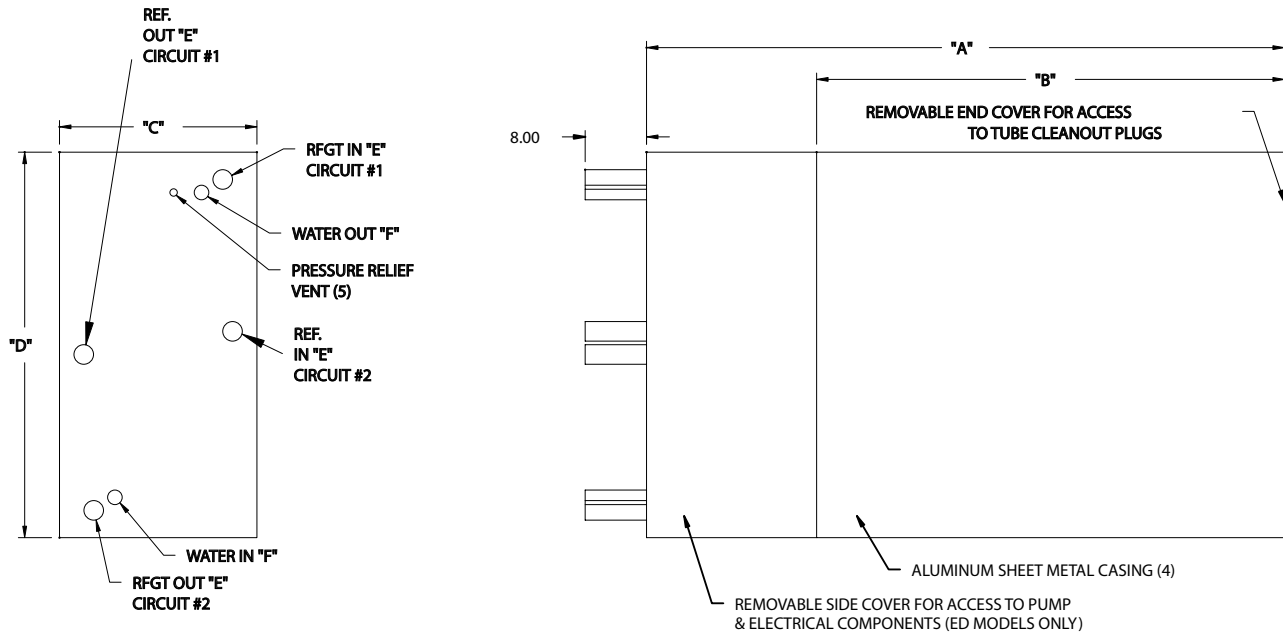
# General Specifications 5-200 Ton Commercial HRU Single Refrigerant Circuit



ENVIRO-TEMP (1,7) MODEL #	NOMINAL CAPACITY (Tons)	NOMINAL (8) WATER FLOW (gpm)	TOTAL PUMP HEAD (ft-H <sup>2</sup> O) @ NOMINAL gpm	NOMINAL (2) HEAT TRANSFER (Btu/hr)	DIMENSIONS (inches) (6)						DRY WEIGHT (lbs)	
					LENGTH "A"	LENGTH "B"	WIDTH "C"	HEIGHT "D"	REF OD "E"	WATER OD "F"	E-MODELS	S-MODELS
E-341-5	5	1.25	19.0	27,000	68	51	8	12	.625	.625	44	34
E-341-10	10	2.50	18.0	54,000	69	52	14	12	.875	.625	63	53
E-341-15	15	3.75	17.0	81,000	69	52	14	14	1.125	.875	80	70
E-341-20	20	5.00	16.0	108,000	69	52	14	16	1.125	1.125	98	88
E-341-25	25	6.25	15.0	135,000	69	52	14	19	1.375	1.125	115	105
E-341-30	30	7.50	14.0	162,000	70	53	14	21	1.375	1.375	132	122
E-341-40	40	10.00	22.0	216,000	72	53	14	26	1.625	1.625	171	157
E-341-50	50	12.50	21.0	270,000	72	53	14	30	1.625	1.625	205	191
E-341-60	60	15.00	19.5	324,000	72	53	14	35	2.125	1.625	240	226
E-341-80	80	20.00	16.5	432,000	73	54	28	30	2.125	2.125	289	275
E-341-100	100	25.00	20.0	540,000	73	54	28	37	2.625	2.125	409	381
E-341-120	120	30.00	18.5	648,000	74	55	28	41	2.625	2.625	482	457
E-341-150	150	37.50	17.0	810,000	74	55	28	50	3.125	2.625	571	543
E-341-200	200	50.00	14.0	1,080,000	74	55	28	63	3.625	3.125	739	711

1. E Models apply to single circuit active units supplied with integral pump. S Models apply to dual circuit slave units supplied without pump.
2. Nominal heat transfer (total for both circuits) based on R-22 air-cooled system with 220 F compressor discharge temp., 125 F saturated condensing temp., and 70 F entering water temp.
3. Overall length "A" applies to E Models. Overall length for S Models is dimension "B".
4. Grade 3003 Aluminum casing. .040" thick.
5. Pressure relief valve provided on E Models only. Relief pressure 150 psig.
6. All dimensions are for reference only.
7. Other specifications:  
Heat exchanger is tube-in-tube mechanically cleanable type with U.L. listed vented double wall construction for potable water use. All copper construction. Maximum working pressure 600 psig. ref.side. 500 psig water side. Heat exchanger encased in two part closed cell urethane foam insulation 1.0" min. thickness. 130 Btu-hr-ft<sup>2</sup>-F conductivity.  
E Models provided with adjustable limit thermostat for on/off pump control. Fuse protection of pump motor and manual electrical disconnect switch. Standard voltage is 230V.1 Ø.
8. Maximum rated water flow is 3.0 times the nominal water flow. Head loss at nominal water flow is 1.2 ft-H<sup>2</sup>O.

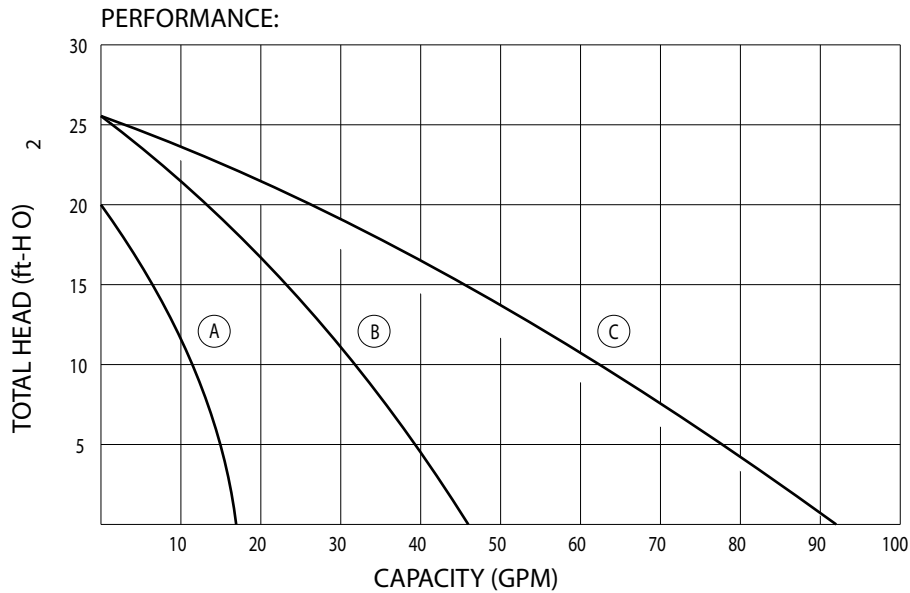
# General Specifications 10-200 Ton Commercial HRU Dual Refrigerant Circuit



ENVIRO-TEMP (1,7) MODEL #	NOMINAL CAPACITY (Tons)	NOMINAL (8) WATER FLOW (gpm)	TOTAL PUMP HEAD (ft-H <sup>2</sup> O) @ NOMINAL gpm	NOMINAL (2) HEAT TRANSFER (Btu/hr)	DIMENSIONS (inches) (6)						DRY WEIGHT (lbs)	
					LENGTH "A"	LENGTH "B"	WIDTH "C"	HEIGHT "D"	REF OD "E"	WATER OD "F"	ED-MODELS	SD-MODELS
ED-341-5/5	5/5	2.50	18.0	54,000	69	52	14	15	.625	.875	63	53
ED-341-10/10	10/10	5.00	16.0	108,000	69	52	14	20	.875	1.125	98	88
ED-341-15/15	15/15	7.50	14.0	162,000	70	52	14	25	1.125	1.375	132	122
ED-341-20/20	20/20	10.00	22.0	216,000	72	52	14	30	1.125	1.625	171	157
ED-341-25/25	25/25	12.50	21.0	270,000	72	53	14	36	1.375	1.625	205	191
ED-341-30/30	30/30	15.00	19.5	324,000	72	53	14	40	1.375	1.625	240	226
ED-341-40/40	40/40	20.00	16.5	432,000	73	54	28	30	1.625	2.125	289	275
ED-341-50/50	50/50	25.00	20.0	540,000	73	54	28	37	1.625	2.125	409	381
ED-341-60/60	60/60	30.00	19.0	648,000	73	54	28	42	2.125	2.125	474	446
ED-341-80/80	80/80	40.00	16.5	864,000	74	55	28	53	2.125	2.625	605	577
ED-341-100/100	100/100	50.00	14.0	1,080,000	74	55	28	63	2.625	3.125	739	711

- ED Models apply to dual circuit active units supplied with integral pump. SD Models apply to dual circuit slave units supplied without pump.
- Nominal heat transfer (total for both circuits) based on R-22 air-cooled system with 220 F compressor discharge temp., 125 F saturated condensing temp., and 70 F entering water temp.
- Overall length "A" applies to ED Models. Overall length for SD Models is dimension "B".
- Grade 3003 Aluminum casing. .040" thick.
- Pressure relief valve provided on ED Models only. Relief pressure 150 psig.
- All dimensions are for reference only.
- Other specifications:  
Heat exchanger is tube-in-tube mechanically cleanable type with U.L. listed vented double wall construction for potable water use. All copper construction. Maximum working pressure 600 psig. ref.side. 500 psig water side. Heat exchanger encased in two part closed cell urethane foam insulation 1.0" min. thickness. 130 Btu-hr-ft<sup>2</sup>-F conductivity.  
ED Models provided with adjustable limit thermostat for on/off pump control. Fuse protection of pump motor and manual electrical disconnect switch. Standard voltage is 230V.1 Ø.
- Maximum rated water flow is 3.0 times the nominal water flow. Head loss at nominal water flow is 1.2 ft-H<sup>2</sup>O.

# Pump Performance

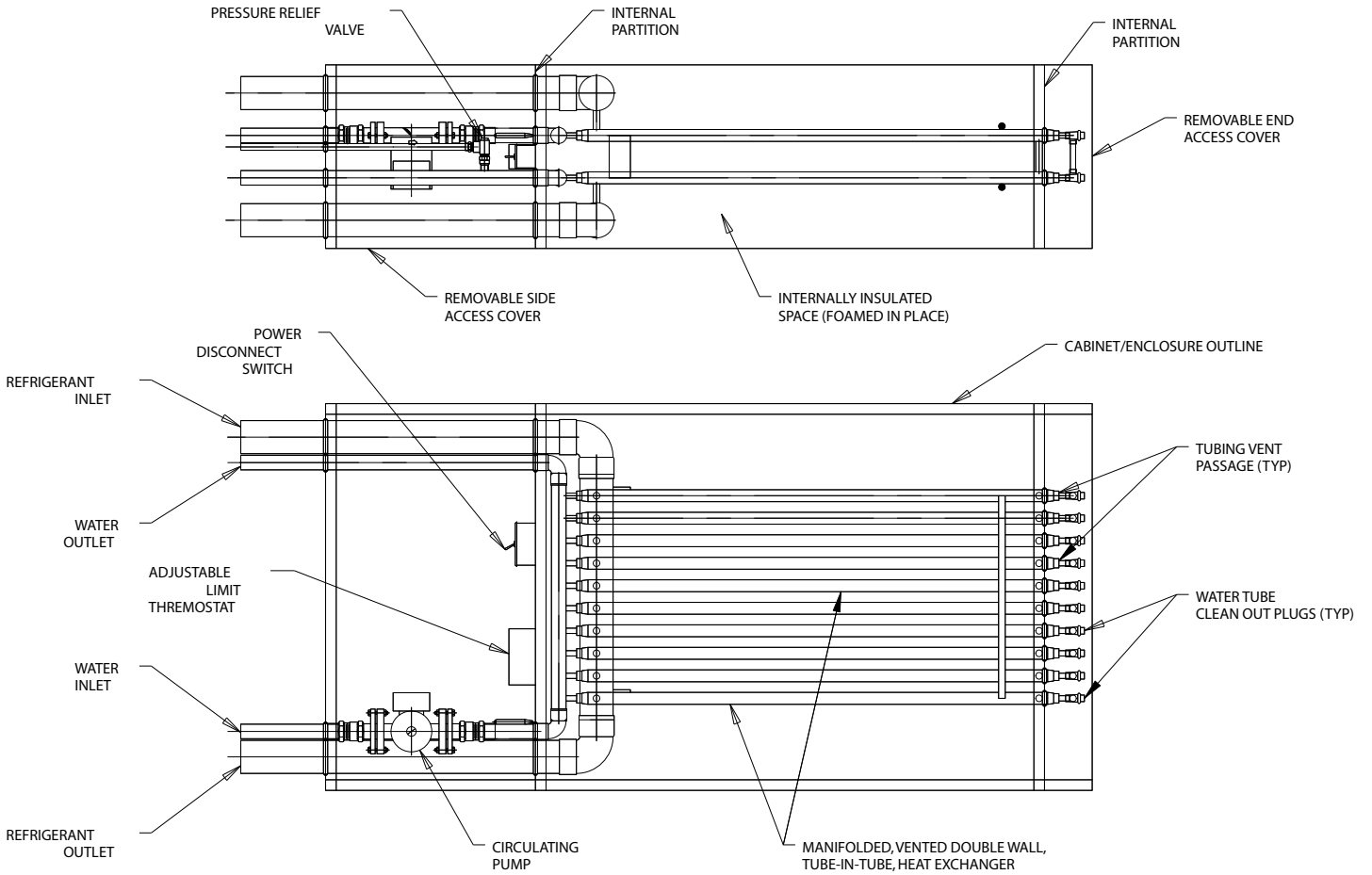


## GENERAL SPECIFICATIONS:

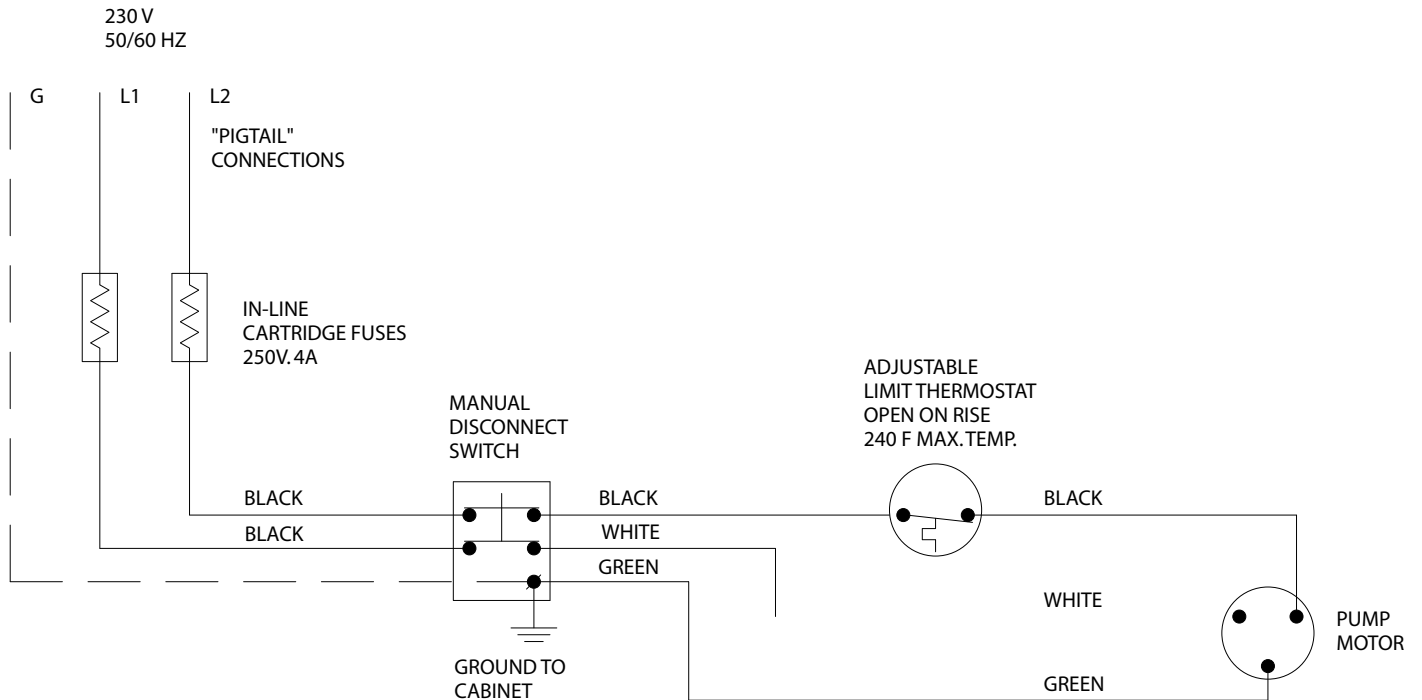
ENVIRO-TEMP MODEL NUMBERS		SYSTEM RATING TONS	WATERSIDE PRESSURE DROP CONSTANT (K) <sup>(2)</sup>	NUMBER PARALLEL PUMPS	PUMP CAPACITY CURVE <sup>(3)</sup>	PUMP MOTOR SPECIFICATIONS <sup>(4)</sup>				
SINGLE REF. CIRCUIT	DUAL REF. CIRCUITS <sup>(1)</sup>					VOLTS	AMPS	WATTS	HP	RPM
E-341-5		5	792.0	1	A	230	.76	170	1/12	2,950
E-341-10	ED-341-5/5	10	198.0							
E-341-15		15	87.9							
E-341-20	ED-341-10/10	20	49.5							
E-341-25		25	31.6							
E-341-30	ED-341-15/15	30	22.0	1	B	230	.96	220	1/6	3,200
E-341-40	ED-341-20/20	40	12.4							
E-341-50	ED-341-25/25	50	7.91							
E-341-60	ED-341-30/30	60	5.49							
E-341-80	ED-341-40/40	80	3.09							
E-341-100	ED-341-50/50	100	1.98	2	C	230	.96	220	1/6	3,200
	ED-341-60/60	120	1.38							
E-341-150		150	.880							
	ED-341-80/80	160	.773							
E-341-200	ED-341-100/100	200	.495							

1. On ED-Series units, water flow is equally split between heat exchanger segments dedicated to each refrigerant circuit.
2. Waterside pressure drop through HRU: P.D. (ft-H<sub>2</sub>O) = (K)(GPM) / 1,000.
3. Pump capacity curve "C" represents total capacity of two parallel connected pumps.
4. Pumps are hermetic type provided with stainless steel impeller, stainless steel or bronze volute assembly, and bronze flanged connections. Pump motors have automatic resetting thermal protection of motor windings. Pump maximum working pressure.

# Typical HRU Arrangement

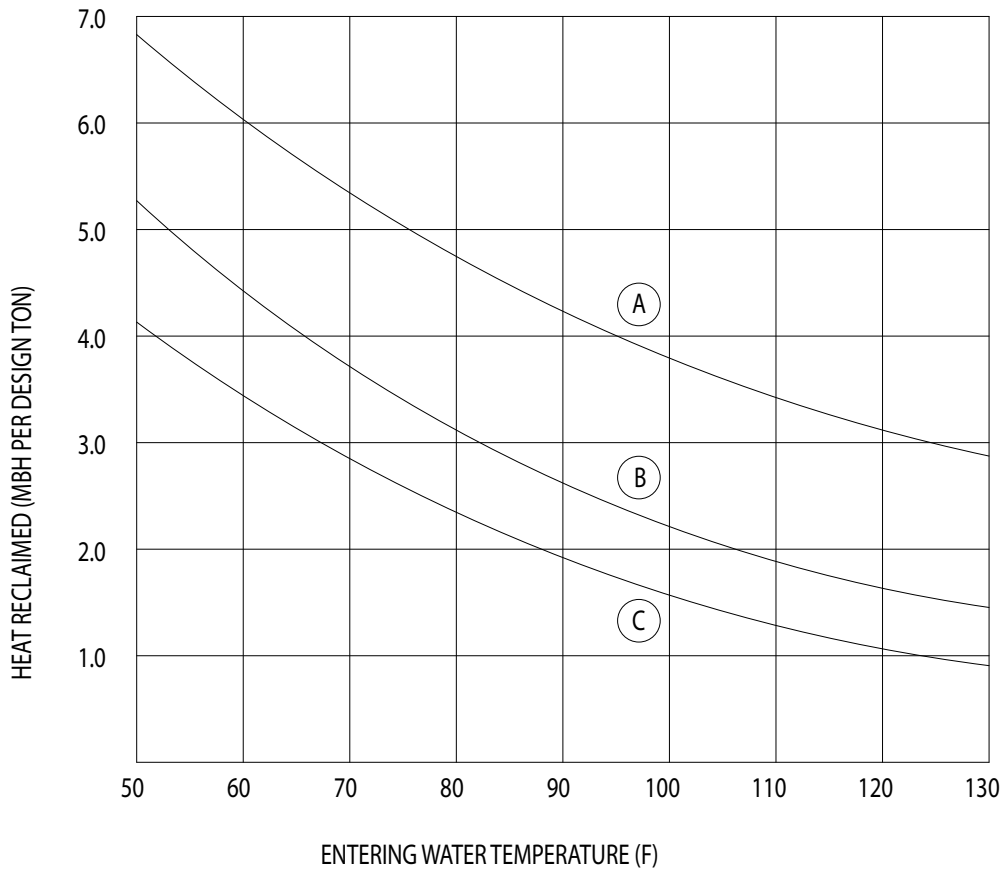


# Electrical Schematic



1. Wiring is 14 gauge braided copper
2. All electrical components enclosed within integral electrical box.
3. L1, L2 & Ground connections to be field wired into integral electrical box. External ground wire must connect to ground terminal. L1 and L2 must connect to compressor contactor (either directly or by relay) so that thru circuit is energized.

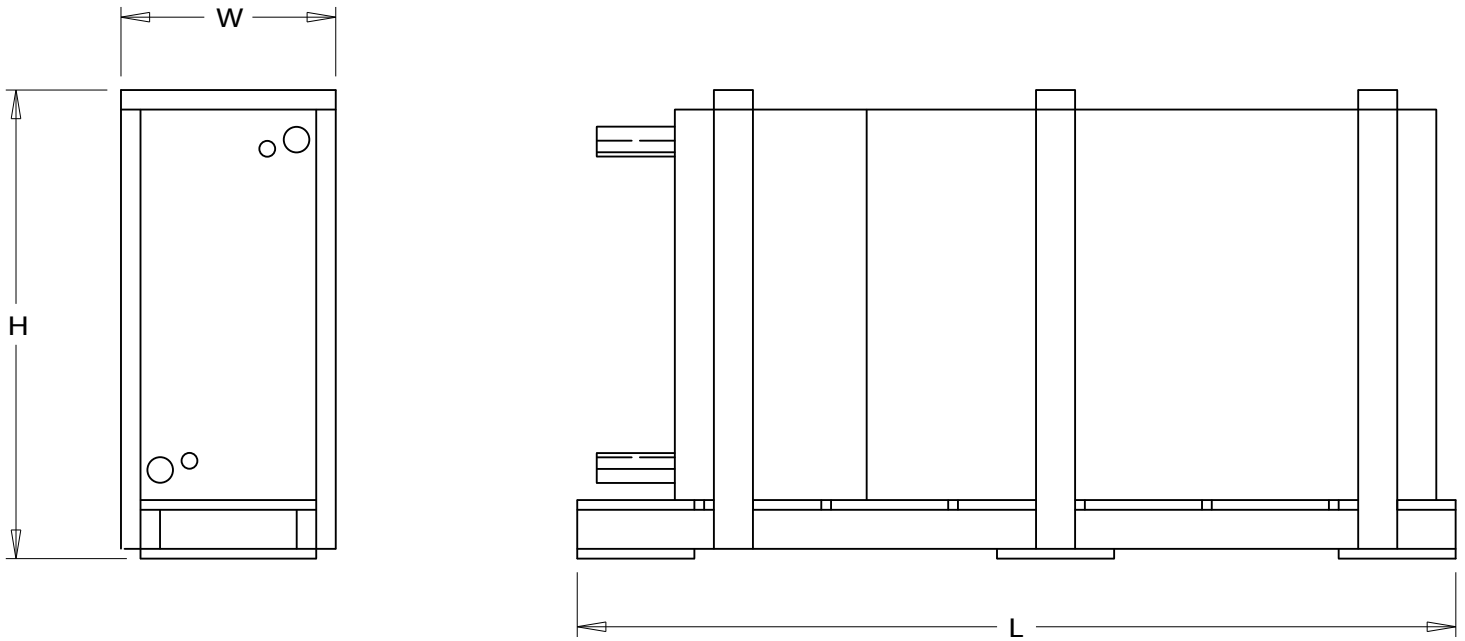
# Enviro-Temp Thermal Performance



CONDENSER TYPE	CAPACITY CURVE	COMPRESSOR DISCHARGE TEMP (F)	SATURATED CONDENSING TEMP (F)
AIR COOLED	(A)	220	125
WATER COOLED	(B)	180	105
EVAPORATIVE COOLED	(C)	160	95

1. The design cooling capacity of the refrigeration circuit defines the design tons. The nominal capacity rating of the Enviro-Temp Heat Recovery Unit defines the nominal tons.
2. Performance is based on R-22, 45F Sat. Evap. Temp., and minimum water flow of 0.25 GPM per nominal ton.

# Crating Specifications



ENVIRO-TEMP MODEL NUMBERS		APPROXIMATE CRATING DIMENSIONS (INCHES)			APPROXIMATE SHIPPING WEIGHT (LB)	
SINGLE REF. CIRCUIT	DUAL REF. CIRCUIT	L	W	H	ACTIVE UNITS	SLAVE UNITS
E-341-10	ED-341-5/5				84	18
E-341-15		84	18	23	156	141
E-341-20	ED-341-10/10	84	18	28	178	163
E-341-25		84	18	28	195	180
E-341-30	ED-341-15/15	84	18	33	216	201
E-341-40	ED-341-20/20	84	18	38	258	239
E-341-50	ED-341-25/25	84	18	43	296	277
E-341-60	ED-341-30/30	84	18	48	334	315
E-341-80	ED-341-40/40	100	40	30	430	411
E-341-100	ED-341-50/50	100	40	36	554	521
	ED-341-60/60	100	40	39	621	588
E-341-150		100	40	45	722	689
	ED-341-80/80	100	40	48	759	726
E-341-200	ED-341-100/100	100	40	53	896	863

For S-Series (slave) units, subtract 18 inches from length.