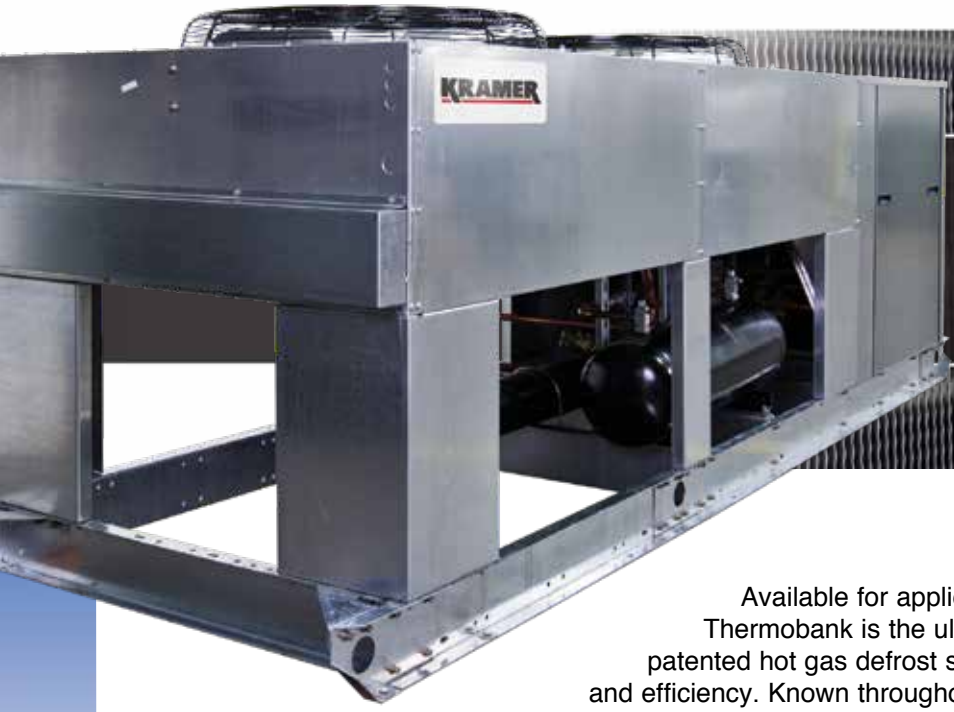
Catalog KM-CTT-0320B
Replaces KM-CTT-0320A and all previous versions

CTT Series



Thermobank

Hot Gas Defrost – 12 through 70 HP

Available for applications from +35°F down to -30°F, Kramer's Thermobank is the ultimate refrigeration package. Thermobank's patented hot gas defrost system provides the ultimate in ruggedness and efficiency. Known throughout the industry as the definitive refrigeration system, Thermobank delivers more refrigeration with less energy consumption, less equipment,lower installation costs and lower operating costs than conventional refrigeration packages. With its fast defrost period (typically 5 to 10 minutes), Thermobank is refrigerating while other systems are still defrosting. Superior design, superior components and superior manufacturing quality lead to Thermobank.

Standard Features:

- All Welded Thermobank
- Liquid Subcooling Circuit
- Manual Pumpdown Switch
- Crankcase Heater(s)
- Liquid Line Filter-Drier
- Semi-Hermetic Compressor(s)
- Moisture Indicating Sightglass
- Electronic Room Thermostat (Loose)
- Environmentally Safe Refrigerants
- Suction Solenoid Valve
- Liquid Line Solenoid Valve (Loose)
- Floating Head Pressure
- Sub-Circuit Fusing
- Hot Gas Solenoid (Loose)
- Replaceable Core Liquid Line Filter-Drier
- Replaceable Core Suction Line Filter
- Low Noise / Energy Efficient 850 RPM Motors
- Bank Water Level Gauge
- Thermobank Drain Valve
- Adjustable Fan Cycling
- Copper Tube-Aluminum Fin Coils
- Hi-Lo Pressure Switch
- Pressure Relief Valve
- Electronic Oil Pressure Safety Control
- Weatherproof Outdoor Housing
- Manual Compressor Switch
- Receiver With Service Valves
- Evaporator(s)
- Expansion Valve(S) (Loose)
- Complete Defrost Controls
- X-Braided Pressure Control Hose
- Suction & Discharge Vibration Elim.
- Control Circuit Transformer - 460V & 575V

optional features on following page

KRAMER

SINCE 1914 – with over 100 years of continuous improvement in heat transfer technology, KRAMER presents models CTT refrigeration units.

Options:

- Oil Separator
- Non-Fused Disconnect
- Phase Loss Monitor
- Pressure Relief Valve
- Oversize Condenser
- Oversize Liquid Receiver
- Suction Accumulator
- Anti-Short Cycle Timer
- Single Point Alarm
- High, Low, And Oil Pressure Gauges
- Copper Fin Coil
- Coated Fin Coil

THERMOBANK is available for all commercial and industrial applications with temperatures ranging from -30°F to +35°F. This factory packaged hot gas defrost system employs a re-evaporator, ensuring a highly efficient defrost cycle, but requires no suction accumulators, reversing valves or hot gas line from condensing unit to evaporator.

THERMOBANK provides continuous energy savings as the outdoor temperature drops; BTU per Hour increases and compressor watts decrease resulting in more cooling and less energy usage for each operating hour.

Less equipment is needed with **THERMOBANK** because it does more refrigeration in 24 hours than other packaged systems. With it's extremely fast defrost period (typically 5 to 10 minutes), **THERMOBANK** is refrigerating while others are still defrosting. With the lowest possible, head pressure there is a marked increase in BTU per Hour capacity.

Models CTT

Low and Medium Temperature Models

Nomenclature:

CTT	4	1200	L	44	-	E
I	II	III	IV	V		VI

NOMENCLATURE

I — **Series Designator**
CTT - Thermobank

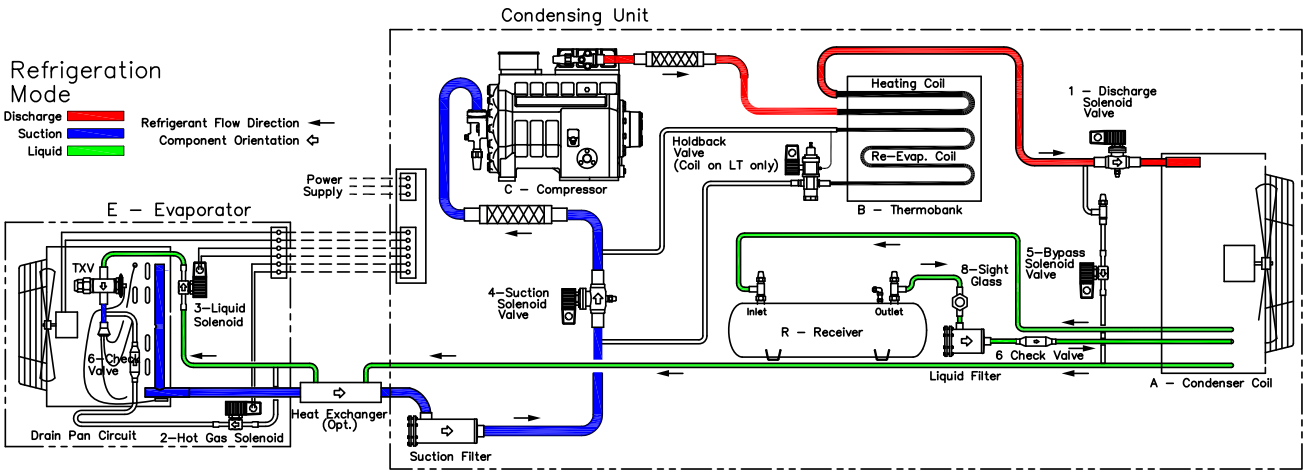
II — **Compressor Code**
2 - Copeland Discus
4 - Bitzer

III — **Nominal HP**
EX: 1200 - 12 HP

IV — **Temperature Range**
L - Low
M - Medium

V — **Refrigerant Type**
44 - R404A or R507
47 - R407C

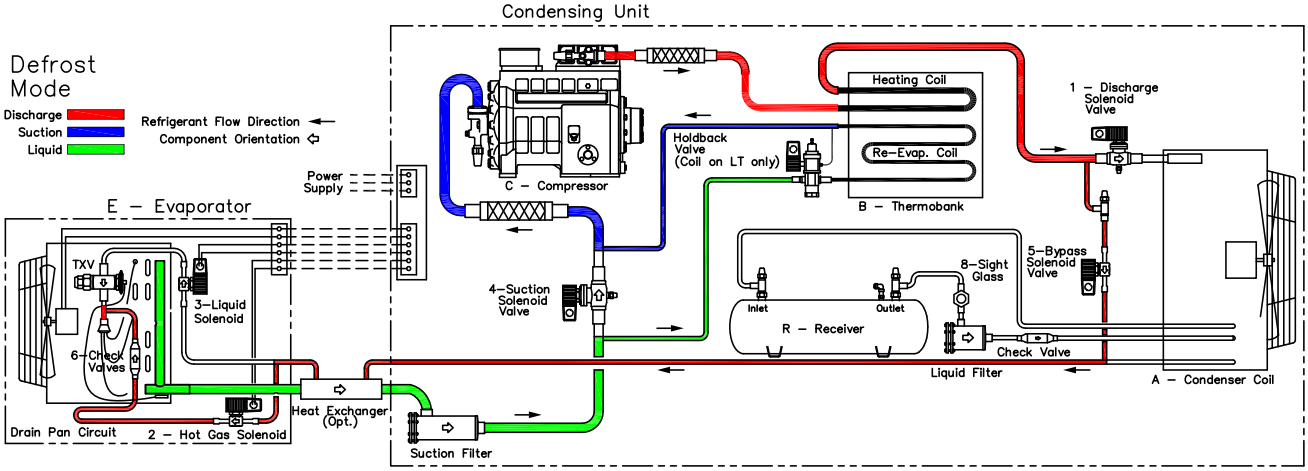
VI — **Voltage Code**
E - 208-230/3/60
G - 460/3/60
J - 575/3/60
V - 208/3/60
W - 230/3/60



SCHEMATIC LEGEND

A = CONDENSER
B = THERMOBANK
C = COMPRESSOR
E = EVAPORATOR
R = RECEIVER
X = EXPANSION VALVE

1 = DISCHARGE SOLENOID
2 = HOT GAS SOLENOID
3 = LIQUID SOLENOID
4 = SUCTION SOLENOID
5 = BY-PASS VALVE
6 = CHECK VALVE
8 = SIGHT GLASS



HOW THERMOBANK WORKS

Every refrigeration system discharges the heat picked up from the evaporator and the compressor. This waste heat is normally rejected by the condenser. With Thermobank, the compressor (C) discharge passes through a heating loop that is submerged in a water filled bank (B), and then on through the condenser (A). The bank stores sufficient heat to fully re-evaporate all the liquid resulting from the defrost of the Evaporator (E).

THE REFRIGERATION CYCLE

The compressor discharge refrigerant, after heating the bank water, flows to the air cooled condenser and then to the receiver (R). From the receiver the liquid refrigerant flows through a sub-cooling circuit in the condenser and on to the expansion valve (X), and the evaporator (E). The refrigerant returns to the compressor as in any standard system.

To prevent excessive super-heating of the refrigerant vapor returning to the compressor and to maintain the water temperature in the bank, the refrigerant flow bypasses the bank through the suction line solenoid (4) during the refrigeration cycle. This normally closed suction line solenoid is generously sized for minimum pressure drop, providing an extra margin of safety. On low temperature systems, an electronically operated holdback valve (H) ensures that no refrigerant flows through the bank during the refrigeration cycle.

THE DEFROST CYCLE

A time clock automatically puts the Thermobank system into a defrost cycle and initiates the following: Discharge solenoid Valve (1) closes; the evaporator (E) fans stop; hot gas solenoid valve (2) opens; liquid solenoid valve (3) closes; suction solenoid valve (4) closes.

The compressor discharge gas goes directly into the liquid line because by-pass solenoid valve (5) is open when discharge solenoid (1) is closed. All the warm liquid refrigerant in the liquid line flows through the evaporator. This liquid refrigerant insures a rapid defrost and charges the defrost circuit. Additional hot gas condenses in the evaporator providing an unusually rapid defrost at all ambient conditions.

With the suction solenoid (4) closed, the liquid refrigerant flows through the holdback valve (H) which controls the rate of refrigerant flow and the pressure in the bank. The bank becomes an evaporator and absorbs the stored heat. The Thermobank system utilizes a high pressure safety control which functions to momentarily open the discharge line solenoid (1) if discharge pressures rise to a high level.

The defrost cycle is terminated by a pressure switch that senses evaporator pressures and starts the post-defrost period. During post-defrost the discharge solenoid (1) is open; by-pass solenoid valve (5) is closed and hot gas solenoid (2) is closed. Suction solenoid (4) and liquid solenoid (3) remain closed. At the end of the pressure terminated post-defrost period, both suction solenoid (4) and liquid solenoid (3) open and the evaporator fan motors start. During defrost, the hot gas by-passes the receiver so after defrost the receiver contains ample liquid refrigerant to begin refrigerating immediately and prevent compressor short cycling. The system then returns to the normal refrigeration cycle.

FASTEST DEFROST

THERMOBANK has a typical defrost cycle duration of 5 to 10 minutes. The defrost is uniform throughout the coil, and minimizes the heat and vapor added to the room during defrost. The defrosting evaporator receives the full heat of rejection of the refrigerant. This is the sum of the compressor heat while operating at maximum suction pressure during the defrost cycle and the heat extracted from the bank. There is always an adequate supply of refrigerant for defrosting.

EXTRA COMPRESSOR PROTECTION

Many factors are incorporated in Thermobank to protect the compressor and insure long life. All units utilize a pump-down cycle to prevent refrigerant migration to the compressor during the off-cycle. During the defrost cycle the bank is protected against flood-back. The holdback valve protects against overloading the compressor motor by regulating the inlet pressure to the compressor. The reduced refrigerant charge is additional protection for the compressor.

BANK DESIGN

The bank has a welded hermetic design to insure a long, leak free life. The heavy gauge steel shell has a bulls-eye water level gauge. Checking the water level is quick and easy. The shell is insulated with closed cell foam to maintain proper water temperature at any ambient condition and provide optimum system performance. The internal heat transfer loops are die formed from extra heavy wall, seamless copper tubing. The bank contains a thermostat controlled immersion heater for stabilizing water temperature and automatic freeze protection. The heavy duty welded design makes the bank durable, reliable, safe and service free. A drain connection is also provided for seasonal shutdown when applicable.

EXTRA LARGE CONDENSERS

Ratings for ambient temperatures to 105°F are given for all Thermobank systems. Special systems are available for ambient design temperatures above 110°F. All condensers have a maximum fin spacing of 12 FPI to help prevent coil fouling and increase the time between coil cleanings. Generous coil surface keeps head pressures lower, saves energy, and extends the life of the equipment. An integral subcooling circuit is standard to prevent flash gas in liquid risers and increase system efficiency. Fan cycle controls allow some adjustability to the head pressure and will minimize fan motor energy consumption in low ambient's. An optional pressure control may be provided on the header end fan to assure sufficient head pressure is available for a good cold ambient re-start.

OPERATING HOURS

The length of defrost must be taken into account when selecting equipment. Thermobank's defrost cycle is very rapid, typically 5 to 10 minutes, and for this reason the equipment can be selected on the basis of 24 hours per day operation. Other systems require 30 to 40 minutes for a complete defrost and the general practice is to select this equipment on eighteen hours per day operation. For the same job, Thermobank equipment requirement is 10% less than others. Thermobank will be refrigerating while others are still defrosting.

AVERAGE OUTDOOR TEMPERATURE

The Average Outdoor Temperature is considerably less than the design outdoor temperature. The outdoor temperature may vary hourly during a twenty-four hour day. It varies day to day, month to month, and season to season. It is the average outdoor temperature that dictates the number of hours of equipment operation. As the outdoor temperature drops, the capacity of Thermobank increases. With more BTU's per hour, the equipment operates less time to handle the 24 hour refrigeration load. Page 7 shows the Annual Average Outdoor Temperature for locations throughout the U.S.A. and Canada. Select the location nearby or similar in temperature. The estimated annual electrical savings can be calculated from Table 1.

AVERAGE OUTDOOR TEMPERATURE

STATE-CITY	AAOT-°F
ALABAMA	63
Birmingham	62
Huntsville	60
Mobile	67
ALASKA	26
Anchorage	36
Fairbanks	27
Juneau	41
ARIZONA	60
Flagstaff	46
Phoenix	72
ARKANSAS	61
Little Rock	61
CALIFORNIA	59
Fresno	63
Los Angeles	65
Redding	62
San Francisco	57
Stockton	61
COLORADO	45
Colorado Springs	49
Denver	50
Grand Junction	53
CONNECTICUT	49
Hartford	50
DELAWARE	55
Wilmington	54
D.C.	55
Washington	57
FLORIDA	71
Gainesville	68
Jacksonville	68
Miami	75
Orlando	72
Tampa	72
W. Palm Beach	74
GEORGIA	64
Atlanta	61
Macon	64
Savannah	66
HAWAII	76
Honolulu	77
IDAHO	45
Boise	51
ILLINOIS	52
Chicago	49
Peoria	51
INDIANA	52
Fort Wayne	50
Indianapolis	52

STATE-CITY	AAOT-°F
IOWA	48
Des Moines	50
KANSAS	55
Goodland	51
Wichita	56
KENTUCKY	56
Louisville	56
LOUISIANA	66
New Orleans	68
Shreveport	65
MAINE	41
Portland	45
MARYLAND	54
Baltimore	55
MASSACHUSETTS	48
Boston	51
Blue Hill Obs.	48
MICHIGAN	45
Detroit	49
Grand Rapids	47
Marquette	39
MINNESOTA	41
Duluth	38
Minneapolis	45
MISSISSIPPI	63
Jackson	64
Tupelo	62
MISSOURI	55
Kansas City	54
St. Louis	56
MONTANA	433
Billings	47
Glasgow	42
Great Falls	45
Helena	44
NEBRASKA	49
North Platte	48
Omaha	50
Scottsbluff	48
Valentine	47
NEVADA	50
Las Vegas	67
Reno	51
NEW HAMPSHIRE	44
Concord	45
NEW JERSEY	63
Newark	55
Trenton	54
NEW MEXICO	54
Albuquerque	56

STATE-CITY	AAOT-°F
NEW YORK	46
Albany	47
Buffalo	48
New York	55
Syracuse	47
NORTH CAROLINA	59
Asheville	55
Charlotte	60
Raleigh	59
NORTH DAKOTA	41
Bismarck	41
OHIO	51
Akron	50
Cincinnati	53
Cleveland	50
Columbus	51
Youngstown	48
OKLAHOMA	60
Oklahoma City	60
OREGON	49
Portland	53
PENNSYLVANIA	49
Allentown	51
Erie	49
Philadelphia	54
Pittsburgh	50
Scranton	49
RHODE ISLAND	50
Providence	50
SOUTH CAROLINA	63
Charleston	65
Greer	60
SOUTH DAKOTA	46
Huron	45
TENNESSEE	58
Bristol	55
Knoxville	57
Memphis	62
TEXAS	65
Amarillo	57
Dallas	65
El Paso	63
Houston	68
Lubbock	60
San Antonio	68
Wichita Falls	63
UTAH	49
Salt Lake City	52
VERMONT	43
Burlington	44

STATE-CITY	AAOT-°F
VIRGINIA	55
Norfolk	59
Richmond	58
Roanoke	56
WASHINGTON	48
Seattle	53
Spokane	47
PUERTO RICO	76
San Juan	79
WEST VIRGINIA	52
Beckley	51
Charleston	55
Elkins	49
WISCONSIN	43
Green Bay	44
Milwaukee	46
WYOMING	43
Cheyenne	46
Sheridan	45

CANADA

PROVINCE-CITY	AAOT-°F
ALBERTA	
Calgary	35
Edmonton	34
BRITISH COLUMBIA	
Vancouver	51
Victoria	51
MANITOBA	
Brandon	35
Winnipeg	36
NEW BRUNSWICK	
Saint John	42
NEWFOUNDLAND	
Gander	43
St. John's	44
NOVA SCOTIA	
Halifax	46
ONTARIO	
Ottawa	42
Sault Ste. Marie	40
Thunder Bay	37
Toronto	47
Windsor	49
QUEBEC	
Montreal	43
Quebec	39
SASKATCHEWAN	
Regina	35
Saskatoon	34

Calculate Your Savings

ANNUAL AVERAGE OUTDOOR TEMPERATURE	75°F	70°F	65°F	60°F	55°F	50°F	45°F	40°F
ESTIMATED ANNUAL ELECTRICAL SAVINGS	5%	10%	15%	20%	25%	30%	35%	40%
FACTOR TO COST CONVENTIONAL SYSTEM	0.95	0.90	0.85	0.80	0.75	0.70	0.65	0.60

Conventional System Operating Cost x Factor = Thermobank Operating Cost. For temperature between those shown, interpolate to obtain savings.

LOW TEMPERATURE (0ºF to -40ºFst) PERFORMANCE DATA

MODEL CTT	SUCTION TEMPERATURE							
	0°F	-5°F	-10°F	-15°F	-20°F	-25°F	-30°F	-40°F
1200L44	96,100	86,000	76,800	68,400	60,700	53,400	46,500	33,200
1500L44	113,700	102,400	92,200	82,700	73,900	65,700	57,800	42,400
2200L44	132,000	119,800	109,200	98,100	87,500	77,300	67,600	49,100
2700L44	169,800	153,700	138,100	123,100	108,700	95,200	82,600	60,400
3100L44	187,300	169,600	153,900	136,300	121,700	106,400	92,700	69,350
4400L44	267,000	242,100	218,600	196,300	175,100	154,800	135,300	98,300
5400L44	340,500	307,900	279,100	248,500	219,400	192,000	166,400	121,700
6200L44	373,300	338,000	306,700	271,650	242,600	212,100	184,750	138,200

AMBIENT CORRECTION FACTOR	
AMB.	R404A
80°F	1.15
85°F	1.10
90°F	1.05
95°F	1.00
100°F	0.95
105°F	0.90

For design conditions other than 95° F, multiply the rating by the correction factor.

LOW TEMPERATURE PHYSICAL DATA

MODEL CTT	COMPRESSOR		COND FANS			CONNECTIONS		CHARGE LBS.		UNIT CONFIG.	APPROX. NET LBS.
	QTY.	MODEL NO.	QTY.	DIA.	HP	SUC. OD	LIQ. OD	UNIT[2]	RECV[1]		
1200L44	1	4DA-F47KE	2	30	1	1-5/8	5/8	22	95	B	1,300
1500L44	1	4DH-F63KE	2	30	1	1-5/8	5/8	29	95	B	2,200
2200L44	1	4DJ-F76KE	2	30	1	2-1/8	7/8	39	128	B	2,500
2700L44	1	6DH-F93KE	2	30	1	2-1/8	7/8	49	162	B	3,100
3100L44	1	6DJ-F11ME	3	30	1	2-1/8	7/8	58	195	C	3,600
4400L44	2†	4DJ-F76KE	4	30	1	3-1/8	1-1/8	58	195	D	5,000
5400L44	2†	6DH-F93KE	4	30	1	3-1/8	1-1/8	101	370	D	5,500
6200L44	2†	6DJ-F11ME	6	30	1	3-1/8	1-1/8	101	370	E	7,000

† Compressors piped in parallel.

[1] Receiver at 90% full.

[2] Estimated refrigerant charge is for a condensing unit only. It does not include evaporators, interconnecting piping or other accessories.

See back cover for unit configuration.

LOW TEMPERATURE ELECTRICAL DATA

MODEL CTT	230/3/60					208/3/60 and 230/3/60					460/3/60				
	COMP.		COND. FLA	UNIT AMPS	MCA‡	COMP.		COND. FLA	UNIT AMPS	MCA‡	COMP.		COND. FLA	UNIT AMPS	MCA‡
	RLA	LRA				RLA	LRA				RLA	LRA			
1200L44	45.2	220	8.0	58.2	70	–	–	–	–	–	22.6	110	4.0	31.1	37
1500L44	52.6	278	8.0	65.6	79	–	–	–	–	–	26.3	139	4.0	34.8	42
2200L44	–	–	–	–	–	57.7	374	8.0	70.7	86	28.8	187	4.0	37.3	45
2700L44	–	–	–	–	–	72.4	450	8.0	85.4	104	36.2	225	4.0	44.7	54
3100L44	–	–	–	–	–	85.9	470	12.0	102.9	125	42.9	235	6.0	53.4	65
4400L44	–	–	–	–	–	115.4	748	16.0	137.4	152	57.6	374	8.0	70.6	78
5400L44	–	–	–	–	–	144.8	900	16.0	166.8	185	72.4	450	8.0	85.4	95
6200L44	–	–	–	–	–	171.8	940	24.0	201.8	224	85.8	470	12.0	102.8	114

MODEL CTT	575/3/60				
	COMP.		COND. FLA	UNIT AMPS	MCA‡
	RLA	LRA			
1200L44	17.5	106	4.2	22.2	27
1500L44	20.9	113	4.2	25.6	31
2200L44	24.1	135	4.2	28.8	35
2700L44	32.5	172	4.2	37.2	45
3100L44	39.6	200	6.3	46.4	56
4400L44	48.2	270	8.4	57.1	69
5400L44	65.0	344	8.4	73.9	90
6200L44	79.2	400	8.4	88.1	108

‡ MCA does not include evaporator motors.

– Not Available

MEDIUM TEMPERATURE (+10°F to +25°Fst) PERFORMANCE DATA

MODEL CTT	R404A & R507 SUCTION TEMPERATURE				R407C SUCTION TEMPERATURE			
	+25°F	+20°F	+15°F	+10°F	+25°F	+20°F	+15°F	+10°F
1200M**	125,300	114,700	104,600	95,000	112,100	101,300	91,300	81,800
1500M**	144,300	130,700	119,100	108,000	129,100	115,500	103,900	93,000
2000M**	157,900	143,500	132,200	118,900	150,000	136,300	125,600	113,000
2500M**	201,000	183,200	167,700	151,200	179,700	161,800	146,300	130,200
3000M**	228,100	207,700	188,400	170,100	204,000	183,400	164,300	146,500
3500M**	298,900	272,000	246,700	222,900	267,300	240,200	215,200	192,000
4000M**	339,400	310,000	282,000	255,400	303,500	273,800	246,000	219,900
5000M**	384,800	350,400	317,300	285,900	344,100	309,500	276,700	246,200
6000M**	455,400	384,800	376,300	339,800	407,200	339,800	328,200	292,600
7000M**	584,100	455,400	485,700	440,300	522,200	402,200	423,600	379,100

AMBIENT CORRECTION FACTOR		
AMB.	R404A	R407C
80°F	1.15	1.10
85°F	1.10	1.07
90°F	1.05	1.03
95°F	1.00	1.00
100°F	0.95	0.96
105°F	0.90	0.92

** 44 = R404A OR R507, 47 = R407C. For ambient design conditions other than 95°F, multiply the rating by the correction factor.

MEDIUM TEMPERATURE PHYSICAL DATA

MODEL CTT	COMPRESSOR		COND. FANS			CONNECTIONS R407C		CONNECTIONS R-404A & R-507		CHARGE LBS. R407C		CHARGE LBS. R-404A & R-507		UNIT CONFIG.	APPROX. NET LBS.
	QTY.	MODEL NO.	QTY.	DIA.	HP	SUC. OD	LIQ. OD	SUC. OD	LIQ. OD	UNIT[2]	RECV[1]	UNIT[2]	RECV[1]		
1200M**	1	3DF-R15ME	2	30	1	1-5/8	7/8	1-5/8	7/8	29	106	25	91	B	2,000
1500M**	1	3DS-R17ME	2	30	1	1-5/8	7/8	1-5/8	7/8	34	102	29	94	B	2,200
2000M**	1	4DB-R20ME	2	30	1	2-1/8	7/8	2-1/8	7/8	34	102	29	94	B	2,600
2500M**	1	4DH-R22ME	2	30	1	2-1/8	7/8	2-1/8	7/8	45	140	39	128	B	3,000
3000M**	1	4DJ-R28ME	3	30	1	2-1/8	1-1/8	2-1/8	1-1/8	68	213	58	195	C	3,600
3500M**	1	6DH-R35ME	3	30	1	2-1/8	1-1/8	2-1/8	1-1/8	68	213	58	195	C	3,800
4000M**	1	6DJ-R40ME	3	30	1	2-1/8	1-3/8	2-1/8	1-1/8	86	286	74	262	C	4,300
5000M**	2‡	4DH-R22ME	4	30	1	2-5/8	1-1/8	2-5/8	1-1/8	90	286	78	262	D	5,250
6000M**	2‡	4DJ-R28ME	4	30	1	2-5/8	1-5/8	2-5/8	1-3/8	118	403	101	370	D	5,700
7000M**	2‡	6DH-R35ME	6	30	1	3-1/8	1-3/8	3-1/8	1-3/8	131	403	113	370	E	8,000

** 44 = R404A or R507, 47 = R407C † Compressors piped in parallel. See back cover for unit configuration.
1 Receiver at 90% full.
2 Estimated refrigerant charge is for a condensing unit only. It does not include evaporators, interconnecting piping or other accessories.

MEDIUM TEMPERATURE ELECTRICAL DATA

MODEL CTT	208-230/3/60 COMP. RLA	208-230/3/60 COMP. LRA	208-230/3/60 COND. FLA	208-230/3/60 UNIT AMPS	208-230/3/60 MCA[3]	208/3/60 and 230/3/60 COMP. RLA	208/3/60 and 230/3/60 COMP. LRA	208/3/60 and 230/3/60 COND. FLA	208/3/60 and 230/3/60 UNIT AMPS	208/3/60 and 230/3/60 MCA[3]	460/3/60 COMP. RLA	460/3/60 COMP. LRA	460/3/60 COND. FLA	460/3/60 UNIT AMPS	460/3/60 MCA[3]
1200M**	48.2	275	8.0	57.2	69	–	–	–	–	–	23.6	138	4.0	28.6	34
1500M**	53.5	275	8.0	65.5	79	–	–	–	–	–	26.0	138	4.0	34.0	41
2000M**	–	–	–	–	–	64.7	374	8.0	76.7	93	32.4	187	4.0	40.4	49
2500M**	–	–	–	–	–	73.7	428	8.0	85.7	105	36.9	214	4.0	44.9	55
3000M**	–	–	–	–	–	94.6	470	12.0	110.6	135	47.3	235	6.0	57.3	70
3500M**	–	–	–	–	–	112.3	565	12.0	128.3	157	56.2	283	6.0	66.2	81
4000M**	–	–	–	–	–	128.2	594	12.0	144.2	177	64.1	297	6.0	74.1	91
5000M**	–	–	–	–	–	147.4	856	16.0	167.4	186	73.8	428	8.0	85.8	96
6000M**	–	–	–	–	–	189.2	940	16.0	209.2	233	94.6	470	8.0	106.6	119
7000M**	–	–	–	–	–	224.6	1130	24.0	252.6	281	112.4	566	12.0	128.4	143

MODEL CTT	575/3/60 COMP. RLA	575/3/60 COMP. LRA	575/3/60 COND. FLA	575/3/60 UNIT AMPS	575/3/60 MCA[3]
1200M**	–	–	–	–	–
1500M**	23.6	110	4.2	28.8	34
2000M**	28.2	135	4.2	36.2	44
2500M**	34.4	172	4.2	39.6	48
3000M**	39.3	200	6.3	46.6	56
3500M**	42.5	230	6.3	49.8	60
4000M**	53.5	245	6.3	60.8	74
5000M**	68.8	344	8.4	78.2	95
6000M**	78.6	400	8.4	88.0	107
7000M**	85.0	460	12.6	98.6	119

** 44 = R404A OR R507, 47 = R407C
[3] MCA does not include evaporator motors.
– Not Available

4 FPI EVAPORATORS WITH HOT GAS DRAIN PAN

EVAP. MODEL*	BTUH @ 10°TD		FAN MOTORS					CFM	DIMENSIONS (inches)							APPROX. NET LBS.
					TOTAL AMPS				OVERALL			MOUNTING				
	+10°F SST	-20°F SST	QTY.	HP	230 V	460 V	575 V		H	W	D	A	B	C	E	
MSG325T	36,800	32,500	2	1/3	6.4	2.6	1.6	5,430	25	76	20	18	63	–	–	220
MSG390T	44,100	39,000	3	1/3	9.6	3.9	2.4	8,890	25	106	20	18	93	31	–	275
MSG510T	57,700	51,000	3	1/3	9.6	3.9	2.4	8,150	25	106	20	18	93	31	–	300
TV400D	44,000	40,000	2	1/2	3.6	1.8	–	8,600	43	75	32	26	58	7-1/2	3-1/4	305
TV550D	60,500	55,000	2	1/2	3.6	1.8	–	8,400	43	75	32	26	58	7-1/2	3-1/4	430
TV750D	83,000	75,000	2	3/4	7.0	3.5	–	13,100	43	111	33	26	94	7-1/2	4	500
TV950D	104,500	95,000	2	3/4	7.0	3.5	–	15,000	43	111	33	26	94	7-1/2	4	535
TV1100D	119,000	108,000	2	3/4	7.0	3.5	–	14,500	44	111	36	28	94	7-1/2	5-3/4	580
TV1200D	132,000	120,000	3	3/4	10.5	5.3	–	20,200	48	136	42	28-1/4	113-1/4	11-3/8	7-1/2	1,120
TV1400D	154,000	140,000	3	3/4	10.5	5.3	–	19,500	48	136	42	28-1/4	113-1/4	11-3/8	7-1/2	1,265
TV1600D	176,000	160,000	4	3/4	14.0	7.0	–	26,900	48	174	42	28-1/4	151-1/4	11-3/8	7-1/2	1,660
TV1900D	205,000	186,000	4	3/4	14.0	7.0	–	26,000	48	174	42	28-1/4	151-1/4	14-1/2	7-1/2	1,700

* Contact Factory if low profile evaporators are required.

– Not Available

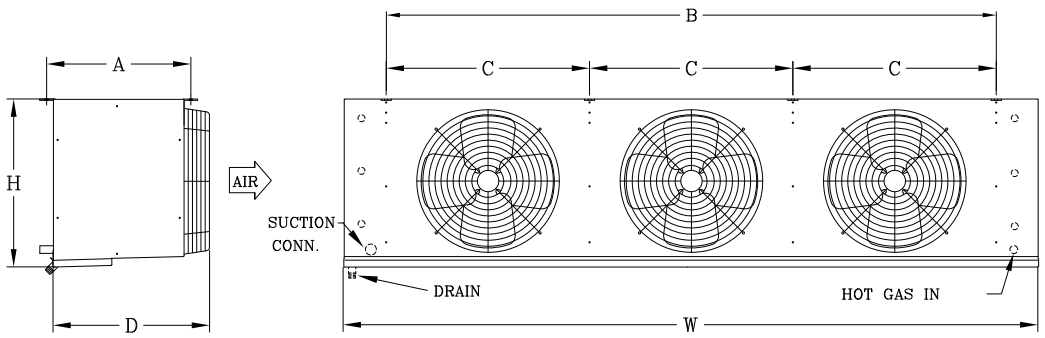
6 FPI EVAPORATORS WITH HOT GAS DRAIN PAN

EVAP. MODEL*	BTUH @ 10°TD		FAN MOTORS					CFM	DIMENSIONS (inches)							APPROX. NET LBS.
					TOTAL AMPS				OVERALL			MOUNTING				
	+10°F SST	-20°F SST	QTY.	HP	230 V	460 V	575 V		H	W	D	A	B	C	E	
CSG320T	35,600	32,000	2	1/3	6.4	2.6	1.6	5,480	25	76	20	18	63	–	–	200
CSG385T	43,600	38,500	3	1/3	9.6	3.9	2.4	9,130	25	106	20	18	93	31	–	270
CSG460T	52,000	46,000	3	1/3	9.6	3.9	2.4	9,090	25	106	20	18	93	31	–	285
CSG520T	58,800	52,000	3	1/2	9.6	3.9	2.4	8,190	25	106	20	18	93	31	–	300
CTV450	49,800	45,200	2	1/2	3.6	1.8	–	8,400	43	75	32	26	58	7-1/2	3-1/4	305
CTV620	68,400	62,200	2	3/4	3.6	1.8	–	8,200	43	75	32	26	58	7-1/2	3-1/4	430
CTV850	93,200	84,800	2	3/4	7.0	3.5	–	12,800	43	111	33	26	94	7-1/2	4	500
CTV1070	118,700	107,400	2	3/4	7.0	3.5	–	14,600	43	111	33	26	94	7-1/2	4	535
CTV1220	134,500	122,000	2	3/4	7.0	3.5	–	14,100	44	111	36	28	94	7-1/2	5-3/4	580
CTV1360	149,200	135,600	3	3/4	10.5	5.3	–	19,700	48	136	42	28-1/4	113-1/4	11-3/8	7-1/2	1,120
CTV1580	174,900	458,200	3	3/4	10.5	5.3	–	19,000	48	136	42	28-1/4	113-1/4	11-3/8	7-1/2	1,265
CTV1800	200,700	180,800	4	3/4	14.0	7.0	–	21,500	48	174	42	28-1/4	151-1/4	11-3/8	7-1/2	1,660
CTV2100	231,700	210,270	4	3/4	14.0	7.0	–	21,200	48	174	42	28-1/4	151-1/4	14-1/2	7-1/2	1,700

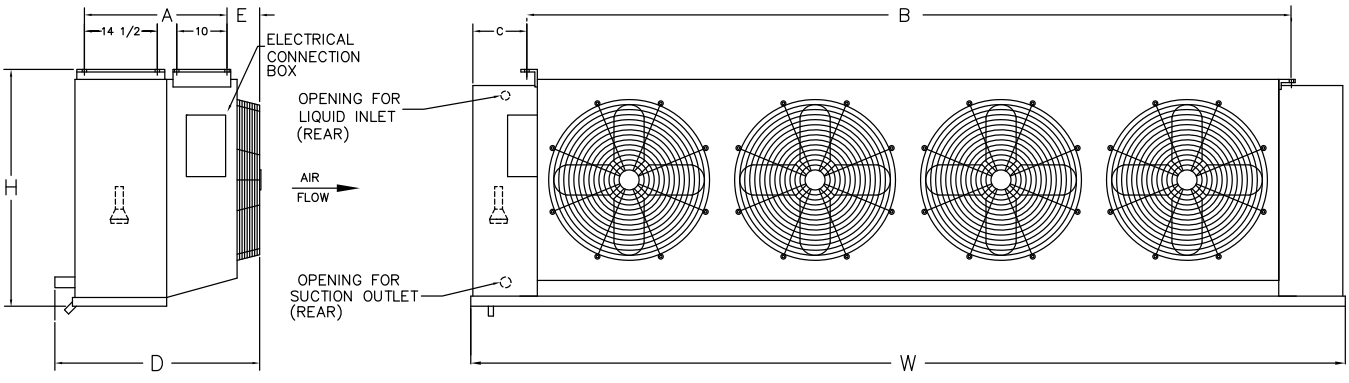
* Contact Factory if low profile evaporators are required.

– Not Available

MSG & CSG MODELS



TV & CTV MODELS



NOTE: Models CM 450 - 1250 have 4 mounting holes (dimension A). Models CM 1350-2100 have 8 mounting holes (4 per side).

4 FPI EVAPORATORS WITHOUT HEATED DRAIN PAN

EVAP. MODEL	BTUH @ 10°TD +25°F SST	FAN MOTORS					CFM	DIMENSIONS							APPROX. NET LBS.
		QTY.	HP	TOTAL AMPS				OVERALL			MOUNTING				
				230 V	460 V	575 V		H	W	D	A	B	C	E	
MSA340	34,000	2	1/3	6.4	2.6	1.6	5,710	25	76	20	18	63	–	–	200
MSA395	39,500	2	1/3	6.4	2.6	1.6	5,430	25	76	20	18	63	–	–	215
MSA465	46,500	3	1/3	9.6	3.9	2.4	8,990	25	106	20	18	93	31	–	270
MSA585	58,500	3	1/3	9.6	3.9	2.4	8,140	25	106	20	18	93	31	–	295
CM450	45,500	2	1/2	3.6	1.8	–	8,600	43	75	32	26	58	7-1/2	3-1/4	300
CM620	62,700	2	1/2	3.6	1.8	–	8,400	43	75	32	26	58	7-1/2	3-1/4	425
CM850	85,500	2	3/4	7.0	3.5	–	13,100	43	111	33	26	94	7-1/2	4	495
CM1100	107,900	2	3/4	7.0	3.5	–	15,000	43	111	33	26	94	7-1/2	4	530
CM1250	123,500	2	3/4	7.0	3.5	–	14,500	44	111	36	28	94	7-1/2	5-3/4	575
CM1350	136,600	3	3/4	10.5	5.3	–	20,200	48	136	42	28-1/4	113-1/4	11-3/8	7-1/2	1,110
CM1600	159,900	3	3/4	10.5	5.3	–	19,500	48	136	42	28-1/4	113-1/4	11-3/8	7-1/2	1,255
CM1800	182,200	4	3/4	14.0	7.0	–	25,200	48	174	42	28-1/4	151-1/4	11-3/8	7-1/2	1,650
CM2100	212,500	4	3/4	14.0	7.0	–	24,300	48	174	42	28-1/4	151-1/4	14-1/2	7-1/2	1,690

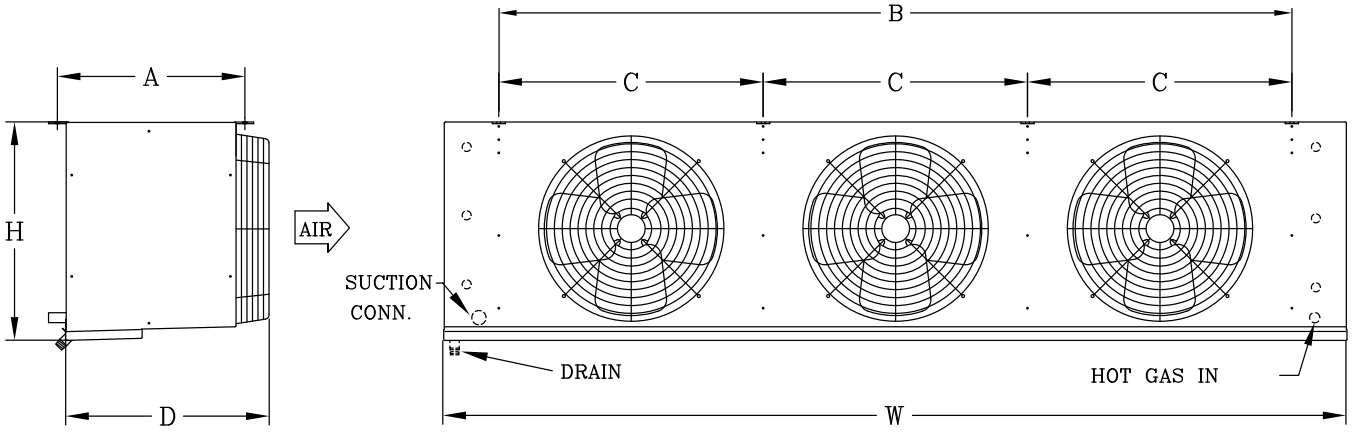
Note: Units without heated drain pans are not to be used for room temperatures below +34°F
– Not Available

6 FPI EVAPORATORS WITHOUT HEATED DRAIN PAN

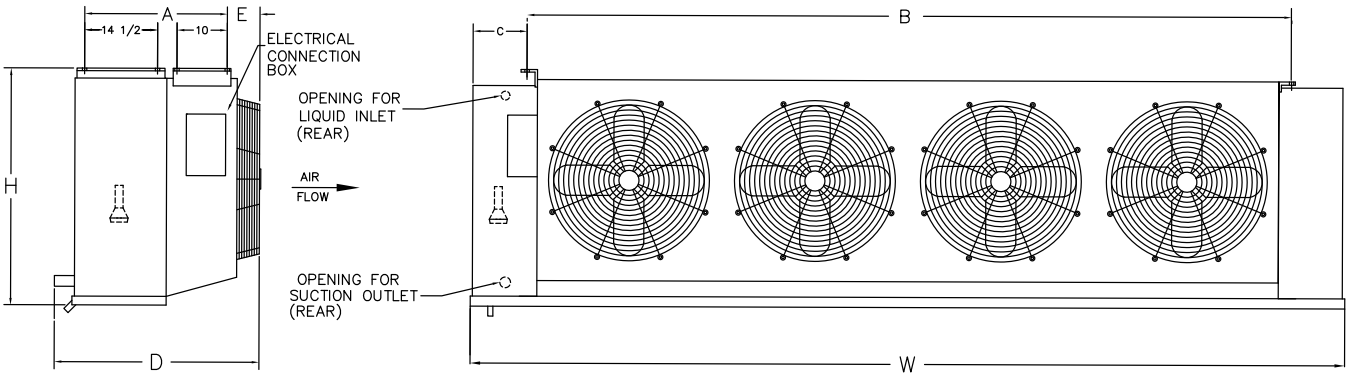
EVAP. MODEL	BTUH @ 10°TD +25°F SST	FAN MOTORS					CFM	DIMENSIONS							APPROX. NET LBS.
		QTY.	HP	TOTAL AMPS				OVERALL			MOUNTING				
				230 V	460 V	575 V		H	W	D	A	B	C	E	
CSA370	37,000	2	1/3	6.4	2.6	1.6	5,460	25	76	20	18	63	–	–	210
CSA415	41,500	3	1/3	6.4	2.6	2.4	8,620	25	76	20	18	63	–	–	230
CSA490	49,000	3	1/3	9.6	3.9	2.4	8,580	25	106	20	18	93	31	–	275
CSA620	62,000	3	1/3	9.6	3.9	2.4	7,770	25	106	20	18	93	31	–	300
CCM520	51,400	2	1/2	3.6	1.8	–	8,385	43	75	32	26	58	7-1/2	3-1/4	305
CCM710	70,825	2	1/2	3.6	1.8	–	8,190	43	75	32	26	58	7-1/2	3-1/4	430
CCM970	97,125	2	3/4	7.0	3.5	–	12,800	43	111	33	26	94	7-1/2	4	510
CCM1220	122,250	2	3/4	7.0	3.5	–	14,600	43	111	33	26	94	7-1/2	4	540
CCM1390	139,400	2	3/4	7.0	3.5	–	14,100	44	111	36	28	94	7-1/2	5-3/4	590
CCM1550	154,500	3	3/4	10.5	5.3	–	19,700	48	136	42	28-1/4	113-1/4	11-3/8	7-1/2	1,125
CCM1810	180,450	3	3/4	10.5	5.3	–	19,000	48	136	42	28-1/4	113-1/4	11-3/8	7-1/2	1,265
CCM2060	205,560	4	3/4	14.0	7.0	–	24,600	48	174	42	28-1/4	151-1/4	11-3/8	7-1/2	1,660
CCM2400	239,900	4	3/4	14.0	7.0	–	23,700	48	174	42	28-1/4	151-1/4	14-1/2	7-1/2	1,700

Note: Units without heated drain pans are not to be used for room temperatures below +34°F
– Not Available

MSA & CSA MODELS



CM & CCM MODELS



NOTE: Models CCM520 - 1390 have 4 mounting holes (dimension A). Models CCM 1550-2400 have 8 mounting holes (4 per side).

LOW TEMP THERMOBANK - 4 FPI EVAPS

MODEL CTT	MBH @ -20°F SST	EVAP FOR -10°F ROOM			MBH @ -30°F SST	EVAP FOR -20°F ROOM			MBH @ -40°F SST	EVAP FOR -30°F ROOM
		LPG-T	MSG-T	TV		LPG-T	MSG-T	TV		TV
1200L44	60.7	—	(2) 325	550	46.5	—	510, (2) 230	550	33.2	400
1500L44	73.9	—	(2) 390	750	57.8	—	510, (2) 390	550	42.4	550
2200L44	87.5	—	(2) 510	950, (2) 550	67.6	—	(2) 390	750, (2) 400	49.1	550
2700L44	108.7	—	(2) 510	1100, (2) 550	82.6	—	(2) 510	950, (2) 550	60.4	750, (2) 400
3100L44	121.7	—	—	1200, 1400	92.7	—	(2) 510	1100, (2) 550	69.4	950, (2) 550
4400L44	175.1	—	—	1900, (2) 950	135.3	—	—	1400, (2) 750	98.3	1200
5400L44	219.4	—	—	(2) 1100, (2) 1200	166.4	—	—	1900, (2) 950	121.7	1400, (2) 750
6200L44	242.6	—	—	(2) 1400	184.8	—	—	(2) 1100, (2) 1200	138.2	1900, (2) 950

MEDIUM TEMP THERMOBANK - 4 FPI EVAPS

MODEL CTT	MBH @ +10°F SST		EVAP FOR +20°F ROOM			MBH @ +20°F SST		EVAP FOR +30°F ROOM		
	M44	M47	LPG-T	MSG-T	TV	M44	M47	LPG-T	MSG-T	TV
1200M	95.0	81.8	—	(2) 390	950, (2) 400	114.7	1.103	—	(2) 510	1100, (2) 550
1500M	108.0	93.0	—	(2) 510	1100, (2) 550	130.7	115.5	—	—	1200, (2) 550
2000M	118.9	102.4	—	(2) 510	1100, (2) 550	143.5	126.8	—	—	1400, (2) 750
2500M	151.2	130.2	—	—	1400, (2) 750	183.2	161.8	—	—	1600, (2) 750
3000M	170.1	146.5	—	—	1600, (2) 750	207.7	183.4	—	—	1900, (2) 950
3500M	222.9	192.0	—	—	1900, (2) 950	272.0	240.2	—	—	(2) 1200
4000M	255.4	219.9	—	—	(2) 1100	310.0	273.8	—	—	(2) 1400
5000M	285.9	246.5	—	—	(2) 1400	350.4	309.5	—	—	(2) 1600
6000M	339.8	292.6	—	—	(2) 1600	384.8	339.8	—	—	(2) 1900
7000M	440.3	379.1	—	—	(2) 1900	455.4	402.2	—	—	(2) 1900

MODEL CTT	MBH @ +25°F SST		EVAP FOR +35°F ROOM	
	M44	M47	MSA (4 FPI)	CM (4 FPI)
1200M	125.3	112.1	(2) 585	1250, (2) 620
1500M	144.3	129.1	—	1350, 1600, (2) 850
2000M	157.9	141.2	—	1600, (2) 850
2500M	201.0	179.7	—	1800, 2100, (2) 1100
3000M	228.1	204.0	—	2100, (2) 1100
3500M	298.9	267.3	—	(2) 1600
4000M	339.4	303.5	—	(2) 1600
5000M	384.8	344.1	—	(2) 1800
6000M	455.4	407.2	—	(2) 2100
7000M	584.1	522.2	—	(3) 1800

– Not Available

LOW TEMP THERMOBANK - 6 FPI EVAPS

MODEL CTT	MBH @ -20°F SST	EVAP FOR -10°F ROOM			MBH @ -30°F SST	EVAP FOR -20°F ROOM		
		LPG-T	CSG-T	CTV		LPG-T	CSG-T	CTV
1200L44	60.7	—	(2) 320	620	46.5	(2) 265	520	450
1500L44	73.9	—	(2) 385	850	57.8	—	(2) 320	620
2200L44	87.5	—	(2) 460	850, (2) 450	67.6	—	(2) 385	620
2700L44	108.7	—	(2) 520	1070, (2) 620	82.6	—	(2) 460	850, (2) 450
3100L44	121.7	—	—	1220, 1360	92.7	—	(2) 520	1070, (2) 620
4400L44	175.1	—	—	1800, (2) 850	135.3	—	—	1360, (2) 620
5400L44	219.4	—	—	2100, (2) 1220	166.4	—	—	1800, (2) 850
6200L44	242.6	—	—	(2) 1360, (2) 1580	184.8	—	—	2100, (2) 1070

MEDIUM TEMP THERMOBANK - 6 FPI EVAPS

MODEL CTT	MBH @ +10°F SST		EVAP FOR +20°F ROOM			MBH @ +20°F SST		EVAP FOR +30°F ROOM		
	M44	M47	LPG-T	CSG-T	CTV	M44	M47	LPG-T	CSG-T	CTV
1200M	95.0	81.8	—	(2) 460	850, (2) 450	114.7	101.3	—	(2) 520	1070
1500M	108.0	93.0	—	(2) 520	1070	130.7	115.5	—	—	1220, (2) 620
2000M	118.9	102.4	—	(2) 520	1220, (2) 620	143.5	126.8	—	—	1360, 1580
2500M	151.2	130.2	—	—	1360, 1580	183.2	161.8	—	—	1800, (2) 850
3000M	170.1	146.5	—	—	1580, (2) 850	207.7	183.4	—	—	2100, (2) 1070
3500M	222.9	192.0	—	—	2100, (2) 1070	272.0	240.2	—	—	(2) 1360
4000M	255.4	219.9	—	—	(2) 1220	310.0	273.8	—	—	(2) 1580
5000M	285.9	246.5	—	—	(2) 1360	350.4	309.5	—	—	(2) 1800
6000M	339.8	292.6	—	—	(2) 1580	384.8	339.8	—	—	(2) 2100
7000M	440.3	379.1	—	—	(2) 2100	455.4	402.2	—	—	(2) 2100

MODEL CTT	MBH @ +25°F SST		EVAP FOR +35°F ROOM	
	M44	M47	MSA (6 FPI)	CM (6 FPI)
1200M	125.3	112.1	(2) 620	1220, (2) 520
1500M	144.3	129.1	(2) 620	1390, (2) 710
2000M	157.9	141.2	—	1550, (2) 710
2500M	201.0	179.7	—	1810, 2060, (2) 970
3000M	228.1	204.0	—	2060, 2400, (2) 1220
3500M	298.9	267.3	—	2400, (2) 1390
4000M	339.4	303.5	—	(2) 620
5000M	384.8	344.1	—	(2) 620
6000M	455.4	407.2	—	(2) 620
7000M	584.1	522.2	—	(2) 620

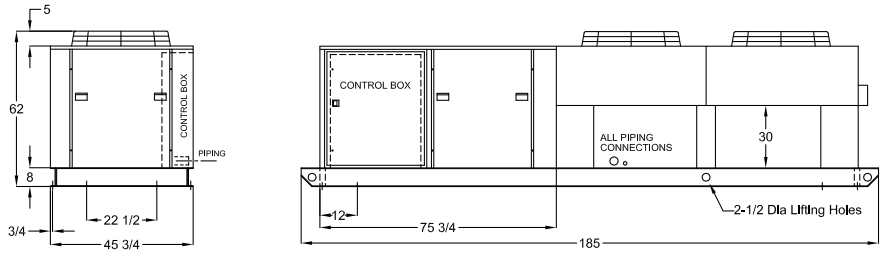
– Not Available

Department of Energy Annual Walk-In Energy Factor (AWEF) Ratings		
Base Model Number	AWEF	
	Outdoor Rated	Indoor Rated
Medium Temperature Models		
1200M4*	7.6	–
1500M4*	7.6	–
2000M4*	7.6	–
2500M4*	7.6	–

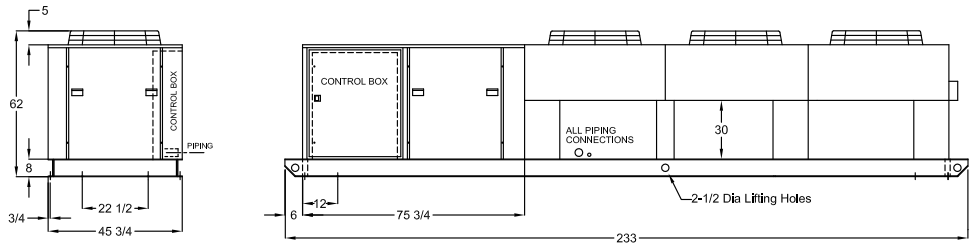
* Each asterisk represents a variable character based upon model, voltage, and vintage ordered. See page 3 for nomenclature.

Larger HP models are not intended for use in walk-in coolers less than 3,000 sq. feet thus are outside the scope of this DOE regulation.

Dept. of Energy AWEF ratings for low temperature condensing models will be implemented in 2020.



FAN CONFIGURATION "B"



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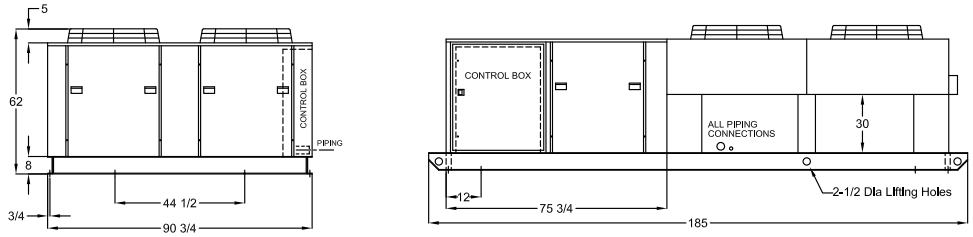

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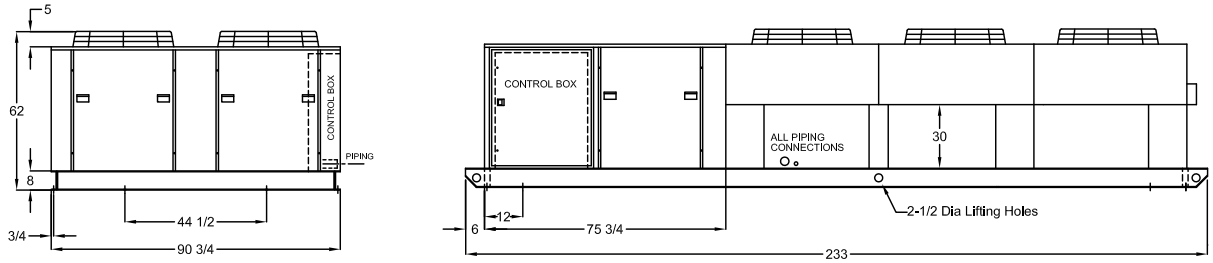

FAN CONFIGURATION "E"

Due to ongoing product improvement, specifications are subject to change without notice.