KRAMER

Catalog
C-806C
FEB 1997
Supercedes
C-806B

THERMOBANK

KRAMER 14230 Lochridge Boulevard / Covington, GA / 30014
Phone: 770-788-5800 Fax: 770-788-5820
www.kramerusa.net

Model CTT
Hot Gas Defrost
Refrigeration System

STANDARD FEATURES INCLUDE

- Semi-hermetic Copeland Compressor
- Copper tube, aluminum fin air cooled condenser
- Receiver with service valves and fusible plug
- Discharge and suction line vibration eliminators
- High-Low pressure control
- Crankcase heater
- Weathertight control cabinet
- Rugged galvanized steel construction
- Permanent liquid line filter-drier (loose)
- Permanent suction line filter (loose)
- Minimum Charge Monitor
- Insulated Thermolator (loose)

OPTIONAL COMPONENTS

- Non-fused disconnect (loose)
- Pressure relief valve
- Suction accumulator
- Oil separator

CTT THERMOBANK NOMENCLATURE

CTT 1 0200 L 44 X

- X — Special
- 44 — Refrigerant (22=R-22, 44=R-404A, R-507)
- L — Temperature (L=Low, M=Medium)
- 0200 — Nominal Compressor HP (0075= 3/4HP, 0300=3HP)
- 1 — Compressor Code (1=Copeland Semi-Hermetic Reed)
- CTT — Thermobank Condensing Unit

CAPACITY - BTUH at 95°F AMBIENT

MODEL NUMBER	HP	COMPRESSOR MODEL	SATURATED SUCTION TEMPERATURE - °F				
			+25	+20	+15	+10	+5
CTT10075M22	3/4	KAN-0075	6400	5660	4960	4320	3750
CTT10100M22	1	KAR-0100	9240	8260	7360	6530	5800
CTT10100M44	1	KAR-010E	8200	7600	6900	6300	5700
CTT10150M22	1 1/2	KAG-0150	11780	10500	9300	8400	7350
CTT10200M22	2	KAK-0200	15700	14070	12510	10990	9680
CTT10200M44	2	KAK-021E	14200	12900	11750	10700	9650
CTT10300M22	3	ERF-0310	24340	21830	19480	17490	15650
CTT10300M44	3	ERF-031E	25950	23650	21500	19370	17450

CAPACITY - BTUH at 95°F AMBIENT

MODEL NUMBER	HP	COMPRESSOR MODEL	SATURATED SUCTION TEMPERATURE - °F				
			-10	-15	-20	-25	-30
CTT10075L44	3/4	KAM-007E	4450	3870	3350	2850	2450
CTT10100L44	1	KAJ-010E	5850	5150	4500	3900	3350
CTT10150L44	1 1/2	KAL-015E	8800	7800	6850	6050	5100
CTT10200L44	2	EAV-020E	11600	10100	8650	7550	6400
CTT10300L44	3	LAH-031E	18300	15900	13700	11250	9650

AMBIENT CORRECTION FACTORS

REFRIGERANT	AMBIENT TEMPERATURE - °F					
	80	85	90	95	100	105
R-22	1.10	1.07	1.03	1.00	0,96	0.92
R-404A or R-507	1.15	1.10	1.05	1.00	0.95	0.90

All CTT Models suitable for operation up to 110°F ambient

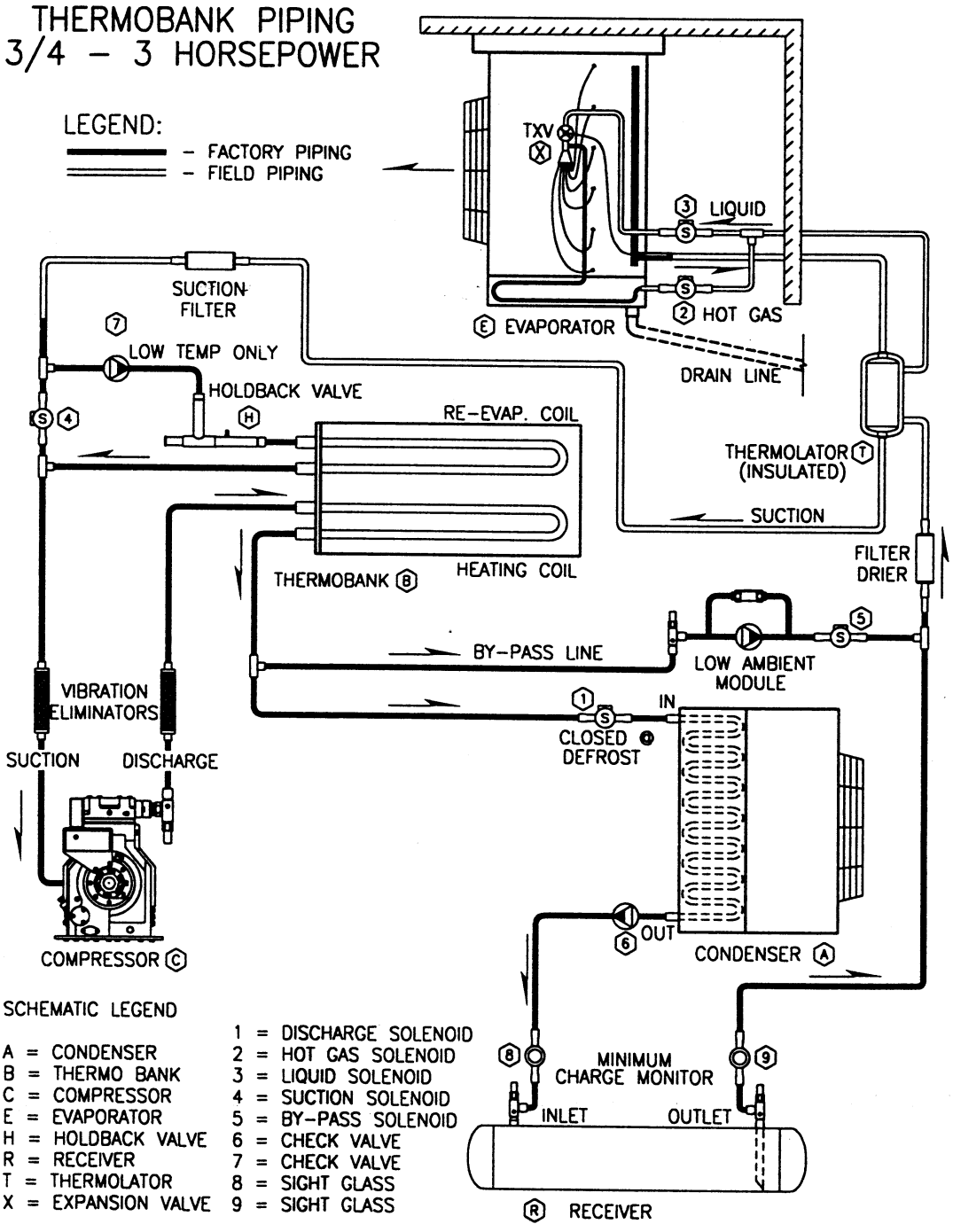
KRAMER *THERMOBANK* IS A PATENTED SYSTEM

THE THERMOBANK SYSTEM

The THERMOBANK is a patented, factory packaged, air cooled, completely automatic refrigeration system with WARM GAS defrost. Less equipment is required with THERMOBANK because it does more refrigeration in 24 hours than other packaged systems. With a typical defrost time of 5 to 10 minutes, THERMOBANK is refrigerating while others are still defrosting. The "BANK" stores sufficient discharge heat to fully re-evaporate all the liquid resulting from the defrost of the evaporator. With the lowest possible floating head pressure, there is a marked increase in BTU per day. THERMOBANK has no head pressure controls, no reversing valves, and no hot gas line between the condensing unit and evaporator.

With THERMOBANKS fast defrost, room temperatures are very consistent and do not rise like they do with longer defrost times.

The THERMOBANK delivers more refrigeration with less energy consumption, less equipment, less installation and lower operating cost than any other refrigeration package now on the market or likely to be in the foreseeable future! The THERMOBANK Condensing Unit is delivered factory assembled and run tested complete with a matching THERMOBANK Evaporator and controls for easy and economical on site installation. THERMOBANK is available for all refrigerated room applications from -20°F to+35°F.

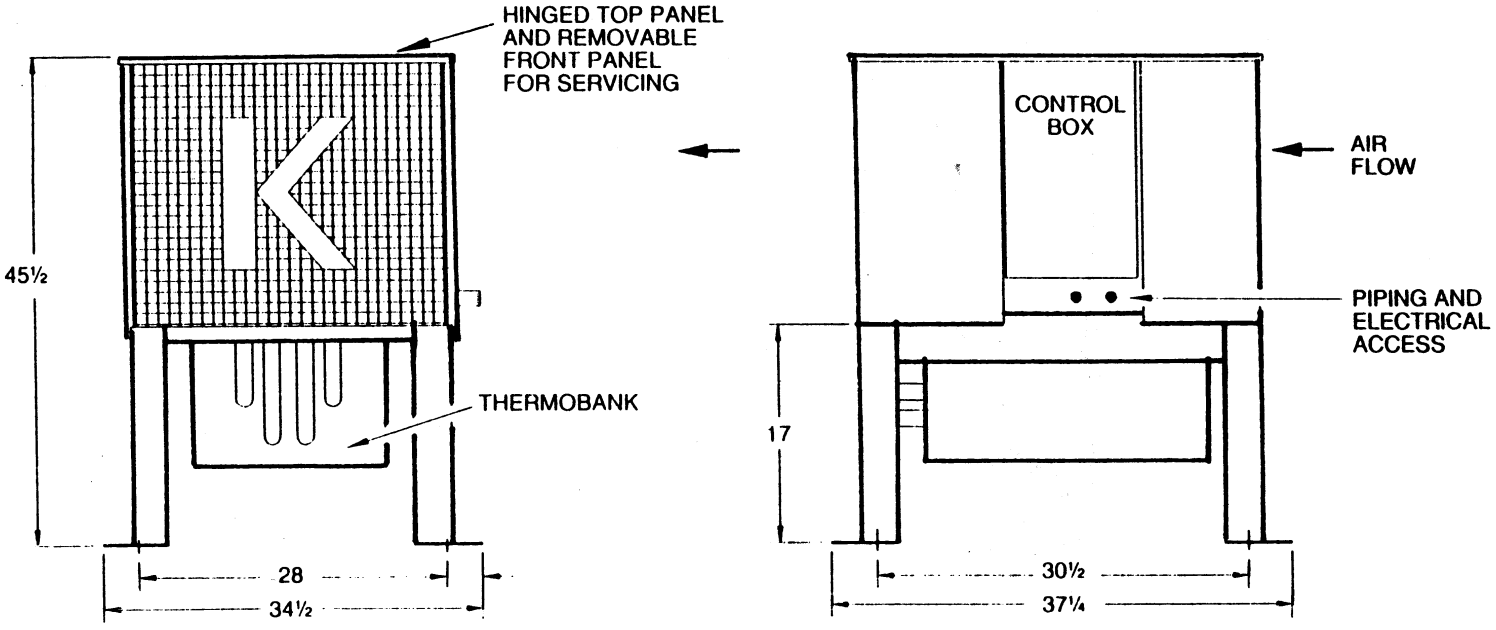


KRAMER MODEL CTT 3/4 THRU 3 HP THERMOBANK

PHYSICAL AND ELECTRICAL DATA

CTT MODEL NUMBER	CONNECTIONS		RCVR. LBS. 90%	AMPS at 230 / 1 / 60					AMPS at 230 / 3 / 60					APRX. SHIP LBS.
	SUCT. ODS	LIQ. ODS		COMPRESSOR RLA	COMPRESSOR HP	COND. FLA	UNIT AMPS	* MCA	COMPRESSOR RLA	COMPRESSOR HP	COND. FLA	UNIT AMPS	* MCA	
0075M22	5/8	3/8	6.0	6.1	3/4	2.9	10.0	15	3.5	3/4	2.9	7.4	15	380
0100M22	5/8	3/8	6.0	7.4	1	2.9	11.3	15	4.3	1	2.9	8.2	15	390
0100M44	5/8	3/8	5.1	7.4	1	2.9	11.3	15	4.3	1	2.9	8.2	15	390
0150M22	7/8	3/8	10.0	9.6	1 1/2	2.9	13.5	16	5.5	1 1/2	2.9	9.4	15	415
0200M22	7/8	3/8	10.0	10.6	2	2.9	14.5	18	6.8	2	2.9	10.7	15	490
0200M44	7/8	3/8	8.6	10.6	2	2.9	14.5	18	6.8	2	2.9	10.7	15	490
0300M22	1 1/8	1/2	19.6	17.0	3	2.9	20.9	26	12.4	3	2.9	16.3	20	550
0300M44	1 1/8	1/2	16.8	---	---	---	---	---	12.4	3	2.9	16.3	20	550
0075L44	5/8	3/8	5.1	5.6	3/4	2.9	9.5	15	3.2	3/4	2.9	7.1	15	380
0100L44	5/8	3/8	5.1	6.9	1	2.9	10.8	15	4.6	1	2.9	8.5	15	390
0150L44	7/8	3/8	8.6	9.9	1 1/2	2.9	13.8	17	6.6	1 1/2	2.9	10.5	15	405
0200L44	7/8	3/8	8.6	14.7	2	2.9	18.6	23	7.4	2	2.9	11.3	15	490
0300L44	1 1/8	1/2	16.8	16.7	3	2.9	20.6	25	12.8	3	2.9	16.7	20	550

* MCA does not include evaporator load. Evaporator load may increase MCA requirements. UNIT AMPS includes 1.0 amp for control circuit. RLA = Rated Load Amps of compressor manufacturer. 460/3/60 units are available in most sizes - please contact the factory for availability.



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COMPLETE AUTOMATIC SYSTEMS

STANDARD FEATURES

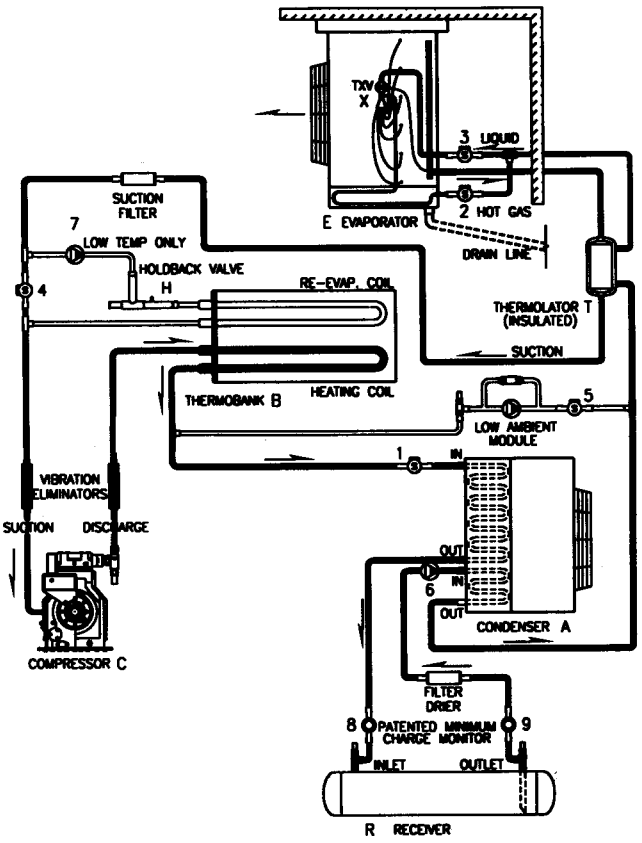
- ALL WELDED THERMOBANK
- LIQUID SUB-COOLING CIRCUIT
- MANUAL PUMPDOWN SWITCH
- CRANKCASE HEATER(S)
- LIQUID LINE FILTER-DRIER
- SEMI-HERMETIC COMPRESSOR(S)
- MOISTURE INDICATING SIGHTGLASSES
- LOW AMBIENT START MODULE
- ROOM THERMOSTAT (LOOSE)
- ENVIRONMENTALLY SAFE REFRIGERANTS
- SUCTION SOLENOID VALVE
- LIQUID LINE SOLENOID VALVE (LOOSE)
- FLOATING HEAD PRESSURE
- SUB-CIRCUIT FUSING
- HOT GAS SOLENOID (LOOSE)
- REPLACEABLE CORE FILTERS 15hp & LARGER
- SUCTION LINE FILTER
- BANK WATER LEVEL GAUGE
- ADJUSTABLE FAN CYCLING
- COPPER TUBE-ALUMINUM FIN COILS
- HI-LO PRESSURE SWITCH
- FUSIBLE PLUG OR RELIEF VALVE
- THERMOLATOR (LOOSE)
- OIL PRESSURE SAFETY CONTROL
- WEATHERPROOF OUTDOOR HOUSING
- MANUAL COMPRESSOR SWITCH
- MINIMUM CHARGE MONITOR (PATENTED)
- 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.

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 SYSTEM

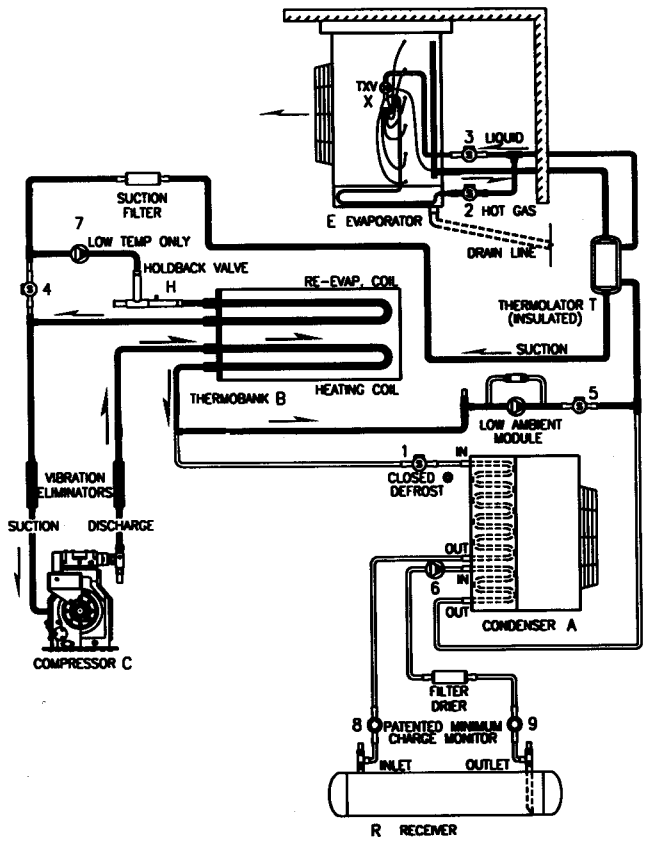
Refrigeration Cycle



SCHEMATIC LEGEND

A = CONDENSER
B = THERMO BANK
C = COMPRESSOR
E = EVAPORATOR
H = HOLDBACK VALVE
R = RECEIVER
T = THERMOLATOR
X = EXPANSION VALVE
1 = DISCHARGE SOLENOID
2 = HOT GAS SOLENOID
3 = LIQUID SOLENOID
4 = SUCTION SOLENOID
5 = BY-PASS VALVE
6 = CHECK VALVE
7 = CHECK VALVE
8 = SIGHT GLASS
9 = SIGHT GLASS

Defrost Cycle



NEW - IMPROVED HOT GAS DEFROST

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 the 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 Thermolator (T), the Expansion Valve (X), and the Evaporator (E). The refrigerant returns to the Compressor as in any standard system.

To prevent excessive superheating of the refrigerant vapor returning to the compressor and maintain the water temperature in the Bank, the refrigerant flow bypasses the Bank through the Suction Line Solenoid (4) during the refrigeration cycle. This Suction Line Solenoid is generously sized for minimum pressure drop and is of the normally closed type providing an extra margin of safety. On low temperature systems a spring loaded hold back Check Valve (7) is installed upstream of the Holdback Valve (H) to ensure 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 into and 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.

During the defrost cycle the hot gas passes through the liquid side of the Thermolator (T) and the suction from the Evaporator goes through the inner core. The heat transfer in the Thermolator reduces the superheat of the hot gas and minimizes coil steaming and temperature rise in the refrigerated room.

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 will function 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 pressure 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.

IMPROVED THERMOBANK SYSTEM

EVAPORATOR DESIGN

Evaporator designs were developed to fulfill the ruggedness and reliability requirements of the industrial and commercial refrigeration industry. Heavy gauge aluminum tube sheets virtually eliminate the potential for refrigerant leaks at the tube sheets caused by thermal expansion and contraction. Corrosion resistant construction will give maximum performance. All **THERMOBANK** evaporators feature mechanically expanded coils for positive fin-tube bond to insure maximum heat transfer. All coils are custom circuited for the exact requirements of each application thereby providing maximum efficiency and performance during both refrigeration and defrost mode.

Four fin per inch coils are used in low and medium temperature levels. Four fin per inch coils will allow the defrost water to clear the coil faster and allows more time between defrost. Four fin per inch coils should be used for the minimum number of defrost per day and the shortest defrost time. They should always be used if heavy frost loading is possible.

Six fin per inch coils are available and may provide optimum performance for a specific area. They are often used in confined spaces where other coils will not fit. They are sometimes used when light frost loads are expected.

THERMOLATOR

The Thermolator is a unique Kramer engineering development and plays a significant part in the Kramer **THERMOBANK** System. It has no moving parts to wear out. It consists of a round vessel with convolute interior that will turbulate the refrigerant flow for maximum heat transfer. The suction stream from the evaporator moves through this convolute interior on the way to the compressor. Surrounding the outside of this convolute interior is the liquid on the way to the expansion valve. Should the suction stream contain any liquid mist it would be boiled off. The liquid is sub-cooled and feeds liquid to the expansion valve at a considerably lower temperature.

The Thermolator has a dual purpose and its function differs during the defrost cycle. During defrost the hot discharge gas passes through the liquid side of the Thermolator and the suction from the evaporator goes through the convolute core of the Thermolator. The heat transfer in the Thermolator reduces the superheat of the hot gas and minimizes coil steaming and temperature rise in the refrigerated room.

The Thermolator improves system efficiency, stabilizes the defrost, and provides additional insurance that only vapor is returned to the compressor. The complete Thermolator assembly is insulated to insure high efficiency heat transfer.

MINIMUM-CHARGE-MONITOR (Patented)

Thermobank uses the unique Minimum-Charge-Monitor for charging simply, accurately and quickly. Incorporating the use of two sight glasses, one glass shows system undercharge while the other sight glass indicates system overcharge.

DEPENDABLE HOT GAS DEFROST

SMALLEST REFRIGERANT CHARGE

Ton for ton, THERMOBANK'S refrigerant charge is much lower than any conventional equipment. This is made possible by applying a receiver in combination with the Minimum-Charge-Monitor and the elimination of condenser liquid flooding for head pressure control. The same charge works for all seasons - summer or winter. The Minimum-Charge-Monitor allows the contractor to easily fine tune the refrigerant charge and prevents overcharging. With the Minimum-Charge-Monitor and floating head pressure combination a Thermobank system will only use about 70 to 80% of the refrigerant required by a conventional flooded condenser system. Saving 20 to 30% on refrigerant cost can amount to substantial $$ savings.

FASTEST DEFROST - ADEQUATE HEAT

Thermobank has the fastest defrost, typically 5 to 10 minutes, of any outdoor packaged refrigeration system. In addition, 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. To prevent refrigerant migration to the compressor during the off-cycle, all units have a pumpdown cycle. During the defrost cycle the BANK is protection against floodback. 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.

NEW IMPROVED BANK DESIGN

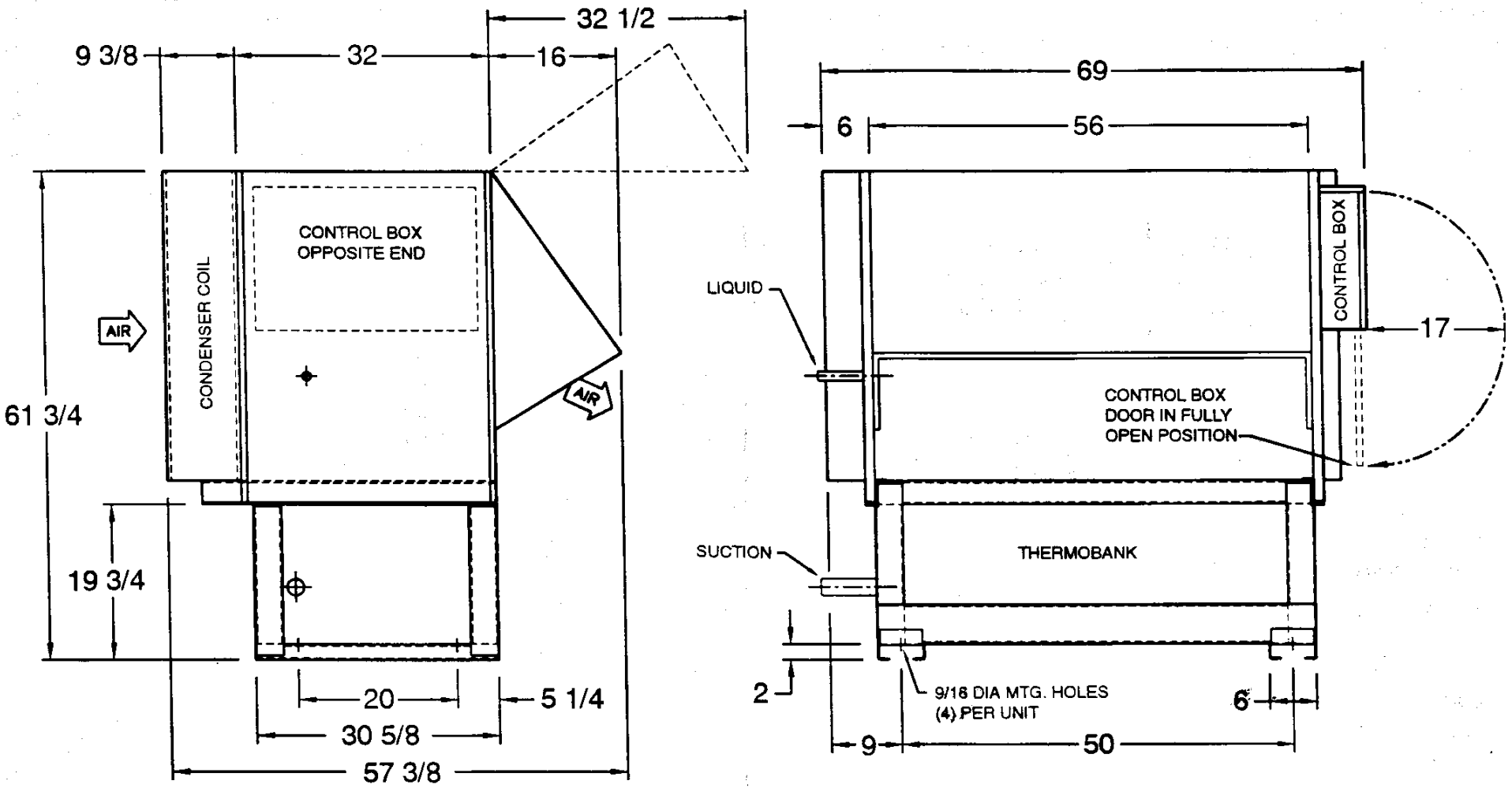
The BANK has a totally new welded hermetic design to insure a long, leak free life. The heavy gauge steel shell has a bulls-eye water level gauge. Checking the water level is quick and easy. The shell is insulated with closed cell foam to maintain proper water temperature at any ambient condition and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

EXTRA LARGE CONDENSERS

Ratings for ambient temperatures to 105°F are given for all Thermobank systems. Many competitive systems are limited to 100°F ambient. Special systems are available for ambient design temperatures above 110°F. All condensers have a maximum fin spacing of 10 FPI to help prevent coil fouling and increase the time between coil cleanings. The generous coil surface keeps head pressures lower, saves energy, and extends the life of the equipment. An integral sub-cooling 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 ambients. A pressure control on the header end fan assures sufficient head pressure is available for a good cold ambient re-start.

LOW TEMPERATURE HOT GAS DEFROST

MODEL CTT DIMENSIONS SIZE 0400-1200



THERMOBANK

0°F TO -40°F
SUCTION TEMPERATURE

PHYSICAL DATA - R-404A & R-507

MODEL	COMPRESSOR		COND FANS			CONNECTIONS		CHARGE LBS.		APPROX.
CTT	QTY	MODEL NO.	QTY	DIA	HP	SUC OD	LIQ OD	UNIT[2]	RECV[1]	NET LBS.
0400L44	1	2DF-030E	2	24	1/2	1 1/8	1/2	8	30	700
0500L44	1	2DA-060E	2	24	1/2	1 3/8	1/2	8	30	880
0600L44	1	3DA-060E	2	24	1/2	1 3/8	1/2	10	30	950
0800L44	1	3DB-075E	2	24	1/2	1 5/8	5/8	10	30	1100
0900L44	1	3DF-090E	2	24	1/2	1 5/8	5/8	19	64	1120
1000L44	1	3DS-100E	2	24	1/2	1 5/8	5/8	19	64	1150
1200L44	1	4DA-101E	2	24	1/2	1 5/8	5/8	20	64	1230
1500L44	1	4DL-150E	3	24	1/2	1 5/8	7/8	21	71	1500
2200L44	1	4DT-220E	3	24	1/2	2 1/8	7/8	24	71	1870
2700L44	1	6DL-270E	3	24	3/4	2 1/8	7/8	27	71	2240
3100L44	1	6DT-300E	3	24	3/4	2 1/8	7/8	31	103	2890
4400L44	2a	4DT-220E	4	30	3/4	2 1/8	1 1/8	44	103	4030
5400L44	2a	6DL-270E	5	30	3/4	2 5/8	1 1/8	49	103	4580
6200L44	2a	6DT-300E	5	30	3/4	2 5/8	1 1/8	57	103	5930

[a] 2 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.

ELECTRICAL DATA - R-404A & R-507

	230 - 3 - 60					460-3-60				
MODEL	COMPRESSOR		COND	UNIT		COMPRESSOR		COND	UNIT	
CTT	RLA	LRA	FLA	AMPS	MCA[3]	RLA	LRA	FLA	AMPS	MCA[3]
0400L44	16.8	102	8.0	25.8	30	8.1	52	4.0	12.6	15
0500L44	28.8	161	8.0	37.8	45	10.2	60	4.0	14.7	18
0600L44	30.3	150	8.0	39.3	47	13.7	77	4.0	18.2	22
0800L44	31.5	161	8.0	40.5	49	16.1	83	4.0	20.6	25
0900L44	39.0	215	8.0	48.0	58	16.9	106	4.0	21.4	26
1000L44	42.0	215	8.0	51.0	62	18.6	106	4.0	23.1	28
1200L44	45.2	220	8.0	54.2	66	22.6	110	4.0	27.6	34
1500L44	52.6	278	5.4	59.0	73	26.3	139	2.7	29.5	37
2200L44	66.0	374	5.4	72.4	89	33.0	187	2.7	36.2	45
2700L44	80.8	450	10.2	92.0	113	40.4	225	5.1	46.0	57
3100L44	95.6	470	10.2	106.8	131	47.8	235	5.1	53.4	66
4400L44	(2) 66.0	(2) 374	13.6	146.6	164	(2) 33.0	(2) 187	6.8	73.3	83
5400L44	(2) 80.8	(2) 450	17.0	179.6	200	(2) 40.4	(2) 225	8.5	89.8	101
6200L44	(2) 95.6	(2) 470	17.0	209.2	234	(2) 47.8	(2) 235	8.5	104.6	118

[3] MCA does not include evaporator motors.

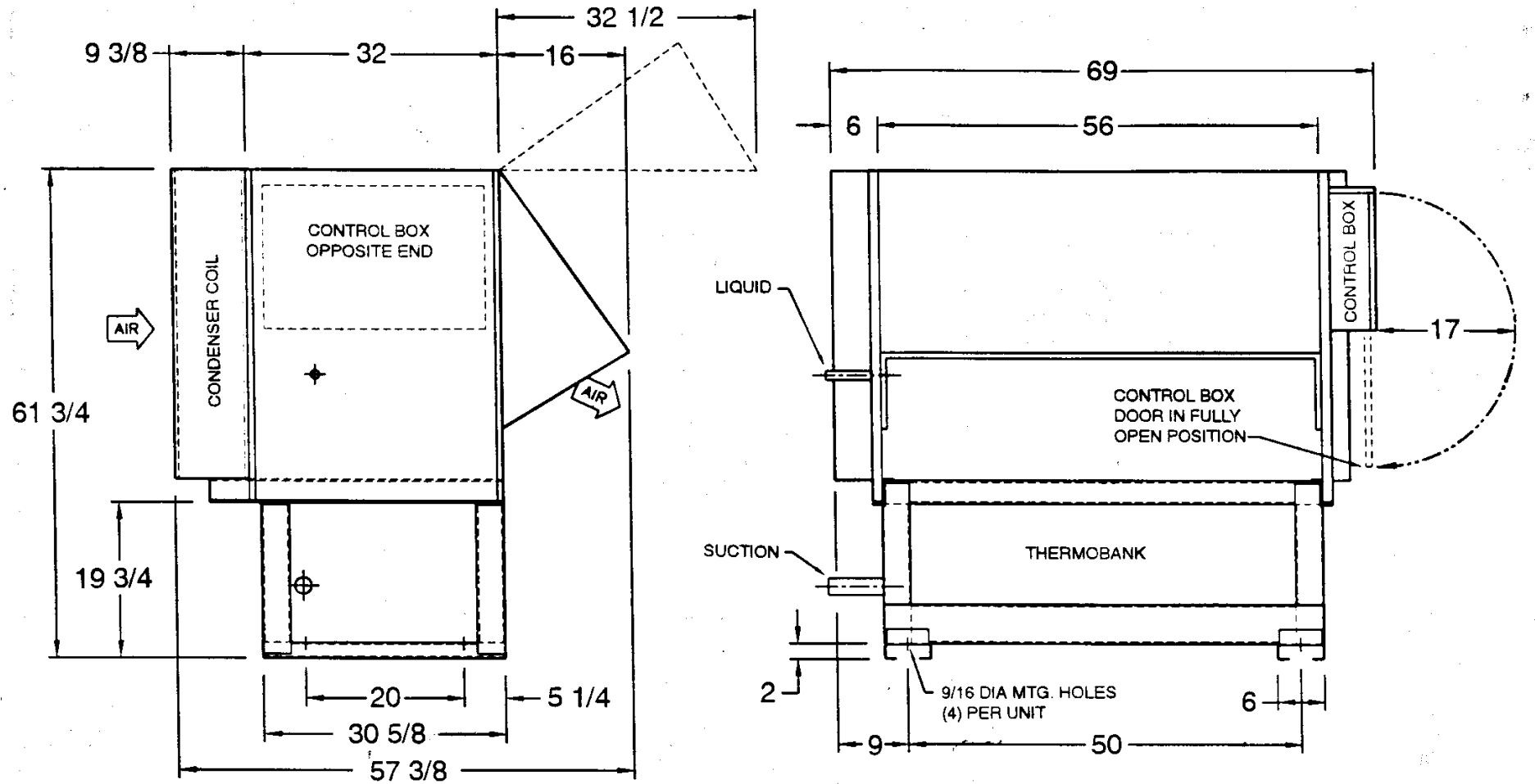
CAPACITY- BTUH @ 95°F AMBIENT

MODEL CTT	SUCTION TEMPERATURE							
	0°F	-5°F	-10°F	-15°F	-20°F	-25°F	-30°F	-40°F
0400L44	32700	29100	25700	22600	19700	17100	14700	10400
0500L44	42800	38400	34300	30400	26900	23600	20500	14900
0600L44	52500	47100	42000	37200	32800	28700	24900	18500
0800L44	60800	54600	48800	43400	38400	33700	29400	21600
0900L44	78100	69900	62300	55300	48700	42600	37100	27400
1000L44	82900	74700	67000	59700	52800	46400	40400	29800
1200L44	96100	86000	76800	68400	60700	53400	46500	33200
1500L44	113700	102400	92200	82700	73900	65700	57800	42400
2200L44	132000	119800	109200	98100	87500	77300	67600	49100
2700L44	169800	153700	138100	123100	108700	95200	82600	60400
3100L44	187300	169600	153900	136300	121700	106400	92700	69350
4400L44	267000	242100	218600	196300	175100	154800	135300	98300
5400L44	340500	307900	279100	248500	219400	192000	166400	121700
6200L44	373300	338000	306700	271650	242600	212100	184750	138200

AMBIENT CORR. FACTOR	
AMB.	404A
80°F	1.15
85°F	1.10
90°F	1.05
95°F	1.00
100°F	0.95
105°F	0.90

MEDIUM TEMPERATURE HOT GAS DEFROST

MODEL CTT DIMENSIONS SIZE 0500-1200



THERMOBANK +10°F TO+25°F

SUCTION TEMPERATURE

PHYSICAL DATA - R-22, R-404A & R-507

MODEL CTT	COMPRESSOR		COND FANS			CONNECTIONS				CHARGE LBS.				APPX NET LBS.
						R-22		R-404A & R-507		R-22		R-404A & R-S07		
	QTY	MODEL NO.	QTY	DIA	HP	SUC OD	LIQ OD	SUC OD	LIQ OD	UNIT[2]	RECV[1]	UNIT[2]	RECV[1]	
0500M**	1	2DD-050*	2	24	1/2	1 3/8	1/2	1 1/8	1/2	7	35	8	30	820
0700M**	1	2DA-075*	2	24	1/2	1 3/8	5/8	1 3/8	5/8	9	35	10	30	980
0800M**	1	3DA-075*	2	24	1/2	1 3/8	5/8	1 3/8	5/8	15	74	14	64	1030
1000M**	1	3DB-100*	2	24	1/2	1 3/8	5/8	1 3/8	5/8	19	74	17	64	1150
1200M**	1	3DF-120*	2	24	1/2	1 3/8	7/8	1 3/8	5/8	21	74	19	64	1225
1500M**	1	3DS-150*	3	24	1/2	1 5/8	7/8	1 3/8	5/8	25	103	23	88	1450
2000M**	1	4DA-200*	3	24	1/2	1 5/8	7/8	1 5/8	7/8	29	103	26	88	1850
2500M**	1	4DH-250*	3	24	3/4	2 1/8	7/8	2 1/8	7/8	32	103	29	88	2190
3000M**	1	4DJ-300*	3	30	3/4	2 1/8	7/8	2 1/8	7/8	46	120	33	103	3030
3500M**	1	6DH-350*	4	30	3/4	2 1/8	1 1/8	2 1/8	1 1/8	49	120	42	103	4130
4000M**	1	6DJ-400*	4	30	3/4	2 1/8	1 3/8	2 1/8	1 1/8	60	120	53	103	3630
5000M**	2[a]	4DH-250*	5	30	3/4	2 5/8	1 3/8	2 5/8	1 1/8	65	120	57	103	4130
6000M**	2[a]	4DJ-300*	5	30	3/4	2 5/8	1 5/8	2 5/8	1 1/8	74	120	65	103	4480
7000M**	2[a]	6DH-350*	5	30	3/4	2 5/8	1 5/8	2 5/8	1 1/8	89	182	78	157	6130

* 0=Mineral Oil, R-22. E=POE Synthetic Lubricant. **22 = R-22, 44 = R-404A or R-507.
[a] 2 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.

ELECTRICAL DATA - R-22, R-404A & R-507

MODEL CTT	230 - 3 - 60					460 - 3 - 60				
	COMPRESSOR		COND	UNIT		COMPRESSOR		COND	UNIT	
	RLA	LRA	FLA	AMPS	MCA[3]	RLA	LRA	FLA	AMPS	MCA[3]
0500M**	22.3	120	8.0	31.3	37	10.5	60	4.0	15.0	18
0700M**	32.0	169	8.0	41.0	49	14.1	85	4.0	18.7	23
0800M**	41.0	215	8.0	50.0	61	20.0	106	4.0	24.5	30
1000M**	43.6	215	8.0	52.6	64	20.0	106	4.0	24.5	30
1200M**	48.2	275	8.0	57.2	70	23.6	138	4.0	28.1	34
1500M**	59.6	275	5.4	66.0	81	29.0	138	2.7	32.2	40
2000M**	66.6	308	5.4	73.0	90	33.0	154	2.7	36.2	45
2500M**	82.2	428	10.2	93.4	114	41.1	214	5.1	46.7	57
3000M**	94.0	470	10.2	105.2	129	47.0	235	5.1	52.6	65
3500M**	107.0	565	13.6	121.6	149	53.5	283	6.8	60.8	75
4000M**	142.0	594	13.6	156.6	193	71.0	297	6.8	78.3	97
5000M**	(2) 82.2	(2) 428	17.0	182.4	203	(2) 41.1	(2) 214	8.5	91.8	103
6000M**	(2) 94.0	(2) 470	17.0	206.0	230	(2) 47.0	(2) 235	8.5	103.5	115
7000M**	(2) 107.0	(2) 565	17.0	232.0	259	(2) 53.5	(2) 283	8.5	116.5	130

**22 = R-22, 44 = R-404A or R-507. 3 MCA does not include evaporator motors

CAPACITY- BTUH @ 95°F AMBIENT

MODEL CTT	R-22 SUCTION TEMPERATURE				R-404A & R-507 SUCTION TEMPERATURE			
	+25°F	+20°F	+15°F	+10°F	+25°F	+20°F	+15°F	+10°F
0500M**	52100	46600	41300	36500	52800	47700	42900	38400
0700M**	72300	65000	57900	51200	74600	67900	61600	55700
0800M**	89300	80500	72300	64600	91000	82800	75100	67700
1000M**	105200	95200	85900	77300	107800	98300	89300	80700
1200M**	116000	105200	95000	85500	125300	114700	104600	95000
1SOOM**	136600	123000	111300	100200	144300	130700	119100	108000
2000M**	152500	137600	125900	112500	157900	143500	132200	118900
2500M**	192100	172200	154900	128200	201000	183200	167700	151200
3000M**	216700	196200	177000	159200	228100	207700	188400	170100
3500M**	278800	252200	227700	205200	298900	272000	246700	222900
4000M**	319800	290800	263800	238900	339400	310000	282000	255400
5000M**	374100	338800	306100	275800	384800	350400	317300	285900
6000M**	433600	392600	353900	317200	455400	414900	376300	339800
7000M**	555000	502700	454400	410200	584100	533700	485700	440300

"22 = R-22, 44 = R-404A or R-507

AMBIENT CORR. FACTOR		
AMB.	404A	22
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

THERMOBANK SYSTEMS WITH 4 FPI EVAPORATORS

LOW TEMPERATURE THERMOBANK SYSTEMS WITH 4 FPI EVAPORATORS

MODEL	MBH @ -	EVAP FOR -10°F ROOM			MBH @	EVAP FOR -20°F ROOM			MBH @	FOR -30°F ROOM
		LPG-T	MSG-T	TV		LPG-T	MSG-T	TV		TV
0400L44	19.7	182,214	175		14.7	182	175		10.	
0500L44	26.9	214	230		20.5	214	175, 230		4	
0600L44	32.8	(2) 182	325		24.9	(2) 142	230		18.	
0800L44	38.4	(2) 214	390	400	29.4	(2) 182	325		5	
0900L44	48.7		510	550	37.1	(2) 214	390, (2) 175	400	27.	400
1000L44	52.8		510	550	40.4		390	400	4	400
1200L44	60.7		(2) 325	550	46.5		510, (2) 230	550	29.	400
1500L44	73.9		(2) 390	750	57.8		510, (2) 390	550 750, (2)	42.	550
2200L44	87.5		(2) 510	950, (2) 550	67.6		(2) 390	400	4	550
2700L44	108.7		(2) 510	1100, (2) 550	82.6		(2) 510	950, (2) 550	60.	750, (2) 400
3100L44	121.7			1200,1400	92.7		(2) 510	1100, (2) 550	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 TEMPERATURE THERMOBANK SYSTEMS WITH 4 FPI EVAPORATORS

MODEL	MBH @ +10° SST		EVAP FOR +20°F ROOM			MBH @ +20° SST		EVAPORATOR FOR +30°F ROOM		
CTT	M22	M44	LPG-T	MSG-T	TV	M22	M44	LPG-T	MSG-T	TV
0500M	36.5	38.4	(2) 182, (2) 214	390	400	46.6	47.7	(2) 214	390, 510	400
0700M	51.2	55.7	(2) 214	510	400, 550	65.0	67.9		510, (2) 325	550
0800M	64.6	67.7		510, (2) 325	550	80.5	82.8		(2) 390	750, (2) 400
1000M	77.3	80.7		(2) 390	750, (2) 400	95.2	98.3		(2) 390	950, (2) 400
1200M	85.5	95.0		(2) 390	950, (2) 400	105.2	114.7		(2) 510	1100, (2) 550
1SOOM	100.2	108.0		(2) 510	1100, (2) 550	123.0	130.7			1200, (2) 550
2000M	112.5	118.9		(2) 510	1100, (2) 550	137.6	143.5			1400, (2) 750
2500M	128.2	151.2			1400, (2) 750	172.2	183.2			1600, (2) 750
3000M	159.2	170.1			1600, (2) 750	196.2	207.7			1900, (2) 950
3500M	205.2	222.9			1900, (2) 950	252.2	272.0			(2) 1200
4000M	238.9	255.4			(2) 1100	290.8	310.0			(2) 1400
5000M	275.8	285.9			(2) 1400	338.8	350.4			(2) 1600
6000M	317.2	339.8			(2) 1600	392.6	414.9			(2) 1900
7000M	410.2	440.3			(2) 1900	502.7	533.7			(2) 1900

MEDIUM TEMP THERMOBANK SYSTEMS

MODEL	MBH @ +25°F SST		EVAPORATOR FOR +35°F ROOM	
CTT	M22	M44	MSA (4 FPI)	CM (4 FPI)
0500M	52.1	52.8	465, 585	450
0700M			585, (2) 340	620
0800M			(2) 465	850, (2) 450
1000M	77.3	80.7	(2) 585	1100, (2) 450
1200M	85.5	95.0	(2) 585	1250, (2) 620
1500M	100.2	108.0		1350, 1600, (2) 850
2000M	112.5	118.9		1600, (2) 850
2500M	128.2	151.2		1800, 2100, (2) 1100
3000M	159.2	170.1		21,00, (2) 1100
3500M	205.2	222.9		(2) 1600
4000M	238.9	255.4		(2) 1600
5000M	275.8	285.9		(2) 1800
6000M	317.2	339.8		(2) 2100
7000M	555.0	584.1		(3) 1800

System selections are based on 95°F ambient and approximately 9 to 11° TD. Other balanced systems are available and can be customized for your specific application.

THERMOBANK SYSTEMS WITH 6 FPI EVAPORATORS

LOW TEMPERATURE THERMOBANK SYSTEMS WITH 6 FPI EVAPORATORS

MODEL CTT		EVAP FOR -10°F ROOM				EVAP FOR -20°F ROOM		
	-20° SST	LPG-T	CSG-T	CTV	-30°SST	LPG-T	CSG-T	CTV
0400L44	19.7	220	185		14.7	184	185	
0500L44	26.9	240, 265	270		20.5	220, 240	270	
0600L44	32.8	(2) 184	320		24.9	265	270	
0800L44	38.4	(2) 210	385	450	29.4	(2) 184	320	
0900L44	48.7	(2) 240	460	620	37.1	(2) 220	385	
1000L44	52.8	(2) 265	520	620	40.4	(2) 240	460	450
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 TEMPERATURE THERMOBANK SYSTEMS WITH 6 FPI EVAPORATORS

MODEL	MBH @ +10°SST		EVAPORATOR FOR +20°F ROOM			MBH @ +20° SST		EVAPORATOR FOR 430°F ROOM		
CTT	M22	M44	LPG-T	CSG-T	CTV	M22	M44	LPG-T	CSG-T	CTV
0500M	36.5	38.4	(2) 184, (2) 220	385	450	46.6	47.7	(2) 240	460 520,	450
0700M	51.2	55.7	(2) 240, (2) 265	520	450, 620	65.0	67.9	(2) 265	(2) 320	620
800M	64.6	67.7	(2) 265	520, (2) 320	620 850	80.5	82.8		(2) 385	850
1000M	77.3	80.7		(2) 385	850, (2) 450	95.2	98.3		(2) 460	1070, (2) 450
1200M	85.5	95.0		(2) 460		105.2	114.7		(2) 520	1070
1500M	100.2	108.0		(2) 520	1070 1220,	123.0	130.7			1220, (2) 620
2000M	112.5	118.9		(2) 520	(2) 620	137.6	143.5			1360, 1580
2500M	128.2	151.2			1360,1580	172.2	183.2			1800, (2) 850
3000M	159.2	170.1			1580, (2) 850	196.2	207.7			2100, (2) 1070
3500M	205.2	222.9			2100, (2) 1070	252.2	272.0			(2) 1360
4000M	238.9	255.4			(2) 1220	290.8	310.0			(2) 1580
5000M	275.8	285.9			(2) 1360	338.8	350.4			(2) 1800
6000M	317.2	339.8			(2) 1580	392.6	414.9			(2) 2100
7000M	410.2	440.3			(2) 2100	502.7	533.7			(2) 2100

MEDIUM TEMP THERMOBANK SYSTEMS

MODEL	MBH @ +25°F SST		EVAPORATOR FOR +35°F ROOM |	
CTT	M22	M44	MSA (6 FPI)	CM (6 FPI)
0500M	52.1	52.8	490, 620	520
0700M	72.3	74.6	620, (2) 370	710
0800M	89.3	91.0	(2) 415	970
1000M	77.3	80.7	(2) 490	970, (2) 520
1200M	85.5	95.0	(2) 620	1220, (2) 520
1500M	100.2	108.0	(2) 620	1390, (2) 710
2000M	112.5	118.9		1550, (2) 710
2500M	128.2	151.2		1810, 2060, (2) 970
3000M	159.2	170.1		2060, 2400, (2) 1220
3500M	205.2	222.9		2400, (2) 1390
4000M	238.9	255.4		(2) 1550
5000M	275.8	285.9		(2) 1810 (2) 2060,
6000M	317.2	339.8		(2) 2400 (2) 2400
7000M	555.0	584.1		

System selections are based on 95°F ambient and approximately 9 to 11° TD. Other balanced systems are available and can be customized for your specific application.