

**BULLETIN
UI879A**

**FEBRUARY
1999**

KRAMER UNICON

**MODEL DD - KCC - KEC
AIR COOLED CONDENSERS**

INSTALLATION AND SERVICE MANUAL

KRAMER 3075 N. Lanier Parkway Decatur, Georgia 30034
Tel: (404) 244-8004 Fax: (404) 244-1846

GENERAL SAFETY INFORMATION

- Installation and maintenance are to be performed only by qualified and experienced commercial refrigeration technicians who are familiar with this type of equipment.
- Avoid contact with coil surfaces and the inherent sharp edges found in sheet metal products of this type. They are a potential injury hazard. Wear gloves.
- All field wiring must conform to the requirements of the equipment and national and local codes.
- Make sure all power sources are disconnected and locked off before any service work is done on a unit.

RECEIVING INSPECTION

Check all items against the bill of lading to make sure all crates and cartons have been received. If there is any damage or shortage, report it immediately to the carrier and file a claim. Check the voltage on the unit nameplate to make sure it agrees with the power supply available.

RIGGING AND HANDLING

All units are shipped on a wood skid that should be left attached until the unit is close to its final location. If handling with a lift truck, lift against the skid. Do not lift against sheet metal panels.

All units have built in lifting lugs. It may be necessary to use spreader bars to prevent damage to the fan section. Never use the coil headers or return bends for lifting or moving the condenser. Use the lifting brackets. Experienced crane operators and rigging personnel should be employed to prevent damage and avoid accidents.

UNIT LOCATION

The UNICON is an outdoor unit and must be installed where the inlet coil face can receive an unrestricted supply of clean, fresh air. The air discharge must also be free of restrictions.

Ductwork should not be used. Do not locate any unit to be bordered by tall walls or structures on three or more sides. Short circuiting of the air flow or the intake of warm air from another unit will seriously reduce the performance of the air cooled condenser. Do not locate close to plumbing vents or other types of exhaust. The open space under the UNICON provided by the legs should not be reduced. See Figure 2 for minimum clearance from obstructions and between units.

Structural supports and roofs or platforms must be strong enough to support the condensers operating weight. Consult with a professional structural engineer to determine safe platform loading. Units can be mounted on concrete pads. Pads should be of sufficient thickness and design to prevent cracking and settling. All units should be mounted level and the legs secured to the mounting surface through holes provided in the leg foot flange.

Noise should also be considered when locating an air cooled condenser. Proximity to windows, walls, and surrounding structures can cause objections by the occupants.

LEG INSTALLATION

See Figure 1 for leg installation procedures. Leg installation instructions are also on each condenser. Model DD310 through 1550, KCC295 through 2095, and KEC254 through 1844 use 3/8 inch bolts, washers, and locknuts. A 9/16 inch socket and open end wrench can be used to secure these fasteners.

Model KCC2115 through 2685, and KEC1854 through 2354 use 1/2 inch bolts and locknuts. 3/4 inch sockets or wrenches can be used with these fasteners.

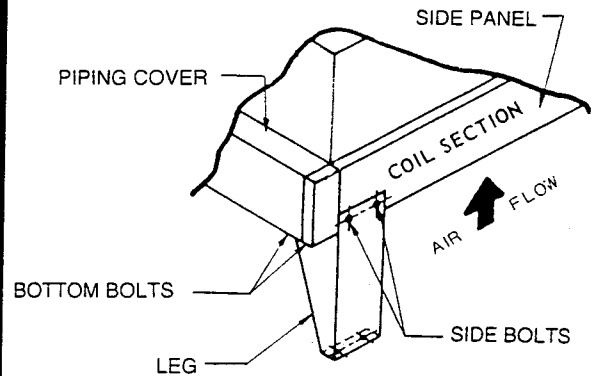
Figure 1

LEG ATTACHMENT PROCEDURE

IMPORTANT: THE TIGHTENING SEQUENCE OF THE LEG BOLTS IS EXTREMELY IMPORTANT. FAILURE TO DO SO WILL DAMAGE THE CONDENSER.

- 1) REMOVE THE 2 SIDE BOLTS, WASHERS AND NUTS FROM THE SIDE OF THE UNIT. THEN REMOVE THE 2 BOTTOM BOLTS FROM THE FLANGE OF THE LEG.
- 2) POSITION THE LEG UNDER THE UNIT AND INSERT THE 2 BOTTOM BOLTS SO THAT THEY ARE LOOSE. **IT IS VERY IMPORTANT THAT THESE 2 BOLTS ARE NOT TIGHTENED AT THIS TIME.**
- 3) INSTALL THE SIDE BOLTS WITH THE NUTS AND WASHERS AND TIGHTEN SECURELY, DRAWING THE LEG TIGHTLY AGAINST THE SIDE PANEL.
- 4) COMPLETE THE LEG INSTALLATION BY NOW TIGHTENING THE BOTTOM BOLTS.
- 5) REPEAT STEP 1 UNTIL ALL OF THE LEGS ARE INSTALLED.
- 6) THE UNIT IS READY TO BE LIFTED INTO POSITION.

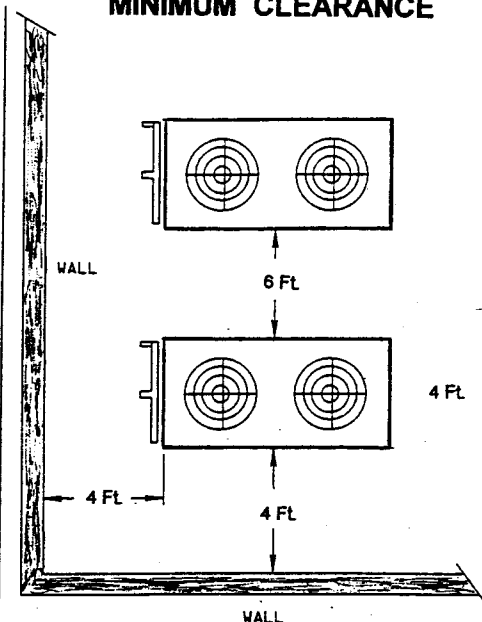
DD310-1550 KCC295-2095 KEC254-1844



USE 9/16" SOCKET & WRENCH

Figure 2

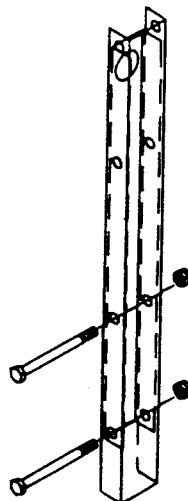
MINIMUM CLEARANCE



WHEN THE UNIT IS RIGGED AND IS IN THE AIR, DROP THE MOUNTING LEGS INTO POSITION. REMOVE (2) 1/2" BOLTS AND LOCKNUTS SHOWN IN POSITION "A", LOWER LEG TO POSITION "B" AND REINSTALL BOLTS AND LOCKNUTS AS SHOWN.

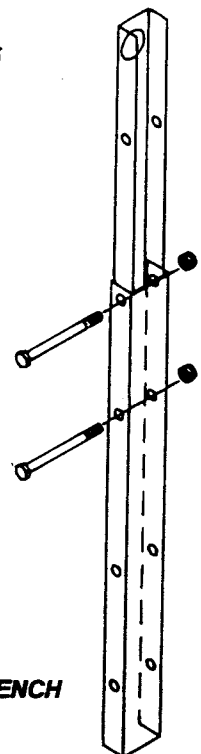
KCC2115-2685

KEC1854-2354



USE 3/4" SOCKET & WRENCH

**POSITION "A"
FOR SHIPPING**



**POSITION "B"
FOR INSTALLATION**

REFRIGERANT PIPING

All piping must be done to conform with good refrigeration piping practice. Use only clean and dry refrigeration grade copper tube. Flow dry nitrogen through lines while brazing to prevent internal oxidation. Use high temperature silver alloy brazing rod. Do not leave piping or components open to the atmosphere. Pitch horizontal lines 1/4 inch per foot in the direction of flow to insure oil return. All refrigerant piping must be supported so that line weight, line vibration, and expansion and contraction forces are not imposed on any component connection. Support condenser piping as close to the condenser as possible. Supports with a cushioned clamp are recommended.

SUGGESTED LINE SIZES - O.D.

RANGE IN TONS	NET EVAP CAPACITY BTUH	TOTAL EQUIV LNGTH	R-22			R-404A, R-507			R-134a		
			DISCH LINE	LIQUID TO RECV	LIQUID TO TXV	DISCH LINE	LIQUID TO RECV	LIQUID TO TXV	DISCH LINE	LIQUID TO RECV	LIQUID TO TXV
0.7	12,000	50	1/2	3/8	3/8	1/2	3/8	3/8	5/8	1/2	1/2
1.0		100	5/8	3/8	3/8	5/8	3/8	3/8	7/8	1/2	1/2
1.0	18,000	50	1/2	3/8	3/8	5/8	1/2	1/2	7/8	1/2	1/2
1.5		100	5/8	3/8	3/8	5/8	1/2	1/2	7/8	1/2	1/2
1.5	24,000	50	5/8	1/2	3/8	5/8	5/8	1/2	7/8	5/8	1/2
2.0		100	5/8	1/2	1/2	7/8	5/8	1/2	7/8	5/8	1/2
2.0	36,000	50	7/8	5/8	1/2	7/8	5/8	1/2	7/8	5/8	1/2
3.0		100	7/8	5/8	1/2	7/8	5/8	1/2	1 1/8	5/8	5/8
2.8	48,000	50	7/8	5/8	1/2	7/8	7/8	1/2	1 1/8	7/8	5/8
4.0		100	7/8	5/8	5/8	7/8	7/8	5/8	1 1/8	7/8	5/8
3.5	60,000	50	7/8	7/8	1/2	7/8	7/8	5/8	1 1/8	7/8	5/8
5.0		100	7/8	7/8	5/8	1 1/8	7/8	5/8	1 1/8	7/8	7/8
4.2	72,000	50	7/8	7/8	5/8	7/8	7/8	5/8	1 1/8	7/8	7/8
6.0		100	1 1/8	7/8	5/8	1 1/8	7/8	7/8	1 3/8	7/8	7/8
5.3	90,000	50	7/8	7/8	5/8	1 1/8	1 1/8	5/8	1 3/8	7/8	7/8
7.5		100	1 1/8	7/8	7/8	1 1/8	1 1/8	7/8	1 3/8	7/8	7/8
7.0	120,000	50	1 1/8	1 1/8	5/8	1 1/8	1 3/8	7/8	1 3/8	1 1/8	7/8
10.0		100	1 1/8	1 1/8	7/8	1 3/8	1 3/8	7/8	1 5/8	1 1/8	7/8
9.5	180,000	50	1 3/8	1 3/8	7/8	1 3/8	1 3/8	7/8	1 5/8	1 3/8	7/8
15.0		100	1 3/8	1 3/8	7/8	1 5/8	1 3/8	1 1/8	1 5/8	1 3/8	1 1/8
14.0	240,000	50	1 5/8	1 3/8	7/8	1 3/8	1 5/8	7/8	1 5/8	1 5/8	1 1/8
20.0		100	1 5/8	1 3/8	1 1/8	1 5/8	1 5/8	1 1/8	2 1/8	1 5/8	1 1/8
17.7	300,000	50	1 5/8	1 5/8	7/8	1 5/8	1 5/8	1 1/8	2 1/8	1 5/8	1 1/8
25.0		100	1 5/8	1 5/8	1 1/8	1 5/8	1 5/8	1 1/8	2 1/8	1 5/8	1 1/8
21.0	360,000	50	1 5/8	1 5/8	1 1/8	1 5/8	2 1/8	1 1/8	2 1/8	1 5/8	1 1/8
30.0		100	2 1/8	1 5/8	1 1/8	2 1/8	2 1/8	1 1/8	2 5/8	1 5/8	1 3/8
28.0	480,000	50	2 1/8	2 1/8	1 1/8	2 1/8	2 1/8	1 1/8	2 1/8	2 1/8	1 1/8
40.0		100	2 1/8	2 1/8	1 3/8	2 1/8	2 1/8	1 3/8	2 5/8	2 1/8	1 3/8
35.0	600,000	50	2 1/8	2 1/8	1 1/8	2 1/8	2 5/8	1 3/8	2 5/8	2 1/8	1 3/8
50.0		100	2 1/8	2 1/8	1 3/8	2 5/8	2 5/8	1 3/8	3 1/8	2 1/8	1 5/8
42.0	720,000	50	2 5/8	2 5/8	1 3/8	2 1/8	3 1/8	1 3/8	2 5/8	2 5/8	1 5/8
60.0		100	2 5/8	2 5/8	1 3/8	2 5/8	3 1/8	1 5/8	3 1/8	2 5/8	1 5/8
50.0	840,000	50	2 5/8	2 5/8	1 3/8	2 1/8	3 1/8	1 3/8	2 5/8	2 5/8	1 5/8
70.0		100	2 5/8	2 5/8	1 5/8	2 5/8	3 1/8	1 5/8	3 1/8	2 5/8	2 1/8
57.0	960,000	50	2 5/8	3 1/8	1 3/8	2 1/8	3 1/8	1 5/8	2 5/8	3 1/8	1 5/8
80.0		100	2 5/8	3 1/8	1 5/8	2 5/8	3 1/8	1 5/8	3 1/8	3 1/8	2 1/8
64.0	1,080,000	50	2 5/8	3 1/8	1 3/8	2 5/8	3 5/8	1 5/8	2 5/8	3 1/8	1 5/8
90.0		100	2 5/8	3 1/8	1 5/8	3 1/8	3 5/8	2 1/8	3 1/8	3 1/8	2 1/8
70.0	1,200,000	50	2 5/8	3 1/8	1 5/8	2 5/8	3 5/8	1 5/8	3 1/8	3 5/8	2 1/8
100.0		100	3 1/8	3 1/8	1 5/8	3 1/8	3 5/8	2 1/8	3 5/8	3 5/8	2 1/8
84.0	1,440,000	50	2 5/8	3 5/8	1 5/8	2 5/8	3 5/8	1 5/8	3 1/8	3 5/8	2 1/8
120.0		100	3 1/8	3 5/8	2 1/8	3 1/8	3 5/8	2 1/8	3 5/8	3 5/8	2 1/8
100.0	1,680,000	50	2 5/8	3 5/8	1 5/8	3 1/8	3 5/8	2 1/8	3 1/8	3 5/8	2 1/8
140.0		100	3 1/8	3 5/8	2 1/8	3 5/8	4 1/8	2 1/8	4 1/8	4 1/8	2 5/8
107.0	1,820,000	50	3 1/8	3 5/8	2 1/8	3 1/8	3 5/8	2 1/8	3 5/8	3 5/8	2 1/8
150.0		100	3 5/8	3 5/8	2 1/8	3 5/8	4 1/8	2 1/8	4 1/8	4 1/8	2 5/8

WIRING UNICON CONDENSERS

Where single phase fan motors are used on DD Unicons, they are prewired to provide the closest possible balance on three phase networks. The motors may be rewired for single phase network by following the instructions on the sticker in the junction box. All single phase motors used on Unicons are inherently protected and a contactor may be used to control them singly or in groups.

Where three phase motors are employed on Unicons, they have inherent protection and may be controlled by contactors, individually or in groups. Three phase motors can run in either direction. Check that the direction of rotation is in accord with the arrow on the fan. If discharge is wrong, correct by reversing 2 of the motor leads in the junction box. Most three phase motors are dual voltage and can be quickly converted in the field by repositioning the Voltage Change Device (VCD) located on the motor.

Always make sure that the voltage applied to the unit matches the voltage rating of the unit as indicated on the unit's nameplate.

All electrical wiring should be in compliance with the National Electrical Code and all local codes and regulations.

A typical 3 phase wiring diagram is shown below. Always refer to the wiring diagram in the unit junction box. Many condensers are custom wired to the customers specifications.

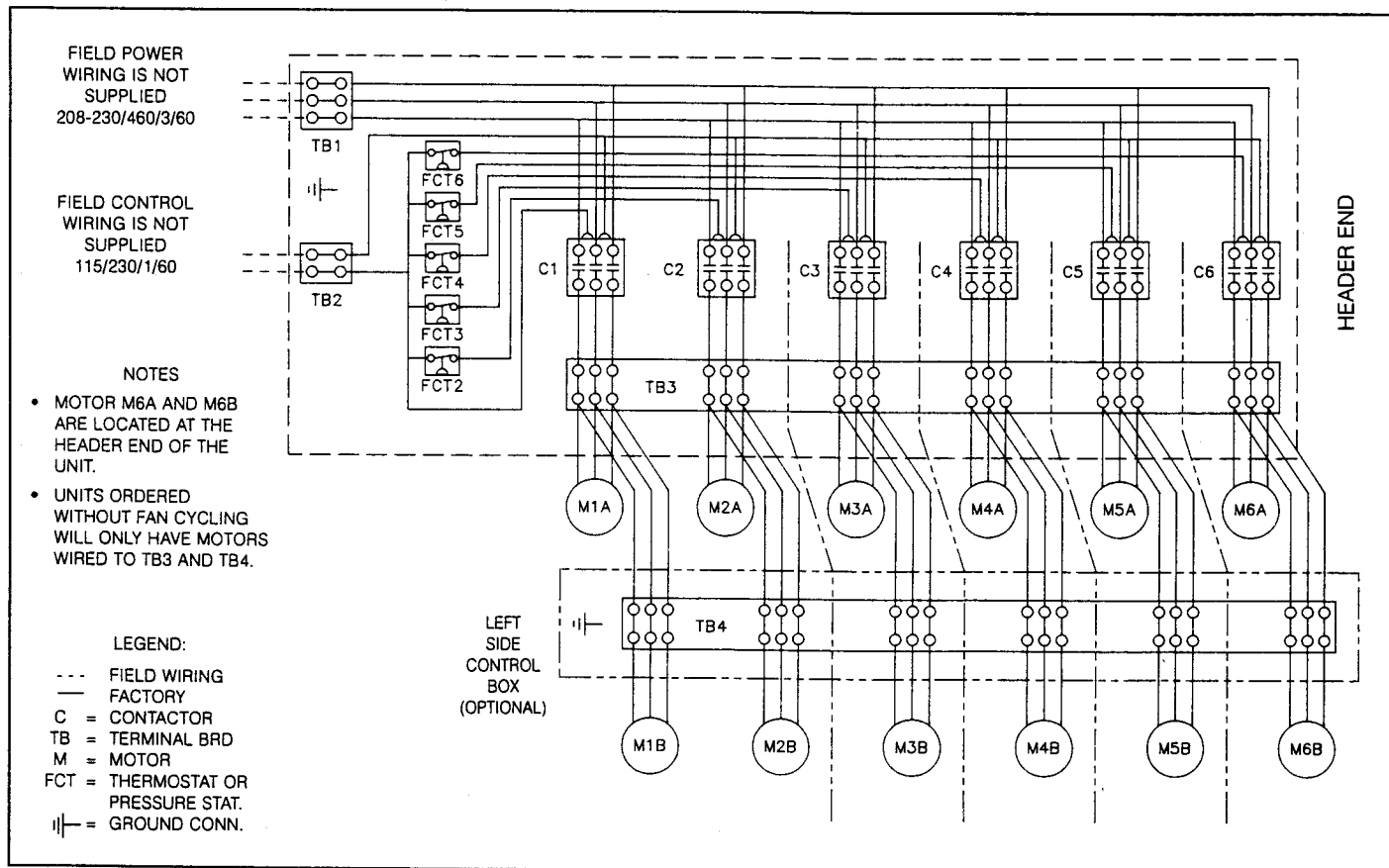


Table 1

REFRIGERANT CHARGE

DD MODEL NO.	TOTAL CIRCUITS AVAILABLE	TOTAL * POUNDS R-22	POUNDS PER CIRCUIT
30	1	2.6	2.6
40	1	3.7	3.7
60	12	5.8	0.5
100	18	8.3	0.5
130	25	11.0	0.4
190	18	13.5	0.8
230	25	18.0	0.7
260	20	22.6	1.1
310	13	16.8	1.3
360	18	22.5	1.3
410	15	28.1	1.9
530	27	34.6	1.3
590	37	46.3	1.3
660	30	57.6	1.9
790	37	69.2	1.9
910	42	52.5	1.3
1010	56	70.0	1.3
1150	46	87.4	1.9
1360	46	108.0	2.3
1550	56	130.0	2.3

KCC MODEL NO.	KEC MODEL NO.	TOTAL CIRCUITS AVAILABLE	TOTAL * POUNDS R-22	POUNDS PER CIRCUIT
295	254	27	16.5	0.6
335	294	37	22.0	0.6
375	334	30	27.5	0.9
425	374	37	33.0	0.9
495	434	37	33.0	0.9
525	464	37	33.0	0.9
635	564	37	49.5	1.3
665	584	37	44.0	1.2
755	664	37	55.0	1.5
765	674	46	41.6	0.9
835	734	56	50.0	0.9
845	744	37	66.0	1.8
995	874	30	68.8	2.3
1005	884	56	50.0	0.9
1085	954	46	62.5	1.4
1255	1104	56	75.0	1.3
1335	1164	56	66.3	1.2
1455	1274	46	83.3	1.8
1535	1344	46	83.3	1.8
1675	1474	56	100.0	1.8
1815	1564	46	104.0	2.3
2095	1844	56	125.0	2.2
2115	1854	50	126.0	2.5
2235	1954	50	126.0	2.5
2285	2004	50	120.0	2.4
2535	2224	50	150.0	3.0
2685	2354	50	150.0	3.0

* Total refrigerant charge required for a condenser with or without fan cycling controls. (Summer charge)
See page 7 for flooded condenser (Winter) operating charge factor.

Total pounds R-22 charge \times 0.90 = pounds R-404A or R-507 charge.

Total pounds R-22 charge \times 1.00 = pounds R-134a charge.

Charging of a system should be carried out using visual reference to the refrigerant sight glass. Charging should be stopped when the sight glass becomes clear. Care must be taken when charging a system with a blended or near azeotropic refrigerant. Liquid charging may be mandatory. If you are unfamiliar with the proper charging procedures, contact your refrigerant supplier for guidance.

The summer design refrigerant charge necessary for effective system operation is the sum of operating charge for the evaporator, refrigerant piping (suction, liquid, and discharge lines), condenser, and receiver. The pumpdown capacity of the receiver should be somewhat greater (10 to 15%) than the total refrigerant charge required. When using a low ambient control system, additional refrigerant, over and above the summer design system charge, must be added to the system to allow for condenser flooding. The amount of this added charge to flood is determined by the ambient in which the condenser will operate. Table 2 shows the factor to apply to the above summer charge values. Multiply the charge above by the flooded head pressure correction factor (page 7) to determine the charge required for winter operation.

Table 2

**REFRIGERANT CHARGE CORRECTION FACTOR
WHEN USING FLOODED HEAD PRESSURE CONTROL**

UNIT LENGTH	DESIGN TD - °F	MINIMUM (WINTER) DESIGN AMBIENT TEMPERATURE - °F								
		60°F	50°F	40°F	30°F	20°F	10°F	0°F	-10°F	-20°F
ALL SIZES	WITHOUT FAN CYCLING									
	30	1.07	1.88	2.36	2.68	2.92	3.09	3.22	3.33	3.43
	25	1.61	2.28	2.68	2.95	3.15	3.29	3.40	3.49	3.56
	20	2.15	2.68	3.00	3.22	3.36	3.49	3.57	3.65	3.70
	15	2.68	3.09	3.33	3.49	3.59	3.70	3.75	3.81	3.85
	10	3.22	3.49	3.65	3.75	3.83	3.88	3.93	3.97	4.00
TWO FANS LONG	WITH FAN CYCLING									
	30	1.03	1.05	1.07	1.60	1.99	2.28	2.50	2.68	2.83
	25	1.05	1.07	1.60	2.06	2.37	2.60	2.80	2.95	3.09
	20	1.05	1.60	2.15	2.50	2.76	2.95	3.11	3.22	3.32
	15	1.60	2.28	2.68	2.95	3.15	3.29	3.41	3.49	3.62
	10	2.50	2.95	3.22	3.41	3.53	3.60	3.69	3.75	3.81
THREE FANS LONG	30	1.01	1.01	1.03	1.05	1.07	1.37	1.77	2.03	2.24
	25	1.01	1.03	1.05	1.15	1.59	1.92	2.19	2.40	2.58
	20	1.04	1.06	1.27	1.77	2.04	2.40	2.62	2.78	2.92
	15	1.06	1.37	2.03	2.40	2.68	2.88	3.05	3.17	3.28
	10	1.78	2.40	2.78	3.05	3.22	3.34	3.46	3.53	3.61
FOUR FANS LONG	30	1.01	1.01	1.01	1.02	1.04	1.06	1.23	1.54	1.79
	25	1.01	1.01	1.03	1.05	1.07	1.43	1.74	2.01	2.21
	20	1.02	1.04	1.07	1.23	1.67	2.01	2.33	2.46	2.62
	15	1.05	1.07	1.54	2.01	2.33	2.58	2.75	2.92	3.05
	10	1.23	2.01	2.46	2.75	2.98	3.15	3.27	3.37	3.45
FIVE FANS LONG	30	1.00	1.00	1.00	1.00	1.00	1.01	1.01	1.06	1.36
	25	1.00	1.00	1.00	1.00	1.00	1.01	1.04	1.63	1.85
	20	1.00	1.00	1.00	1.01	1.20	1.63	2.07	2.19	2.36
	15	1.01	1.01	1.12	1.63	2.03	2.32	2.52	2.72	2.87
	10	1.01	1.65	2.13	2.46	2.72	2.92	3.10	3.23	3.33
SIX FANS LONG	30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.06	1.09
	25	1.00	1.00	1.00	1.00	1.00	1.01	1.08	1.25	1.51
	20	1.00	1.00	1.00	1.00	1.08	1.21	1.79	1.94	2.10
	15	1.00	1.00	1.00	1.18	1.71	2.04	2.26	2.52	2.74
	10	1.00	1.35	1.83	2.19	2.37	2.69	2.94	3.11	3.23

Summer refrigerant charge × Correction Factor = Total flooded charge.

Total flooded charge - Summer charge = Winter flooding charge.

Summer charge + Winter flooding charge = Total charge for flooded (Winter) operation.

Example for Calculating Refrigerant Charge

Given:

KCC845 (4 fans long)

Design TD = 20°F

Flooded control, with fan cycling

R-22 refrigerant

Minimum design ambient, 30°F

Solution:

Summer refrigerant charge for KCC845 is 66 pounds.

Flooding factor (Table 2 above) is 1.23 at the given conditions.

Calculating 66 x 1.23 = 81 pounds total charge.

START-UP

Prior to start-up check the following items:

1. Check all fans for freedom of movement and clearance with venturi.
2. Check that the nameplate voltage matches the power supply voltage.
3. Check all fan blade set screws, motor mounts, and leg mounting fasteners.
4. Upon start-up check the rotation of fans for proper air discharge.

DD MODELS WITH 1050 - 1140 RPM BASE MOUNT MOTORS

DD MODEL NUMBER	MBH R-22 10°TD	FAN AND MOTOR			DIMENSIONS (INCHES)			CONNECTIONS - OD		SHIPPING WEIGHT LBS	REFRIG CHARGE LBS R-22*
		FAN ARANGT	UNIT AMPS		HEIGHT H	LENGTH L	WIDTH W	HOT GAS INLET ‡	LIQUID OUTLET ‡		
			230/3	460/3							
30	11.4	1	2.0**	---	25 3/8	41	20 1/2	(1) 7/8	(1) 7/8	75	2.6
40	17.2	1	2.0**	---	25 3/8	41	20 1/2	(1) 7/8	(1) 7/8	80	3.7
60	26.9	1	2.5**	---	37 5/8	45 1/2	31	(1) 1 1/8	(1) 1 1/8	150	5.8
100	41.6	1 x 2	3.6	1.8	35 5/8	66	41 3/8	(1) 1 1/8	(1) 7/8	250	8.3
130	55.4	1 x 2	3.6	1.8	35 5/8	66	41 3/8	(1) 1 1/8	(1) 7/8	265	11.0
190	80.3	1 x 3	5.4	2.7	35 5/8	105	41 3/8	(1) 1 3/8	(1) 7/8	370	13.5
230	96.2	1 x 3	5.4	2.7	35 5/8	105	41 3/8	(1) 1 3/8	(1) 1 1/8	400	18.0
260	111.3	1 x 3	5.4	2.7	35 5/8	105	41 3/8	(1) 1 5/8	(1) 1 1/8	520	22.6
310	130.2	1 x 5	9.0	4.5	42	186 1/4	28 5/8	(1) 1 5/8	(1) 1 1/8	610	16.8
360	151.2	1 x 5	9.0	4.5	42	186 1/4	28 5/8	(1) 1 5/8	(1) 1 1/8	660	22.5
410	173.3	1 x 5	9.0	4.5	42	186 1/4	28 5/8	(1) 2 1/8	(1) 1 1/8	750	28.1
530	223.7	1 x 5	17.0	8.5	46	186 1/4	57 1/8	(2) 1 5/8	(2) 1 1/8	1020	34.6
590	249.9	1 x 5	17.0	8.5	46	186 1/4	57 1/8	(2) 1 5/8	(2) 2 1/8	1175	46.3
660	278.3	1 x 5	17.0	8.5	46	186 1/4	57 1/8	(2) 1 5/8	(2) 2 1/8	1200	57.6
790	329.7	1 x 5	17.0	8.5	46	186 1/4	57 1/8	(2) 2 1/8	(2) 2 1/8	1500	69.2
910	383.3	2 x 4	27.2	13.6	57	186 1/4	85 1/2	(2) 2 1/8	(2) 1 3/8	1635	52.5
1010	422.1	2 x 4	27.2	13.6	57	186 1/4	85 1/2	(2) 2 1/8	(2) 1 3/8	1965	70.0
1150	485.1	2 x 4	27.2	13.6	57	186 1/4	85 1/2	(2) 2 1/8	(2) 1 3/8	2260	87.4
1360	542.7	2 x 5	34.0	17.0	57	228 3/4	85 1/2	(2) 2 5/8	(2) 1 5/8	2900	108.0
1550	641.1	2 x 5	34.0	17.0	57	228 3/4	85 1/2	(2) 2 5/8	(2) 1 5/8	3100	130.0

* Refrigerant charge based on R-22 at 20° TD.

For R-404A or R-507 multiply R-22 values by 0.90

‡ Standard connection size. When the refrigerant and design conditions are specified, coils are custom circuited and connections sized for optimum performance. Contact the factory for exact connection size at a given design condition.

** 208/230/1 Motor and unit

FLOODED CONTROLS

MODEL *	QUANTITY OF VALVES	LIQUID MANIFOLD	MAXIMUM TONS at the EVAP. **			DO NOT UNDERSIZE FLOODED CONTROLS
			R - 22	R-404A, 507	R - 134a	
A1 or A2	1	No	21	12	15	
B1 or B2	2	Yes	42	24	30	
C1 or C2	3	Yes	63	36	45	
D1 or D2	4	Yes	84	48	60	
E1 or E2	5	Yes	105	60	75	
F1 or F2	6	Yes	126	72	90	
G1 or G2	7	Yes	147	84	105	
H1 or H2	8	Yes	168	96	120	
J1 or J2	10	Yes	210	120	150	
						OVERSIZING IS ACCEPTABLE

* 1 = 100psig Valves; 2 = 180psig Valves

** Capacity rating at 4psi pressure drop across valve

KCC MODELS have 1½ HP, 1140 RPM MOTORS and 30 INCH DIAMETER FANS

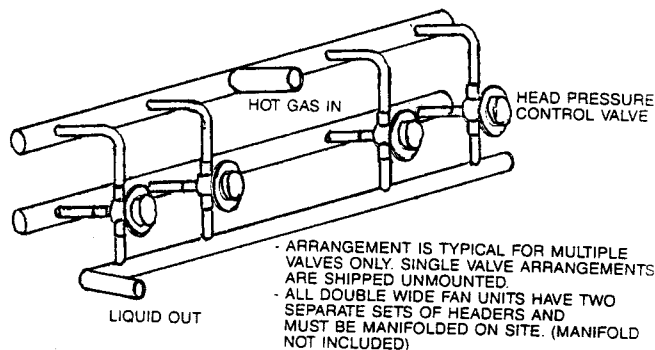
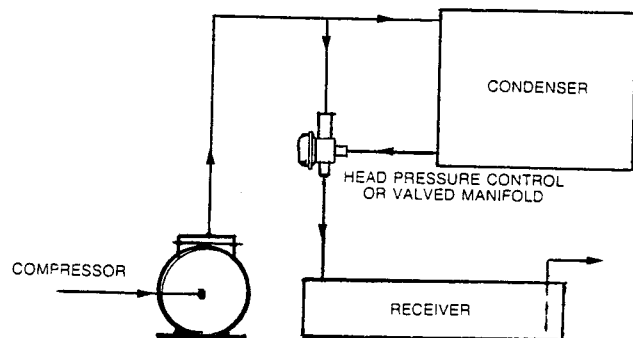
KCC MODEL NUMBER	MBH R-22 10°TD	FAN AND MOTOR			DIMENSIONS (INCHES)			CONNECTIONS - OD		SHIPPING WEIGHT LBS	REFRIG CHARGE LBS R-22*
		FAN ARANGT	UNIT AMPS		HEIGHT H	LENGTH L	WIDTH W	HOT GAS INLET ‡	LIQUID OUTLET ‡		
			230/3	460/3							
KCC295	117.2	1 x 2	12.8	6.4	46	101 1/4	57 1/4	(2) 1 3/8	(2) 1 1/8	690	16.5
KCC335	132.9	1 x 2	12.8	6.4	46	101 1/4	57 1/4	(2) 1 3/8	(2) 1 1/8	730	22.0
KCC375	150.4	1 x 2	12.8	6.4	46	101 1/4	57 1/4	(2) 1 3/8	(2) 1 1/8	790	27.5
KCC425	169.5	1 x 2	12.8	6.4	46	101 1/4	57 1/4	(2) 1 3/8	(2) 1 1/8	850	33.0
KCC495	199.4	1 x 3	19.2	9.6	46	143 3/4	57 1/4	(2) 1 5/8	(2) 1 1/8	990	33.0
KCC525	210.5	1 x 3	19.2	9.6	46	143 3/4	57 1/4	(2) 1 5/8	(2) 1 1/8	1030	33.0
KCC635	254.2	1 x 3	19.2	9.6	46	143 3/4	57 1/4	(2) 1 5/8	(2) 1 1/8	1170	49.5
KCC665	265.8	1 x 4	25.6	12.8	46	186 1/4	57 1/4	(2) 1 5/8	(2) 1 1/8	1450	44.0
KCC755	300.8	1 x 4	25.6	12.8	46	186 1/4	57 1/4	(2) 2 1/8	(2) 1 1/8	1540	55.0
KCC765	306.8	2 x 2	25.6	12.8	46	101 1/4	85 1/2	(2) 2 1/8	(2) 1 1/8	1440	41.6
KCC835	335.6	2 x 2	25.6	12.8	46	101 1/4	85 1/2	(2) 2 1/8	(2) 1 1/8	1880	50.0
KCC845	339.0	1 x 4	25.6	12.8	46	186 1/4	57 1/4	(2) 2 1/8	(2) 1 1/8	1680	66.0
KCC995	397.5	1 x 5	32.0	16.0	46	228 3/4	57 1/4	(2) 2 1/8	(2) 1 3/8	1690	68.8
KCC1005	399.6	2 x 3	38.4	19.2	56 3/4	143 3/4	85 1/2	(2) 2 1/8	(2) 1 3/8	1950	50.0
KCC1085	435.8	2 x 3	38.4	19.2	56 3/4	143 3/4	85 1/2	(2) 2 1/8	(2) 1 3/8	2020	62.5
KCC1255	503.4	2 x 3	38.4	19.2	56 3/4	143 3/4	85 1/2	(2) 2 5/8	(2) 1 3/8	2480	75.0
KCC1335	532.8	2 x 4	51.2	25.6	56 3/4	186 1/4	85 1/2	(2) 2 5/8	(2) 1 3/8	2540	66.3
KCC1455	581.0	2 x 4	51.2	25.6	56 3/4	186 1/4	85 1/2	(2) 2 5/8	(2) 1 3/8	2640	83.3
KCC1535	613.5	2 x 4	51.2	25.6	56 3/4	186 1/4	85 1/2	(2) 2 5/8	(2) 1 5/8	3010	83.3
KCC1675	671.2	2 x 4	51.2	25.6	56 3/4	186 1/4	85 1/2	(2) 2 5/8	(2) 1 5/8	3100	100.0
KCC1815	726.3	2 x 5	64.0	32.0	56 3/4	228 3/4	85 1/2	(2) 2 5/8	(2) 1 5/8	3220	104.0
KCC2095	839.0	2 x 5	64.0	32.0	56 3/4	228 3/4	85 1/2	(2) 2 5/8	(2) 1 5/8	3450	125.0
KCC2115	845.0	2 x 5	64.0	32.0	50	257 3/4	95 5/8	(2) 2 5/8	(2) 1 5/8	3470	126.0
KCC2235	892.5	2 x 5	64.0	32.0	50	257 3/4	95 5/8	(2) 2 5/8	(2) 1 5/8	3640	126.0
KCC2285	913.6	2 x 6	76.8	38.4	50	305 3/4	95 5/8	(2) 2 5/8	(2) 1 5/8	3880	120.0
KCC2535	1014.0	2 x 6	76.8	38.4	50	305 3/4	95 5/8	(2) 3 1/8	(2) 2 1/8	4120	150.0
KCC2685	1071.2	2 x 6	76.8	38.4	50	305 3/4	95 5/8	(2) 3 1/8	(2) 2 1/8	4630	150.0

* Refrigerant charge based on R-22 at 20° TD.

For R-404A or R-507 multiply R-22 values by 0.90

‡ Standard connection size. When the refrigerant and design conditions are specified, coils are custom circuited and connections sized for optimum performance. Contact the factory for exact connection size at a given design condition.

TYPICAL FLOODED CONTROL PIPING



KEC MODELS have 1 HP, 850 RPM MOTORS and 30 INCH DIAMETER FANS

KEC MODEL NUMBER	MBH R-22 10°TD	FAN AND MOTOR			DIMENSIONS (INCHES)			CONNECTIONS - OD		SHIPPING WEIGHT LBS	REFRIG CHARGE LBS R-22*
		FAN ARANGT	UNIT AMPS		HEIGHT H	LENGTH L	WIDTH W	HOT GAS INLET ‡	LIQUID OUTLET ‡		
KEC254	102.5	1 x 2	10.6	5.3	46	101 1/4	57 1/4	(2) 1 3/8	(2) 1 1/8	708	16.5
KEC294	116.3	1 x 2	10.6	5.3	46	101 1/4	57 1/4	(2) 1 3/8	(2) 1 1/8	748	22.0
KEC334	131.6	1 x 2	10.6	5.3	46	101 1/4	57 1/4	(2) 1 3/8	(2) 1 1/8	808	27.5
KEC374	148.3	1 x 2	10.6	5.3	46	101 1/4	57 1/4	(2) 1 3/8	(2) 1 1/8	868	33.0
KEC434	174.5	1 x 3	15.9	7.9	46	143 3/4	57 1/4	(2) 1 5/8	(2) 1 1/8	1017	33.0
KEC464	184.2	1 x 3	15.9	7.9	46	143 3/4	57 1/4	(2) 1 5/8	(2) 1 1/8	1057	33.0
KEC564	222.4	1 x 3	15.9	7.9	46	143 3/4	57 1/4	(2) 1 5/8	(2) 1 1/8	1197	49.5
KEC584	232.5	1 x 4	21.2	10.6	46	186 1/4	57 1/4	(2) 1 5/8	(2) 1 1/8	1486	44.0
KEC664	263.2	1 x 4	21.2	10.6	46	186 1/4	57 1/4	(2) 2 1/8	(2) 1 1/8	1576	55.0
KEC674	268.4	2 x 2	21.2	10.6	46	101 1/4	85 1/2	(2) 2 1/8	(2) 1 1/8	1476	41.6
KEC734	293.6	2 x 2	21.2	10.6	46	101 1/4	85 1/2	(2) 2 1/8	(2) 1 1/8	1916	50.0
KEC744	296.6	1 x 4	21.2	10.6	46	186 1/4	57 1/4	(2) 2 1/8	(2) 1 1/8	1716	66.0
KEC874	347.8	1 x 5	26.5	13.2	46	228 3/4	57 1/4	(2) 2 1/8	(2) 1 3/8	1735	68.8
KEC884	349.6	2 x 3	31.8	15.9	56 3/4	143 3/4	85 1/2	(2) 2 1/8	(2) 1 3/8	2004	50.0
KEC954	381.3	2 x 3	31.8	15.9	56 3/4	143 3/4	85 1/2	(2) 2 1/8	(2) 1 3/8	2074	62.5
KEC1104	440.4	2 x 3	31.8	15.9	56 3/4	143 3/4	85 1/2	(2) 2 5/8	(2) 1 3/8	2534	75.0
KEC1164	466.1	2 x 4	42.4	21.2	56 3/4	186 1/4	85 1/2	(2) 2 5/8	(2) 1 3/8	2612	66.3
KEC1274	508.3	2 x 4	42.4	21.2	56 3/4	186 1/4	85 1/2	(2) 2 5/8	(2) 1 3/8	2712	83.3
KEC1344	536.7	2 x 4	42.4	21.2	56 3/4	186 1/4	85 1/2	(2) 2 5/8	(2) 1 5/8	3082	83.3
KEC1474	587.2	2 x 4	42.4	21.2	56 3/4	186 1/4	85 1/2	(2) 2 5/8	(2) 1 5/8	3172	100.0
KEC1564	635.4	2 x 5	53.0	26.5	56 3/4	228 3/4	85 1/2	(2) 2 5/8	(2) 1 5/8	3310	104.0
KEC1844	734.0	2 x 5	53.0	26.5	56 3/4	228 3/4	85 1/2	(2) 2 5/8	(2) 1 5/8	3540	125.0
KEC1854	739.3	2 x 5	53.0	26.5	50	257 3/4	95 5/8	(2) 2 5/8	(2) 1 5/8	3560	126.0
KEC1954	780.8	2 x 5	53.0	26.5	50	257 3/4	95 5/8	(2) 2 5/8	(2) 1 5/8	3730	126.0
KEC2004	799.3	2 x 6	63.6	31.8	50	305 3/4	95 5/8	(2) 2 5/8	(2) 1 5/8	3968	120.0
KEC2224	887.1	2 x 6	63.6	31.8	50	305 3/4	95 5/8	(2) 3 1/8	(2) 2 1/8	4228	150.0
KEC2354	937.2	2 x 6	63.6	31.8	50	305 3/4	95 5/8	(2) 3 1/8	(2) 2 1/8	4738	150.0

* Refrigerant charge based on R-22 at 20° TD. For R-404A or R-507 multiply R-22 values by 0.90

‡ Standard connection size. When the refrigerant and design conditions are specified, coils are custom circuited and connections sized for optimum performance. Contact the factory for exact connection size at a given design condition.

MAINTENANCE

Maintenance of an air cooled condenser is extremely important for extended life and peak performance. The equipment warranty does not cover corrosion, misuse, or misapplication of the condenser. **Site conditions will dictate the frequency of any maintenance plan.**

Industrial atmospheres can be very corrosive to coil surface. Coated fins or coils are available and are recommended. Condensers in areas with petroleum processing, chemical plants, landfills, sewer vents, acid rain, smog, or heavy air pollution may have coated fins or coils but frequent and regular inspection and cleaning is still necessary.

For inland installations 20 or more miles from any body of salt water schedule inspection every 6 months. Clean the coil if it shows signs of dirt accumulation. **The recommended MINIMUM cleaning cycle is once every 12 months for any air cooled condenser.**

For sea coast installations 20 miles or less from any body of salt water schedule inspections a minimum of once every 3 months. Clean the coil thoroughly every 3 to 6 months to remove any accumulated layers of salt. Every 12 months clean the coil with an approved cleaning solution. **Always rinse thoroughly.**

1. Shut all power off to the air cooled condenser and refrigeration system at the closest disconnect switch and use a lock to prevent others from turning power back on.
2. Remove the fan guards or optional side access doors or raise the optional flip top fan assembly.
3. Remove all debris (leaves, twigs, paper, plastic film, cardboard, styrofoam, etc.) from the top and beneath the unit. Keep the area around the condenser clean!
4. Inspect the coil for damaged fins. Straighten any bent fins. Air flow must not be restricted. Inspect the unit for signs of corrosion. If any corrosion is found, determine what can be done to prevent it. Make notes to compare and use at the next inspection.

5. Should the heat transfer surface (coil) require cleaning use a cleaning solution that is compatible with the finned material and any protective coating that may have been applied. Follow the instructions of the cleaning solution manufacturer. **It is extremely important that a proper rinse be applied to the coil once the cleaning process is complete. Rinse thoroughly from the top of the coil.** Any residue of cleaner left for any extended period will begin to corrode the heat transfer surface. Do not use any cleaner containing ammonia or acid.
6. Inspect all fan and motor fasteners for tightness. Visually inspect the entire unit. Prolong the unit life by attending to problem areas. Secure the guards and side access doors.
7. Turn power back on to the system. Observe the operation of all system components before leaving the jobsite.

UNICON REPLACEMENT PARTS

DD MODEL PARTS LIST

<u>Model Number</u>	<u>Description</u>	<u>Part Number</u>
DD30-40	Motor 1/4 HP 208/230/1/60	114656000
DD60	Motor 1/3 HP 208/230/1/60	114657000
DD100-130	Motor 1/2 HP 208/230/1/60	114637000
DD100-130-190-230- 260-310-360-410	Motor 1/2 HP 208/230/460/3/60	114638000
DD530-590-660-790- 910-1010-1150- 1360-1550	Motor 3/4 HP 208/230/460/3/60	114639000
DD30-40	Fan Blade 20 inch	214101000
DD60	Fan Blade 30 inch	214102000
DD100-130-190-230-260- 310-360-410	Fan Blade 24 inch	213142000
DD530-590-660-790-910- 1010-1150-1360-1550	Fan Blade 30 inch	213143000
DD30-40	Fan Guard 20 inch	213706000
DD60-530-590-660-790-910- 1010-1150-1360-1550	Fan Guard 30 inch	202136007
DD100-130-190-230-260- 310-360-410	Fan Guard 24 inch	213144000

KCC and KEC MODEL PARTS LIST

All KCC models	Motor 1 1/2 HP 1140 RPM 208/230/460/3/60	110204000
All KEC models	Motor 1 HP 850 RPM 208/230/460/3/60	114105000
All KCC and KEC models	Fan Blade 30 inch	210385000
All KCC and KEC models	Fan Guard 30 inch	202136007
All KCC and KEC models	Motor Mount 30 inch	210203000

When ordering replacement parts please provide, (1) quantity, (2) unit model number, (3) serial number, (4) description of part, (5) part number, (6) ship to address, and (7) shipping instructions to insure fast, accurate shipment. The above parts are shippable by next day air.

For your convenience, record the model number and serial number below and retain for future reference.

Model Number _____

Serial Number _____

Date Installed _____

Condenser I.D. _____

KRAMER

3075 N. Lanier Parkway ~ Decatur, GA 30034 ~ Tel 404 244-8004 ~ Fax 404 244-1846