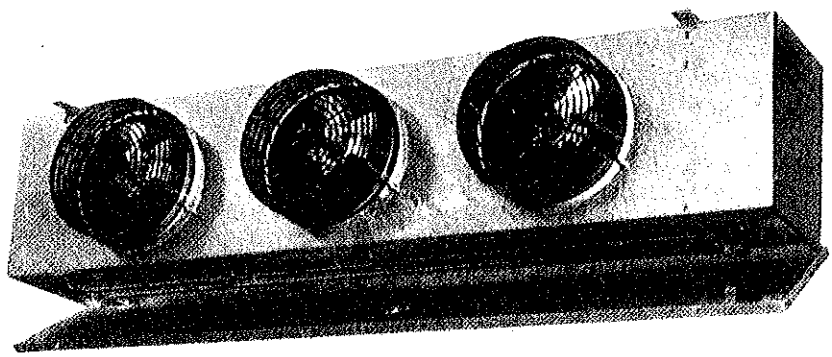
OPERATING and INSTALLATION INSTRUCTIONS

KRACK

SK Unit Coolers



SK 18-52-A
SK 56-205-KGE
SK 34-102-ED

- NO FANS
- FINS/INCH
- BTUH 10°TO (00)
- DEFROST

A — AIR
ED — ELECTRIC
KGE — 2 PIPE HOT GAS with electrically heated drain pan
HGE — 3 PIPE HOT GAS with drain pan
KGG — 2 PIPE HOT GAS — Hot Gas loop in drain pan
HGG — 3 PIPE HOT GAS — Hot Gas loop in drain pain

UL 60 Hz.
50 Hz.

CSA 60 Hz.

NSF

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KRACK®

GENERAL PRECAUTIONS AND SAFETY PROCEDURES FOR REFRIGERATION COILS AND UNIT COOLERS

BULLETIN GP-SP
MAY 1978

1. The use of any refrigerant can be dangerous. Where people or product can be exposed, frequent visual inspections and continuous monitoring should be made and employed for the detection of any defect or malfunction which could cause the escape of refrigerant, thereby creating a potentially hazardous condition, harmful to both people and/or product. Electronic detection devices should be used for sensing and warning of the presence of refrigerants in the atmosphere. In addition temperature monitoring devices should be employed to warn against loss of refrigeration from whatever cause, and/or rise in temperature in refrigerated areas that would be harmful to people, equipment, and/or product stored. Only experienced, qualified personnel should service, operate, and maintain refrigeration equipment.

2. Where there are liquid lines, or lines which might contain liquid refrigerant, it is important that certain precautions be taken to avoid hydraulic shock or hammer, and also hydraulic lock-up. This latter condition will occur whenever the ambient temperature causes a temperature increase in a section full of trapped solid liquid. If this occurs with the coil as part of the trapped section, bulged or ruptured coil header plugs from liquid expansion pressure will result. Hydraulic shock caused by liquid accumulation in hot gas lines or suction lines used for hot gas defrost can also cause coil damage. Traveling at high velocity, the liquid-slug energy may be sufficient to break coil header caps or plugs right off their lines.

   To protect personnel, product, plant and equipment, remove liquid refrigerant from the coil or section to be isolated before hand valves are closed. Pump out lines to remove liquid accumulation which in combination with high flow velocities produces hydraulic shock and hammer. The operation of any refrigerant coil must be such that the pressure/temperature relationship for that particular refrigerant used is always maintained. If the coil is subjected to a pressure greater than the pressure that would correspond to the saturated temperature for the refrigerant used, coil damage can result.

3. If the unit is suspected of having been damaged in transit, immediately notify the carrier and file a claim with that carrier. The refrigeration coil on all units should be pressurized with 150 psi dry nitrogen gas prior to hanging to insure no damage has occurred after the unit left the factory.

4. Prior to connecting refrigeration and drain line piping to the unit, make sure piping is properly designed and supported according to recognized standards. The unit has not been designed to carry the weight of any external piping and valves.

5. Refrigeration coils and unit coolers must not be used with other than the type refrigerant and refrigerant feed indicated on the equipment nameplate. Refrigerant coils and unit coolers must not be used or subjected to pressures higher than the working pressure stamped on the equipment nameplate.

6. All refrigerant piping systems must be properly evacuated to remove noncondensibles and moisture prior to charging. A vacuum of 1,000 microns is required to effectively remove moisture. In most cases this requires separate 2-stage vacuum pump that is not part of the refrigeration system. Do not use the refrigeration system compressor(s) to pull a vacuum as damage to the compressor(s) will result.

   Refrigerant piping systems should be evacuated to remove free moisture even if the system will not be started at the time. Leaving a system lie idle prior to charging and startup can result in internal corrosive damage to coil tubes and piping. This is especially true for refrigerant R717 systems employing steel piping and coils. A holding charge of R717 (ammonia) is especially to be avoided under these circumstances. Use 100% dry nitrogen instead.

7. Before connecting the final power supply, check the electrical characteristics on the unit nameplate to see that it is in agreement with the power supplied. Only qualified electricians should work on the electrical portion of any unit installation.

   Before performing any electrical work, shut the electrical power to the unit off and make sure it is in the "OFF" and locked position. All wiring must be in accordance with governing electrical codes.

8. Motors in cold rooms may draw greater than nameplate amperage due to the denser, heavier air. Electrical line sizes and services must take this into account. For motors requiring external overload protection, measure motor amps after pulldown and select overloads for this amperage compensating also for the variance in ambient temperature difference between motor location and overload location.

9. Solutions used to clean coils or neutralize bacteria growth must not be corrosive to metals, materials, and/or coatings used in the manufacture of this equipment.

10. If units are installed in atmospheres containing other than water vapor moisture and air, said atmosphere must be checked for compatibility with metals, materials, and coating used in manufacturing of this equipment.

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INSTALLATION

1. THERMAL EXPANSION VALVE

Before hanging the unit cooler, install the expansion valve and connect the equalizer tube. All models require an external equalizer for proper expansion valve operation. Select expansion valve from Table 1 or 2.

EXPANSION VALVE SELECTIONS - SPORLAN

TABLE 1

MODEL NO. SK	BTUH	20° F EVAPORATOR 10° TD		
		R-12	R-22	R-502
18-52	5200	FFE 1/2C GFE 1/2C	FVE 1/2C GVE 1/2C	FRE 1/2C GRE 1/2C
S8-80	8000	FFE 1C GFE 1C	FVE 1C GVE 1C	FRE 1C GRE 1C
28-104	10400	FFE 1C GFE 1C	FVE 1C GVE 1C	FRE 1C GRE 1C
38-156	15600	FFE 1-1/2C GFE 1-1/2C	FVE 1-1/2C GVE 1-1/2C	FRE 1-1/2C GRE 1-1/2C
48-208	20800	FFE 2C GFE 2C	FVE 1-1/2C GVE 1-1/2C	FRE 1-1/2C GRE 1-1/2C
58-260	26000	CFE 2-1/2C	FVE 2C GVE 2C	FRE 2C GRE 2C
68-312	31200	CFE 3C	FVE 3C GVE 3C	CRE 3C
16-47	4700	FFE 1/2C GFE 1/2C	FVE 1/2C GVE 1/2C	FRE 1/2C GRE 1/2C
S6-72	7200	FFE 1C GFE 1C	FVE 1C GVE 1C	FRE 1C GRE 1C
26-94	9400	FFE 1C GFE 1C	FVE 1C GVE 1C	FRE 1C GRE 1C
36-141	14100	FFE 1-1/2C GFE 1-1/2C	FVE 1-1/2C GVE 1-1/2C	FRE 1C GRE 1C
46-188	18800	FFE 2C GFE 2C	FVE 1-1/2C GVE 1-1/2C	FRE 1-1/2C GRE 1-1/2C
56-235	23500	FFE 2C GFE 2C	FVE 2C GVE 2C	FRE 2C GRE 2C
66-282	28200	CFE 2-1/2C	FVE 3C GVE 3C	FRE 2C GRE 2C
14-39	3900	FFE 1/2C GFE 1/2C	FVE 1/2C GVE 1/2C	FRE 1/2C GRE 1/2C
S4-59	5900	FFE 1/2C GFE 1/2C	FVE 1/2C GVE 1/2C	FRE 1/2C GRE 1/2C
24-78	7800	FFE 1C GFE 1C	FVE 1C GVE 1C	FRE 1C GRE 1C
34-117	11700	FFE 1C GFE 1C	FVE 1C GVE 1C	FRE 1C GRE 1C
44-156	15600	FFE 1-1/2C GFE 1-1/2C	FVE 1-1/2C GVE 1-1/2C	FRE 1C GRE 1C
54-195	19500	FFE 2C GFE 2C	FVE 1-1/2C GVE 1-1/2C	FRE 1-1/2C GRE 1-1/2C
64-234	23400	FFE 2C GFE 2C	FVE 2C GVE 2C	FRE 2C GRE 2C

TABLE 2

MODEL NO. SK	BTUH	- 20° F EVAPORATOR 10° TD		
		R-12	R-22	R-502
16-41	4100	FFE 1/2Z GFE 1/2Z	FVE 1/2Z GVE 1/2Z	FRE 1/4Z GRE 1/4Z
S6-62	6200	FFE 1/2Z GFE 1/2Z	FVE 1/2Z GVE 1/2Z	FRE 1/4Z GRE 1/4Z
26-82	8200	FFE 1Z GFE 1Z	FVE 1Z GVE 1Z	FRE 1Z GRE 1Z
36-123	12300	FFE 1-1/2Z GFE 1-1/2Z	FVE 1-1/2Z GVE 1-1/2Z	1-FRE 1Z GRE 1Z
46-164	16400	FFE 2Z GFE 2Z	FVE 2Z GVE 2Z	FRE 2Z GRE 2Z
56-205	20500	CFE 2-1/2Z	FVE 2Z GVE 2Z	FRE 2Z GRE 2Z
66-246	24600	CFE 3Z	FVE 3C GVE 3Z	FRE 2Z GRE 2Z
14-34	3400	FFE 1/2Z GFE 1/2Z	FVE 1/2Z GVE 1/2Z	FRE 1/4Z GRE 1/4Z
S4-51	5100	FFE 1/2Z GFE 1/2Z	FVE 1/2Z GVE 1/2Z	FRE 1/4Z GRE 1/4Z
24-68	6800	FFE 1Z GFE 1Z	FVE 1Z GVE 1Z	FRE 1/2Z GRE 1/2Z
34-102	10200	FFE 1-1/2Z GFE 1-1/2Z	FVE 1Z GVE 1Z	FRE 1Z GRE 1Z
44-136	13600	FFE 2Z GFE 2Z	FVE 1-1/2Z GVE 1-1/2Z	FRE 1Z GRE 1Z
54-170	17000	CFE 2-1/2Z	FVE 2Z GVE 2Z	FRE 1-1/2Z GRE 1-1/2Z
64-204	20400	CFE 3Z	FVE 2Z GVE 2Z	FRE 2Z GRE 2Z

Every thermostatic expansion valve is adjusted at the factory before shipment. The setting will be correct for the majority of applications and generally no further adjustment should be necessary. However, when the operating conditions of an application require a change, the valve superheat may be adjusted.

To 'reduce' the superheat turn the adjusting stem 'counter-clockwise.'

To 'increase' the superheat, turn the adjusting stem 'clockwise.'

To prevent overshooting the desired setting, only one turn of the stem should be made at a time. As much as 30 minutes may be required for the new balance to take place after an adjustment is made. Always tighten the adjusting stem packing nut and replace the seal cap tightly when the adjustment is completed.

If an expansion valve appears to be operating erratically, this action may be due to moisture or foreign material within the system. Field experience has proven that most expansion valve operating difficulties are due to the presence of dirt, sludge and moisture in the system. The working parts of most expansion valves may be inspected, cleaned and dried by removing the internal parts. Moisture and foreign material are equally harmful to other components of the system and must be removed for efficient system performance.

Mount the expansion valve outlet directly to the distributor and connect the 1/4" diameter external equalizer line, located on the suction line, to the equalizer connection on the expansion valve.

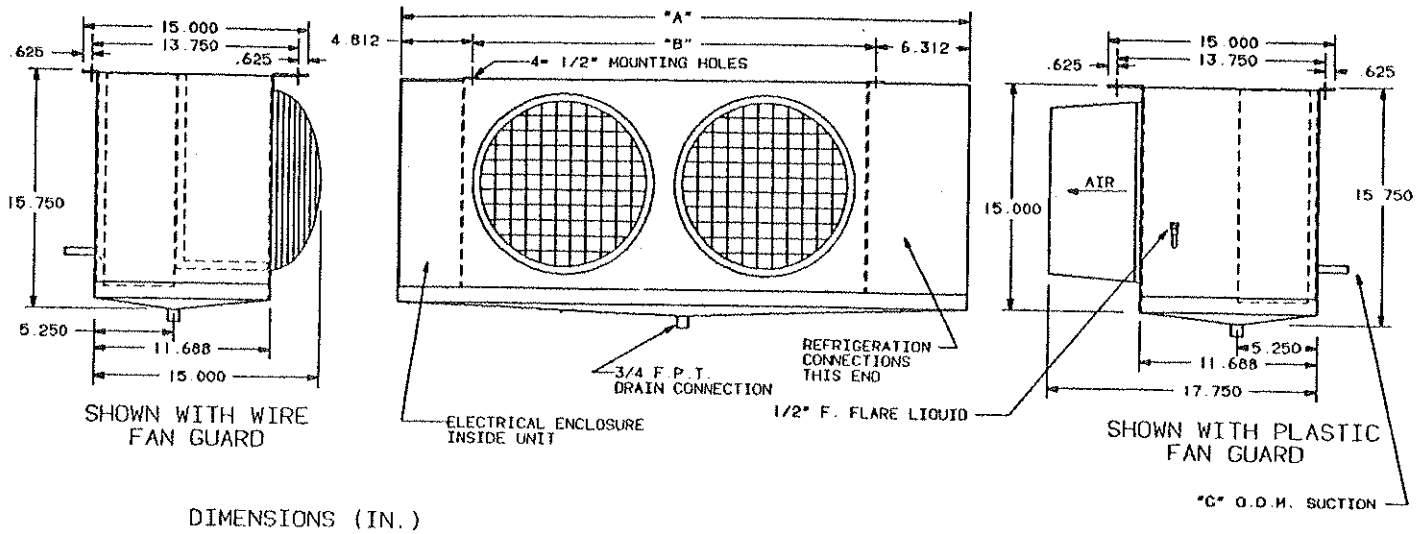
When the evaporator and thermostatic expansion valve are located above the receiver, there is a static pressure loss in the liquid line. If the vertical lift is great enough, vapor or flash gas will form in the liquid line causing a serious reduction in the capacity of the expansion valve. When an appreciable vertical lift is unavoidable, provide enough subcooling of the liquid refrigerant in the condenser or after the liquid leaves the receiver by means of a suction-liquid heat exchanger.

At normal condensing temperatures, the following relation between each 1°F of subcooling and corresponding change in saturation pressures applies.

REFRIGERATION	SUBCOOLING °F	EQUIVALENT CHANGE IN SAT. PRESS. PSIG
R-12	1	1.75
R-22	1	2.75
R-502	1	2.85

As can be seen, a 5°F subcooling will allow a pressure drop of 8.75 PSIG with R-12, 13.75 PSIG with R-22 and 14.25 PSIG with R-502 without flashing in the liquid line. As a rule of thumb, a head of two feet of liquid halocarbon refrigerant is approximately equivalent to 1 PSIG.

2. UNIT COOLER MOUNTING



DIMENSIONS (IN.)

SK MODEL	A	B	C
1 FAN	29	18	5/8
2 FAN (SHORT MODULE)	38	27	7/8
2 FAN	47	36	7/8
3 FAN	65	54	7/8
4 FAN	83	36/36	1 1/8
5 FAN	101	36/54	1 1/8
6 FAN	119	54/54	1 1/8

NOTES
1. Install units not less than 12" from wall.
2. Plastic fan guard standard on air defrost model.
3. Wire fan guard standard on electric or gas defrost models.
4. HGG model includes hot gas loop for field installation in lieu of electric drain pan heater.
5. Service panels on each end.

HANGERS REQUIRED
4—SK1, 2 & 3
6—SK4, 5 & 6

FIG. 1

The SK type unit cooler should be suspended with 3/8" diameter hanger rods or flush mounted against the ceiling. Rods should be **double nutted** top and bottom.

The unit must be level in all directions to insure proper drainage of the condensate. Suspended units must have sufficient clearance above for cleaning the top.

See Fig. #1 for mounting dimensions and sizes of suction, liquid and drain connections.

The discharge air should be directed toward the entry doors to minimize outside air infiltration when the doors are opened.

3. DRAIN LINES

A union in the drain line is recommended for ease of installation and future servicing. The union should be located as close to the drain pan as possible. Use two wrenches when tightening to prevent drain fitting from twisting and damaging the unit.

The drain line from the unit should be as short and as steeply pitched as possible with a minimum of 1/4 inch per foot.

Where room temperatures run 32°F and lower, wrap the drain line located in the cold room, with a thermostatically controlled heat cable bringing it up and around the drain coupling of the unit. Cover the drain line, drain coupling and cable with insulation. Follow the manufacturer's recommendation when installing the drain line heater.

The drain line heater must be energized continuously. Do not use the lighting circuit for a power source. **All drain lines must be trapped.** If two or more units use the same drain line and are defrosted together, only one trap is necessary. If the units are defrosted independently from one another, each unit must have its own trap before it enters the common drain line. The traps may be inside or outside the refrigerated space but must be heated if subjected to temperatures below 33°F.

4. REFRIGERATION PIPING

System design must conform to all codes, laws and regulations applying to the site of installation. In addition the safety code for mechanical refrigeration and code for pressure piping should be followed as a guide to safe practice. Following industry practices for piping, leak testing and evacuation of the system, 162 PSIG is recommended for low side pressure testing. See Fig. 1 for piping connections. Vertical suction lines may require a trap installed at the bottom of the vertical riser perhaps one size smaller than the outlet connection. Horizontal suction lines should slope away from the evaporator toward the compressor.

5. WIRING THE UNIT

The electrical data for motors and defrost heaters is marked on the unit nameplate. Field wiring should comply with N.E.C. and local codes. The field wiring compartment is constructed as part of the unit cooler enclosure. Wiring connections are made at the junction box located inside and on the right hand side of the unit cooler. Check all terminals for loose connections which may develop in transit.

Fan motors, electric defrost heaters, defrost pressure switch, fan delay and heater safety thermostat are factory wired to the junction box. Refer to appropriate wiring diagram for specifics.

Individually compartmented fan sections prevent reverse rotation in the event of motor failure. Each motor is provided with a quick-connect water tight connector. The fan motors are totally enclosed with inherant overheat protection and lifetime lubricated ball bearings.

The unit must be grounded.

6. PRE-STARTUP

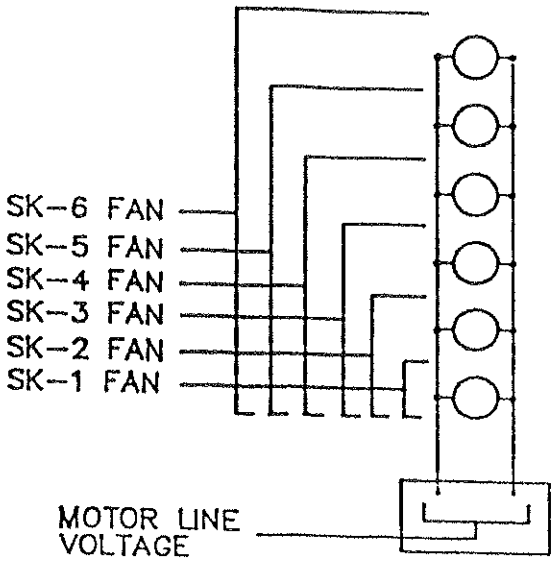
Check fan set screws and all other fasteners for tightness. Be sure thermostatic expansion valve bulb is properly located and strapped.

7. REFRIGERATION OPERATION

Check direction of fan rotation. It should be clockwise, viewed when facing the front of the unit or shaft end of the motor.

Adjust the expansion valve for best performance after the system has stabilized.

8. AIR DEFROST



UNIT TOTAL F.L.A.			PSC
MODEL	115/60/1	230/60/1	230-60-1
SK-1 FAN—A	1.6	0.8	.37
SK-S FAN—A	3.2	1.6	.74
SK-2 FAN—A	3.2	1.6	.74
SK-3 FAN—A	4.8	2.4	1.11
SK-4 FAN—A	6.4	3.2	1.48
SK-5 FAN—A	8.0	4.0	1.85
SK-6 FAN—A	9.6	4.8	2.22

UNIT WIRING (BY MFRR)

All wiring components and enclosures are in accordance with NEMA-1 standards.

AIR DEFROST UNITS

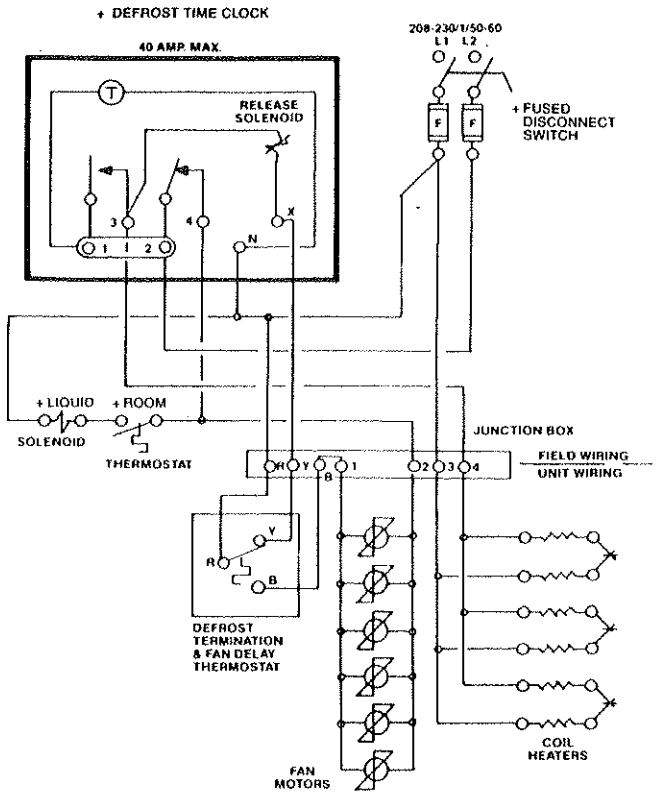
Direct Expansion:

For room temperatures above 35°F and evaporator temperatures below 30°F air defrost may be used. For this method of defrost, fan motors run continuously with the defrost time clock shutting the liquid line solenoid valve at timed intervals to initiate defrost.

Off cycle defrost initiates on a room thermostat which cycles the solenoid to a pump down mode. Coil may need to be oversized for this defrost method.

9. ELECTRIC DEFROST

SINGLE PHASE WIRING



Efficient stainless steel tubular heaters rated for 115 volts, are inserted in fin grooves. Three on the face and three on the coil bottom. Heaters are replaceable from the face or by removing the drain pan. Standard electric defrost configuration is with 208-230/1/50-60 fan motors and heaters wired for 230 volts, single.

Defrost cycles are time clock initiated and temperature terminated by a factory mounted adjustable thermostat which creates a fan restarting delay preventing warm air and condensate from being discharged into the space. The timer has a fail-safe feature. Its time setting is longer than necessary resulting in a second termination if the thermostat should fail.

When defrosting two SK units at one time with one time clock; temp termination thermostats must be wired in series.

SEQUENCE

A. Upon initiation of defrost, timer contact between 2 and 4 opens stopping the fan motors and closing the liquid solenoid.

Timer contact between 1 and 3 closes which turns on the defrost heaters.

B. As the coil defrosts its temperature rises and upon reaching the setting of the defrost duration (termination thermostats) contacts R and Y close activating the timer release solenoid which returns the timer contacts to the refrigeration position.

C. When the coil temperature reaches +25° contact R and B close in the defrost duration thermostat starting the fan motors.

	HEATER SPECIFICATIONS				MOTOR	
		230/60/1			115/60/1	230/60/1
MODEL	NO. HTR'S	WATTS PER HTR	TOTAL NOM. WATTS •	TOTAL NOM. AMPS •	TOTAL NOM. AMPS	TOTAL NOM. AMPS
SK-1 FAN—ED	6	200	1200	5.2	1.6	0.8
SK-S FAN—ED	6	300	1800	7.8	3.2	1.6
SK-2 FAN—ED	6	400	2400	10.4	3.2	1.6
SK-3 FAN—ED	6	600	3600	15.6	4.8	2.4
SK-4 FAN—ED	6	800	4800	20.8	6.4	3.2
SK-5 FAN—ED	6	1000	6000	26.1	8.0	4.0
SK-6 FAN—ED	6	1200	7200	31.3	9.6	4.8

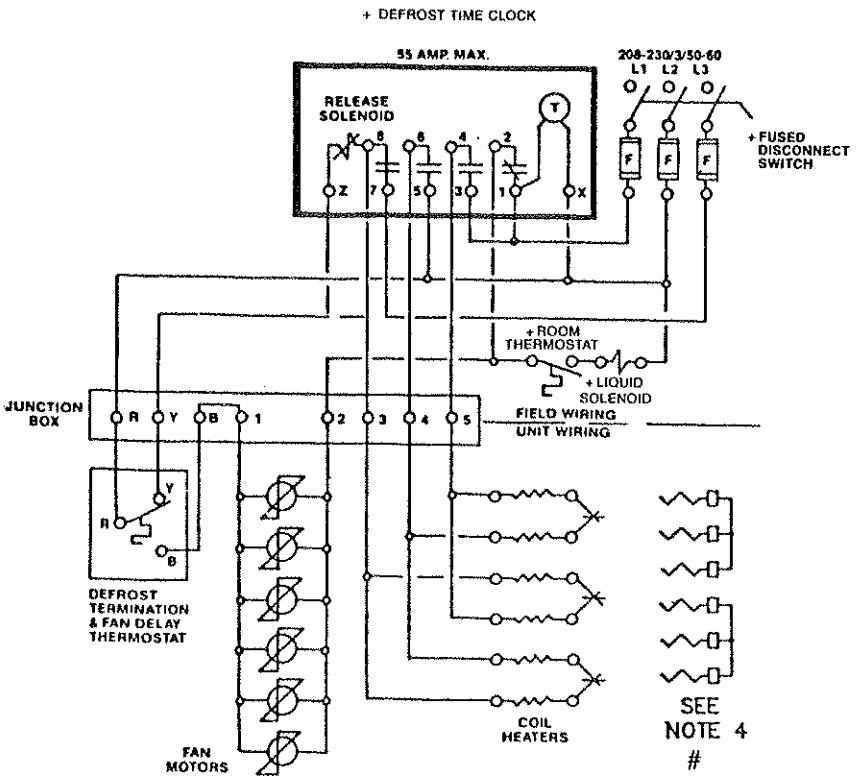
CORRECTION FACTORS •

POWER	240/60/1	208/60/1	208/60/3 #	220/60/1
WATTAGE	1.09	0.82	1.09	0.91
AMPERAGE	1.04	0.90	1.04	0.96

• 1—Multiply nominal heater wattage and amperage listed by correction factor to get wattage and amperage at other power supply.
2—All wiring components and enclosures are in accordance with NEMA-1 standards.
3—Fan delay set 25°F adj. ±5°F R-B makes on temp fall temperature termination adj. 45°F to 85°F.
+ 4—Furnished by others

10. ELECTRIC DEFROST

THREE PHASE WIRING



Efficient stainless steel tubular heaters rated for 115 volts, are inserted in fin grooves. Three on the face and three on the coil bottom. Heaters are replaceable from the face or by removing the drain pan. Standard electric defrost configuration is with 208-230/1/50-60 fan motors and heaters wired for 230 volts, single or three phase. If 208 volt or lower power abnormally extends defrost cycles, three phase heaters are easily reconnected in star to obtain 230 volt wattage.

Defrost cycles are time clock initiated and temperature terminated by a factory mounted adjustable thermostat which creates a fan restarting delay preventing warm air and condensate from being discharged into the space. The timer has a fail-safe feature. Its time setting is longer than necessary resulting in a second termination if the thermostat should fail.

When defrosting two SK units at one time with one time clock; temp termination thermostats must be wired in series.

SEQUENCE

A. Upon initiation of defrost timer, contacts between 1 and 2 open stopping the fan motors and closing liquid solenoid. Timer contacts between 3 and 4, 5 and 6, and 7 and 8 close energizing the defrost heaters.

B. As the coil defrosts, its temperature rises and upon reaching the setting the defrost duration (termination thermostats) contacts R and Y close activating the timer release solenoid which returns the timer contacts to the refrigeration position.

C. When the coil temperature reaches +25° contact R and B close in the defrost duration thermostat starting the fan motors.

		HEATER SPECIFICATIONS									MOTOR	
		230/60/1			230/60/3			460/60/3			115/60/1	230/60/1
MODEL	NO. HTR'S	WATTS PER HTR	TOTAL NOM. WATTS •	TOTAL NOM. AMPS •	WATTS PER HTR	TOTAL NOM. WATTS •	TOTAL NOM. AMPS •	WATTS PER HTR	TOTAL NOM. WATTS	TOTAL NOM. AMPS	TOTAL NOM. AMPS	TOTAL NOM. AMPS
SK-1 FAN—ED	6	200	1200	5.2	200	1200	3.0	200	1200	1.5	1.6	0.8
SK-S FAN—ED	6	300	1800	7.8	300	1800	4.5	300	1800	2.3	3.2	1.6
SK-2 FAN—ED	6	400	2400	10.4	400	2400	6.0	400	2400	3.0	3.2	1.6
SK-3 FAN—ED	6	600	3600	15.6	600	3600	9.1	600	3600	4.5	4.8	2.4
SK-4 FAN—ED	6	800	4800	20.8	800	4800	12.1	800	4800	6.0	6.4	3.2
SK-5 FAN—ED	6	1000	6000	26.1	1000	6000	15.1	1000	6000	7.5	8.0	4.0
SK-6 FAN—ED	6	1200	7200	31.3	1200	7200	18.1	1200	7200	9.1	9.6	4.8

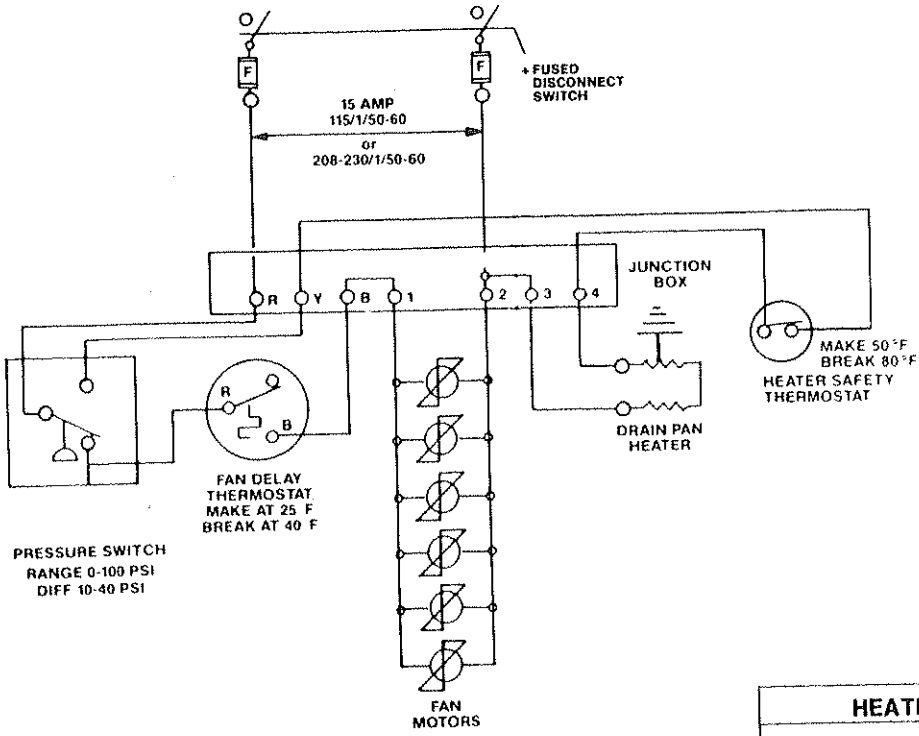
CORRECTION FACTORS •

POWER	240/60/1 OR 3	208/60/1	208/60/3 #	220/60/1 OR 3
WATTAGE	1.09	0.82	1.09	0.91
AMPERAGE	1.04	0.90	1.04	0.96

• 1—Multiply nominal heater wattage and amperage listed by correction factor to get wattage and amperage at other power supply.
2—All wiring components and enclosures are in accordance with NEMA-1 standards.
3—Fan delay set 25°F adj. ±5°F R-B makes on temp fall temperature termination adj. 45°F to 85°F.
#4—This end of heater leads must be wired in star as shown for 208/60/3 & 460/60/3 Phase Heater Power
+5—Furnished by others

11. HOT GAS DEFROST

KGE Models



Reverse Cycle (2 pipe) systems distribute compressor discharge gas thru the suction line during defrost. Defrost condensate is relieved thru a check valve, bypassing the TEV and LSV, to the liquid line which is reduced in pressure.

Sweat 1/2 ODS by-pass check valves are provided for field assembly with each unit. Defrost cycles are time clock initiated and terminated. A factory mounted pressure switch; senses the rise in suction line pressure; cycles fans off and energizes a drain pan stainless steel tubular heater. A temperature sensing Klixon; located in a coil return bend; senses when the coil has been re-cooled after termination; and cycles the fans on. Pan heaters will have been deenergized by the pressure switch.

All models require one 15 amp, 115 or 208-230/1/50-60 circuit adequately protected.

SEQUENCE

A. The power supply to the unit cooler is continuous.

B. The hot gas is supplied to the unit via the suction line. A factory mounted pressure switch senses a rise in suction pressure. The SPDT pressure switch shuts off the fan motors and energizes the drain pan heater circuit with the rise in pressure.

C. As the coil defrosts, its temperature rises and contact on the fan delay thermostat breaks.

D. When the defrost is complete and the hot gas supply is stopped, the pressure lowers, resetting the pressure switch de-energizing the drain pan heater circuit.

E. When the coil temperature reaches +25°F contact on the fan delay thermostat makes, starting the fan motors.

HEATER SPECIFICATIONS				MOTOR	
		115/60/1	230/60/1	115/60/1	230/60/1
MODEL	• TOTAL NOM. WATTS	TOTAL NOM. AMPS	• TOTAL NOM. AMPS	TOTAL NOM. AMPS	• TOTAL NOM. AMPS
SK-1 FAN—KGE	300	2.6	1.3	1.6	0.8
SK-S FAN—KGE	500	4.4	2.2	3.2	1.6
SK-2 FAN—KGE	600	5.2	2.6	3.2	1.6
SK-3 FAN—KGE	800	7.0	3.5	4.8	2.4
SK-4 FAN—KGE	1000	8.7	4.4	6.4	3.2
SK-5 FAN—KGE	1100	9.6	4.8	8.0	4.0
SK-6 FAN—KGE	1400	12.2	6.1	9.6	4.8

CORRECTION FACTORS •

	240/60/1	208/60/1	220/60/1
WATTAGE	1.09	0.82	0.91
AMPERAGE	1.04	0.90	0.96

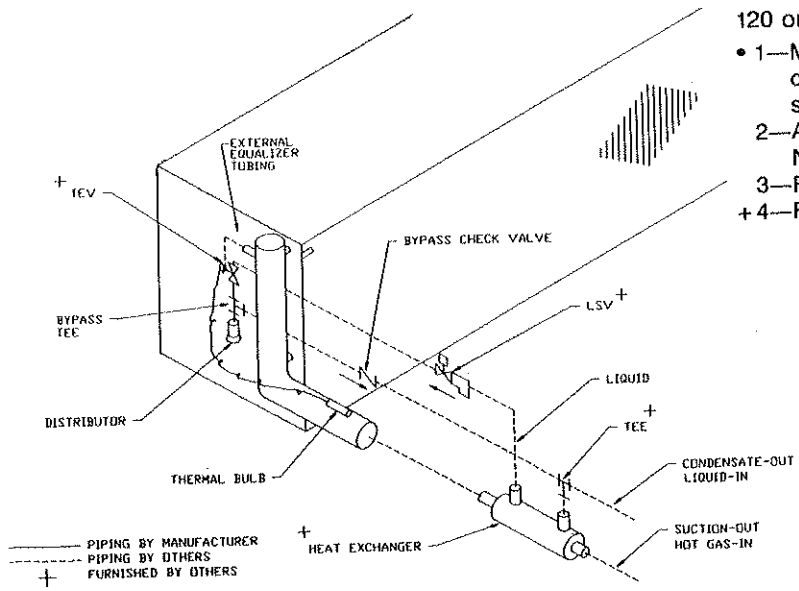
120 or 208-240V/60/1 Motors — 115 or 230/60/1 Heater

• 1—Multiply 230V nominal heater wattage and amperage listed by correction factor to get wattage and amperage at other power supply.

2—All wiring components and enclosures are in accordance with NEMA-1 standards.

3—Fan delay set 25°F adj. ±6°F R-B makes on temperature fall.

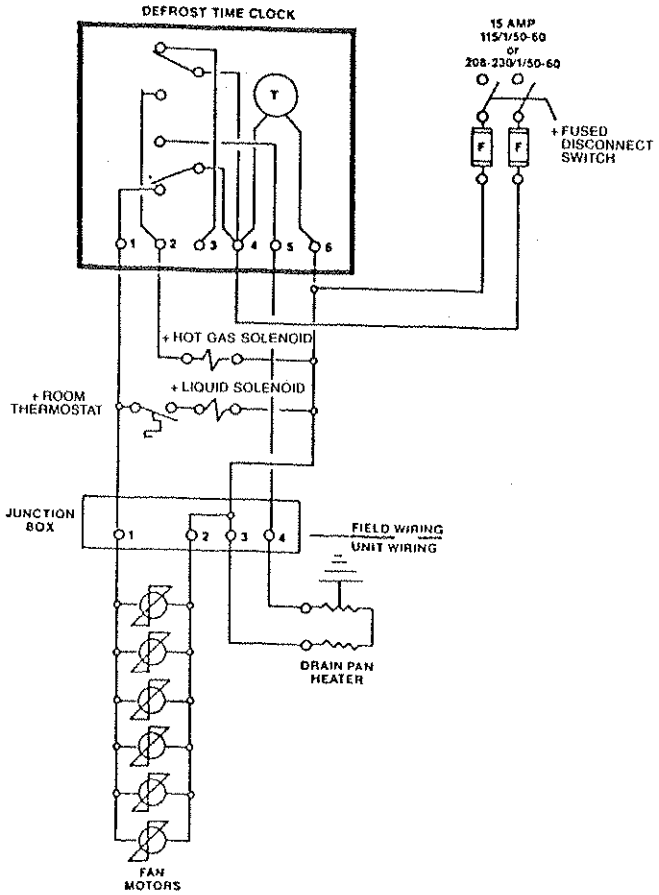
+ 4—Furnished by others



KG OR KGE MODEL

12. HOT GAS DEFROST

HGE Models



Three pipe systems distribute compressor discharge gas in a separate hot gas line, controlled by a solenoid valve, thru a check valve to the liquid distributor tee inlet. Defrost condensate and gas blow-by is collected in a suction trap which may meter liquid to the compressor suction.

Defrost cycles are time clock initiated and terminated. The clock cycles fan motors, drain pan heaters, liquid and hot gas solenoids. Suction pressure control may be required to maintain defrost pressure above 40°F or to control compressor crankcase pressure.

SEQUENCE

A. Upon initiation of pumpout, timer contact between 4 and 1 open de-energizing the liquid solenoid and the fan motors. Contact 4 and 5 make energizing the drain pan heater during this period. The compressor pumps the refrigerant out of the coil.

B. Upon initiation of hot gas timer contact between 4 and 2 make energizing the hot gas solenoid, discharging hot gas into the coil through a check valve to the liquid distributor side port.

C. Upon initiation of vent down timer contact between 4 and 2 open de-energizing the hot gas solenoid. During this period the coil pressure will vent down to compressor suction pressure.

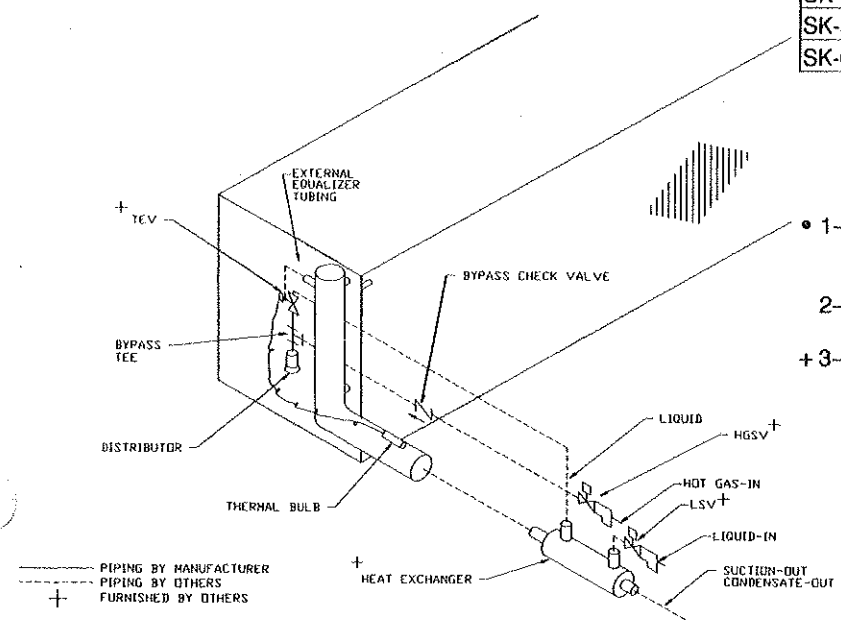
D. Upon termination of vent down timer contact between 4 and 5 open de-energizing the drain pan heater. Contact between 4 and 1 close opening the liquid line solenoid and starting the fan motors.

HEATER SPECIFICATIONS				MOTOR	
		115/60/1	230/60/1	115/60/1	230/60/1
MODEL	• TOTAL NOM. WATTS	TOTAL NOM. AMPS	• TOTAL NOM. AMPS	TOTAL NOM. AMPS	• TOTAL NOM. AMPS
SK-1 FAN—KGE	300	2.6	1.3	1.6	0.8
SK-S FAN—KGE	500	4.4	2.2	3.2	1.6
SK-2 FAN—KGE	600	5.2	2.6	3.2	1.6
SK-3 FAN—KGE	800	7.0	3.5	4.8	2.4
SK-4 FAN—KGE	1000	8.7	4.4	6.4	3.2
SK-5 FAN—KGE	1100	9.6	4.8	8.0	4.0
SK-6 FAN—KGE	1400	12.2	6.1	9.6	4.8

CORRECTION FACTORS •

	240/60/1	208/60/1	220/60/1
WATTAGE	1.09	0.82	0.91
AMPERAGE	1.04	0.90	0.96

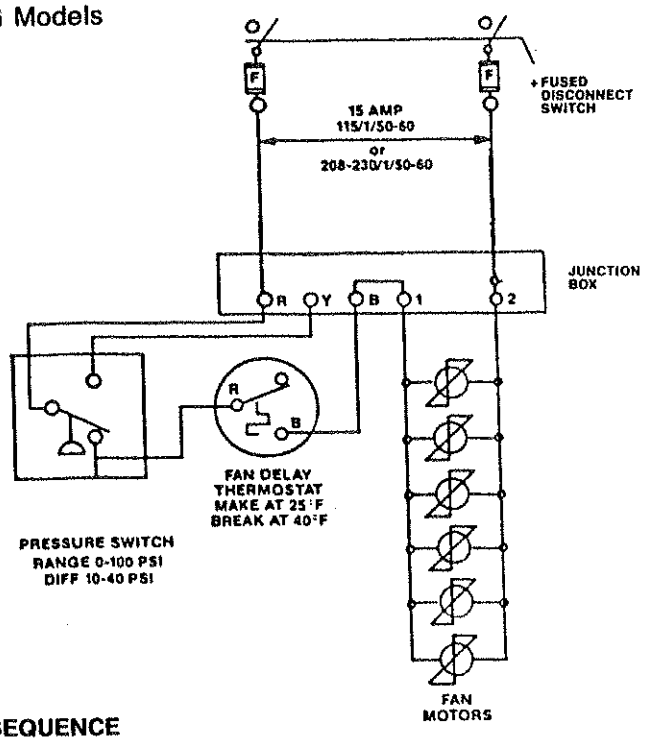
• 1—Multiply 230V nominal heater wattage and amperage listed by correction factor to get wattage and amperage at other power supply.
2—All wiring components and enclosures are in accordance with NEMA-1 standards.
+ 3—Furnished by others.



HG OR HGE MODEL

13. HOT GAS DEFROST

KGG Models



Reverse Cycle (2 pipe) systems distribute compressor discharge gas thru the suction line during defrost. Defrost condensate is relieved thru a check valve, bypassing the TEV and LSV, to the liquid line which is reduced in pressure.

Sweat 1/2 ODS by-pass check valves are provided for field assembly with each unit. Defrost cycles are time clock initiated and terminated. A factory mounted pressure switch; senses the rise in suction line pressure and cycles fans off.

A temperature sensing klixon; located in a coil return bend; senses when the coil has been re-cooled after termination; and cycles the fans on.

All models require one 15 amp, 115 or 208-230/1/50-60 circuit adequately protected.

SEQUENCE

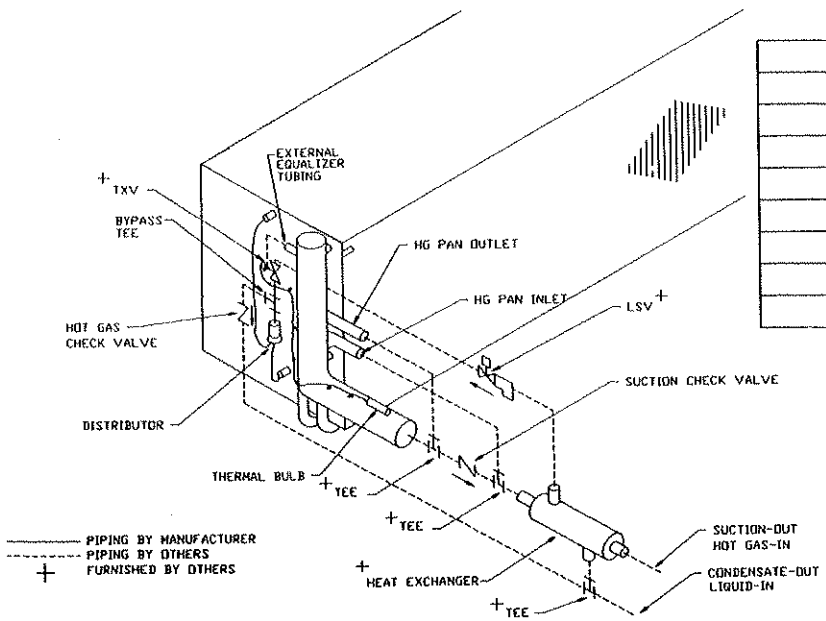
A. The power supply to the unit cooler is continuous.

B. The hot gas is supplied to the unit via the suction line. A factory mounted pressure switch senses a rise in suction pressure. The SPDT pressure switch shuts off the fan motors with the rise in pressure.

C. As the coil defrosts, its temperature rises and contact on the fan delay thermostat breaks.

D. When the defrost is complete and the hot gas supply is stopped, the pressure lowers, resetting the pressure switch circuit.

E. When the coil temperature reaches +25°F contact on the fan delay thermostat makes, starting the fan motors.

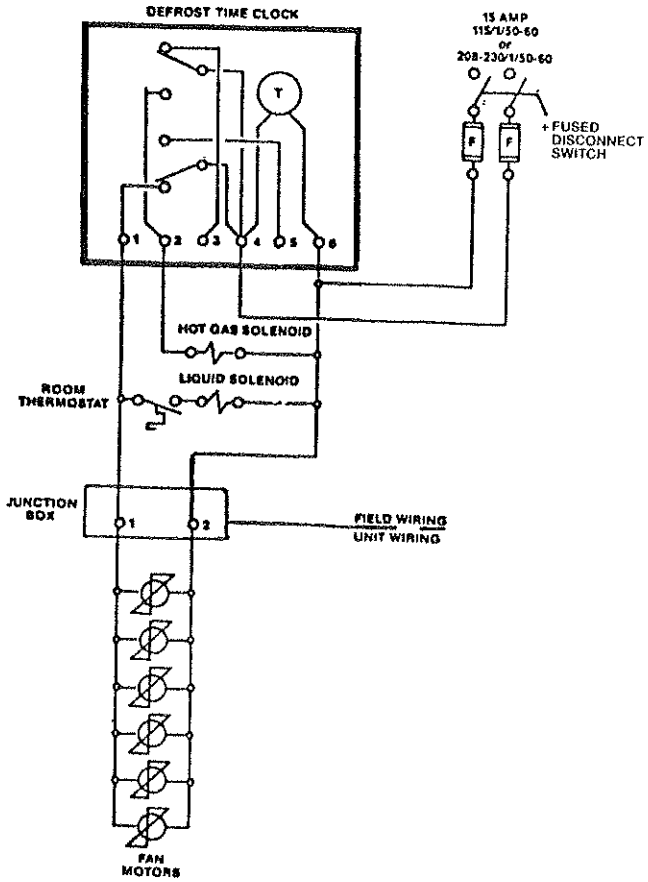


KGG MODEL

UNIT TOTAL F.L.A.		
MODEL	115/60/1	230/60/1
SK-1 FAN—KGG	1.6	0.8
SK-S FAN—KGG	3.2	1.6
SK-2 FAN—KGG	3.2	1.6
SK-3 FAN—KGG	4.8	2.4
SK-4 FAN—KGG	6.4	3.2
SK-5 FAN—KGG	8.0	4.0
SK-6 FAN—KGG	9.6	4.8

14. HOT GAS DEFROST

HGG Models



Three pipe systems distribute compressor discharge gas in a separate hot gas line, controlled by a solenoid valve, thru a check valve to the liquid distributor tee inlet. Defrost condensate and gas blow-by is collected in a suction trap which may meter liquid to a semi-hermetic compressor suction.

Defrost cycles are time clock initiated and terminated. The clock cycles fan motors, liquid and hot gas solenoids. Suction pressure control may be required to maintain defrost pressure above 40°F or to control compressor crankcase pressure.

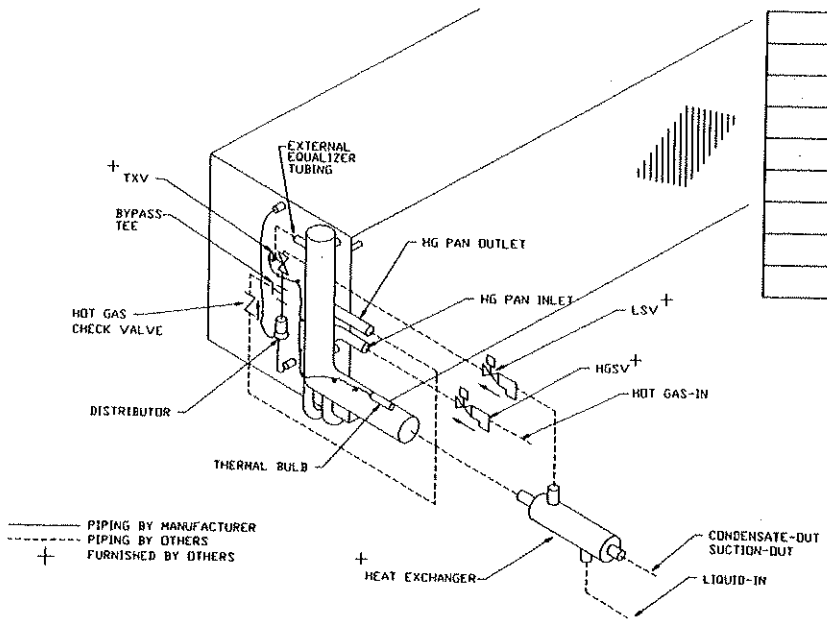
SEQUENCE

A. Upon initiation of pumpout, timer contact between 4 and 1 open de-energizing the liquid solenoid and the fan motors.

B. Upon initiation of hot gas timer contact between 4 and 2 make energizing the hot gas solenoid, discharging hot gas into inlet of hot gas drain pan coil through the hot gas check valve to the coil hot gas bypass tee connection.

C. Upon initiation of vent down timer contact between 4 and 2 open de-energizing the hot gas solenoid. During this period the coil pressure will vent down to compressor suction pressure.

D. Upon termination of vent down timer contact between 4 and 1 close opening the liquid line solenoid and starting the fan motors.



HGG MODEL

UNIT TOTAL F.L.A.		
MODEL	115/60/1	230/60/1
SK-1 FAN—HGG	1.6	0.8
SK-S FAN—HGG	3.2	1.6
SK-2 FAN—HGG	3.2	1.6
SK-3 FAN—HGG	4.8	2.4
SK-4 FAN—HGG	6.4	3.2
SK-5 FAN—HGG	8.0	4.0
SK-6 FAN—HGG	9.6	4.8

MAINTENANCE:

CAUTION: DISCONNECT ALL ELECTRICAL POWER BEFORE SERVICING.

15. **FAN MOTOR AND FAN BLADE REPLACEMENT**

(b) Referring to Fig. 3, unfasten 3 - 10-32 acorn cap nuts that hold the fan guard to the face of the housing.

(b) Remove the 3 - 10 flat washers from the legs of the motor mount and take off the motor fan guard.

(c) Loosen the 10-32 set screw on hub of fan blade and remove the fan blade.

(d) Unplug motor from the harness.

(e) Hold the motor with one hand and remove the 3 - 10-32 screws that hold the motor to the motor mounting bracket. Take care not to lose the 6 - cup washers.

(f) Remove the motor through the orifice outlet.

(g) Remove the rubber grommet from the motor and save.

(h) Install new motor by reversing removal sequence.

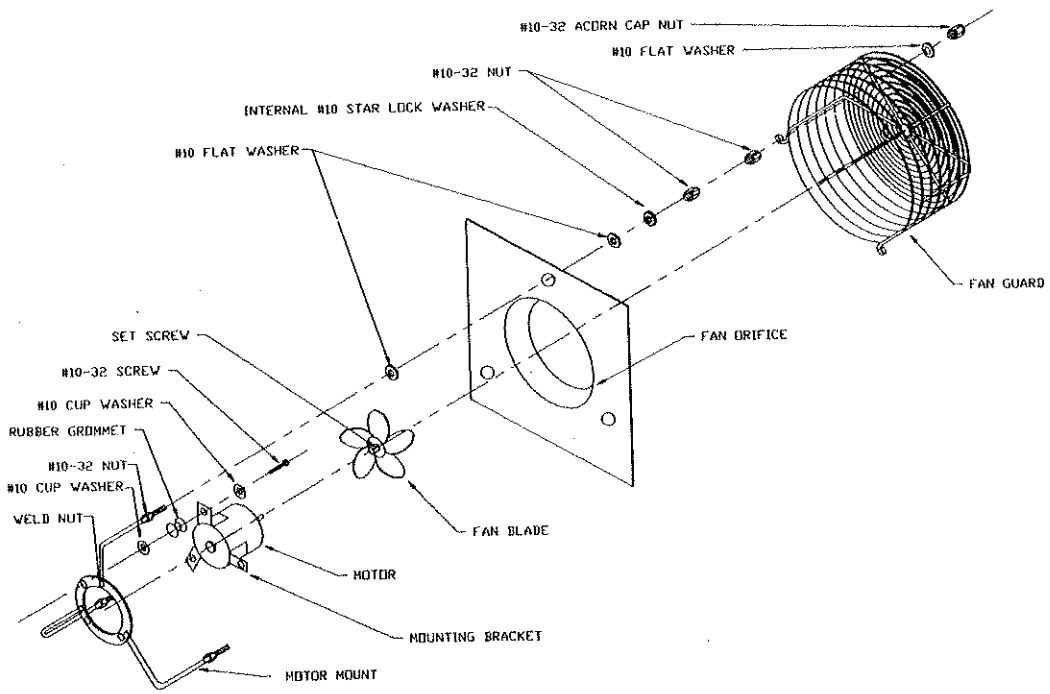


Fig. 3

CAUTION: DISCONNECT ALL POWER BEFORE SERVICING.

16. **FACE HEATER REPLACEMENT:**

REMOVAL:

1. Remove right and left coil end covers.
2. Remove heater retaining clips. Use needle nose pliers.
3. Remove heater support bracket located at left side of the coil (viewed when looking at the coil face).
4. Disconnect heater wiring at both ends.
5. Remove heater from coil.

INSTALLATION:

1. Move identification tag from old heater to new heater.
2. Install new heater by reversing removal sequence.

LOWER COIL HEATERS:

REMOVAL:

1. Disconnect drain line.
2. Lower drain pan.
3. Disconnect heater wiring at both ends.
4. While preventing heater from falling, use needle nose pliers to remove heater retaining clips.
5. Remove heater from slot in the fins.

REPLACEMENT:

1. Move identification tag from old heater to new heater.
2. Install new heater by reversing removal sequence. Make sure heater is in the same slot formerly occupied by the replaced heater.

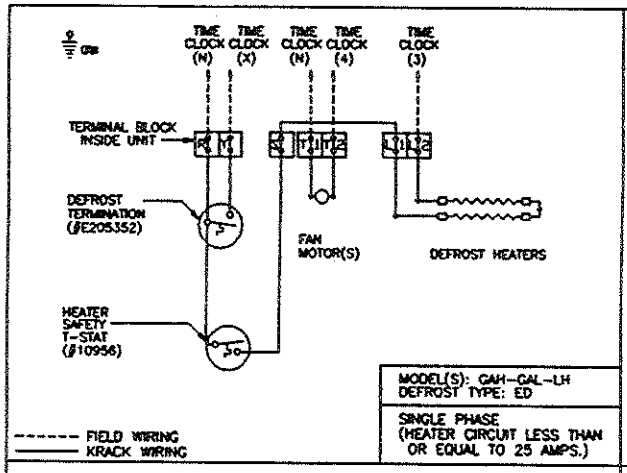
17. SK UNIT COOLERS REPLACEMENT PARTS LIST

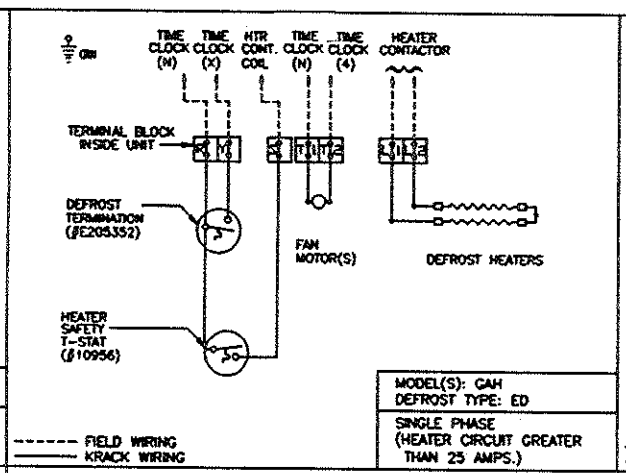
ITEM	DESCRIPTION	MODEL AND QUANTITY SK-1	SK-S	SK-2	SK-3	SK-4	SK-5	SK-6	PART #
1	115V Motor	1	2	2	3	4	5	6	11528
2	230V Motor	1	2	2	3	4	5	6	11529
3	Fan Blade	1	2	2	3	4	5	6	E102011
4	Fan Guards								
	Plastic	1	2	2	3	4	5	6	66391
	Wire	1	2	2	3	4	5	6	E201904
5	Defrost Cntrl								
	Ed Thermostat	1	1	1	1	1	1	1	E205004
	KGE Safety	1	1	1	1	1	1	1	10956
	KGE Fan Delay	1	1	1	1	1	1	1	E201818
6	Coil Heaters Ed Models								
	115/230 V	6							E101930
			6						E102024
				6					E101931
					6				E101932
						6			E101933
							6		E101934
								6	E101935
	460V	6							E101936
			6						E102025
				6					E101937
					6				E101938
						6			E101939
							6		E101940
								6	E101941
7	Check Valve								
	KGE, HGE or HGG	1	1	1	1	1	1	1	11852
	KGG	2	2	2	2	2	2	2	11852

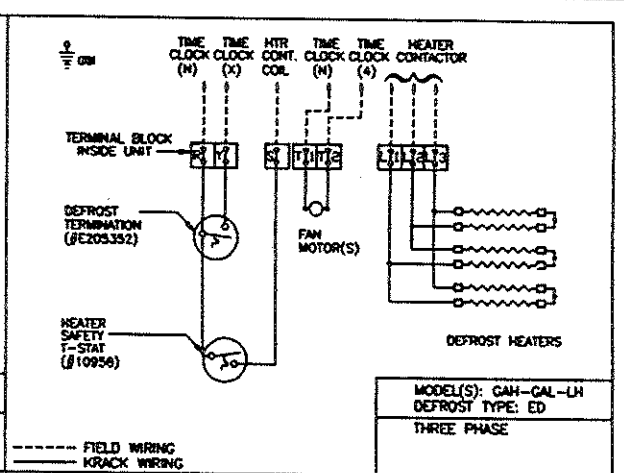
17. (CONTINUED)

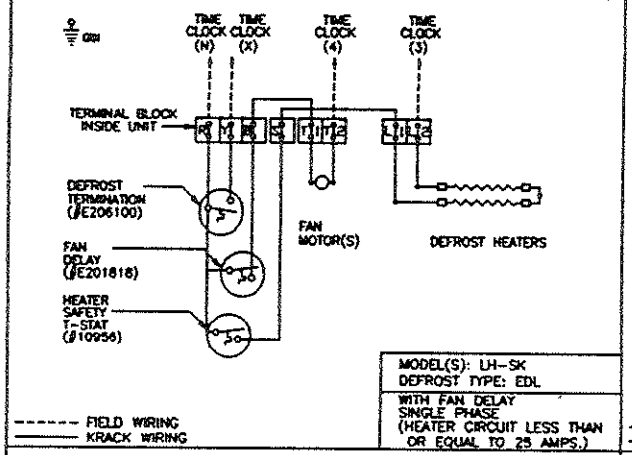
MODEL AND QUANTITY

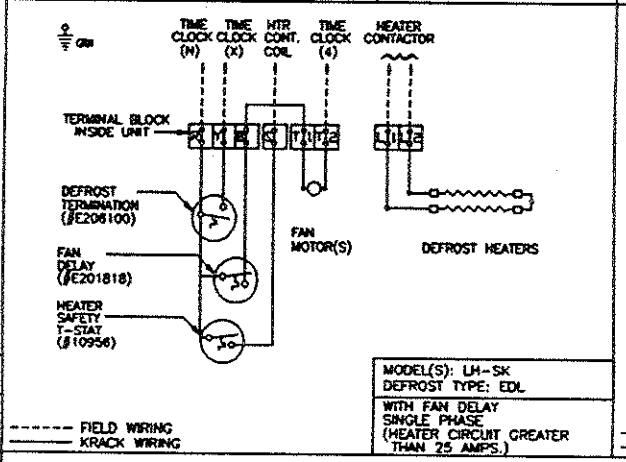
ITEM	DESCRIPTION		SK-1	SK-S	SK-2	SK-3	SK-4	SK-5	SK-6	PART #
8	Press Switch KGE Only		1	1	1	1	1	1	1	10928
9	Drain Pan Heater									
	KGE OR HGE	115V	1							E201883
				1						E201886
					1					E201889
						1				E201892
							1			E201895
								1		E201898
									1	E201901
		230V	1							E201884
				1						E201905
					1					E201890
						1				E201893
							1			E201896
								1		E201899
									1	E201902

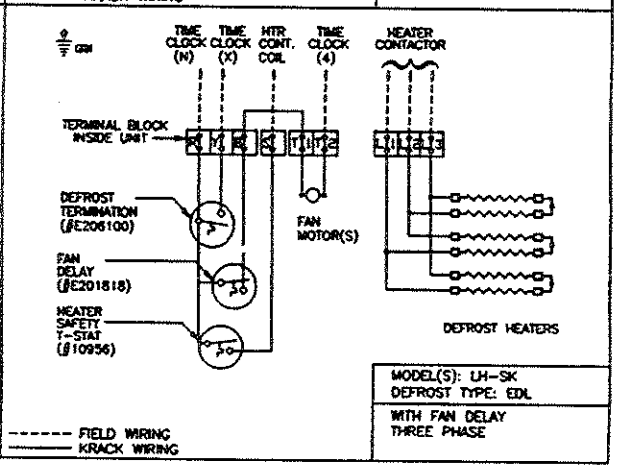


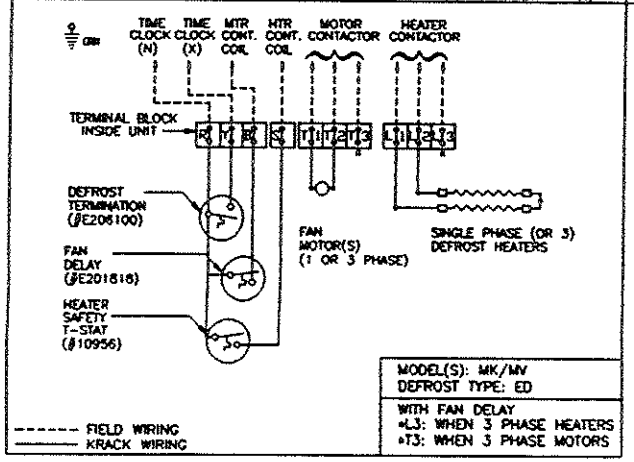












NOTES:

1. THIS DRAWING REPRESENTS THE NEW STANDARD DEFROST CONTROL SYSTEM TO REPLACE THE ONE SHOWN IN FIGURE '1.'
2. EXAMINE THE MODEL AND DEFROST TYPE LOCATED IN THE LOWER RIGHT-HAND CORNER TO SEE WHICH DIAGRAM IS NEEDED FOR REFERENCE.
3. PART NUMBERS ARE PROVIDED IN CASE REPLACEMENT PARTS ARE NEEDED.
4. FIGURE '1' CAN BE REFERENCED IN THE FOLLOWING OPERATING AND INSTALLATION INSTRUCTION LOCATIONS:

MODEL	LOCATION
GAH/GAL	PAGE 3&4
LH	PAGE 4
MK	PAGE 11&12 UNIT WIRING
SK	SECTION 9&10

5. IN REGARD TO GAH/GAL AND LH-ED PRODUCT LINES, THE ONLY REVISION WAS ADDING A HEATER SAFETY T-STAT.

NOTICE

REFER TO UNIT WIRING DIAGRAMS FOR ACTUAL INTERNAL MOTOR AND HEATER WIRING.

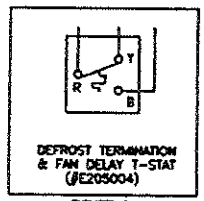


FIGURE 1.

WORK TO DIMENSIONS - DO NOT SCALE DRAWING

NO.	CHANGE DESCRIPTION	DATE	CKD
2	REVISED HEATER SAFETY THERMOSTAT TO SHOW OPEN ON TEMP. RISE	07-21-1994	SR
1	RELEASED	07-13-1994	SR

REVISIONS

TOLERANCES
UNLESS OTHERWISE SPECIFIED THE FOLLOWING TOLERANCES APPLY
ANGULAR ± DECIMAL ±
TOLERANCES ARE NOT CUMULATIVE

ASSEMBLY | TOOL ROOM | TOOLING (HCL) | COIL/COND. | SHEET METAL

MATERIAL: AS SPECIFIED

DRAWN BY: S.R. | CKD. BY: | APPROVED BY: | SUPERVISOR:
DATE: 07/21/94 | SCALE: SHEET = 1.000" | NO. REVS: | FINISH:

TITLE: CATALOG DEFROST CONTROL SYSTEM DWG

MODEL: GAH/L, LH, MK, & SK

KRACK CORP.

PART NO. E105576 | REV. 2