

INSTALLATION INSTRUCTIONS

MODELS

18ECQ2	31ECQ2	42ECQ1
18ECS2	31ECS2	42ECS1
24ECQ4	36ECQ5	48ECQ2
24ECS4	36ECS5	48ECS2
30ECQ4	37ECQ1	60ECQ1
30ECS4	37ECS1	60ECS1

SPLIT AIR CONDITIONER
OUTDOOR SECTION

FOR USE WITH:
MATCHING INDOOR BLOWER
COIL UNITS AND MATCHING
ADD ON COIL UNITS ONLY

APPLICATION AND INSTALLATION INSTRUCTIONS

GENERAL

These instructions explain the recommended method to install the pre-charged air cooled remote type condensing unit, the inter-connecting refrigerant tubing and the electrical wiring connections to the unit.

The condensing units are to be used in conjunction with the matching evaporator coil for comfort cooling applications as shown in the specification sheet.

These instructions and any instructions packaged with any separate equipment required to make up the entire air conditioning system should be carefully read before beginning the installation. Note particularly "Starting Procedure" and any tags and/or labels attached to the equipment.

While these instructions are intended as a general recommended guide, they do not supersede any national and/or local codes in any way. Authorities having jurisdiction should be consulted before the installation is made.

SHIPPING DAMAGE

Upon receipt of equipment, the carton should be checked for external signs of shipping damage. If damage is found, the receiving party must contact the last carrier immediately, preferably in writing, requesting inspection by the carrier's agent.

INSTALLATION

Size of unit for a proposed installation should be based on heat loss calculation made according to methods of National Warm Air Heating and Air Conditioning Association. The air duct should be installed in accordance with the Standards of the National Fire Protection Association for the Installation of Air Conditioning and Ventilating Systems of Other Than Residence Type, NFPA No. 90A, and Residence Type Warm Air Heating and Air Conditioning Systems, NFPA No. 90B. Where local regulations are at a variance with instructions, installer should adhere to local codes.

LOCATION

The condensing unit (outdoor unit) must be located in an area having good air circulation and set where the hot discharge air from the unit will not be recirculated into the condensing coil. Figure 1 illustrates the recommended clearances for unrestricted airflow and service access.

MOUNTING UNIT OUTSIDE ON SLAB

A solid level base or platform, capable to support the unit's weight, must be set at the outdoor unit predetermined location. The base should be at least two inches larger than the base dimensions of the unit and at least two inches higher than the surrounding grade level. The required unit minimum installed clearances must be maintained as called out in Figure 1 when locating and setting the base.

Remove the unit from its shipping carton and position the unit on the prepared base or platform.

Do not attach the unit or its base to the building structure to avoid the transmission of noise into the occupied area.

NOTE: These units employ internally sprung compressors; therefore, it is not necessary to remove or loosen the base mounting bolts on the compressor prior to operation.

Consideration should be given to the electrical and tubing connections when placing the unit to avoid unnecessary bends or length of material.

WIRING

All wiring must be installed in accordance with the National Electrical Code and local codes. Power supply voltage must conform to the voltage shown on the unit serial plate. A wiring diagram of the unit is attached to the inside of the electrical cover. The power supply shall be sized and fused according to the specifications supplied. A ground lug is supplied in the control compartment for equipment ground.

The control circuit is a 24 volt circuit. "Typical" wiring diagrams illustrating some of the various circuits which could be encountered can be found later in the manual.

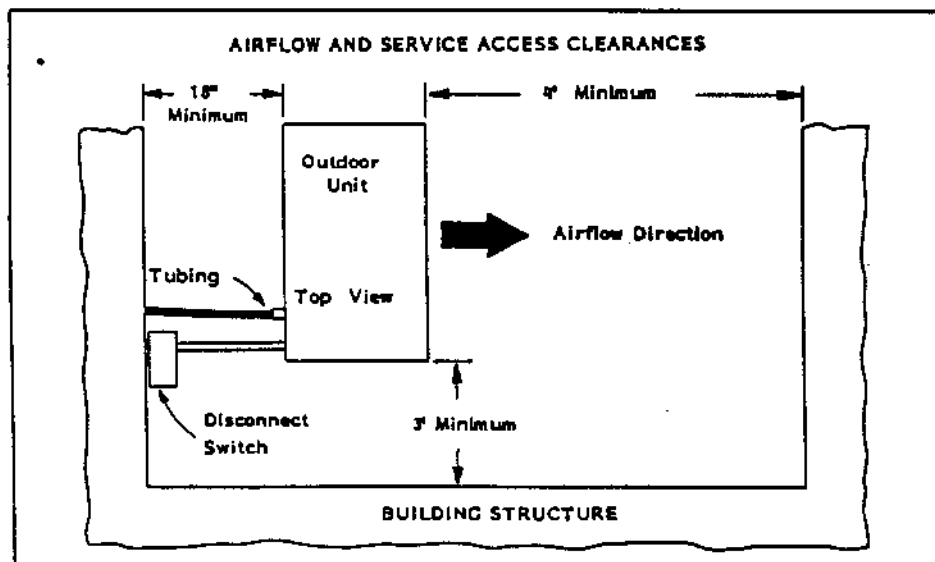


FIGURE 1.

The unit rating plate lists a "Maximum Time Delay Fuse" or "HACR Type" circuit breaker that is to be used with the equipment. The correct size must be used for proper circuit protection and also to assure that there will be no nuisance tripping due to the momentary high starting current of the compressor motor.

When matching with a B-model blower coil unit, refer to the installation instructions with that indoor unit for 24V wiring information.

PRESSURE SERVICE PORTS

High and low pressure service ports are installed on all units so that the system operating pressures can be observed. Pressure curves can be found later in the manual covering all models. It is imperative to match the correct pressure curve to the unit by model number.

The pressure service ports on the split system air conditioners are located on the inter-connecting tubing quick connect fittings or base valves.

CRANKCASE HEATERS

All units are provided with some form of compressor crankcase heat. Some single phase units utilize the compressor motor start winding in series with a portion of the run capacitor to generate heat within the compressor shell to prevent liquid refrigerant migration.

Some three phase units utilize a wraparound type of crankcase heater that warms the compressor oil from the outside.

Some single and three phase models have an insertion well-type heater located in the lower section of the compressor housing. This is a self-regulating type heater that draws only enough power to maintain the compressor at a safe temperature.

Some form of crankcase heat is essential to prevent liquid refrigerant from migrating to the compressor, causing oil pump out on compressor start-up and possible valve failure due to compressing a liquid.

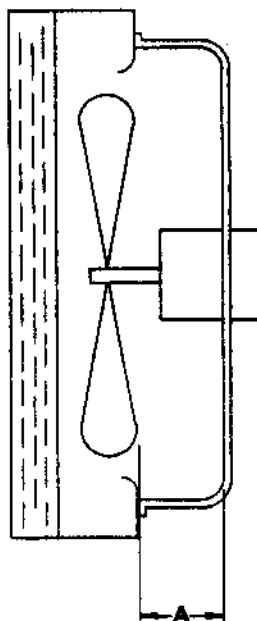
Refer to unit wiring diagram to find exact type of crankcase heater used.

The following decal is affixed to all outdoor units detailing start-up procedure. This is very important. Please read carefully.

FAN BLADE SETTING DIMENSIONS

Shown in the drawing below are the correct fan blade setting dimensions for proper air delivery across the outdoor coil.

Any service work requiring removal or adjustment in the fan and/or motor area will require that the dimensions below be checked and blade adjusted in or out on the motor shaft accordingly.



MODEL	DIM. A
All	1/2"

IMPORTANT INSTALLER NOTE:

For improved start-up performance, wash the indoor coil with a dishwasher detergent.

IMPORTANT

THESE PROCEDURES MUST BE FOLLOWED AT INITIAL START-UP AND AT ANY TIME POWER HAS BEEN REMOVED FOR 12 HOURS OR LONGER.

TO PREVENT COMPRESSOR DAMAGE WHICH MAY RESULT FROM THE PRESENCE OF LIQUID REFRIGERANT IN THE COMPRESSOR CRANKCASE

1. MAKE CERTAIN THE ROOM THERMOSTAT IS IN THE "OFF" POSITION (THE COMPRESSOR IS NOT TO OPERATE).
2. APPLY POWER BY CLOSING THE SYSTEM DISCONNECT SWITCH. THIS ENERGIZES THE COMPRESSOR HEATER WHICH EVAPORATES THE LIQUID REFRIGERANT IN THE CRANKCASE.
3. ALLOW 4 HOURS OR 90 MINUTES PER POUND OF REFRIGERANT IN THE SYSTEM AS NOTED ON THE UNIT RATING PLATE WHICHEVER IS GREATER.
4. AFTER PROPERLY ELAPSED TIME THE THERMOSTAT MAY BE SET TO OPER THE COMPRESSOR.
5. EXCEPT AS REQUIRED FOR SAFETY WHILE SERVICING - DO NOT OPEN SYSTEM DISCONNECT SWITCH.

7961-061

ELECTRICAL DATA							
Model	Electrical Rating	Operating Voltage Range	Total Unit Amps ①	Minimum Circuit Ampacity	Maximum Overcurrent Protection ②	60°C Copper Wire Size	Copper Ground Wire Size
18ECQ,S2	230/208-60-1	197-253	11.6	15	20	#14	#14
24ECQ,S4	230/208-60-1	197-253	12.1	15	25	#14	#14
30ECQ,S4	230/208-60-1	197-253	16	22	35	#10	#10
31ECQ,S2	230/208-60-1	197-253	15	20	30	#12	#12
36ECQ,S5	230/208-60-1	197-253	22	29	50	#10	#10
37ECQ,S1	230/208-60-1	197-253	19	26	40	#10	#10
	230/208-60-3	187-253	13	18	30	#12	#12
	460-60-3	414-506	7.7	15	20	#14	#14
42ECQ,S1	230/208-60-1	197-253	24.3	30	50	#10	#10
	230/208-60-3	187-253	16.8	21	30	#10	#10
	460-60-3	414-506	9.4	15	20	#14	#14
48ECQ,S2	230/208-60-1	197-253	25.8	32	50	#8	#10
	230/208-60-3	187-253	19.3	24	35	#10	#10
	460-60-3	414-506	11.4	16	25	#12	#12
60ECQ,S1	230/208-60-1	197-253	31.8	39	60	#8	#10
	230/208-60-3	187-253	22.8	28	45	#10	#10
	460-60-3	414-506	9.2	15	15	#14	#14

① Compressor and outdoor motor. ② Time Delay Fuse or HACR Type Circuit Breaker.

If this unit is operated in cooling below a 65° outdoor ambient temperature, the installation of low ambient control (LAC-1) to unit is required.

REFRIGERANT CHARGE

To obtain maximum rated capacity and efficiency, the system charge may have to be adjusted at installation to obtain a suction line temperature (6" from compressor) as shown in the following table.

Outdoor Unit	Indoor Unit	95°F O.D. Temp.	82°F O.D. Temp.
18ECQ,S2	18QS3	55 - 57	65 - 67
	2ACQ1	48 - 50	57 - 59
	B18EHQ1	58 - 60	63 - 65
24ECQ,S4	B24EHQ1	58 - 60	62 - 64
	24QS1	50 - 52	56 - 58
	2ACQ1	44 - 46	50 - 52
30ECQ,S4	B24EHQ1	50 - 52	56 - 58
	B18EHQ1	50 - 52	56 - 58
	3ACQ3	48 - 50	60 - 62
31ECQ,S2	3HCQ1	52 - 54	64 - 66
	B36EHQ1	52 - 54	63 - 65
	B30EHQ	54 - 56	58 - 60
31ECQ,S2	3ACQ3	47 - 49	58 - 60
	3HCQ1	54 - 56	67 - 69
	B36EHQ1	50 - 52	61 - 63
36ECQ,S5	B30EHQ	46 - 48	57 - 59
	3ACQ3	52 - 54	60 - 62
	3HCQ1	56 - 58	63 - 65
37ECQ,S1	B36EHQ1	52 - 54	63 - 65
	3ACQ3	45 - 47	55 - 57
	3HCQ1	55 - 57	65 - 67
42ECQ,S1	B36EHQ1	52 - 54	63 - 65
	4ACQ2	47 - 49	59 - 61
	5ACQ1	50 - 52	53 - 55
48ECQ,S2	4HCQ	55 - 57	63 - 65
	BC48A	51 - 53	55 - 57
	4ACQ2	52 - 54	62 - 64
60ECQ,S1	5ACQ1	50 - 52	52 - 54
	5HCQ	56 - 58	66 - 68
	BC48A	53 - 55	60 - 62
60ECQ,S1	5ACQ1	50 - 52	59 - 61
	5HCQ	49 - 51	58 - 60
	BC48A	55 - 57	63 - 65
60ECQ,S1	BC68A	48 - 50	58 - 60

The above suction line temperatures are based upon 80°F dry bulb/67° wet bulb (50% R.H.) temperature and rated airflow across the evaporator during cooling cycle.

TABLE 2

RATED CFM AND AIRFLOW DATA (WET COIL - COOLING)						
Outdoor Unit Model	Indoor Coil Model	Rated CFM	Pressure Drop in H ₂ O (1)	Rated E.S.P. (2)	Recommended Air Flow Range	
18ECQ,S2	18QS3	600	.30		540 - 660	
	2ACQ1	640	.20	.30	575 - 705	
	B18EHQ1	650		.30	585 - 715	
	B24EHQ1	650			585 - 715	
24ECQ,S4	24QS1	870	.30		780 - 960	
	2ACQ1	870	.30	.10	780 - 960	
	B24EHQ1	800		.10	720 - 880	
	B18EHQ1	800			720 - 880	
30ECQ,S4	3ACQ3	1100	.28		990 - 1210	
	3HCQ1	1035	.30	.50 (3)	900 - 1150	
	B36EHQ1	1050		.10	945 - 1155	
	B30EHQ	800			720 - 880	
31ECQ,S2	3ACQ3	1050	.25		940 - 1160	
	3HCQ1	1035	.30	.55 (3)	900 - 1150	
	B36EHQ1	1000		.10	900 - 1150	
	B30EHQ	800			720 - 880	
36ECQ,S5	3ACQ3	1180	.30		1060 - 1300	
	3HCQ1	1000	.30	.40	900 - 1100	
	B36EHQ1	1275			1150 - 1400	
	3ACQ3	1180	.30		1060 - 1300	
37ECQ,S1	3HCQ1	1000	.30	.50	900 - 1100	
	B36EHQ1	1200			1080 - 1320	
	4ACQ2	1450	.25		1300 - 1600	
	5ACQ1	1600	.14		1440 - 1760	
42ECQ,S1	4HCQ	1500	.30		1350 - 1650	
	BC48A	1575		.40	1420 - 1730	
	4ACQ2	1690	.30		1520 - 1860	
	5ACQ1	1800	.18		1620 - 1980	
48ECQ,S2	4HCQ	1600	.30		1440 - 1760	
	BC48A	1725		.30	1550 - 1900	
	5ACQ1	1990	.28		1790 - 2190	
	5HCQ	1650	.30	.30	1485 - 1815	
60ECQ,S1	BC48A	1625		.30	1460 - 1790	
	BC68A	1800		.30	1590 - 1950	

- (1) Measured across the evaporator coil assembly, including drain pan.
- (2) External static pressure available for the duct system—supply and return. All blower coil models have multi-speed motors, and value shown is at recommended speed. Consult specification airflow charts for complete information as to other speeds available.
- (3) Rated external static pressure on low speed.

TABLE 1

INSTALLING REFRIGERANT TUBING

(PRE-CHARGED - Applicable to "Q" Models)

PRE-CHARGED TUBING - Examine carefully the two lengths of pre-charged tubing furnished with the unit. The larger is the suction line. The smaller is the liquid line. The end of the tubing with the hex nut and gauge port is to be attached to the condensing unit.

Unroll the tubing, being careful not to kink, and install it between the condensing unit and the evaporator coil.

CAUTION: Be careful not to tear the insulation when pushing it through holes in masonry or frame walls.

When sealing tube opening in house wall use a soft material to prevent tube damage and vibration transmission.

Before fastening either end, use a tubing bender to make any necessary bends in the tubing. **AVOID EXCESSIVE BENDING IN ANY ONE PLACE TO AVOID KINKING.**

Start connecting the tubing at the evaporator coil end, first remove the protective caps and plugs from the quick-connect fittings on the evaporator coil and the pre-charged tubing. Inspect fittings and clean if necessary, making sure they are clear of foreign materials. If you clean the fittings, lubricate them with refrigeration oil. Connect both tubes to the fittings on the coil and draw up by hand.

When necessary to bend the insulated tube, suction line, cut the insulation around its circumference at a distance far enough beyond the point of the bend so as to clear the tubing bender.

Slip the insulation back together and vapor seal the joint with tape.

NOTE: The maximum distance for pre-charge tubing between the condenser and the evaporator is 45 feet.

CAUTION: Prior to connecting the pre-charged tubing to the evaporator coil or condensing unit, be sure all bends have been made, then coil any excess tubing in a horizontal plane, with the slope of the tubing toward the condensing unit.

CAUTION: Be sure to hold the coupling firmly to prevent movement of the coupling and tubing. Failure to do so could tear out the diaphragm causing a blockage of the system.

CAUTION: After starting to tighten up the fitting never try to back it off or take it apart.

For connecting the tubing at the condensing unit end, first remove the protective caps and plugs from the quick-connect fittings on the condensing unit and the pre-charged tubing. Inspect fittings and clean if necessary, making sure they are clear of foreign materials. If you clean the fittings, lubricate them with refrigeration oil. Connect both tubes to the fittings on the coil and draw up by hand.

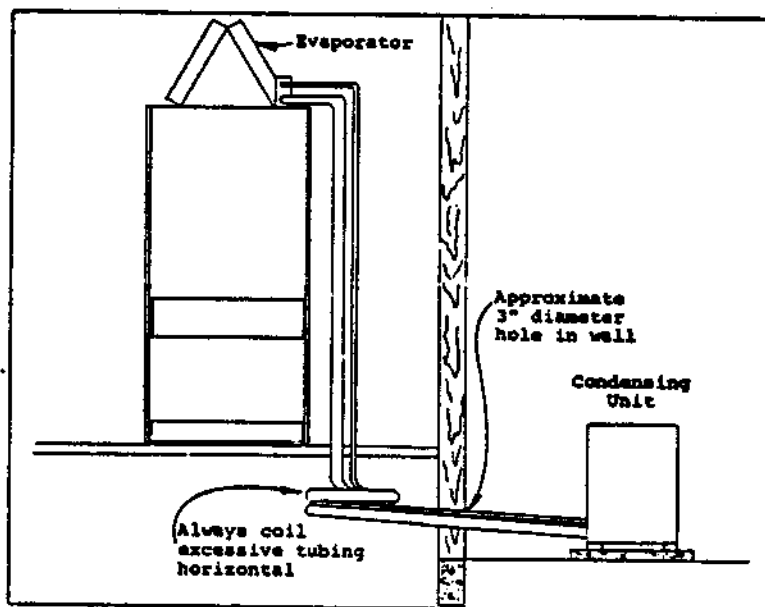
Locate the gauge port in a 45° angle from a vertical up position so as to be accessible for gauge connections.

Use a wrench on the hex nut of the female fitting backing up the fitting with another wrench to keep tube from turning. Tighten the fittings together until they bottom out then tighten for an additional 1/4 turn so that coupling will seat properly.

Check the gauge port cap to make sure it is tight. If loose, tighten, being careful not to tighten too much as it will damage the valve in the gauge port.

Leak test all connections using an Electronic Leak Detector or a Halide Torch.

When tubing is installed in attics or drop ceiling, insulate the quick connect fitting on the larger tube thoroughly with 3/8" wall thickness, closed cell sponge tube insulation or equivalent. Failure to insulate will result in water damage to ceiling since the fitting will "sweat" and drop water on the ceiling.



INSTALLER NOTE: Stamp or mark the Total System Charge on the outdoor unit serial plate. See TOTAL SYSTEM CHARGE Table, Part No. 7960-002 located on inside of outdoor unit access panel.

R22 TOTAL SYSTEM CHARGE FOR SPLIT AIR CONDITIONING AND HEAT PUMP SYSTEMS

The following tables are used to determine the operating charge for split air conditioning and heat pump systems. The values shown are the total amount of refrigerant received in the precharged system components, which include the outdoor unit, indoor unit, and inter-connecting tubing. This is also the amount of refrigerant required for a system recharge following any refrigeration system repairs.

Find the outdoor section (and matching indoor section (Table A) and connecting tubing set (Table B) for system being used. Add the ounces of charge for each of the system components together. This value is the TOTAL SYSTEM CHARGE.

$$\frac{\text{OZs}}{\text{OUTDOOR UNIT (Table A)}} + \frac{\text{OZs}}{\text{INDOOR UNIT (Table A)}} + \frac{\text{OZs}}{\text{TUBING SET (Table B)}} = \frac{\text{OZs}}{\text{TOTAL SYSTEM CHARGE}}$$

To change total charge to lbs. and Ozs., divide by 16.

EXAMPLE: 37ECQ1 with 3ACQ3 and CT35 tubing set.

$$\frac{\text{OZs}}{\text{ }} + \frac{\text{OZs}}{\text{ }} + \frac{\text{OZs}}{\text{ }} = \frac{\text{OZs}}{\text{ }}$$

or $\frac{\text{ }}{16} = 5 \text{ lbs. } 2 \text{ oz.}$

TABLE B CHARGED TUBING SETS FOR USE WITH 18ECQ2, 24ECQ4, 18HPQ5, 24HPQ5				
Model	Charge	Length in Ft.	Liquid Line	Suction Line
CT15	2 oz.	15	1/4"	5/8"
RW25	3 oz.	25	1/4"	5/8"
RW35	7 oz.	35	1/4"	5/8"
RW45	11 oz.	45	1/4"	5/8"
FOR USE WITH 30ECQ4, 31ECQ2, 36ECQ5, 37ECQ1, WQ530, WQ536, WQ5030, WQ5036				
CTO	None*	0	3/8"	3/4"
CT15	2 oz.	15	1/4"	5/8"
CT25	3 oz.	25	1/4"	3/4"
CT35	14 oz.	35	3/8"	3/4"
CT45	20 oz.	45	3/8"	3/4"
FOR USE WITH 30HPQ6, 36HPQ7				
CTO	None*	0	3/8"	3/4"
CT15A	2 oz.	15	3/8"	5/8"
CT25A	8 oz.	25	3/8"	3/4"
CT35A	14 oz.	35	3/8"	3/4"
CT45A	20 oz.	45	3/8"	3/4"
FOR USE WITH 42ECQ1, 48ECQ2, 60ECQ1, 42HPQ4, 48HPQ5, 60HPQ5, WQ550, WQ5D50				
CTO-12	None*	0	3/8"	7/8"
CT15-12	2 oz.	15	3/8"	7/8"
CT25-12	8 oz.	25	3/8"	7/8"
CT35-12	14 oz.	35	3/8"	7/8"
CT45-12	20 oz.	45	3/8"	7/8"

*CTO and CTO-12 for field installed tubing. (See Table C for charging).

TOTAL SYSTEM OPERATING CHARGE (Includes charge for the basic outdoor unit, indoor unit and 25' of inter-connecting tubing)		
Model	Indoor Section	Indoor Unit
18ECS2	18QS3	42
	2ACQ1 1	40
	B18EHQ1	45
	B24EHQ1	45
24ECS4	24QS1	53
	2ACQ1 1	53
	B18EHQ1	58
	B24EHQ1	58
30ECS4	3ACQ3	69
	3HCQ1 1	71
	B30EHQ	66
	B36EHQ1	72
31ECS2	3ACQ3	71
	3HCQ1 1	73
	B30EHQ	68
	B36EHQ1	74
36ECS5	3ACQ3 1	75
	3HCQ1	77
	B36EHQ1	78
37ECS1	3ACQ3	80
	3HCQ1 1	82
	B36EHQ1	83
	A36AS-A	84
42ECS1	4ACQ2	94.5
	4HCQ 1	104
	5ACQ1	99
	BC48A	115
	A42AS-A	91.5
	A48AS-A	103.5
48ECS2	4ACQ2	97
	4HCQ 2	106.5
	5ACQ1	101.5
	A48AS-A	100.5
60ECS1	5ACQ1	116
	5HCQ 2	116
	BC48A	132
	BC60A	152
	A60AS-A	120.5

- 1 Has "quick-connect" fitting--requires use of 1/2 stub kit CTO-A.
 2 Has "quick-connect" fitting--requires use of 1/2 stub kit CTO-12A.

The above includes 25' of 3/8" diameter liquid line. For other than 25' and other tube sizes, adjust the total charge according to the following schedule.

Liquid Line Diameter	Oz. R-22 Per Ft.
1/4"	.25
3/8"	.6
1/2"	1.2

INSTALLER NOTE: Stamp or mark the final system charge determined above on the outdoor unit serial plate.

TABLE A

Model	Outdoor Unit Factory Charge	For Use With Indoor Unit	Indoor Unit Factory Charge
18ECQ2	26 oz.	18QS2 2ACQ1 B24EBQ1 B18EBQ1	4 oz. 2 oz. 7 oz. 7 oz.
24ECQ4	39 oz.	24QS4 2ACQ1 B24EBQ1 B18EBQ1	2 oz. 2 oz. 7 oz. 7 oz.
30ECQ4	52 oz.	3HCQ1 3ACQ3 B30EBQ B36EBQ1	7 oz. 5 oz. 2 oz. 8 oz.
31ECQ2	54 oz.	3HCQ1 3ACQ3 B30EBQ B36EBQ1	7 oz. 5 oz. 2 oz. 8 oz.
36ECQ5	58 oz.	3HCQ1 3ACQ3 B36EBQ1	7 oz. 5 oz. 8 oz.
37ECQ1	63 oz.	3HCQ1 3ACQ3 B36EBQ1	7 oz. 5 oz. 8 oz.
42ECQ2	48 oz.	4HCQ 4ACQ2 BC48A	12 oz. 2.5 oz. 23 oz.
48ECQ2	86.5 oz.	4HCQ 4ACQ2 5ACQ1 BC48A	12 oz. 2.5 oz. 7 oz. 23 oz.
60ECQ1	101 oz.	5HCQ 5ACQ1 BC48A BC60A	7 oz. 7 oz. 23 oz. 43 oz.

In the event that the installer is running his own tubing by using a CTO kit or is modifying a precharged tubing set by adding or subtracting a few feet of tubing length, the tubing set should be evacuated and charged before being connected to the outdoor and indoor section. To determine TUBING SET ONLY charges, use the following table:

TABLE C (Shows Charge in Ozs.)												
	Tubing Set Length in Ft.	10	15	20	25	30	35	40	45	50	55	60
RW Series	1/4" O.D. Liquid Line	2	2	3	3	5	7	9	11	--	--	--
CT Series	3/8" O.D. Liquid Line	2	2	5	8	11	14	17	20	23	26	29

To determine a TOTAL SYSTEM CHARGE for a system that is connected with a non-standard tubing length, the outdoor basic charge (from Table A) plus the indoor unit basic charge (from Table A), is added to the tube set based on liquid line O.D. size (Table C). This value is the TOTAL SYSTEM CHARGE.

NOTE: If your tubing length is between the sizes shown in the table, use a charge value appropriately between the values shown for the tubing length shorter and longer than actual length.

INSTALLING REFRIGERANT TUBING

(Applicable to "S" models)

Use only refrigeration grade (dehydrated and sealed) copper tubing of the size indicated below. Care must be taken to insure that the tubing is kept clean and dry before and during installation. DO NOT remove the plugs from the tubing ends, coil connections or base valves until the connection is ready to be made.

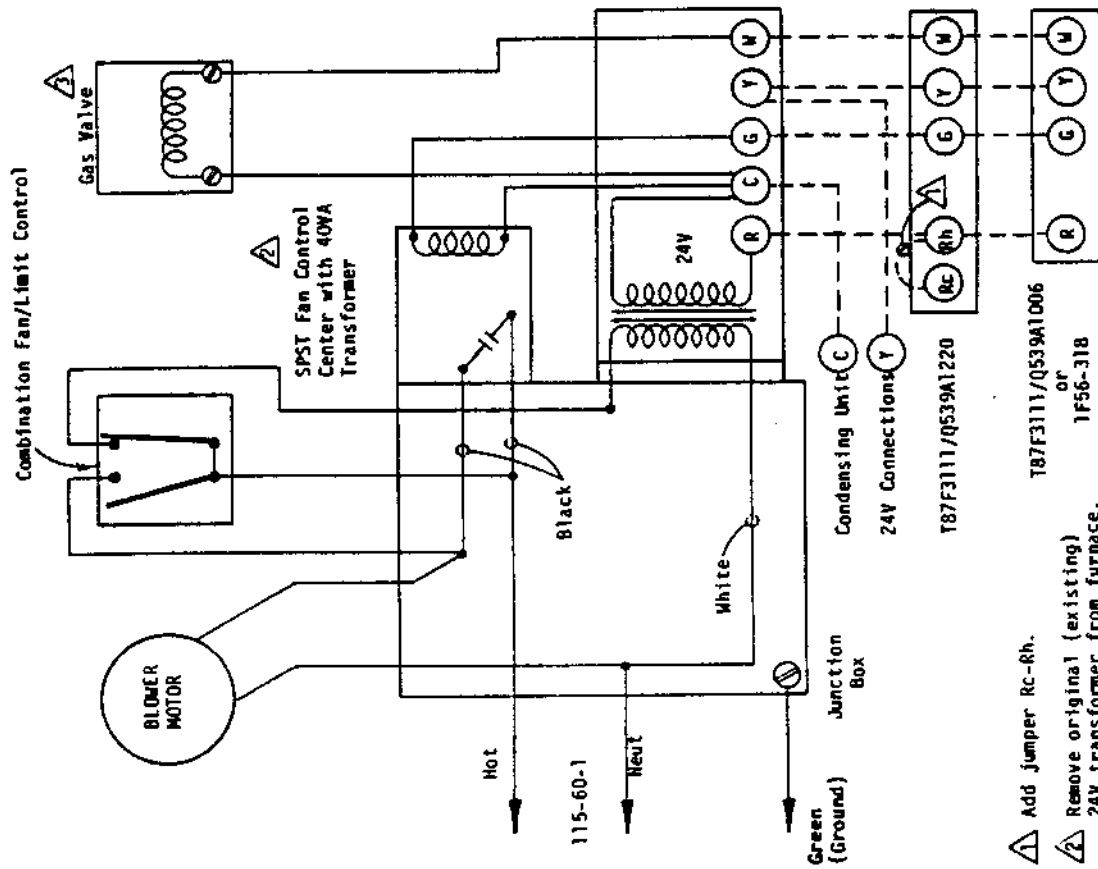
Insulate the suction line with a minimum of 3/8" Armaflex or equivalent. Install the insulation to the suction line before cutting and making connections.

When connecting to an indoor coil which has quick connect fittings, a CTO-A or CTO-12A stub kit is required. See chart on Total System Operating Charge, part number 7960-054, located on inside of outdoor unit access panel. Total system charge should be stamped or marked on the outdoor unit serial plate.

Basic Condensing Unit Model	REFRIGERANT LINE LENGTH (Ft.)		
	0-20	21-60	61-100
	Liq. & Suct.	Liq. & Suct.	Liq. & Suct.
18 or 24ECS	3/8 & 5/8	3/8 & 5/8	3/8 & 3/4
30ECS	3/8 & 5/8	3/8 & 3/4	3/8 & 3/4
36ECS	3/8 & 5/8	3/8 & 3/4	1/2 & 7/8
42ECS	3/8 & 3/4	3/8 & 7/8	1/2 & 7/8
48ECS	3/8 & 7/8	3/8 & 7/8	1/2 & 1-1/8
60ECS	3/8 & 7/8	3/8 & 7/8	1/2 & 1-1/8

NOTE: The outdoor unit on the "S" models has the full operating charge for the most frequently used combination of outdoor to indoor section. First, discharge the small holding charge in the indoor coil, then connect the tubing to the indoor coil and to the base valves of the outdoor unit. Leak test and evacuate the coil and tubing before opening the base valves. After operating the system, check and adjust the R-22 charge as shown under "Refrigerant Charge", Table 2, on page 3.

TYPICAL APPLICATION — GAS FURNACE WITH SINGLE SPEED MOTOR



⚠ Add jumper Rc-Rh.

⚠ Remove original (existing) 24V transformer from furnace.

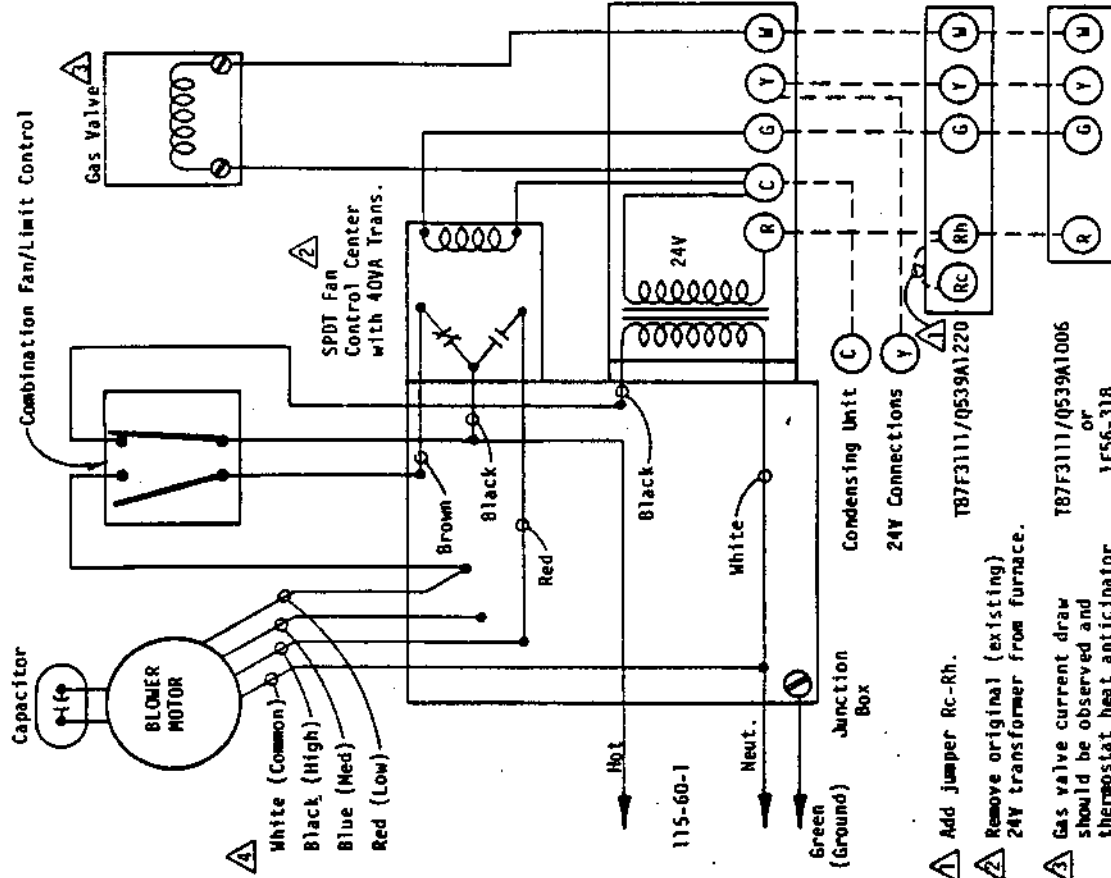
⚠ Gas valve current draw should be observed and thermostat heat anticipator set at a corresponding value.

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or
1F56-318

4051-110

TYPICAL APPLICATION — GAS FURNACE WITH MULTI-SPEED MOTOR



⚠ Add jumper Rc-Rh.

⚠ Remove original (existing) 24V transformer from furnace.

T87F3111/Q539A1006

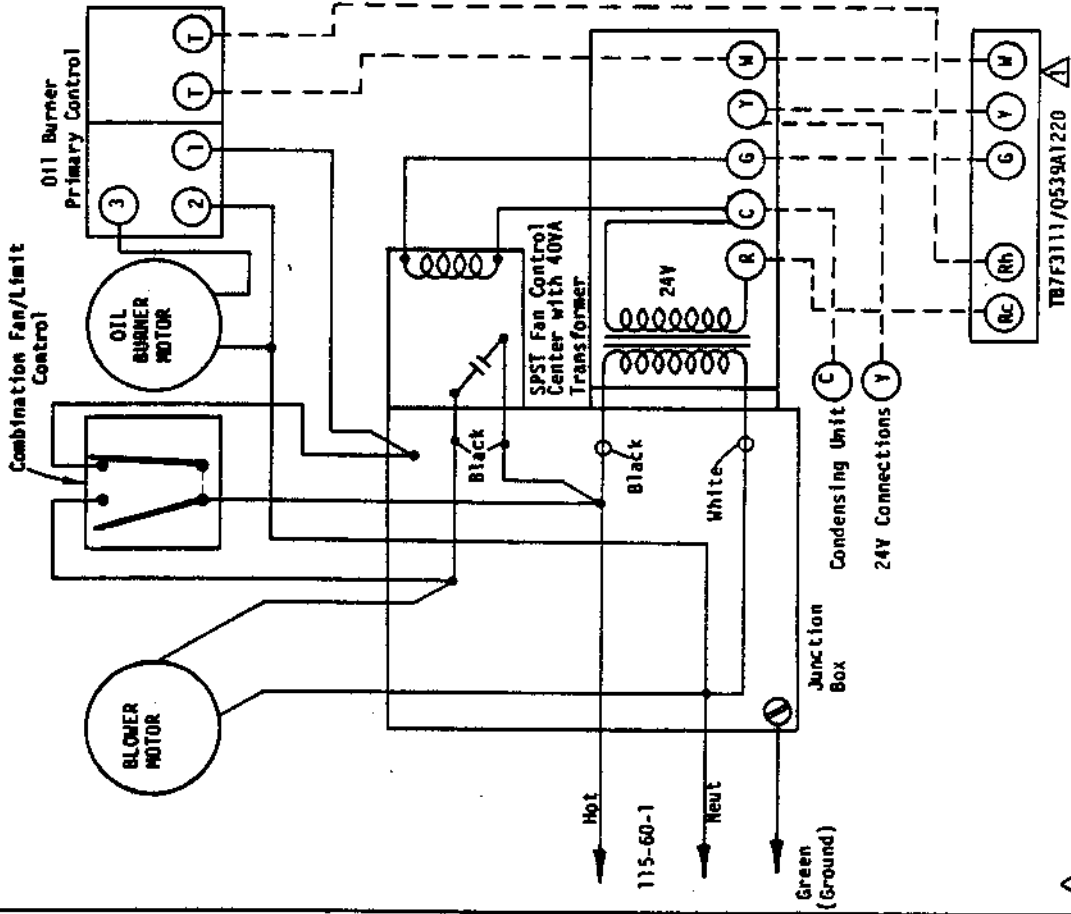
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1F56-318

⚠ Gas valve current draw should be observed and thermostat heat anticipator set at a corresponding value.

⚠ Any combination of speeds can be used. Be sure to connect only one speed to any one point and that all unused speeds are taped off separately.

4051-120

TYPICAL APPLICATION — OIL FURNACE



1 Set heat anticipator to match current draw of oil burner primary control.

4051-130

PARTS LIST
SPLIT SYSTEM CONDENSING UNITS

Part No.	Description	18ECQ, S2	24ECQ, S4
8552-044	Capacitor 15/10-370V	x	
8552-007	Capacitor 20/15-370V		x
8552-002	Capacitor 5/370V	x	x
8000-061	Compressor RES3-0175-PFV	x	
8000-071	Compressor AB225HT		x
5051-011	Condenser Coil	x	
5051-013	Condenser Coil		x
8401-007	Contactora - Comp. 25A	x	x
5151-001	Fan Blade TF1839	x	x
8103-008	Motor - Fan 1/5 h.p.	x	x
8200-001	Motor Mount - Fan	x	x
7051-010	Wire Grille - Inlet	x	x
7051-009	Condenser Grille	x	x
5651-051	Base Valve*	x	x
5651-052	Base Valve*	x	x
4021-110	Wiring Diagram	x	x

*Used only on "S" versions.

**PARTS LIST
SPLIT SYSTEM CONDENSING UNITS**

Part No.	Description	30ECQ, S4	31ECQ, S2	36ECQ, S5	37ECQ, S1	37ECQ1-B	37ECQ1-C 460V
8552-007	Capacitor 20/15-370V	x					
8552-030	Capacitor 40/440V			x			
8552-031	Capacitor 45/440V				x		
8552-002	Capacitor 5/370V	x	x	x	x	x	x
8552-032	Capacitor 35/370V		x				
8000-080	Compressor AB233FT	x					
8000-099	Compressor H23B283ABC		x				
8000-072	Compressor AV144ET			x			
8000-084	Compressor AV135ET				x		
8000-059	Compressor CRJ3-0300-TF5					x	
8000-060	Compressor CRJ3-0300-TFD						x
5051-034	Condenser Coil	x		x			
5051-035	Condenser Coil				x	x	x
5051-020	Condenser Coil		x				
8401-003	Contactora - Comp. 30A			x			
8401-002	Contactora - Comp. 25A					x	x
8401-007	Contactora - Comp. 25A	x	x				
5151-007	Fan Blade TP2029	x	x	x	x	x	x
8103-009	Motor - Fan 1/5 hp	x	x	x	x	x	
8103-014	Motor - Fan 1/5 hp						x
8200-001	Motor Mount - Fan	x	x	x	x	x	x
8607-002	Terminal Block 230V						x
7051-003	Wire Grille - Inlet	x	x	x	x	x	x
7051-001	Condenser Grille	x	x	x	x	x	x
5651-051	Base Valve*	x	x	x	x		
5651-053	Base Valve*	x	x	x	x		
4062-110	Wiring Diagram	x					
4062-111	Wiring Diagram		x	x	x		
4062-110	Wiring Diagram	x					
4062-310	Wiring Diagram						x
4062-210	Wiring Diagram					x	

*Used only on "S" versions.

PARTS LIST
SPLIT SYSTEM CONDENSING UNITS

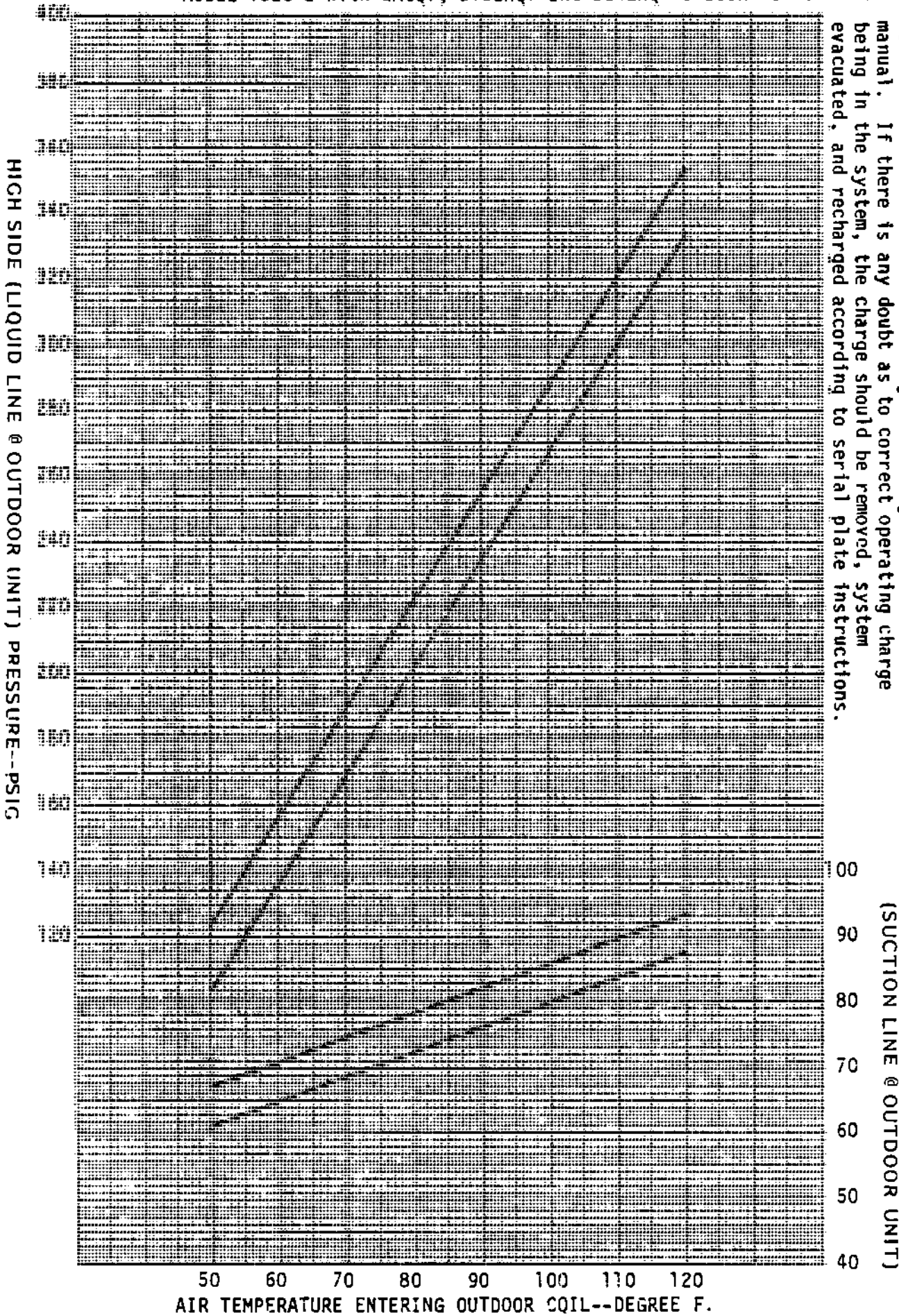
Part No.	Description	42ECQ, S1	42ECQ1-B	48ECQ, S2	48ECQ2-B	60ECQ, S1	60ECQ1-B	42ECQ1-C 460V	48ECQ2-C 460V	60ECQ1-C 460V
8552-030	Capacitor 40/440V	x								
8552-036	Capacitor 70/370V			x						
8552-031	Capacitor 45/440V					x				
8552-026	Capacitor 15/370V	x	x	x	x	x	x	x	x	x
8000-063	Compressor CRK3-0325-PFV	x								
8000-064	Compressor CRK3-0325-TF5		x							
8000-067	Compressor AG112ET			x						
8000-030	Compressor AG111RT				x					
8000-027	Compressor AG122ET					x				
8000-065	Compressor CRK3-0325-TFD							x		
8000-031	Compressor AG122RT						x			
8000-047	Compressor AG111UT								x	
8000-048	Compressor AG122UT									x
5051-009	Condenser Coil	x	x	x	x			x	x	x
5051-024	Condenser Coil					x	x			x
8401-003	Contactator - Comp. 30A	x		x						
8401-002	Contactator - Comp. 25A		x		x		x	x	x	x
8401-016	Contactator - Comp. 35A					x				
5151-017	Fan Blade FA2430-4B	x	x	x	x	x	x	x	x	x
8105-021	Motor - Fan 1/3 hp	x	x	x	x	x	x	x	x	x
8200-004	Motor Mount - Fan	x	x	x	x	x	x	x	x	x
8407-003	Transformer - Stepdown							x	x	x
7051-004	Wire Grille - Inlet	x	x	x	x	x	x	x	x	x
7051-005	Condenser Grille	x	x	x	x	x	x	x	x	x
5651-051	Base Valve*	x		x		x				
5651-054	Base Valve*	x		x		x				
4025-120	Wiring Diagram	x		x		x				
4025-210	Wiring Diagram		x		x		x			
4025-310	Wiring Diagram							x	x	x

*Used only on "S" versions.

SPLIT AIR CONDITIONER
MODEL 18EC*2 with 2ACQ1, B18EHQ1 and B24EHQ1 INDOOR COILS

5/87

These curves are based upon 80°DB, 67°WB R.A. Temp. and Rated CFM (air-flow) across the evaporator coil and should be used for reference purposes only. Special information can be found under section titled "Refrigerant Charge" elsewhere in manual. If there is any doubt as to correct operating charge being in the system, the charge should be removed, system evacuated, and recharged according to serial plate instructions.

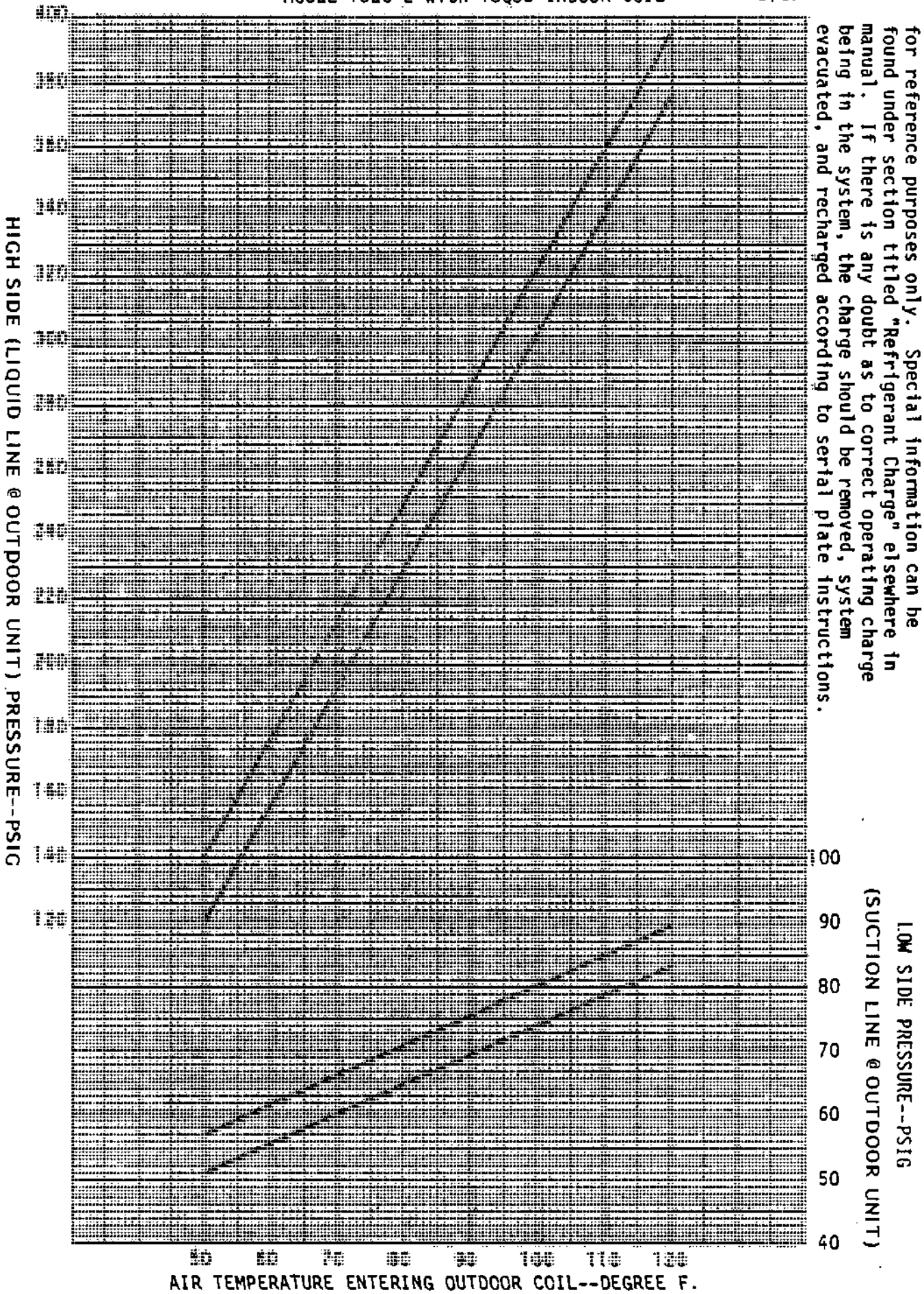


LOW SIDE PRESSURE--PSIG
 (SUCTION LINE @ OUTDOOR UNIT)

SPLIT AIR CONDITIONER
 MODEL 18EC*2 with 18QS3 INDOOR COIL

5/87

These curves are based upon 80°DB, 67°WB R.A. Temp. and Rated CFM (air-flow) across the evaporator coil and should be used for reference purposes only. Special information can be found under section titled "Refrigerant Charge" elsewhere in manual. If there is any doubt as to correct operating charge being in the system, the charge should be removed, system evacuated, and recharged according to serial plate instructions.



LOW SIDE PRESSURE--PSIG
 (SUCTION LINE @ OUTDOOR UNIT)

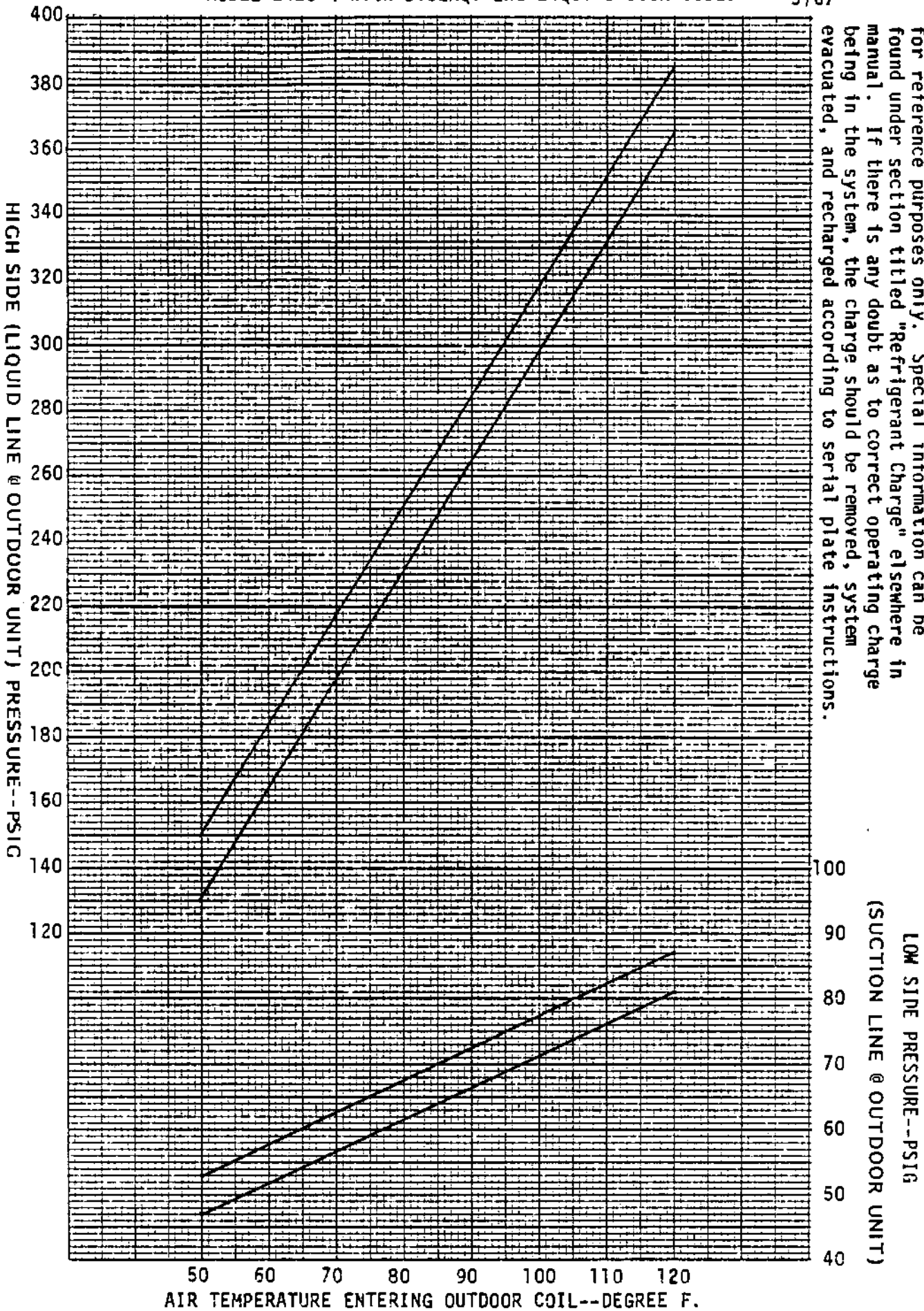
HIGH SIDE (LIQUID LINE @ OUTDOOR UNIT) PRESSURE--PSIG

AIR TEMPERATURE ENTERING OUTDOOR COIL--DEGREE F.

SPLIT AIR CONDITIONER
 MODEL 24EC*4 with B18EHQ1 and 24QS1 INDOOR COILS

5/87

These curves are based upon 80°DB, 67°WB R.A. Temp. and Rated CFM (air-flow) across the evaporator coil and should be used for reference purposes only. Special information can be found under section titled "Refrigerant Charge" elsewhere in manual. If there is any doubt as to correct operating charge being in the system, the charge should be removed, system evacuated, and recharged according to serial plate instructions.



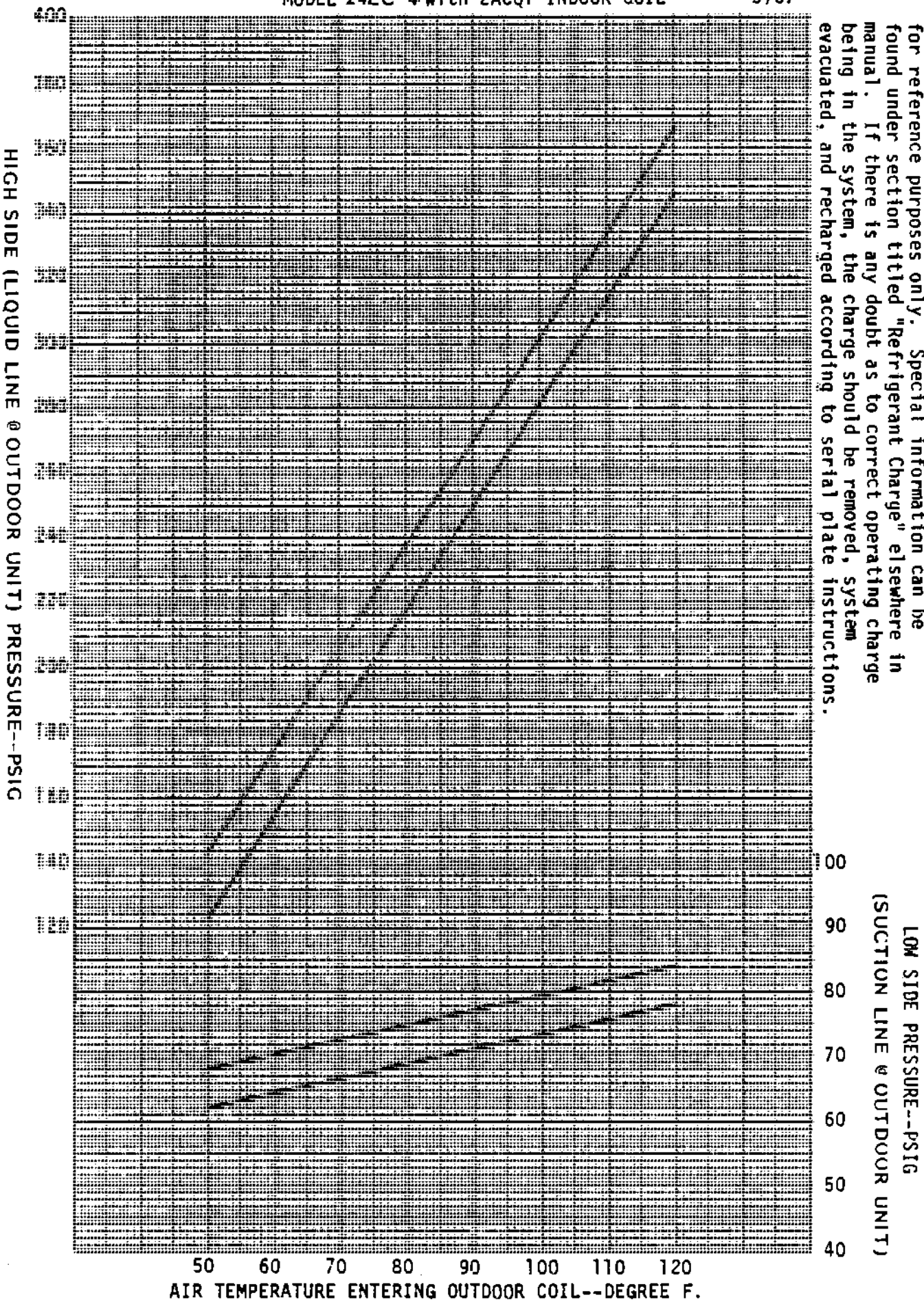
AIR TEMPERATURE ENTERING OUTDOOR COIL--DEGREE F.

LOW SIDE PRESSURE--PSIG
 (SUCTION LINE @ OUTDOOR UNIT)

SPLIT AIR CONDITIONER
 MODEL 24EC*4 with 2ACQ1 INDOOR COIL

5/87

These curves are based upon 80°DB, 67°WB R.A. Temp. and Rated CFM (airflow) across the evaporator coil and should be used for reference purposes only. Special information can be found under section titled "Refrigerant Charge" elsewhere in manual. If there is any doubt as to correct operating charge being in the system, the charge should be removed, system evacuated, and recharged according to serial plate instructions.



LOW SIDE PRESSURE--PSIG
 (SUCTION LINE @ OUTDOOR UNIT)

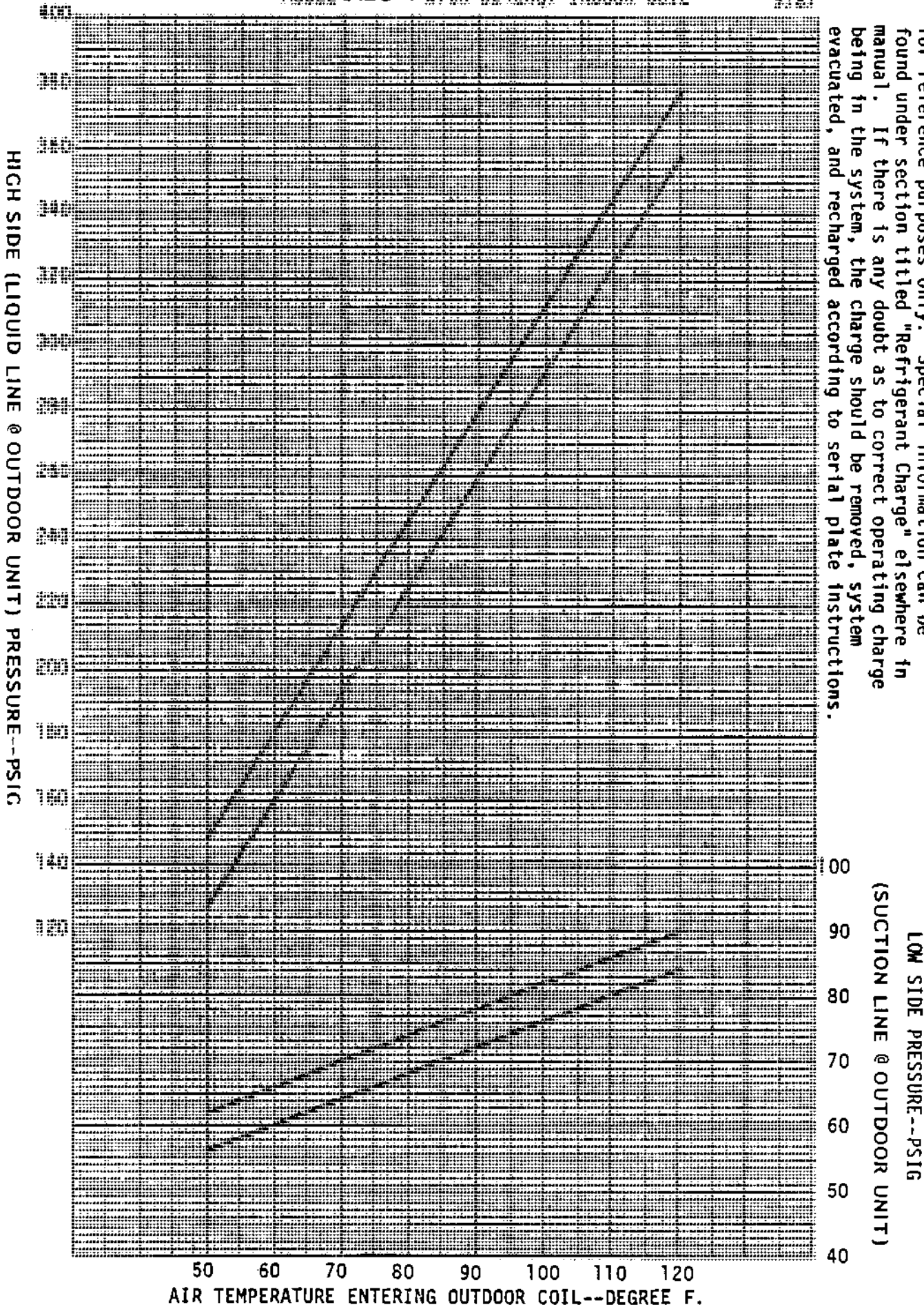
HIGH SIDE (LIQUID LINE @ OUTDOOR UNIT) PRESSURE--PSIG

AIR TEMPERATURE ENTERING OUTDOOR COIL--DEGREE F.

SPLIT AIR CONDITIONER
 MODEL 24EC*4 with B24EHQ1 INDOOR COIL

5/87

These curves are based upon 80°DB, 67°WB R.A. Temp. and Rated CFM (air-flow) across the evaporator coil and should be used for reference purposes only. Special information can be found under section titled "Refrigerant Charge" elsewhere in manual. If there is any doubt as to correct operating charge being in the system, the charge should be removed, system evacuated, and recharged according to serial plate instructions.

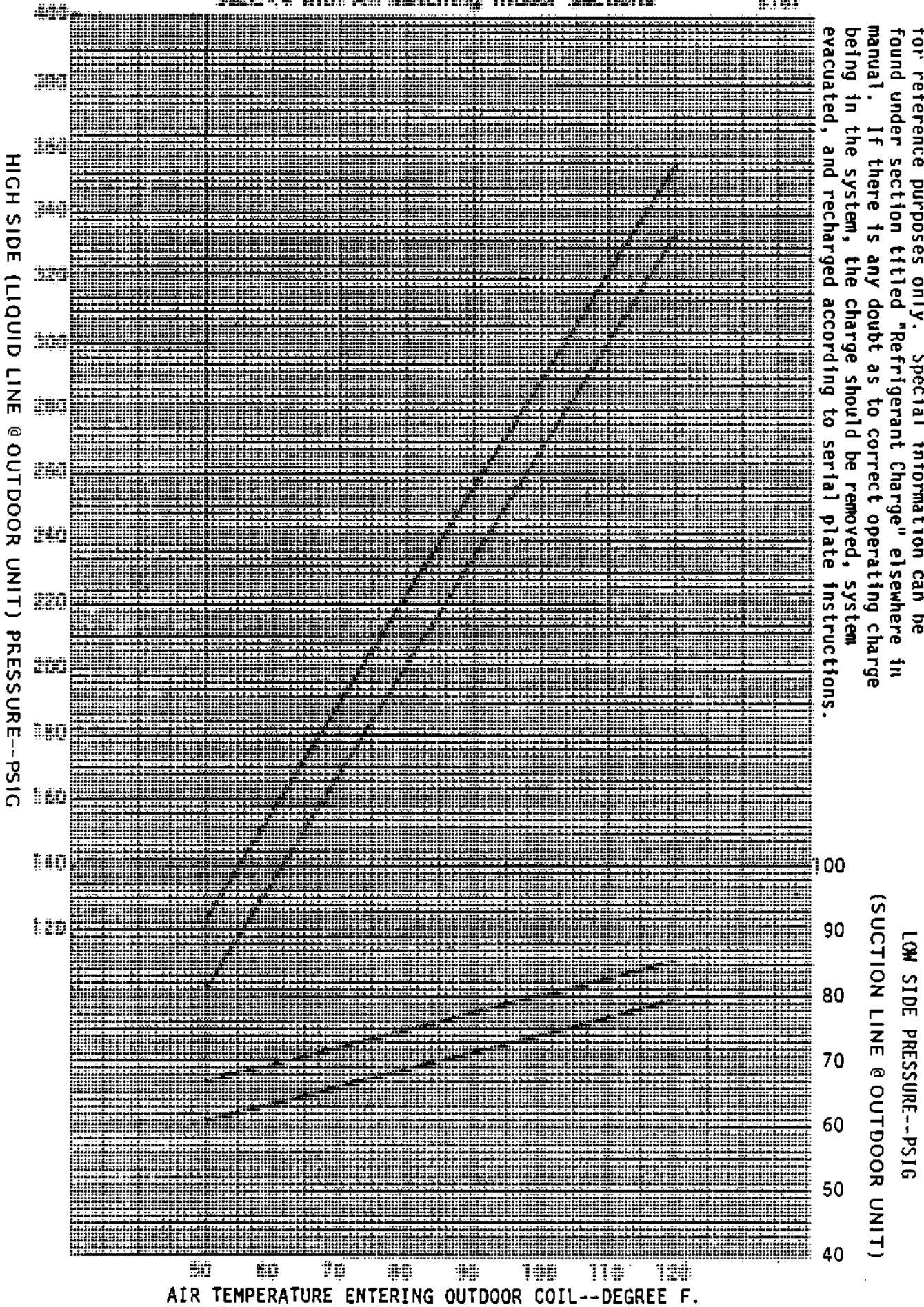


SPLIT AIR CONDITIONER

2000's With All Matching Indoor Sections

LIST

These curves are based upon 80°DB, 67°WB R.A. Temp. and Rated CFM (airflow) across the evaporator coil and should be used for reference purposes only. Special information can be found under section titled "Refrigerant Charge" elsewhere in manual. If there is any doubt as to correct operating charge being in the system, the charge should be removed, system evacuated, and recharged according to serial plate instructions.



50 60 70 80 90 100 110 120
AIR TEMPERATURE ENTERING OUTDOOR COIL--DEGREE F.

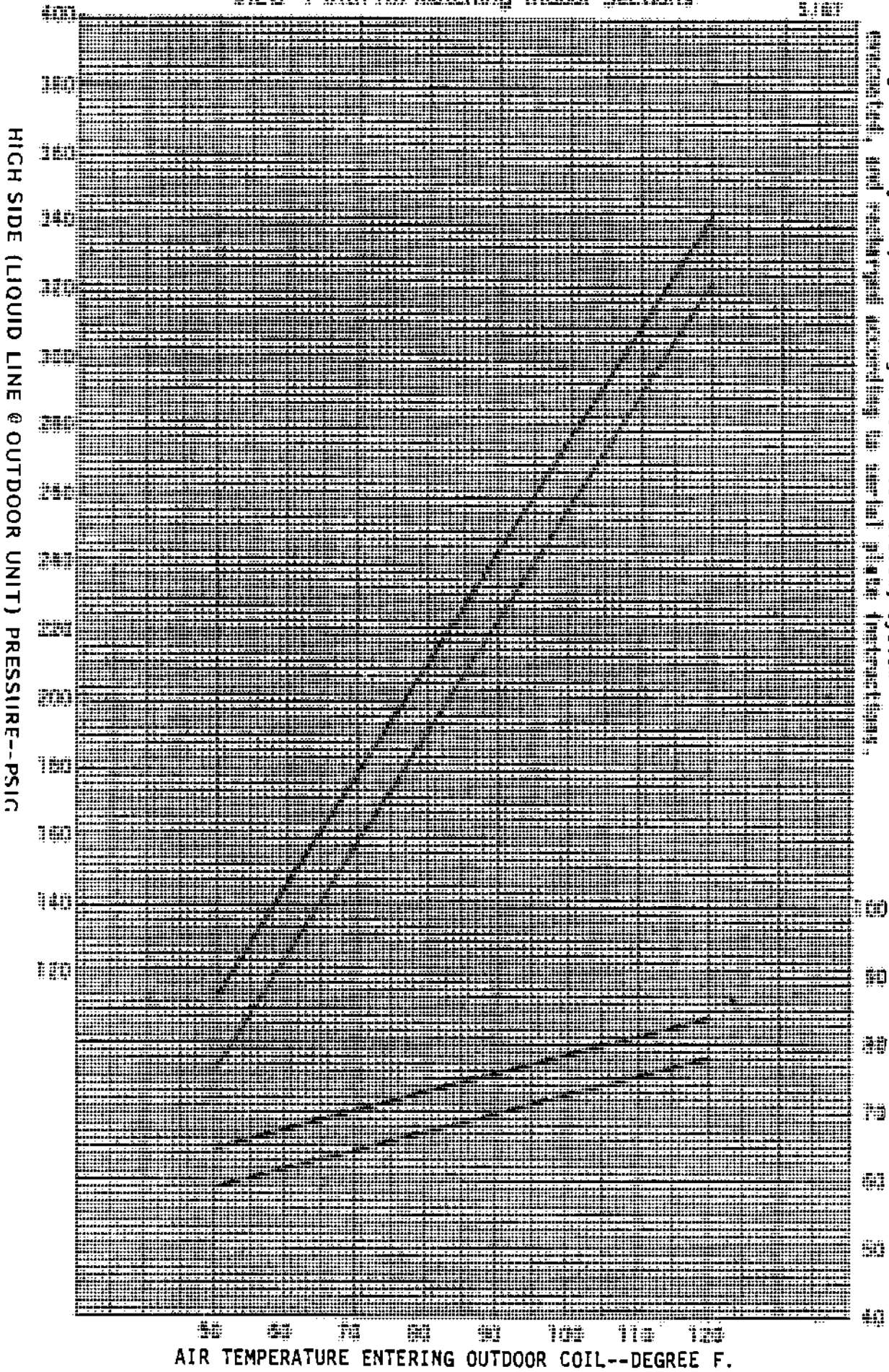
HIGH SIDE (LIQUID LINE @ OUTDOOR UNIT) PRESSURE--PSIG

LOW SIDE SUCTION LINE @ OUTDOOR UNIT)
(SUCTION LINE @ OUTDOOR UNIT) PSIG

SPLIT AIR CONDITIONER

31EC *1 With All Matching Indoor Sections

5.127



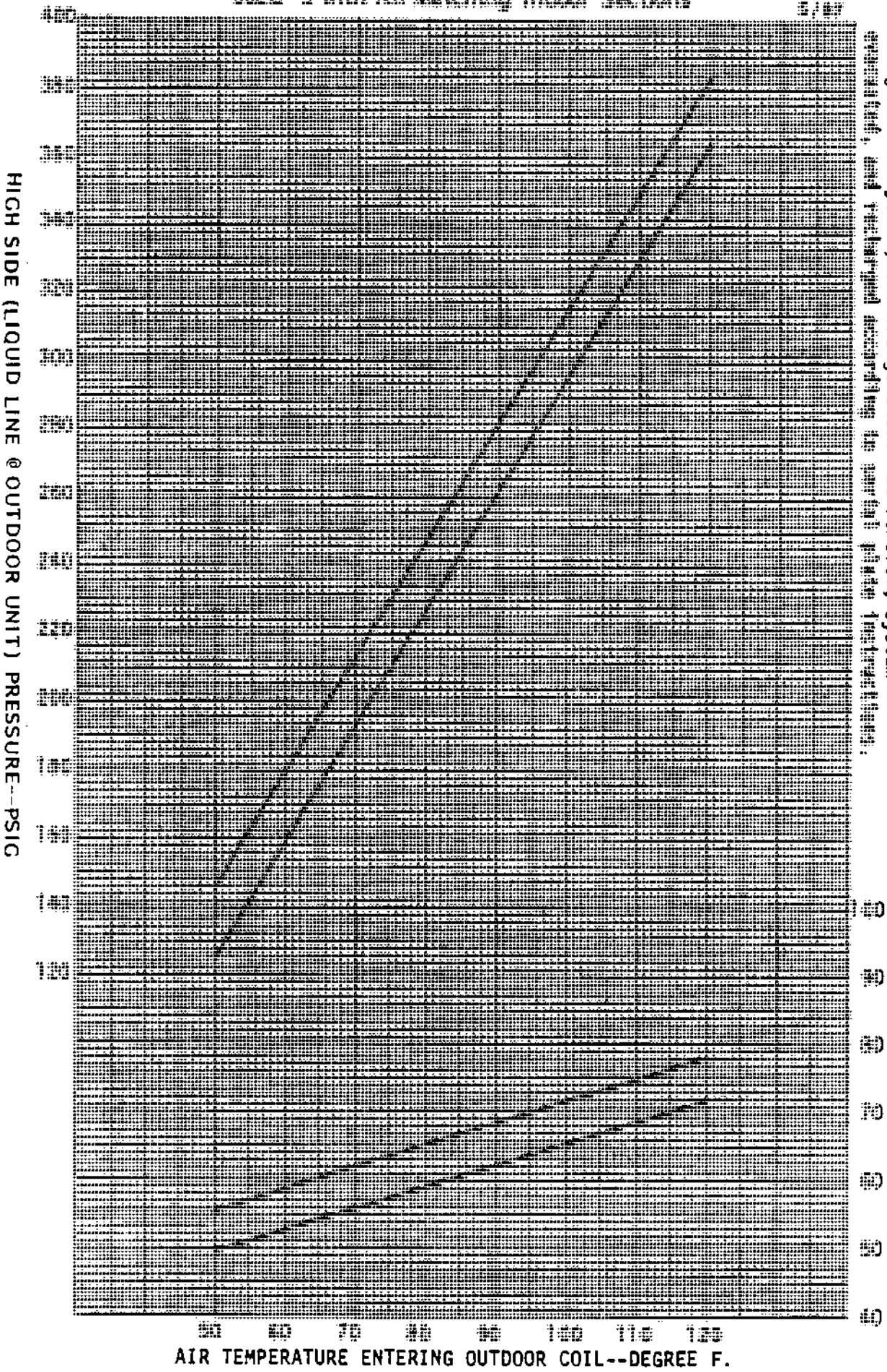
These curves are based upon 80°DB, 67°WB R.A. Temp. and Rated CFM (airflow) across the evaporator coil and should be used for reference purposes only. Special information can be found under section titled "Refrigerant Charge" elsewhere in manual. If there is any doubt as to correct operating charge being in the system, the charge should be removed, system

LOW SIDE PRESSURE--PSIG
(SUCTION LINE @ OUTDOOR UNIT)

AIR TEMPERATURE ENTERING OUTDOOR COIL--DEGREE F.

SPLIT AIR CONDITIONER
36EC *5 With All Matching Indoor Sections

These curves are based upon 80°DB, 67°WB R.A. Temp. and Rated CFM (airflow) across the evaporator coil and should be used for reference purposes only. Special information can be found under section titled "Refrigerant Charge" elsewhere in manual. If there is any doubt as to correct operating charge being in the system, the charge should be removed, system



LOW SIDE PRESSURE--PSIG
 (SUCTION LINE @ OUTDOOR UNIT)

AIR TEMPERATURE ENTERING OUTDOOR COIL--DEGREE F.

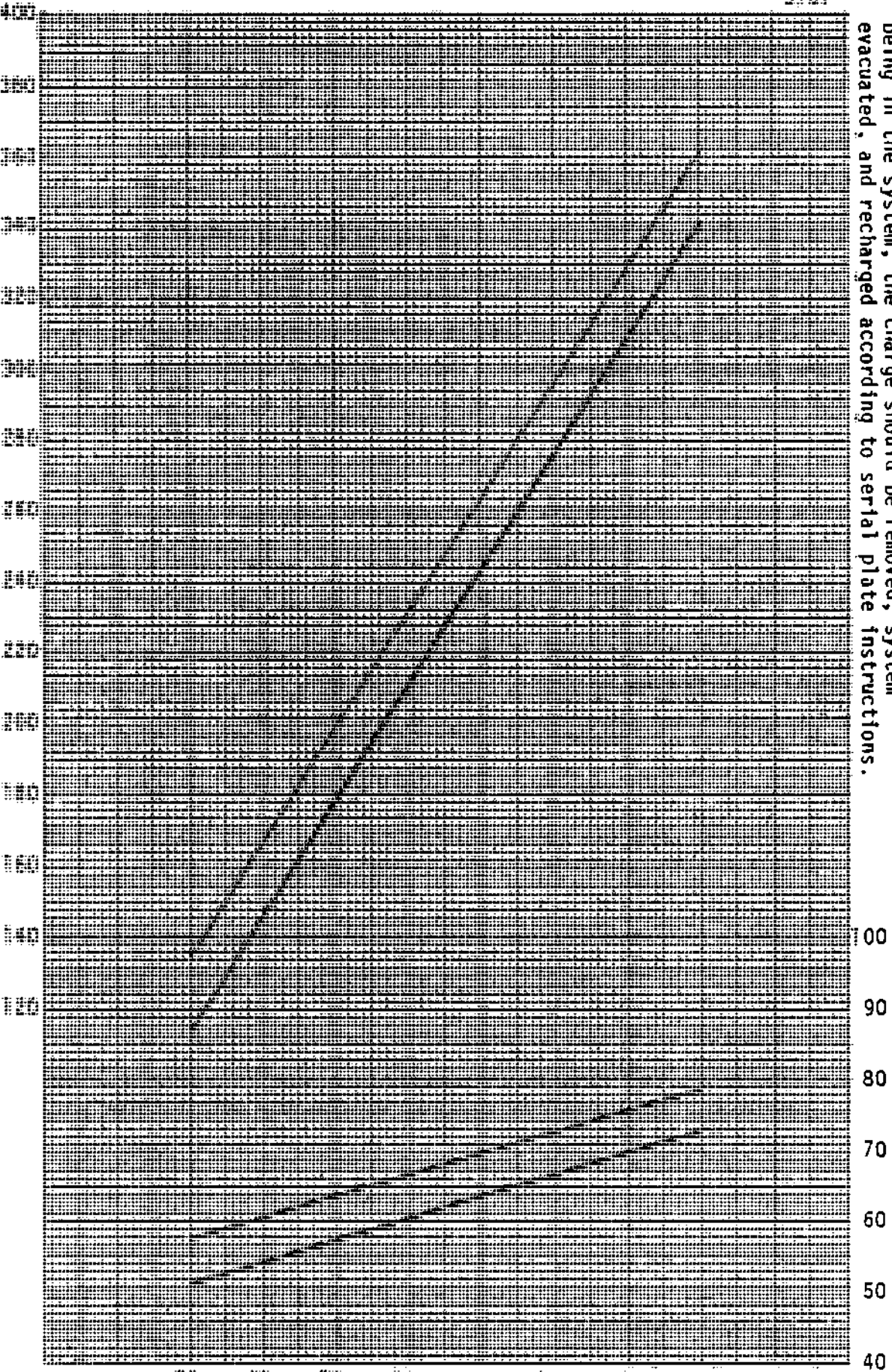
SPLIT AIR CONDITIONER
37EC *1 With All Matching Indoor Sections

5/87

These curves are based upon 80°DB, 67°WB R.A. Temp. and Rated CFM (airflow) across the evaporator coil and should be used for reference purposes only. Special information can be found under section titled "Refrigerant Charge" elsewhere in manual. If there is any doubt as to correct operating charge being in the system, the charge should be removed, system evacuated, and recharged according to serial plate instructions.

HIGH SIDE (LIQUID LINE @ OUTDOOR UNIT) PRESSURE--PSIG

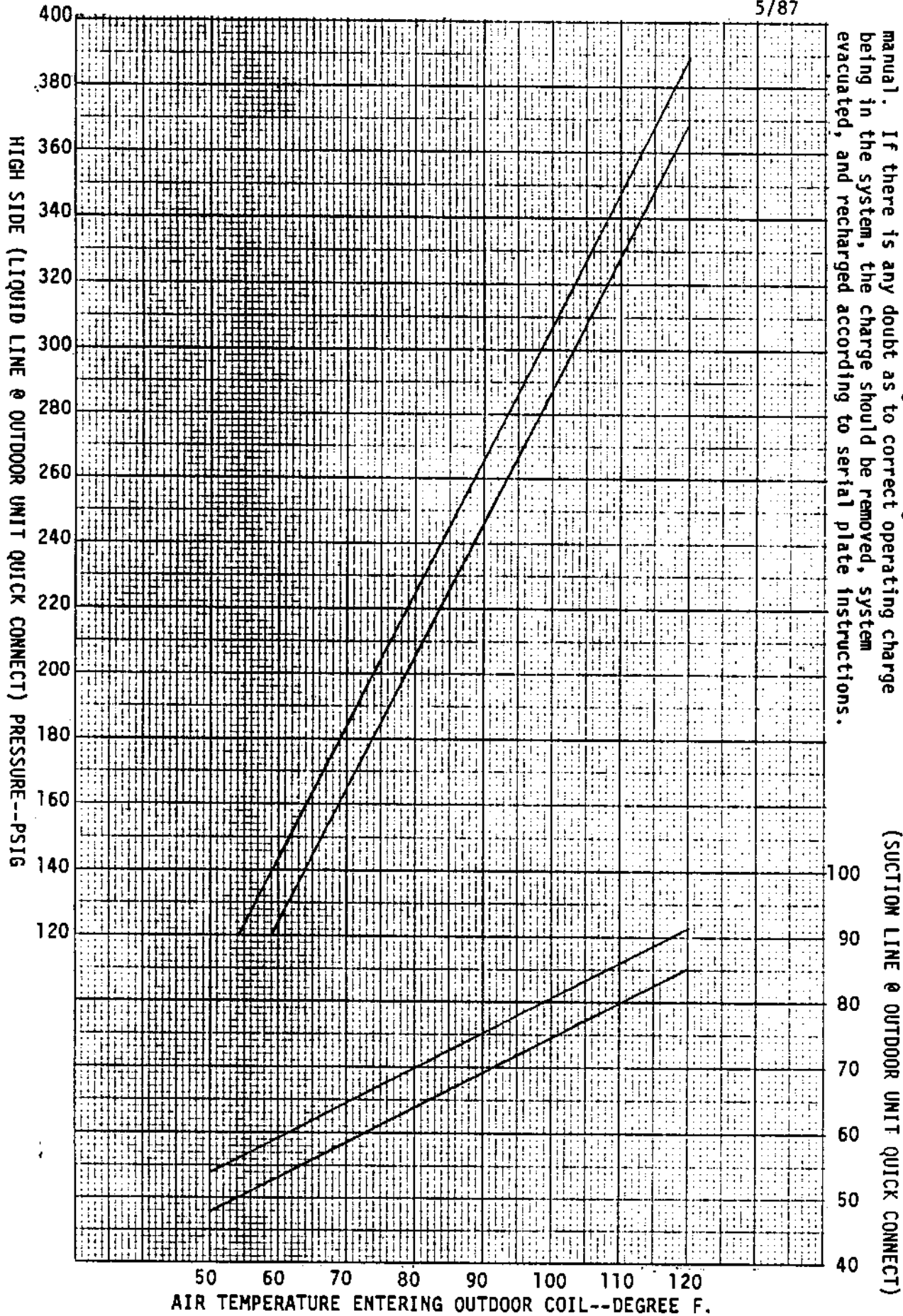
LOW SIDE PRESSURE--PSIG
 (SUCTION LINE @ OUTDOOR UNIT)



AIR TEMPERATURE ENTERING OUTDOOR COIL--DEGREE F.

SPLIT AIR CONDITIONER
37ECS1 With A36AS-A

5/87

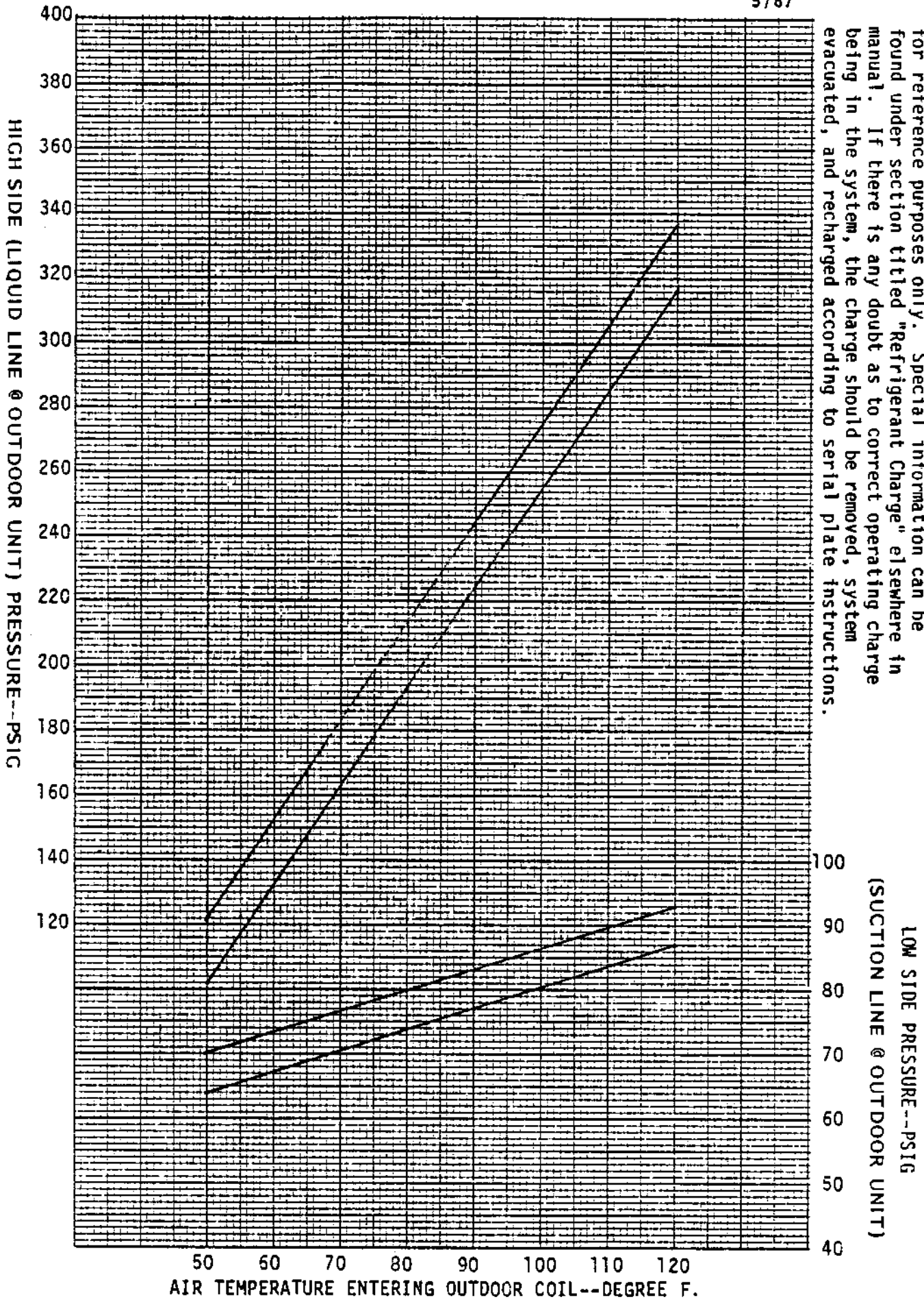


These curves are based upon 80°DB, 67°WB R.A. Temp. and Rated CFM (air-flow) across the evaporator coil and should be used for reference purposes only. Special information can be found under section titled "Refrigerant Charge" elsewhere in manual. If there is any doubt as to correct operating charge being in the system, the charge should be removed, system evacuated, and recharged according to serial plate instructions.

LOW SIDE PRESSURE--PSIG
(SUCTION LINE @ OUTDOOR UNIT QUICK CONNECT)

SPLIT AIR CONDITIONER
 MODEL 42EC*1 with BC48A and 5ACQ1 INDOOR COILS

5/87



These curves are based upon 80°DB, 67°WB R.A. Temp. and Rated CFM (air-flow) across the evaporator coil and should be used for reference purposes only. Special information can be found under section titled "Refrigerant Charge" elsewhere in manual. If there is any doubt as to correct operating charge being in the system, the charge should be removed, system evacuated, and recharged according to serial plate instructions.

LOW SIDE PRESSURE--PSIG
 (SUCTION LINE @ OUTDOOR UNIT)

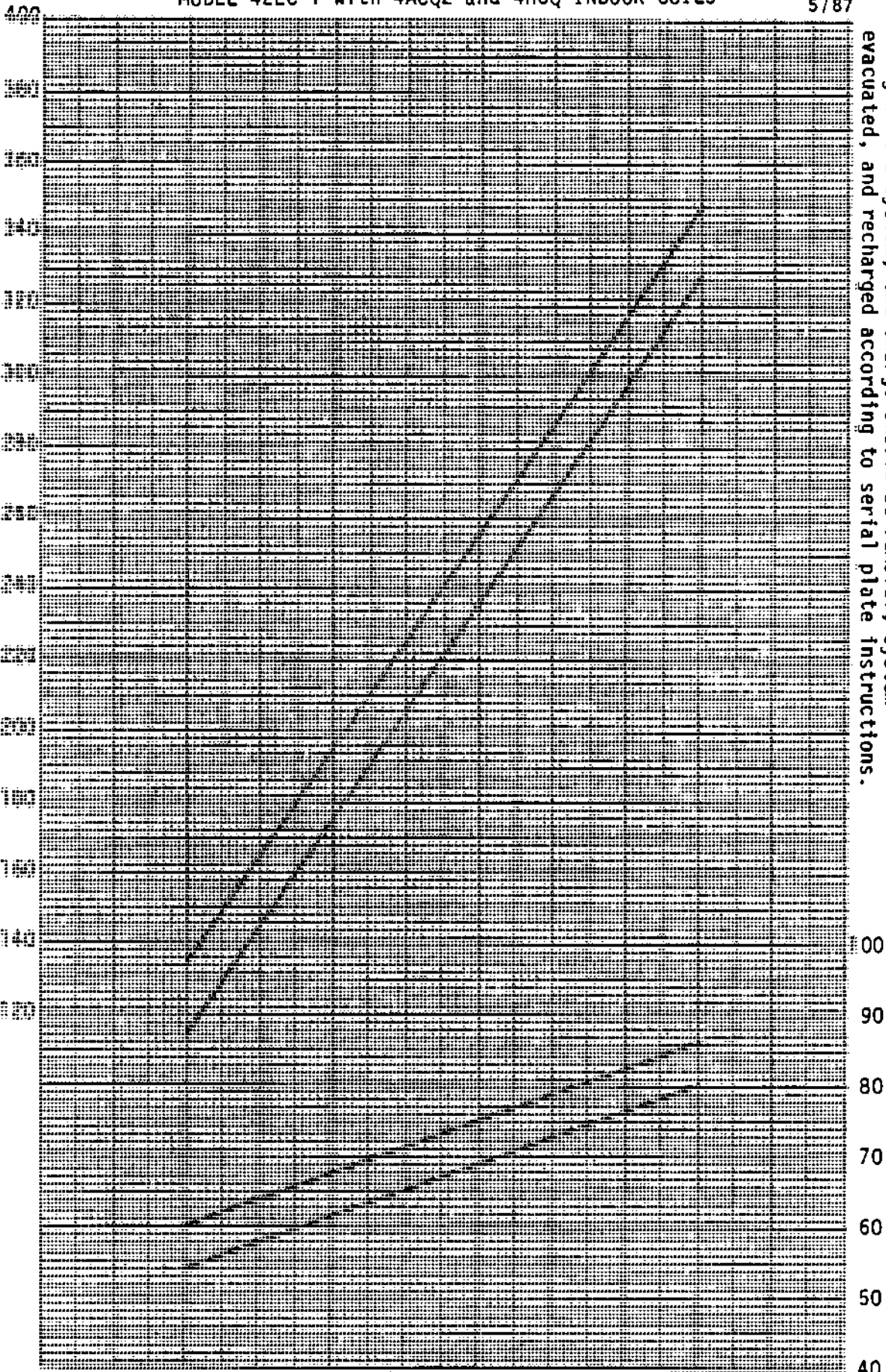
SPLIT AIR CONDITIONER
 MODEL 42EC*1 with 4ACQ2 and 4HCQ INDOOR COILS

5/87

These curves are based upon 80°DB, 67°WB R.A. Temp. and Rated CFM (airflow) across the evaporator coil and should be used for reference purposes only. Special information can be found under section titled "Refrigerant Charge" elsewhere in manual. If there is any doubt as to correct operating charge being in the system, the charge should be removed, system evacuated, and recharged according to serial plate instructions.

HIGH SIDE (LIQUID LINE @ OUTDOOR UNIT) PRESSURE--PSIG

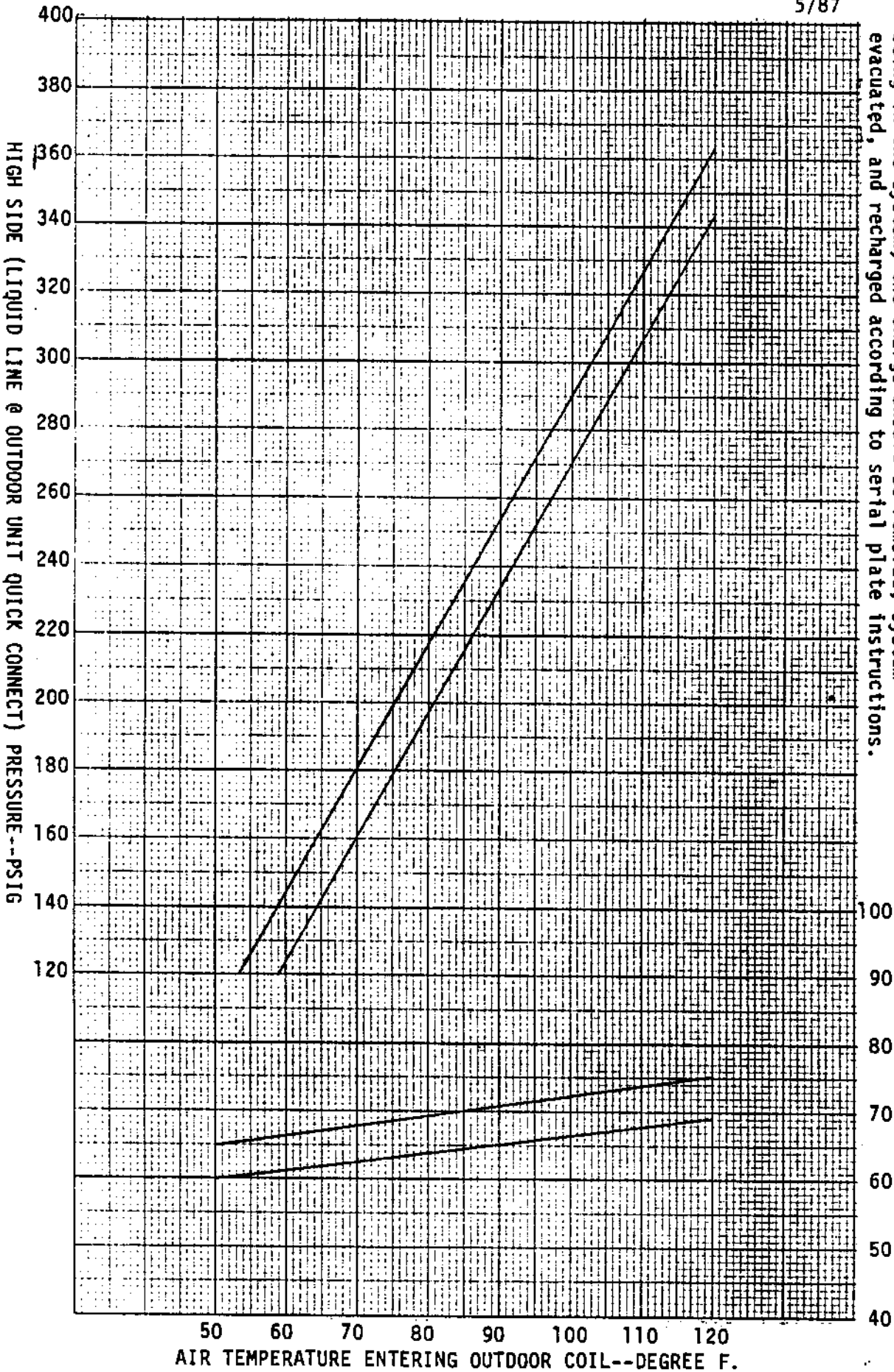
LOW SIDE PRESSURE--PSIG
 (SUCTION LINE @ OUTDOOR UNIT)



AIR TEMPERATURE ENTERING OUTDOOR COIL--DEGREE F.

SPLIT AIR CONDITIONER
 MODEL 42ECS1 WITH A42AS-A

5/87



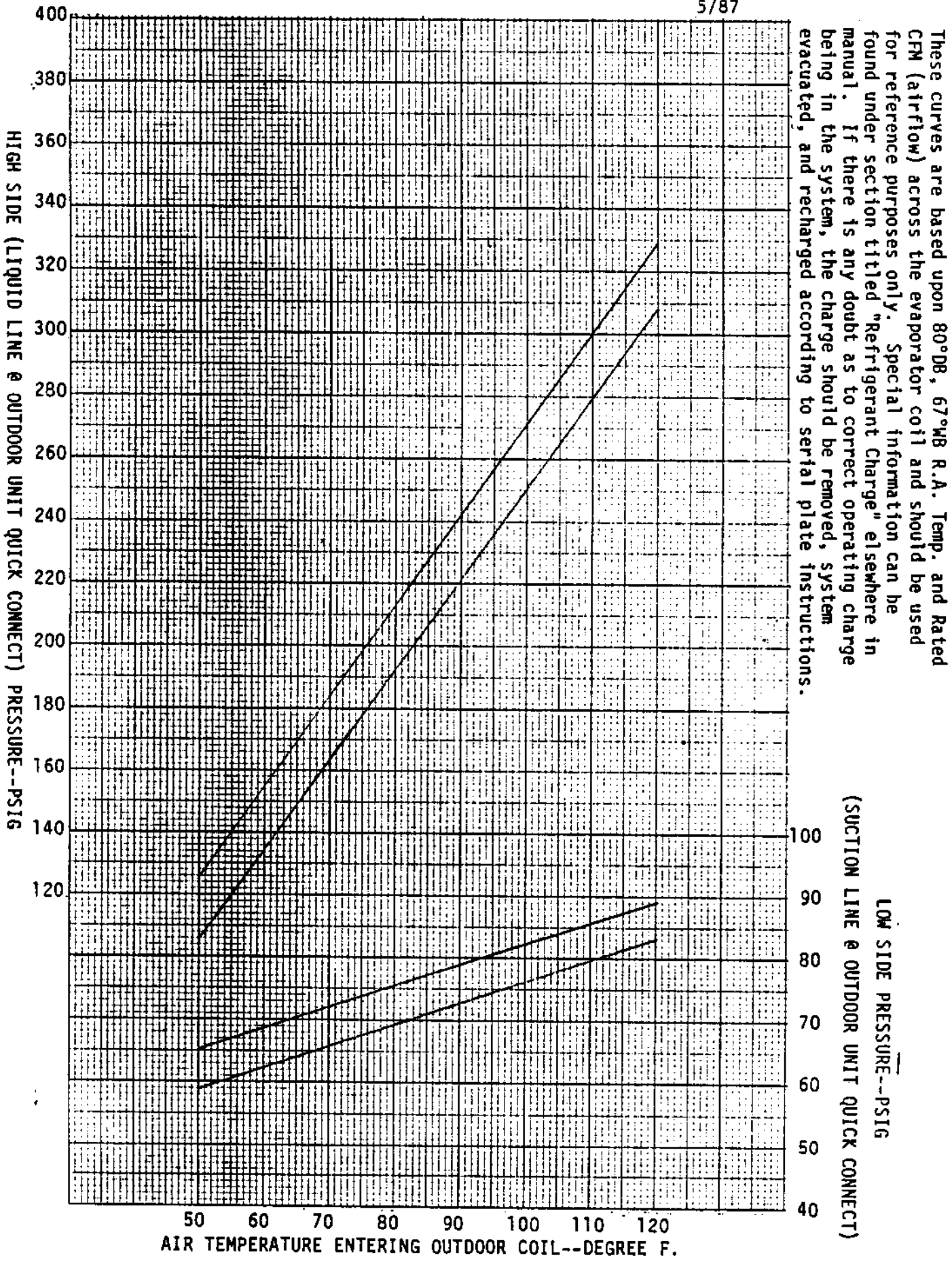
These curves are based upon 80°DB, 67%RH R.A. Temp. and Rated CFM (air-flow) across the evaporator coil and should be used for reference purposes only. Special information can be found under section titled "Refrigerant Charge" elsewhere in manual. If there is any doubt as to correct operating charge being in the system, the charge should be removed, system evacuated, and recharged according to serial plate instructions.

LOW SIDE PRESSURE--PSIG
 (SUCTION LINE @ OUTDOOR UNIT QUICK CONNECT)

AIR TEMPERATURE ENTERING OUTDOOR COIL--DEGREE F.

SPLIT AIR CONDITIONER
42ECS1 WITH A48AS-A

5/87



These curves are based upon 80°DB, 67°WB R.A. Temp. and Rated CFM (air-flow) across the evaporator coil and should be used for reference purposes only. Special information can be found under section titled "Refrigerant Charge" elsewhere in manual. If there is any doubt as to correct operating charge being in the system, the charge should be removed, system evacuated, and recharged according to serial plate instructions.

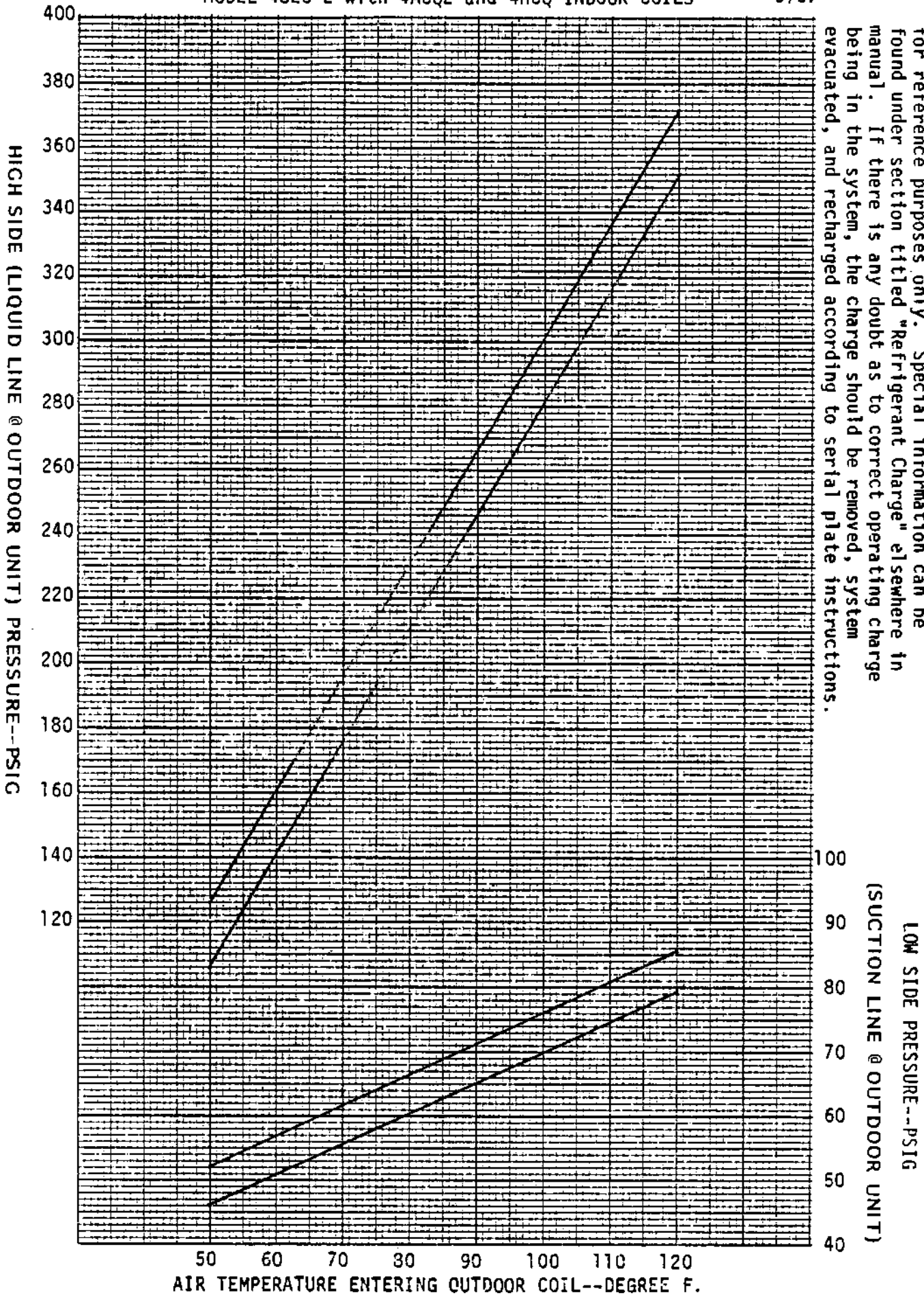
LOW SIDE PRESSURE--PSIG
(SUCTION LINE @ OUTDOOR UNIT QUICK CONNECT)

HIGH SIDE (LIQUID LINE @ OUTDOOR UNIT QUICK CONNECT) PRESSURE--PSIG

AIR TEMPERATURE ENTERING OUTDOOR COIL--DEGREE F.

SPLIT AIR CONDITIONER
 MODEL 48EC*2 with 4ACQ2 and 4HCQ INDOOR COILS

5/87



These curves are based upon 80°DB, 67°WB R.A. Temp. and Rated CFM (airflow) across the evaporator coil and should be used for reference purposes only. Special information can be found under section titled "Refrigerant Charge" elsewhere in manual. If there is any doubt as to correct operating charge being in the system, the charge should be removed, system evacuated, and recharged according to serial plate instructions.

LOW SIDE PRESSURE--PSIG
 (SUCTION LINE @ OUTDOOR UNIT)

HIGH SIDE (LIQUID LINE @ OUTDOOR UNIT) PRESSURE--PSIG

AIR TEMPERATURE ENTERING OUTDOOR COIL--DEGREE F.

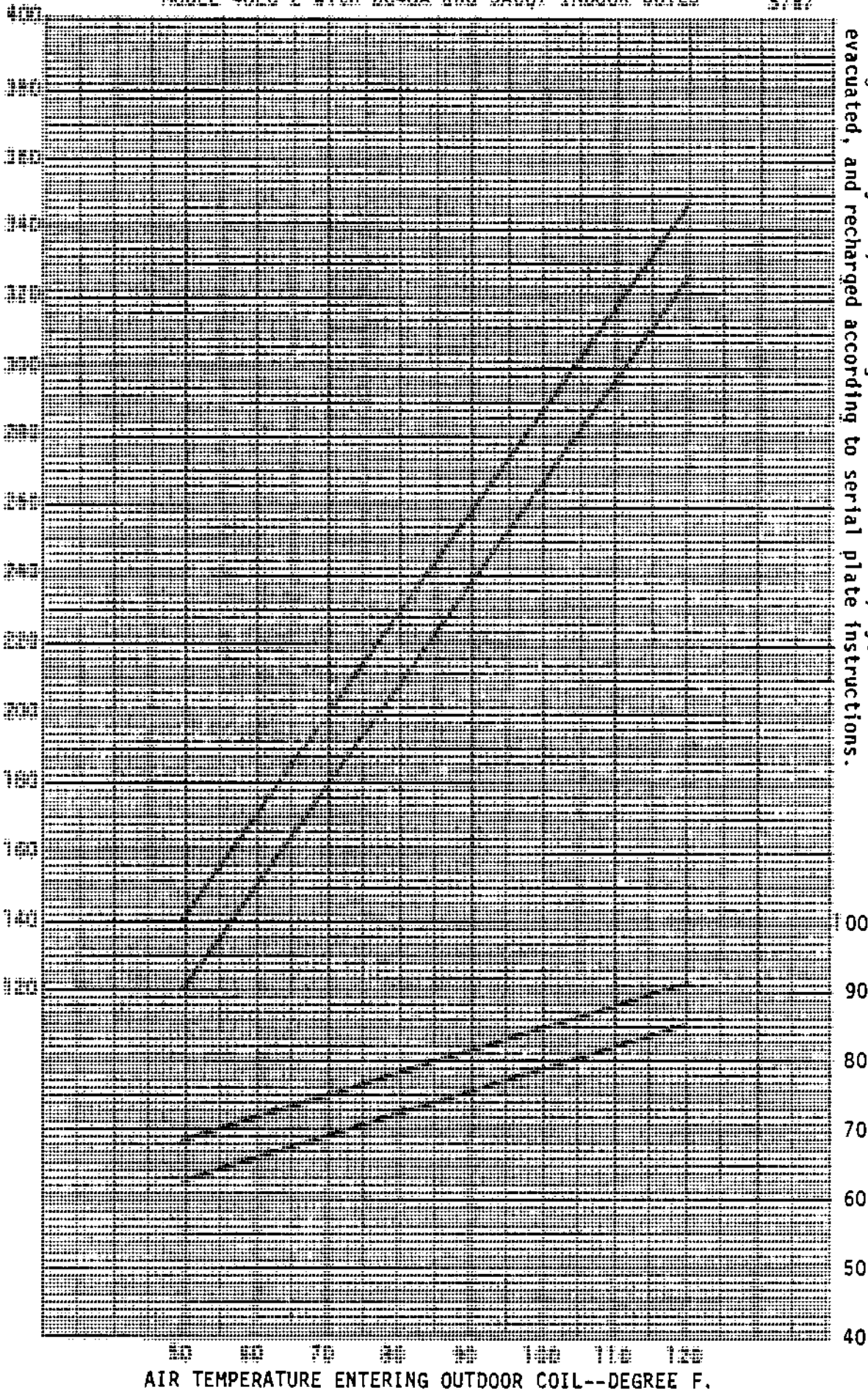
SPLIT AIR CONDITIONER
 MODEL 48EC*2 with BC48A and 5AC01 INDOOR COILS

5/87

These curves are based upon 80°DB, 67°WB R.A. Temp. and Rated CFM (airflow) across the evaporator coil and should be used for reference purposes only. Special information can be found under section titled "Refrigerant Charge" elsewhere in manual. If there is any doubt as to correct operating charge being in the system, the charge should be removed, system evacuated, and recharged according to serial plate instructions.

HIGH SIDE (LIQUID LINE @ OUTDOOR UNIT) PRESSURE--PSIG

LOW SIDE PRESSURE--PSIG
 (SUCTION LINE @ OUTDOOR UNIT)

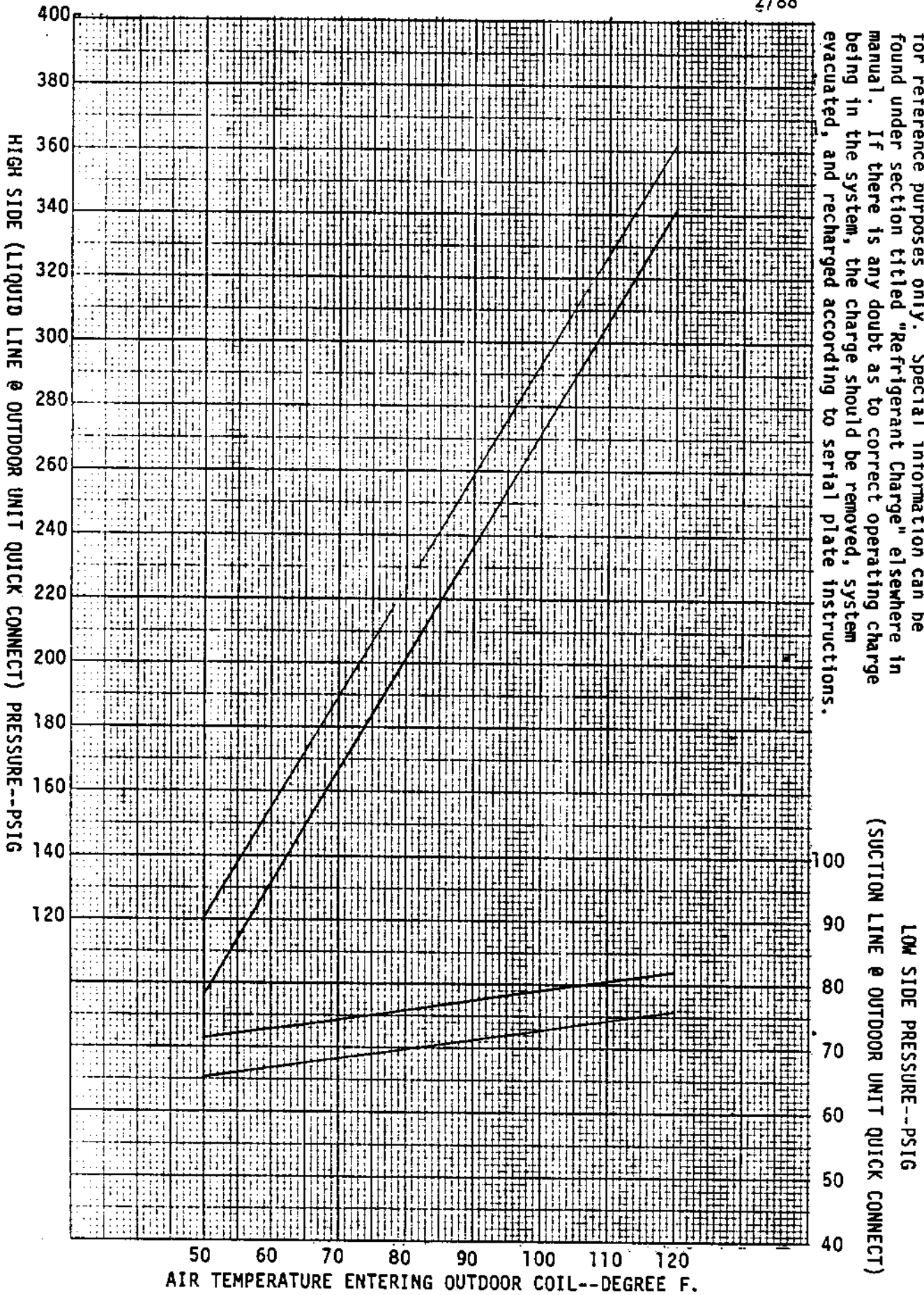


AIR TEMPERATURE ENTERING OUTDOOR COIL--DEGREE F.

SPLIT AIR CONDITIONER
48ECS1 WITH A48AS-A

2/88

These curves are based upon 80°DB, 67°WB R.A. Temp. and Rated CFM (airflow) across the evaporator coil and should be used for reference purposes only. Special information can be found under section titled "Refrigerant Charge" elsewhere in manual. If there is any doubt as to correct operating charge being in the system, the charge should be removed, system evacuated, and recharged according to serial plate instructions.



LOW SIDE PRESSURE--PSIG
(SUCTION LINE @ OUTDOOR UNIT QUICK CONNECT)

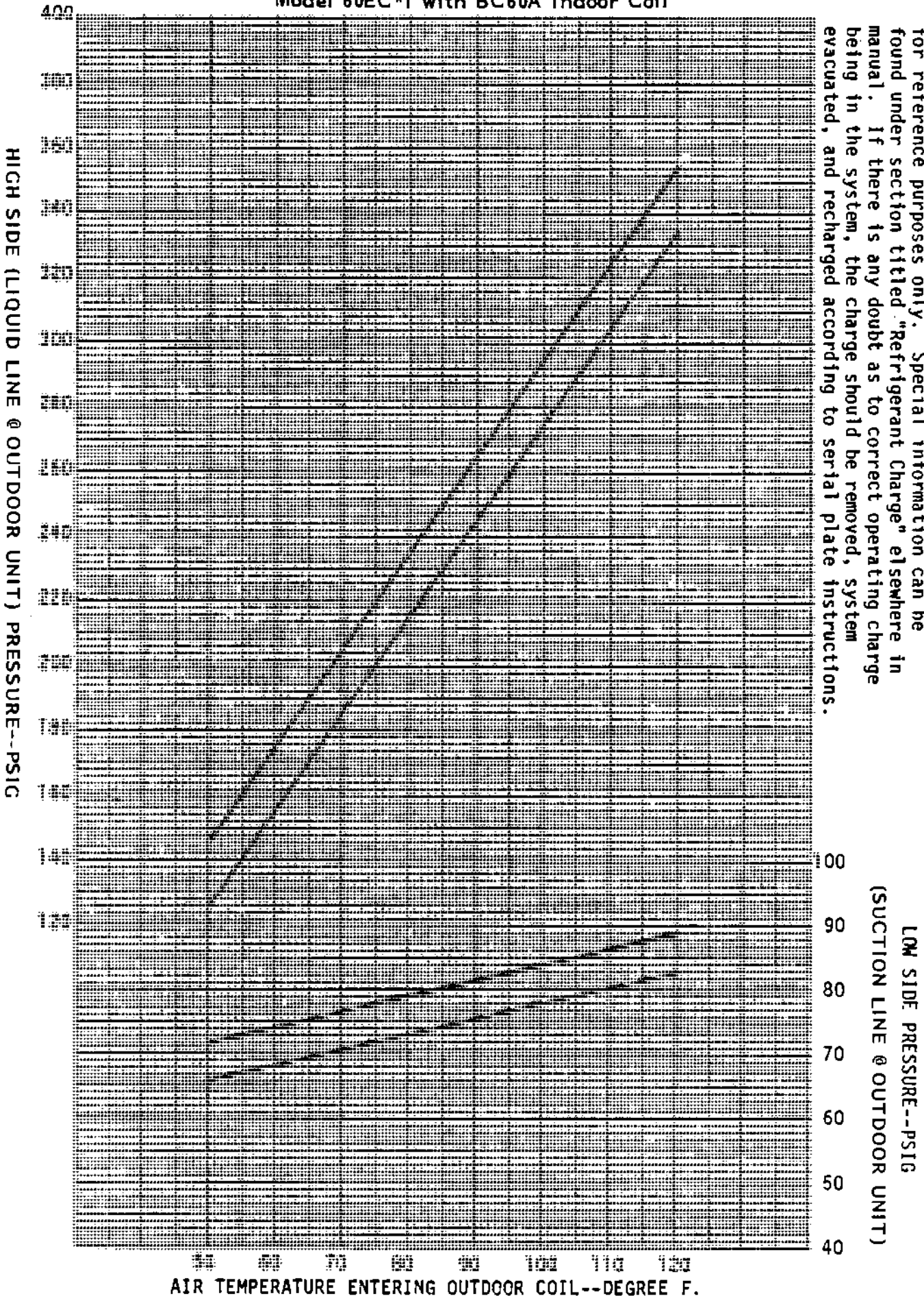
HIGH SIDE (LIQUID LINE @ OUTDOOR UNIT QUICK CONNECT) PRESSURE--PSIG

AIR TEMPERATURE ENTERING OUTDOOR COIL--DEGREE F.

SPLIT AIR CONDITIONER
 Model 60EC*1 with BC60A Indoor Coil

5/87

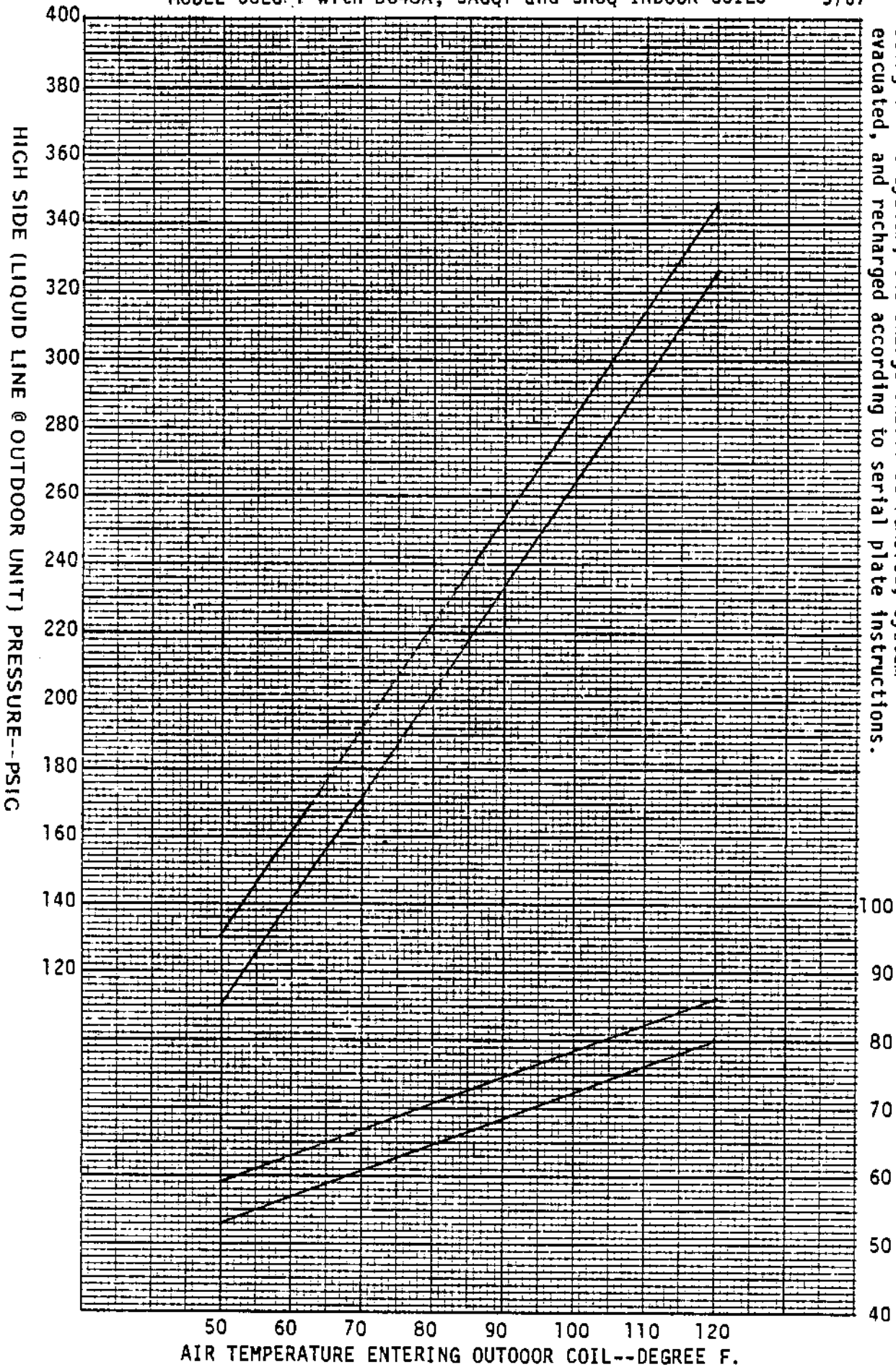
These curves are based upon 80°DB, 67°WB R.A. Temp. and Rated CFM (airflow) across the evaporator coil and should be used for reference purposes only. Special information can be found under section titled "Refrigerant Charge" elsewhere in manual. If there is any doubt as to correct operating charge being in the system, the charge should be removed, system evacuated, and recharged according to serial plate instructions.



LOW SIDE PRESSURE--PSIG
 (SUCTION LINE @ OUTDOOR UNIT)

SPLIT AIR CONDITIONER
 MODEL 60EC*1 with BC48A, 5ACQ1 and 5HCQ INDOOR COILS

5/87



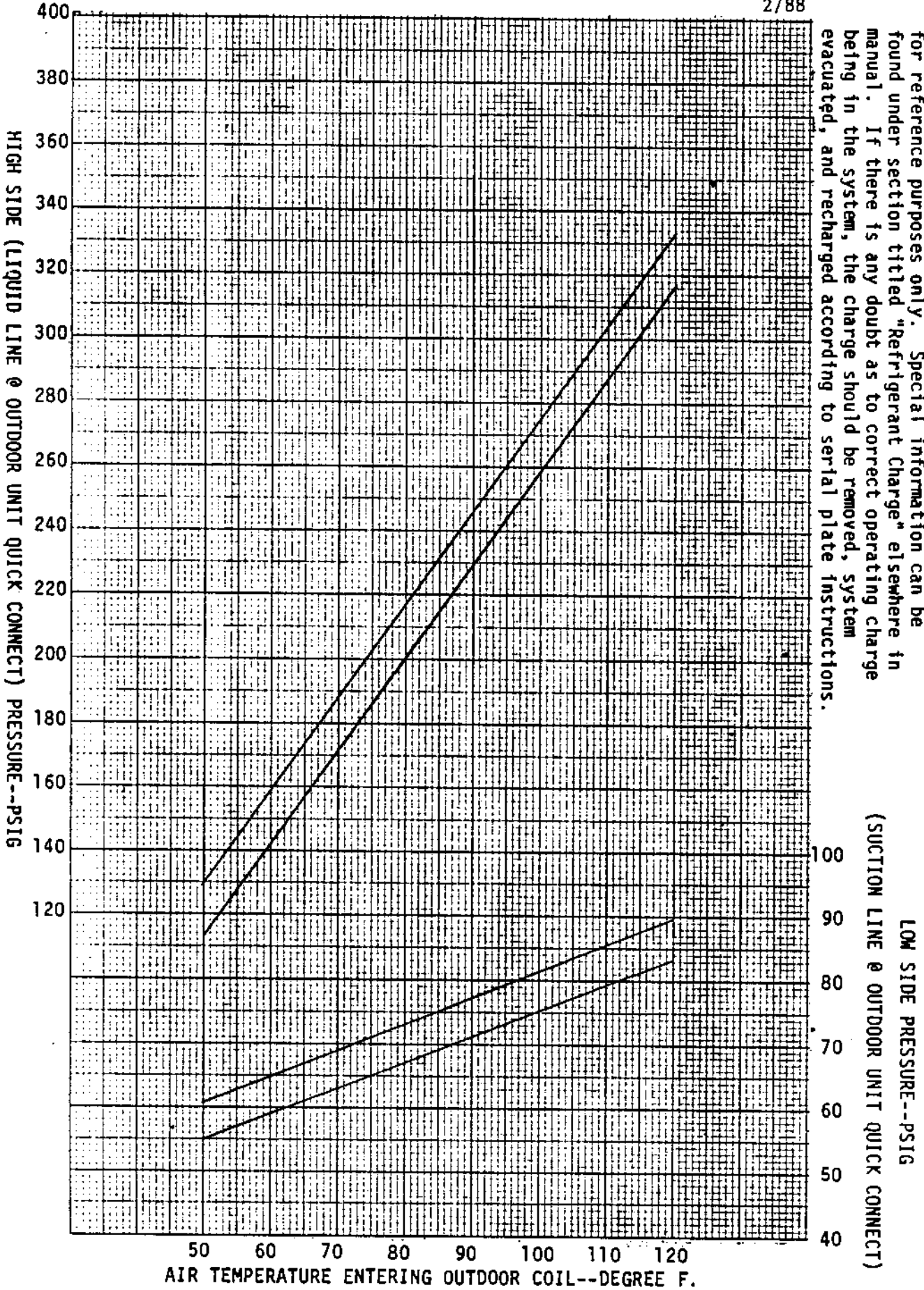
These curves are based upon 80°DB, 67°WB R.A. Temp. and Rated CFM (airflow) across the evaporator coil and should be used for reference purposes only. Special information can be found under section titled "Refrigerant Charge" elsewhere in manual. If there is any doubt as to correct operating charge being in the system, the charge should be removed, system evacuated, and recharged according to serial plate instructions.

LOW SIDE PRESSURE--PSIG
 (SUCTION LINE @ OUTDOOR UNIT)

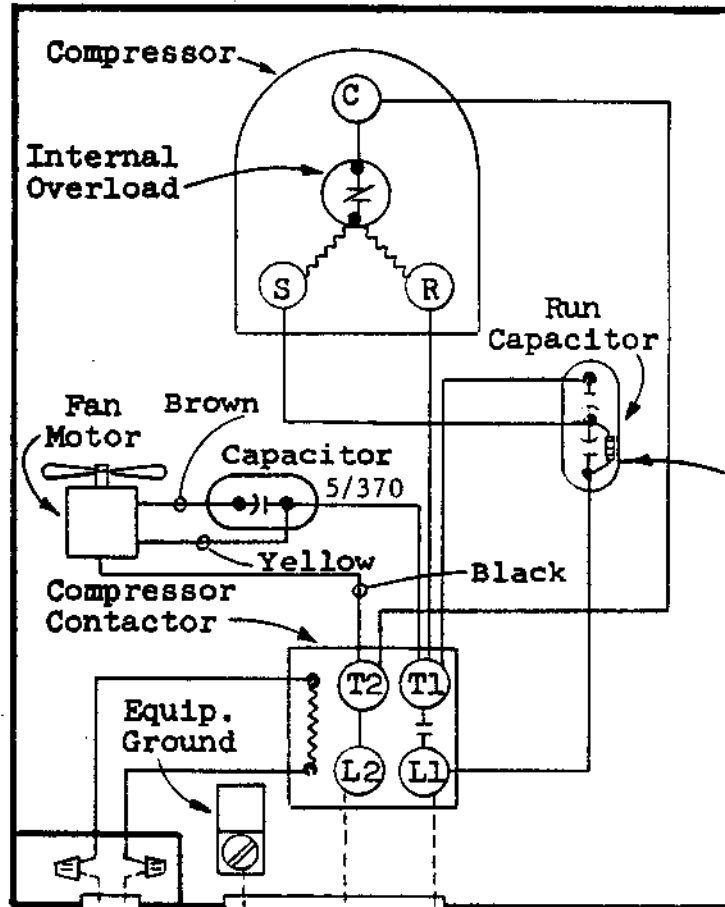
SPLIT AIR CONDITIONER
60ECS1 WITH A60AS-A

2/88

These curves are based upon 80°DB, 67°WB R.A. Temp. and Rated CFM (at flow) across the evaporator coil and should be used for reference purposes only. Special information can be found under section titled "Refrigerant Charge" elsewhere in manual. If there is any doubt as to correct operating charge being in the system, the charge should be removed, system evacuated, and recharged according to serial plate instructions.



LOW SIDE PRESSURE--PSIG
(SUCTION LINE @ OUTDOOR UNIT QUICK CONNECT)



CAPACITOR	
Model	Size
18ECQ,S2	15/10-370
24ECQ,S4	20/15-370

Use Minimum
Transformer
Rating of 40VA

Use Copper
Conductors
Only

C Y
24V

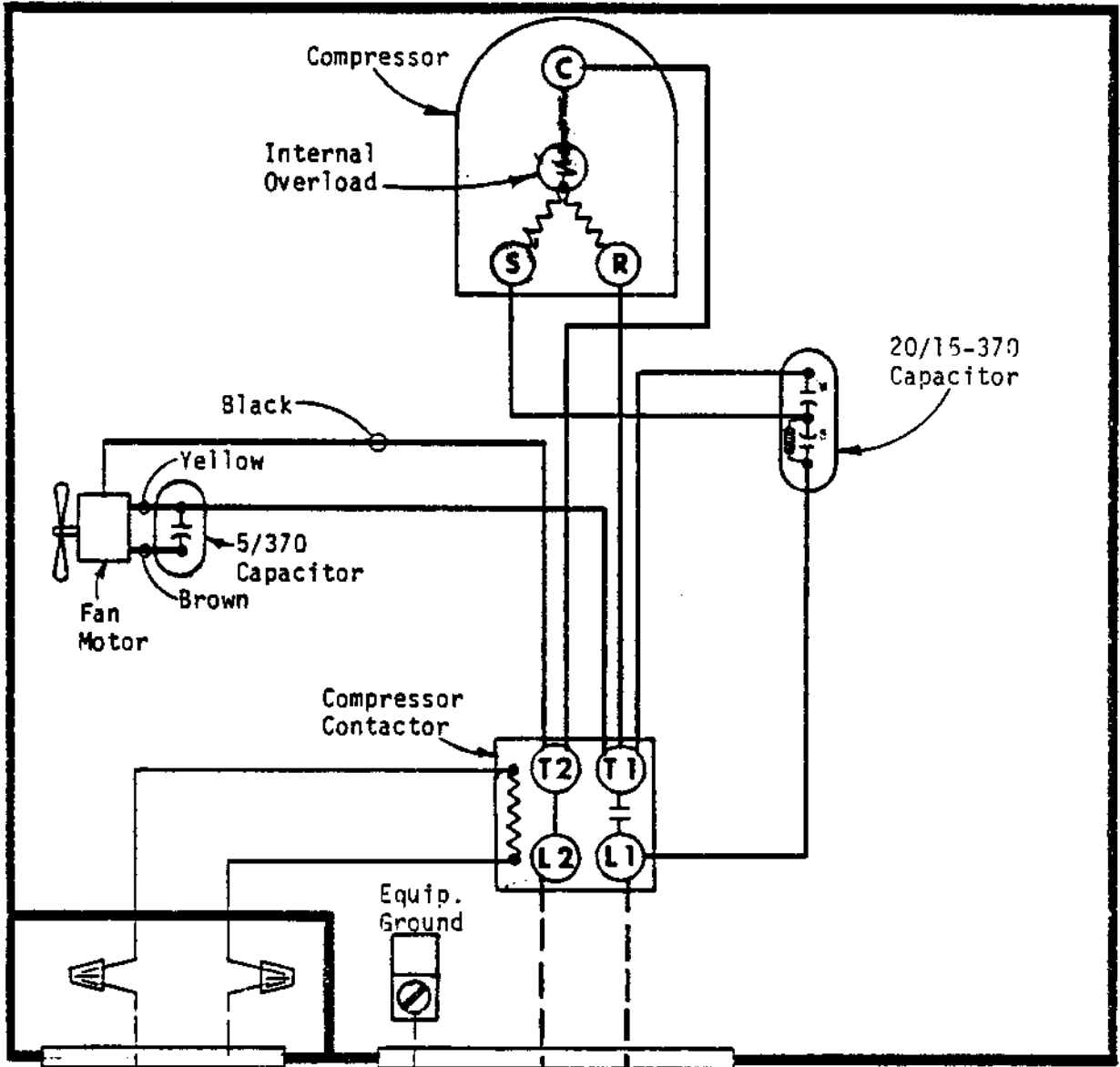
Factory Wiring

Field Wiring

Fused
Disconnect
Switch

230/208-60-1

4021-110E



Use Minimum
Transformer
Rating of
40VA

24V

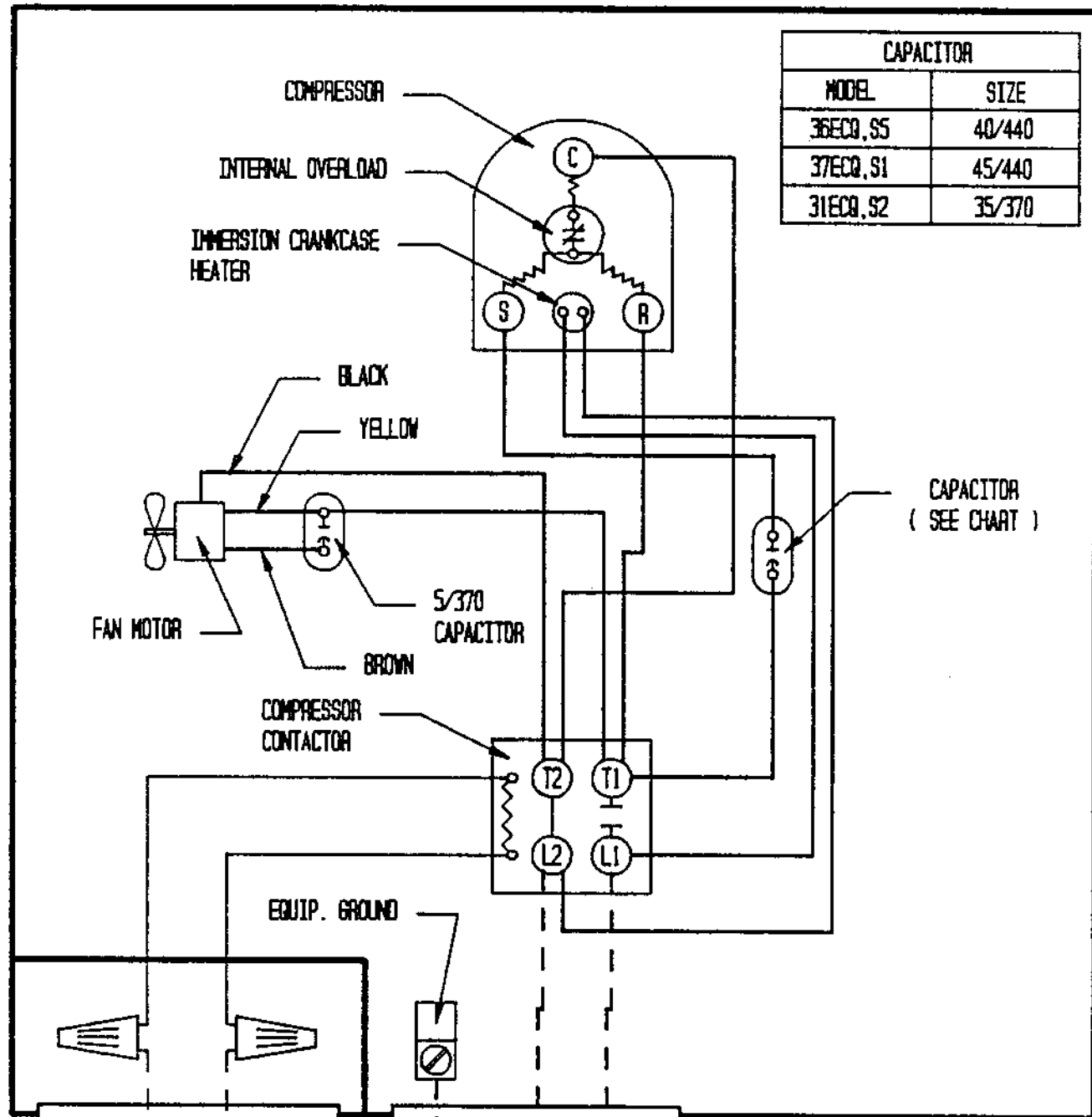
Use Copper
Conductors
Only

Fused
Disconnect
Switch

FACTORY WIRING	FIELD WIRING
Low Voltage	-----
High Voltage	-----

230/208-60-1

4062-110 A



CAPACITOR	
MODEL	SIZE
36ECQ, S5	40/440
37ECQ, S1	45/440
31ECQ, S2	35/370

CAPACITOR
(SEE CHART)

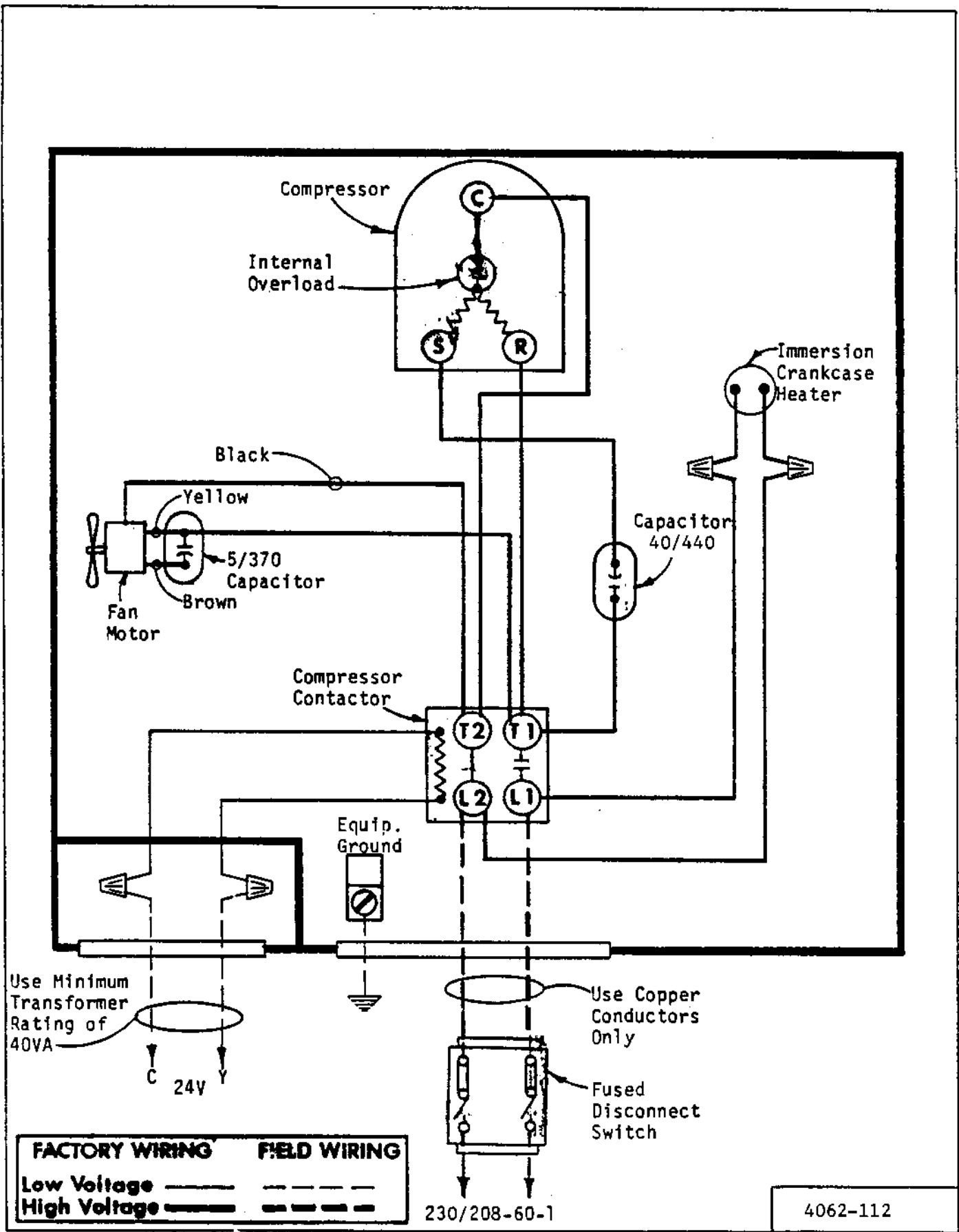
USE COPPER
CONDUCTORS ONLY

	FACTORY WIRING	FIELD WIRING
Low Voltage	————	-----
High Voltage	————	-----

USE MINIMUM
TRANSFORMER
RATING OF 40VA

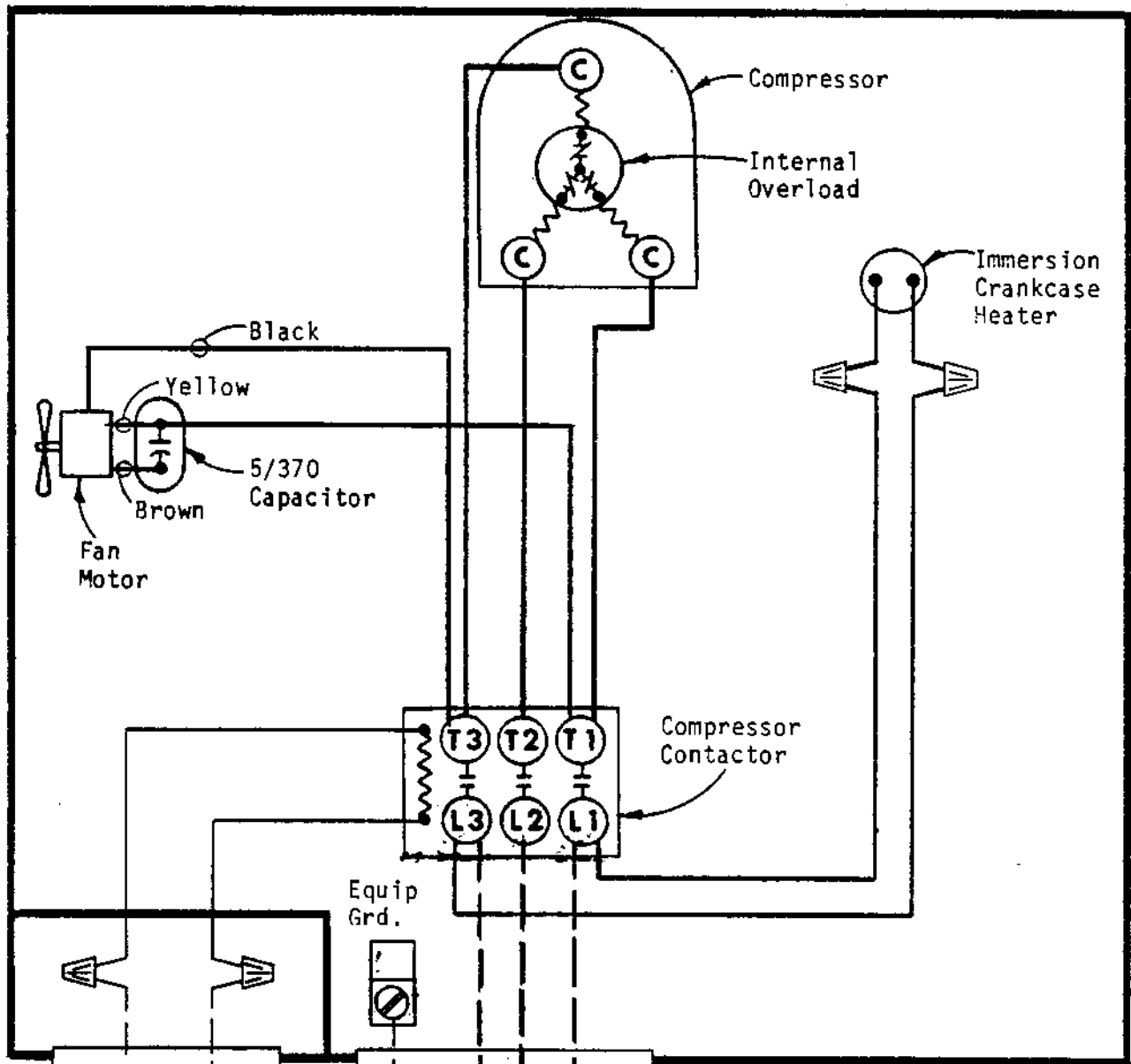


230/208-60-1



230/208-60-1

4062-112



Use Minimum
Transformer
Rating of
40VA

24V

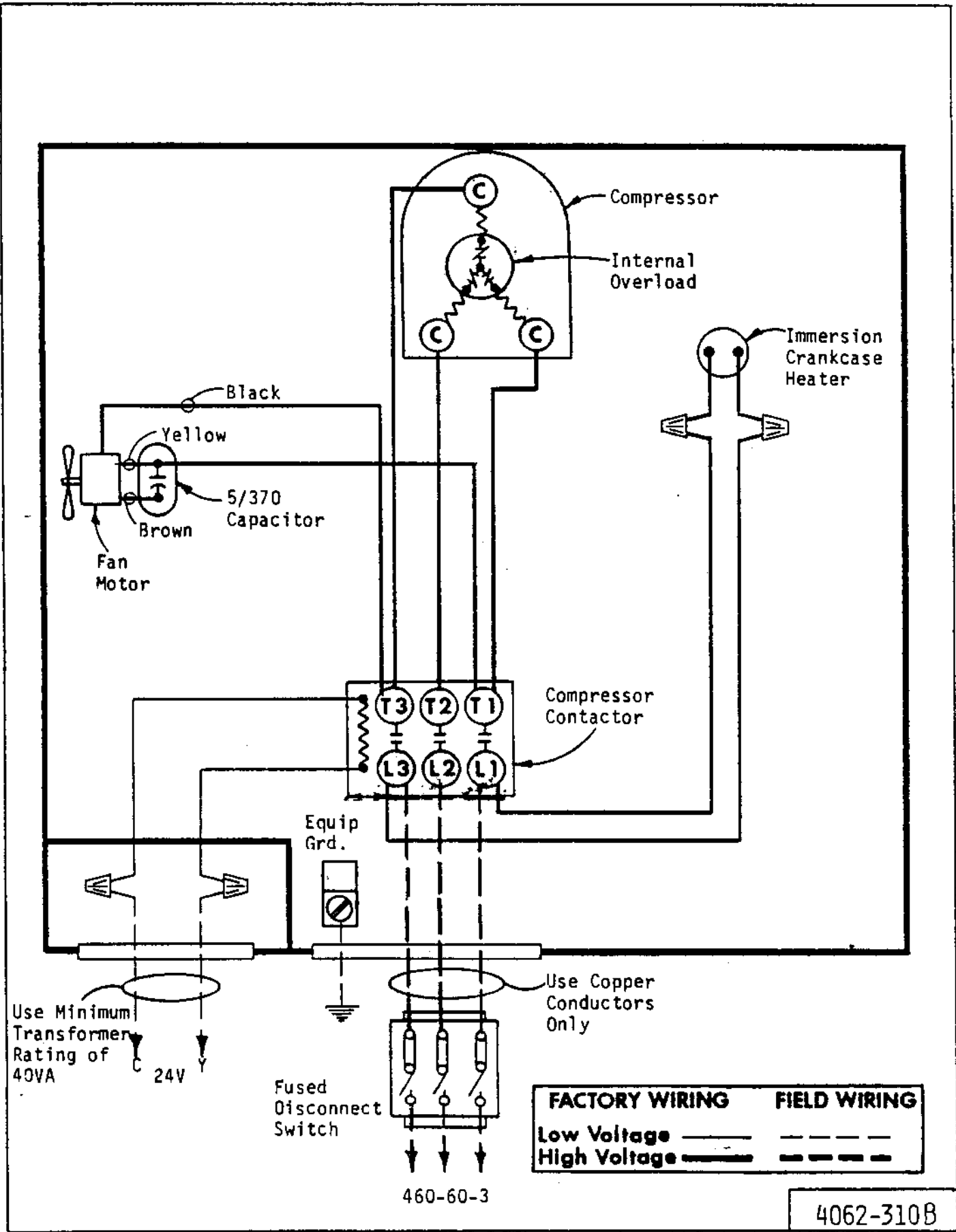
Fused
Disconnect
Switch

230/208-60-3
240/200-50-3

FACTORY WIRING	FIELD WIRING
Low Voltage	-----
High Voltage	-----

Use Copper
Conductors
Only

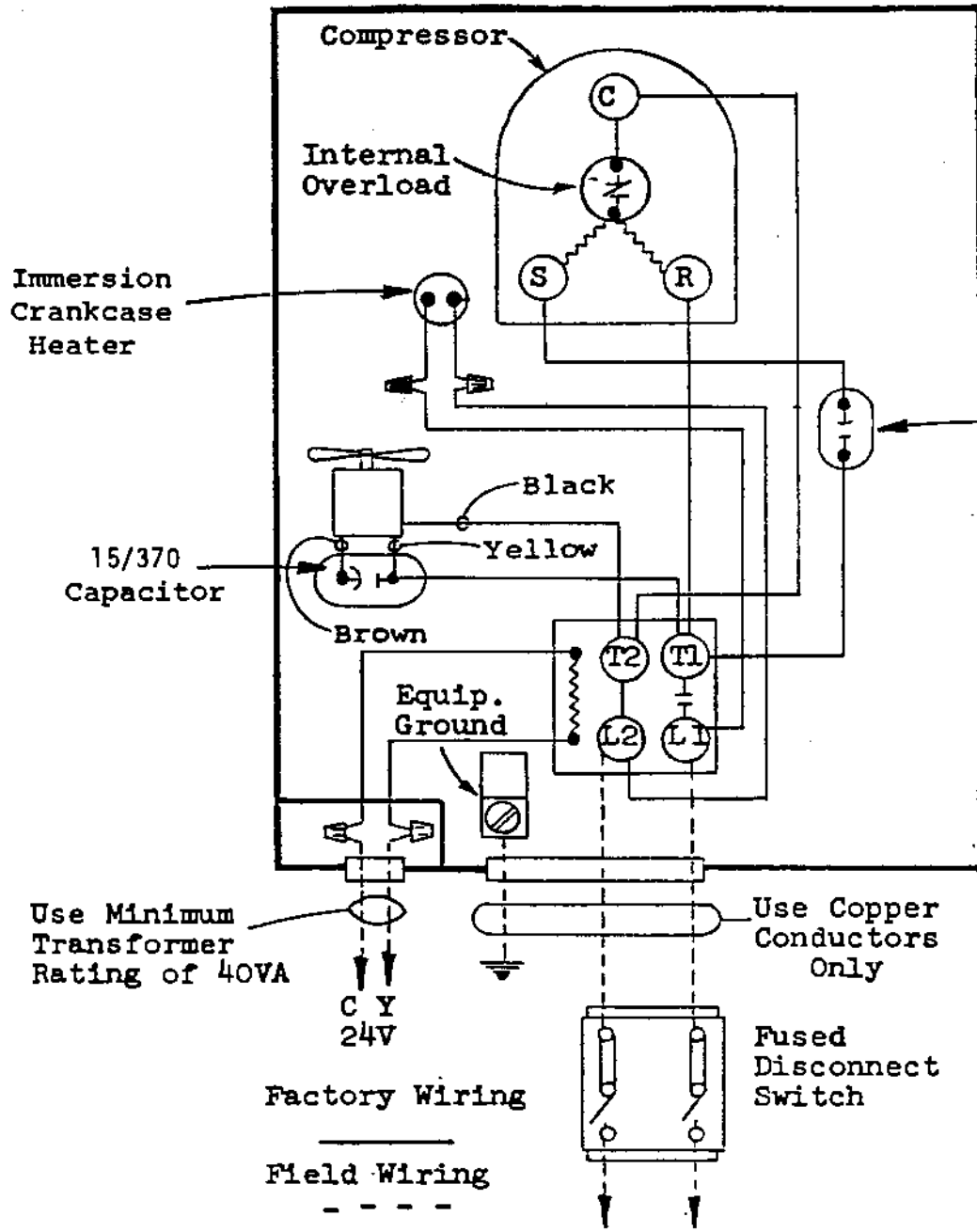
4062-210 B



	FACTORY WIRING	FIELD WIRING
Low Voltage	—————	- - - - -
High Voltage	—————	- - - - -

460-60-3

4062-310B



CAPACITOR	
Model	Size
42ECQ1	40/440
48ECQ2	70/370
60ECQ1	45/440

230/208-60-1

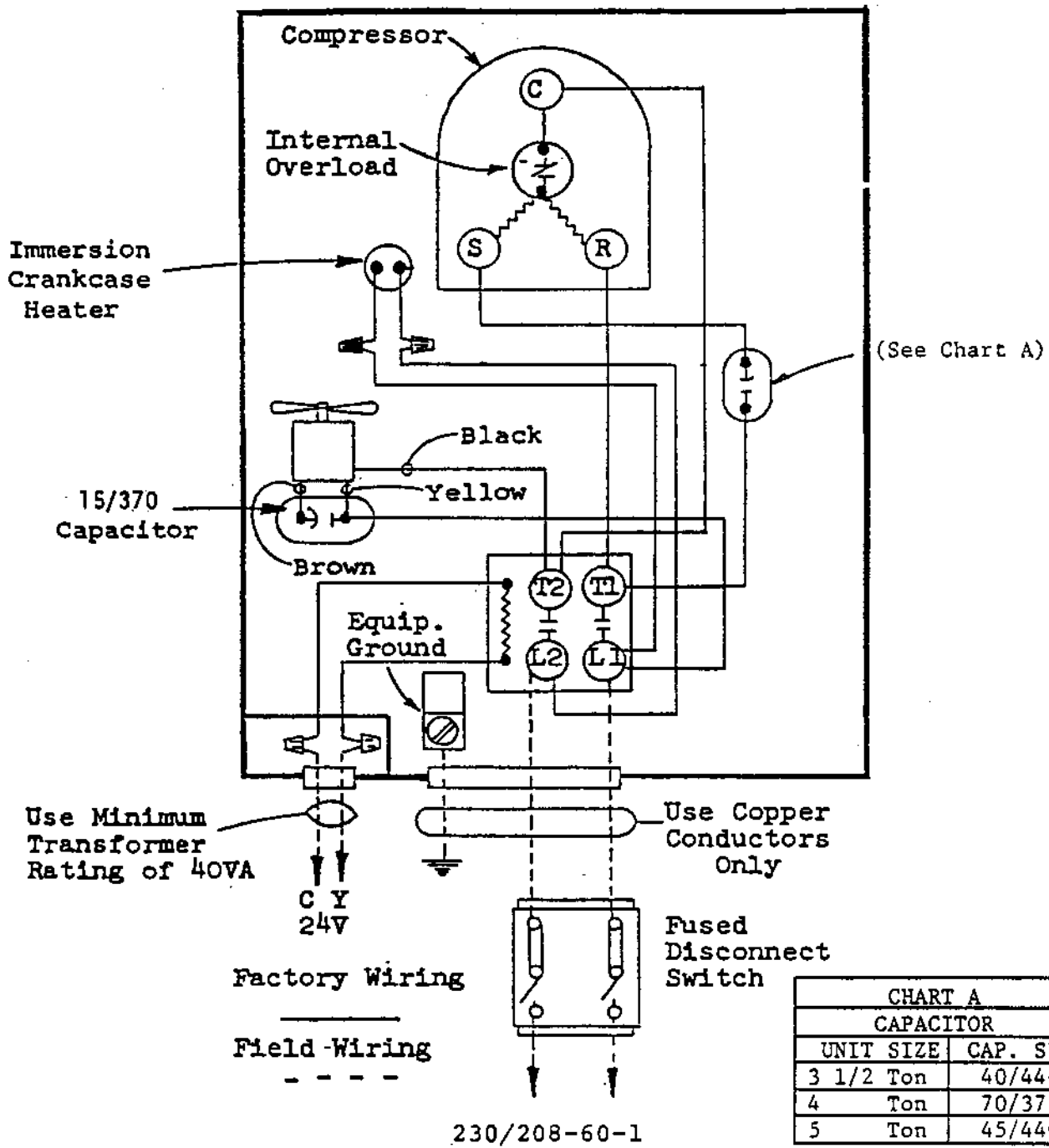
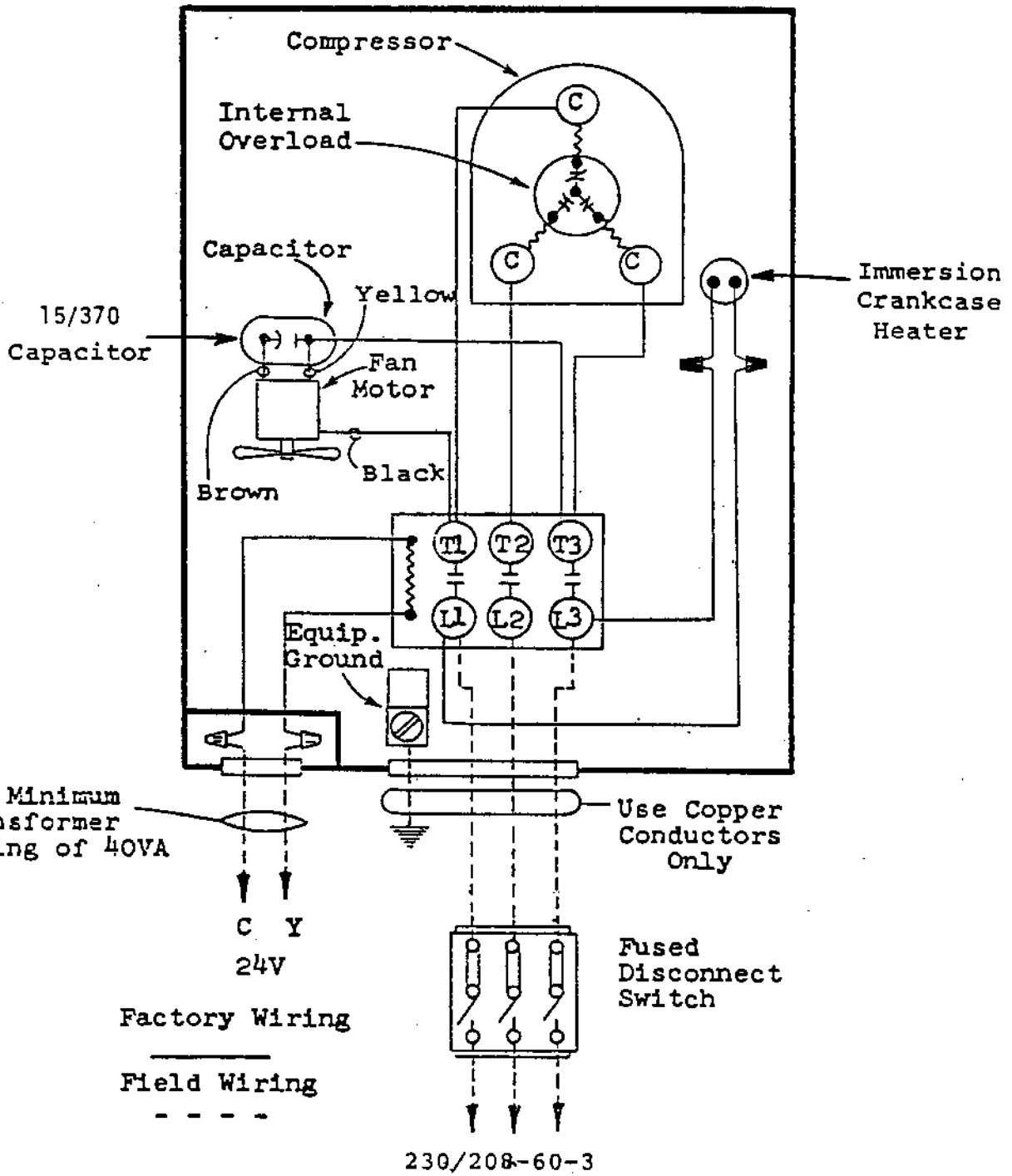


CHART A	
CAPACITOR	
UNIT SIZE	CAP. SIZE
3 1/2 Ton	40/440
4 Ton	70/370
5 Ton	45/440



4025-210 C

