

INSTALLATION INSTRUCTIONS



MODELS

18ECQ1, 24ECQ1, 30ECQ2, 31ECQ, 36ECQ4,
37ECQ, 42ECQ1, 48ECQ2, 60ECQ1

SPLIT AIR CONDITIONER OUTDOOR SECTIONS

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

BARD MANUFACTURING COMPANY
P. O. Box 607 Bryan, Ohio 43506
(419) 636-1194

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 pre-charged refrigerant tubing and the electrical wiring connections to the unit.

The condensing units are to be used in conjunction with the matching pre-charged evaporator coils or pre-charged evaporator blower units 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 "Connecting Quick-Connect Couplings, 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.

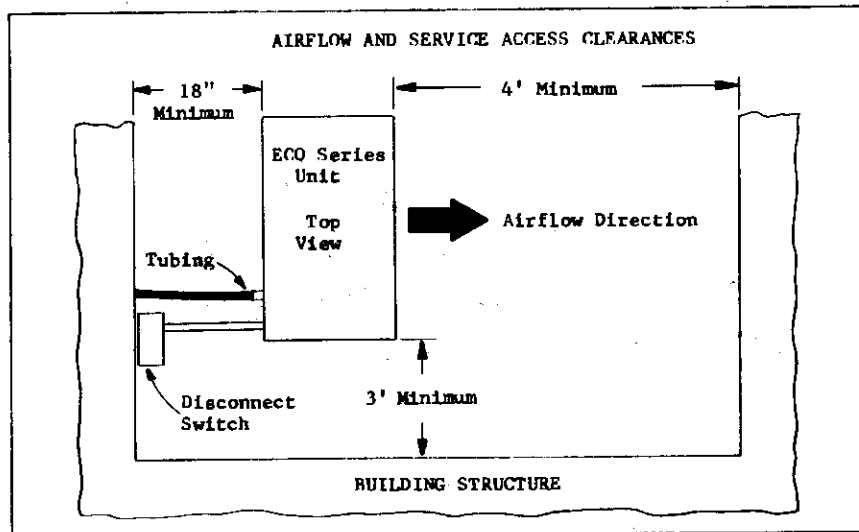


Figure 1

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.

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.

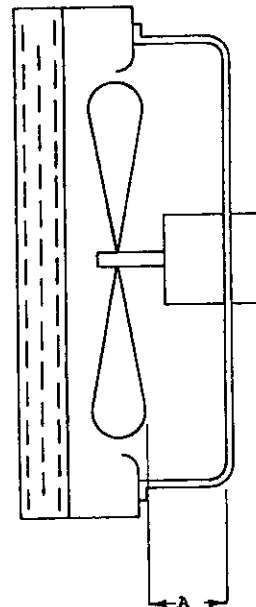
Refer to unit wiring diagram to find exact type of crankcase heater used.

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:

1. 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 60 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 OPERATE 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 2 OVERCURRENT PROTECTION	60°C COPPER WIRE SIZE	COPPER GROUND WIRE SIZE
18ECQ1	230/208-60-1	197-253	13.6	17	25	#12	#12
24ECQ1	230/208-60-1	197-253	15.6	19	30	#12	#12
30ECQ2	230-60-1	207-253	17.6	22	35	#10	#10
31ECQ	230/208-60-1	197-253	14.6	18	30	#12	#12
36ECQ4	230-60-1	197-253	25.6	32	50	#8	#10
	230-60-3	187-253	13.8	17	25	#12	#12
	460-60-3	414-506	7.0	15	15	#14	#14
37ECQ	230-208-60-1	197-253	19.6	24	40	#10	#10
42ECQ1	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
48ECQ2	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
60ECQ1	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

REFRIGERANT CHARGE

The correct system R-22 charge is shown on the unit rating plate. Optimum unit performance will occur with a refrigerant charge resulting in a suction line temperature (6" from compressor) as shown in the following table:

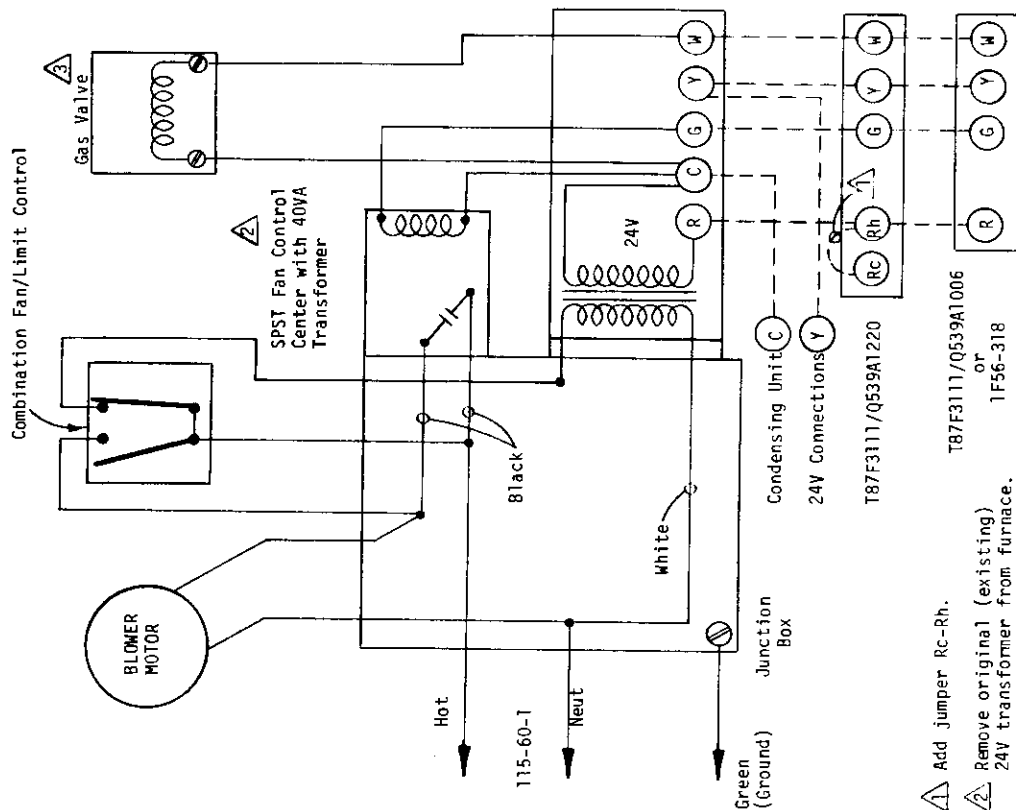
OUTDOOR UNIT	INDOOR UNIT	RATED AIRFLOW	95°F O.D. TEMP.	82°F O.D. TEMP.
18ECQ1	18QS3 2ACQ B18EQ1	575 680 635	47 - 49 62 - 64 62 - 64	60 - 62 64 - 66 67 - 69
24ECQ1	24QS 2ACQ B24EQ1	780 815 780	43 - 45 45 - 47 43 - 45	50 - 52 57 - 59 54 - 56
30ECQ2	3ACQ3 3HCQ B36EHQ1	1100 925 1080	52 - 54 60 - 62 61 - 63	59 - 61 63 - 65 65 - 67
31ECQ	3ACQ3 3ACQ4 3HCQ B36EHQ1	1050 1100 925 1000	52 - 54 50 - 52 69 - 71 67 - 69	61 - 63 54 - 56 74 - 76 72 - 74
36ECQ4	3ACQ3 3HCQ B36EHQ1	1150 925 1275	41 - 43 45 - 47 48 - 50	40 - 42 53 - 55 58 - 60
37ECQ	3ACQ3 3ACQ5 3HCQ B36EHQ1	1150 1150 925 1295	55 - 57 48 - 50 52 - 54 61 - 63	62 - 64 62 - 64 66 - 68 70 - 72
42ECQ1	4ACQ2 5ACQ1 4HCQ B48EHQ	1450 1600 1500 1575	47 - 49 49 - 51 54 - 56 51 - 53	59 - 61 53 - 55 63 - 65 92 - 94
48ECQ2	4ACQ2 5ACQ1 4HCQ B48EHQ	1690 1800 1600 1725	49 - 51 43 - 45 68 - 70 53 - 55	64 - 66 52 - 54 72 - 74 60 - 62
60ECQ1	5ACQ1 5HCQ B48EHQ	1990 1650 1625	61 - 63 49 - 51 55 - 57	67 - 69 58 - 60 63 - 65

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

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
18ECQ1	18QS3 2ACQ B18EQ1	575 680 635	.30 .22	.10
24ECQ1	24QS 2ACQ B24EQ1	780 815 780	.30 .30	.10
30ECQ2	3ACQ3 3HCQ B36EHQ1	1100 925 1080	.28 .30	.30
31ECQ	3ACQ3 3ACQ5 3HCQ B36EHQ1	1050 1100 925 1000	.28 .27 .30	.30
36ECQ4	3ACQ3 3HCQ B36EHQ1	1150 925 1275	.30 .30	.25
37ECQ	3ACQ3 3ACQ5 3HCQ B36EHQ1	1150 1150 925 1295	.30 .30 .30	.20
42ECQ1	4ACQ2 5ACQ1 4HCQ B48EHQ	1450 1600 1500 1575	.25 .14 .30	.40
48ECQ2	4ACQ2 5ACQ1 4HCQ B48EHQ	1690 1800 1600 1725	.30 .18 .30	.30
60ECQ1	5ACQ1 5HCQ B48EHQ	1990 1650 1625	.28 .30	.30

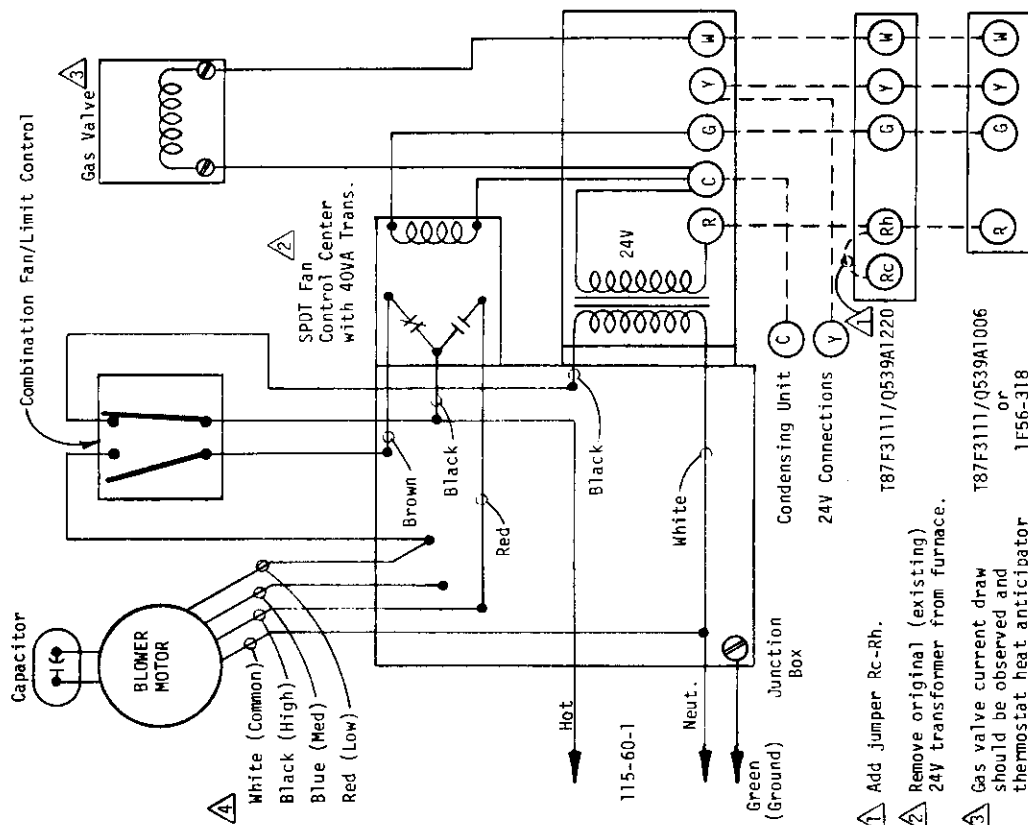
- ¹ Measured across the evaporator coil assembly, including drain pan.
² External static pressure available for the duct system—supply and return. All blower coil models have multi-speed motors, and value shown is at recommended speed. Consult specification airflow charts for complete information as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

TYPICAL APPLICATION — GAS FURNACE WITH SINGLE SPEED MOTOR

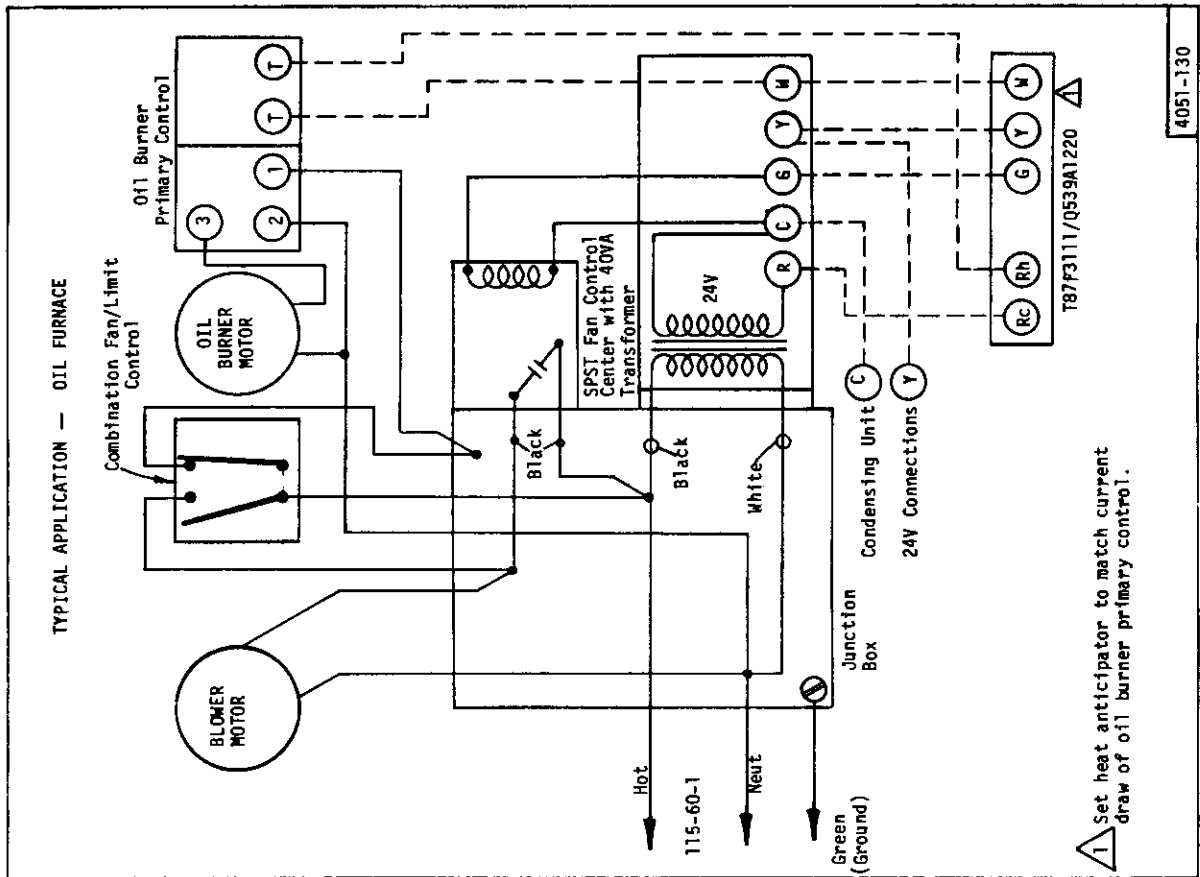


4051-170

TYPICAL APPLICATION — GAS FURNACE WITH MULTI-SPEED MOTOR



4051-120



PARTS LIST
SPLIT SYSTEM CONDENSING UNITS

PART NO.	DESCRIPTION	18ECQ1	24ECQ1	30ECQ2	31ECQ	36ECQ4	36ECQ4-3	37ECQ	42ECQ1	42ECQ1-3	48ECQ2	48ECQ2-3	60ECQ1	60ECQ1-3	36ECQ4-3	42ECQ1-3	460V	48ECQ2-3	460V	60ECQ1-3	460V
8552-027	Capacitor 25/370V	x																			
8552-040	Capacitor 20/15-370V																				
8552-030	Capacitor 40/440V																				
8552-036	Capacitor 70/370V																				
8552-031	Capacitor 45/440V																				
8552-026	Capacitor 15/370V																				
8552-033	Capacitor 20/370V																				
8552-035	Capacitor 40/370V																				
8552-002	Capacitor 5/370V																				
8000-001	Compressor AB111FT																				
8000-002	Compressor AB114FT																				
8000-006	Compressor AH152GT																				
8000-050	Compressor H2EA253AB																				
8000-008	Compressor AH301FT																				
8000-051	Compressor H2EA363AB																				
8000-009	Compressor AH302RT																				
8000-063	Compressor CRK1-0325-PFV																				
8000-064	Compressor CRK1-0325-TF5																				
8000-067	Compressor AG112ET																				
8000-030	Compressor AG112ET																				
8000-027	Compressor AG122ET																				
8000-031	Compressor AG122RT																				
8000-010	Compressor AH302TT																				
8000-065	Compressor CRK1-0325-TFD																				
8000-047	Compressor AG111UT																				
8000-048	Compressor AG122UT																				
5051-011	Condenser Coil																				
5051-013	Condenser Coil																				
5051-001	Condenser Coil																				
5051-023	Condenser Coil																				
5051-009	Condenser Coil																				
5051-024	Condenser Coil																				
8401-007	Contactor - Comp. 25A																				
8401-003	Contactor - Comp. 30A																				
8401-002	Contactor - Comp. 25A																				
8401-016	Contactor - Comp. 35A																				
8605-001	Crankcase Heater																				
8605-002	Crankcase Heater																				
5151-001	Fan Blade TF1839																				
5151-007	Fan Blade TP2029																				
5151-017	Fan Blade FA2430-4B																				
8103-008	Motor - Fan 1/5 hp																				
8105-021	Motor - Fan 1/3 hp																				
8200-001	Motor Mount - Fan																				
8200-004	Motor Mount - Fan																				
8607-002	Terminal Block 230V																				
8407-003	Transformer-Stepdown																				
7051-010	Wire Grille - Inlet																				
7051-009	Condenser Grille																				
7051-003	Wire Grille - Inlet																				
7051-001	Condenser Grille																				
7051-004	Wire Grille - Inlet																				
7051-005	Condenser Grille																				
8552-028	Capacitor 35/440V																				

INSTALLING REFRIGERANT TUBING

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.

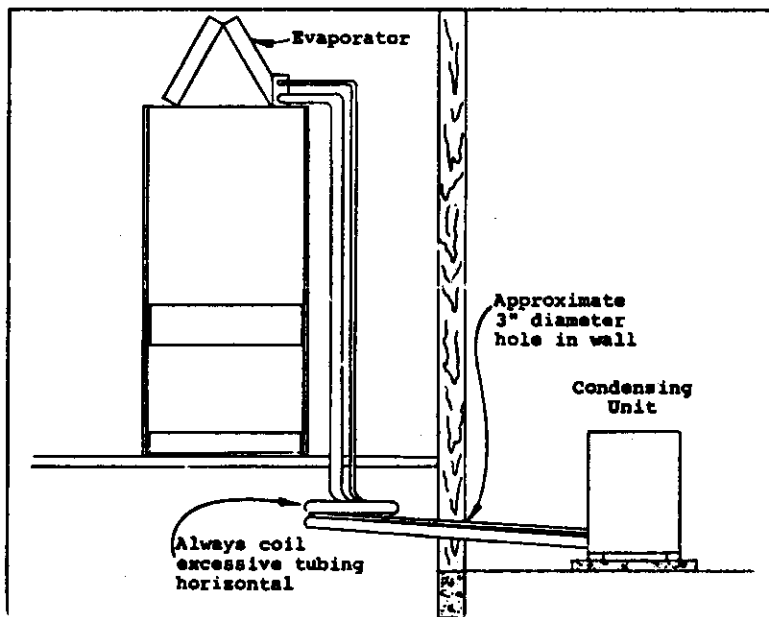
Locate the Gauge Port in a 45° angle from a vertical up position so as to be accessible for gauge connections.

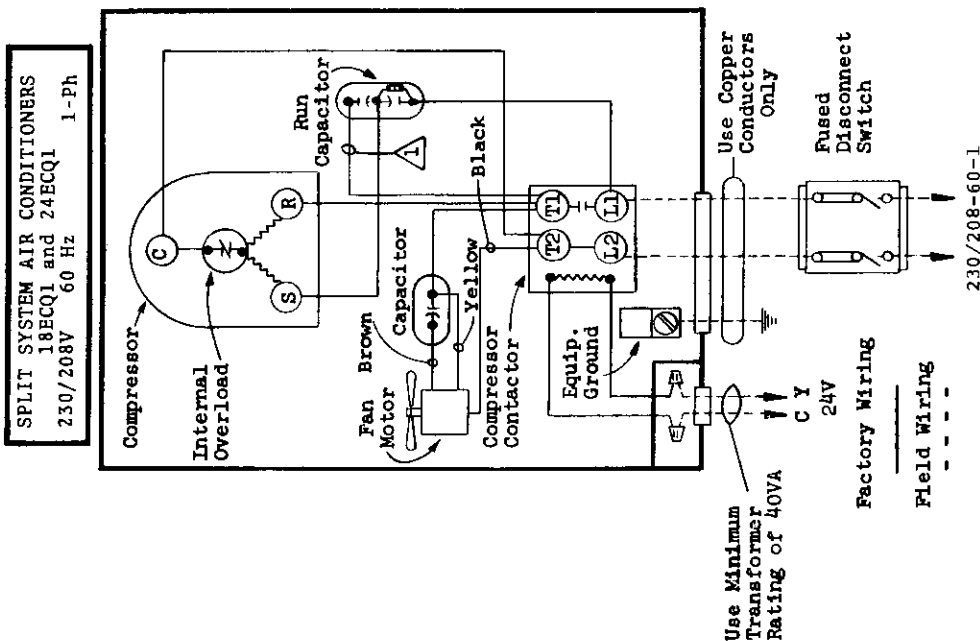
Use a wrench on the hex nut of the female fitting backing up the fitting with another wrench to keep tube from turning. Tighten the fittings together until they bottom out then tighten for an additional 1/4 turn so that coupling will seat properly.

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.

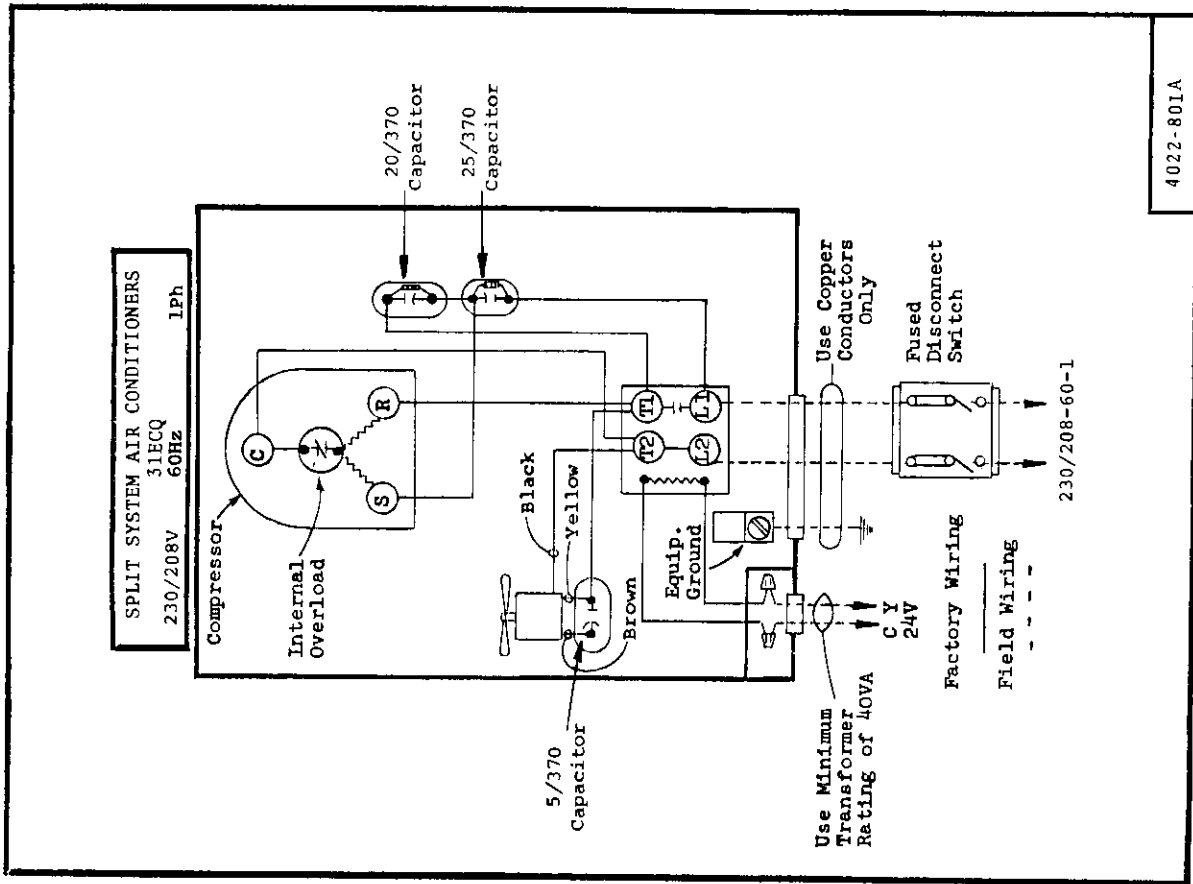
Leak test all connections using an Electronic Leak Detector or a Halide Torch.

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.

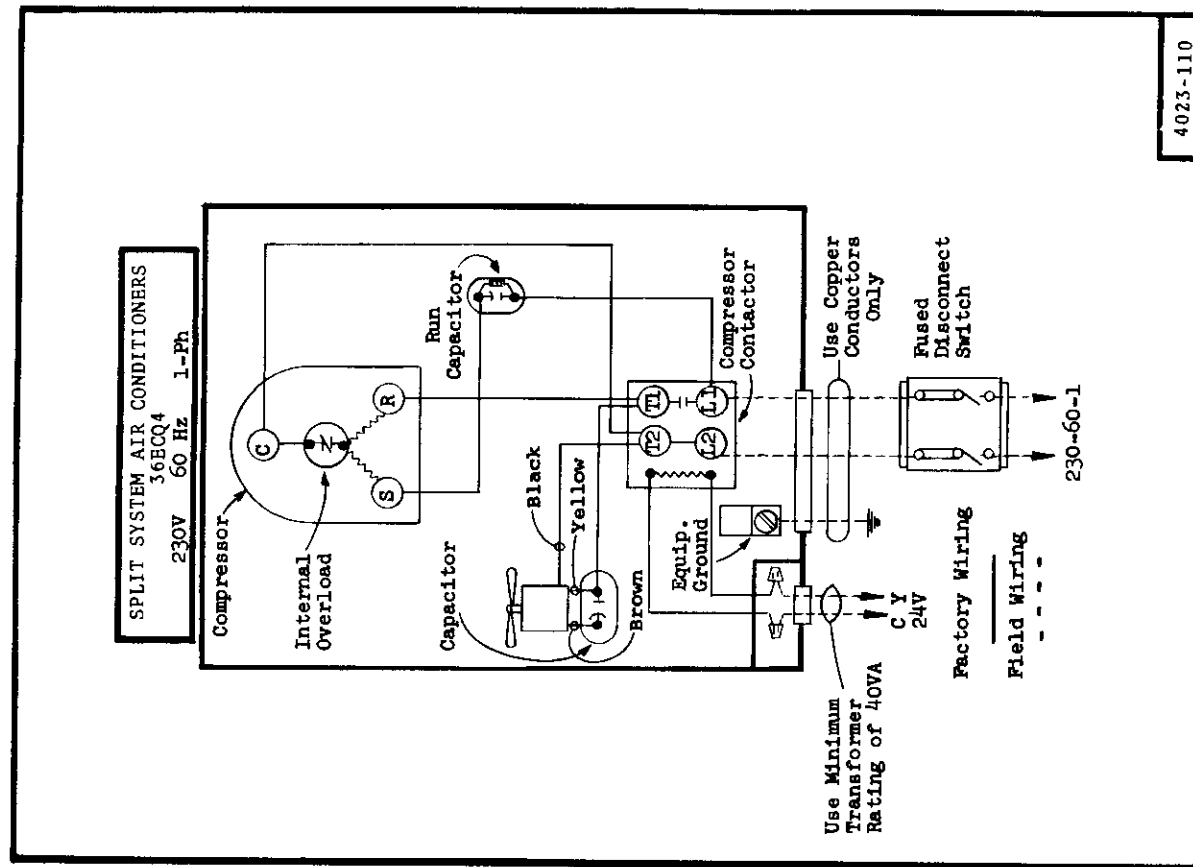




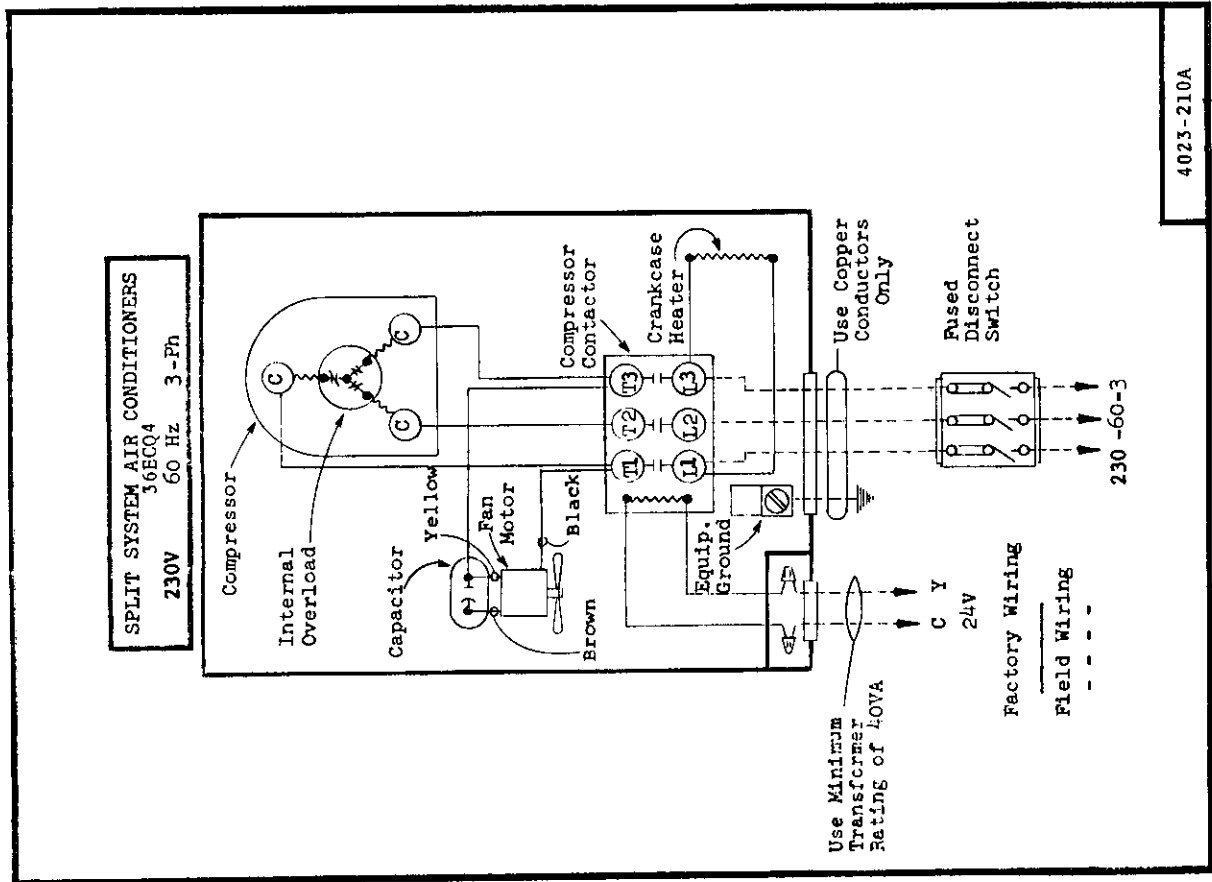
1 This wire not used on 1.5 ton model.
two terminal capacitor only.



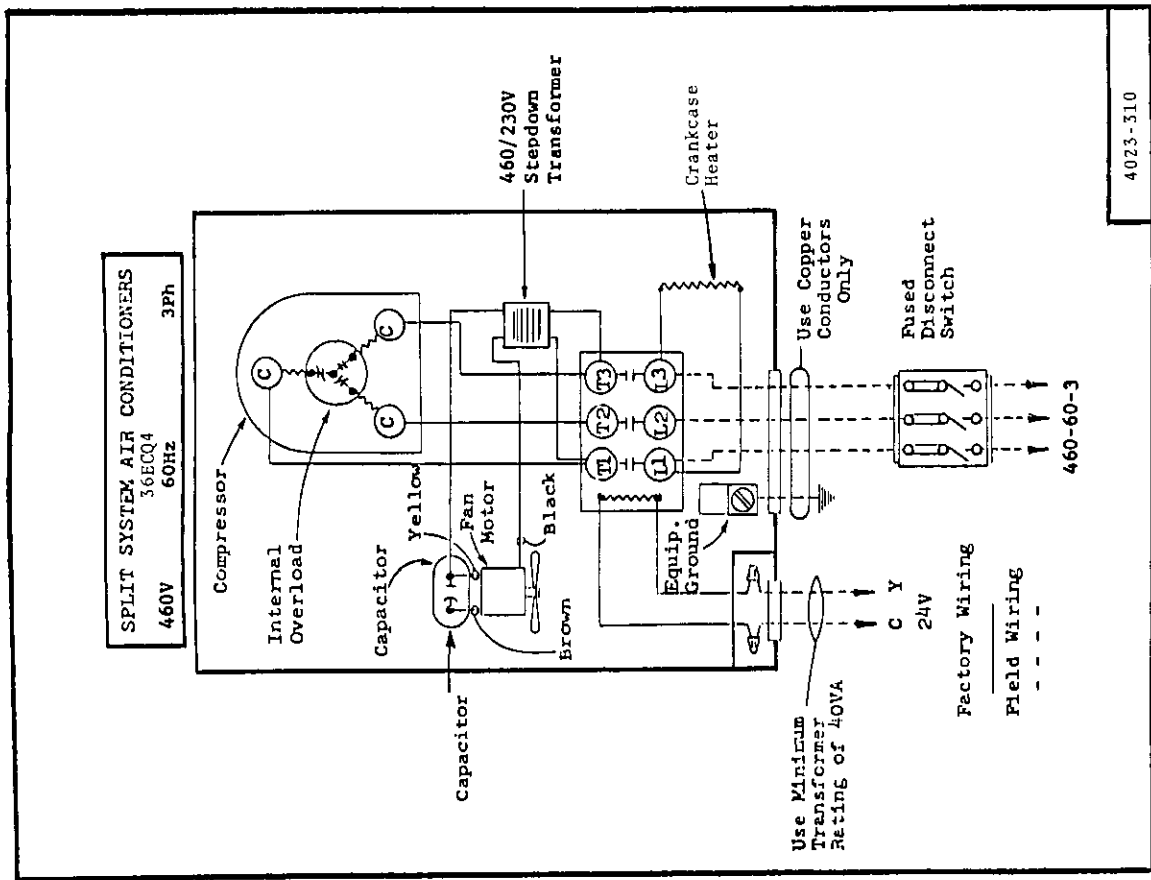
4022-801A



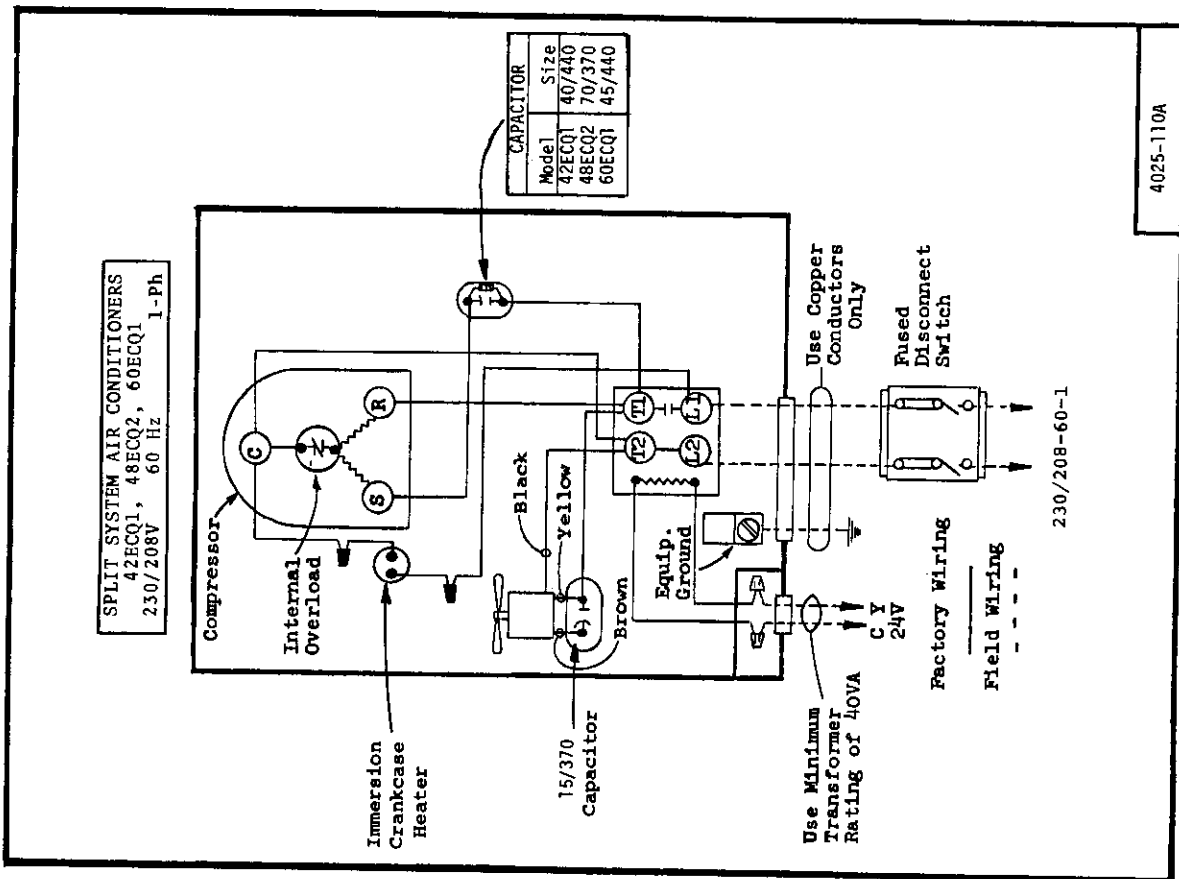
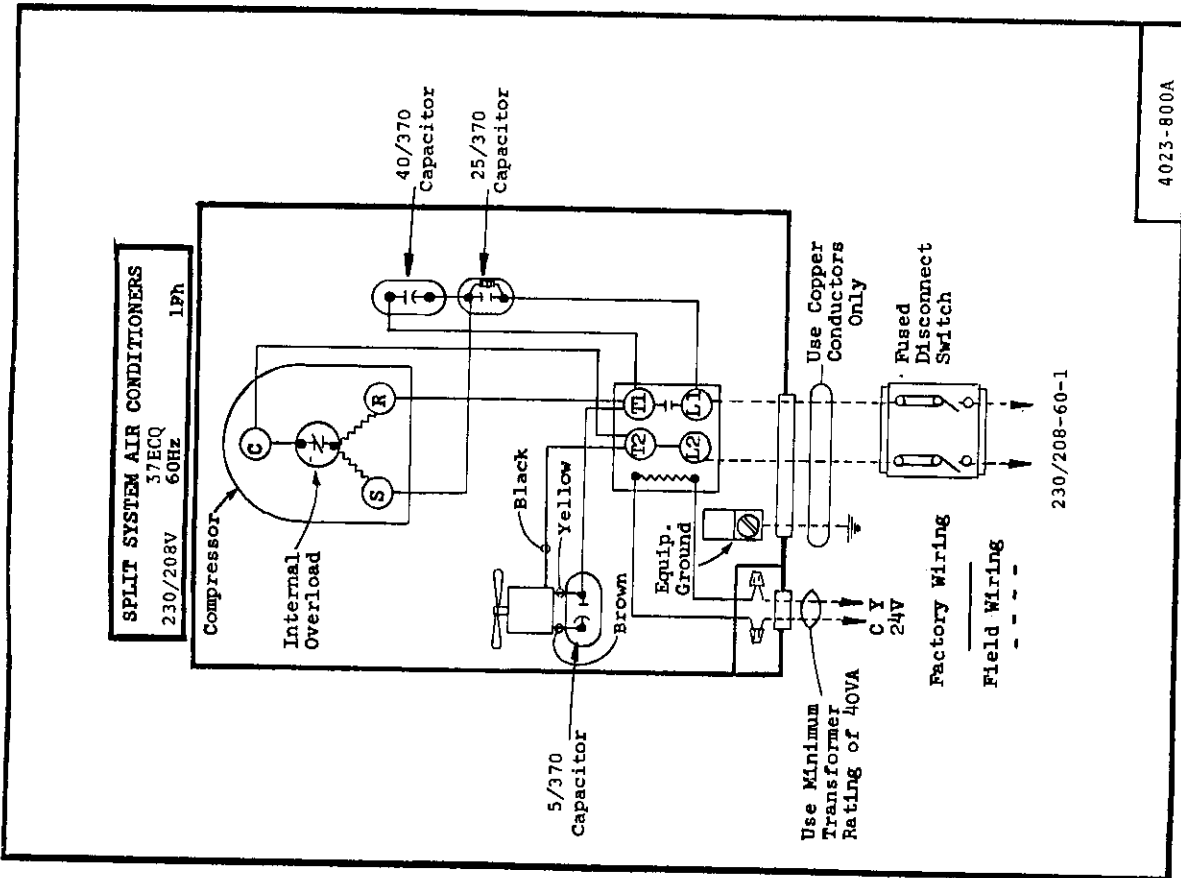
4023-110

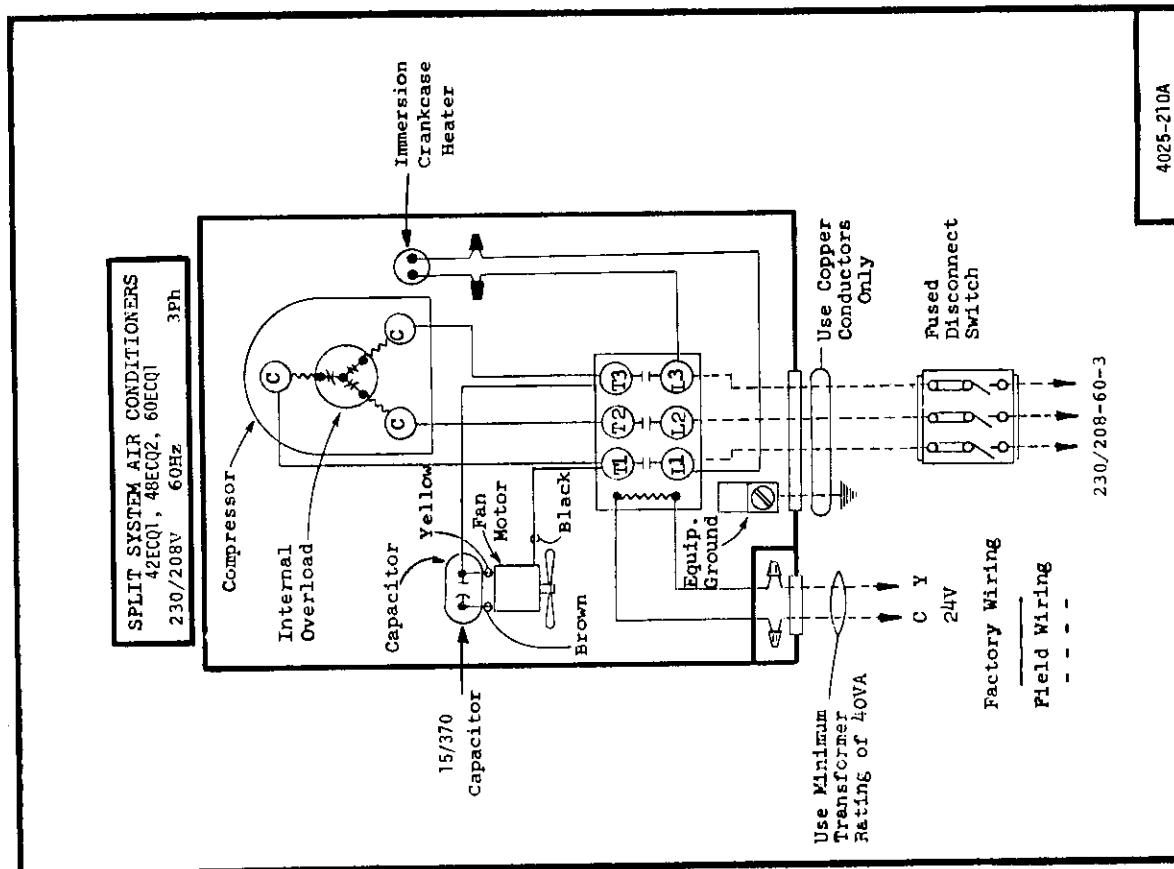


4023-210A

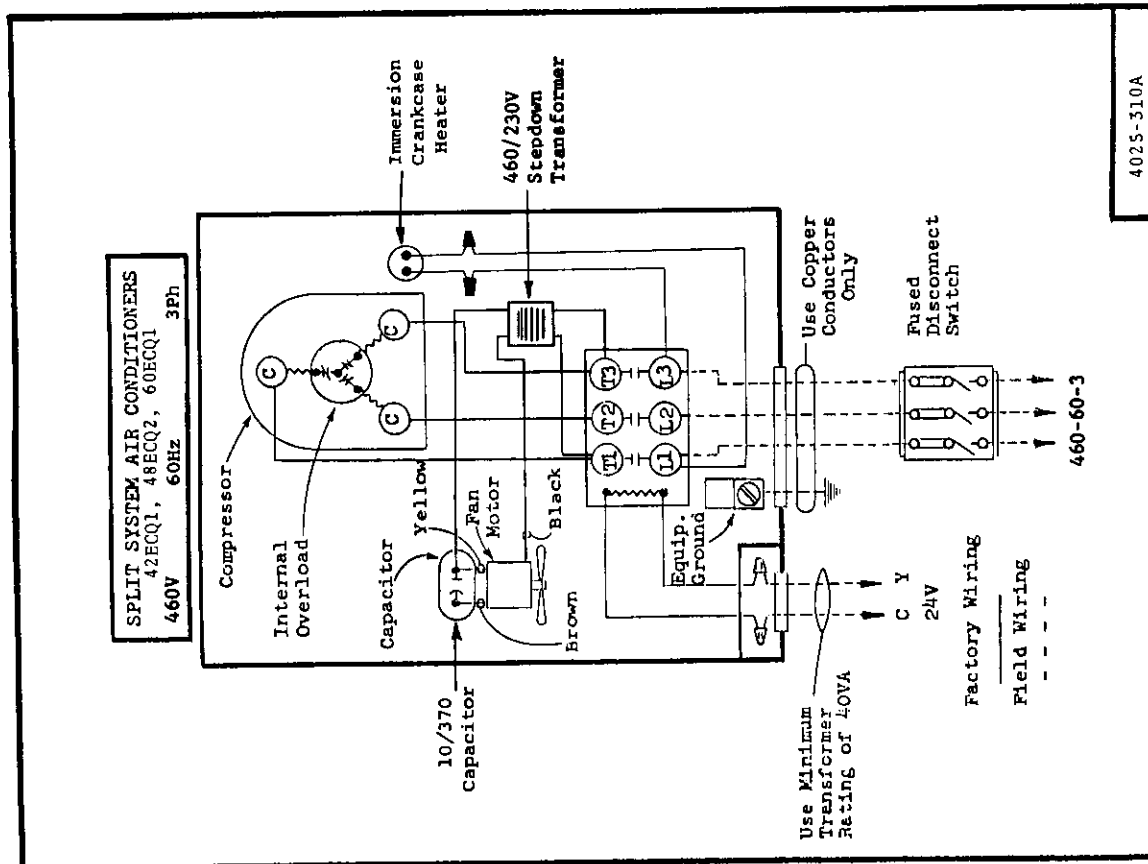


4023-310

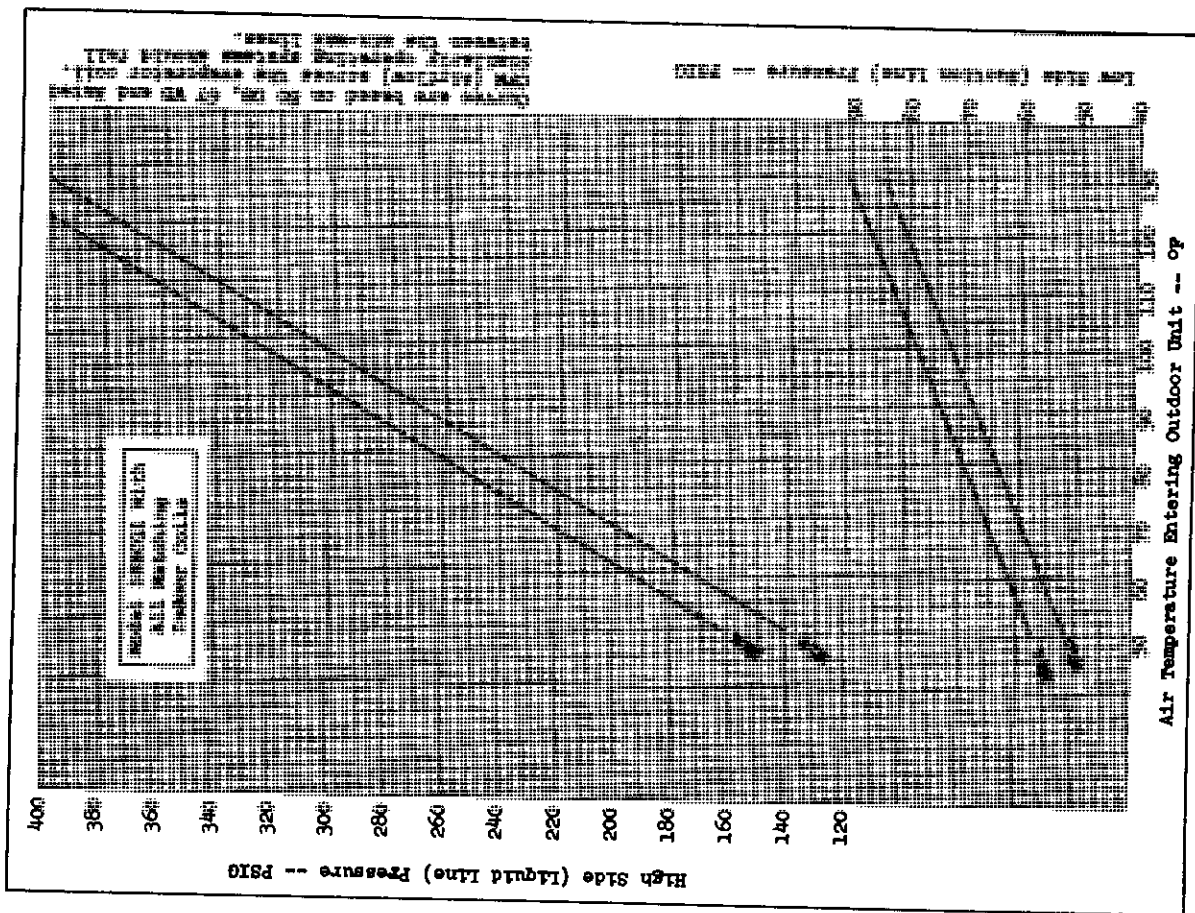


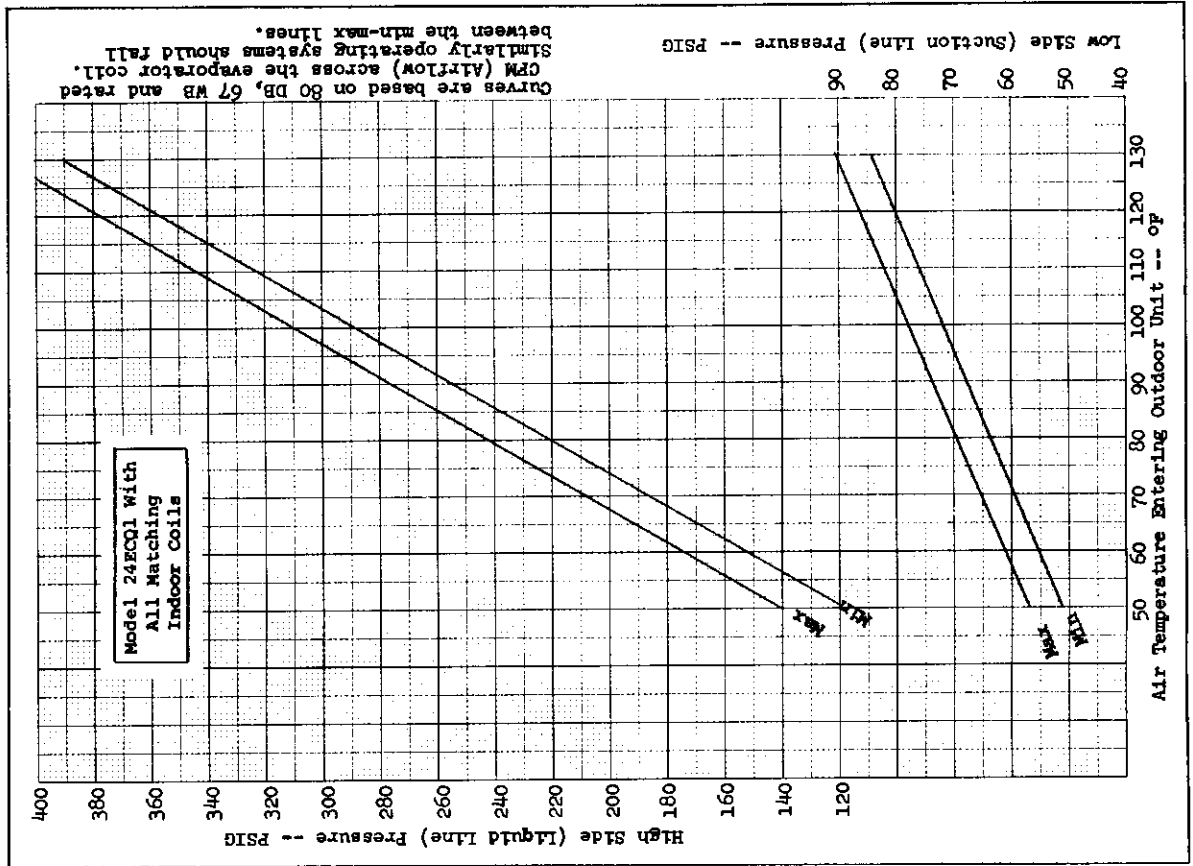
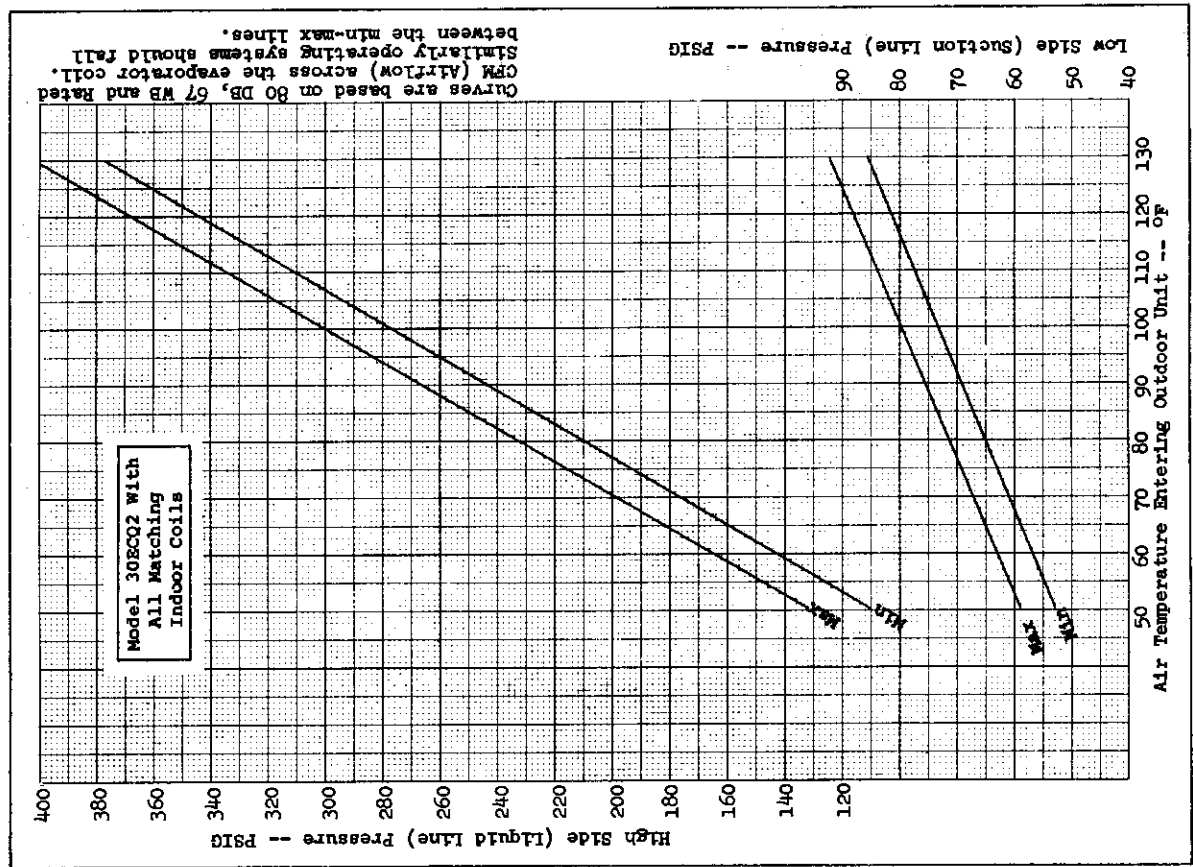


4025-210A

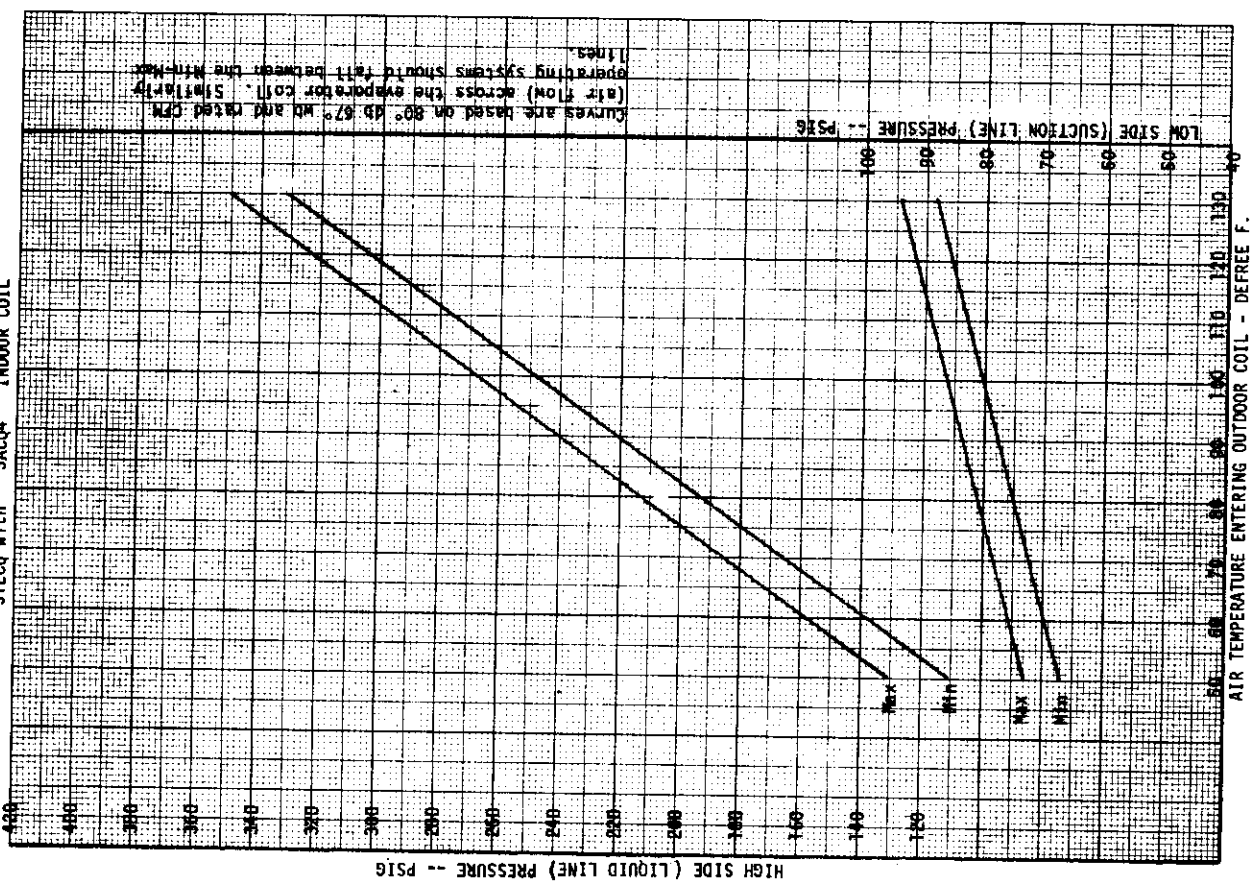


4025-310A

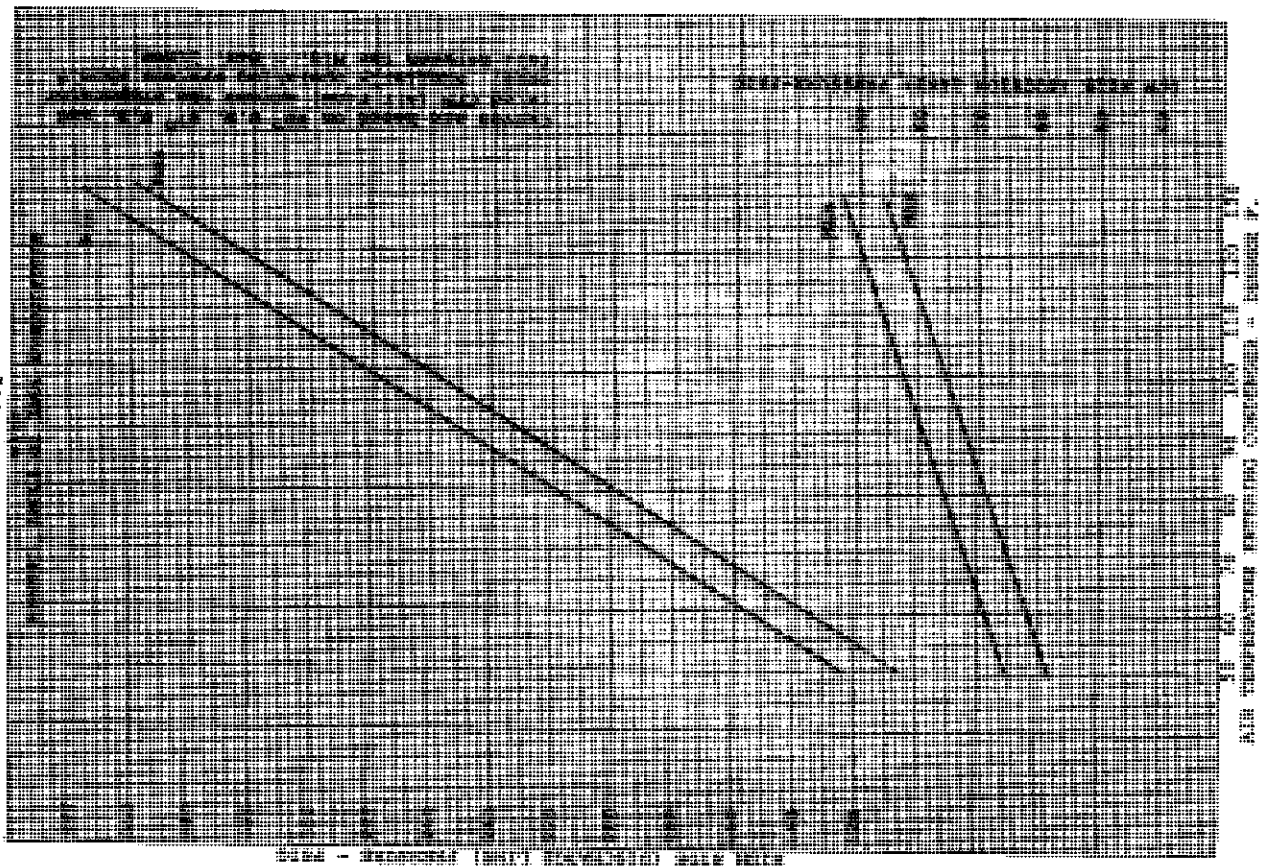




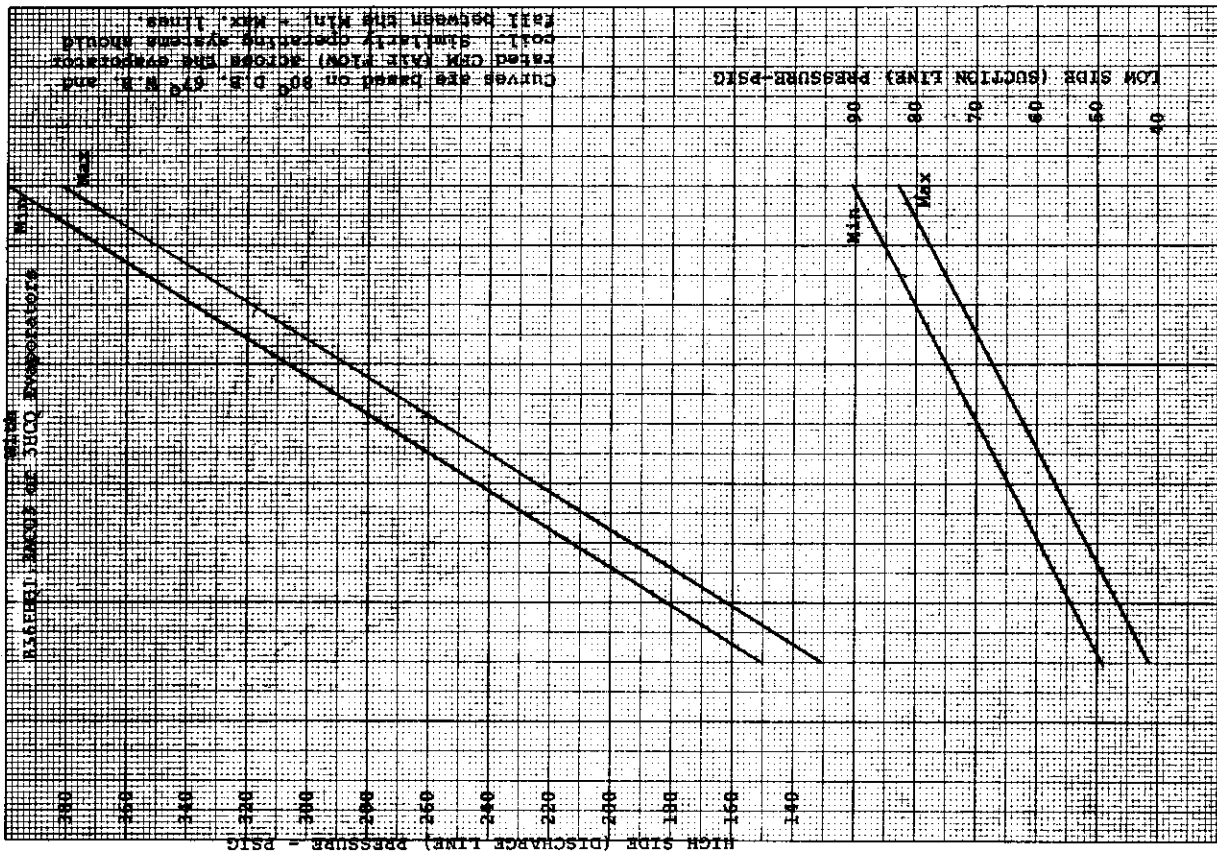
BARD MANUFACTURING COMPANY
31ECQ With 3ACQ4 INDOOR COIL



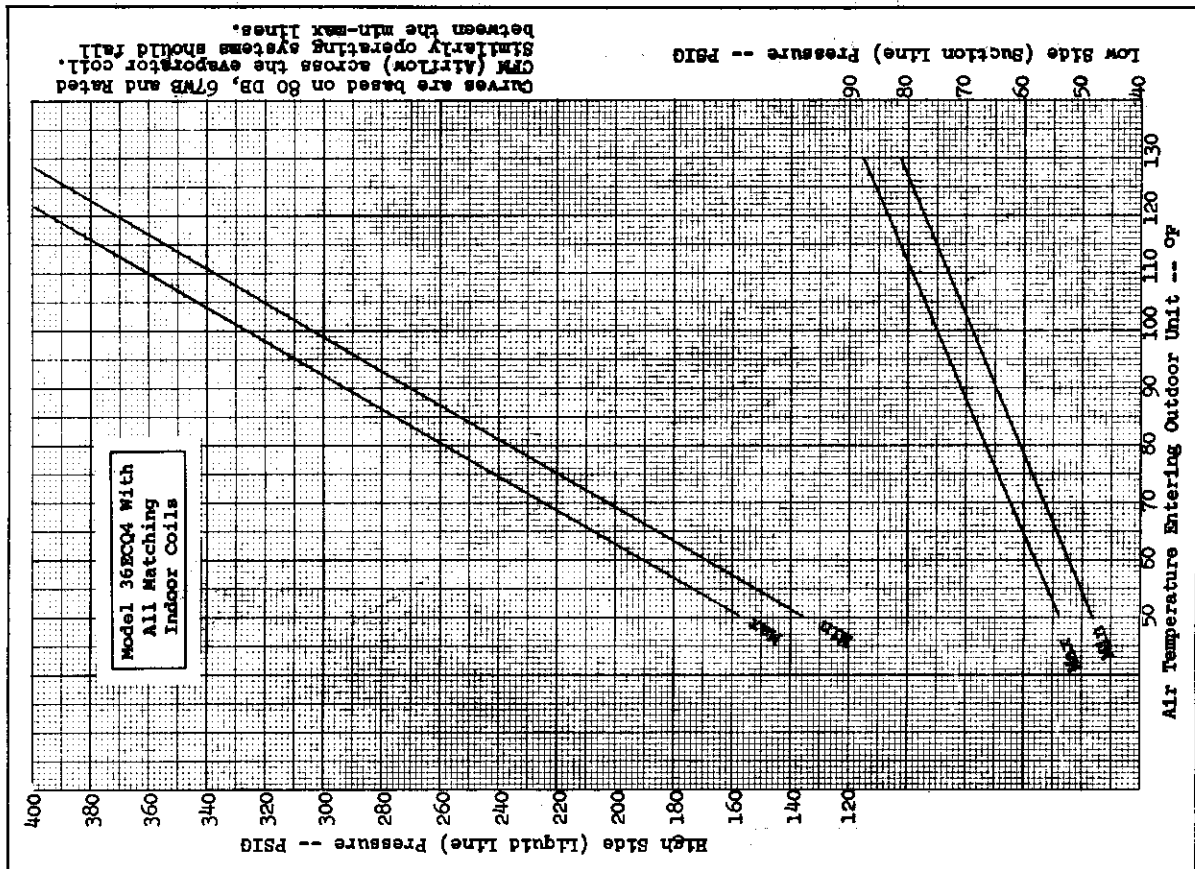
BARD
MODEL 31ECQ



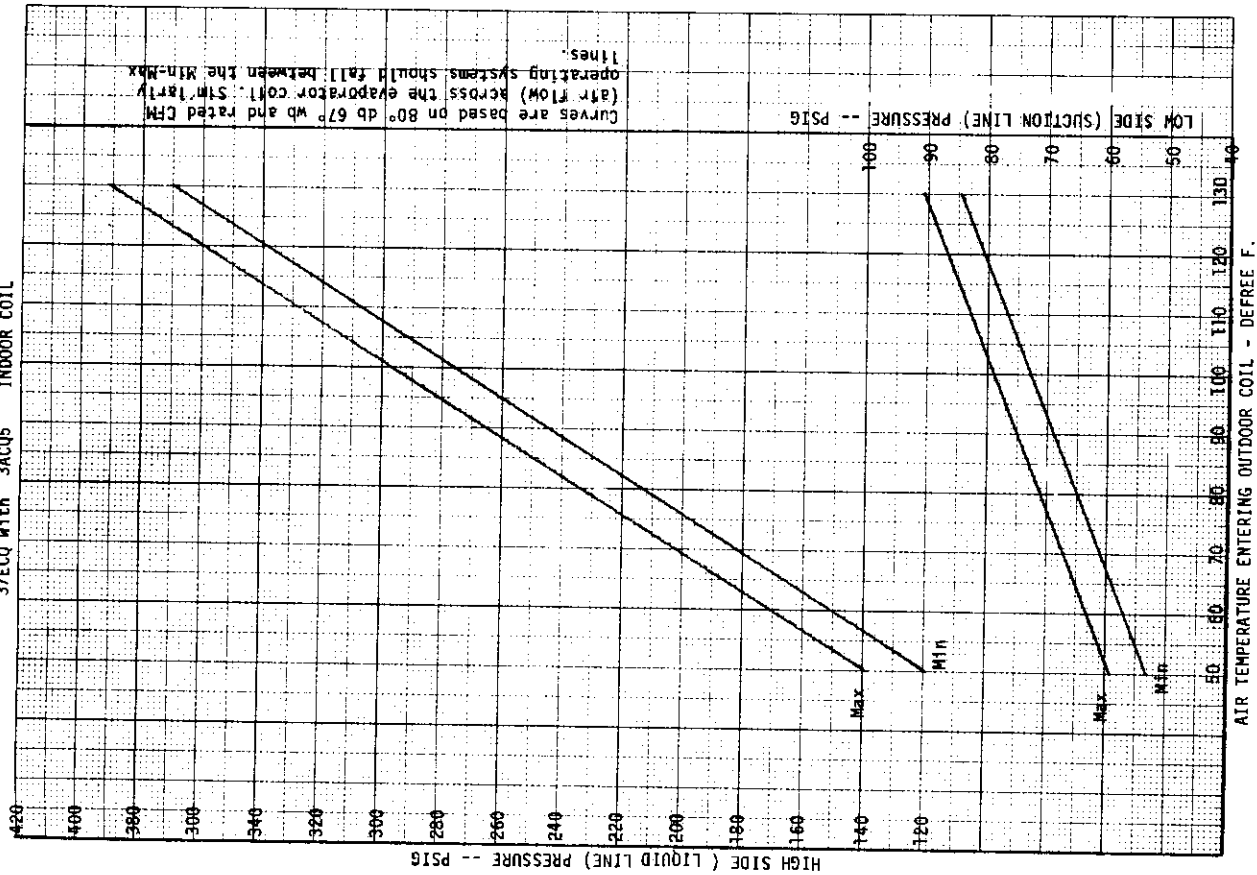
BARD
MODEL 37ECQ



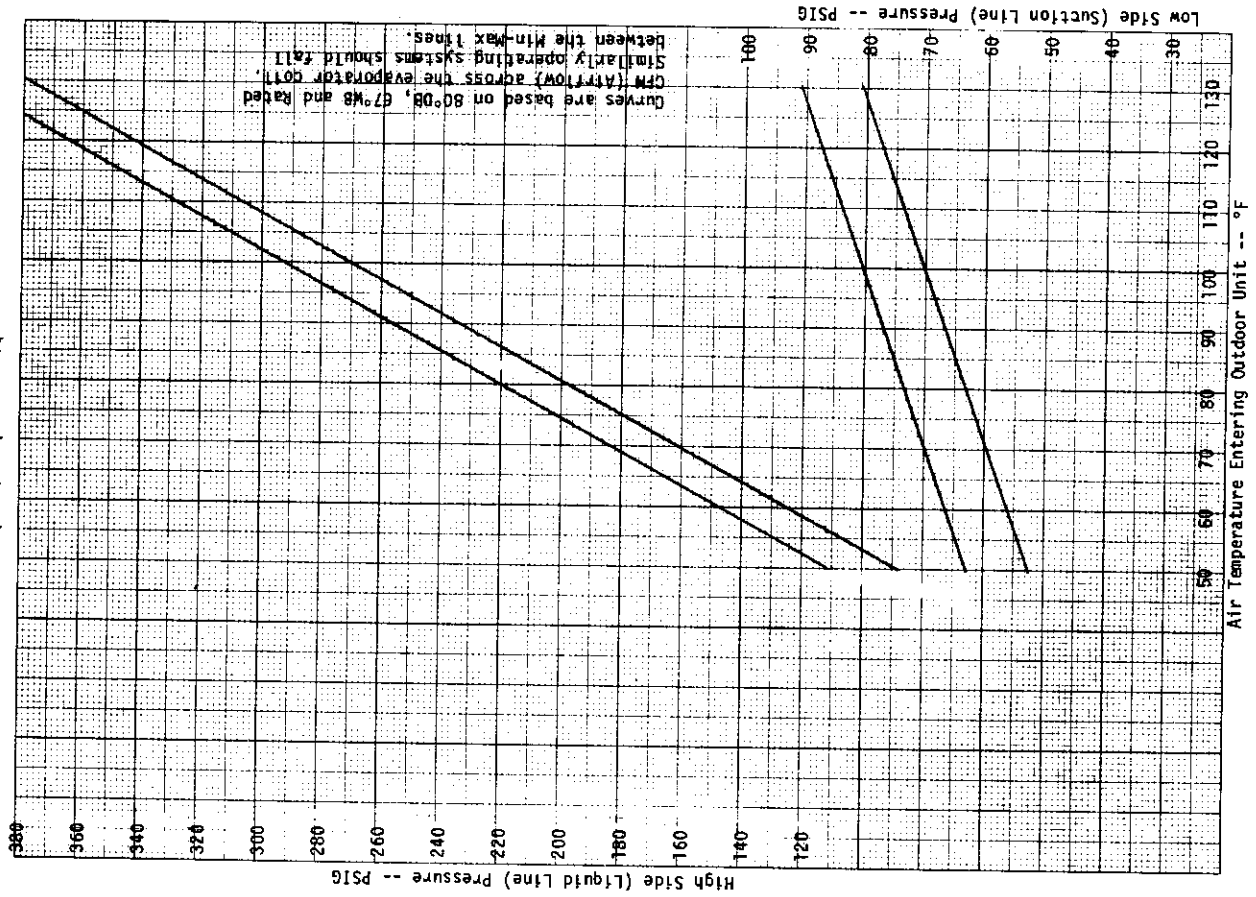
AIR TEMPERATURE ENTERING OUTDOOR COIL - DEGREE F.



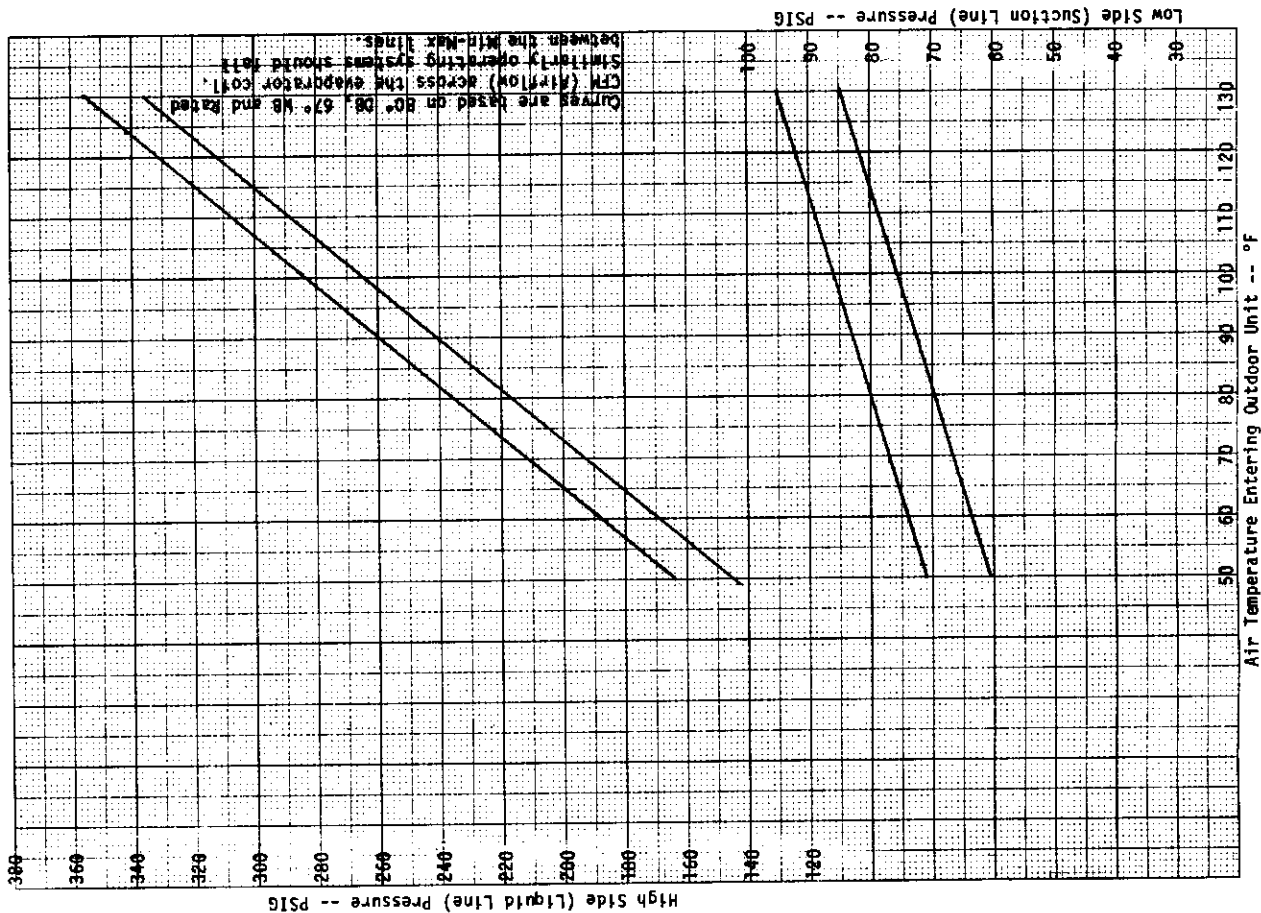
BARD MANUFACTURING COMPANY
37ECQ With 3AC05 INDOOR COIL



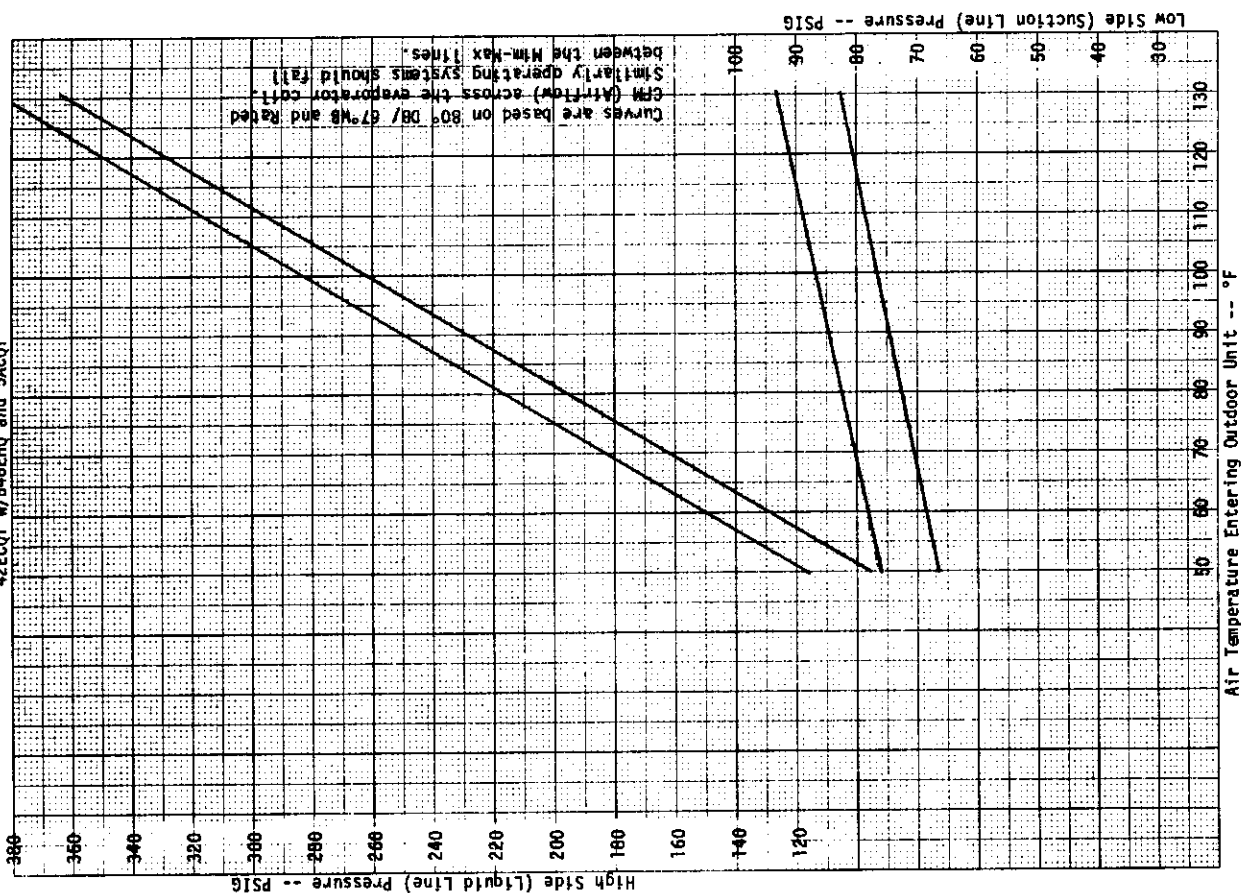
BARD MANUFACTURING COMPANY
42ECQ1 w/4ACQ2 and 4HCQ



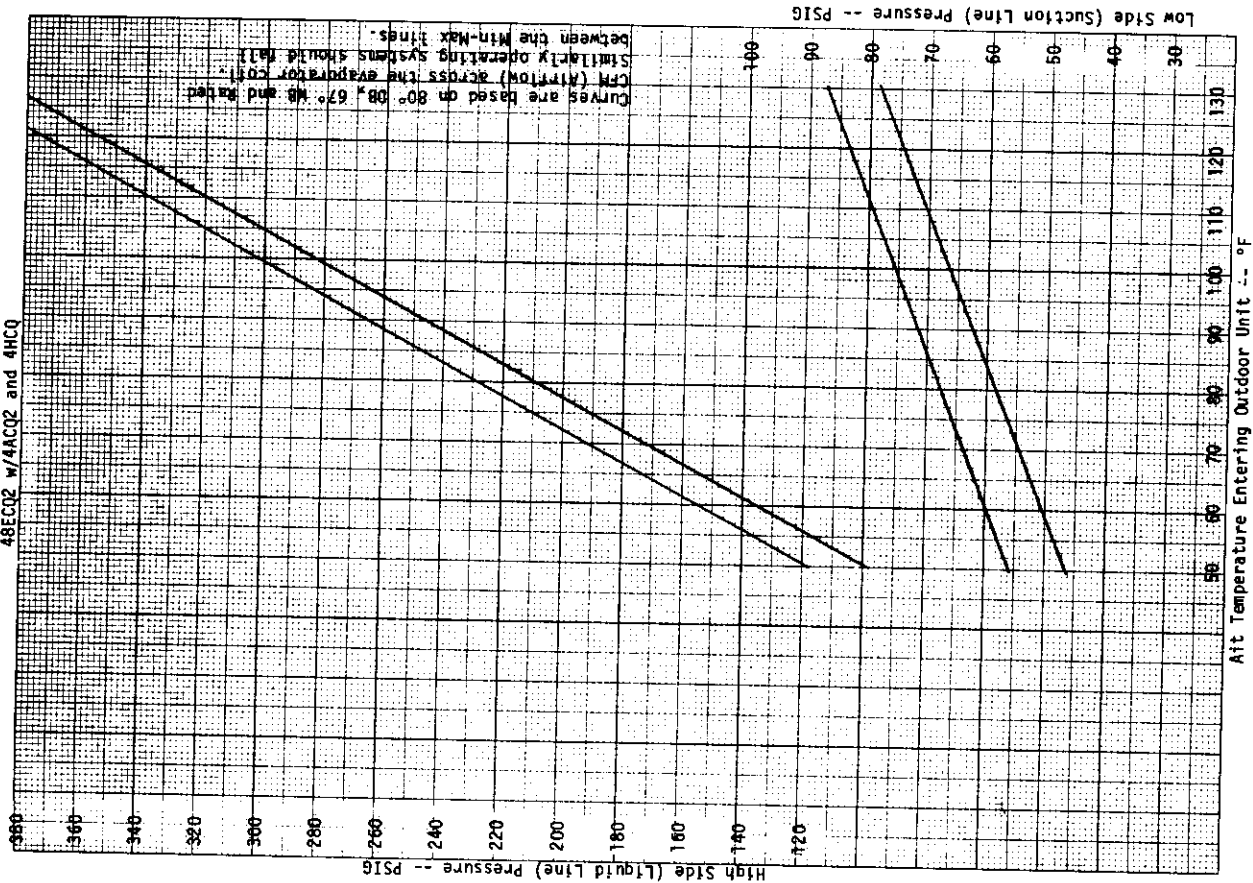
BARD MANUFACTURING COMPANY
48ECQ2 w/B48EHQ and 5ACQ1



BARD MANUFACTURING COMPANY
42ECQ1 w/B48EHQ and 5ACQ1



BARD MANUFACTURING COMPANY
48EC02 w/4AC02 and 4HC0



BARD
MODEL 60EC01

