MANUAL 2100-019 E

INSTALLATION INSTRUCTIONS

MODELS

MU30A, MU36C, MU42D

PACKAGED AIR CONDITIONERS

FOR RESIDENTIAL, COMMERCIAL,

OR MOBILE HOME

HEATING/COOLING APPLICATIONS

IMPORTANT

The equipment covered in this manual is to be installed by trained, experienced service and installation technicians. Any heat pump is more critical of proper operating, charge and an adequate duct system than a straight air conditioning unit. All ductwork, supply and return, must be properly sized for the design air flow requirement of the equipment. NESCA is an excellent guide to proper sizing. All duct work or portions thereof not in the conditioned space should be properly insulated in order to both conserve energy and prevent condensation or moisture damage.

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.

GENERAL

The refrigerant system is completely assembled and charged. All internal wiring is complete.

These instructions explain the recommended method to install the air cooled self-contained unit and the electrical wiring connections to the unit.

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.

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.

WIRING - MAIN POWER

Refer to the unit rating plate for wire sizing information and maximum fuse or "HACR Type" circuit breaker size. Each unit is marked with a "Minimum Circuit Ampacity." This means that the field wiring used must be sized to carry that amount of current. Refer to the National Electrical Code for complete current carrying capacity data on the various insulation grades of wiring material.

If an optional heater package is installed, a separate power circuit must be added. Refer to the Electrical Information Chart for circuit information. DO NOT ATTEMPT TO COMBINE A BASIC UNIT AND A HEATER PACKAGE TO ONE POWER SUPPLY CIRCUIT.

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.

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.

ELECTRICAL INFORMATION										WIRING INFORMATION (2)			
Model	Volts/ PH	Optional Heater Package	Max. Unit Amps	No. Field Power Circuits	Optional Heater Internal Fuses	Required (1) Over Current Protection		Minimum Circuit Ampacity		Power Circuit Wiring		Ground Wire Size (3)	
						CKT.A	CKT.B	CKT.A	CKT.B	CKT.A	CKT.B	CKT.A	CKT.B
HU30A	230/208 60-1	None	19.3	1		35		24		10		10	
		EH3MA-A05	23.4	2			30		26		10		10
		EH3MA-A10	44.2	2			60		52		6		10
		EH3MA-A15	65.1	2	30/60		80		78		3		8
		EH3MA-A20	85.7	2	60		110		104		1		6
HU36C	230/208 60-1	None	22.3	1		40		27		10		10	
		EH3MA-A05	23.4	2			30		26		10		10
		EH3MA-A10	44.2	2			60		52		6		10
		EH3MA-A15	65.1	2	30/60		80		78		3		8
		EH3MA-A20	85.7	2	60		110		104		1		6
HU42D	230/208 60-1	None	25.3	1		50		31		8		10	
		EH3MA-A05	25.3	2			30		26		10		10
		EH3MA-A10	44.2	2			60		52		6		10
		EH3MA-A15	65.1	2	30/60		80		78		3		8
		EH3MA-A20	85.7	2	60		110		104		1		6

(1) Time delay fuses or "HACR Type" circuit breakers must be used for 60 and smaller sizes. Standard fuses or circuit breakers are suitable for sizes 70 and larger.

(2) Based on 60°C copper wire. Other wiring materials must be rated for marked "Minimum Circuit Ampacity" or greater.

(3) Based upon Table 250-95 of N.E.C., 1981.

UNPACKING THE SELF-CONTAINED UNIT

It is recommended that the unit be unpacked at the installation site to minimize damage due to handling.

1. Cut and remove the metal band from around unit.
2. Remove the carton from the unit.
3. The installation manual is contained in an envelope shipped with the unit. Make sure that it does not get lost.
4. Carefully block up the unit and remove the shipping skid.
5. CAUTION - DO NOT tip the unit on its side. Oil may enter the compressor cylinders and cause starting or operating trouble. If unit has set on its side, restore to upright position and do not run for several hours. Also run intermittently for a few seconds. Do this three or four times with three minutes in between. Observe abnormal compressor noise.

INSTALLING THE SUPPLY AND RETURN FITTINGS ON THE SELF-CONTAINED UNIT

The supply and return fittings are to be fastened with sheet metal screws on three sides. Seal with duct tape on all four sides.

LOCATING AND INSTALLING THE RETURN AIR ASSEMBLY-MOBILE HOME APPLICATION

IMPORTANT

The MU42D unit requires two twelve inch diameter return air ducts. Sufficient airflow for proper system operation is not available using a single return air duct.

To avoid complications, locate and install the return air assembly first. The return air box with grille and filter can be located anywhere in the floor of the mobile home. Keep in mind that the closer to the cooling unit the better because less duct will be needed. Always use at least one 7' length of duct, however, a good spot is under the television set in a corner or under a table or davenport if a minimum two inch clearance is available. If desired, the return opening can be located inside a closet with louvered doors. The return air grille can be placed in the wall of a closet and the air conducted into the filter box through a boxed-in area at the closet floor level. Make sure filter is readily accessible.

After determining the location of the return air opening, start the installation from under the home by cutting a small hole in the fiber underboard to determine how the floor joist location will affect the cutting of the opening needed for the box. Floor joists generally are located on 16" centers leaving 14-3/8" between joists. After measuring the return air box cut the hole so the box will fit between the floor joists. In most installations it will be necessary to cut a similar hole in the fiberboard directly under the one in the floor. However, if the floor is more than 10" deep, it will only be necessary to cut a round hole for the collar on the return air box or for the insulated duct.

Finally, set the box into the opening and fasten with screws or nails. Put the filter and the return air grille in place.

LOCATING AND INSTALLING THE SUPPLY DUCT CONNECTORS MOBILE HOME APPLICATION

When locating the supply duct connector, check carefully for floor joists, axles, wheels and frame members that could interfere with the installation of the connector or with the running of the flexible duct. Ideally, the supply duct connector should be located in the bottom of the main duct, forward of center of the mobile home BUT NOT UNDER A REGISTER.

To locate the center of the duct, first cut a 6" hole in the fiberboard below the duct at the desired location. After locating the duct center, increase the hole in the fiberboard to approximatley the size of the connector to be used. Next cut an opening in the bottom of the duct 1/8" larger than the actual dimension of the connector being used. After inserting the connector, bend the tabs flat inside the duct.

It is a good practice to seal all connections with duct tape. Seal the opening in the fiberboard around the duct connector.

For double wide homes or for special applications, these connectors are fed by two flexible ducts.

CONNECTING THE INSULATED RETURN-AIR AND SUPPLY FLEXIBLE DUCTING

All flexible ducts are furnished with a male and female metal end. The ducts can be connected to the corresponding fitting and sheet metal screwed in place. Slide the insulation and other jacket over the end and use duct tape to seal joints.

If the flexible ducts are long enough, it will be easier to connect them to the fittings on the unit before sliding the unit into place.

RECOMMENDED REGISTER TYPE

Satisfactory heating/cooling of a mobile home will depend greatly on what type register is used. A very open type with no deflection (allowing the air to move straight up) is best. If these are not available, straighten the fins of the present registers as much as possible.

DUCT REQUIREMENTS

THE SUPPLY DUCT SYSTEM, INCLUDING THE NUMBER AND TYPE OF REGISTERS, WILL HAVE MUCH MORE EFFECT ON THE PERFORMANCE OF AN AIR CONDITIONING SYSTEM THAN ANY OTHER FACTOR! The duct must be sufficiently large to conduct an adequate amount of air to each registar. The registers must be designed to throw the cooled air up to the ceiling. The duct must be built tightly enough to prevent loss of cooled air to the outside.

IMPORTANT

The MU42D unit requires two twelve inch diameter return air ducts. Sufficient airflow for proper system operation is not available for using a single return air duct.

The output delivery of the system will not cool the home if the air is lost to the outside through leaks in the duct system. Also, the duct can be large enough in dimension but too small because it is collapsed or restricted with a foreign object. See chart for airflow and static pressure capabilities.

For rooftop or permanent structure applications, either round pipe or rectangular ductwork can be used, following standard duct sizing and layout techniques.

INDOOR BLOWER PERFORMANCE			
CFM - Dry Coil*			
E.S.P. In.H_2O***	MU30A	MU36C	MU42D
.00	1295	1335	1475
.10	1250	1290	1445
.20	1200	1230	1410
.30	1135	1175	1360
.40	1075	1120	1310
.50	1000	1050	1235
.60**	940	980	1160

*CFM with 10Kw heaters installed.
**Maximum E.S.P. on heating.
***With 20x20 permanent filter and return air filter box installed.

RATED CFM and E.S.P. (Wet Coil-Cooling)			
Model	Rated CFM	Rated E.S.P.	Recommended Airflow Range
MU30A	1000	.50	900 - 1100
MU36C	1050	.50	945 - 1155
MU42D	1200	.50	1080 - 1320

OPTIONAL ELECTRIC HEATER PACKAGES

Four electric heater packages are available as options. Each package comes complete with heaters and controls. Model numbers of approved electric heat packages are as follows:

EH3MA-A05	(5kw)
EH3MA-A10	(10kw)
EH3MA-A15	(15kw)
EH3MA-A20	(20kw)

IMPORTANT: A separate power entrance is required for the heater package. DO NOT ATTEMPT TO WIRE A BASIC unit and a heater package to one power circuit.

INSTALLATION

Installation of the heat package requires removing the unit blower from its securing slide mount, inserting the heat package into the same mount and reinstalling the unit blower into a similar mount on the heat package. A minimal amount of wiring is required. Refer to the heat package installation instructions for detailed installation information.

WIRING - LOW VOLTAGE, THERMOSTAT

To select the appropriate number of thermostat wires to be run and the correct thermostat, refer to the chart below.

Optional Heater Package	Number of Thermostat Wires Req'd.	Thermostat/Subbase
None	3	T87F-3111/Q539A1220 1F56-318/
EH3MA-A05	4	T87F-3111/Q539A1220 1F56-318/
EH3MA-A10	4	T87F-3111/Q539A1220 1F56-318/
EH3MA-A15	5	T874C1000/Q674A1001
EH3MA-A20	5	T874C1000/Q674A1001

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.

SERVICE HINTS

1. Caution homeowner to maintain clean air filters at all times. Also, not to needlessly close off supply and return air registers. This reduces air flow through the system, which shortens equipment service life as well as increasing operating costs.
2. Check all power fuses or circuit breakers to be sure that they are the correct rating.
3. Periodic cleaning of the outdoor coil to permit full and unrestricted air flow circulation is essential.

IMPORTANT INSTALLER NOTE

For improved start-up performance wash the indoor coil with a dish-washer detergent.

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:

Model	Rated Airflow	95°F O.D. Temperature	82°F O.D. Temperature
MU30A	1000	49 - 51	63 - 65
MU36C	1050	57 - 59	63 - 65
MU42D	1200	59 - 61	64 - 66

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.

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 single 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 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.

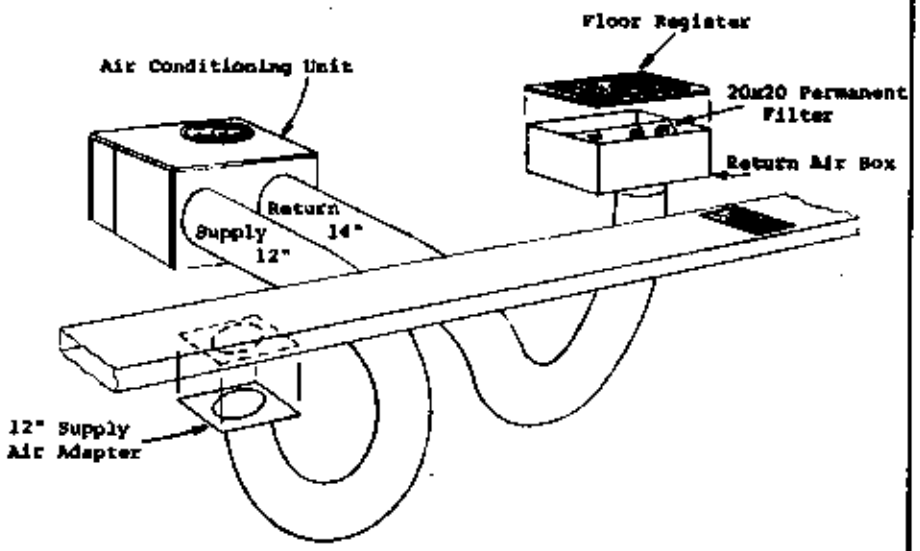
IMPORTANT

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 SHOULD NOT 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 OPEN THE COMPRESSOR.
6. EXCEPT AS REQUIRED FOR SAFETY WHILE SERVICING — DO NOT OPEN SYSTEM DISCONNECT SWITCH.

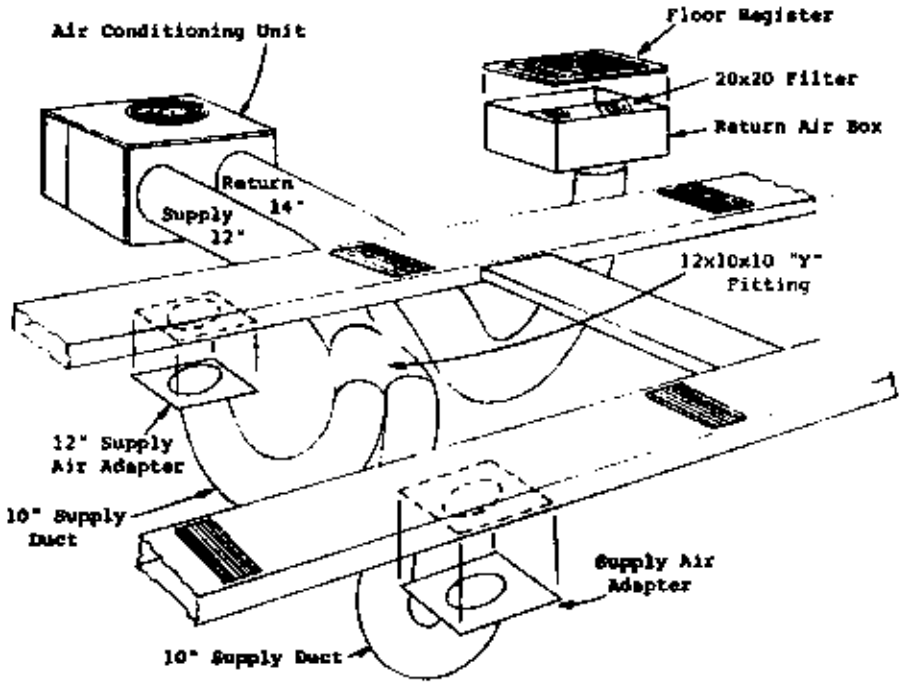
TYPICAL MU30A, MU36C SINGLE SUPPLY DUCT SYSTEM



Qty. 1 7001-014 Fitting Pack
- (1) 12½ x 20 x 10½ Return Air Box
- (1) 20 x 20 Permanent Filter
- (1) 12 x 20 Floor Register
- (1) 12" Supply Air Adapter

NOTE: Flex Ducts are not supplied as part of the basic unit (field supplied).

OPTIONAL MU30A, MU36C DOUBLE SUPPLY DUCT SYSTEM

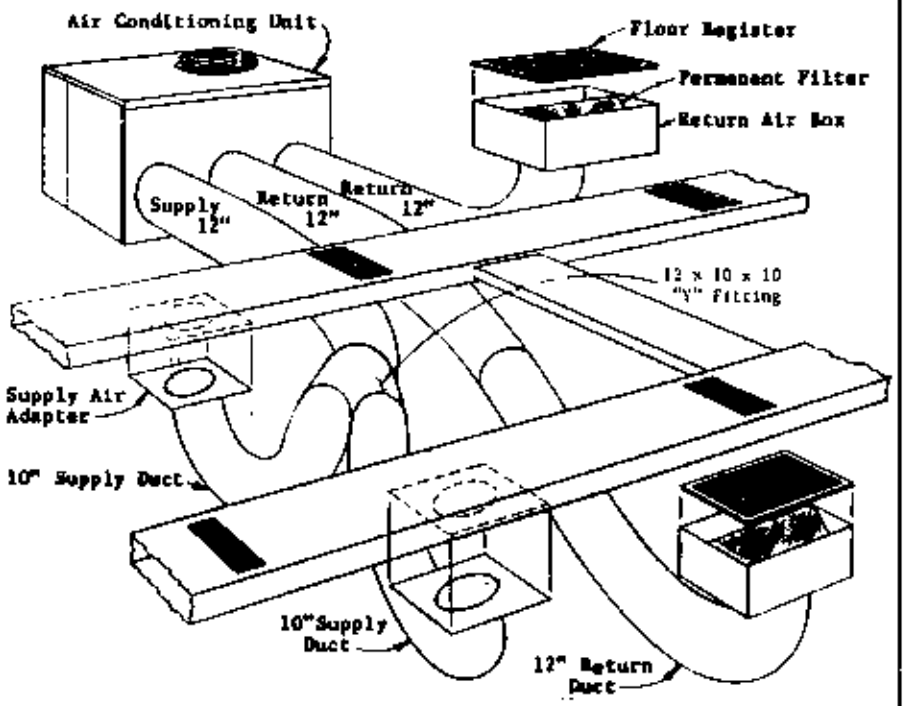


Qty. 1 7001-014 Fitting Pack
- (1) 12½ x 20 x 10½ Return Air Box
- (1) 20 x 20 Permanent Filter
- (1) 12 x 20 Floor Register
- (1) 12" Supply Air Adapter

Qty. 1 7001-015 Fitting Pack
- (1) 12 x 10 x 10 "Y" Fitting
- (2) 10" Supply Air Adapter

NOTE: Flex Ducts are not supplied as part of the basic unit (field supplied).

OPTIONAL MU42D
DOUBLE SUPPLY DUCT SYSTEM

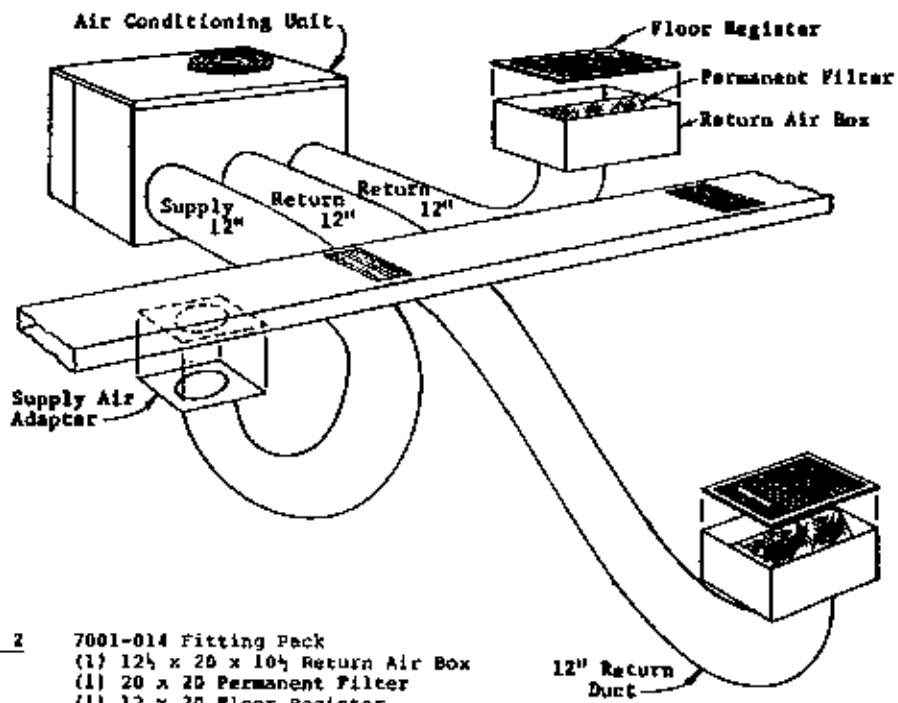


Qty. 2 7001-014 Fitting Pack
- (1) 12½ x 20 x 10½ Return Air Box
- (1) 20 x 20 Permanent Filter
- (1) 12 x 20 Floor Register
- (1) 12" Supply Air Adapter

Qty. 1 7001-015 Fitting Pack
- (1) 12 x 10 x 10 "Y" Fitting
- (2) 10" Supply Air Adapter

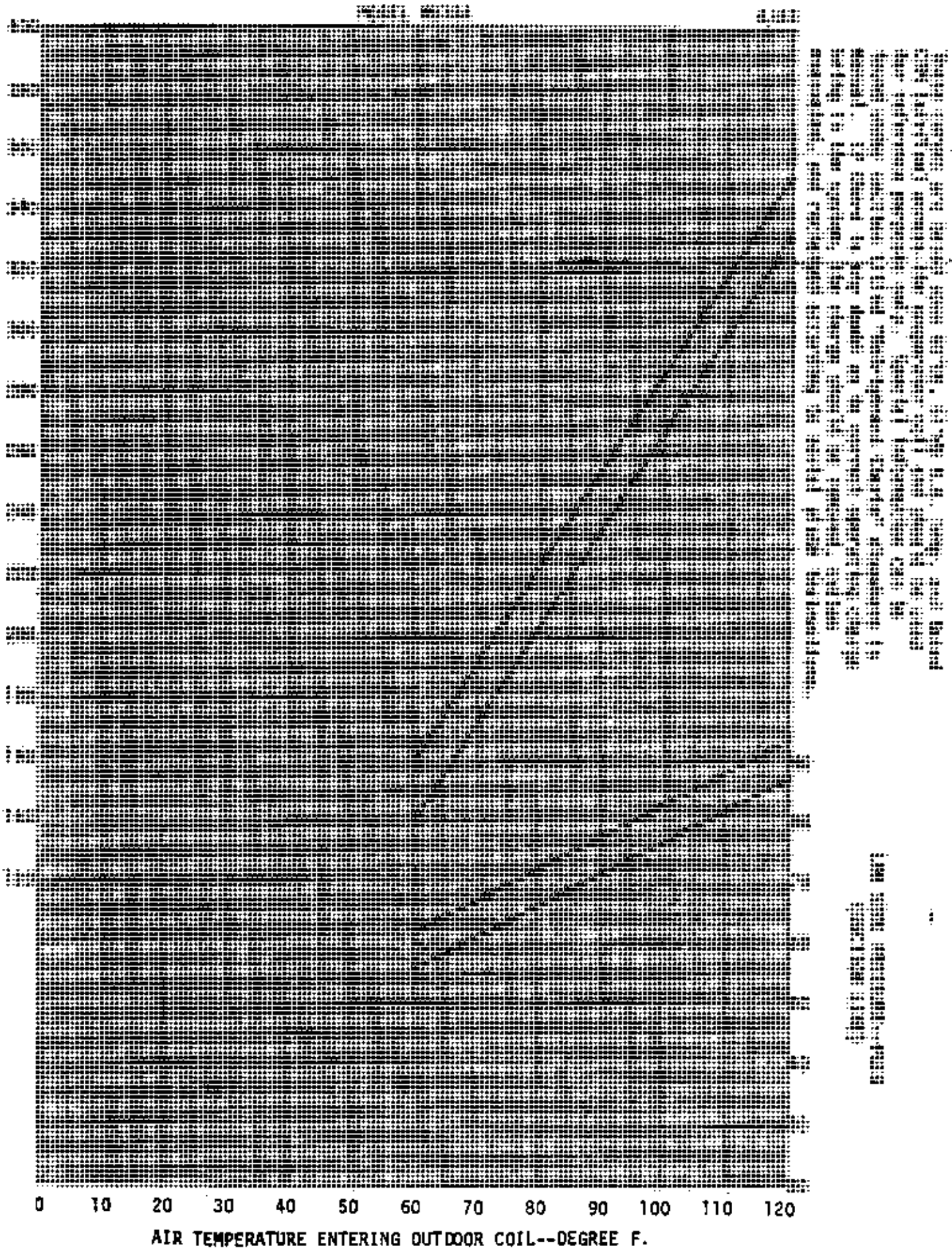
IMPORTANT: Two 12 inch diameter return air ducts must be installed. Ducts are not supplied as part of the basic unit (field supplied).

TYPICAL MU42D
SINGLE SUPPLY DUCT SYSTEM



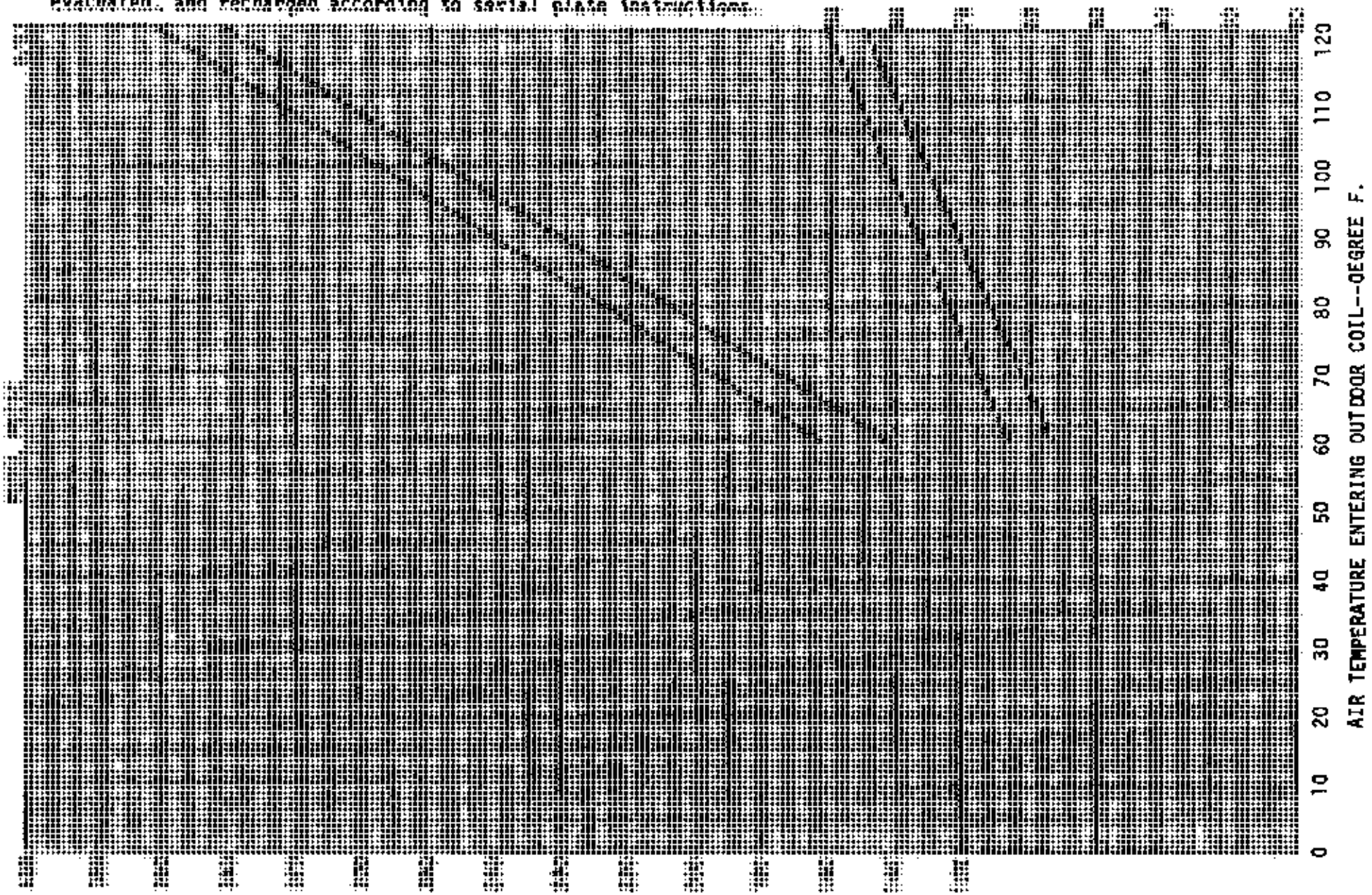
Qty. 2 7001-014 Fitting Pack
- (1) 12½ x 20 x 10½ Return Air Box
- (1) 20 x 20 Permanent Filter
- (1) 12 x 20 Floor Register
- (1) 12" Supply Air Adapter

IMPORTANT: Two 12 inch diameter return air ducts must be installed. Ducts are not supplied as part of the basic unit (field supplied).


HIGH SIDE (DISCHARGE LINE) PRESSURE--PSIG
0
10
20
30
40
50
60
70
80
90
100
110
120
AIR TEMPERATURE ENTERING OUTDOOR COIL--DEGREE F.

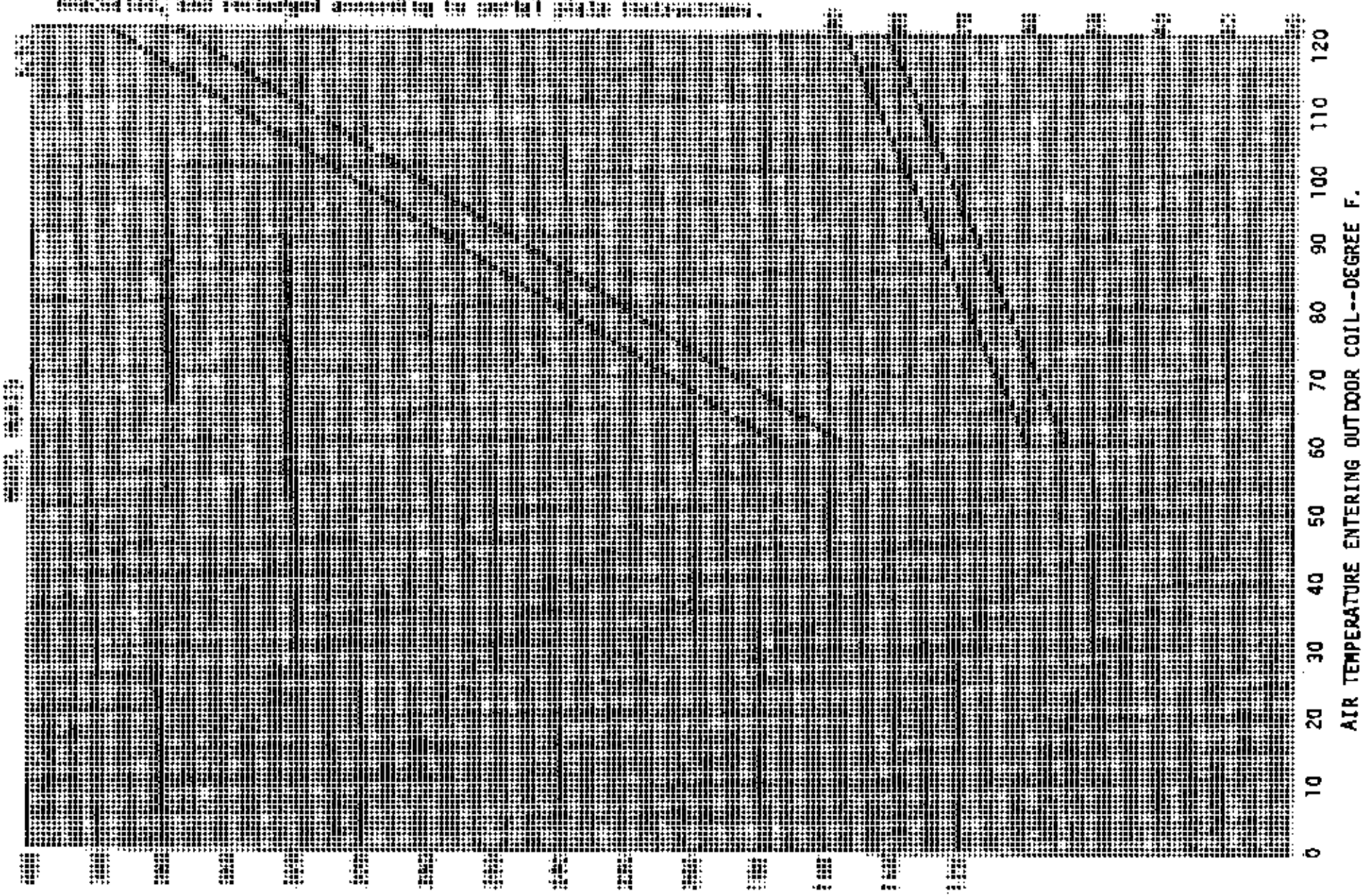
These curves are based upon 80 DB, 67 WB R.A. Temp. and Rated CF airflow) across the evaporator coil and should be used for reference purposes only. Special information can be found under section titled "Refrigerant Charte" elsewhere in manual. If there is any doubt as to correct operating charge being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

LOW SIDE PRESSURE--PSIG
(SUCTION LINE)



HIGH SIDE (DISCHARGE LINE) PRESSURE--PSIG

These curves are based upon 80°DB, 67°WB R.A. Temp. and Rated CFM (airflow) across the evaporator coil and should be used [illegible]



PARTS LIST

SINGLE PACKAGE AIR CONDITIONERS

5/87

PART NO.	DESCRIPTION	MU30A	MU36C	MU42D
*	Blower Housing 10-8	x	x	x
5152-013	Blower Wheel DD10-8A	x	x	x
8552-007	Capacitor 20/15-370V	x		
8552-035	Capacitor 40/370V		x	
8552-030	Capacitor 40/440V			x
8552-002	Capacitor 5/370V	x	x	x
5811-031	Capillary Tube - Cool	(3)	(4)	(4)
8000-070	Compressor AB233HT	x		
8000-055	Compressor CRH3-0275		x	
8000-063	Compressor CRK3-0325			x
5051-032	Condenser Coil	x	x	x
8401-007	Contactor 1P25A	x	x	x
5060-015	Evaporator Coil	x		
5060-033	Evaporator Coil		x	
5060-030	Evaporator Coil			x
5151-028	Fan Blade YTDH9.5-2028	x	x	x
7051-014	Fan Guard	x	x	x
8105-024	Motor - Blower 1/3 hp	x	x	x
8105-023	Motor - Fan 1/3	x	x	x
8200-003	Motor Mount - Blower	x	x	x
8200-022	Motor Mount - Fan	x	x	x
5451-011	Motor Mounting Parts	x	x	x
5451-009	Motor Mounting Parts	x	x	x
5153-022	Rain Shield	x	x	x
5210-006	Strainer		x	x
5210-003	Strainer	x		
8607-013	Terminal Block	x	x	x
8607-006	Terminal Board	x	x	x
8407-034	Transformer 40VA	x	x	x
7051-016	Wire Grille	x	x	x
8201-008	Relay - Blower	x	x	x
4058-110	Wiring Diagram	x		
4058-120	Wiring Diagram		x	x

*Please order by model number.

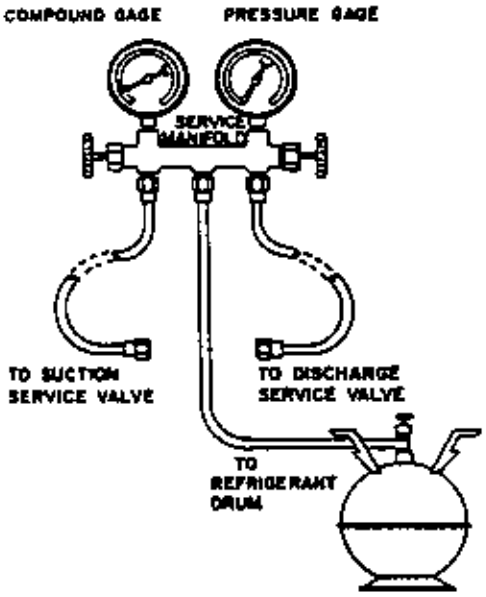
Minimum net billing $15.00. Supersedes all previous lists.
Subject to change without notice.

AIR CONDITIONING
PROCEDURE FOR
LEAK TEST-EVACUATION-CHARGING

GAUGE MANIFOLD

A necessary instrument in checking and servicing air conditioning and heat pump equipment is the gauge manifold. Its purpose is to determine the operating refrigerant pressures in order for the servicemen to analyze the condition of the system.

The valving on the manifold is so arranged that when the valves are closed (front-seated) the center port on the manifold is closed to the gauges and gauge ports. With the valves in the closed position, the gauge ports are still open to the gauges, permitting the gauges to register system pressures. Opening either valve opens the center port to that side of the manifold and system.



ATTACHING GAUGE MANIFOLD

For leak testing, purging, checking charge, charging liquid or evacuating, connect high pressure side of gauge manifold to Schrader valve on liquid or discharge line. Connect suction side of gauge manifold to Schrader valve on suction line. On heat pumps the suction line is between compressor and reversing valve.

ATTACHING MANIFOLD HOSE TO SCHRADER VALVE

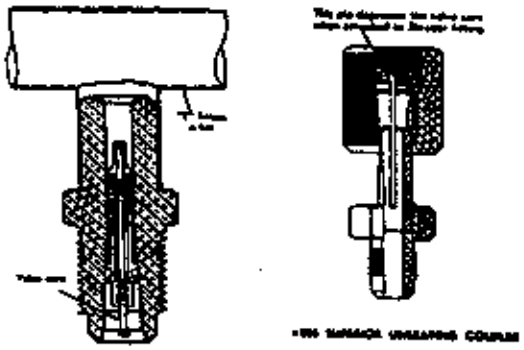
WARNING

As a safety measure, it is wise to attach refrigerant hoses at the lowest pressure readings on the system. To do this:

(a) Put high pressure hose (B) on first. (Unit should not be running).

(b) Put low pressure hose (A) on second. (Unit should be running).

1. Remove cap from valve.
2. Make sure gauge manifold valves are closed.
3. If hose does not have an unseating pin, a number 395 Superior or equivalent unseating coupler must be used.



4. Make sure coupler is lined up straight with Schrader valve. Screw coupler on to valve.
5. Open gauge manifold valve slightly and purge air from hose with refrigerant.
6. Read the suction pressure on compound gauge and heat pressure on pressure gauge.
7. To remove, push end of hose tight against end of Schrader valve and hold in place while quickly unscrewing coupler nut from Schrader valve.
8. Remove coupler from Schrader valve. Replace caps on valve.

WARNING

As a safety measure, it is wise to detach refrigerant hoses at the lowest pressure readings on the system. To do this:

(a) Remove the suction pressure hose (A) first. (Unit is running).

(b) Remove the high pressure hose (B) next. (Unit is not running).

LEAK TEST

1. Remove gauge port cap from suction and liquid service valve ports and attach manifold gauge hoses. Connect an upright R22 drum to center port of gauge manifold. Open refrigerant drum valve and manifold high pressure gauge valve to pressurize system. Pressurize the complete system with R22 until the pressure reaches 140 psig. DO NOT exceed 150 psig.
2. Close manifold high pressure gauge valve. Check all soldered joints, including those on the evaporator coil with an Electronic Leak Detector. If a leak is found which requires soldering, pressure in the system must be bled off since it is impossible to solder with unit pressurized. Be sure all leaks are located and marked before bleeding pressure from system.
3. Close drum valve and disconnect from center port. Release refrigerant into the atmosphere through suction line of gauge manifold.
4. Correct any leaks and recheck. When leaks, if any have been repaired, system is ready to be evacuated and charged. Relieve all pressure from the system down to 0 psig.

EVACUATION

1. Evacuate the system to less than 1000 microns, using a good vacuum pump and an accurate high vacuum gauge. Operate the pump below 1000 microns for 60 minutes and then close valve to the vacuum pump. Allow the system to stand for 30 additional minutes to be sure a 1000 micron vacuum or less is maintained.

2. An alternate method of removing moisture and noncondensables from the system is:

   a) Evacuate system to 29 inches vacuum for ten minutes per ton of system. Break vacuum with refrigerant to be used for final charging of system and vapor charge to 35-50 lbs. gauge pressure. Leave vapor charge in system for a minimum of five minutes. Reduce pressure to five to zero gauge pressure.

   b) Repeat step (a) two more times.

   c) Evacuate system to 30 inches vacuum for twenty minutes per ton. Charge system with the specified kind and quantity of refrigerant (charge into vacuum).

> **WARNING**
>
> At no time use the compressor to evacuate the system or any part of it.

3. Disconnect charging line at vacuum pump and connect to refrigerant supply. (Dial-A-Charge Cylinder) crack valve and purge charging line at center on manifold. Then close valve.

4. The system is now ready for the correct operating charge of Refrigerant 22.

CHARGING

1. SINGLE PACKAGE UNITS - Refer to the unit serial plate for the full operating charge.

2. SPLIT SYSTEMS - The outdoor unit factory charge is shown on the unit serial plate. The total system charge required to recharge the system after service repairs should be marked on the serial plate under TOTAL R22 CHARGE. This is normally marked by the installer and is determined from the R22 System Charge Table located on the inside of the outdoor unit access panel.

3. CTO ADAPTER KITS - When using CTO adapters and field tubing, use the procedure outlined on the bottom of page 3, Manual 2100-001. This determines the correct ounces of R22 for the tubing only.

4. FILTER-DRIER CHARGES - If a liquid line filter-drier is used, either in conjunction with field tubing and a CTO adapter kit, or as part of procedure for system clean-up after a compressor burn-out, additional R22 must be added to the system when recharging. This is in addition to the amount determined from the R22 System Charge Table.

PART NO.	MODEL NO.	OZ. of R22
5202-001	C-063S	8
5202-002	C-163S	10
5201-009	BFK-063S	7
5201-010	BFK-163S	13

PRELIMINARY CHARGING STEPS

If the system has been open to the atmosphere, it should be first evacuated. Then proceed as follows:

1. Attach a drum of proper, clean refrigerant to the center port of the charging manifold with one of the charging hoses.

2. Attach a second charging hose to the suction gauge (low pressure) side of the gauge manifold.

3. Remove the cap from the suction line valve.

4. Loosely attach the suction gauge hose to the line valve. Open the valve on the refrigerant drum and the suction valve on the charging manifold slightly to purge the air from the manifold and hoses before tightening the fitting.

5. Attach the third hose to the high pressure side of the manifold and the liquid line valve. Repeat steps 3 and 4 above.

CHARGING THE SYSTEM BY WEIGHT*

1. Connect manifold as instructed.

2. Place refrigerant drum upright on scale and determine exact weight of the refrigerant and cylinder or use a Dial-A-Charge cylinder.

3. With manifold suction valve closed and manifold discharge valve open, open refrigerant cylinder valve and allow pressure in system to balance with pressure of cylinder. For charging in the liquid phase, drum is placed upside down (valve down).

4. When there is approximately a full charge, front seat (close) the discharge manifold valve and let the system stabilize for about five minutes.

5. Start compressor by setting thermostat.

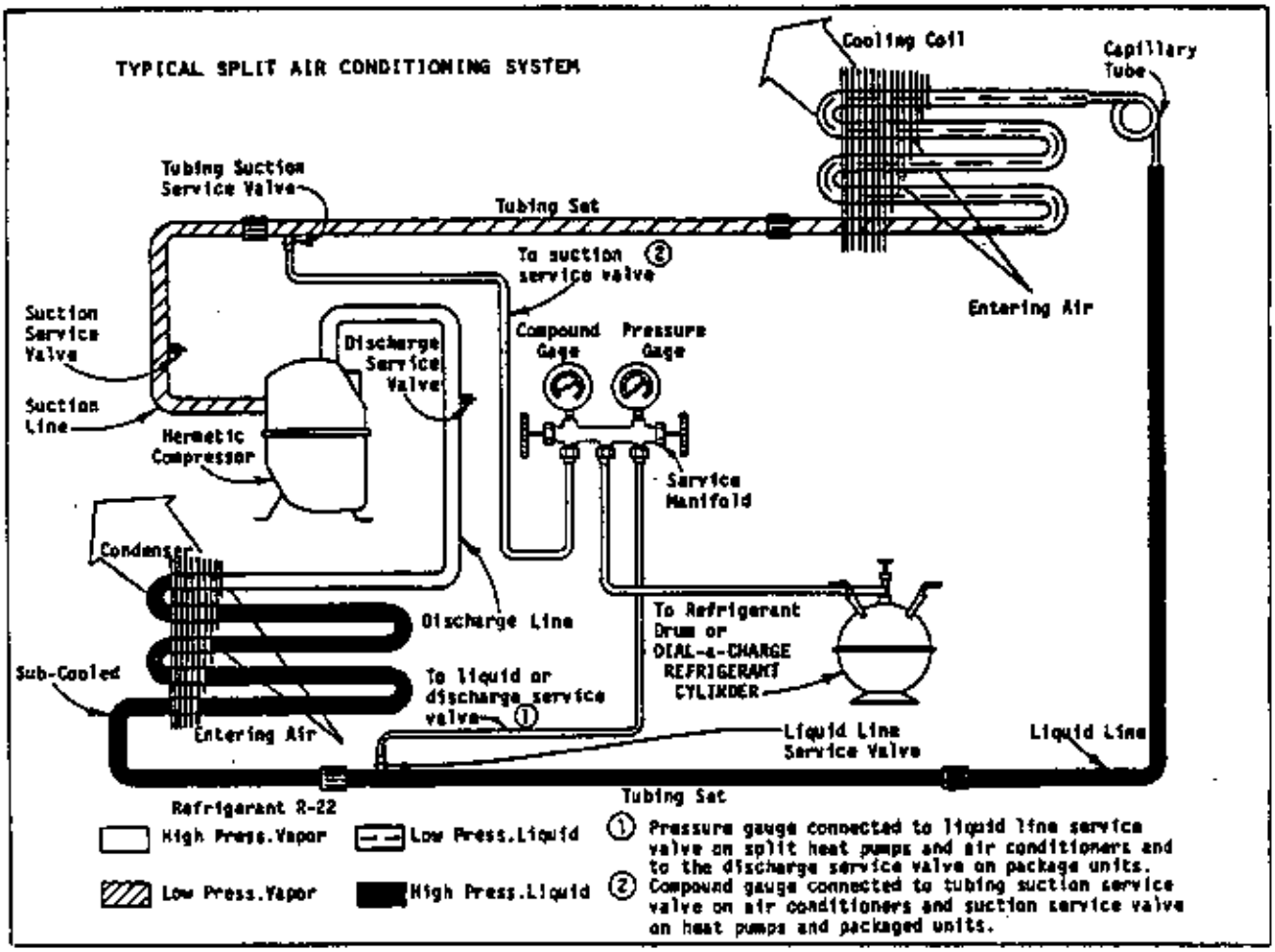
6. Finish charging with vapor by placing drum upright (valve up). Open drum valve and manifold low pressure valve to allow refrigerant to flow into the system. Throttle refrigerant drum valve to keep pressure about 160 psig for R22.

7. When the correct weight of refrigerant has been added to the unit, close refrigerant cylinder valve and allow unit to run for 30 minutes. Refer to Start-Up Procedure and Check List for further start-up details. Check the charge against the allowable head pressure as shown in the Head Pressure Chart and correct if needed.

8. Front seat gauge manifold valves, disconnect charging and gauge hoses and replace all valve caps.

> **WARNING**
>
> To speed refrigerant flow, it may be necessary to place refrigerant drum in a pan of warm water (not greater than 130°F). Remember to either consider the total weight of the pan of water or remove the drum for weighing frequently to keep track of the charging process.

*This charging method requires the scales or Dial-A-Charge cylinder to be extremely accurate since the charge in this type of system is quite critical.



AIR CONDITIONING AND HEAT PUMP ON COOLING CYCLE

TROUBLESHOOTING — SYSTEM PRESSURE CHECK

Low Suction — Low Head Pressure

1. Restricted air flow over indoor coil.
2. Defective indoor fan motor.
3. Low indoor and outdoor temperature.
4. Iced indoor coil.
5. Restricted liquid line, drier, or capillary tube.
6. Low charge.

High Suction — Low Head Pressure

1. Defective or broken valves.
2. IPRV valve open.

Low Suction — High Head Pressure

1. Partial restriction and then overcharged.

Note: On a split heat pump the vapor line should be within 10 psig of the pressure in liquid line on heating mode and within 10 psig of suction line on cooling mode. If not, check for sticking check valves.

High Suction — High Head Pressure

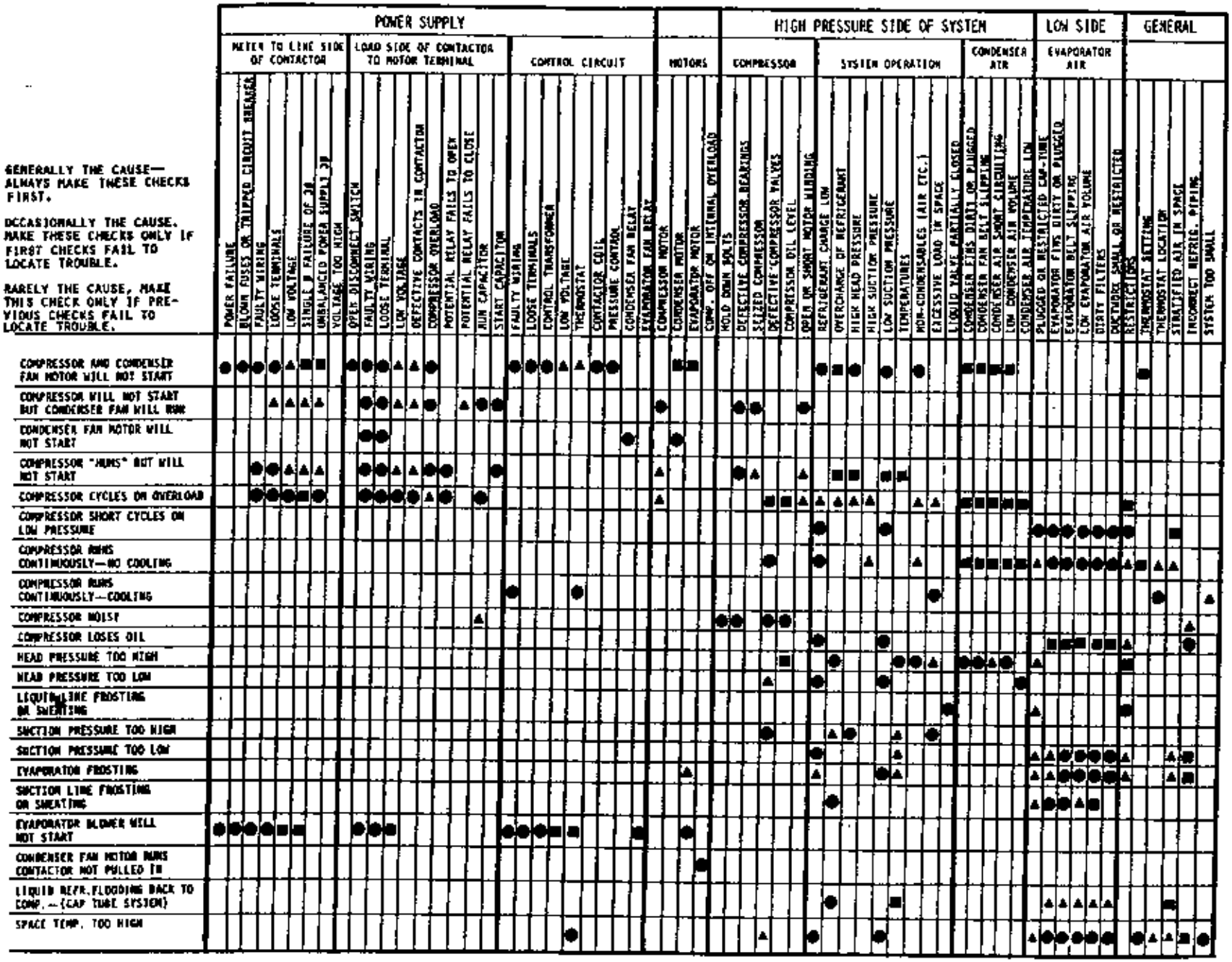
1. High ambient.
2. Low outdoor air flow
3. Overcharged.
4. Air in system.
5. Restricted condenser.

TROUBLE-SHOOTING CHART FOR AIR CONDITIONERS

● GENERALLY THE CAUSE—ALWAYS MAKE THESE CHECKS FIRST.

▲ OCCASIONALLY THE CAUSE. MAKE THESE CHECKS ONLY IF FIRST CHECKS FAIL TO LOCATE TROUBLE.

■ RARELY THE CAUSE, MAKE THIS CHECK ONLY IF PREVIOUS CHECKS FAIL TO LOCATE TROUBLE.



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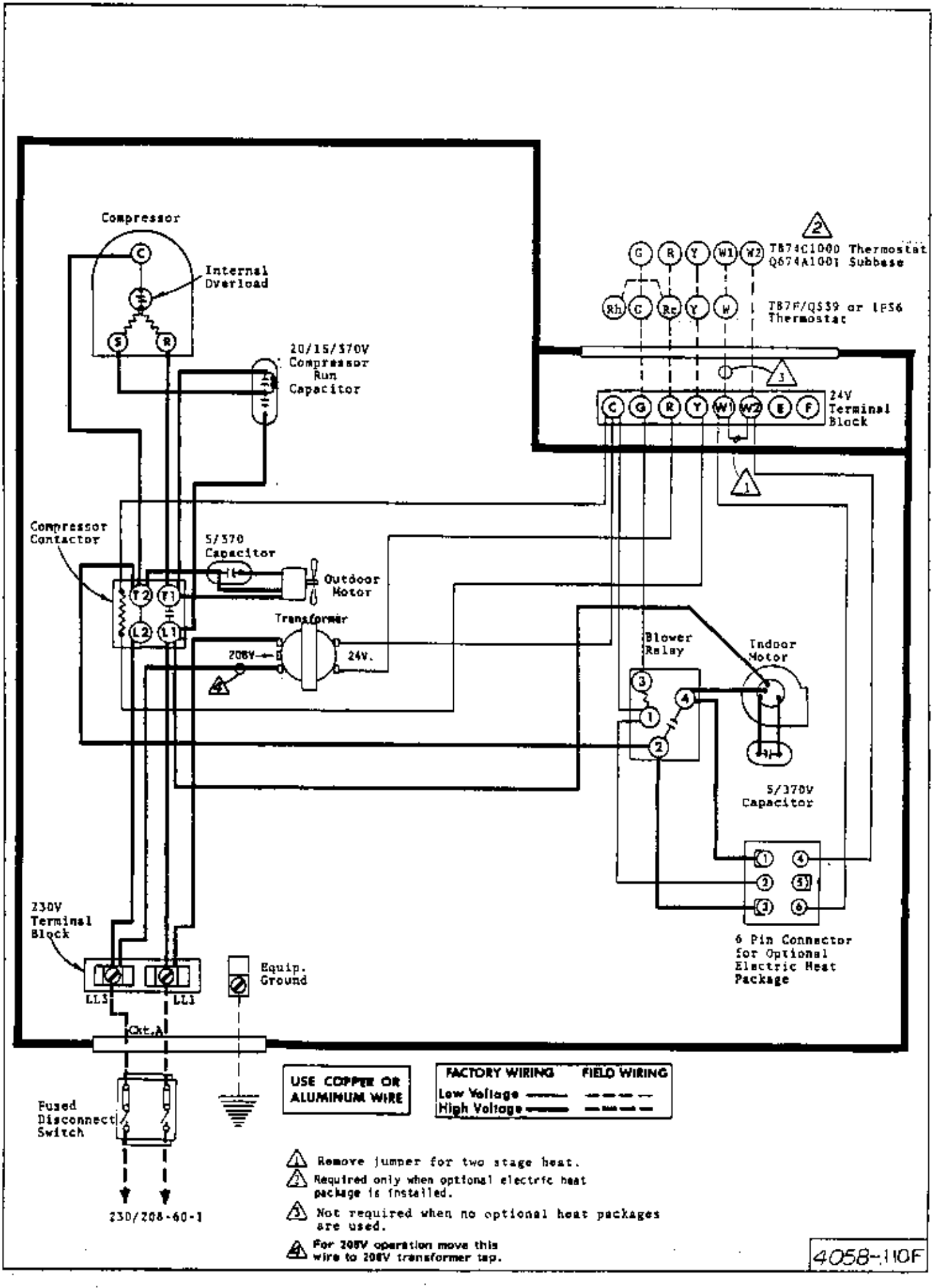
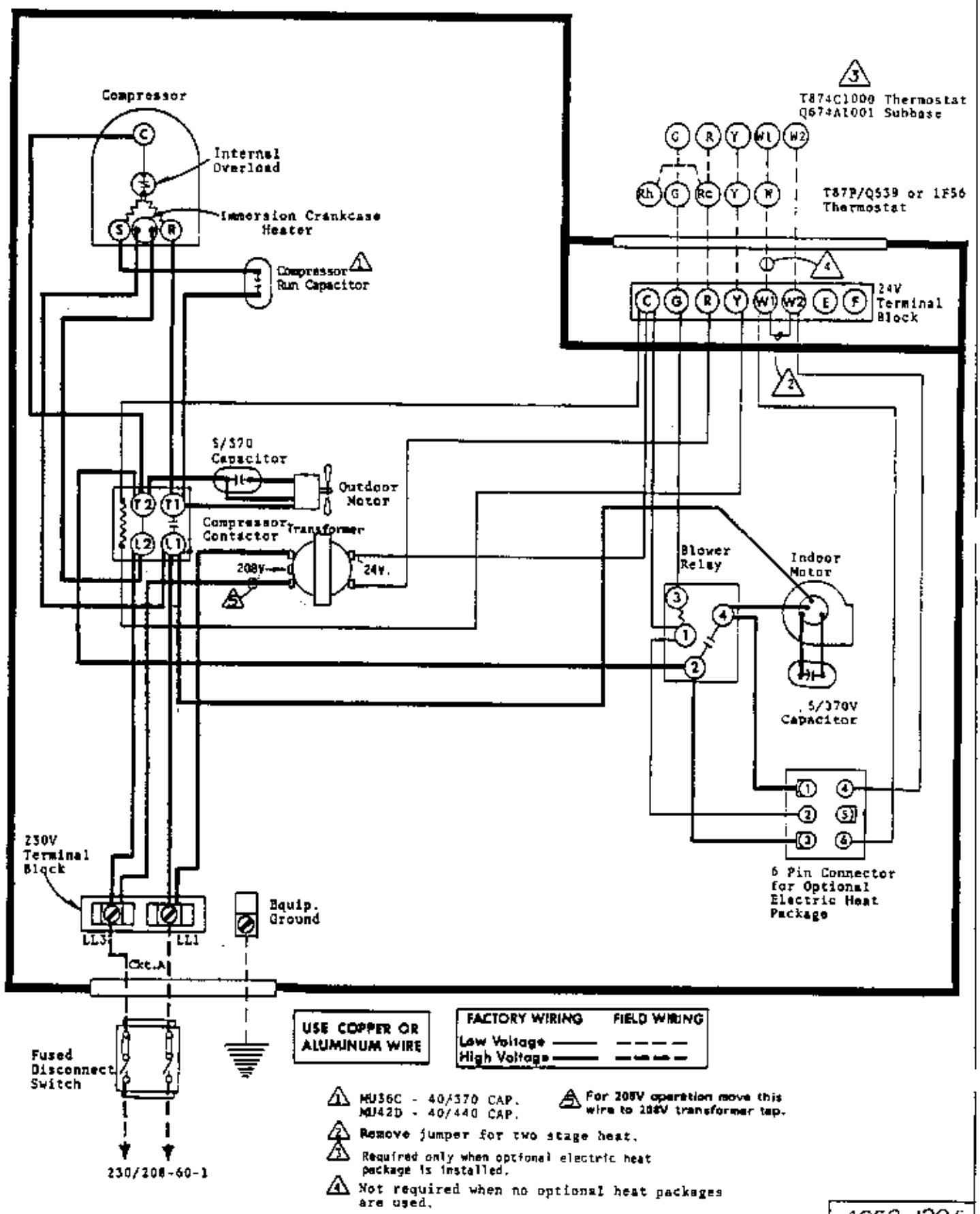
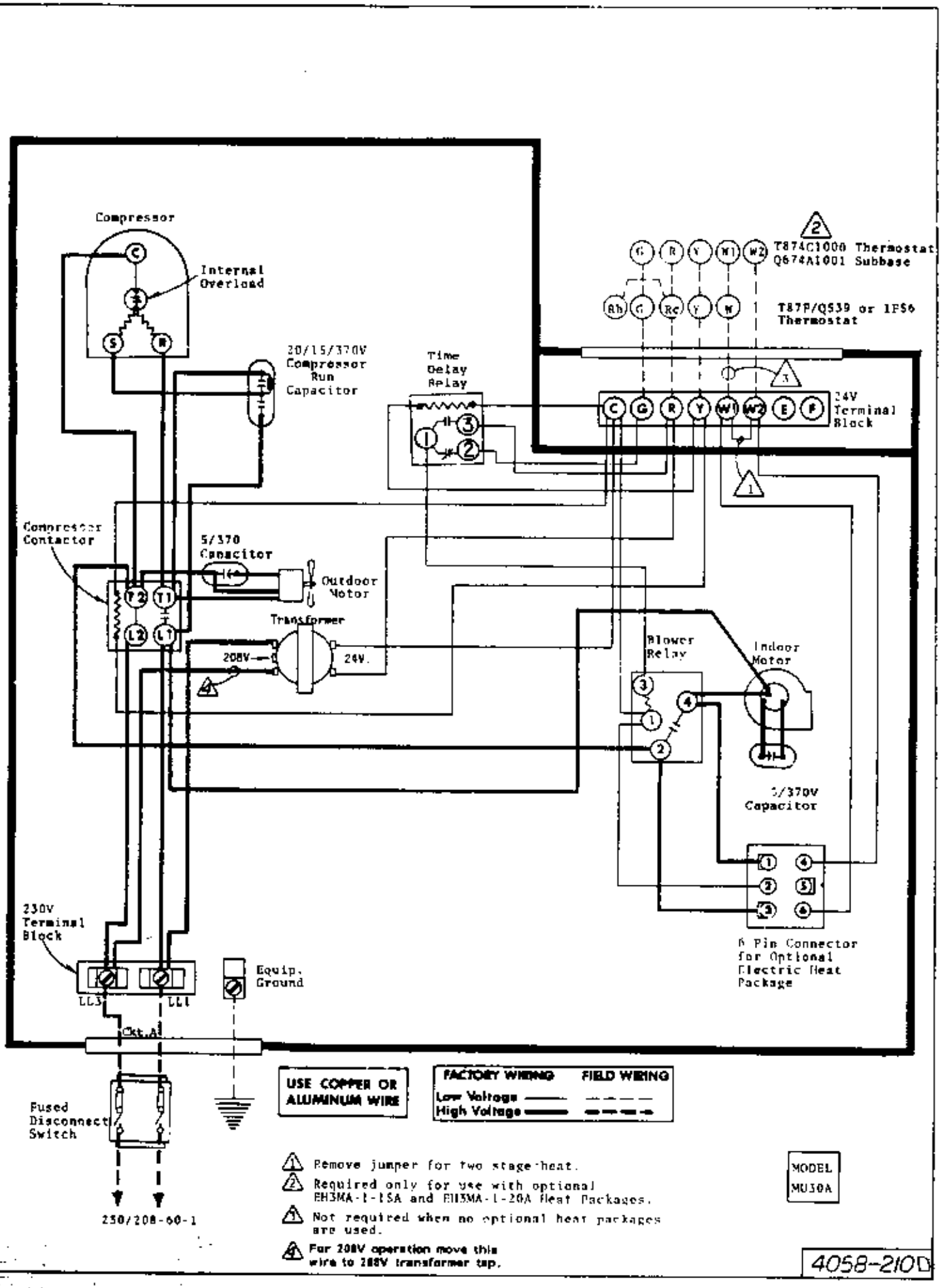
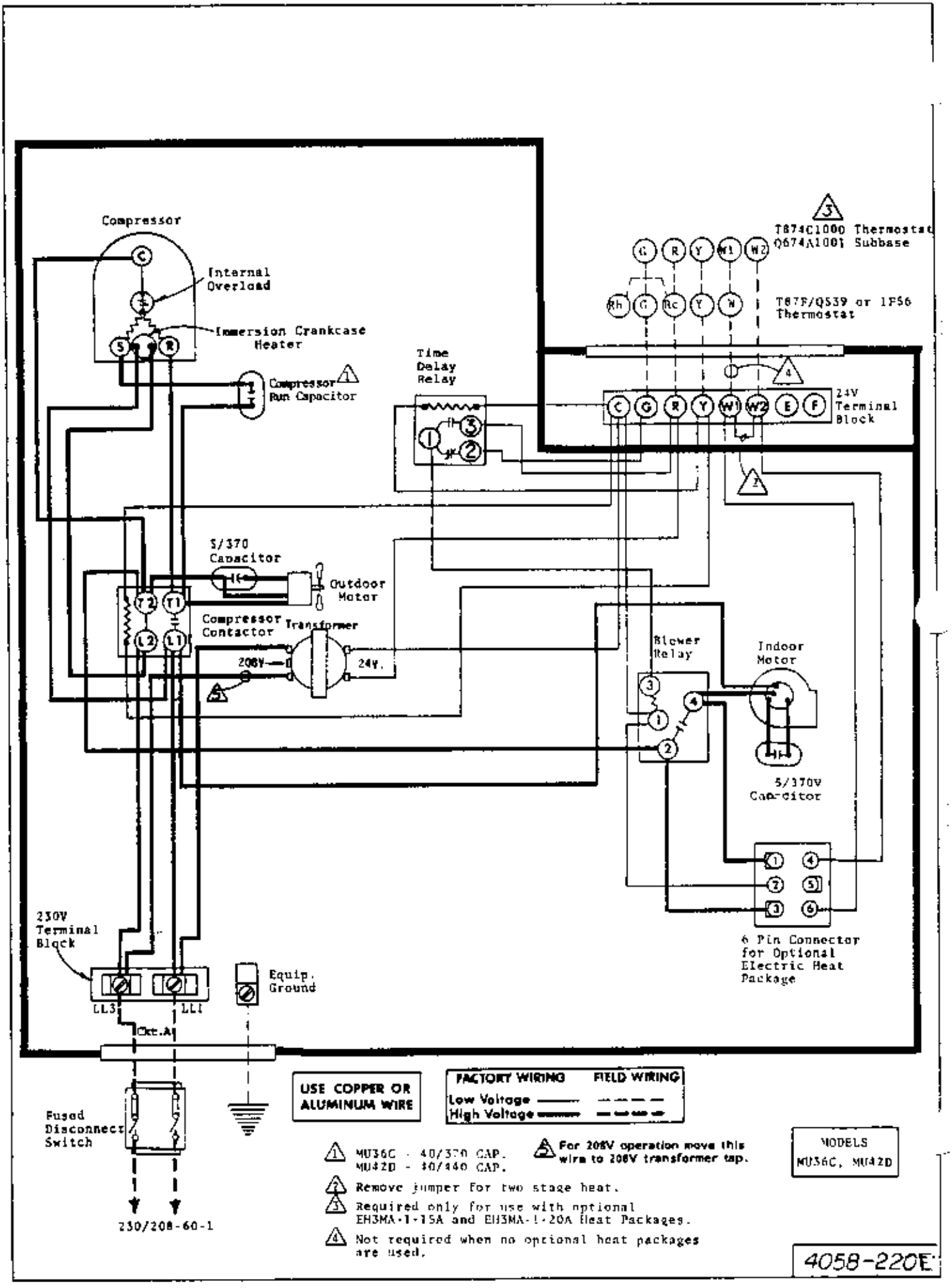

Compressor
C
Internal Overload
S
R
20/15/370V Compressor Run Capacitor
Compressor Contactor
T2
T1
L2
L1
5/370 Capacitor
Outdoor Motor
Transformer
208V
24V.
4
230V Terminal Block
LL2
LL1
Ckt.A
Equip. Ground
Fused Disconnect Switch
230/208-60-1
2
G
R
Y
W1
W2
T874C1000 Thermostat
Q674A1001 Subbase
Rh
C
Rc
Y
W
T87F/Q539 or 1PS6 Thermostat
3
C
G
R
Y
W1
W2
E
F
24V Terminal Block
1
Blower Relay
Indoor Motor
5/370V Capacitor
6 Pin Connector for Optional Electric Heat Package
USE COPPER OR ALUMINUM WIRE
FACTORY WIRING
FIELD WIRING
Low Voltage
High Voltage
1 Remove jumper for two stage heat.
2 Required only when optional electric heat package is installed.
3 Not required when no optional heat packages are used.
4 For 208V operation move this wire to 208V transformer tap.
4058-110F


Compressor
C
Internal Overload
Immersion Crankcase Heater
S
R
Compressor Run Capacitor
1
T874C1000 Thermostat
Q674A1001 Subbase
C
R
Y
W1
W2
Rh
G
Rc
Y
W
T87P/Q539 or 1F56 Thermostat
4
C
G
R
Y
W1
W2
E
F
24V Terminal Block
2
5/370 Capacitor
Outdoor Motor
T2
T1
L2
L1
Compressor Contactor
Transformer
208V
24V.
3
Blower Relay
Indoor Motor
3
4
1
2
.5/370V Capacitor
1
4
2
5
3
6
6 Pin Connector for Optional Electric Heat Package
230V Terminal Block
LL3
LL1
Ckt.A
Equip. Ground
Fused Disconnect Switch
230/208-60-1
USE COPPER OR ALUMINUM WIRE
FACTORY WIRING
FIELD WIRING
Low Voltage
High Voltage
1 HU36C - 40/370 CAP.
HU42D - 40/440 CAP.
2 Remove jumper for two stage heat.
3 Required only when optional electric heat package is installed.
4 Not required when no optional heat packages are used.
5 For 208V operation move this wire to 208V transformer tap.

4058-120 G


Compressor
C
S
R
Internal Overload
20/15/370V Compressor Run Capacitor
Time Delay Relay
T874C1000 Thermostat
Q674A1001 Subbase
T87F/Q539 or 1FS6 Thermostat
Rh
G
Rc
Y
W
W1
W2
24V Terminal Block
C
G
R
Y
W1
W2
E
F
Compressor Contactor
T2
T1
L2
L1
5/370 Capacitor
Outdoor Motor
Transformer
208V
24V.
Blower Relay
Indoor Motor
5/370V Capacitor
6 Pin Connector for Optional Electric Heat Package
230V Terminal Block
LL3
LL1
Equip. Ground
Ckt.A
Fused Disconnect Switch
250/208-60-1
USE COPPER OR ALUMINUM WIRE
FACTORY WIRING
FIELD WIRING
Low Voltage
High Voltage
1 Remove jumper for two stage heat.
2 Required only for use with optional EH3MA-1-15A and EH3MA-1-20A Heat Packages.
3 Not required when no optional heat packages are used.
4 For 208V operation move this wire to 208V transformer tap.
MODEL MU30A
4058-210



1. MU36C - 40/370 CAP.
   MU42D - 50/440 CAP.
2. Remove jumper for two stage heat.
3. Required only for use with optional EH3MA-1-15A and EH3MA-1-20A Heat Packages.
4. Not required when no optional heat packages are used.

⚠ For 208V operation move this wire to 208V transformer tap.