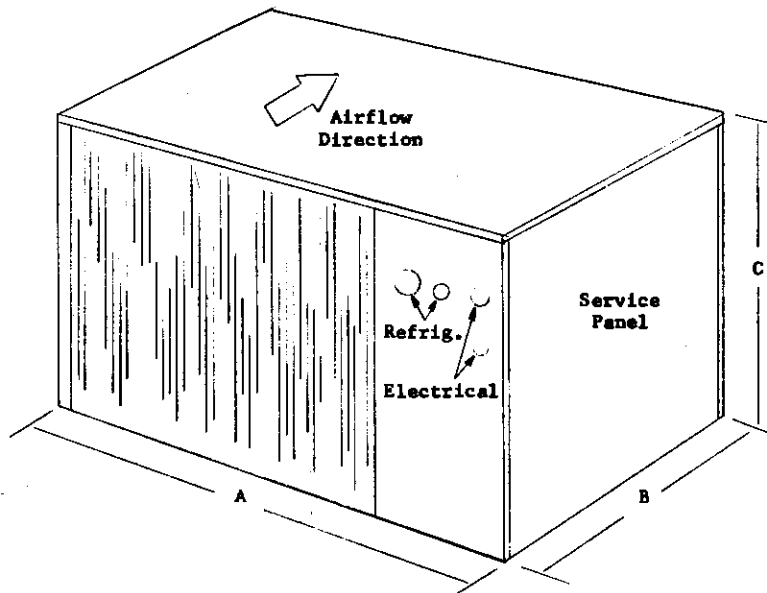


SPLIT SYSTEM AIR CONDITIONERS

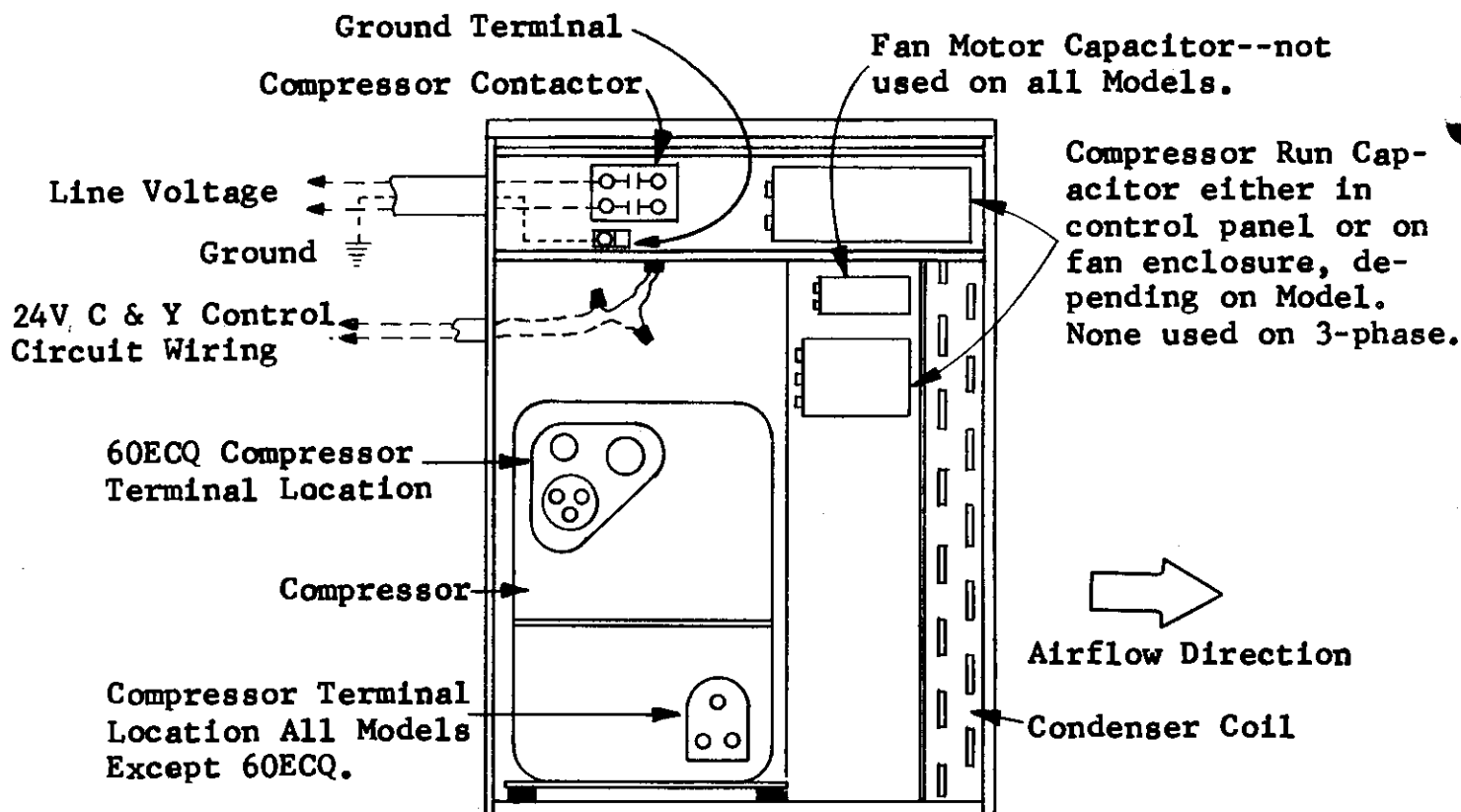
INSTALLATION INSTRUCTIONS



MODEL	18ECQ, 24ECQ	30ECQ1, 36ECQ3	42ECQ, 48ECQ1, 60ECQ
Dimension			
A	36	40	48
B	18	18	18
C	21	22-5/8	30-3/4

MODEL	18ECQ	24ECQ	30ECQ1	36ECQ3	36ECQ3	42ECQ	42ECQ	48ECQ1	48ECQ1	60ECQ	60ECQ
Electrical Rating	208/230-60-1		230-60-1		240-60-3	230-60-1	240-60-3	230-60-1	240-60-3	230-60-1	240-60-3
Operating Voltage -Minimum	197	197	207	197	187	197	187	197	187	207	187
Operating Voltage -Maximum	253	253	253	253	264	253	264	253	264	253	264
Total Unit Amps	15.8	17.8	19.6	27.6	15.8	24.6	15.6	26.6	17.6	37.6	25.6
Min. Cir. Amp.	19	21	24	34	19	30	19	33	22	46	31
60°C Copper Wire Size	#12	#10	#10	#8	#12	#10	#12	#8	#10	#6	#8
Ground Wire Size	#12	#10	#10	#10	#12	#10	#12	#10	#10	#10	#10
Maximum Time Delay Fuse	25	30	35	50	30	50	30	50	35	60	50
Compressor Type	PSC	PSC	PSC	PSC	3-Phase	PSC	3-Phase	PSC	3-Phase	PSC	3-Phase
Crankcase Heat Type	Internal	Internal	Internal	Internal	External	Internal	External	Internal	External	Internal	External
Fan Motor-HP/RPM	1/4 / 1050		1/5 / 1050				1/3 / 825				
Fan Motor Nameplate-F.L.A.	3.8A		3.6A				2.6A				
Fan Dia/CFM	18" / 1950		20" / 2280				24" / 4000				
Coil Face Area, Ft ² .	3.75		5.15				7.7				
Coil Rows/FPI	2/18		2/18				2/15				
Shipping Wt. Lbs.	160	180	190	220	220	280	280	280	280	325	325

BARD MANUFACTURING COMPANY • P. O. BOX 607 • BRYAN, OHIO



TYPICAL ECQ ENDVIEW
SERVICE PANEL END

CFM REQUIREMENTS FOR MATCHING INDOOR COIL SECTIONS		
Outdoor Unit Model	Indoor Coil Model	Rated CFM
18ECQ	18QS3	650
	B18EQ1	650
24ECQ	24QS	900
	2ACQ	900
	B24EQ1	830
30ECQ1	3ACQ3	1070
	3HCQ	950
	B36EHQ	1080
36ECQ3	3ACQ3	1260
	3HCQ	1000
	B36EHQ	1300
42ECQ	4ACQ1	1400
	4HCQ	1400
	B48HQ1	1400
48ECQ1	4ACQ1	1600
	5ACQ1	1600
	4HCQ	1600
	B48HQ1	1600
60ECQ	5ACQ1	2220
	5HCQ	1890
	B60HQ2	2000

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.

The installation should be made in accordance with national codes and/or local codes.

Authorities having jurisdiction should be consulted before the installation is made.

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 crate 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 on pages 7 and 8.

Model 30ECQ1 and 36ECQ3 when matched with B36EHQ blower coil unit should be wired according to the control circuit wiring diagrams shown in the B36EHQ installation instructions. The instructions describe which control circuit diagram should be used based upon installed Kw of electric heat. If OKw model is installed, use diagram AAH-1 and disregard the wire between W terminal at thermostat and J terminal at B36EHQ 24V terminal strip.

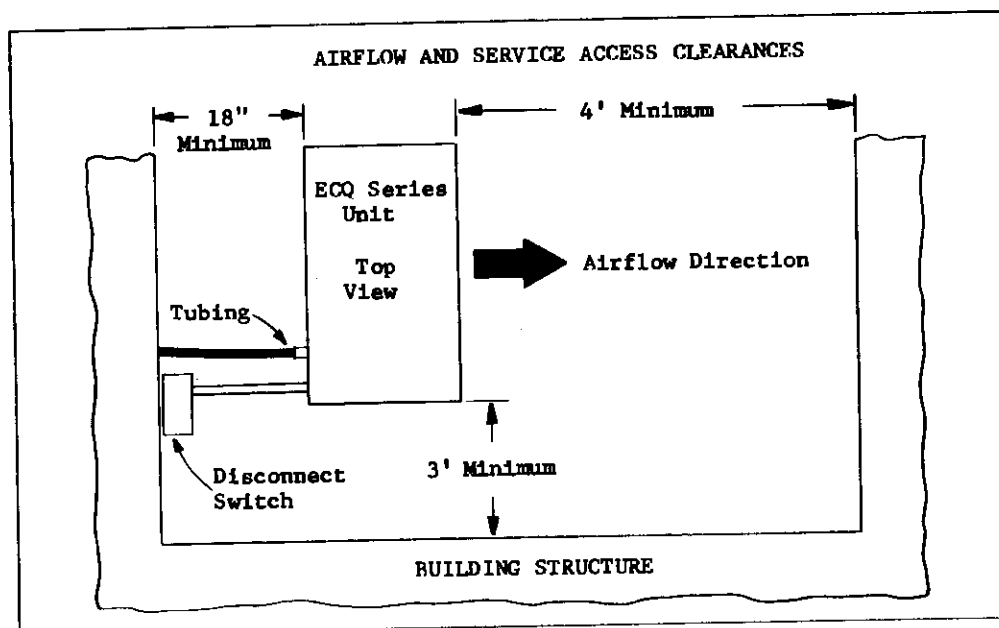
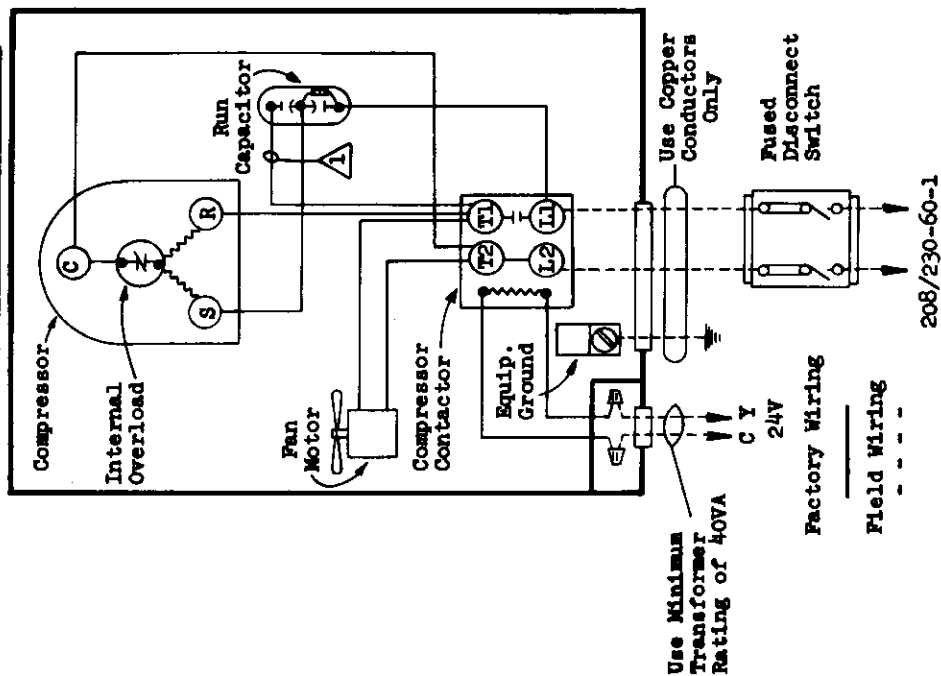


Figure 1

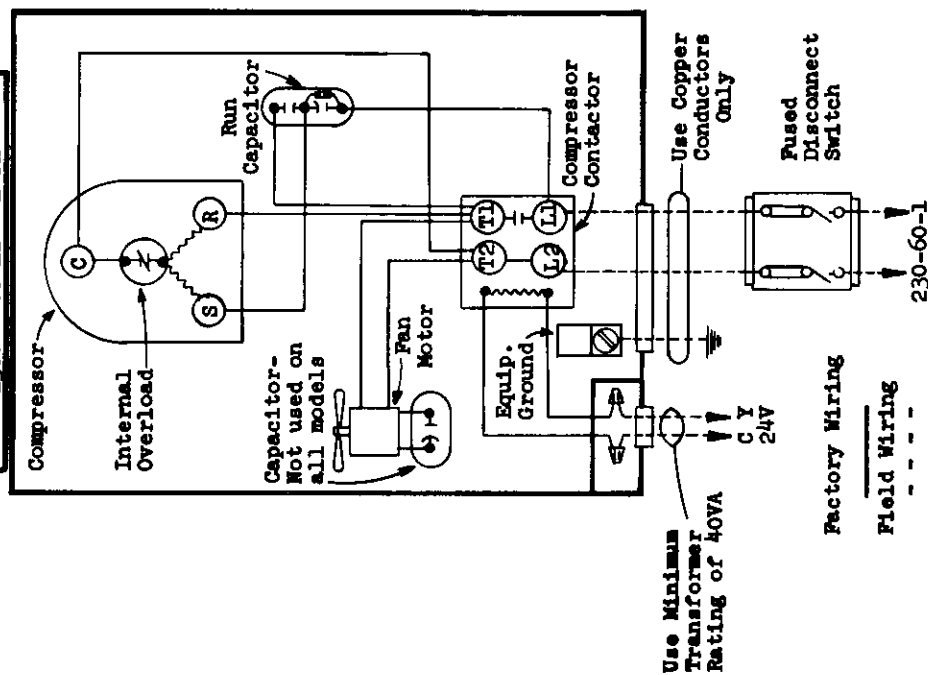
SPLIT SYSTEM AIR CONDITIONERS
18EQ and 24EQ
208/230V 60 Hz 1-Ph



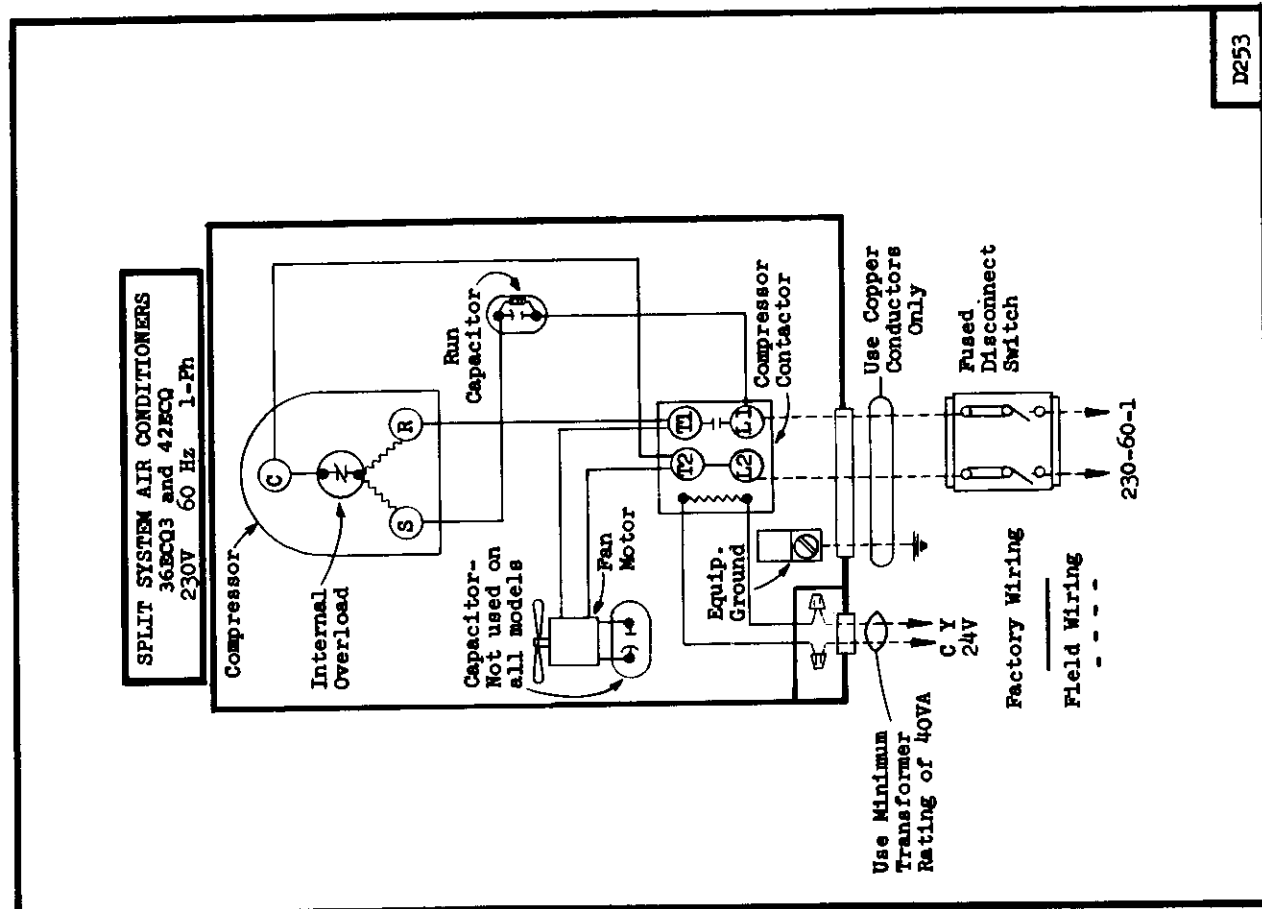
⚠ This wire not used on Model 18EQ, two terminal capacitor only.

D471

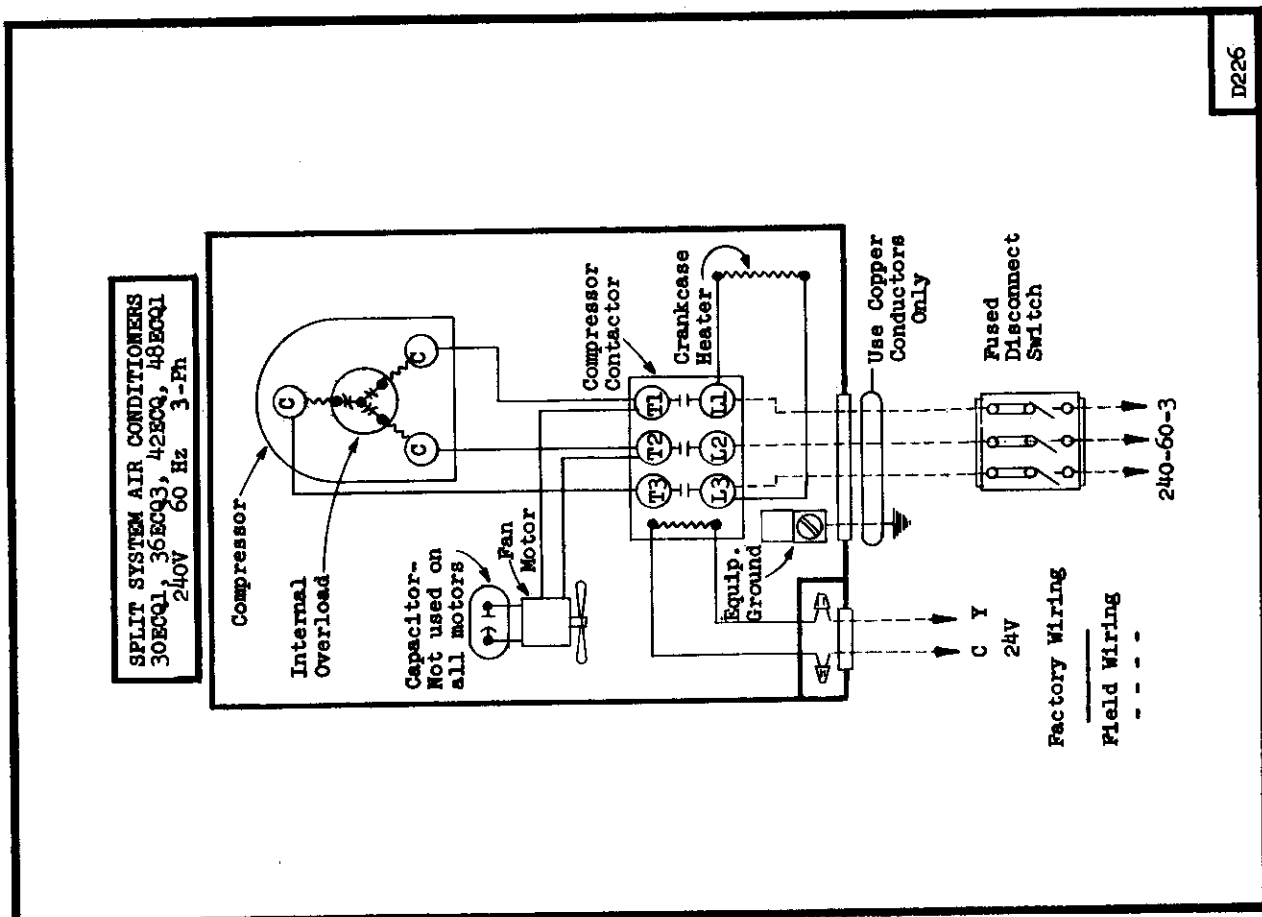
SPLIT SYSTEM AIR CONDITIONERS
30EQ and 48EQ
230V 60 Hz 1-Ph



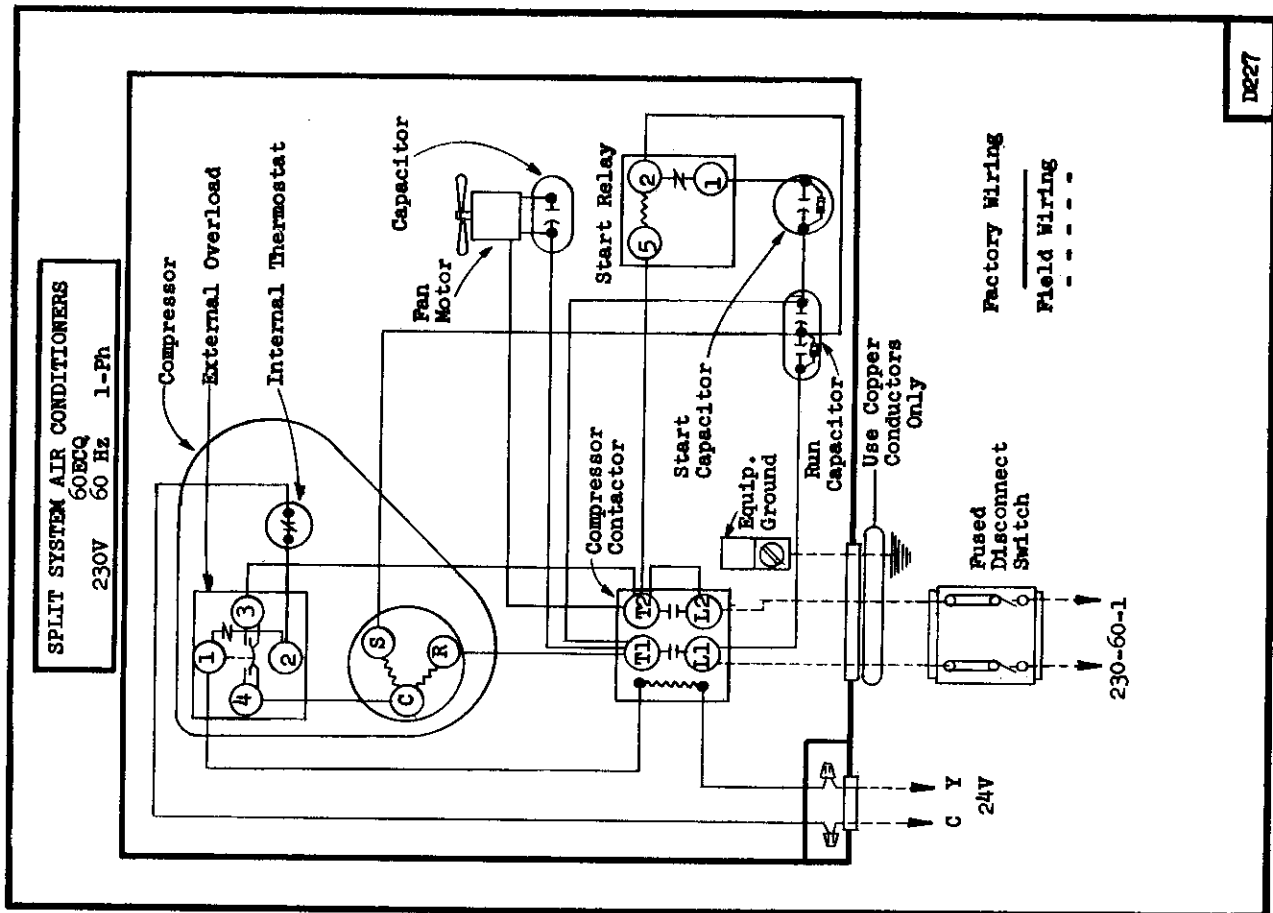
D225



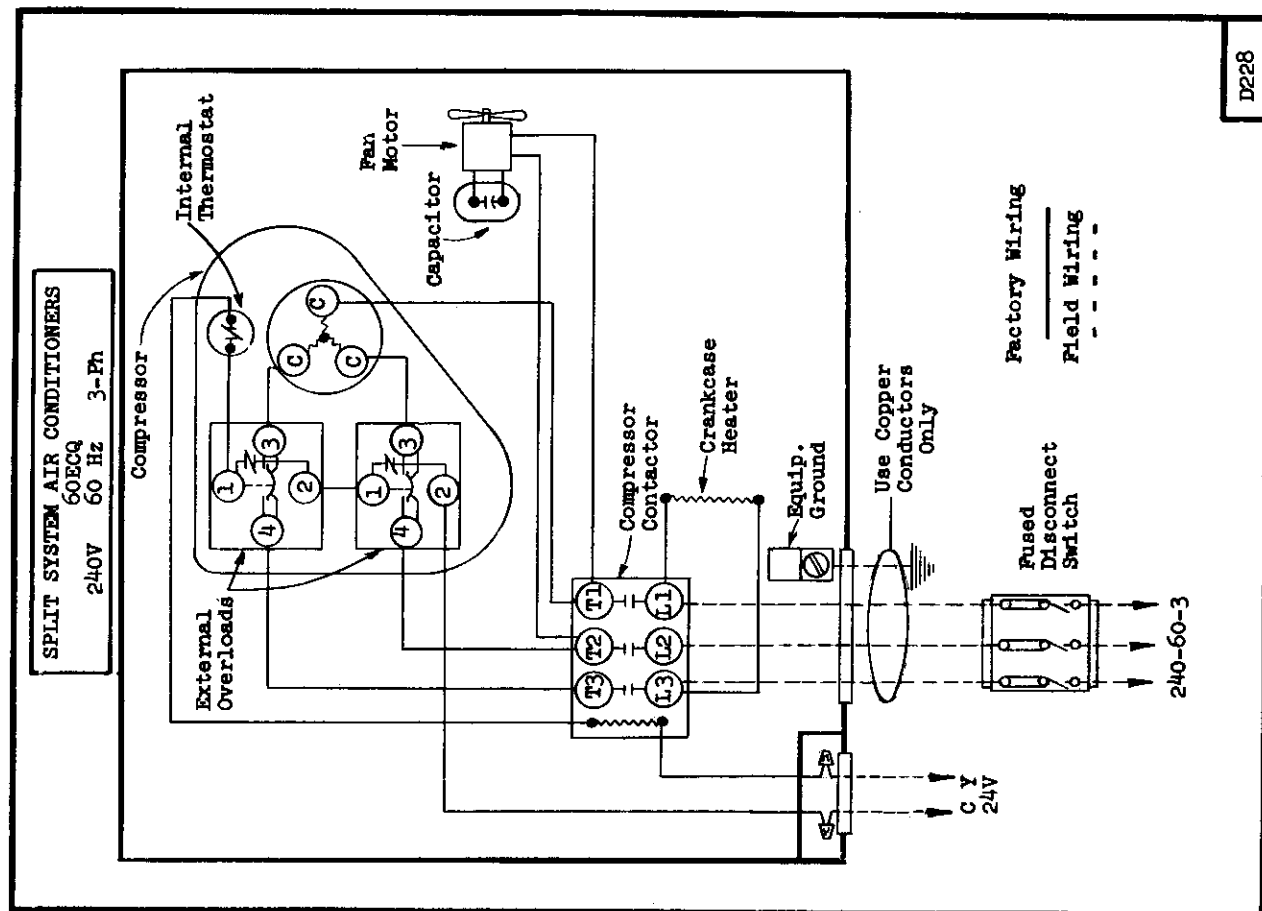
D253



D256

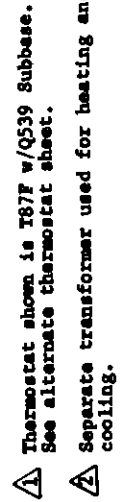


D227

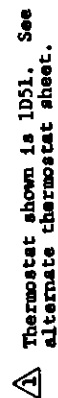


D228

D183

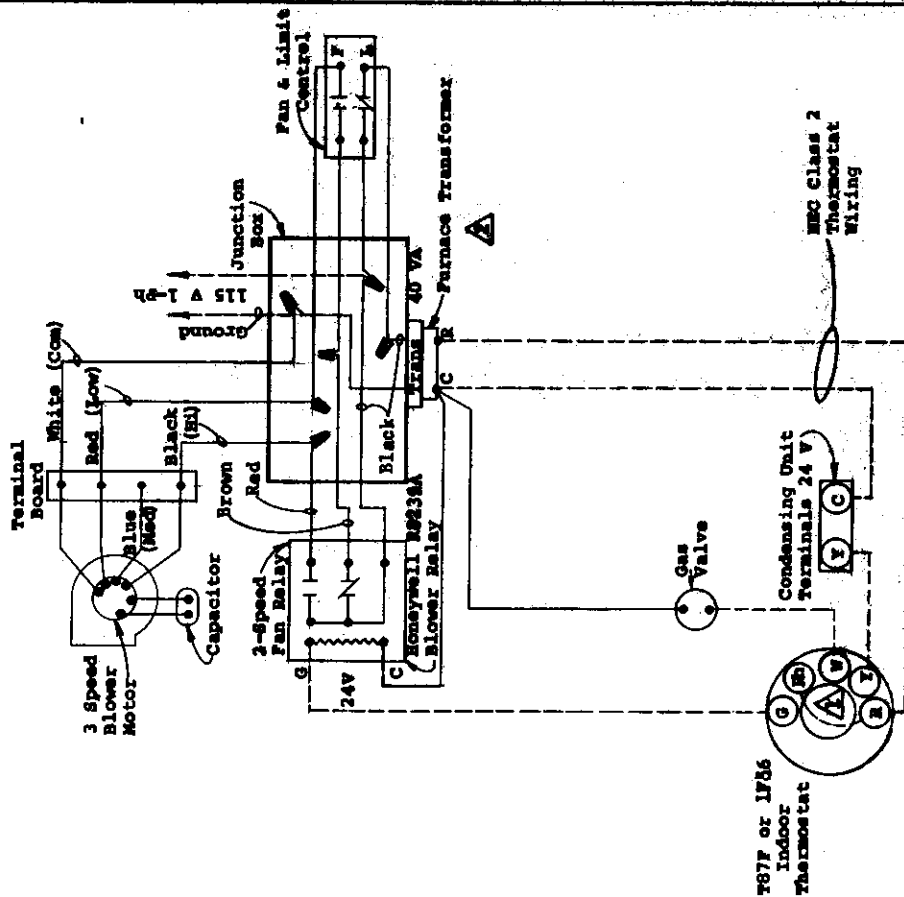


42ECQ, 48ECQ1, 60ECQ



**TYPICAL APPLICATION
WITH 3 SPEED GAS FURNACE
PRE-WIRED FOR COOLING**

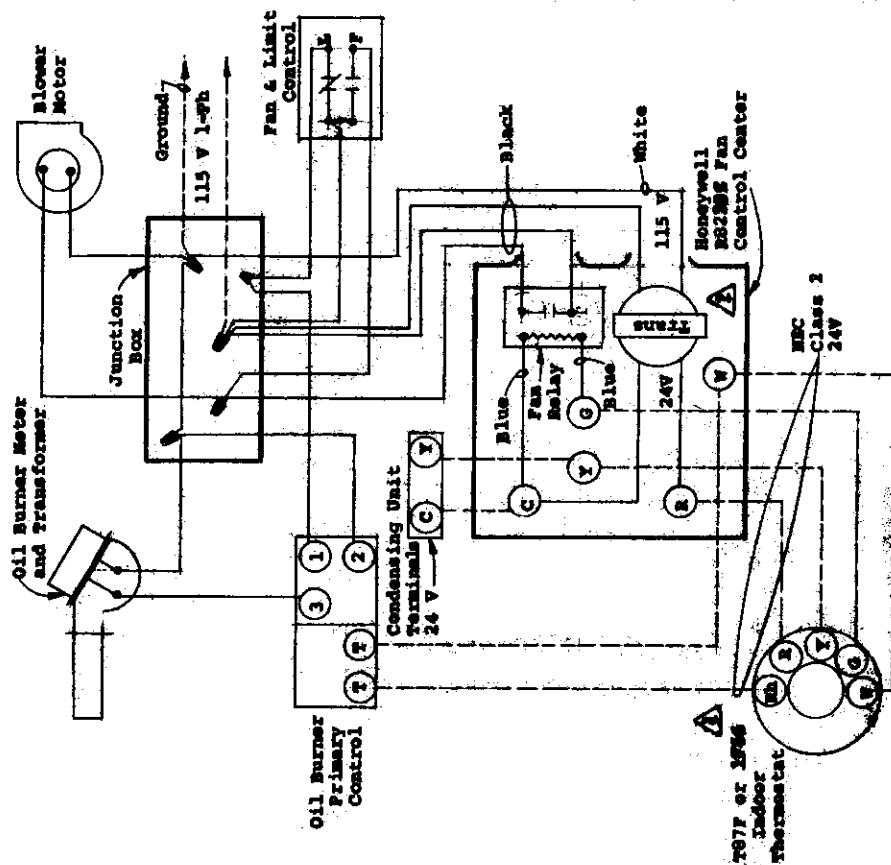
D184



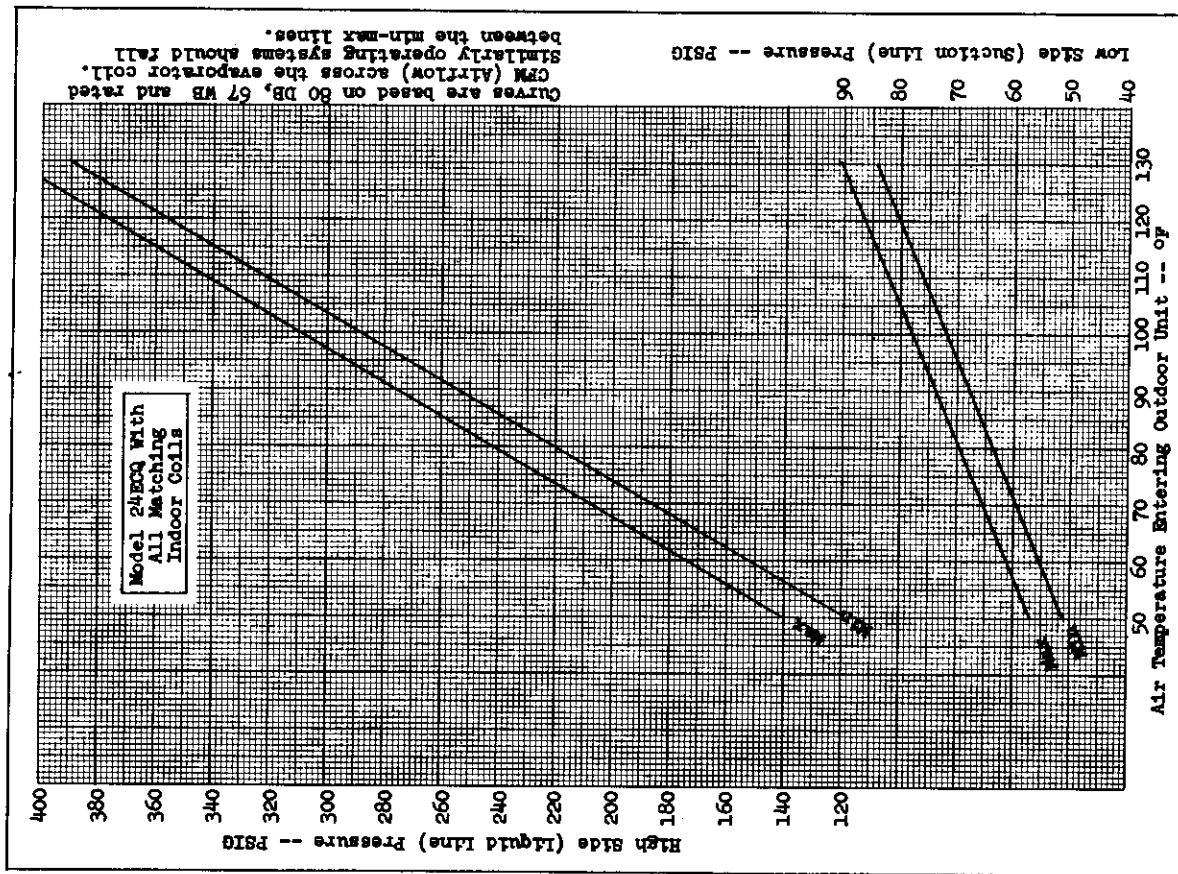
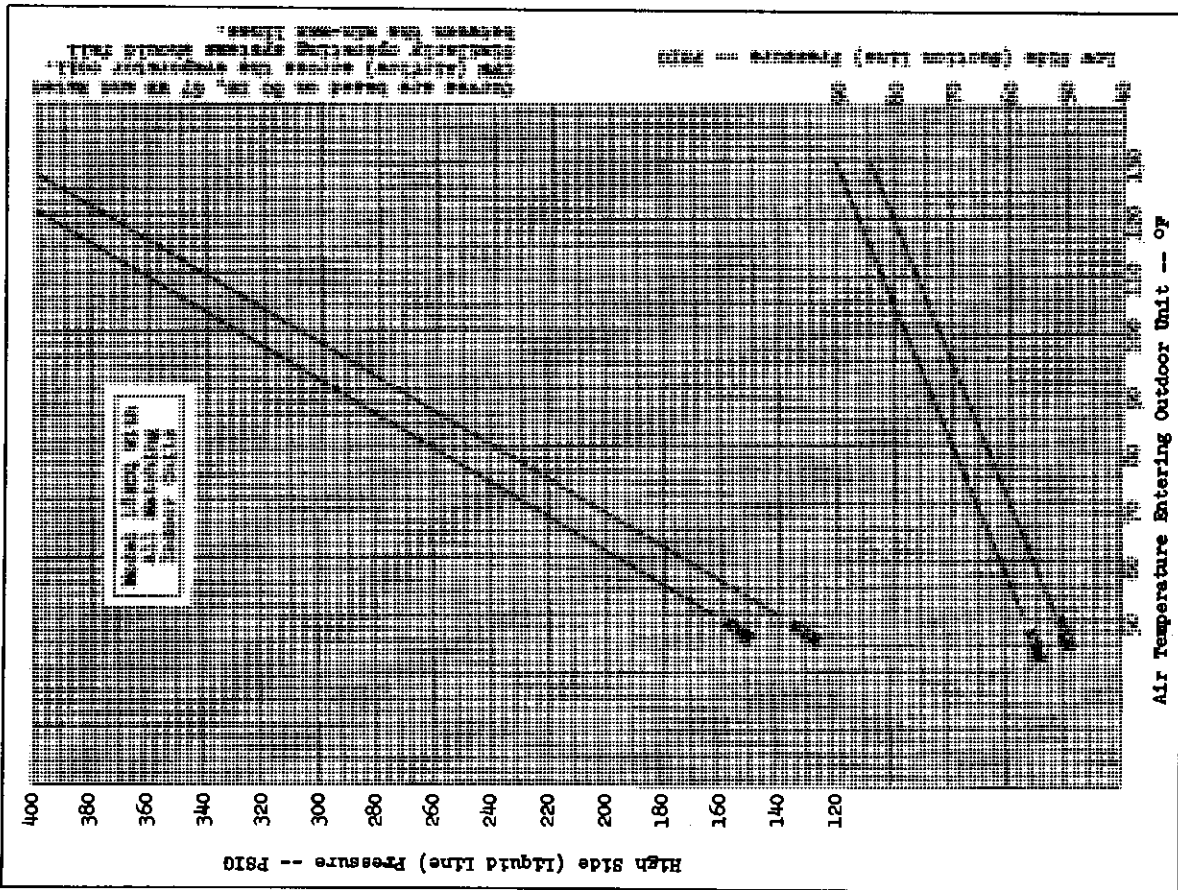
- 1 Add jumper Rh to R when using T87F w/Q539 subbase for common heat-cool transformer. See alternate thermostat sheet.
- 2 Furnace transformer supplies power for both heating and cooling.

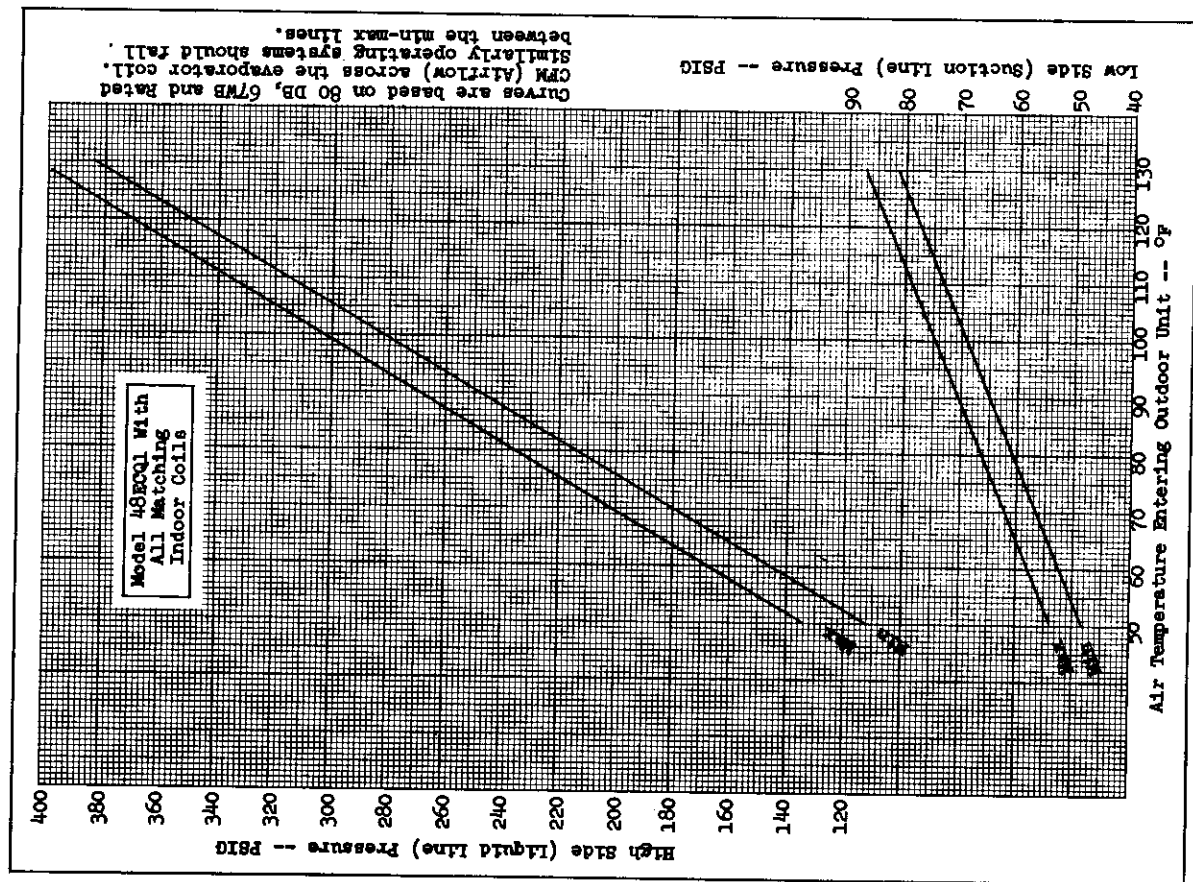
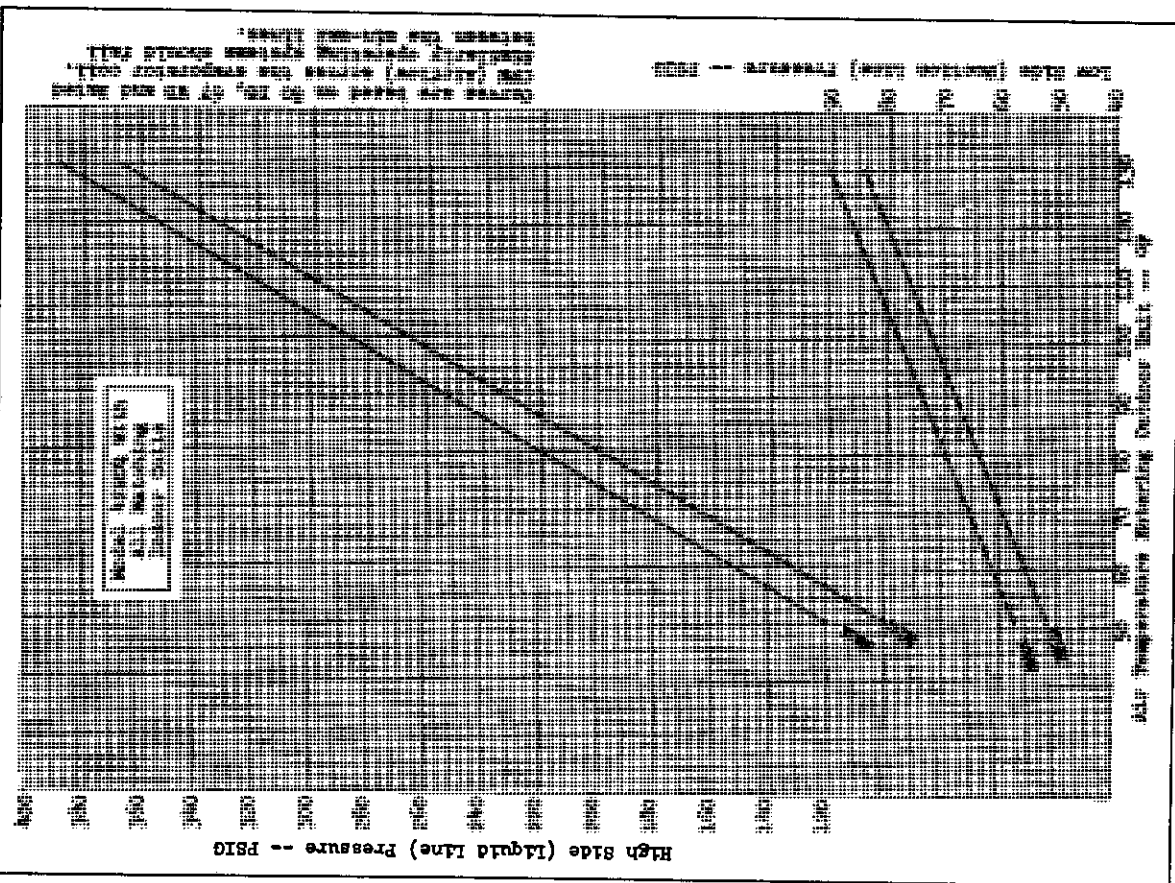
**TYPICAL APPLICATION
WITH OIL FURNACE**

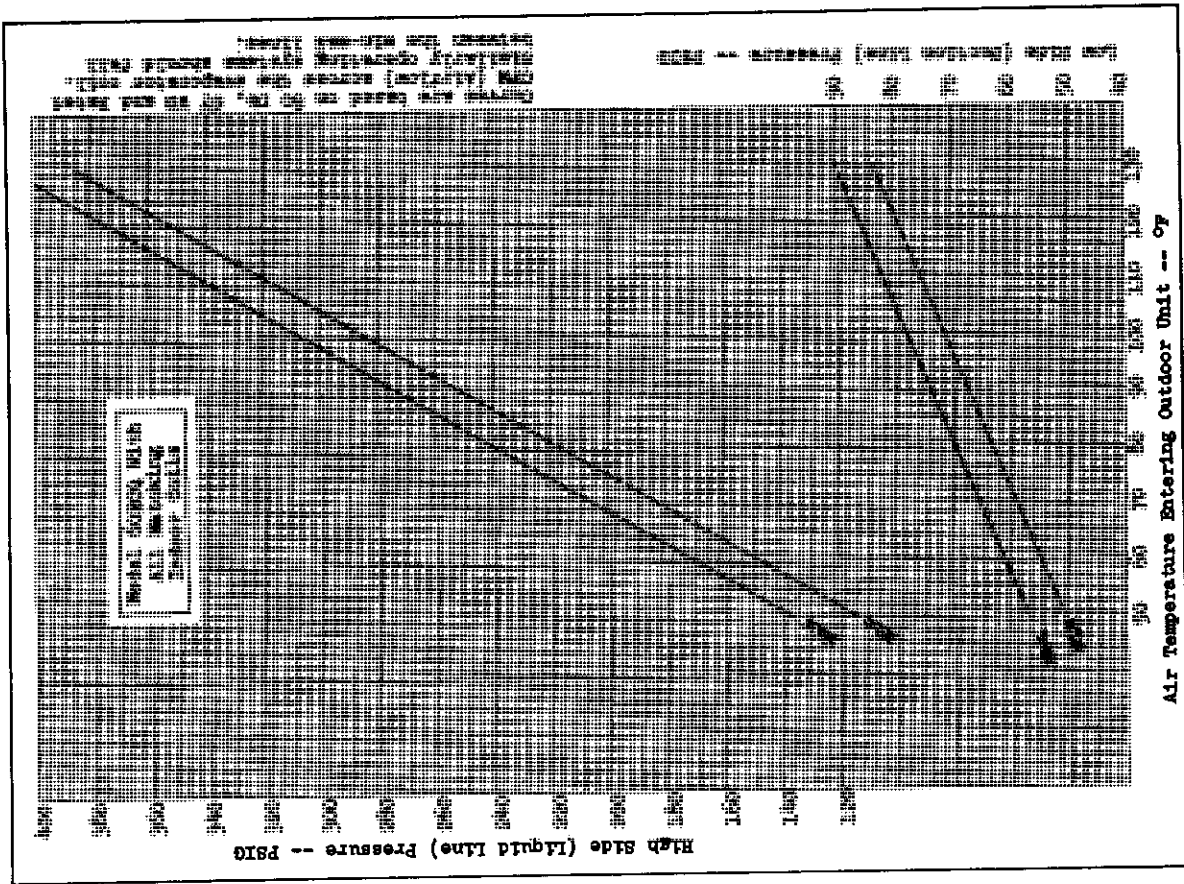
D185



- 1 Thermostat shown is T87F w/Q539 subbase. See alternate thermostat sheet.
- 2 Separate transformer used for heating and cooling.







PARTS LIST FOR SPLIT SYSTEM AIR CONDITIONERS

PART NO.	DESCRIPTION	18B09	24B09	30B09	36B09-3	42B09	42B09-3	48B09	48B09-3	60B09	60B09-3	36B09-3	48B09-3	48B09	60B09-3	48B09
8552-015	Capacitor 370V	X														
8552-012	Capacitor 370V															
8552-012	Capacitor 440V															
8552-009	Capacitor 440V															
8552-011	Capacitor 440V															
8552-005	Capacitor 370V															
8000-001	Compressor 1-Ph															
8000-002	Compressor 1-Ph															
8000-003	Compressor 1-Ph															
8000-004	Compressor 1-Ph															
8000-005	Compressor 1-Ph															
8000-011	Compressor 1-Ph															
8000-013	Compressor 1-Ph															
8000-015	Compressor 1-Ph															
8000-020	Compressor 1-Ph															
8000-021	Compressor 1-Ph															
8000-010	Compressor 3-Ph															
8000-018	Compressor 3-Ph															
8000-022	Compressor 3-Ph															
83672	Comp. Overload															
83684	Comp. Overload															
5051-011	Condenser Coil															
5051-013	Condenser Coil															
5051-001	Condenser Coil															
5051-009	Condenser Coil															
8401-007	Contactor-Comp.															
8401-003	Contactor-Comp.															
8401-002	Contactor-Comp.															
8401-001	Contactor-Comp.															
8605-001	Crankcase Heater															
8605-002	Crankcase Heater															
5151-001	Fan Blade															
5151-007	Fan Blade															
5151-017	Fan Blade															
8201-024	Hi Press. Sw.															
8104-003	Motor - Fan															
8103-002	Motor - Fan															
8105-005	Motor - Fan															
8200-006	Motor Mount-Fan															
8200-001	Motor Mount-Fan															
8200-004	Motor Mount-Fan															
8201-008	Relay - Blower															
8551-001	Start Capacitor															
8201-020	Start Relay															
8607-002	Term. Block 230V															
8407-003	Trans. Stepdown															

Minimum Net Billing \$5.00. Supersedes all previous lists.
Subject to change without notice. F.O.B. Bryan, Ohio.

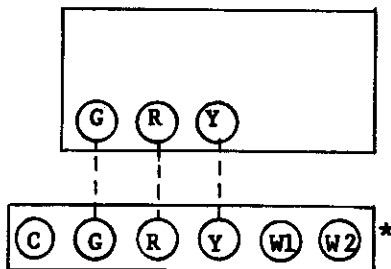
ALTERNATE THERMOSTATS

WIRING

All wiring should be done according to local and National Electrical Codes and Ordinances.

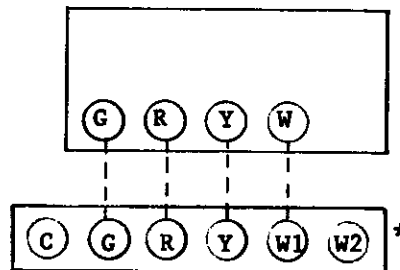
White-Rodgers
1-Stage Cool

1D51-605



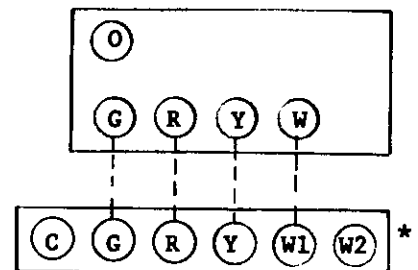
White-Rodgers
1-Stage Cool
1-Stage Heat

1F56-318



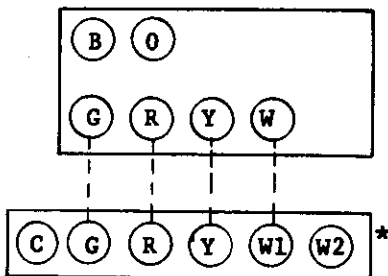
White-Rodgers
1-Stage Cool
1-Stage Heat

1F56-304



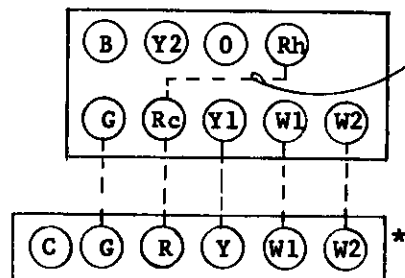
Honeywell
1-Stage Cool
1-Stage Heat

T87F/Q539A-1006



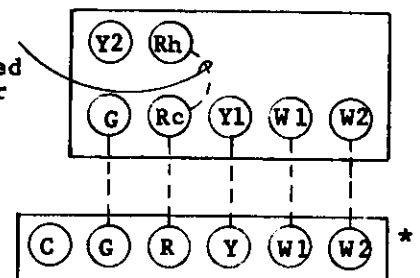
Honeywell
1-Stage Cool
2-Stage Heat

T872C/Q672A-1003



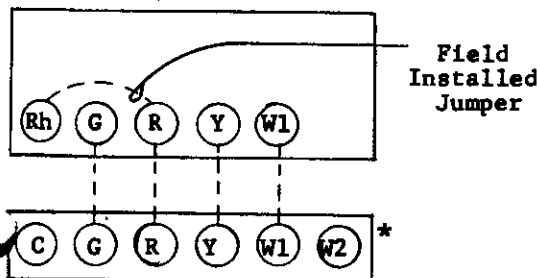
Honeywell
1-Stage Cool
2-Stage Heat

T872C/Q672A-1005

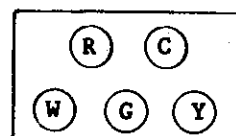


Honeywell
1-Stage Cool
1-Stage Heat

T87F/Q539A-1147



*Terminal block shown is located in Bard Self-Contained Air Conditioners, Self-Contained Heat Pumps, and Remote Heat Pumps. On those Remote Air Conditioning systems employing a fan center (combination fan relay and transformer), the terminals are marked as follows:



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.

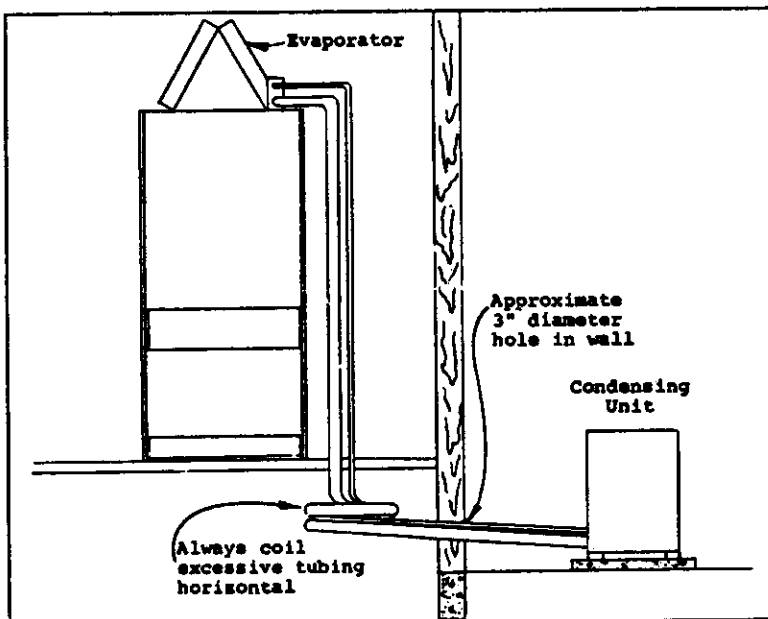
Locate the Gauge Port in a 45° angle from a vertical up position so as to be accessible for gauge connections.

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.



SCT-3
R-22 TOTAL SYSTEM CHARGE FOR
SPLIT AIR CONDITIONING SYSTEMS

The following table lists the total system operating charge for split air conditioning systems when using standard charged tubing lengths of 15 ft, 25 ft, 35 ft, or 45 ft. 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 being used, and follow across horizontally to the correct column based on number of feet of inter-connecting tubing. This value is the TOTAL SYSTEM CHARGE.

Outdoor Unit Model	Indoor Unit Model	Outdoor Unit Basic Charge	Total System Charge For Standard Tubing Lengths			
			15 ft.	25 ft.	35 ft.	45 ft.
18RWQ	18QS3	1# 4 oz	1# 12 oz	2# 0 oz	2# 4 oz	2# 8 oz
	B18EQ1	1# 4 oz	1# 10 oz	1# 14 oz	2# 2 oz	2# 6 oz
24RWQ	24QS	1# 9 oz	1# 13 oz	2# 1 oz	2# 5 oz	2# 9 oz
	2ACQ	1# 9 oz	1# 11 oz	1# 15 oz	2# 3 oz	2# 7 oz
	B24EQ1	1# 9 oz	1# 12 oz	2# 0 oz	2# 4 oz	2# 8 oz
18ECQ	18QS3	1# 7 oz	1# 15 oz	2# 3 oz	2# 7 oz	2# 11 oz
	B18EQ1	1# 7 oz	1# 13 oz	2# 1 oz	2# 5 oz	2# 9 oz
24ECQ	24QS	2# 1 oz	2# 5 oz	2# 9 oz	2# 13 oz	3# 1 oz
	2ACQ	2# 1 oz	2# 3 oz	2# 7 oz	2# 11 oz	2# 15 oz
	B24EQ1	2# 1 oz	2# 4 oz	2# 8 oz	2# 12 oz	3# 0 oz
30ECQ1	3ACQ3	2# 12 oz	3# 0 oz	3# 4 oz	3# 15 oz	4# 5 oz
	3HCQ	2# 12 oz	3# 2 oz	3# 6 oz	4# 1 oz	4# 7 oz
	B36EHQ	2# 12 oz	3# 3 oz	3# 7 oz	4# 2 oz	4# 8 oz
36ECQ3	3ACQ3	3# 1 oz	3# 5 oz	3# 9 oz	4# 4 oz	4# 10 oz
	3HCQ	3# 1 oz	3# 7 oz	3# 11 oz	4# 6 oz	4# 12 oz
	B36EHQ	3# 1 oz	3# 8 oz	3# 12 oz	4# 7 oz	4# 13 oz
42ECQ	4ACQ1	4# 6 oz	4# 15 oz	5# 5 oz	5# 11 oz	6# 1 oz
	4HCQ	4# 6 oz	5# 7 oz	5# 13 oz	6# 3 oz	6# 9 oz
	B48HQ1	4# 6 oz	5# 9 oz	5# 15 oz	6# 5 oz	6# 11 oz
48ECQ1	4ACQ1	4# 11 oz	5# 4 oz	5# 10 oz	6# 0 oz	6# 6 oz
	5ACQ1	4# 11 oz	5# 2 oz	5# 8 oz	5# 14 oz	6# 4 oz
	4HCQ	4# 11 oz	5# 12 oz	6# 2 oz	6# 8 oz	6# 14 oz
	B48HQ1	4# 11 oz	5# 14 oz	6# 4 oz	6# 10 oz	7# 0 oz
60ECQ	5ACQ1	5# 3 oz	5# 10 oz	6# 0 oz	6# 6 oz	6# 12 oz
	5HCQ	5# 3 oz	5# 14 oz	6# 4 oz	6# 10 oz	7# 0 oz
	B60HQ2	5# 3 oz	6# 11 oz	7# 1 oz	7# 7 oz	7# 13 oz

In the event that the installer is running his own tubing 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 sections.

18RWQ-24RWQ and 18ECQ, 24ECQ, 30ECQ1 and 36ECQ3 use 1/4" liquid line up to and including 25A. These models use 3/8" liquid line over 25 ft long, as do all 42ECQ, 48ECQ1 and 60ECQ for all tubing sets regardless of length.

To determine LINE SET ONLY charges, use the following table:

Liquid Line Size		Oz of R-22 per ft.		Less
1/4" O.D.	x	.4	-	7 oz
3/8" O.D.	x	.6	-	7 oz

Example: A 32 ft. line set with 3/8" liquid line is being used.

$$32 \text{ ft.} \times .6 \text{ oz/ft} = 19.2 \text{ oz} - 7 \text{ oz} = 12.2 \text{ oz}$$

After evacuating the line set, weigh in 12 oz of R-22 to line set.

NOTE: The 12 oz should be introduced into both the liquid line and vapor line so that there is a positive pressure in both lines when connected.

To determine a TOTAL SYSTEM CHARGE for a system that is connected with a non-standard tubing length, the outdoor unit basic charge (from above table) is added to the line set calculation based on liquid line O.D. size (.4 oz per ft of 1/4" and .6 oz per ft of 3/8"). An additional adjustment factor may be required depending on the indoor coil section used. Determine this adjustment from the following chart:

Indoor Unit Model	Adjustment Factor	Indoor Unit Model	Adjustment Factor
18QS3	+2	B36EHQ	+1
B18EQ1	0	4ACQ1	0
24QS	-2	4HCQ	0
2ACQ	-4	B48HQ1	+10
B24EQ1	-3	5ACQ1	0
3ACQ3	-2	5HCQ	0
3HCQ	0	B60HQ2	+15

Example: Model 36ECQ3 matched with model 3ACQ3 and connected by a 30 ft line set.

$$\begin{aligned} \text{Basic charge} &= 3\# 1 \text{ oz plus } .6 \times 30 \text{ ft} - 2 \text{ oz adjustment factor} \\ &= 3\# 1 \text{ oz plus } 18 \text{ oz} - 2 \text{ oz} = 4\# 1 \text{ oz total} \end{aligned}$$

*Round off to nearest whole number if calculation does not come out even.