

# INSTALLATION INSTRUCTIONS



## WALL MOUNTED PACKAGE HEAT PUMPS

### MODELS

18WH1

20WH

24WH1

30WH

36WH1

48WH1

**BARD MANUFACTURING CO. • BRYAN, OHIO 43506**

*Dependable quality home equipment... since 1914*



# HI-BOY HEAT PUMPS

EIGHT MODELS • Heating Capacities: 18,000 to 46,000 BTU  
Cooling Capacities: 17,000 to 47,000 BTU

Practical outside wallmount installation provides versatile applications for:

- HOME IMPROVEMENT PROJECTS
- NEW CONSTRUCTION
- APARTMENTS
- MODULAR FACILITIES
- OFFICES
- SCHOOLS

**ALUMINUM FINNED COPPER COIL** surfaces expel heat efficiently as required by system.

**TWIN BLOWERS** move air quietly with more efficiency for effective heat exchange. Motor overload protection is standard on all models.

**HEAT PUMP COMPRESSOR** is totally enclosed for quieter operation. Is specially designed to withstand higher compression ratios and longer operation than ordinary air conditioner compressors. Equipped with crankcase heater which prevents dilution of oil by refrigerant during shutdown periods and internal overload.

**GALVANNEALED STEEL CABINET** is handsomely finished with baked-on polyester enamel.

**ELECTRICAL COMPONENTS** are easily accessible for service and routine inspection.

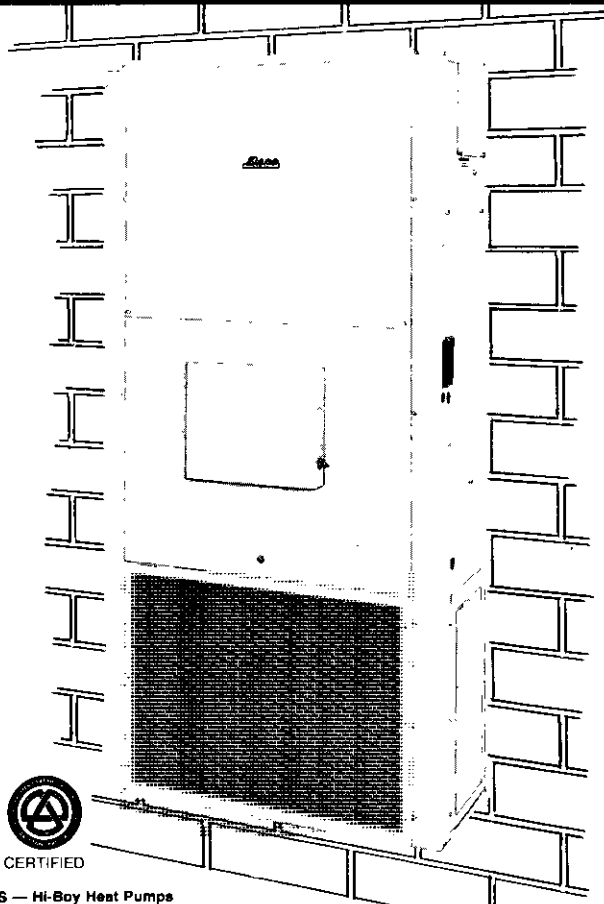
**AIR FILTERS** are standard on all models. Replacement filters are easy to install.

**HIGH PRESSURE SWITCH** provides additional protection for the heat pump system.

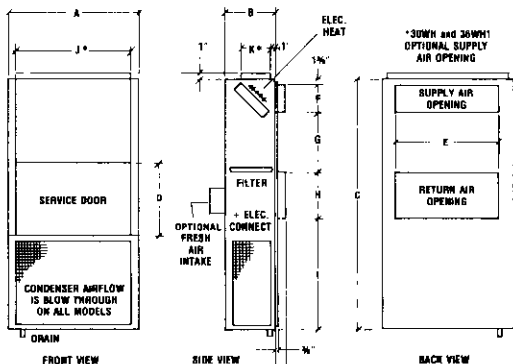
**TIME-TEMPERATURE DEFROST** assures positive, quick removal of frost at all operating temperatures.

**SUCTION ACCUMULATOR** protects the compressor from refrigerant flood-back and prevents damage to the compressor bearing surfaces.

**EMERGENCY HEAT RELAY** permits continuous operation of the system.



**ELECTRIC HEAT STRIPS** with automatic limit and thermo cut-off are available as a built-in option. Accessible from top or side outlet without removing unit from wall.



\*Must be installed at factory. Openings J and K cannot be properly made in the field.

**Dimensions for architectural and installation requirements**

MODEL	A	B	C	D	E	F	G
18WH1, 20WH, 24WH1	32 1/4	13 1/2	67 1/2	20	20	8	20 1/2
30WH, 36WH1	38 1/4	15 1/4	74	22 1/2	28	8	18
48WH	42	22	84	21 1/2	30	10	30

MODEL	H	I	J	K	Fresh Air Intake	Filter Size*
18WH1, 20WH, 24WH1	12	25 1/8	N/A		0 to 25%	14x25
30WH, 36WH1	14	32 1/8	32	8	0 to 25%	15x30 1/2
48WH	16	26 1/8	N/A		0 to 50%	(2) 16x20

\*Dimensions and filter sizes are in inches

**SPECIFICATIONS — Hi-Boy Heat Pumps**

MODEL	18WH1	20WH	24WH1	30WH	36WH1	36WH1	48WH1*	48WH1*
Cooling Capacity BTU	17,000	20,000	23,000	28,500	35,000	36,000	47,000	47,000
Hi-Temp Heating BTU*	18,000	22,000	24,000	29,000	40,000	40,000	46,000	46,000
Low-Temp. Heating BTU*	12,000	13,000	14,000	16,000	26,000	26,000	24,500	24,500
Electrical — Less KW	1-Ph 60Hz	1-Ph 60Hz	1-Ph 60Hz	1-Ph 60Hz	1-Ph 60Hz	3-Ph 60Hz	1-Ph 60Hz	3-Ph 60Hz
Cooling Watts	2700	2700	3350	3700	5400	5200	6300	6100
Hi-Temp Heating Watts	2700	2400	2900	3300	4900	4700	5100	4900
Low-Temp. Heating Watts	2300	2150	2600	2850	4200	4100	4300	4200
Operating Voltage Range	197-253V	197-253V	197-253V	208-253V	187-253V	187-254V	207-253V	187-264V
Min. Circuit Ampacity	17	17	19	22	33	22	36	24
Field Wire Supply**	2 No. 12AWG	2 No. 12AWG	2 No. 12AWG	2 No. 10AWG	2 No. 8AWG	3 No. 10AWG	2 No. 8AWG	3 No. 10AWG
Delay Fuse — Max	25A	25A	30A	35A	50A	35A	50A	35A
Total Unit Amps	13.8	14.3	15.8	18.8	27.5	18.5	30.3	20.3
Compressor — Circuit A	PSC	PSC	PSC	PSC	PSC	3 Ph	PSC	3 Ph
Volts	230/208V	230/208V	230/208V	230/208V	230/208V	230/208V	230/208V	230/208V
Nameplate Amps	11.0	11.5	13	13.8	22.5	13.5	23.5	13.5
Lock Rotor Amps	51	51	60	53	103	72	115	93
Fan Motor & Condenser								
Fan Motor — HP/RPM	1/5/1050	1/5/1050	1/5/1050	1/5/1050	1/5/1050	1/5/1050	1/3/825	1/3/825
Fan Motor — AMPS	1.6	1.6	1.6	1.6	1.6	1.6	2.7	2.7
Fan — DIA./CFM	18"/1450	18"/1400	18"/1400	20"/2100	20"/2100	20"/2100	24"/3000	24"/3000
Face Area								
Sq. Ft./Row/Fins per in	3.75/2/14	3.75/3/14	3.75/3/14	5.04/3/14	5.04/3/14	5.04/3/14	7.72/14	7.72/14
Motor & Evaporator								
Blower Motor — HP/RPM	1/6/1050	1/6/1050	1/6/1050	1/3/1050	1/3/1050	1/3/1050	1/2/1075	1/2/1075
Blower Motor — AMPS	1.2	1.2	1.2	3.4	3.4	3.4	4.1	4.1
CFM Cooling w/Filter (Rated)	635 @ 32	750 @ 22	860 @ 10	1070 @ 35	1300 @ 30	1300 @ 30	1760 @ 40	1760 @ 40
Face Area								
Sq. Ft./Row/Fins per in	2.08/2/14	2.08/3/12	2.08/3/12	3.21/3/13	3.21/3/13	3.21/3/13	4.03/14	4.03/14
Filter Sizes (inches)	14x25x1	14x25x1	14x25x1	15x30 1/2x1	15x30 1/2x1	15x30 1/2x1	(2) 16x20x1	(2) 16x20x1
Refrigerant — R22	54 oz	50 oz	56 oz	76 oz	73 oz	73 oz	108 oz	108 oz
Shipping Weight Lbs.	315	325	325	395	400	400	493	493

NOTE: \*For additional heating capacity add the KW from Table No. 1. See also electrical data table.  
\*\*60°C Copper Wire See basic unit only. See electrical data for models with electric heat.  
\* Model 48WH1 not UL Listed.

Specifications subject to change without notice.

ELECTRICAL DATA										WIRING INFORMATION*						INDOOR BLOWER PERFORMANCE *CFM — DRY COIL			
Model	Rated Volts & Ph	Operating Voltage Range	Heater KW @ 240 V	Max. Unit Amps	No. Field Power Circuits	Internal Fuses		Req'd Maximum External Fuses		Min. Ckt. Ampacity		Field Power Wiring		Ground Wire Size**		E. S. P. in H-O	18WH1 24WH1	30WH 36WH1	48WH1
						Ckt. A	Ckt. B	Ckt. A	Ckt. B	Ckt. A	Ckt. B	Ckt. A	Ckt. B	Ckt. A	Ckt. B				
18WH1	230-1	197-253	0	13.8	1			25		17		12		12		0	940	1485	2256
			4	30.5	1			40		38		8		10		10	870	1395	2160
			8	47.1	2			40	25	38	21	6	10	10	10	10	20	800	1280
20WH	230-1	197-253	0	14.3	1			25		17		12		12		30	715	1170	1983
			4	31	1			45		38		8		10		40	630	1025	1870
			8	47.6	2			45	25	38	21	6	10	10	10	50	520	855	1675
24WH1	230-1	197-253	0	15.8	1			30		19		12		12					
			4	32.5	1			45		40		8		10					
			8	49.1	2			45	25	40	21	6	10	10	10				
30WH	230-1	197-253	0	18.8	1			35		22		10		10					
			5	39.6	1			50		48		6		10					
			10	60.4	2			50	30	48	26	4	8	10	10				
36WH1	230-1	197-253	0	27.5	1			50		33		8		10					
			5	48.3	1			60		59		4		10					
			10	69.1	2			60	30	59	26	3	8	10	10				
36WH1	230/3	187-264	0	18.5	1			35		22		10		10					
			9	40.2	2			35	45	22	45	10	6	10	10				
			15	39.5	2			35	45	22	45	10	6	10	10				
48WH1	230-1	207-253	0	30.3	1			50		36		8		10					
			5	51.1	2			50	30	36	26	8	10	10	10				
			10	71.9	2			50	60	36	52	8	6	10	10				
48WH1	230/3	187-264	0	20.3	1			35		24		10		10					
			9	43.0	2			35	30	24	27	10	10	10	10				
			15	56.5	2			35	45	24	45	10	6	10	10				
			18	63.7	2			35	60	24	54	10	6	10	10				

E. S. P. in H-O	18WH1 24WH1	30WH 36WH1	48WH1
0	940	1485	2256
10	870	1395	2160
20	800	1280	2076
30	715	1170	1983
40	630	1025	1870
50	520	855	1675

ELECTRIC HEAT TABLE No. 1 at 240V		
MODEL	BTU	AMP
4Kw	13650	16.7
5Kw	17065	20.8
8Kw	27304	33.3
9Kw 3-ph	30600	21.7
10Kw	34130	41.7
15Kw	51195	62.5
15Kw 3-ph	51195	36.2
18Kw	61434	75.0
18Kw 3-ph	61200	43.4
20Kw	68260	83.4

**IMPORTANT**  
While the above data is presented as a guide, it is important to electrically connect, properly size fuses and conductor wires in accordance with the National Electrical Code and all existing local codes.  
**Underwriters' Listed for outdoor installation.**

\*Based on using 60 C copper wire. Other wiring materials must be rated for marked minimum circuit ampacity or greater. Not all models approved for aluminum wire.  
\*\*Based upon table 250-95 of N.E.C. - 1978

APPLICATION RATINGS — Cooling Cycle														
MODEL		Outdoor Temperature °F*												
		67°	72°	77°	82°	87°	92°	95°	97°	102°	107°	112°	117°	122°
18WH1	Btuh	19,890	19,550	19,040	18,530	18,020	17,340	17,000	16,660	15,980	15,130	14,110	13,260	12,070
	Kw	2.27	2.35	2.43	2.48	2.56	2.65	2.70	2.73	2.81	2.89	2.94	3.02	3.10
	EER	8.8	8.3	7.8	7.5	7.0	6.5	6.3	6.1	5.7	5.2	4.8	4.4	3.9
20WH	Btuh	23,400	23,000	22,400	21,800	21,200	20,400	20,000	19,600	18,800	17,800	16,600	15,600	14,200
	Kw	2.27	2.35	2.43	2.48	2.56	2.65	2.70	2.73	2.81	2.89	2.94	3.02	3.10
	EER	10.3	9.8	9.2	8.8	8.3	7.7	7.4	7.2	6.7	6.2	5.6	5.2	4.6
24WH1	Btuh	26,910	25,450	25,760	25,070	24,380	23,460	23,000	22,540	21,620	20,470	19,090	17,940	16,330
	Kw	2.81	2.91	3.01	3.06	3.20	3.28	3.35	3.38	3.48	3.58	3.65	3.75	3.85
	EER	9.6	9.1	8.6	8.1	7.6	7.2	6.9	6.7	6.2	5.7	5.2	4.8	4.2
30WH	Btuh	33,345	32,775	31,920	31,065	30,210	29,070	28,500	27,930	26,790	25,365	23,655	22,230	20,235
	Kw	3.11	3.22	3.33	3.40	3.52	3.63	3.70	3.74	3.85	3.96	4.03	4.14	4.26
	EER	10.7	10.2	9.6	9.1	8.6	8.0	7.7	7.5	7.0	6.4	5.9	5.4	4.8
36WH1	Btuh	42,120	41,400	40,320	39,240	38,160	36,720	36,000	35,280	33,840	32,040	29,880	28,080	25,560
	Kw	4.54	4.70	4.86	4.97	5.13	5.29	5.40	5.45	5.62	5.78	5.89	6.05	6.21
	EER	9.3	8.8	8.3	7.9	7.4	6.9	6.7	6.5	6.0	5.5	5.1	4.6	3.6
48WH1	Btuh	54,990	54,050	52,640	51,230	49,820	47,940	47,000	46,060	44,180	41,830	39,010	36,660	33,370
	Kw	5.44	5.60	5.75	5.90	6.05	6.20	6.30	6.35	6.50	6.65	6.80	6.95	7.10
	EER	10.1	9.7	9.2	8.7	8.2	7.7	7.5	7.3	6.8	6.3	5.7	5.3	4.7

\*All values based on 80DB/67WB Return Air and Rated Evaporator Airflow — ARI Standard 240.

APPLICATION RATINGS — Heating Cycle*																	
MODEL		Outdoor Temperature °F*															
		3°	2°	7°	12°	17°	22°	27°	32°	37°	42°	47°	52°	57°	62°	67°	72°
18WH1	Btuh	7,360	8,100	9,180	10,440	12,000	12,600	13,500	14,940	16,380	17,100	18,000	19,080	19,980	20,880	21,600	22,140
	Kw	2.03	2.11	2.19	2.27	2.30	2.40	2.48	2.54	2.59	2.65	2.70	2.78	2.84	2.89	2.94	3.00
	COP	1.1	1.1	1.2	1.3	1.5	1.5	1.6	1.7	1.9	1.9	2.0	2.0	2.1	2.1	2.1	2.2
20WH	Btuh	8,140	9,020	9,900	11,000	13,000	13,640	14,960	16,720	18,480	20,240	22,000	23,320	24,420	25,520	26,400	27,000
	Kw	1.87	1.94	2.02	2.06	2.15	2.21	2.26	2.29	2.33	2.37	2.40	2.47	2.52	2.57	2.62	2.65
	COP	1.3	1.4	1.4	1.6	1.8	1.8	1.9	2.1	2.3	2.5	2.7	2.8	2.8	2.9	3.0	3.0
24WH1	Btuh	8,880	9,840	11,040	12,480	14,000	15,120	16,320	18,240	20,160	22,080	24,000	25,440	26,640	27,840	28,800	29,520
	Kw	2.26	2.35	2.44	2.49	2.60	2.64	2.70	2.76	2.81	2.86	2.90	2.99	3.05	3.10	3.16	3.22
	COP	1.1	1.2	1.3	1.5	1.6	1.7	1.8	1.9	2.1	2.3	2.4	2.5	2.6	2.6	2.7	2.7
30WH	Btuh	10,730	11,890	13,050	14,500	16,000	17,980	19,720	22,040	24,360	26,680	29,000	30,740	32,190	33,640	34,800	35,620
	Kw	2.48	2.57	2.67	2.77	2.85	2.94	3.04	3.10	3.17	3.23	3.30	3.40	3.47	3.53	3.60	3.66
	COP	1.3	1.4	1.4	1.5	1.6	1.8	1.9	2.1	2.2	2.4	2.6	2.6	2.7	2.8	2.8	2.9
36WH1	Btuh	18,000	20,400	22,800	24,400	26,000	27,600	29,600	32,400	35,200	37,600	40,000	42,400	44,400	46,400	48,000	49,200
	Kw	3.66	3.82	3.97	4.12	4.20	4.36	4.51	4.61	4.70	4.80	4.90	5.05	5.15	5.24	5.34	5.44
	COP	1.4	1.6	1.7	1.7	1.8	1.9	1.9	2.1	2.2	2.3	2.4	2.5	2.5	2.6	2.6	2.6
48WH1	Btuh	16,300	18,300	20,300	22,300	24,500	26,700	29,000	31,500	35,000	41,000	46,000	47,700	52,300	55,000	61,000	66,000
	Kw	3.84	3.93	4.07	4.20	4.30	4.37	4.50	4.65	4.80	4.95	5.10	5.32	5.52	5.70	5.88	6.05
	COP	1.2	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.4	2.6	2.6	2.8	2.9	3.0	3.2

\*Integrated ratings including defrost cycles where applicable, 70 F DB and rated airflow across indoor coil — ARI Standard 240



LISTED CERTIFIED



**BARD** MANUFACTURING COMPANY • BRYAN, OHIO 43506  
Dependable equipment since 1914

Specifications subject to change without notice.

ELECTRICAL INFORMATION										WIRING INFORMATION**					
Model	Rated Volts & Ph	Operating Voltage Range	Heater* Kw	Max Unit Amps	No. Field Power Circuits	Internal Fuses		Req'd Ext. Fuses	Min. Ckt. Ampacity	Field Power Wiring		Ground Wire Size		Wiring Diagram Number	
						Ckt.A	Ckt.B			Ckt.A	Ckt.B	Ckt.A	Ckt.B		
18WH1	230/1	197-253	0	13.8	1			25	17	12		12	12	4011-110B	
18WH1	230/1	197-253	4	30.5	1			40	38	8		10	10	-120B	
18WH1	230/1	197-253	8	47.1	2			40	38	6	21	10	10	-130B	
20WH	230/1	197-253	0	14.3	1			25	17	12		12	12	4011-110B	
20WH	230/1	197-253	4	31	1			45	38	8		10	10	-120B	
20WH	230/1	197-253	8	47.6	2			45	38	6	21	10	10	-130B	
24WH1	230/1	197-253	0	15.8	1			30	19	12		12	12	4011-110B	
24WH1	230/1	197-253	4	32.5	1			45	40	8		10	10	-120B	
24WH1	230/1	197-253	8	49.1	2			45	40	6	21	10	10	-130B	
30WH	230/1	197-253	0	18.8	1			35	22	10		10	10	4012-110C	
30WH	230/1	197-253	5	39.6	1			50	48	6		10	10	-120B	
30WH	230/1	197-253	10	60.4	2			50	48	4	26	10	10	-130B	
30WH	230/1	197-253	15	65.9	2		50	60	48	4	52	10	10	-140B	
36WH1	230/1	197-253	0	27.5	1			50	33	8		10	10	4013-110B	
36WH1	230/1	197-253	5	48.3	1			60	59	4		10	10	-120A	
36WH1	230/1	197-253	10	69.1	2			60	59	3	26	10	10	-130A	
36WH1	230/1	197-253	15	65.9	2		60	60	59	3	52	10	10	-140A	
36WH1	230/3	187-264	0	18.5	1			35	22	10		10	10	4013-210A	
36WH1	230/3	187-264	6	32.9	2			35	22	10	27	10	10	-220A	
36WH1	230/3	187-264	9	40.2	2			35	22	10	45	10	10	-220A	
36WH1	230/3	187-264	15	39.5	2			35	22	10	45	10	10	-230A	
48WH1	230/1	197-253	0	30.8	1			60	37	8		10	10	4014-110A	
48WH1	230/1	197-253	5	51.6	2			60	37	8	26	10	10	-120B	
48WH1	230/1	197-253	10	72.4	2			60	37	8	52	10	10	-130B	
48WH1	230/1	197-253	15	93.3	2		60	60/30	37	8	78	10	8	-140B	
48WH1	230/1	197-253	20	114	2		60	60/60	37	8	104	10	6	-150B	
48WH1	230/3	187-264	0	20.8	1			35	24	10		10	10	4014-210A	
48WH1	230/3	187-264	9	42.5	2			35	24	10	27	10	10	-220B	
48WH1	230/3	187-264	12	49.7	2			35	24	10	36	10	10	-230B	
48WH1	230/3	187-264	15	57	2			35	24	10	45	10	10	-230B	
48WH1	230/3	187-264	18	64.2	2			35	24	10	54	10	10	-240B	

\* Electric heaters are nominal Kw @ 240V.

\*\*Based on using 60°C copper wire. Other wiring materials must be rated for marked minimum circuit ampacity or greater. Not all models approved for aluminum wire.

1 48WH1, 3 Phase Rated 230/208 volt.

## APPLICATION AND INSTALLATION INSTRUCTIONS

### GENERAL

Units are shipped completely assembled and internally wired, requiring only duct connections, thermostat wiring and external 220-240 volt AC power supply. The refrigerant system is completely assembled and charged.

These instructions and any instructions packaged with any separate equipment should be carefully read before beginning the installation. Note particularly 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.

### DUCTWORK

Design the ductwork according to methods given by the National Warm Air Heating and Air Conditioning Association. When duct runs through unheated spaces, it should be insulated with a minimum of two inches of insulation. Use insulation with a vapor barrier on the outside of the insulation. Flexible joints should be used to connect the ductwork to the equipment in order to keep the noise transmission to a minimum.

A one inch clearance to combustible material for the first three feet of duct attached to the outlet air frame is required. See pages 7, 8, 9 and 10 for further details.

### FILTER

A 1" throw away filter is supplied with each unit. The filter slides into position making it easy to service. This filter can be serviced from the outside by removing the service door.

### FRESH AIR INTAKE

All units are made with a fresh air inlet hole punched in the service panel. If not ordered originally, a fresh air cover with shut-off damper may be ordered from the factory. The fresh air cover is so positioned that all fresh air intake is filtered by the internal unit filter.

### WALL MOUNTING

1. Two holes, the size of the supply and return air openings must be cut through the wall as shown in Fig. 1, 2, 3, 4, 5 and 6.
2. On wood-frame walls, the wall construction must be strong and rigid enough to carry the weight of the unit without transmitting any unit vibration.
3. Concrete block walls must be thoroughly inspected to insure that they are capable of carrying the weight of the installing unit.
4. Ducts through the walls must be insulated and all joints taped or sealed to prevent air or moisture entering the wall cavity.
5. Some installations may not require any return air duct. It is recommended that on this type of installation that a filter grille be located in the wall. Filters must be of sufficient size to allow a maximum velocity of 400 FPM.

### WIRING - MAIN POWER

Refer to the unit rating plate for wire sizing information and maximum fuse size. Each outdoor unit is marked with a "Minimum Circuit Ampacity." This means that the field wiring used must be sized to carry that amount of current. Depending on the installed Kw of electric heat, there may be two field power circuits required. If this is the case, the unit serial plate will so indicate. Some models are suitable only for connection with copper wire, while others can be wired with either copper or aluminum wire. Each unit and/or wiring diagram will be marked "Use Copper Conductors Only" or "Use Copper or Aluminum Conductors." These instructions MUST BE adhered to. Refer to the National Electrical Code for complete current carrying capacity data on the various insulation grades of wiring material.

The electrical specifications on page 2 lists fuse and wire sizes (60°F copper) for all models, including the most commonly used heater sizes. Also shown are the number of field power circuits required for the various models with heaters.

The unit rating plate lists a "Maximum Time Delay Fuse" that is to be used with the equipment. The correct size fuse 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.

### WIRING - CONTROL CIRCUIT

All units are provided with a 24 volt terminal board which is marked C, G, R, Y, W1, W2, E and F. DO NOT wire to terminal C. This will cause transformer burnout. Refer to specific unit wiring diagram for details.

### CONDENSATE DRAIN

A plastic drain hose extends from the drain pan at the top of the unit down to the unit base. There are openings in the unit base for the drain hose to pass through. In the event the drain hose is connected to a drain system of some type, it must be an open or vented type system to assure proper drainage.

## 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 on both cooling and heating cycles. It is imperative to match the correct pressure curve to the unit by model number.

## CRANKCASE HEATERS

All units are provided with some form of compressor crankcase heat. 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.

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

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.

IMPORTANT NOTICE - Be sure to follow start-up instructions as shown below and also on unit.

<p style="text-align: center;"><b>IMPORTANT</b></p> <p><b>THESE PROCEDURES MUST BE FOLLOWED AT INITIAL START-UP AND AT ANY TIME POWER HAS BEEN REMOVED FOR 12 HOURS OR LONGER.</b></p> <p>TO PREVENT COMPRESSOR DAMAGE WHICH MAY RESULT FROM THE PRESENCE OF LIQUID REFRIGERANT IN THE COMPRESSOR CRANKCASE:</p> <ol style="list-style-type: none"><li>1. MAKE CERTAIN THE ROOM THERMOSTAT IS IN THE "OFF" POSITION. (THE COMPRESSOR IS NOT TO OPERATE).</li><li>2. APPLY POWER BY CLOSING THE SYSTEM DISCONNECT SWITCH. THIS ENERGIZES THE COMPRESSOR HEATER WHICH EVAPORATES THE LIQUID REFRIGERANT IN THE CRANKCASE.</li><li>3. ALLOW 4 HOURS OR 60 MINUTES PER POUND OF REFRIGERANT IN THE SYSTEM AS NOTED ON THE UNIT RATING PLATE, WHICHEVER IS GREATER.</li><li>4. AFTER PROPERLY ELAPSED TIME THE THERMOSTAT MAY BE SET TO OPERATE THE COMPRESSOR.</li><li>5. EXCEPT AS REQUIRED FOR SAFETY WHILE SERVICING - DO NOT OPEN SYSTEM DISCONNECT SWITCH.</li></ol> <p style="text-align: right;">7961-061</p>
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## COMPRESSOR CUT-OFF THERMOSTAT

Heat pump compressor operation at outdoor temperatures below 0°F are neither desirable nor advantageous in terms of efficiency. Since most equipment at time of manufacture is not designed for any specific destination of the country, and most of the equipment is installed in areas not approaching the lower outdoor temperature range, the compressor cut-offs are not factory installed.

Typical wiring diagrams showing the application of a compressor cut-off can be found later in the manual on page 26.

## SEQUENCE OF OPERATION

Cooling - R-Y at thermostat pulls in the compressor contactor starting the compressor and outdoor fan. The same R-Y also feeds G, which pulls in the fan relay for blower operation. The reversing valve is not energized, so the system is in the cooling cycle.

Heating - R-W (or W1) make at thermostat on a call for heat. This pulls in the changeover relay. Terminals 6-4 of changeover relay make R-Y circuit which pulls in compressor contactor starting the compressor and outdoor fan, also R-Y at thermostat completes G circuit, pulling in fan relay starting indoor blower. Terminals 1-3 on changeover relay make, energizing the reversing valve to put the system into the heating cycle. SEE REFRIGERANT FLOW DIAGRAM. The system will now be producing warm air indoors.

## DEFROST CYCLE

The defrost cycle is controlled by time and temperature. When the outdoor temperature is in the lower 40°F temperature range or colder, the outdoor coil temperature is 32°F or below. This temperature is sensed by a defrost thermostat mounted low and at the return bend end of the outdoor coil. The defrost thermostat makes at approximately 32°F refrigerant temperature. The MAKE of the contacts starts the defrost timer motor. The defrost timer motor can run only when the heat pump is in operation. After approximately 30 minutes of heat pump running time, with the outdoor coil below 32°F, the defrost timer contacts make. This causes the defrost relay to pull in.

Terminals 4-5 of the defrost relay open, breaking power to the outdoor fan and the reversing valve. The outdoor fan motor stops and the reversing valve shifts to the cooling cycle. Terminals 7-9 of the defrost relay make which pulls in W2, second stage strip heaters, with the indoor blower continuing to operate.

As the heat pump continues to operate in the defrost cycle, the outdoor coil warms up from the hot gas flow. As the temperature rises to approximately 57°F at the defrost thermostat location, the contacts now open. This de-energizes the defrost timer and defrost relay. All the components then return to the normal heating cycle as before.

## EMERGENCY HEAT RELAY

It is often desired to utilize an emergency heat relay in conjunction with a special heat pump thermostat subbase to allow the operator of the equipment to easily de-energize the heat pump unit and still have total heating capability from the supplemental heaters.

The emergency heat relay is factory installed on all WH models, and a 8404-001 (Q672F1026) subbase is required to operate the relay.

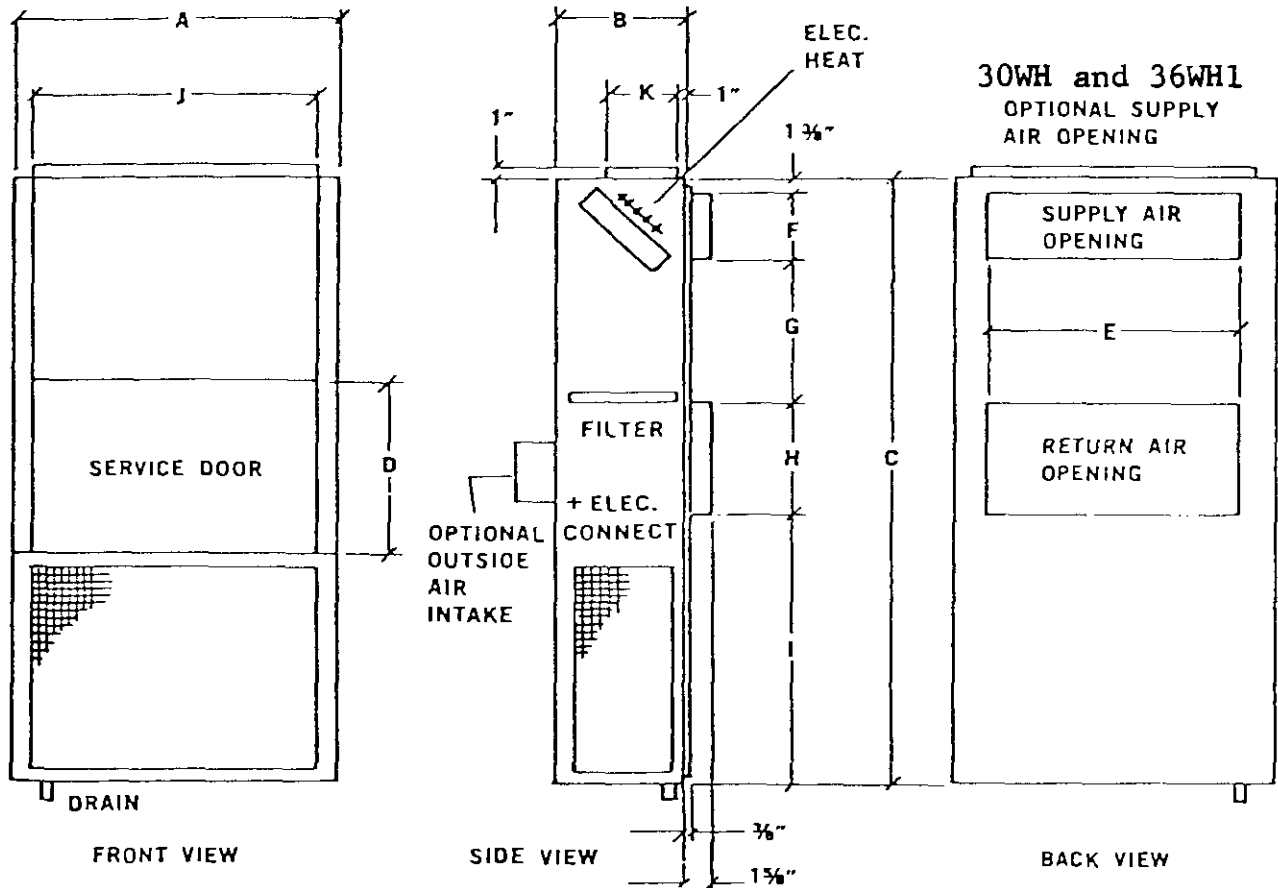
INSTALLER NOTE: Optimum unit performance will occur with a refrigerant charge resulting in a suction line temperature (near the compressor) of 53° to 58°F with 95°F outdoor temperature and 80°F dry bulb/67°F wet bulb (50% R.H.) indoor temperatures and rated airflow across the indoor coil.

# DIMENSIONS \*

... for architect and installation requirements

MODEL	A	B	C	D	E	F	G	H	I	J	K	FILTER SIZES*
18WH1, 20WH, 24WH1	32 1/4	13 1/2	67 1/2	20	20	8	20 1/2	12	25 3/4	None		14 x 25
30WH, 36WH1	38 1/4	15 1/4	74	22 1/2	28	8	18	14	32 3/4	32	8	15 x 30-5/8
48WH1	42	22	84	21 1/2	30	10	30	16	26 3/4	None		(2) 16 x 20

\* Dimensions and filter sizes are in inches.



**COOLING AND HEATING ANTICIPATION  
FOR WALL THERMOSTATS**

All 24V wall thermostats are built with both cooling and heating anticipators. The purpose of these anticipators is to compensate the thermostat for various system controls and allow the best possible cycle rates.

The cooling anticipator for all thermostats, and the heating anticipator on a limited number, are fixed and require no adjustment. Most heating anticipators are adjustable and DO REQUIRE ADJUSTMENT to match the current rating of the relay, contactor or other control being cycled by that heating stage. In the case of a two stage heating thermostat there will be an anticipator for each stage, either both adjustable, one fixed and one adjustable, or both fixed.

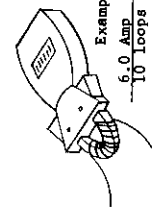
The fixed anticipators are rated for a maximum of 1.5A. The adjustable anticipators generally have a range of .2 - 1.2A, and MUST BE ADJUSTED. Failure to adjust the anticipator lever to correspond to the actual current draw passing through that stage mercury switch and anticipator will cause severe short cycling conditions if set too low and room temperature may never attain the thermostat set point, and if set too high, will cause room temperature over-shoot.

While oil burner primary controls and gas valves are normally marked with the nominal current rating, the contactors and relays installed in air conditioners and heat pumps are not. Listed below are some of the more popularly used controls and their nominal current ratings.

Contactors or Relay	Nominal Current Rating
Honeywell - R810B Series	.55
- R821C Series	.40
- R821E Series	.40
- R822E Series	.38
- R822E Series	.38
- R824E Series	.38
- R824E Series	.38
RBM - Type 84	.12
- Type 91	.34
- Type 112	.34
- Type 143	.26
- Type 154	.12
- Type 184	.12
Elmwood - 30B020	.39
- 30C020	.39
- 30C020	.21
- 30F020	.21
- 30D030	.21
- 30E030	.21

Below is a procedure which allows accurate low amperage current measurements with a standard clamp-on ammeter with a 0-6A range. It is actually recommended that this measurement always be taken, since variations in voltage, thermostat wire length, etc. can all cause some change in current draw.

1. Wrap exactly 10 loops of thermostat wire (#1) around the prongs of an Amprobe.
2. Let the heating system operate for one minute before reading the W1 or W2 current draw.
3. Divide the reading obtained in Step 2 by 10.
4. Use the value calculated in step 3 to set the heat anticipator.
5. Repeat the procedure for (W2) if 2-stage heat.



Example:  
- 6.0 Amp - .6A  
- 10 loops

**SUPPLY AIR METAL DUCT LINER  
MODELS WA AND WH**

The cabinets on all models, with or without electric heaters, are approved for 0" clearance to combustible material. The outlet duct on all models with electric heaters must have 1" clearance to combustible materials for at least the first 3 feet of duct.

Whenever a model WA or WH is installed, a galvanized metal duct liner must always be attached (Fig. 8). Before installing, determine the wall thickness. If the installation is free air flow, with no external duct, then the liner should be cut flush with the inside wall opening. In order to insure no sweating, the duct liner should be wrapped with a minimum of 1" insulation.

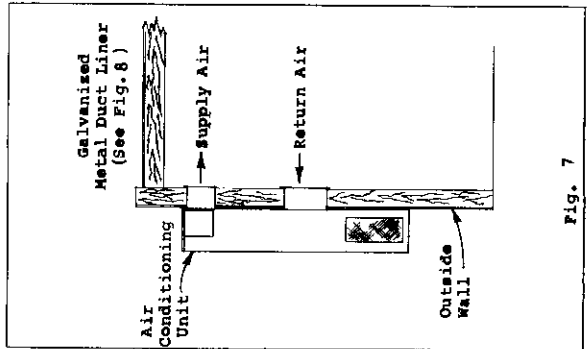


Fig. 7

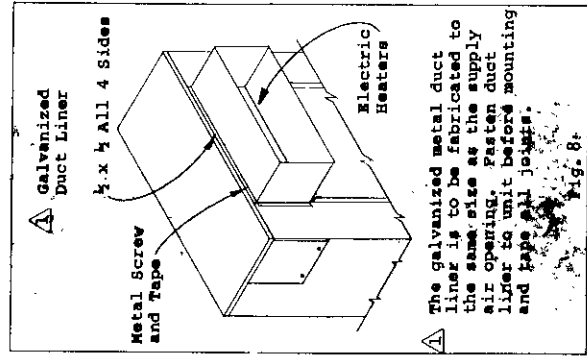


Fig. 8



## MODELS 18WH1-20WH-24WH1

### MOUNTING ON CONCRETE BLOCK WALL

These units are secured by wall mounting brackets which secure the unit to the outside wall surface at both sides and at the bottom. (Fig. 1).

In a standard 8 x 16 in. block wall, saw or knock out two 22 inch sections of concrete blocks normally the 7th, 8th and 11th course of blocks above floor level. In both cases this should be one whole block plus 3 in. of the block on each side.

On the wall, lay out approximately the position for the bottom and side brackets. Fasten these brackets to the wall firmly with 3/8 in. lag screws.

The side brackets should be located approximately 15 in. down from the top of the unit and fastened to both sides with metal screws. After mounting the unit on the wall a metal weather stripping should be installed at the top to insure a water tight application.

### INSTALLATION SCHEMATIC

#### CONCRETE BLOCK WALL

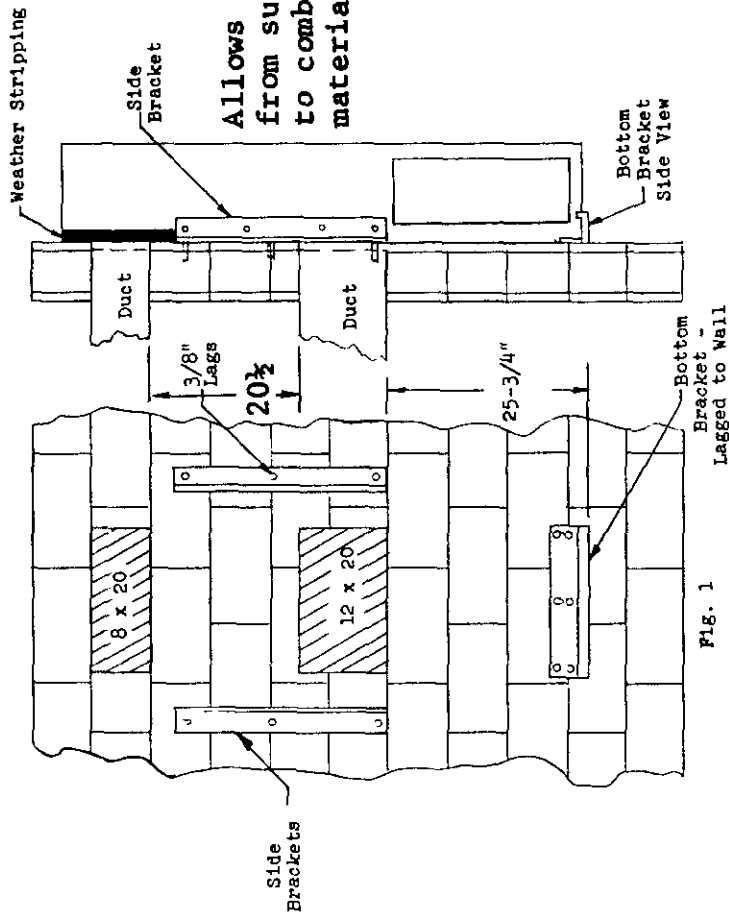


Fig. 1

## MODELS 18WH1-20WH-24WH1

### MOUNTING ON WOOD FRAME WALLS

Locate and cut out two openings as shown in (Fig. 2). Cut away the outside siding to the depth of the sheathing. Install metal weather stripping at the top and caulk or otherwise seal joints between siding and sheathing. Frame in the openings between the wall studs as necessary for the particular wall involved with the plates at the bottom of each wall opening being sufficiently strong to carry the weight of the unit.

Install the two side brackets to the unit (15 in. down from the top). Mount unit on wall and pull in firmly using three 3/8 in. lag screws through each of the wall mounting brackets.

For additional mounting rigidity, each air opening collar may be screwed to the plate at the bottom of each wall opening. Drill two 1/4 in. holes in the bottom flange of each collar before hanging the unit, then fasten to wall plate with No. 10 by 1-1/2 in. wood screws.

### OUTSIDE FRAME WALL SCHEMATIC

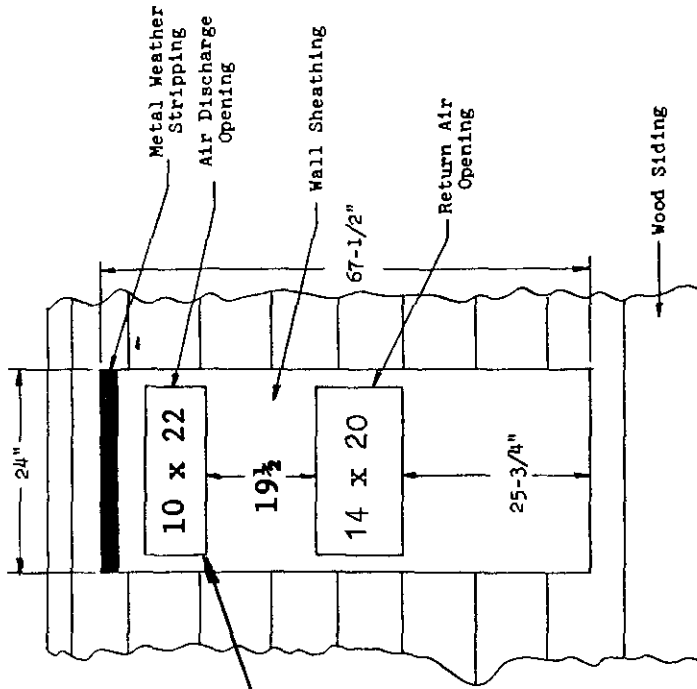


Fig. 2

Allows 1" clearance from supply air duct to combustible materials.

## MODELS 30WH-36WH1

### MOUNTING ON CONCRETE BLOCK WALL

These units are secured by wall mounting brackets which secure the unit to the outside wall surface at both sides and at the bottom (Fig. 3).

In a standard 8 x 16 in. block wall, knock out two 28 in. sections of concrete blocks normally the 7th, 8th, and 11th course of blocks above floor level. In both cases this should be one whole block plus 7 in. of the block on each side.

On the wall, lay out approximately the position for the bottom and side brackets. Fasten these brackets to the wall firmly with 3/8 in. lag screws.

The side brackets should be located approximately 15 in. down from the top of the unit and fastened to both sides with metal screws. Before drilling into side of casing, check inside tubing for clearance. After mounting the unit on the wall a metal weather stripping should be installed at the top to insure a water tight application.

### INSTALLATION SCHEMATIC

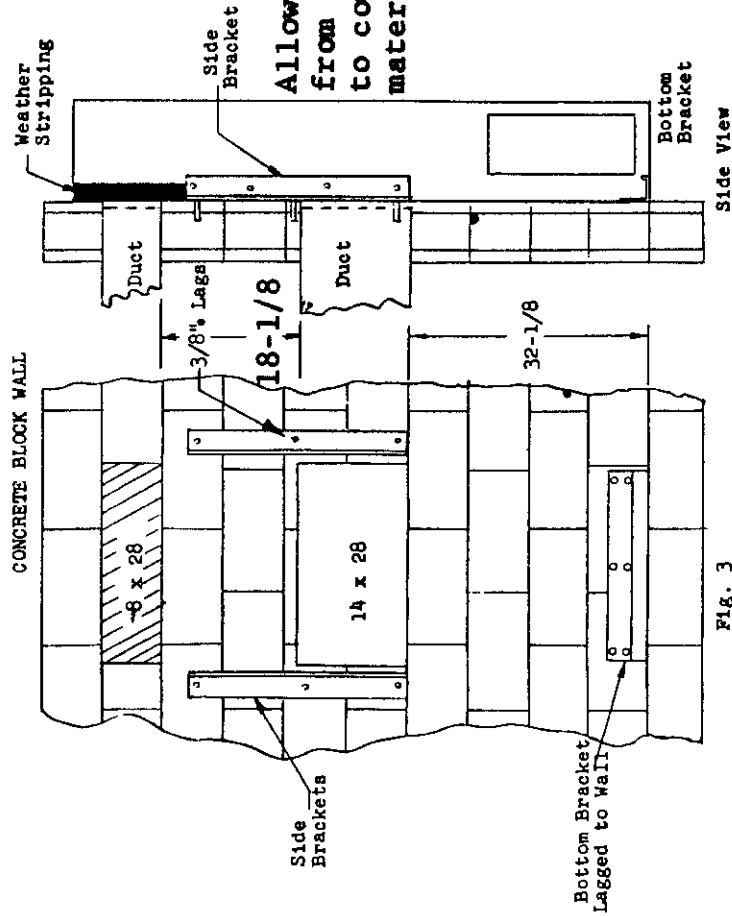


Fig. 3

## MODELS 30WH-36WH1

### MOUNTING ON WOOD FRAME WALLS

Locate and cut out two openings as shown in (Fig. 4). Cut away the outside siding to the depth of the sheathing. Install metal stripping at the top and caulk or otherwise seal joints between siding and sheathing. Frame in the openings between the wall studs as necessary for the particular wall involved with the plates at the bottom of each wall opening being sufficiently strong to carry the weight of the unit.

Install the two side brackets to the unit (15 in. down from the top). Before drilling into side of casing, check inside tubing for clearance. Mount unit on wall and pull in firmly using three 3/8 in. lag screws through each of the wall mounting brackets.

For additional mounting rigidity, each air opening collar may be screwed to the plate at the bottom of each wall opening. Drill two 1/4 in. holes in the bottom flange of each collar before hanging the unit, then fasten to wall plate with No. 10 by 1-1/2 in. wood screws.

### OUTSIDE FRAME WALL SCHEMATIC

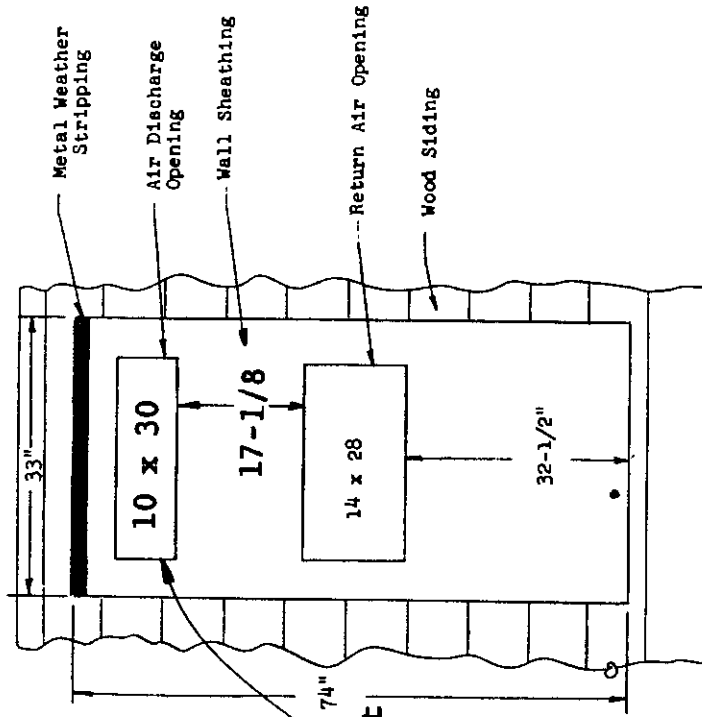


Fig. 4

Allows 1" clearance from supply air duct to combustible materials.

## Model 48WH1

### MOUNTING ON CONCRETE BLOCK WALL

These units are secured by wall mounting brackets which secure the unit to the outside wall surface at both sides and at the bottom (Fig. 5).

In a standard 8 x 16 in. block wall, saw or knock out two 30 in. sections of concrete blocks normally the 8th and 11th course of blocks above floor level. In both cases this should be two whole block.

On the wall, lay out approximately the position for the bottom and side brackets. Fasten these brackets to the wall firmly with 3/8 in. lag screws.

The side brackets should be located approximately 10 in. down from the top of the unit and fastened to both sides with metal screws. Before drilling into side of casing, check inside tubing for clearance. After mounting the unit on the wall, a metal weather stripping should be installed at the top to insure a water-tight application.

### INSTALLATION SCHEMATIC

#### CONCRETE BLOCK WALL

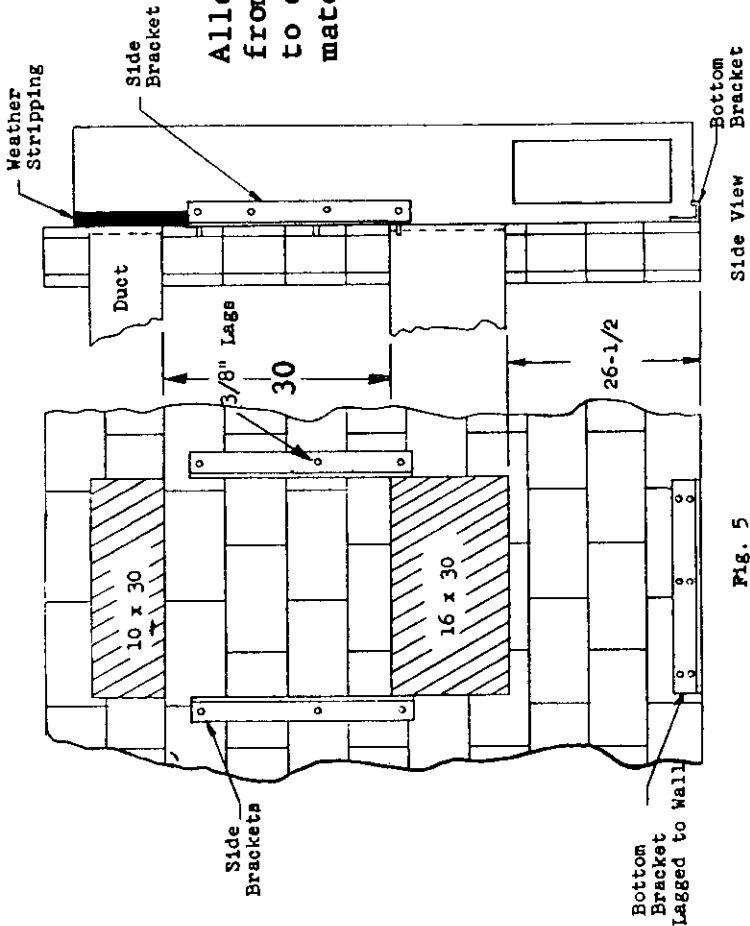


Fig. 5

## Model 48WH1

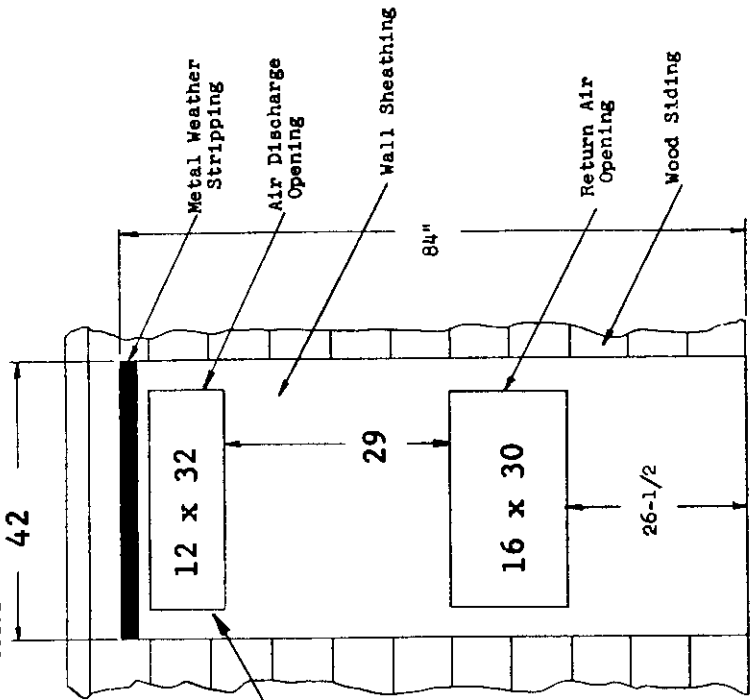
### MOUNTING ON WOOD FRAME WALLS

Locate and cut out two 8 x 28 in. (minimum) openings as shown in (Fig. 6). Cut away the outside siding to the depth of the sheathing. Install metal weather stripping at the top and caulk or otherwise seal joints between siding and sheathing. Frame in the openings between the wall studs as necessary for the particular wall involved with the plates at the bottom of each wall opening being sufficiently strong to carry the weight of the unit.

Install the two side brackets to the unit (10 in. down from the top). Before drilling into side of casing, check inside tubing for clearance. Mount unit on wall and pull in firmly using three - 3/8 in. lag screws through each of the wall mounting brackets.

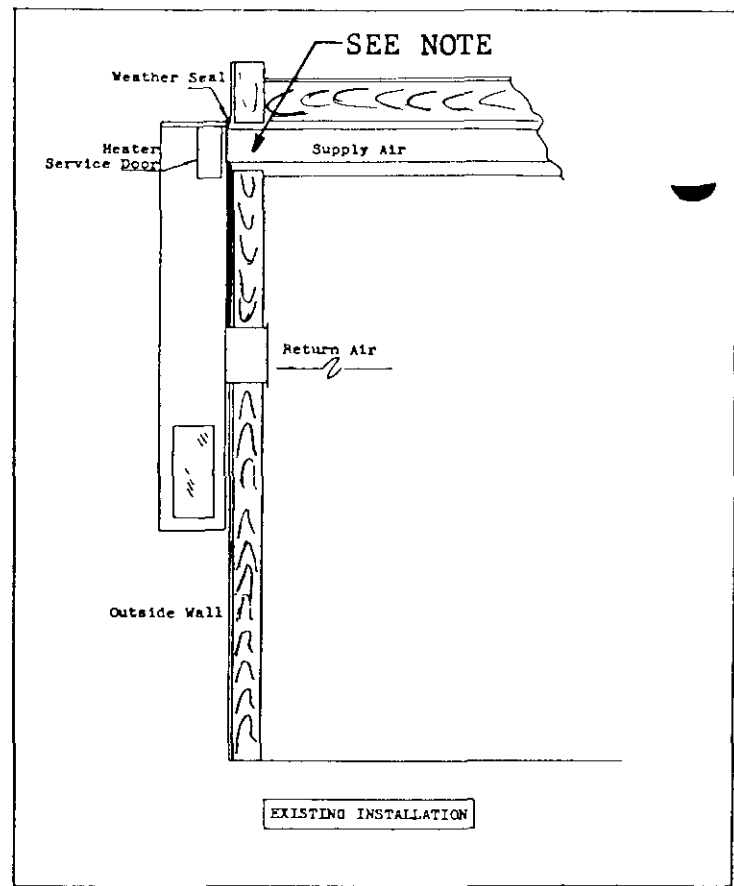
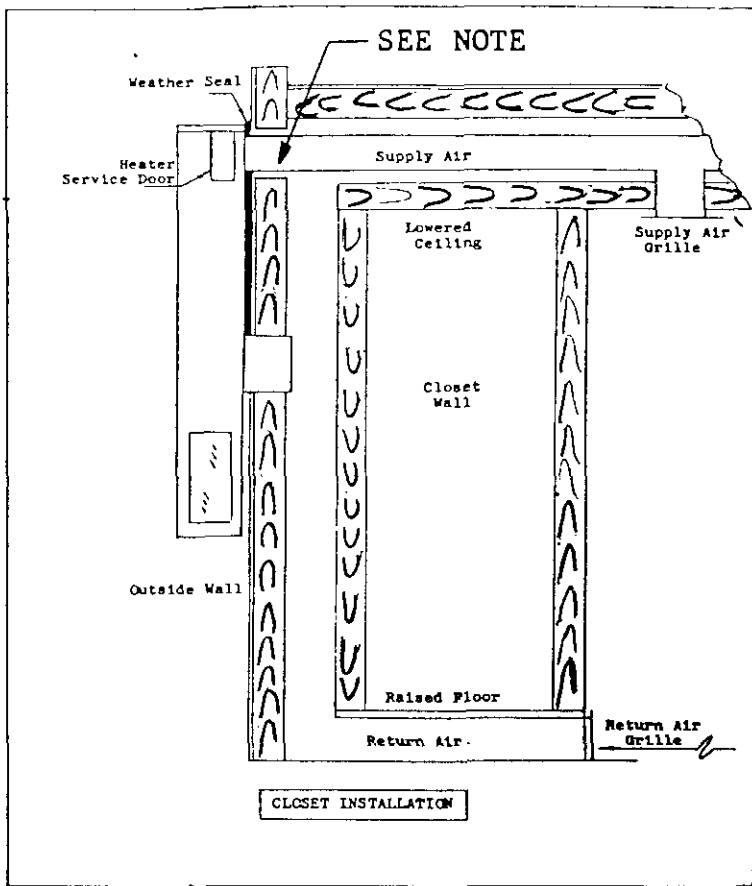
For additional mounting rigidity, each air opening collar may be screwed to the plate at the bottom of each wall opening. Drill two 1/4 in. holes in the bottom flange of each collar before hanging the unit, then fasten to wall plate with No. 10 by 1-1/2 in. wood screws.

### OUTSIDE FRAME WALL SCHEMATIC

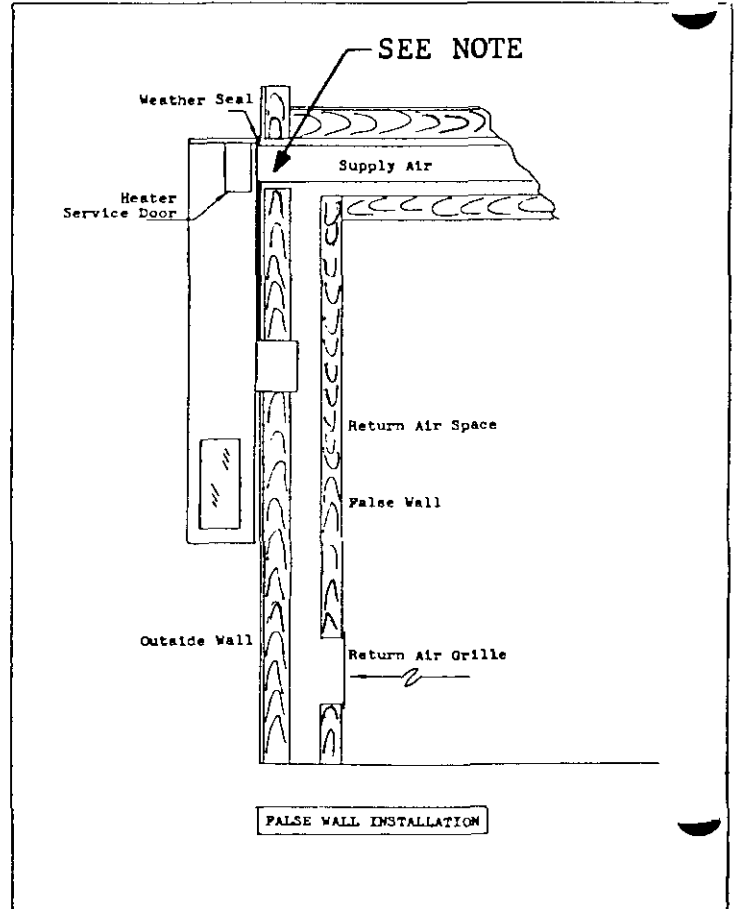
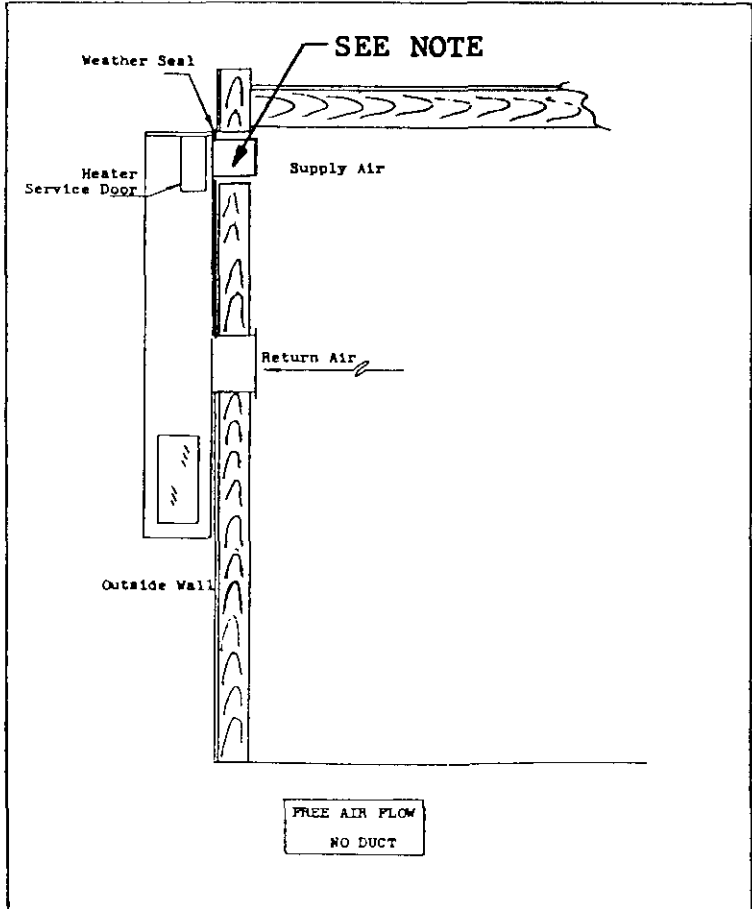


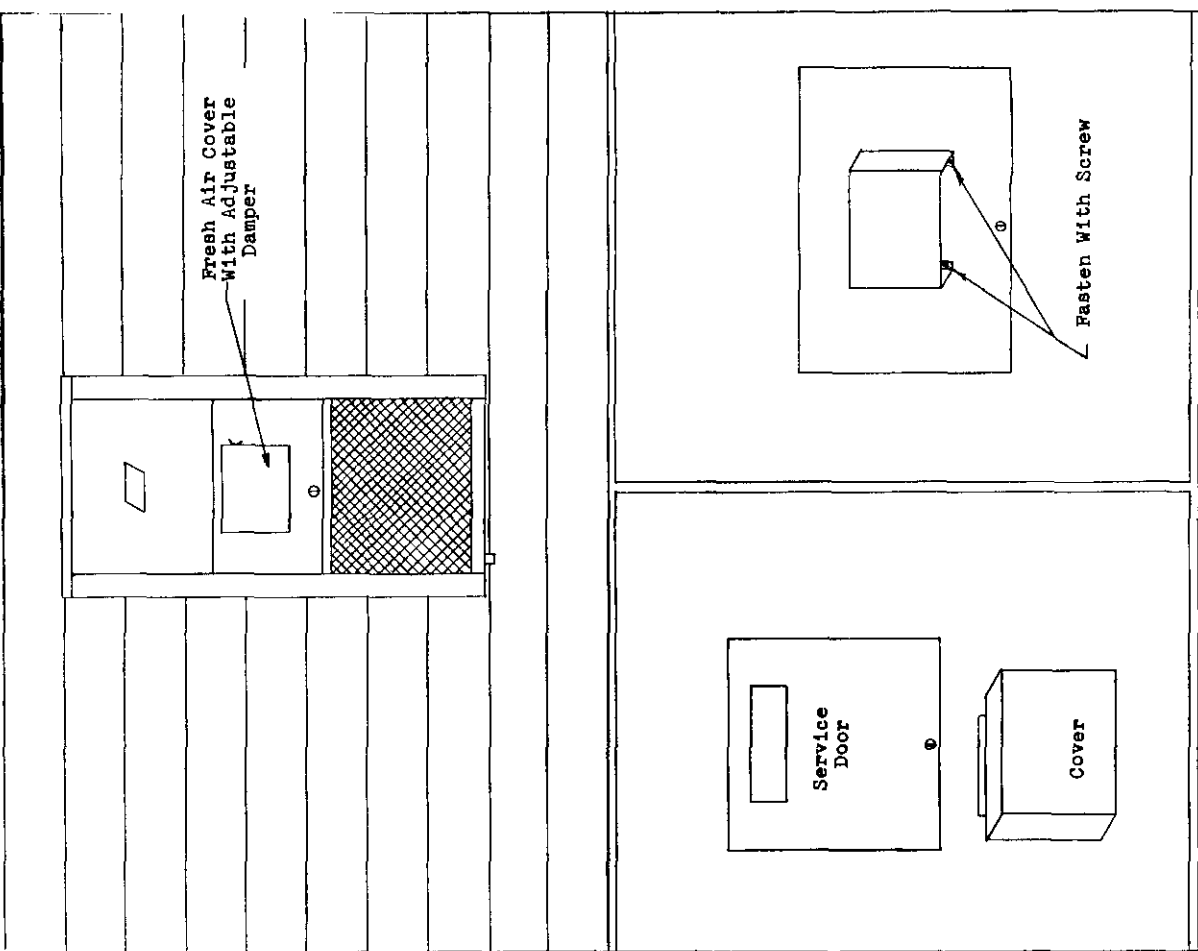
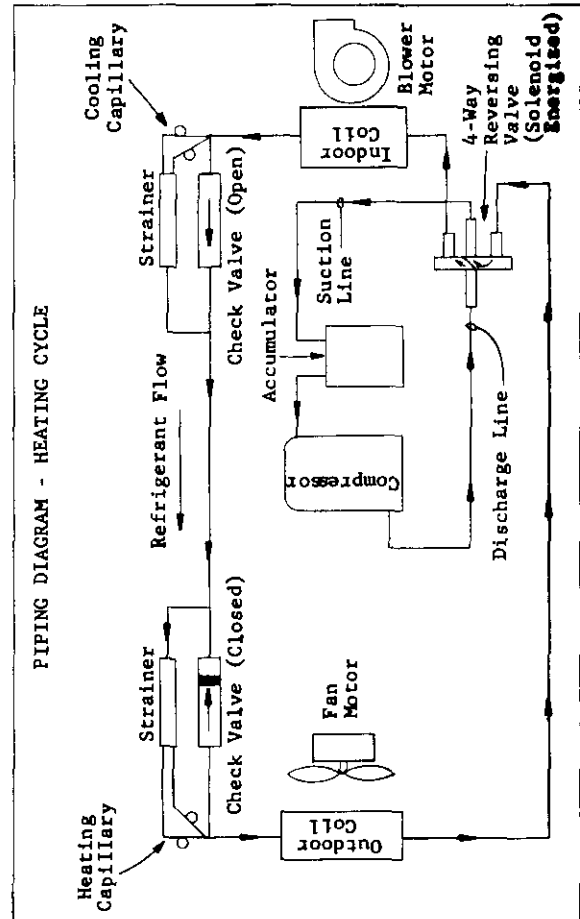
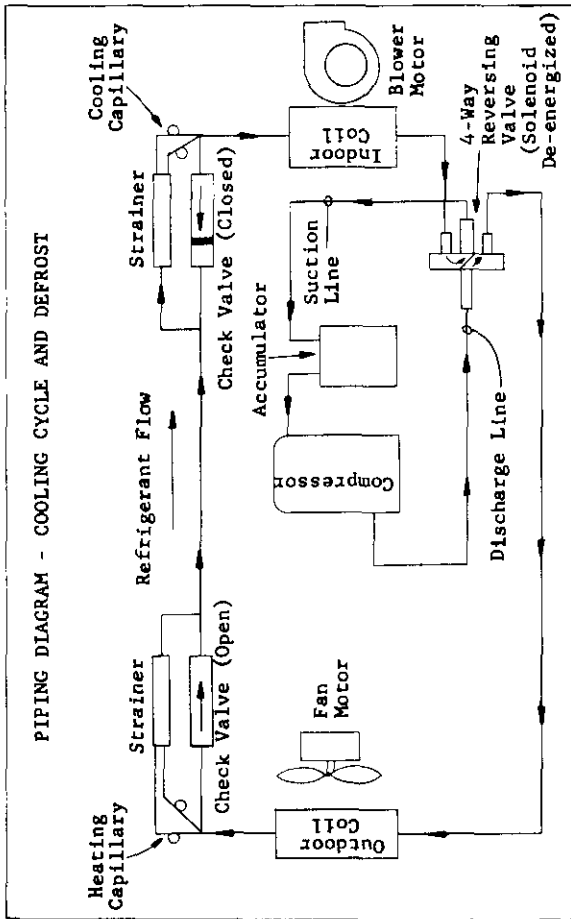
Allows 1" clearance from supply air duct to combustible materials.

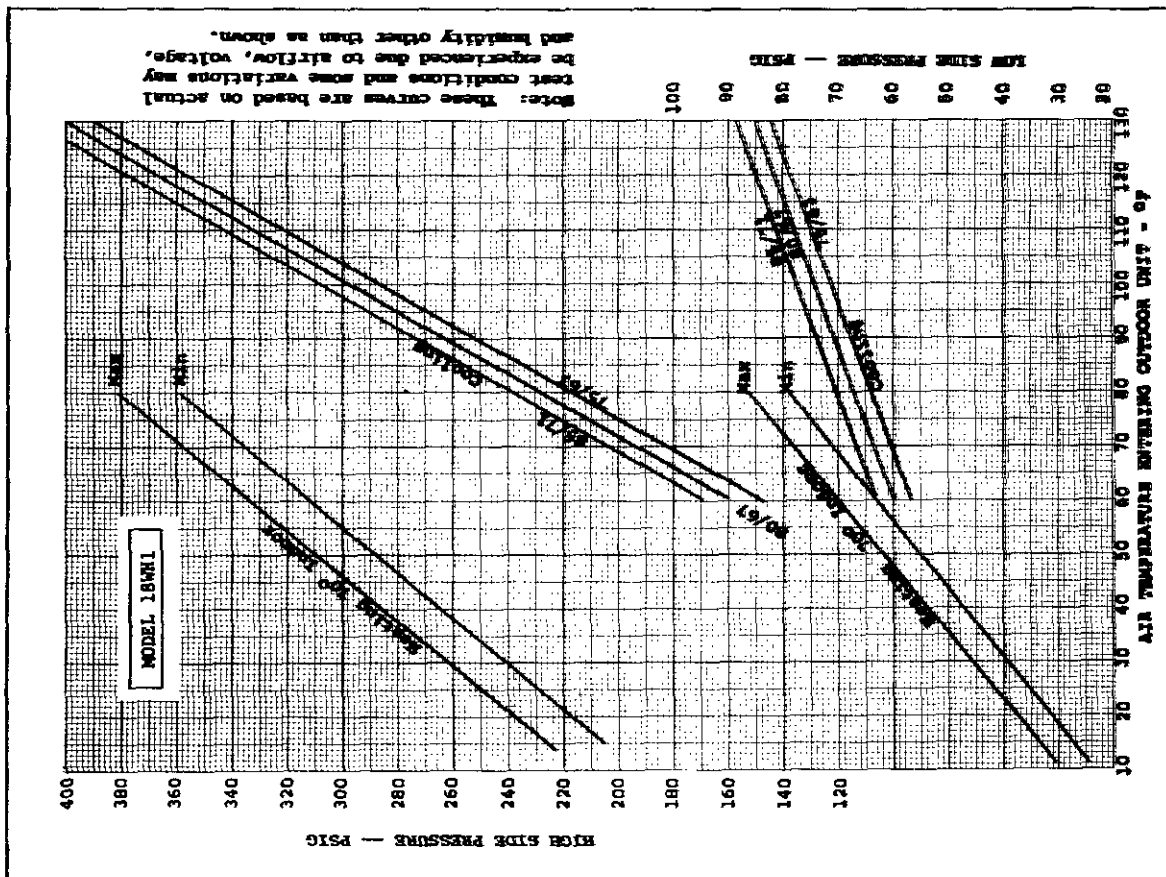
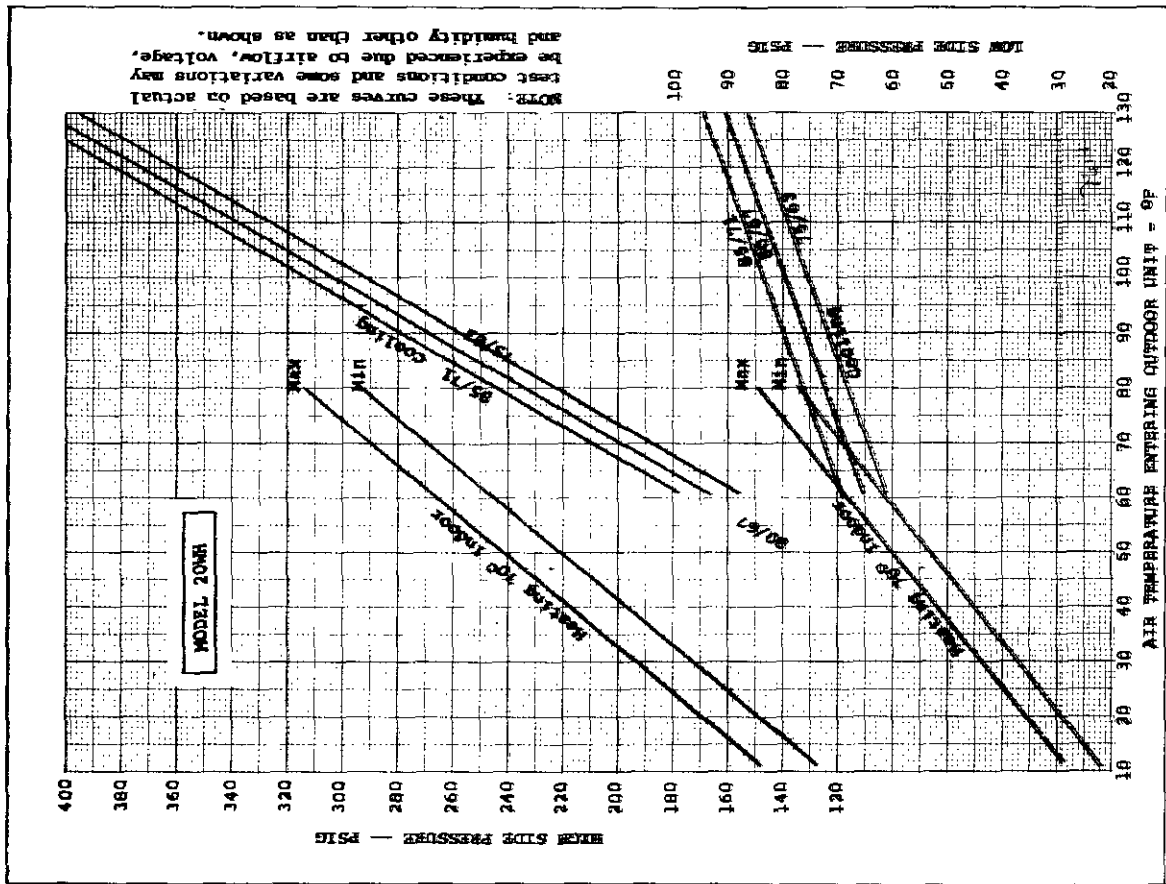
Fig. 6

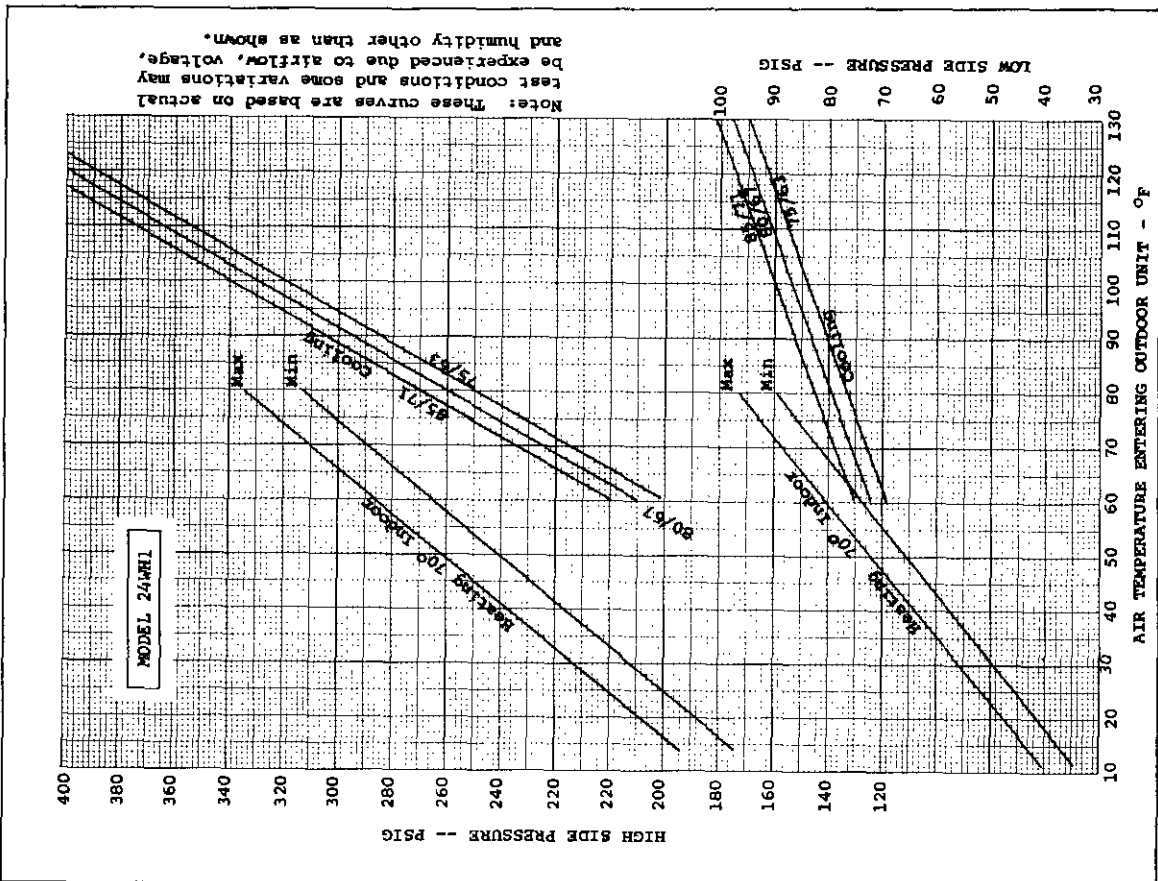
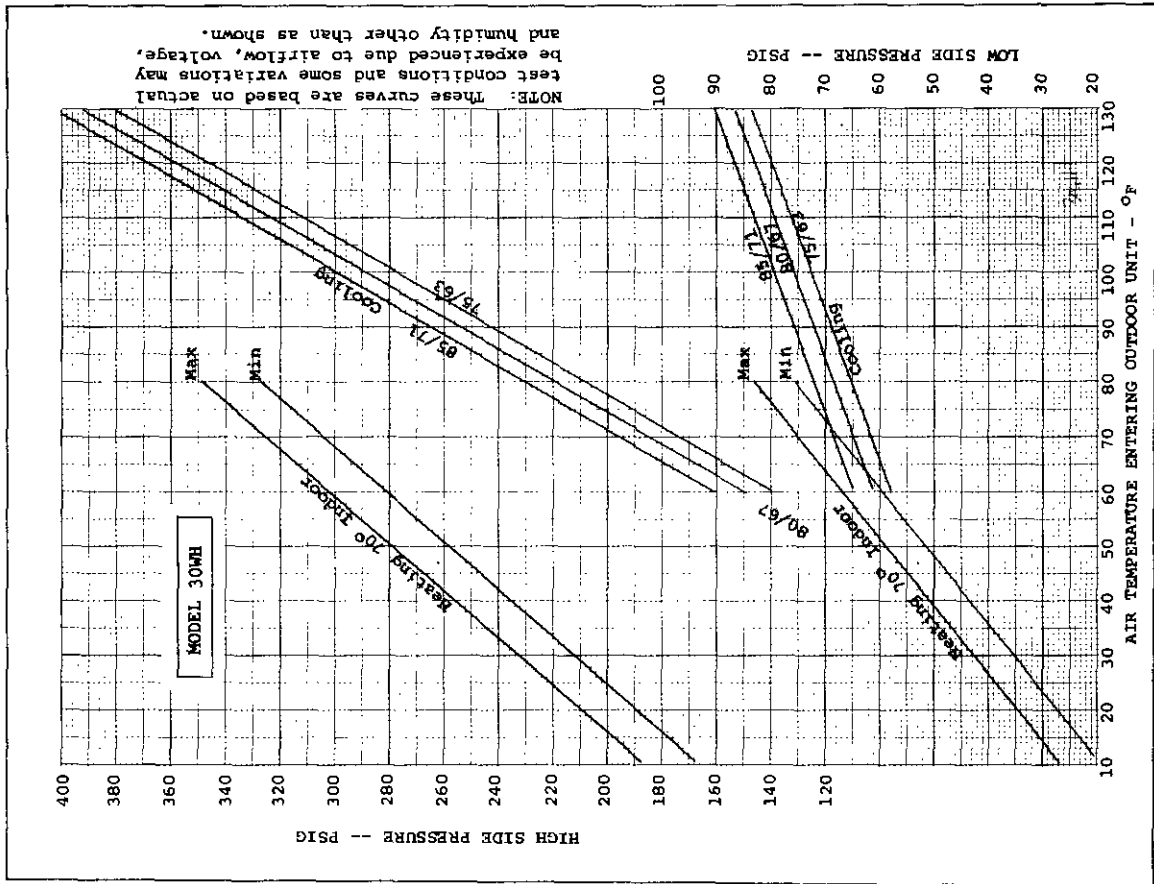


NOTE: 1" clearance to combustable materials required for first 3 feet of supply air duct system.

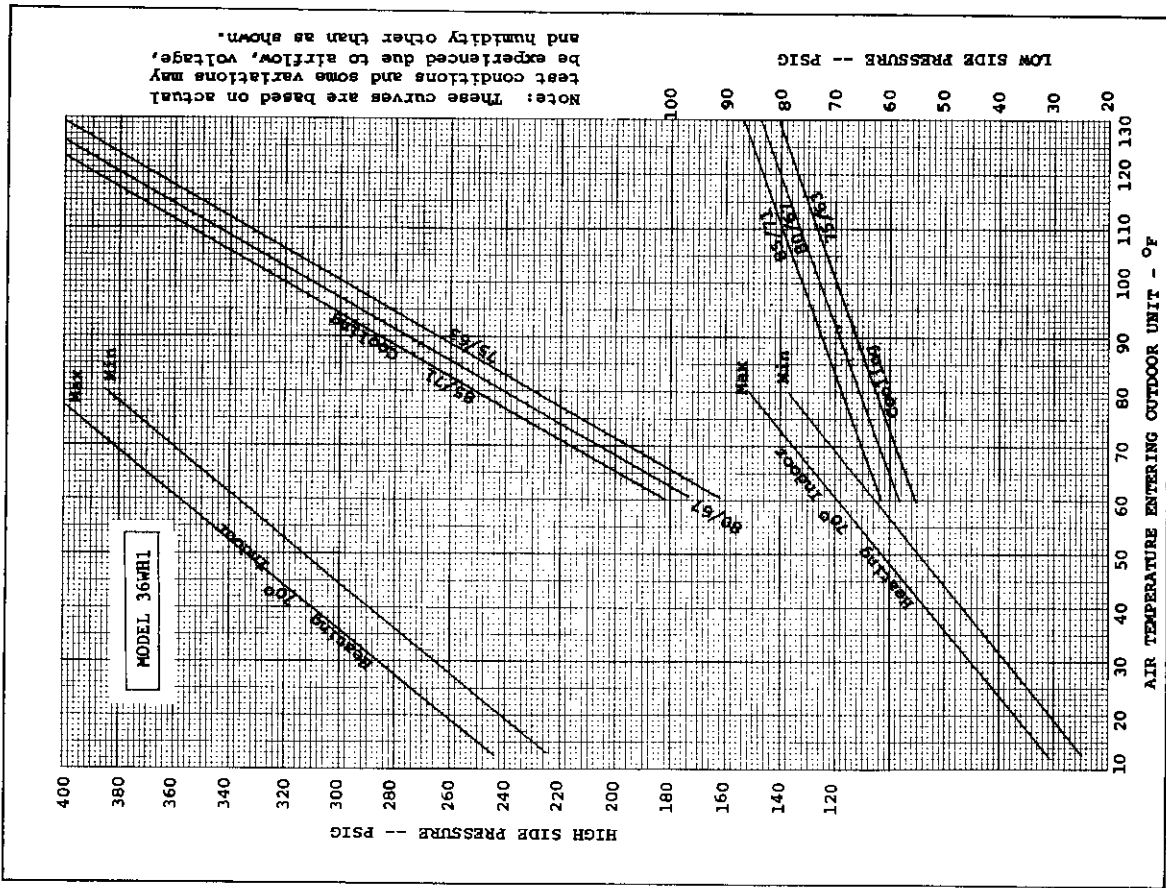
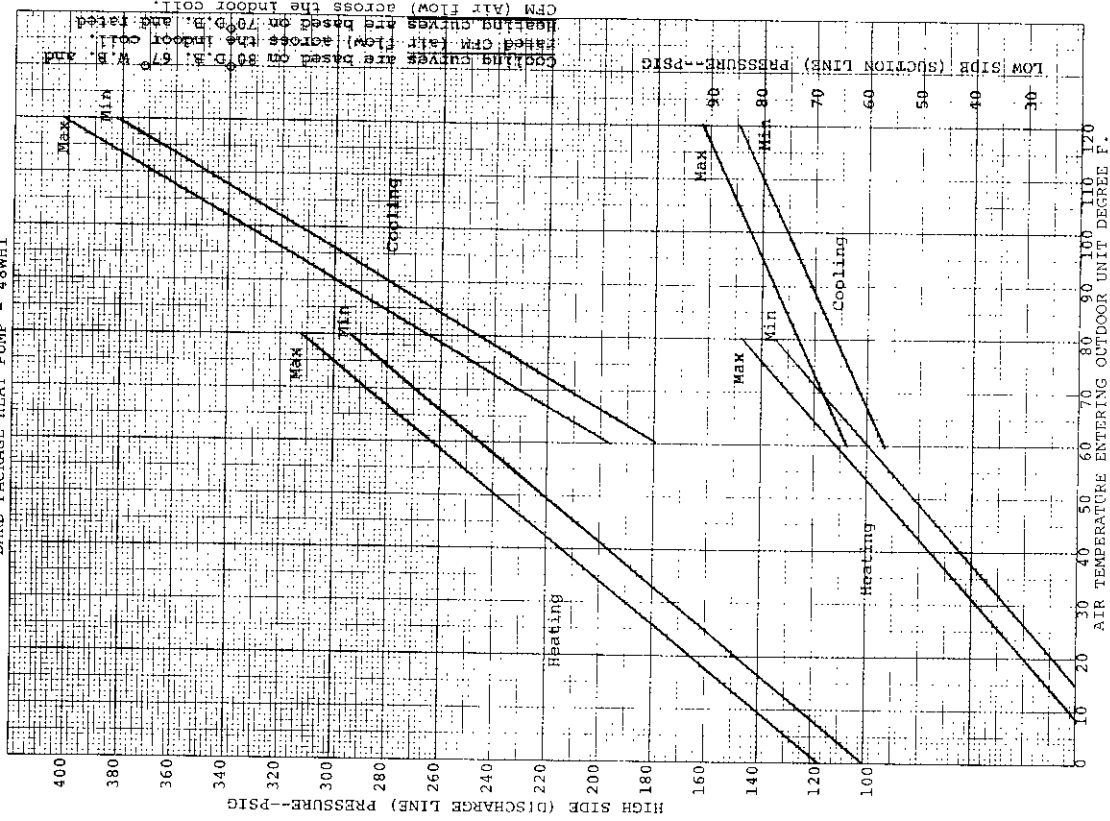




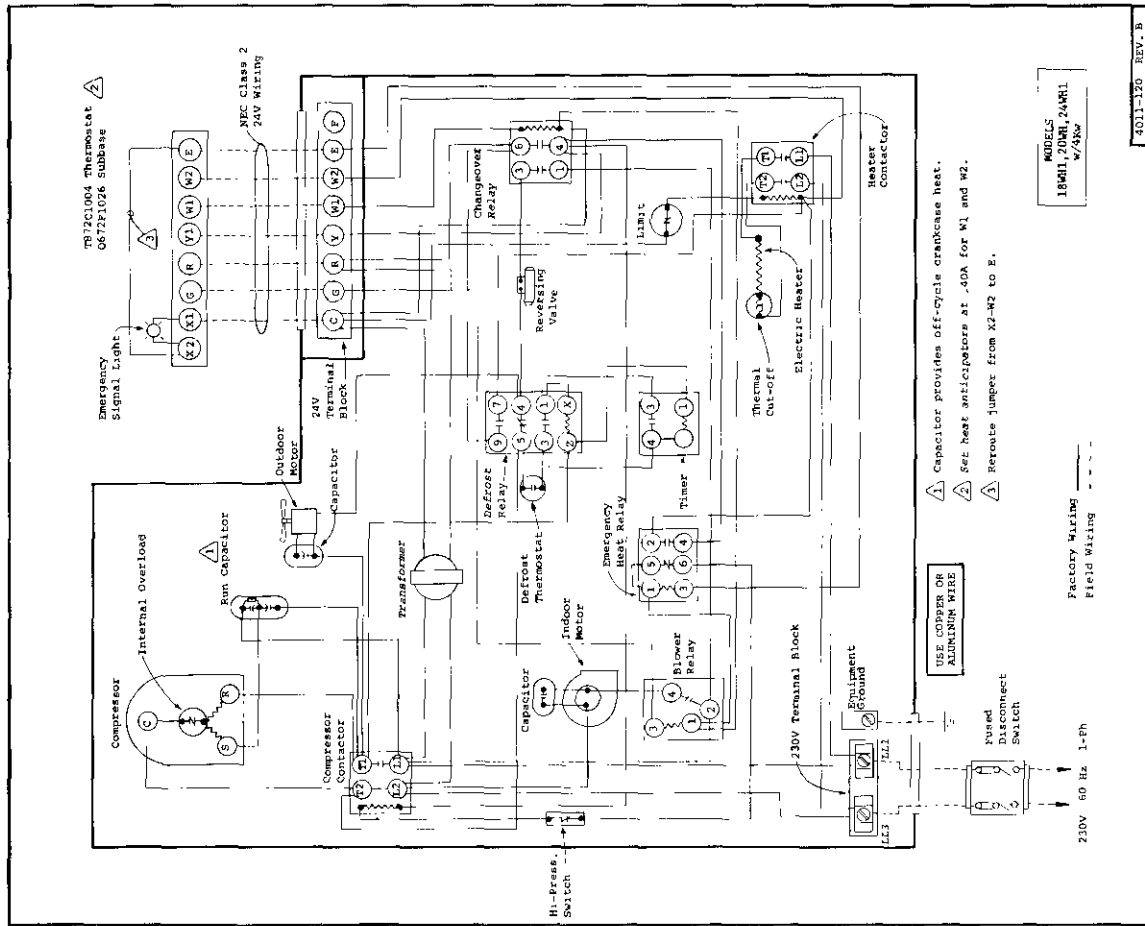
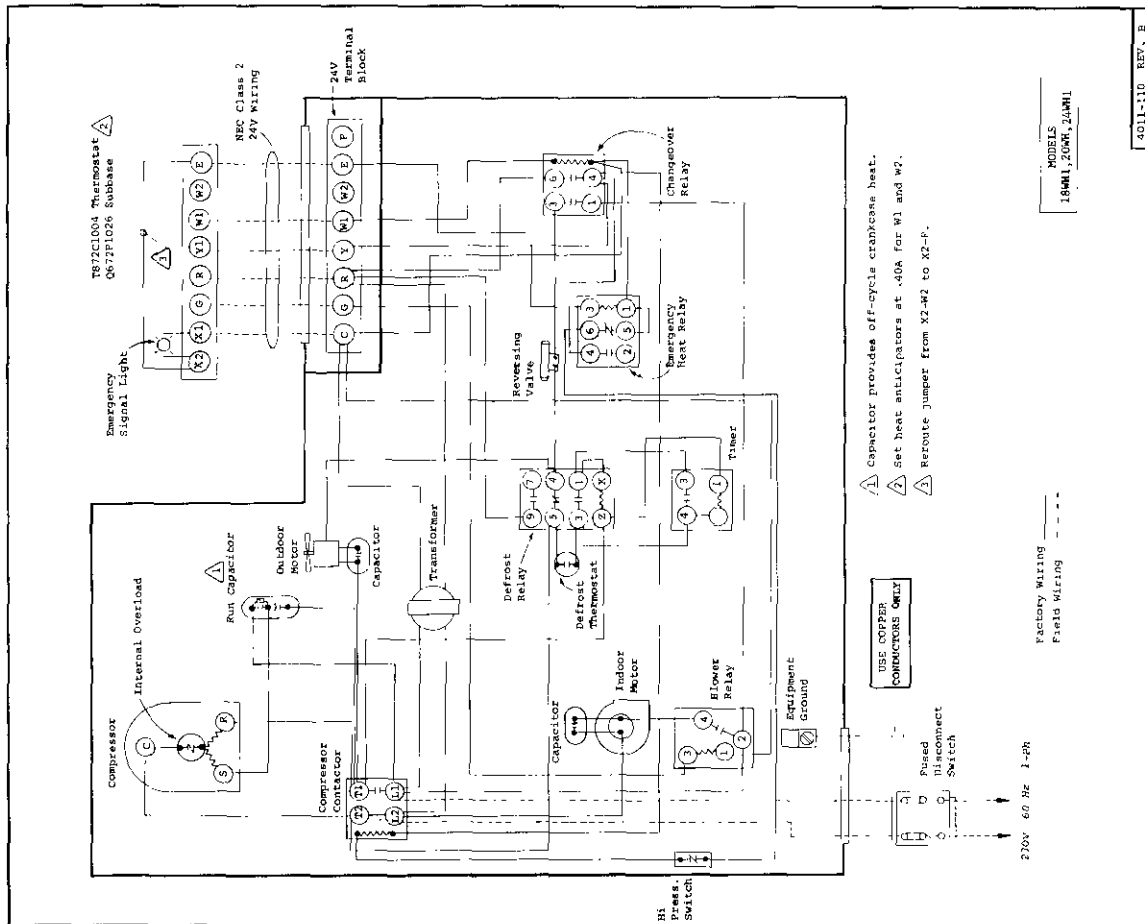


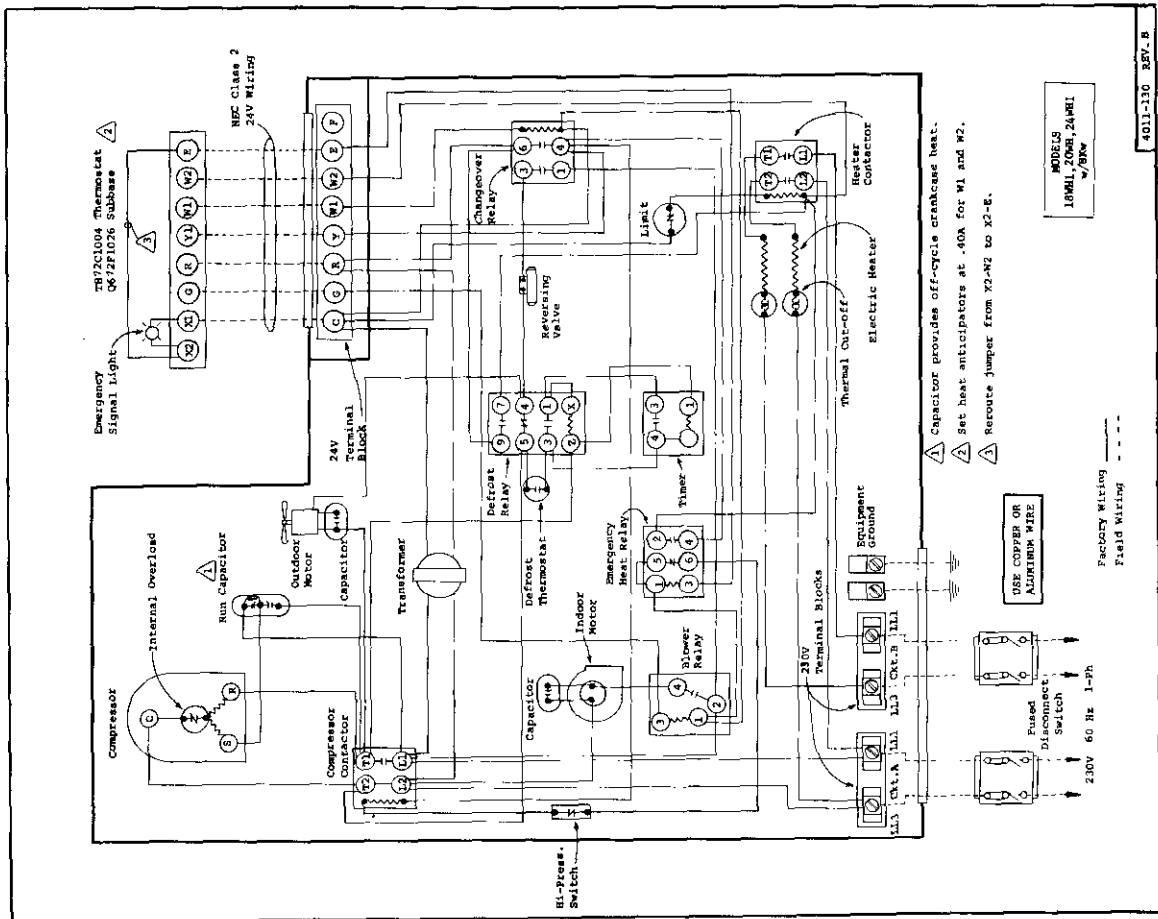
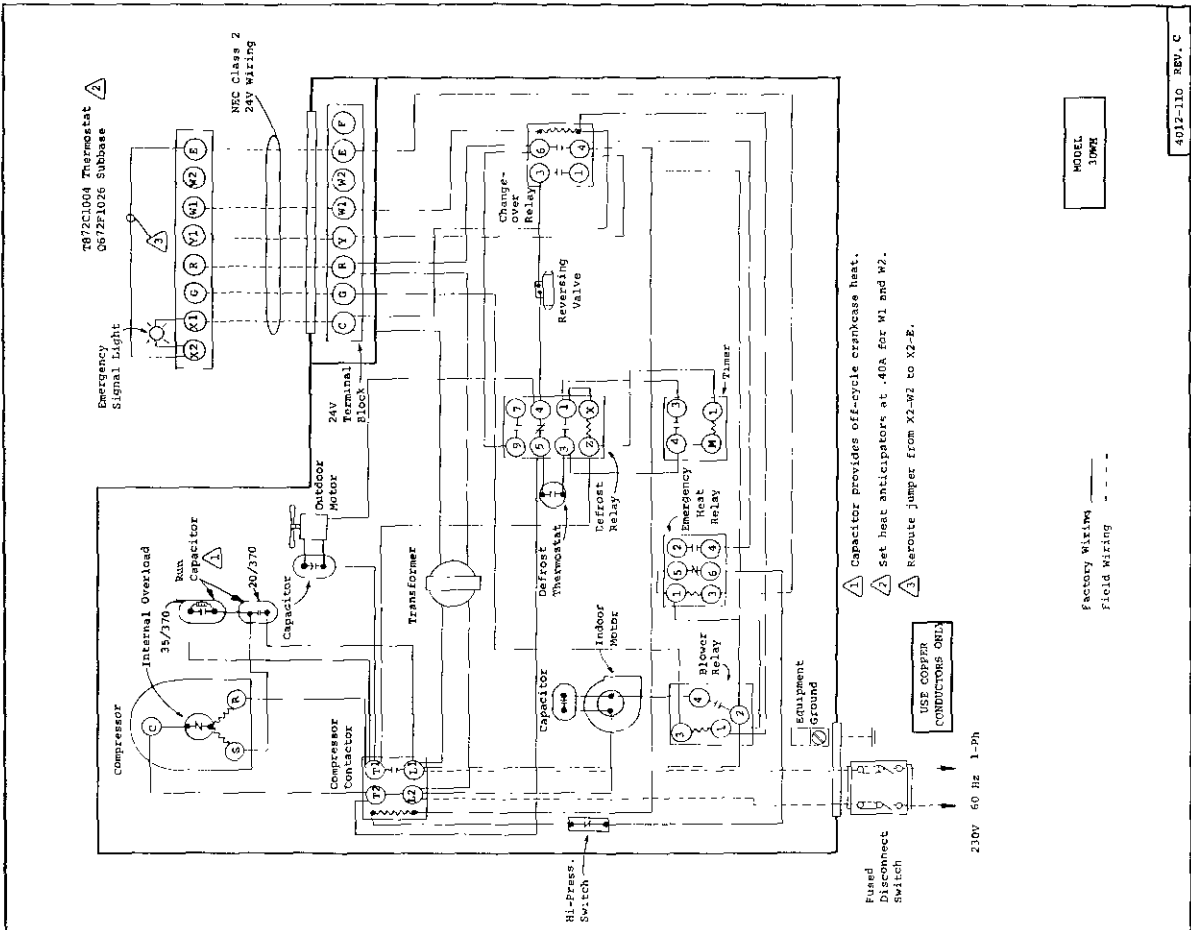


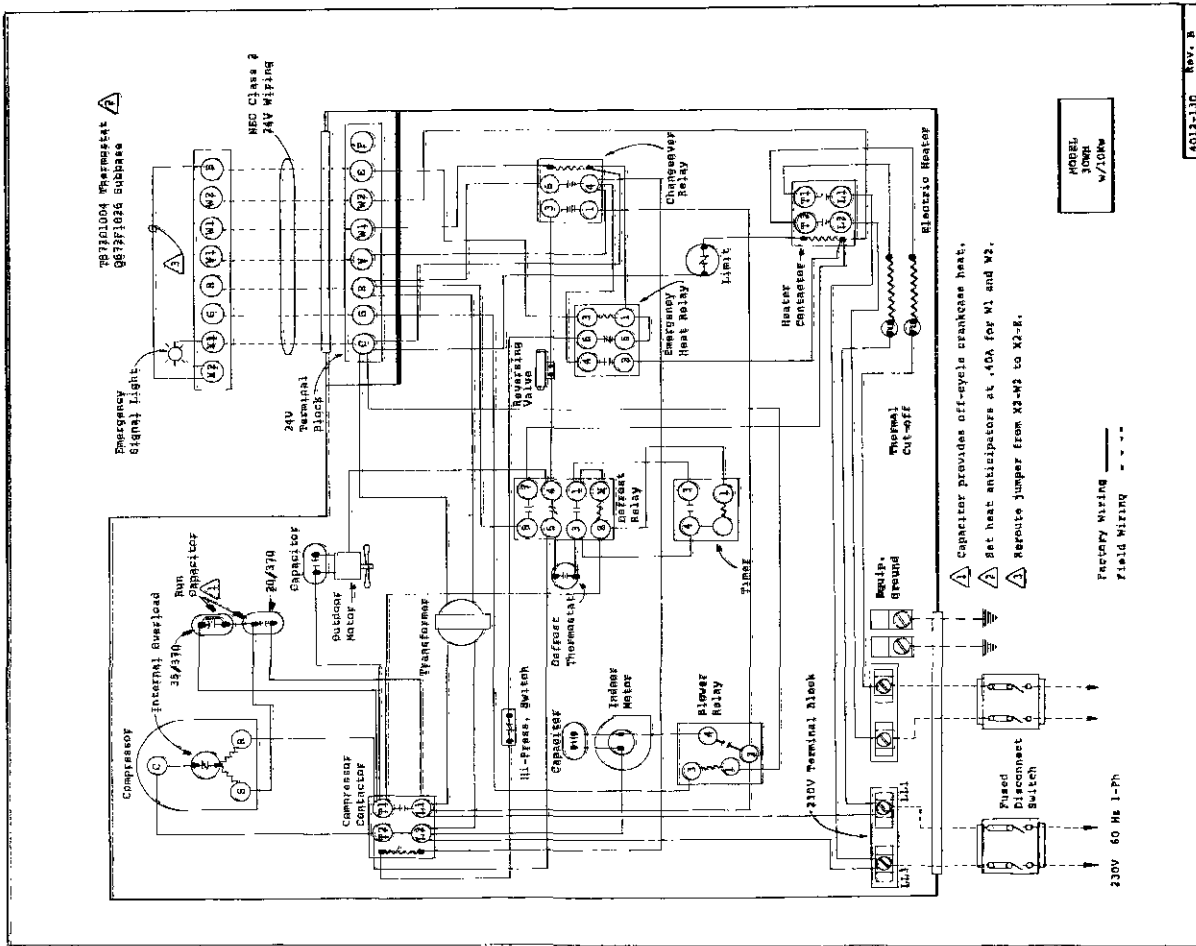
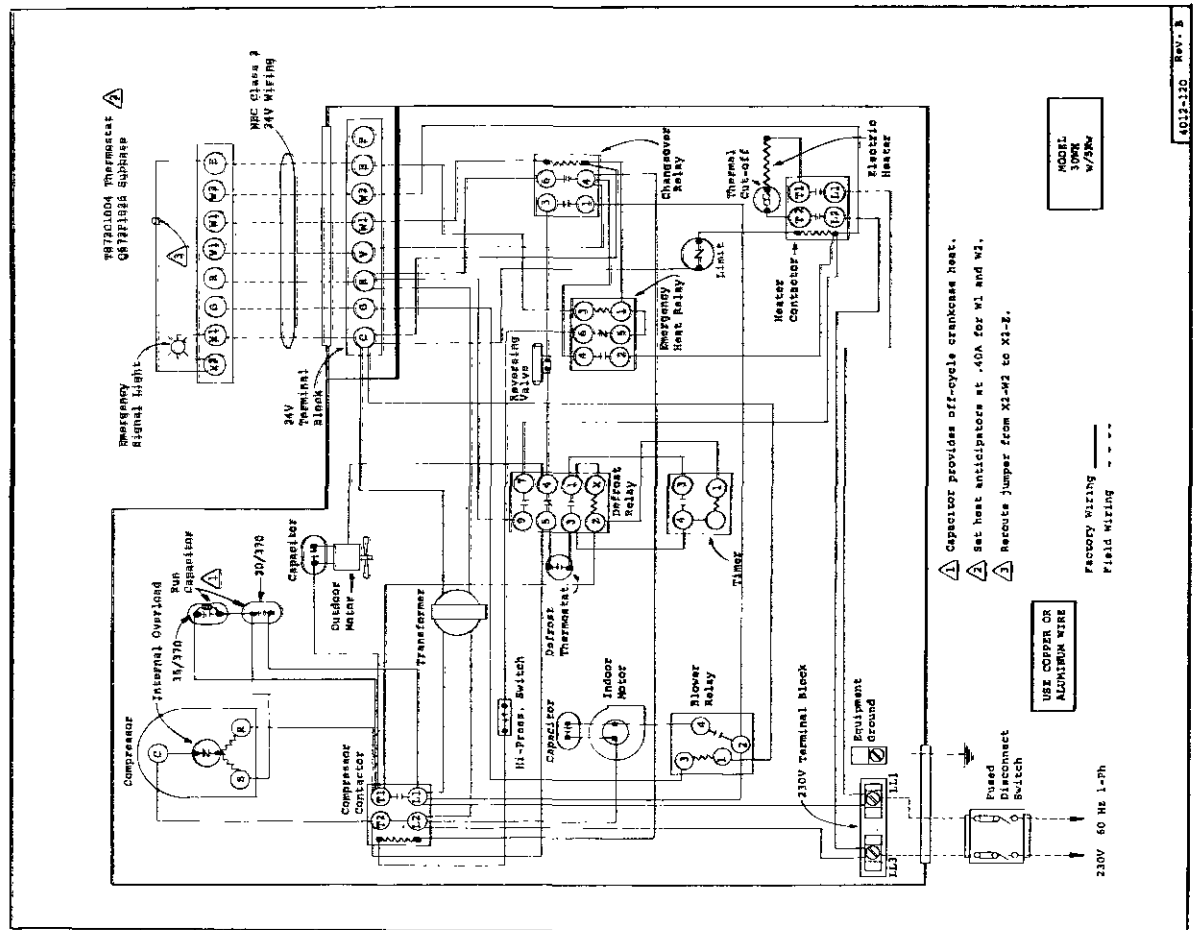
BARD PACKAGE HEAT PUMP - 48WH1

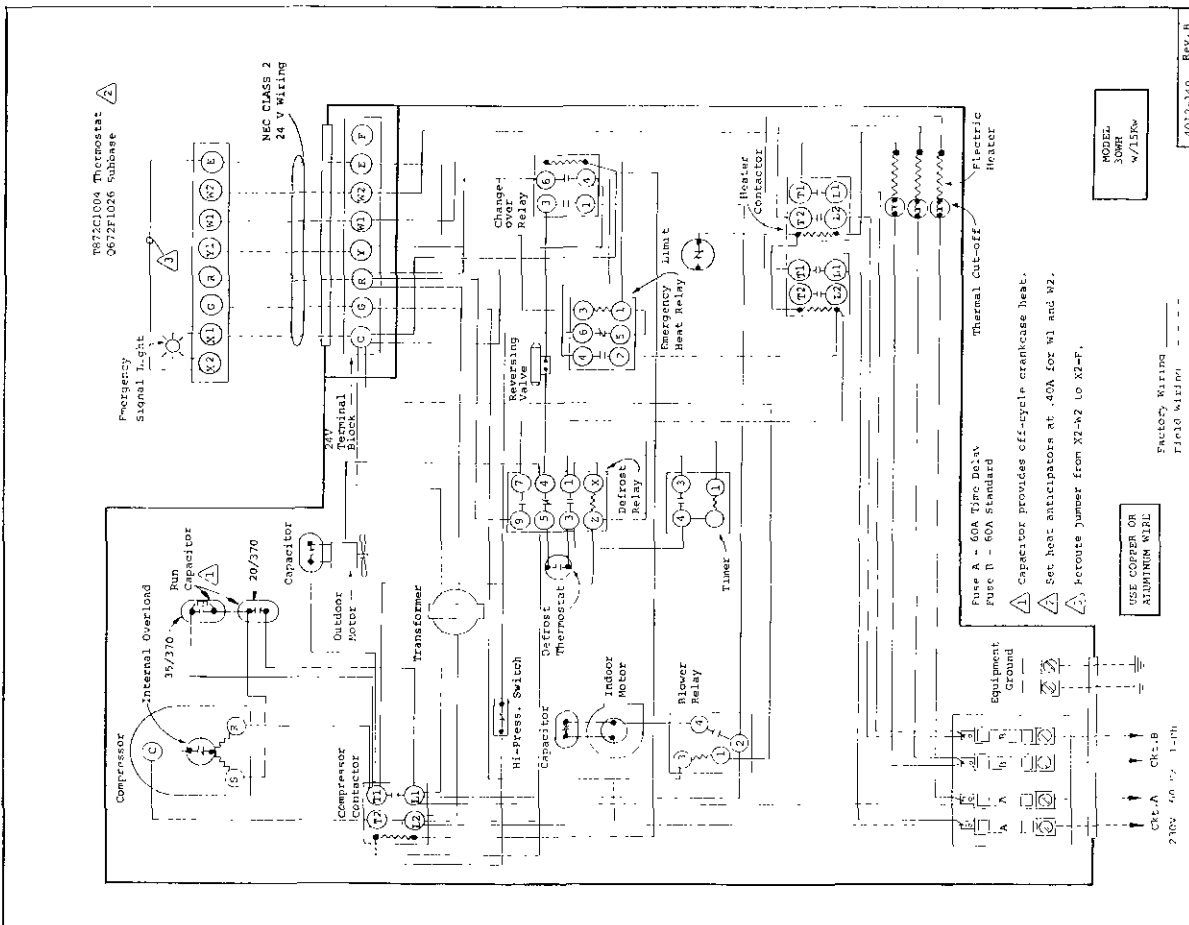
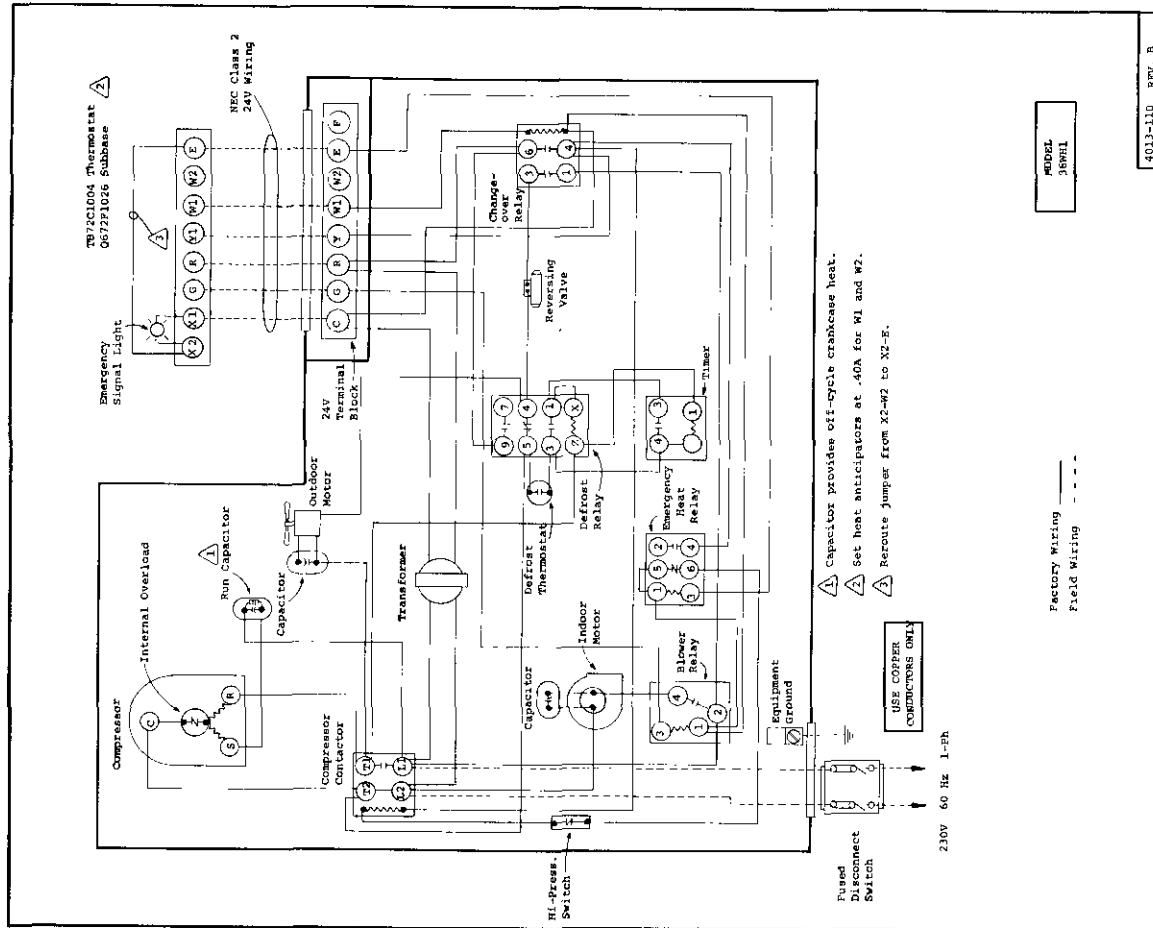


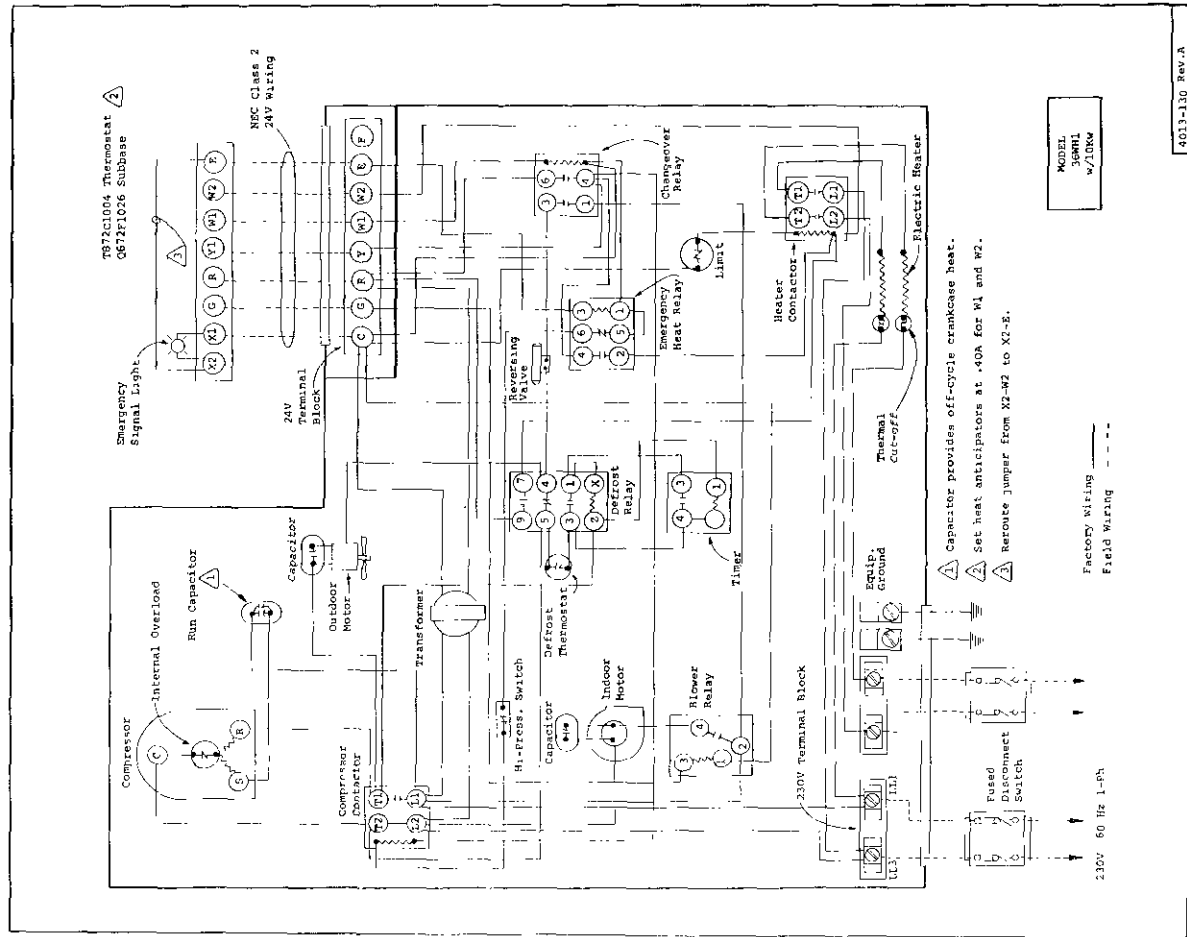
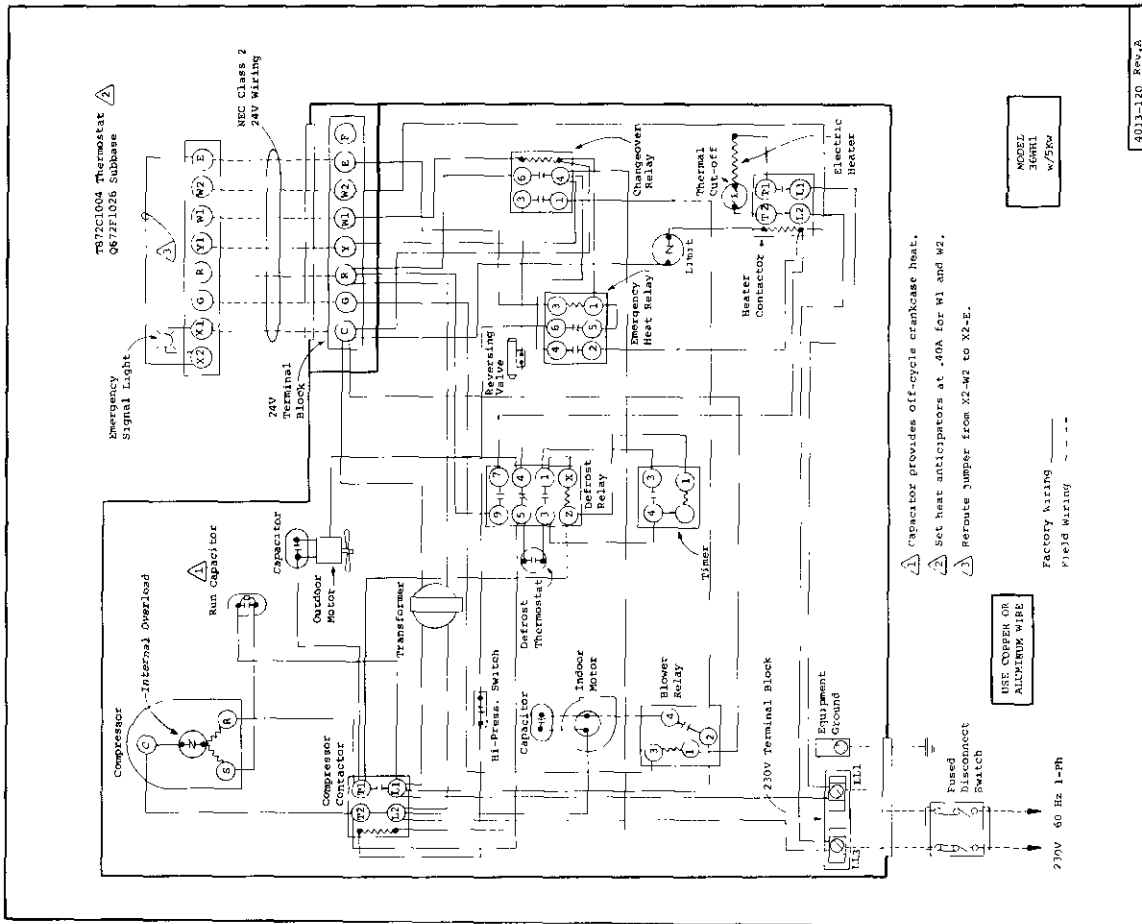


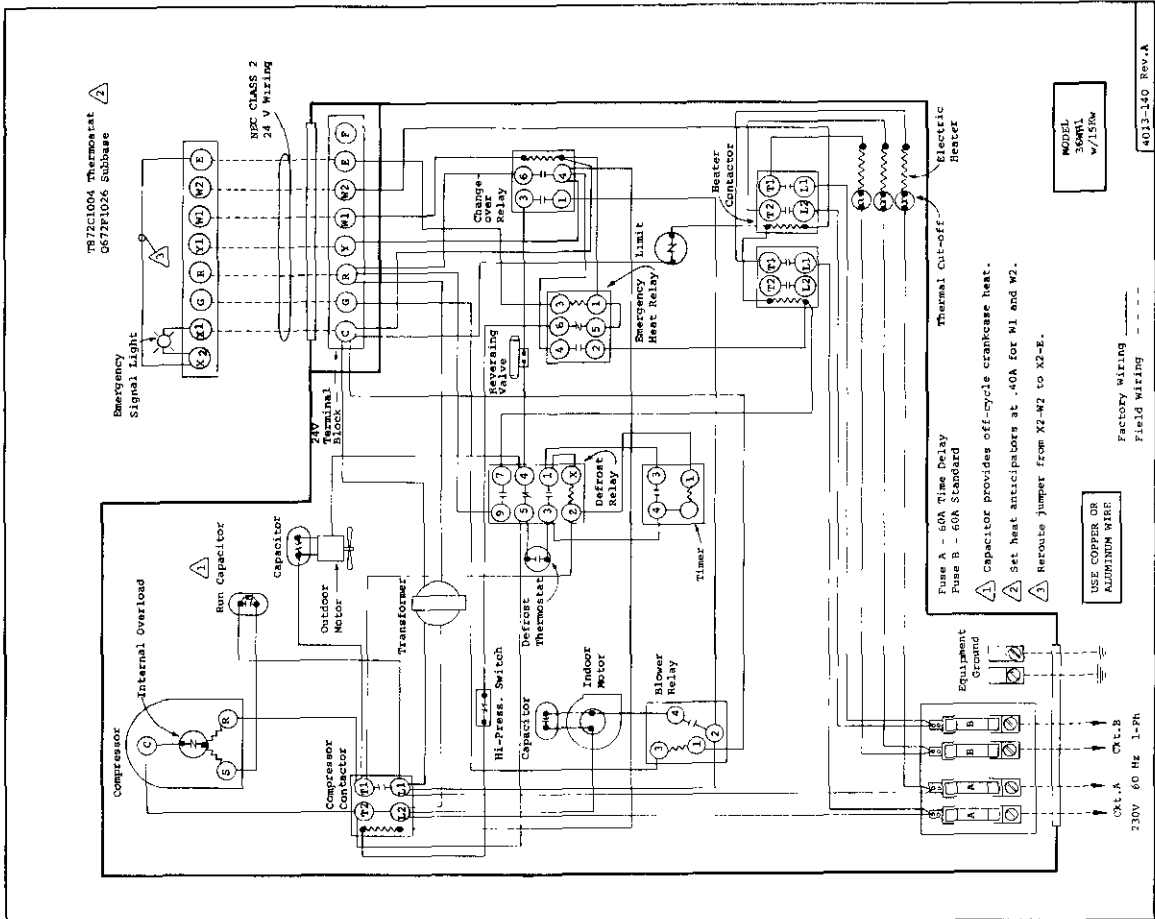
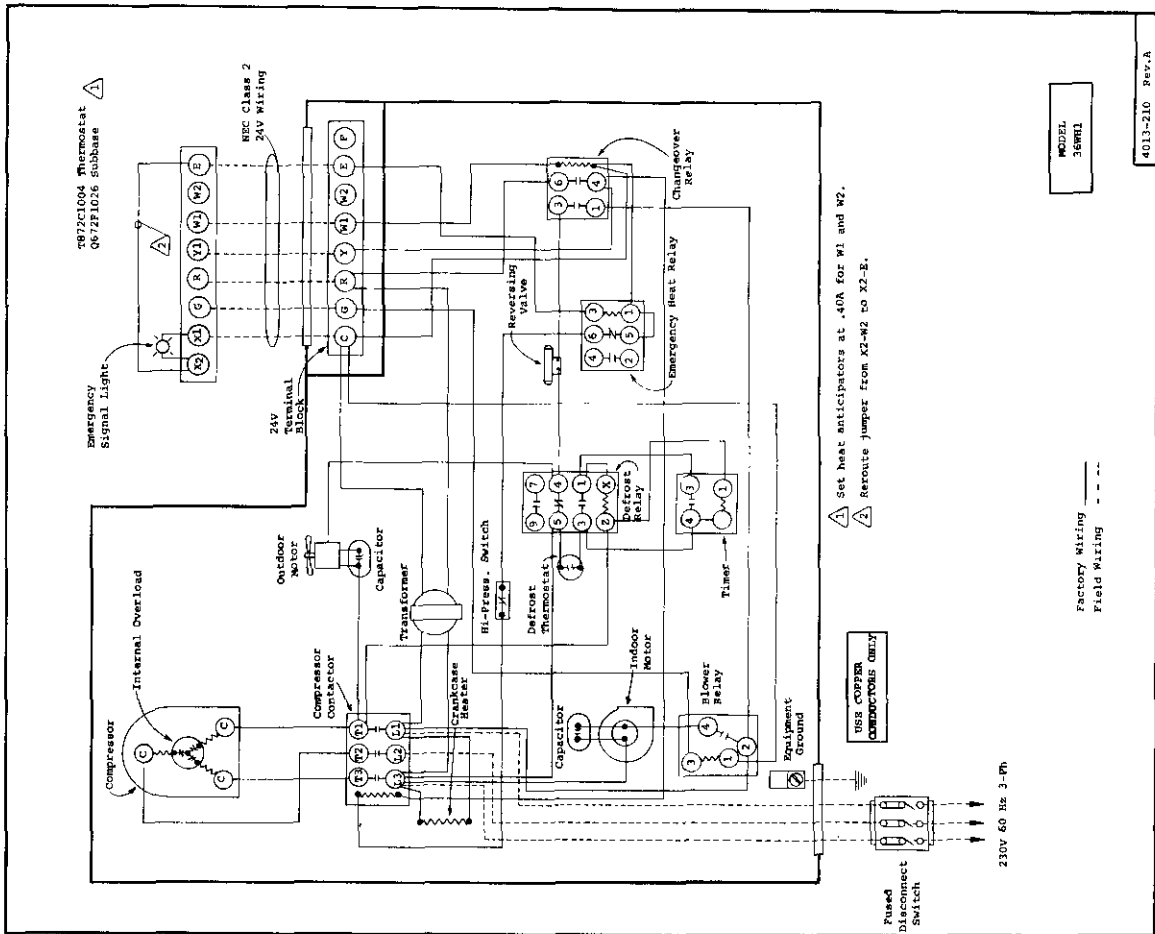


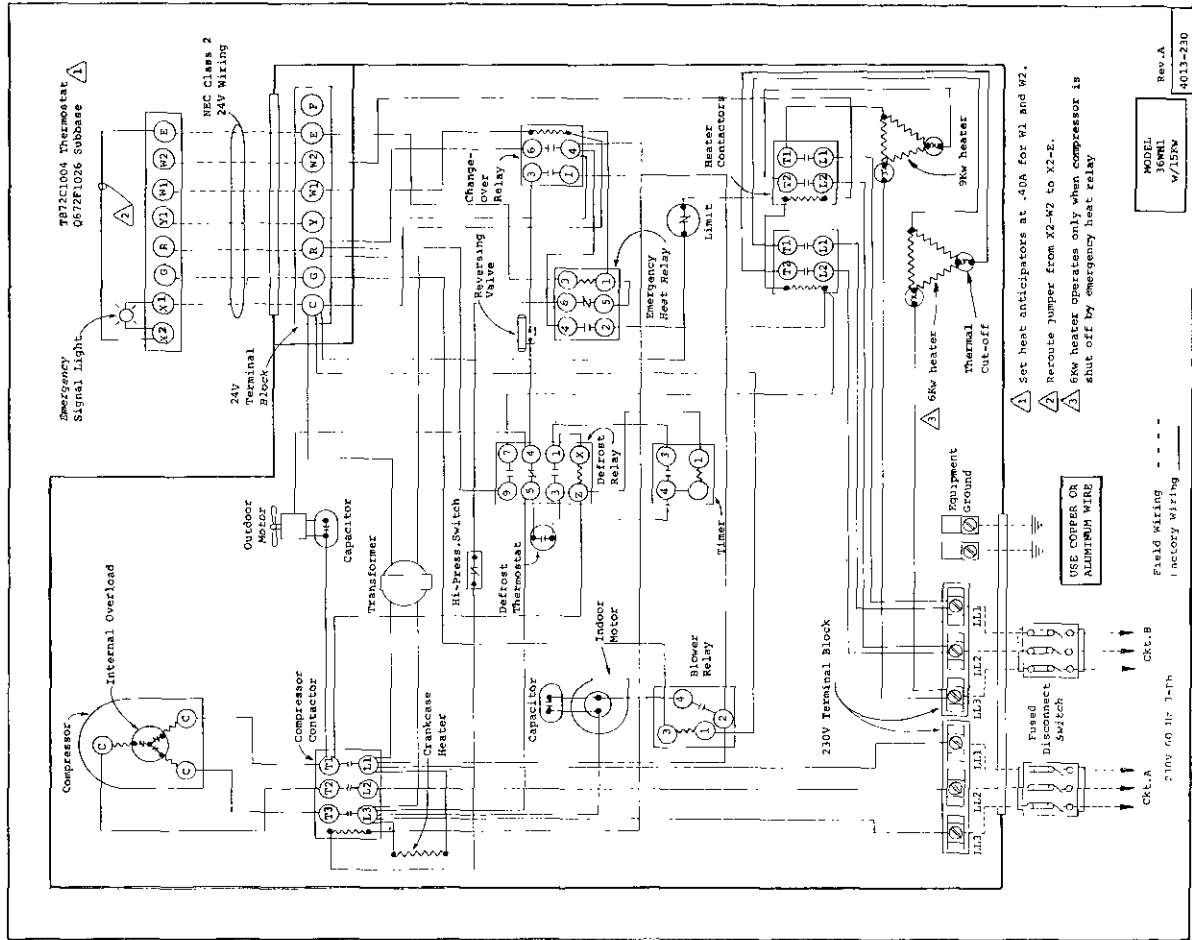
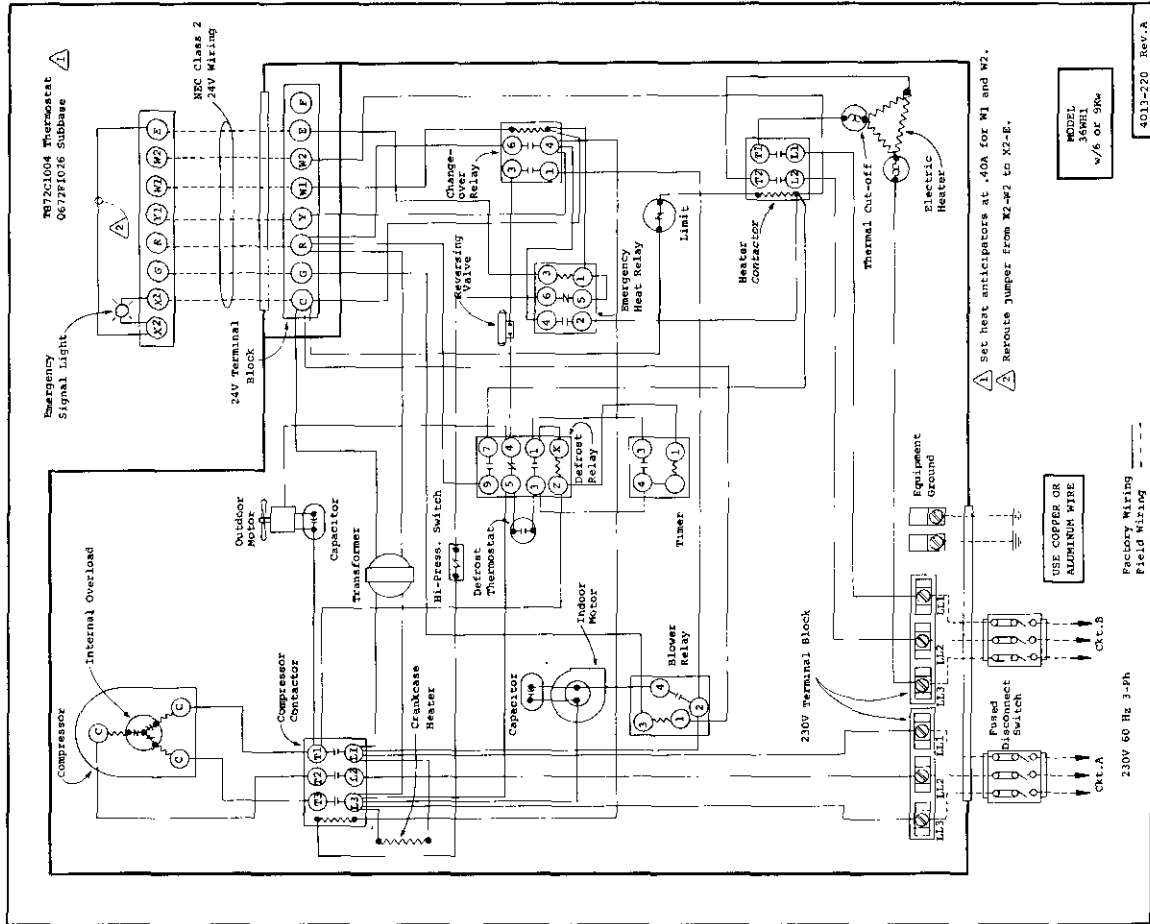


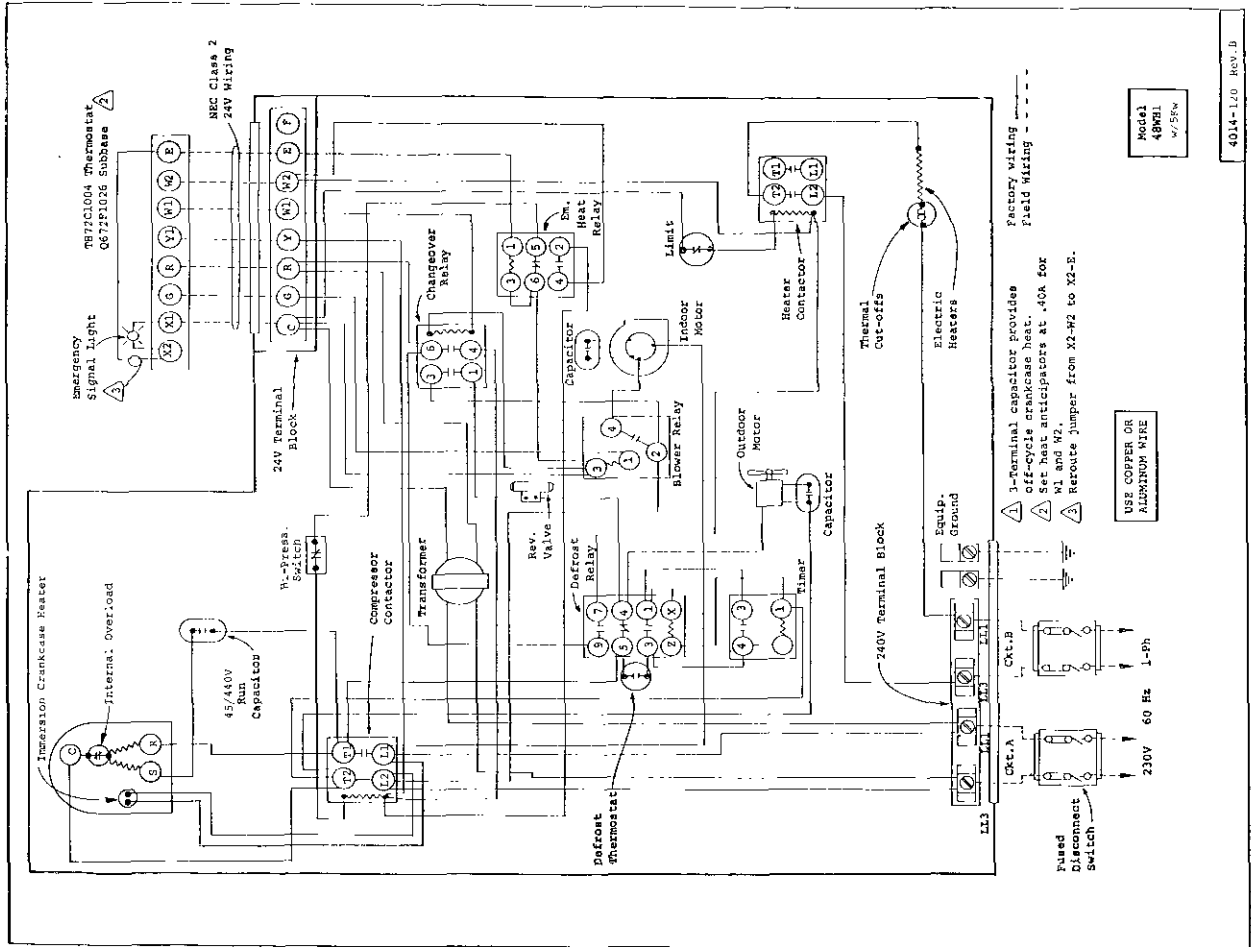
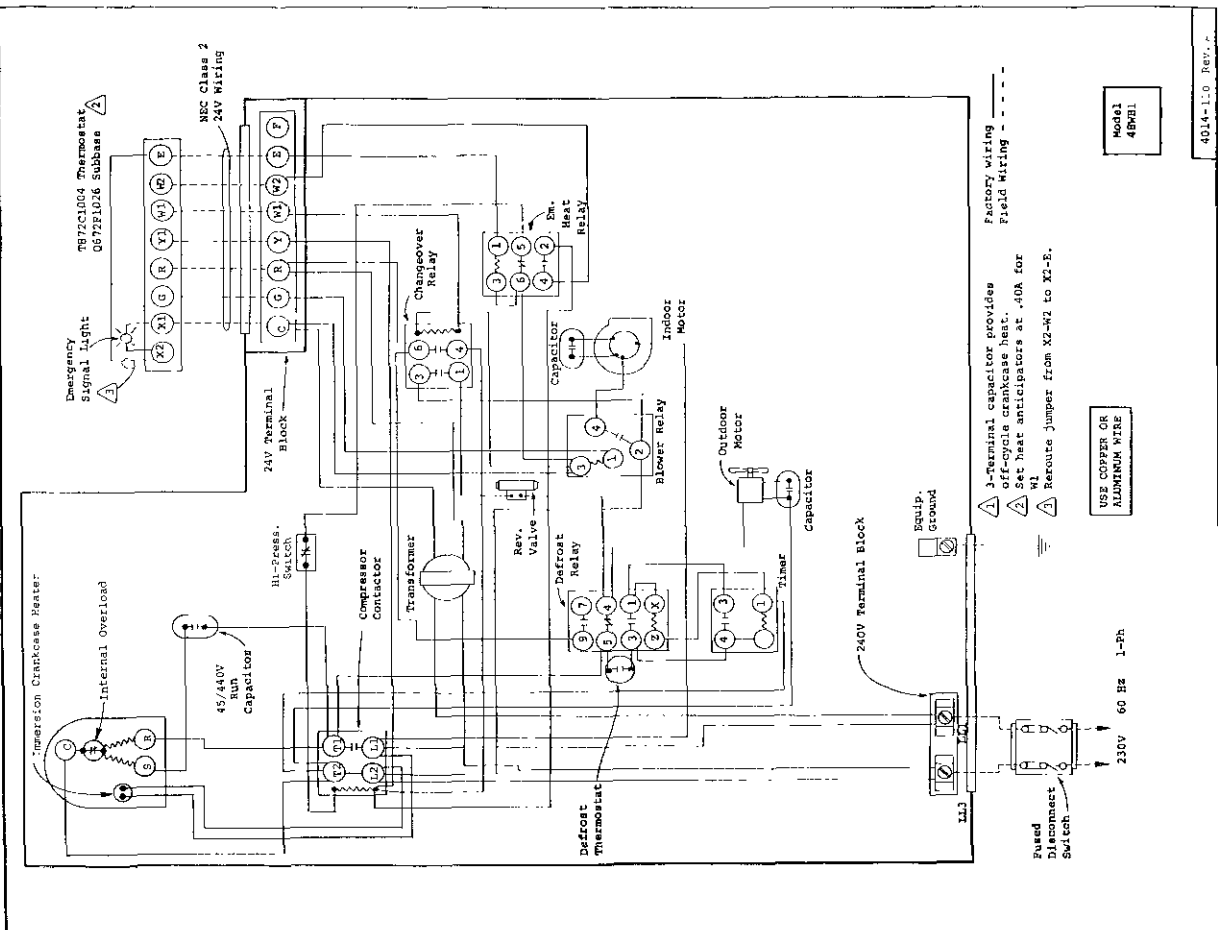






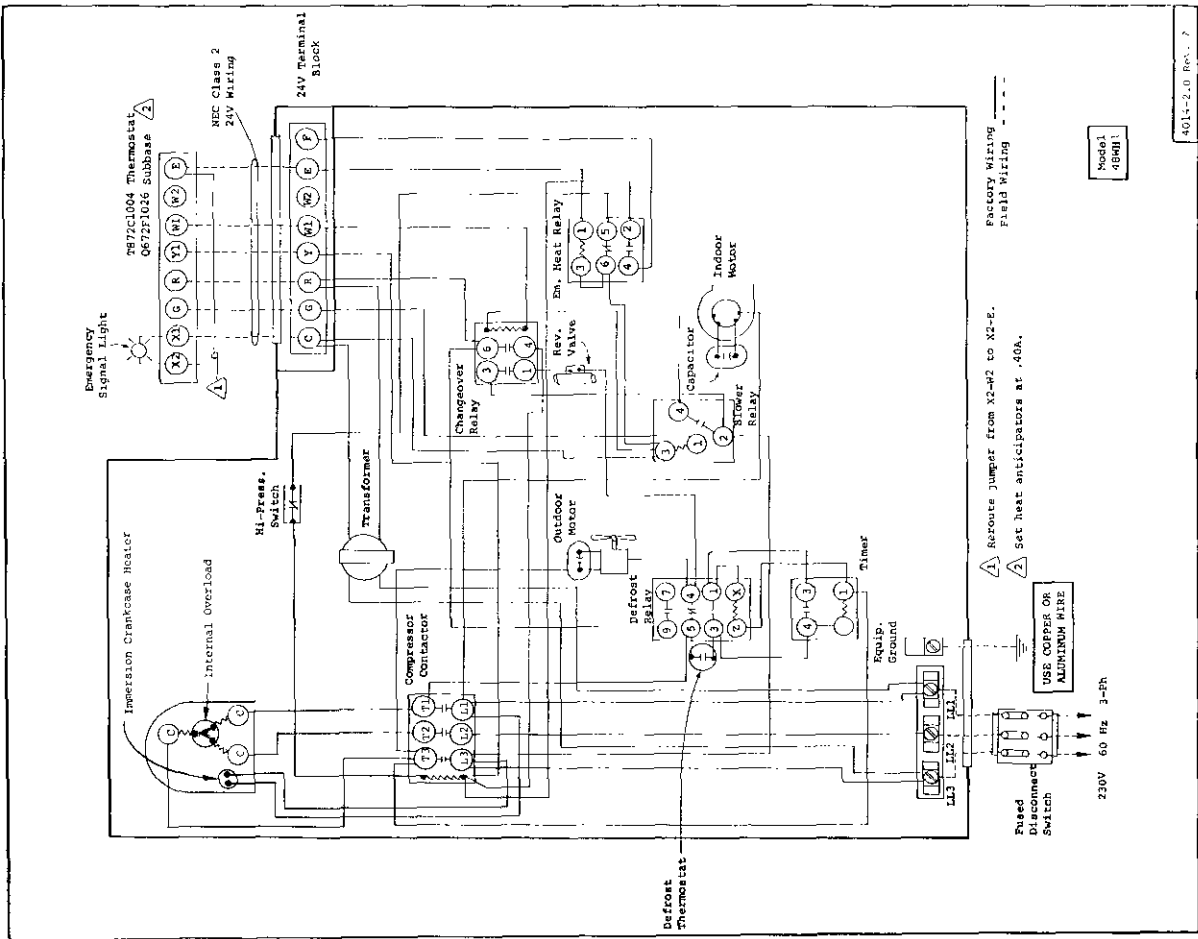
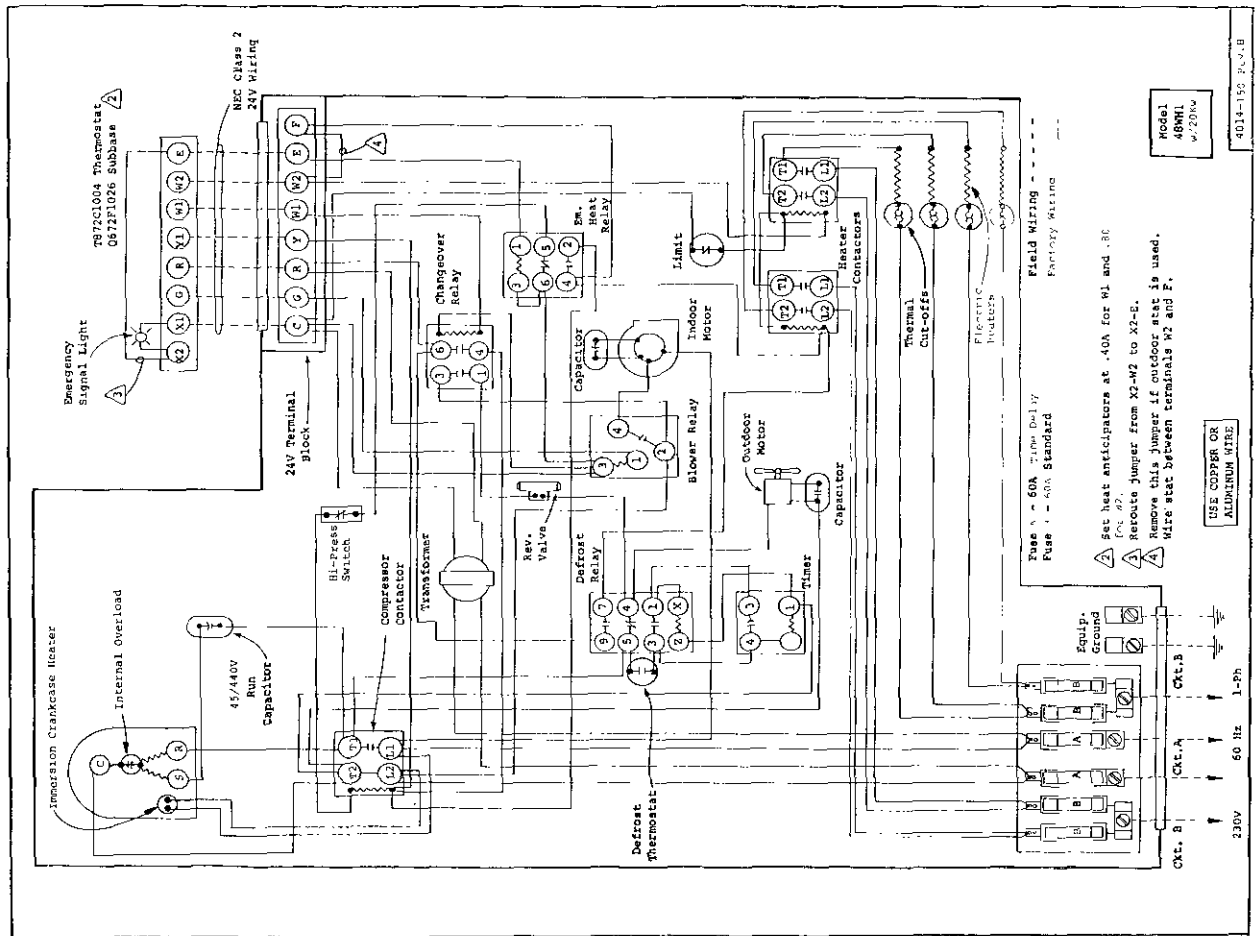


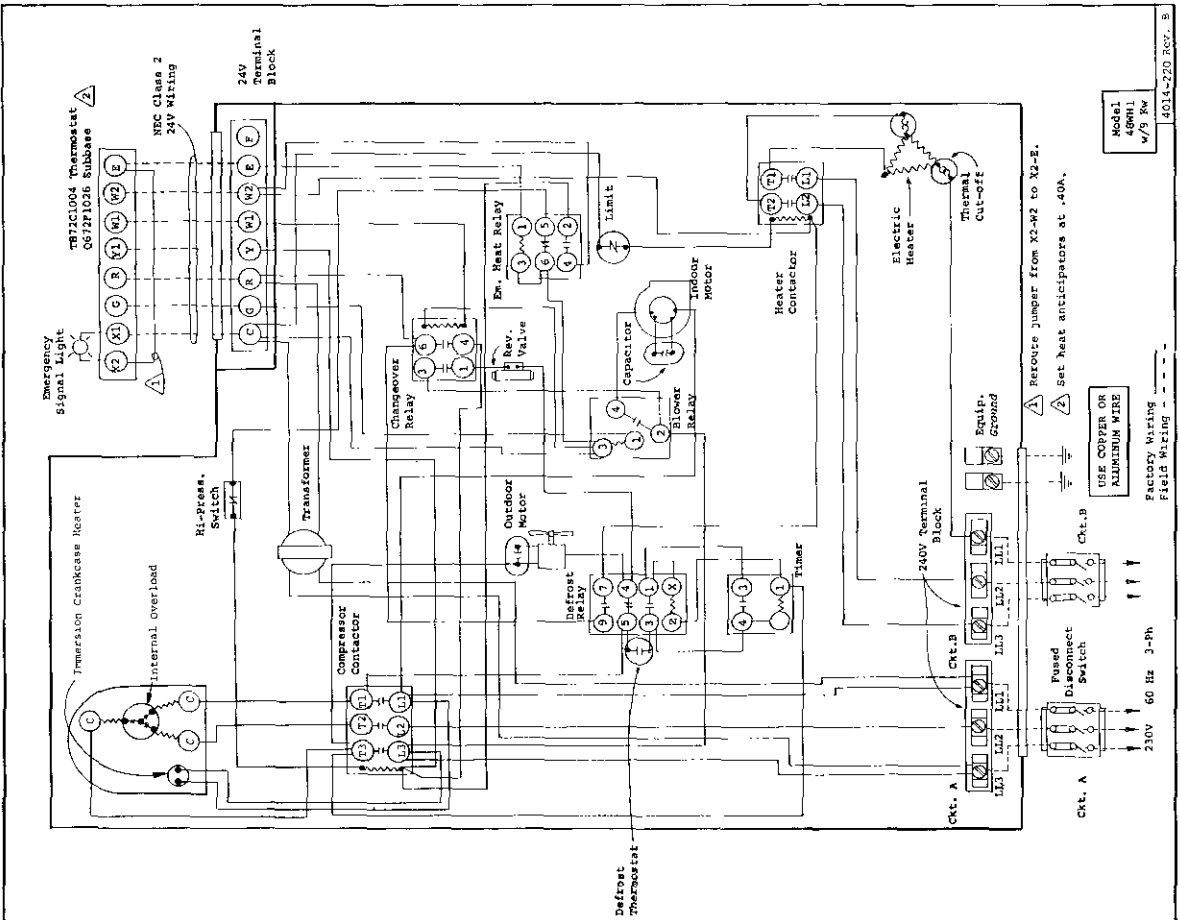
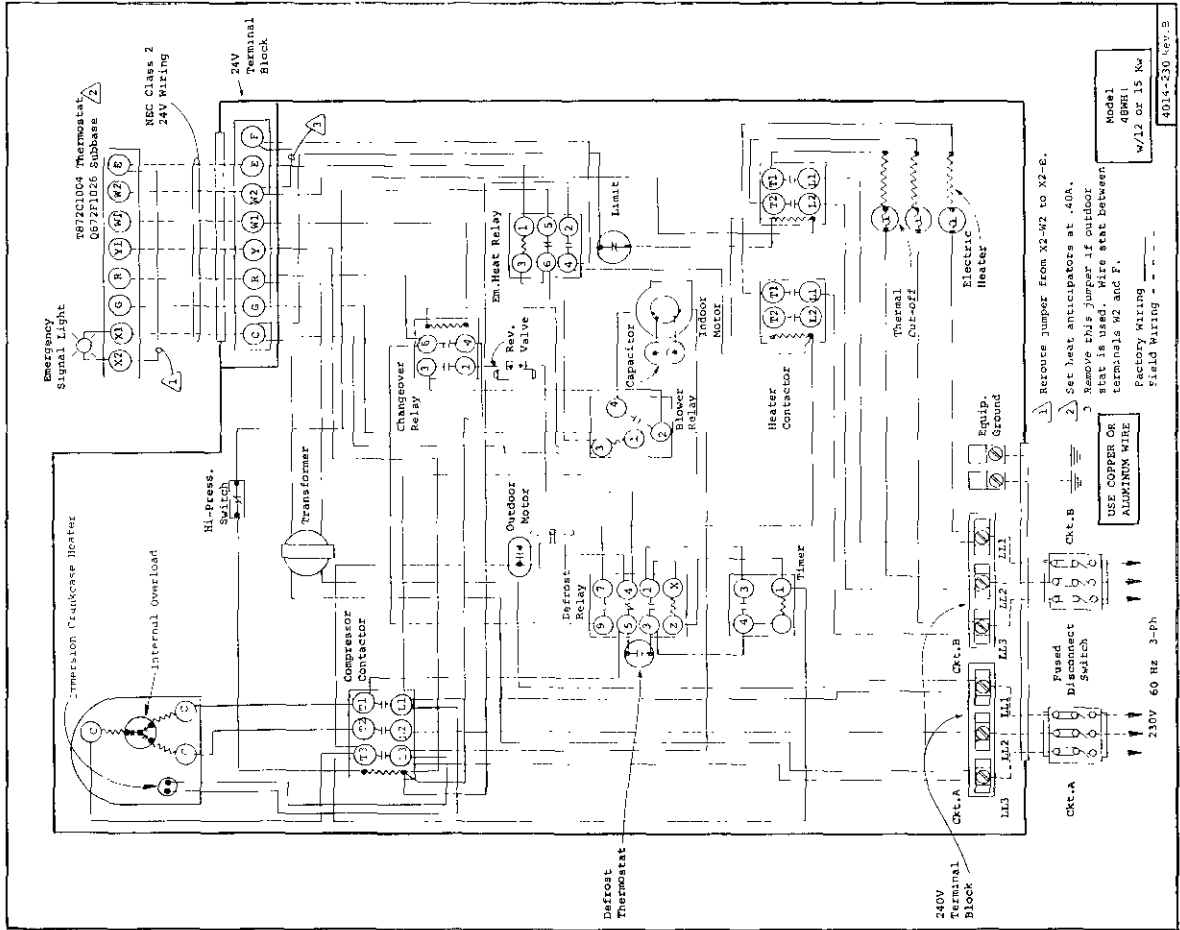






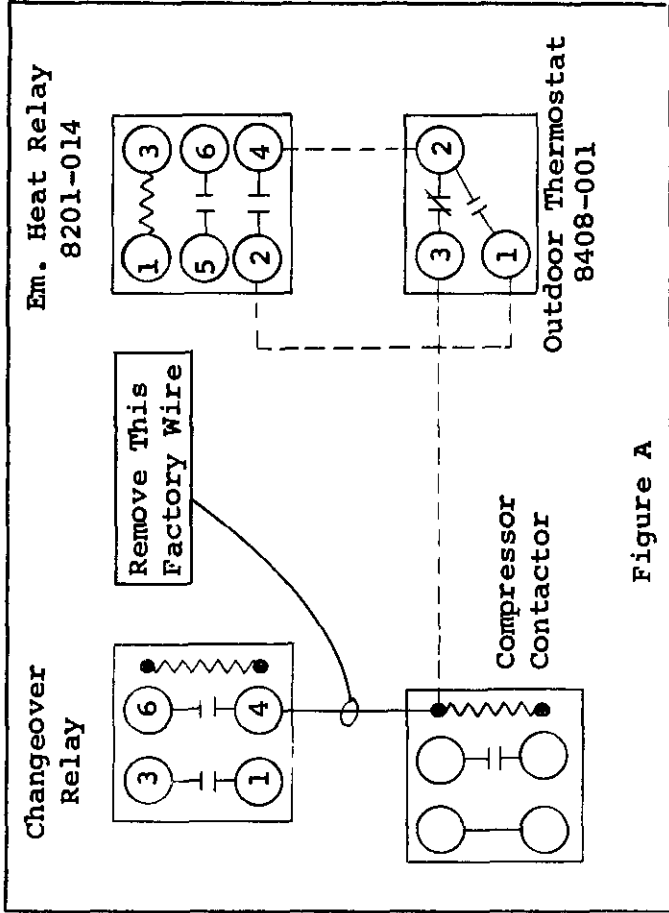
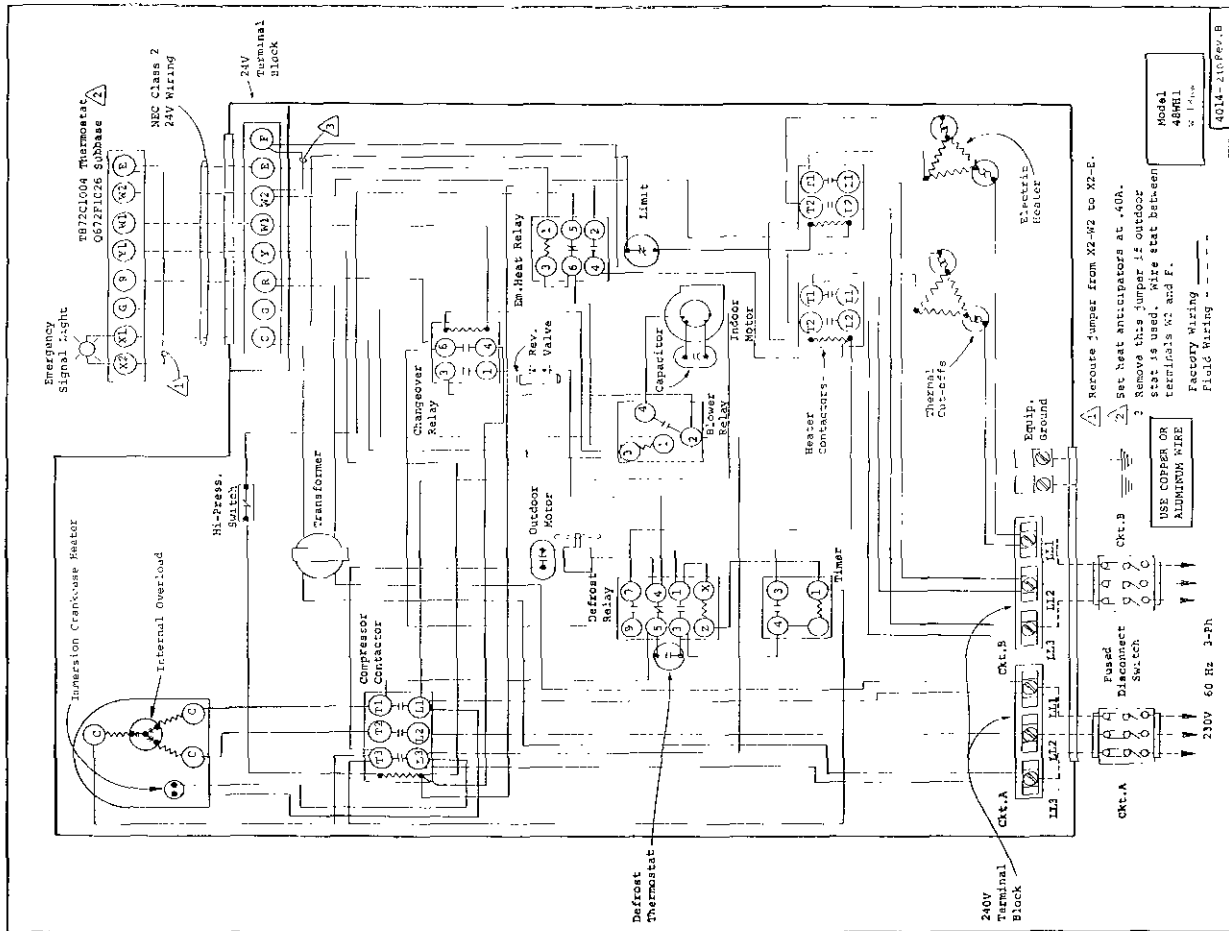






**FIELD INSTALLATION OF COMPRESSOR CUT-OFF**

1. Mount A-22 thermostat, Bard Part No. 8408-001, so that sensing capillary senses the air temperature in the vicinity of the outdoor fan, and shielded from the sun.



**Figure A**

ALPHABETICAL PARTS LIST  
SINGLE PACKAGE HEAT PUMPS

PART NO.	DESCRIPTION	18WH1	20WH	24WH1	30WH	36WH1	48WH1	36WH1-3	48WH1-3	48WH1-3
5702-001	Accumulator	x	x	x	x	x	x	x	x	x
5702-003	Accumulator	x	x	x	x	x	x	x	x	x
5702-004	Accumulator	x	x	x	x	x	x	x	x	x
5702-007	Accumulator	x	x	x	x	x	x	x	x	x
5152-030	Blower Housing 9-7	x	x	x	x	x	x	x	x	x
5152-026	Blower Housing 10-8	x	x	x	x	x	x	x	x	x
5152-028	Blower Wheel 9-7	x	x	x	x	x	x	x	x	x
5152-029	Blower Wheel 9-7	x	x	x	x	x	x	x	x	x
5152-011	Blower Wheel DD10-8A	x	x	x	x	x	x	x	x	x
5152-012	Blower Wheel DD10-8A	x	x	x	x	x	x	x	x	x
8557-007	Capacitor 20/15-370V	x	x	x	x	x	x	x	x	x
8552-012	Capacitor 35/440V	x	x	x	x	x	x	x	x	x
8552-001	Capacitor 4/370V	x	x	x	x	x	x	x	x	x
8552-07	Capacitor 45/440V	x	x	x	x	x	x	x	x	x
8552-033	Capacitor 10/370V	x	x	x	x	x	x	x	x	x
8552-020	Capacitor 35/370V	x	x	x	x	x	x	x	x	x
8552-022	Capacitor 20/370V	x	x	x	x	x	x	x	x	x
8552-022	Capacitor 5/370V	x	x	x	x	x	x	x	x	x
5811-021	Cap Tube - Cool	x	x	x	x	x	x	x	x	x
5811-023	Cap Tube - Heat	x	x	x	x	x	x	x	x	x
5811-027	Cap Tube - Heat	x	x	x	x	x	x	x	x	x
5811-022	Cap Tube - Cool	x	x	x	x	x	x	x	x	x
5811-020	Cap Tube - Heat	x	x	x	x	x	x	x	x	x
5811-018	Cap Tube - Heat	x	x	x	x	x	x	x	x	x
5811-014	Cap Tube - Cool	x	x	x	x	x	x	x	x	x
5811-023	Cap Tube - Heat	x	x	x	x	x	x	x	x	x
5811-008	Cap Tube - Cool	x	x	x	x	x	x	x	x	x
5811-006	Check Valve	x	x	x	x	x	x	x	x	x
8600-004	Compressor AH12HT	x	x	x	x	x	x	x	x	x
8600-005	Compressor AH14HT	x	x	x	x	x	x	x	x	x
8600-042	Compressor H2EA793AB	x	x	x	x	x	x	x	x	x
8600-008	Compressor AH301HT	x	x	x	x	x	x	x	x	x
8600-009	Compressor AH302RT	x	x	x	x	x	x	x	x	x
8600-025	Compressor AG11HT	x	x	x	x	x	x	x	x	x
8600-030	Compressor AG11RT	x	x	x	x	x	x	x	x	x
8600-020	Compressor AH302TT	x	x	x	x	x	x	x	x	x
8600-057	Compressor AG11UT	x	x	x	x	x	x	x	x	x
8600-006	Condenser Coil	x	x	x	x	x	x	x	x	x
8600-003	Condenser Coil	x	x	x	x	x	x	x	x	x
8600-029	Condenser Coil	x	x	x	x	x	x	x	x	x
8600-021	Condenser Coil	x	x	x	x	x	x	x	x	x

ALPHABETICAL PARTS LIST  
SINGLE PACKAGE HEAT PUMPS

PART NO.	DESCRIPTION	18WH1	20WH	24WH1	30WH	36WH1	48WH1	36WH1-3	48WH1-3	48WH1-3
8401-007	Contactor - Comp. 25A	x	x	x	x	x	x	x	x	x
8401-003	Contactor - Comp. 30A	x	x	x	x	x	x	x	x	x
8401-002	Contactor - Comp. 25A	x	x	x	x	x	x	x	x	x
8401-006	Contactor - Heater 20A	x	x	x	x	x	x	x	x	x
8605-001	Crankcase Heater	x	x	x	x	x	x	x	x	x
8605-002	Crankcase Heater	x	x	x	x	x	x	x	x	x
8408-004	Defrost Mfg. Plate	x	x	x	x	x	x	x	x	x
8408-002	Defrost Thermostat	x	x	x	x	x	x	x	x	x
5060-007	Evaporator Coil	x	x	x	x	x	x	x	x	x
5060-005	Evaporator Coil	x	x	x	x	x	x	x	x	x
5060-006	Evaporator Coil	x	x	x	x	x	x	x	x	x
5060-021	Evaporator Coil	x	x	x	x	x	x	x	x	x
5151-009	Fan Blade FF1827-4	x	x	x	x	x	x	x	x	x
5151-004	Fan Blade TP2026	x	x	x	x	x	x	x	x	x
5151-021	Fan Blade F15A24-2430	x	x	x	x	x	x	x	x	x
7004-008	Filter 15 x 30-5/8	x	x	x	x	x	x	x	x	x
7004-010	Filter 15x20	x	x	x	x	x	x	x	x	x
8614-007	Fuse - Heater 60A	x	x	x	x	x	x	x	x	x
8614-027	Fuse - Compressor 60A	x	x	x	x	x	x	x	x	x
8614-023	Fuse - TR50	x	x	x	x	x	x	x	x	x
8614-006	Fuse - 30A	x	x	x	x	x	x	x	x	x
8614-013	Fuse Block 20Kw	x	x	x	x	x	x	x	x	x
8614-014	Fuse Block 25Kw	x	x	x	x	x	x	x	x	x
8614-019	Fuse Block 30Kw	x	x	x	x	x	x	x	x	x
8604-041	Heat Strip 4Kw	x	x	x	x	x	x	x	x	x
8604-043	Heat Strip 8Kw	x	x	x	x	x	x	x	x	x
8604-044	Heat Strip 10Kw	x	x	x	x	x	x	x	x	x
8604-042	Heat Strip 9Kw	x	x	x	x	x	x	x	x	x
8604-048	Heat Strip 9Kw	x	x	x	x	x	x	x	x	x
8604-046	Heat Strip 12Kw	x	x	x	x	x	x	x	x	x
8604-049	Heat Strip 6Kw	x	x	x	x	x	x	x	x	x
8604-047	Heat Strip 15Kw	x	x	x	x	x	x	x	x	x
8604-050	Heat Strip 9Kw	x	x	x	x	x	x	x	x	x
8604-051	Heat Strip 12Kw	x	x	x	x	x	x	x	x	x
8604-052	Heat Strip 15Kw	x	x	x	x	x	x	x	x	x
8406-010	High Pressure Switch	x	x	x	x	x	x	x	x	x
8402-031	Limit Switch L155-2.5	x	x	x	x	x	x	x	x	x
8402-029	Limit Switch L160-2.5	x	x	x	x	x	x	x	x	x

ALPHABETICAL PARTS LIST  
SINGLE PACKAGE HEAT PUMPS

PART NO.	DESCRIPTION	18WH1	20WH	24WH1	30H0E	36WH1	36WH1-3	48WH1	48WH1-3	48WH1-3	48WH1-3
8102-002	Motor - Blower 1/6	x	x	x	x	x	x	x	x	x	x
8105-003	Motor - Blower 1/3	x	x	x	x	x	x	x	x	x	x
8106-005	Motor - Blower 1/2	x	x	x	x	x	x	x	x	x	x
8103-009	Motor - Fan 1/5	x	x	x	x	x	x	x	x	x	x
8105-005	Motor - Fan 1/3	x	x	x	x	x	x	x	x	x	x
8200-001	Motor Mount - Fan	x	x	x	x	x	x	x	x	x	x
8200-004	Motor Mount - Fan	x	x	x	x	x	x	x	x	x	x
8201-008	Relay - Blower	x	x	x	x	x	x	x	x	x	x
8201-013	Relay - Changeover	x	x	x	x	x	x	x	x	x	x
8201-018	Relay - Defrost	x	x	x	x	x	x	x	x	x	x
8201-015	Relay - Emergency Heat	x	x	x	x	x	x	x	x	x	x
5650-004	Reversing Valve	x	x	x	x	x	x	x	x	x	x
5650-005	Reversing Valve	x	x	x	x	x	x	x	x	x	x
5650-006	Reversing Valve	x	x	x	x	x	x	x	x	x	x
5650-002	Solenoid Coil	x	x	x	x	x	x	x	x	x	x
5210-004	Strainer	x	x	x	x	x	x	x	x	x	x
5210-002	Strainer	x	x	x	x	x	x	x	x	x	x
5210-003	Strainer	x	x	x	x	x	x	x	x	x	x
8607-006	Terminal Board 24V	x	x	x	x	x	x	x	x	x	x
8607-001	Terminal Block 230V	x	x	x	x	x	x	x	x	x	x
8607-002	Terminal Block 230V	x	x	x	x	x	x	x	x	x	x
8607-003	Terminal Block 230V	x	x	x	x	x	x	x	x	x	x
8402-030	Thermal Cut-off	x	x	x	x	x	x	x	x	x	x
8402-032	Thermal Cut-off	x	x	x	x	x	x	x	x	x	x
8612-008	Timer	x	x	x	x	x	x	x	x	x	x
8407-015	Transformer	x	x	x	x	x	x	x	x	x	x
8407-004	Transformer-Stepdown	x	x	x	x	x	x	x	x	x	x
8407-003	Transformer-Stepdown	x	x	x	x	x	x	x	x	x	x

IMPORTANT

PURCHASER'S RESPONSIBILITIES

Below are the responsibilities of the purchaser and these items cannot be considered as defects in workmanship or material.

1. Air filter cleaning or replacement.
2. Failure to operate due to improper air distribution over indoor and outdoor equipment sections.
3. Failure to start due to voltage conditions, blown fuses or other damage due to inadequacy or interruption of electrical service.
4. Damage caused directly or indirectly by improper installation.
5. Damage due to lack of proper and periodic maintenance.
6. Damage resulting from transportation, moving or storage of unit.
7. Unit must be readily accessible for servicing and/or repair at all times.
8. Any adjustment or service to the unit should be made by qualified service personnel.
9. Misapplication of product.

MODEL NO. \_\_\_\_\_ SERIAL NO. \_\_\_\_\_ DATE  
INSTALLED \_\_\_\_\_

INSTALLER: Please fill in above blanks and leave  
this manual with equipment owner/operator.