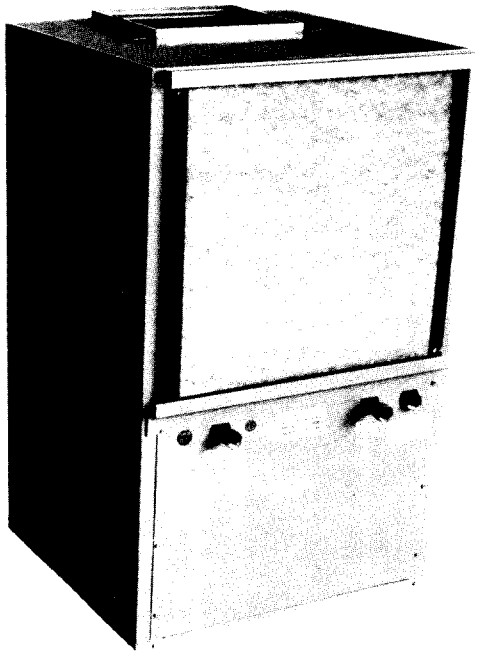
INSTALLATION AND OPERATING INSTRUCTION MANUAL



STANDARD FEATURES

All WPH Models are constructed of heavy gauge, painted and insulated galvanized steel. Each unit includes:

- Hermetic Compressor with crankcase heat
- Copper-tube, aluminum fin indoor coil
- Co-axial condenser with steel outer tube, cupronickel inner tube
- Direct drive blower (belt drive available on 3 phase units)
- High and Low pressure safety controls
- Service Connections — both high and low pressure
- Special connections for installation of accessory water valves to control water flow if required
- Reversing Valve to control refrigerant flow path for heating and cooling cycles
- Bi flow expansion valve for refrigerant control
- Factory mounted air filter
- Lockout Circuit with relay to allow remote resetting of safety controls
- Insulated and mastic lined galvanized steel condensate drain pan
- Special control circuit to allow use of standard manual changeover thermostat or deluxe auto-changeover thermostat with second stage control for supplemental heaters
- Specifications subject to change without notice

CAUTION: READ INSTRUCTION AND RULES FOR SAFE OPERATION CAREFULLY.	THIS MANUAL IS APPLICABLE AS USE & CARE REFERENCE

SAFE OPERATION RULES

Please take a few minutes to read our instructions before you install and use your air conditioner. This will help you obtain the full value from your air conditioner. It will also help you avoid any needless service costs that result from causes we cannot control and cannot cover in our warranty.

Follow these rules and the instructions carefully. Failure to do so could cause a malfunction of the air conditioner, resulting in injury, death and/or property damage.

Check local codes and utility standards. The installation must comply with their rules.

Always shut off electric power before making unit connections or removing any panels.

During installation or servicing, be extremely careful to avoid injury. Components may have sharp edges or protrusions which can cut you. Tubing and compressor contain high pressure refrigerant — they must not be exposed to high temperature or be punctured.

WATER-TO-AIR
PACKAGED HEAT PUMPS

WPH SERIES J	—	DIRECT DRIVE MODELS 22-64
WPH SERIES JB	—	BELT DRIVE MODELS 32-64 (3 PHASE)
WPH SERIES JH	—	DIRECT DRIVE MODELS WITH INSTALLED HEAT RECOVERY UNITS FOR DOMESTIC WATER HEATING

FORM #527 - 359 Rev. A (0996)

GENERAL —
MODEL WPH Series J . . . . . .

HIGH PERFORMANCE . . . HIGH EFFICIENCY

Model WPH water-to-air heat pumps allow comfort cooling and heating from a single source . . . water. The source may be a well or other large body of relatively constant temperature water, as low as 45°F, or a closed loop system utilizing a cooling tower and boiler. Closed loop systems are normally used on multiple unit installations, while a well is often used in residential and light commercial installations. A field-installed water pump is required to assure a continuous flow of water to the unit whenever the compressor is in operation.

Water source heat pumps provide very efficient operation on both heating and cooling cycles, since the water is normally maintained at a constant temperature. High energy-efficiency ratios associated with water-cooled operation provide lower operating costs, and heating coefficient of performance is unusually high.

INSPECTION OF UNIT

After removing the carton from the unit, the panels should be immediately removed to inspect for any damage which might have occurred during shipment. Concealed damage must be reported immediately to the transportation company and request inspection.

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Follow these rules and the instructions carefully. Failure to do so could cause a malfunction of the air conditioner, resulting in injury, death and/or property damage.

Check local codes and utility standards. The installation must comply with their rules.

Always shut off electric power before making unit connections or removing any panels.

INSTALLING THE EQUIPMENT

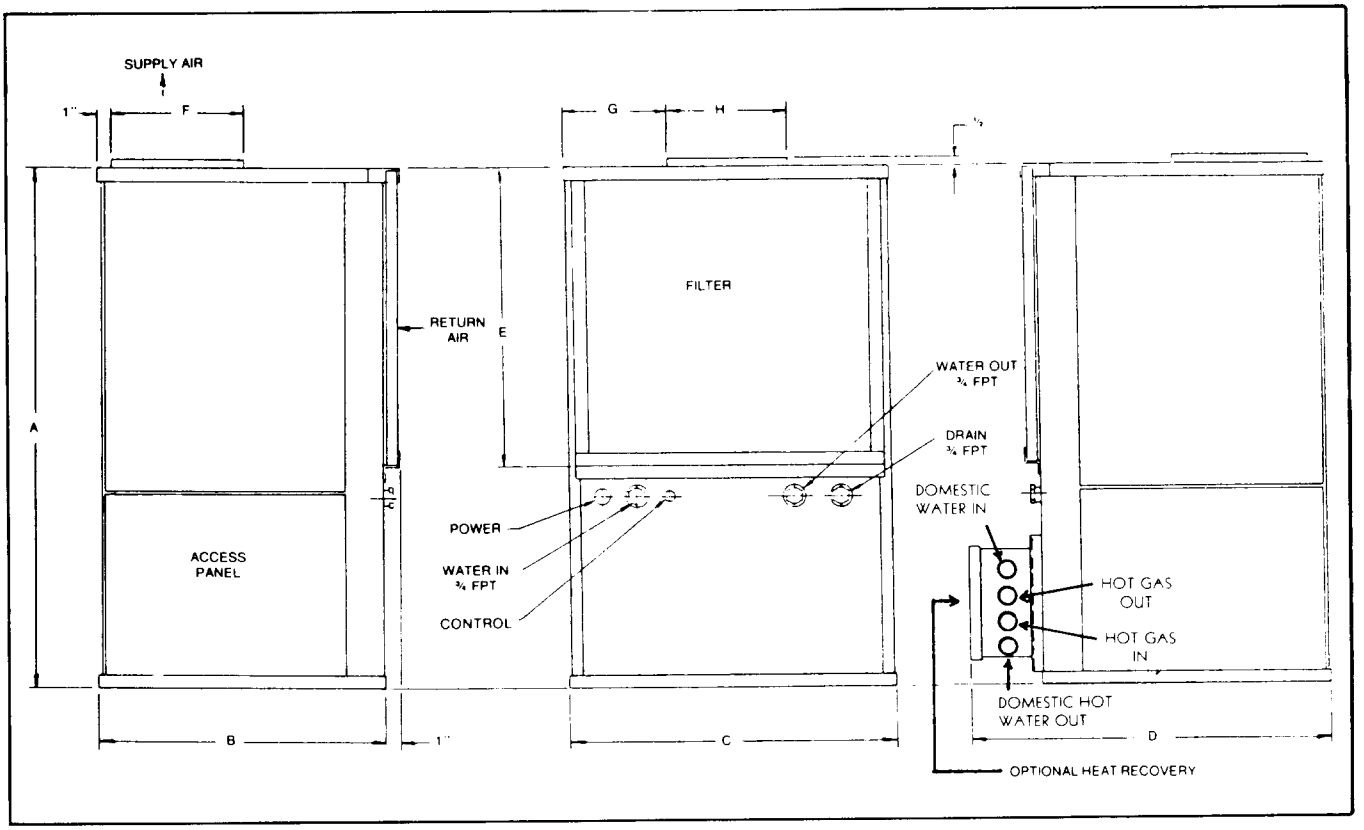
Before setting the unit in place, consider which side of the unit is most accessable for service. Move the control box to that side if different than shipped. Facing the unit with the return air on the right is the normal side for the control panel.

Normal unit sound level must be considered when unit location is next to sleeping areas. Sound attenuation maybe required.

CONTROL PANEL

The control panel is designed to be easily relocated from one side to the other. To accomplish this, remove the bottom panels permitting access to the control panel area. Remove the screw holding the cover in place and remove the cover. Remove the screws in the bottom of the panel which hold the control panel to the compressor base. CAREFULLY slide the panel and connected wires through the opening between the compressor and water coil to the other side of the unit. Remount the panel onto the compressor base using the screws and holes provided. Replace the cover. Using the brackets provided in the unit, reposition the wiring harness to prevent wires from touching the compressor body. Use additional tie wraps if needed.

DIMENSIONS



MODEL	A	B	C	D	E	F	G	H
WPH 22-28	38	21	21	27 1/2	20 1/4	10 1/4	5 29/32	9 3/16
WPH 32-36-44	40	23	24 7/8	29 1/2	22 3/8	10 1/4	6 17/32	11 13/32
WPH 54-64	48	24	34 3/16	30 1/2	24 1/2	11 3/8	10 3/4	13 1/4

* DIMENSIONS IN INCHES

INSTALLING THE EQUIPMENT .....

The unit may be installed inside the house, in a closet or a utility room, but only if adequate space is allowed for servicing the unit, with at least two feet clearance on each side. However, the unit can be serviced if only one of the two service sides is left open, with two feet clearance.

The unit may also be installed in the garage, but only if the garage will not be exposed to freezing temperatures in the winter.

Before placing the unit, consider the location of condenser water lines in and out, and of the condensate drain line. Consider the accessibility and location of electrical service. Be sure the unit sits on a solid floor, preferably concrete. It is better to put the unit flat on the concrete floor, on a thin rubber or carpet pad. **Do not use vibration pads under the four corners . . .** this can allow the unit base to act like a drum and transmit noise.

Do not locate the unit so that a return air grille is right next to the unit. This can allow blower sound to be transmitted through the return air grille, and can cause objectionable sound levels in the occupied room. It is better not to allow a direct straight line from the filter to the return grille, but to have at least one turn to help muffle the sound.

The WPH series is not designed for attic installation. If it is installed over an occupied space, be sure to install a secondary drain pan under the complete unit, as required by local codes. This pan must have its own drain line.

A secondary drain pan is always good insurance against water damage when the unit is installed in an unconditioned space, or in a utility room or closet without a floor drain. A drained secondary drain pan should always be a job requirement if not covered by code.

DUCTWORK

DIRECT DRIVE BLOWER
EVAPORATOR AIR FLOW vs. ESP
WPH-J and JH

WPH	ESP	.10	.15	.20	.25	.30	.35	.40
22	CFM	660	650	635	620	610	570	530
28	CFM	960	920	875	835	790	750	710
32	CFM	1030	990	945	905	860	820	780
36	CFM	1085	1060	1030	1000	965	930	900
44	CFM	1345	1305	1260	1220	1180	1130	1080
54	CFM	1840	1815	1780	1745	1710	1675	1630
64	CFM	2130	2090	2050	2010	1970	1930	1890

NOTE: STANDARD RATING AIR FLOW IN CFM IS SHOWN IN SHADED BLOCKS. SINCE FILTER IS FURNISHED WITH UNIT, TOTAL S.P. ABOVE IS AVAILABLE FOR DUCTWORK AND GRILLES.

All ductwork must be installed according to local codes, practices and requirements. Ducts passing through unconditioned spaces must be well insulated, with vapor barrier to prevent condensation.

BELT DRIVE MODELS: WPH32-64 (3/4) JB models have belt drive blowers for special E.S.P. requirements. The drive is set to deliver air at the customer's requirements of stated CFM and E.S.P. The belt drive has an adjustable motor pulley which can be adjusted up or down to trim the air flow for field conditions. After making speed adjustment, check motor amperage with the blower compartment closed. Do not exceed the motor amperage draw.

NOTE: DO NOT FASTEN DUCTWORK TO ANY SIDE OF BLOWER HOUSING EXTENSION. See blower mounting for blower service and removal.

Return and supply connections are shown on the dimensional drawings.

Be sure to install a flexible connector between supply or return duct and the unit, to prevent any vibration transmission from the unit to the duct.

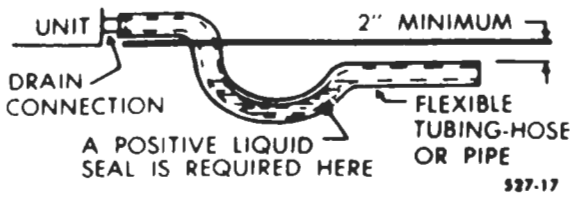
See table for air flow at various external static pressure valves.

Heat pumps are very sensitive to reduced air flow on the heating cycle. Reduced air flow results in high compressor head pressures, inefficient operation and possible nuisance trips of the high pressure control. Always design for full air flow on heat pumps, and insist on frequent filter cleaning.

CONDENSATE DRAINS

INSTALL CONDENSATE DRAIN TRAP (CONNECTED TO PIPE OUTLET) AS SHOWN HERE. DO NOT OPERATE UNIT WITHOUT TRAP. UNIT MUST BE LEVEL OR SLIGHTLY INCLINED TOWARD DRAIN.

If the unit is in unconditioned space, insulate the drain line, particularly inside the unit.



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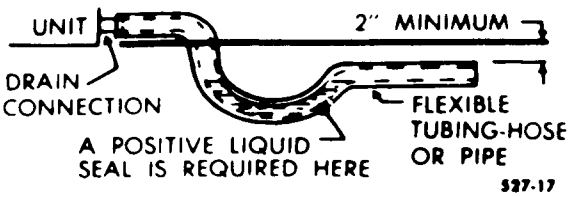
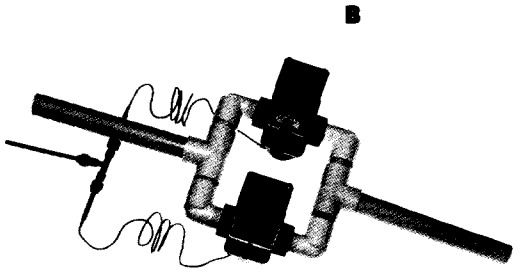


WATER CONNECTIONS

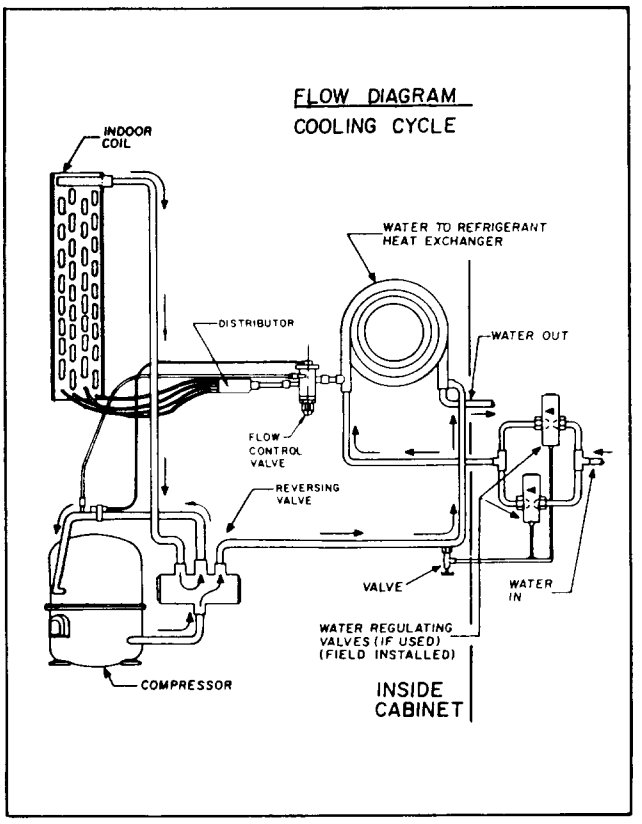
WPH units used on closed loop systems do not require water valves. Many well-water systems do not use water control valves, where there is an adequate supply of constant temperature, non-scaling water at 70°F or above. Water valves may be used to furnish more precise water flow on both heating and cooling cycles, increasing or decreasing flow as required to maintain unit operating pressures at design levels.

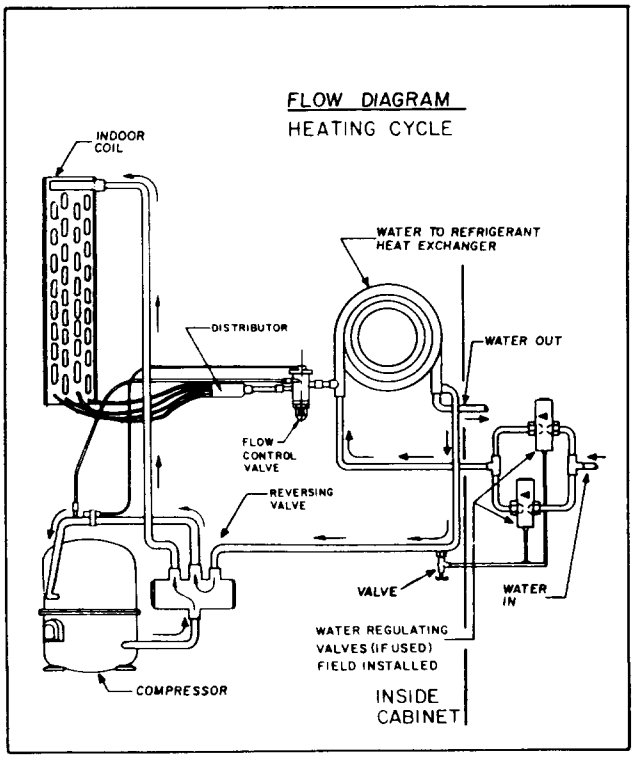
The cooling control valve operates to maintain proper compressor discharge pressure on the cooling cycle. The heating control valve operates to maintain correct compressor suction pressure on the heating cycle. Both valves must be installed so flow direction arrow on the valve body points in the direction of water flow to the unit heat exchanger. Both refrigerant pressure capillaries must be attached to the special service valve installed on the unit.



A

WATER REGULATING VALVES
(For Field Assembly)





Model	Valve Size	A Cooling Valve	B Heating Valve	PRESSURE DROP — WATER REGULATING VALVES										
				GPM	2	4	6	8	10	14	18	22	26	30
WPH 22, 28, 32, 36	½"	V46AB-1	V46NB-2	PSI	3	1.4	3.1	5.5	8.7	17.0				
WPH 44, 54, 64	¾"	V46AC-1	V46NC-2	PSI			1.2	2.1	3.3	6.5	10.7	16.0		
WPH 54, 64	1"	V46AD-1	V46ND-2	PSI					1.4	2.7	4.5	6.7	9.4	12.5

PERFORMANCE DATA

WPH22-J

COOL

EWT	GPM	LWT	QR	PS	PD
45	1.8	78.0	29.7	71-77	187-207
	3.5	62.6	30.8	70-76	141-161
	5.2	57.0	31.1	69-75	124-144
55	1.8	87.2	29.0	73-79	212-232
	3.5	72.1	29.9	72-78	163-183
	5.2	66.7	30.3	71-77	146-166
65	1.8	96.3	28.2	75-81	241-261
	3.5	81.6	29.1	74-80	189-209
	5.2	76.3	29.5	73-79	168-188
75	3.5	90.7	27.5	78-84	215-235
	5.2	85.9	28.3	76-82	195-215
	7.0	83.1	28.5	75-81	184-204
85	3.5	100.4	26.9	79-85	244-264
	5.2	95.6	27.5	78-84	225-245
	7.0	92.9	27.7	77-83	212-232

HEAT

EWT	GPM	LWT	QA	PS	PD
45	3.5	37.8	12.6	51-57	208-228
	5.2	39.9	13.3	54-60	211-231
	7.0	41.1	13.7	57-63	214-234
55	3.5	46.4	15.0	61-67	220-240
	5.2	48.9	15.9	67-73	226-246
	7.0	50.3	16.3	70-76	230-250
65	3.5	55.0	17.5	75-81	236-256
	5.2	57.9	18.5	81-86	243-263
	7.0	59.6	19.0	86-92	246-266
75	1.8	55.9	17.2	73-79	250-270
	3.5	63.6	19.8	90-96	256-276
	5.2	67.0	20.9	97-103	260-280

WPH28-J

COOL

EWT	GPM	LWT	QR	PS	PD
45	2.5	75.2	37.7	70-76	178-198
	5.0	60.6	39.0	69-75	139-159
	7.5	55.5	39.5	68-74	124-144
55	2.5	84.1	36.4	71-77	206-226
	5.0	70.0	37.6	69-75	161-181
	7.5	65.2	38.1	68-74	144-164
65	2.5	93.2	35.2	73-79	234-254
	5.0	79.5	36.3	71-77	186-206
	7.5	74.8	36.7	70-76	168-188
75	5.0	88.6	34.0	74-81	212-232
	7.5	84.3	34.9	73-79	192-212
	10.0	82.0	35.2	72-78	184-204
85	5.0	98.1	32.7	77-83	241-261
	7.5	94.0	33.6	76-82	222-242
	10.0	91.8	33.9	75-81	212-232

HEAT

EWT	GPM	LWT	QA	PS	PD
45	5.0	38.6	15.9	49-55	202-222
	7.5	40.5	16.8	53-59	206-226
	10.0	41.5	17.3	56-62	209-229
55	5.0	47.3	19.3	60-66	215-235
	7.5	49.6	20.4	65-71	218-238
	10.0	50.8	21.0	69-75	221-241
65	5.0	55.9	22.8	73-79	231-251
	7.5	58.6	24.1	79-85	235-255
	10.0	60.0	24.8	83-89	238-258
75	2.5	56.8	22.7	70-76	248-268
	5.0	64.5	26.2	86-92	252-272
	7.5	67.6	27.6	95-101	255-275

WPH32-J

COOL

EWT	GPM	LWT	QR	PS	PD
45	3.0	73.3	42.5	67-73	181-201
	6.0	59.6	43.9	65-72	141-161
	9.0	54.9	44.4	64-70	126-146
55	3.0	82.6	41.4	69-75	209-229
	6.0	69.2	42.7	67-73	163-183
	9.0	64.6	43.2	66-72	148-168
65	3.0	91.9	40.3	69-75	237-257
	6.0	78.8	41.4	68-74	189-209
	9.0	74.3	41.9	67-73	171-191
75	6.0	88.0	39.1	70-76	215-235
	9.0	83.9	40.1	69-75	198-218
	12.0	81.8	40.5	68-74	189-209
85	6.0	97.6	37.8	73-79	247-267
	9.0	93.6	38.8	72-78	228-248
	12.0	91.5	39.1	71-77	219-239

HEAT

EWT	GPM	LWT	QA	PS	PD
45	6.0	38.5	19.5	47-53	202-222
	9.0	40.4	20.6	51-57	206-226
	12.0	41.5	21.2	52-58	209-229
55	6.0	47.6	22.2	58-64	215-235
	9.0	49.8	23.5	63-69	218-238
	12.0	51.0	24.0	66-72	221-241
65	6.0	56.7	25.0	72-78	231-251
	9.0	59.1	26.4	76-82	235-255
	12.0	60.5	27.1	81-87	238-258
75	3.0	58.9	24.2	71-79	248-268
	6.0	65.7	27.9	86-92	252-272
	9.0	68.5	29.4	95-101	255-275

WPH36-J

COOL

EWT	GPM	LWT	QR	PS	PD
45	3.0	74.8	44.7	70-76	187-207
	6.0	60.4	46.2	69-75	141-161
	9.0	55.4	46.8	68-74	126-146
55	3.0	84.5	44.3	71-77	215-235
	6.0	70.2	45.6	69-75	165-185
	9.0	65.2	46.1	68-74	148-168
65	3.0	94.2	43.8	73-79	244-264
	6.0	80.0	45.1	71-77	192-212
	9.0	75.1	45.5	70-76	173-193
75	6.0	89.4	43.3	74-80	218-238
	9.0	85.8	44.5	73-79	204-224
	12.0	82.5	44.9	72-78	192-212
85	6.0	99.3	42.9	77-83	251-271
	9.0	94.8	44.0	76-82	231-251
	12.0	92.4	44.4	75-81	219-239

At standard rated air flow and 80 / 67 air entering cooling coil.

Depending upon return air conditions air flow temperature drops should be from 14° to 20°.

HEAT

EWT	GPM	LWT	QA	PS	PD
45	6.0	37.8	21.6	49-55	208-228
	9.0	39.9	22.9	53-59	211-231
	12.0	41.1	23.4	56-62	214-234
55	6.0	46.8	24.7	61-67	220-240
	9.0	49.2	26.1	65-71	226-246
	12.0	50.1	26.7	69-75	230-250
65	6.0	55.8	27.7	75-81	236-256
	9.0	58.5	29.3	81-87	243-263
	12.0	60.0	30.0	84-90	246-266
75	3.0	57.3	26.6	71-77	250-270
	6.0	64.8	30.7	90-96	256-276
	9.0	67.8	32.3	97-103	260-280

NOTE 1 - At standard rated air flow and 70°F return air.
NOTE 2 - Indoor air temperature difference in heating °F = 25 to 40°F depending on water temperature, GPM and air flow.

QA = BTU/Hr. Heat Absorption at condenser
QR = BTU/Hr. Heat Rejected at condenser
EWT = Entering Water Temperature
LWT = Leaving Water Temperature
PS = Compressor Suction Pressure
PD = Compressor Discharge Pressure

PERFORMANCE DATA

WPH44-J

COOL

EWT	GPM	LWT	Q_R	PS	PD
45	4.0	73.1	56.2	70-76	184-204
	8.0	59.4	58.1	69-75	141-161
	12.0	54.8	58.9	68-74	128-148
55	4.0	82.7	55.4	71-77	212-232
	8.0	69.3	57.2	69-75	165-185
	12.0	64.3	57.8	68-74	148-168
65	4.0	92.4	54.8	73-79	241-261
	8.0	79.1	56.4	71-77	192-212
	12.0	74.5	57.0	70-76	176-196
75	8.0	88.5	54.1	74-81	109-229
	12.0	84.3	55.5	73-79	201-221
	16.0	82.0	56.1	72-78	192-212
85	8.0	98.4	53.4	77-83	251-271
	12.0	94.1	54.8	76-82	231-251
	16.0	91.9	55.2	75-81	222-242

HEAT

EWT	GPM	LWT	Q_A	PS	PD
45	8.0	37.9	28.3	48-54	202-222
	12.0	40.0	29.9	52-58	206-226
	16.0	41.2	30.7	54-60	209-229
55	8.0	47.1	31.7	60-66	215-235
	12.0	49.4	33.4	64-70	218-238
	16.0	50.7	34.4	68-74	221-241
65	8.0	56.2	35.2	73-79	231-251
	12.0	59.3	37.1	79-85	235-255
	16.0	60.2	38.1	83-89	238-258
75	4.0	58.2	33.6	72-78	248-268
	8.0	65.3	38.8	90-96	252-272
	12.0	68.2	40.8	97-103	255-275

WPH54-J

COOL

EWT	GPM	LWT	Q_R	PS	PD
45	4.0	80.1	70.1	67-73	198-218
	8.0	63.1	72.3	65-72	146-166
	12.0	57.2	73.2	64-70	128-148
55	4.0	89.2	68.4	69-75	225-245
	8.0	72.6	70.5	67-73	171-191
	12.0	66.9	71.2	66-72	151-171
65	4.0	98.3	66.7	69-75	254-274
	8.0	82.1	68.5	68-74	195-215
	12.0	76.5	69.2	67-73	173-193
75	8.0	91.2	64.9	70-76	222-242
	12.0	86.1	66.6	69-75	200-220
	16.0	83.4	67.2	68-74	219-239
85	8.0	100.9	63.4	73-79	254-274
	12.0	95.8	64.8	72-78	231-251
	16.0	93.2	65.2	71-77	219-239

HEAT

EWT	GPM	LWT	Q_A	PS	PD
45	8.0	37.1	31.8	48-54	202-222
	12.0	39.4	33.7	52-58	206-226
	16.0	40.1	34.6	54-60	209-229
55	8.0	45.6	37.8	60-66	215-235
	12.0	48.4	39.9	64-70	218-238
	16.0	49.9	41.0	68-74	221-241
65	8.0	54.1	43.8	71-77	231-251
	12.0	57.3	46.3	78-84	235-255
	16.0	69.1	47.4	83-89	238-258
75	4.0	53.5	43.0	67-73	248-268
	8.0	62.6	49.7	86-92	252-272
	12.0	66.3	52.3	93-99	255-275

WPH64-J

COOL

EWT	GPM	LWT	Q_R	PS	PD
45	5.0	77.7	81.7	70-76	187-207
	10.0	61.7	84.4	69-75	141-161
	15.0	56.4	85.4	68-74	124-144
55	5.0	87.0	80.1	71-77	212-232
	10.0	71.5	82.5	69-75	163-183
	15.0	66.1	83.4	68-74	146-166
65	5.0	96.4	78.4	73-79	241-261
	10.0	81.1	80.6	71-77	189-209
	15.0	75.9	81.4	70-76	168-188
75	10.0	90.3	76.6	74-80	215-235
	15.0	85.5	78.6	73-79	195-215
	20.0	82.9	79.3	72-78	184-204
85	10.0	100.0	75.0	77-83	244-264
	15.0	95.2	76.7	76-82	225-245
	20.0	92.8	77.3	75-81	212-232

At standard rated air flow and 80 / 67 air entering cooling coil.

Depending upon return air conditions air flow temperature drops should be from 14° to 20°.

HEAT

EWT	GPM	LWT	Q_A	PS	PD
45	10.0	37.0	39.8	48-54	202-222
	15.0	39.4	42.1	52-58	210-230
	20.0	40.7	43.1	56-62	211-231
55	10.0	46.0	45.1	60-66	217-237
	15.0	48.7	47.6	66-72	223-243
	20.0	50.1	48.8	68-74	226-246
65	10.0	54.9	50.3	73-79	233-253
	15.0	57.9	53.1	79-85	239-259
	20.0	59.5	54.5	84-90	243-263
75	5.0	55.8	48.1	70-76	250-271
	10.0	63.9	55.6	88-94	253-274
	15.0	67.2	58.5	95-101	256-278

NOTE 1 - At standard rated air flow and 70°F return air.
NOTE 2 - Indoor air temperature difference in heating °F = 25 to 40°F depending on water temperature, GPM and air flow.

QA = BTU/Hr. Heat Absorption at condenser
QR = BTU/Hr. Heat Rejected at condenser
EWT = Entering Water Temperature
LWT = Leaving Water Temperature
PS = Compressor Suction Pressure
PD = Compressor Discharge Pressure

ELECTRICAL CONNECTIONS .....

Electrical connections should be made thru the conduit openings provided in the box of the unit. Line voltage connections must be made on the contactor terminals, and low voltage thermostat wires are to be connected to the low voltage. Refer to the wiring diagram in the cover of the unit control box.

Typical ampacity and fusing requirements are shown.

Note: All unit connections are for copper wire only. **DO NOT USE ALUMINUM WIRES ON THE TERMINALS OF THIS UNIT.**

Most local codes have requirements concerning disconnects. They may require a disconnect within sight of the unit. Check your codes.

If using accessory electric heaters, for installation in the ductwork, they must be fused separately in accordance with NEC and local codes and requirements.

Voltage Levels

Abnormally high or low voltage can result in damage to equipment. Always check to see that voltage is within 5% of nameplate rating during normal operation. Unit should function at voltages within 10% high or low, consult your power company and insist on better voltage level or regulation.

ELECTRICAL SERVICE REQUIRED

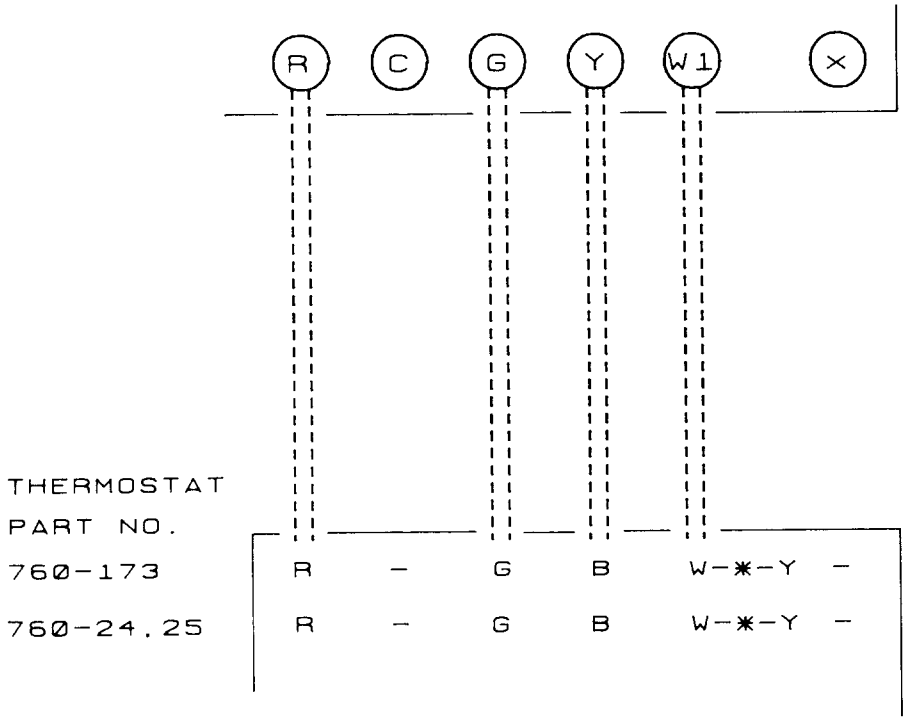
WPH Size	Volts-Phase	Compr. LRA	Compr. RLA	Blower		Min. Circ. Amp.	Max. Fuse Size
				H.P.	FLA	MCA	
22-1J	208/230-1	49.0	8.1	1/5	1.4	12	15
28-1J	208/230-1	61.0	10.0	1/5	1.4	14	20
32-1JA	208/230-1	71.0	12.3	1/2	1.8	18	25
32-3JA	208/230-3	71.0	8.4	1/2	1.8	13	20
32-3JBA	208/230-3	71.0	8.4	1/2	2.2	13	20
32-4JA	460-3	36.0	4.1	1/2	1.1	7	15
32-4JBA	460-3	36.0	4.1	1/2	1.1	7	15
36-1JC	208/230-1	86.0	13.9	1/2	1.8	20	30
36-3JC	208/230-3	71.0	9.3	1/2	1.8	14	20
36-3JBC	208/230-3	71.0	9.3	1/2	2.2	14	20
36-4JC	460-3	36.0	4.6	1/2	1.1	7	15
36-4JBC	460-3	36.0	4.6	1/2	1.1	7	15
44-1JA	208/230-1	95.0	17.2	1/2	1.8	24	40
44-3JA	208/230-3	74.0	10.8	1/2	1.8	16	25
44-3JBA	208/230-3	74.0	10.8	1/2	2.2	16	25
44-JA	460-3	38.0	5.3	1/2	1.1	8	15
44-JBA	460-3	38.0	5.3	1/2	1.1	8	10
54-1JC	208/230-1	129.0	23.8	3/4	4.8	35	50
54-3JC	208/230-3	99.0	13.5	3/4	4.8	22	35
54-3JBC	208/230-3	99.0	13.5	3/4	2.8	20	30
54-4JC	460-3	50.0	7.4	3/4	3.1	13	15
54-4JBC	460-3	50.0	7.4	3/4	1.4	11	15
64-1JC	208/230-1	169.0	28.9	3/4	4.8	41	60
64-3JC	208/230-3	123.0	17.4	3/4	4.8	27	40
64-3JBC	208/230-3	123.0	17.4	3/4	2.8	25	40
64-4JC	460-3	62.0	9.0	3/4	3.1	15	20
64-4JBC	460-3	62.0	9.0	3/4	1.4	13	20

J & JA - Blower Direct Drive
JB & JBA - Blower Belt Drive
1J - 1 Ø 208/230 Volt
3J - 3 Ø 208/230 Volt
4J - 3 Ø 460 Volt

RLA - Rated Load Amps
LRA - Locked Rotor Amps
FLA - Full Load Amps
MCA - Min. Circuit Ampacity

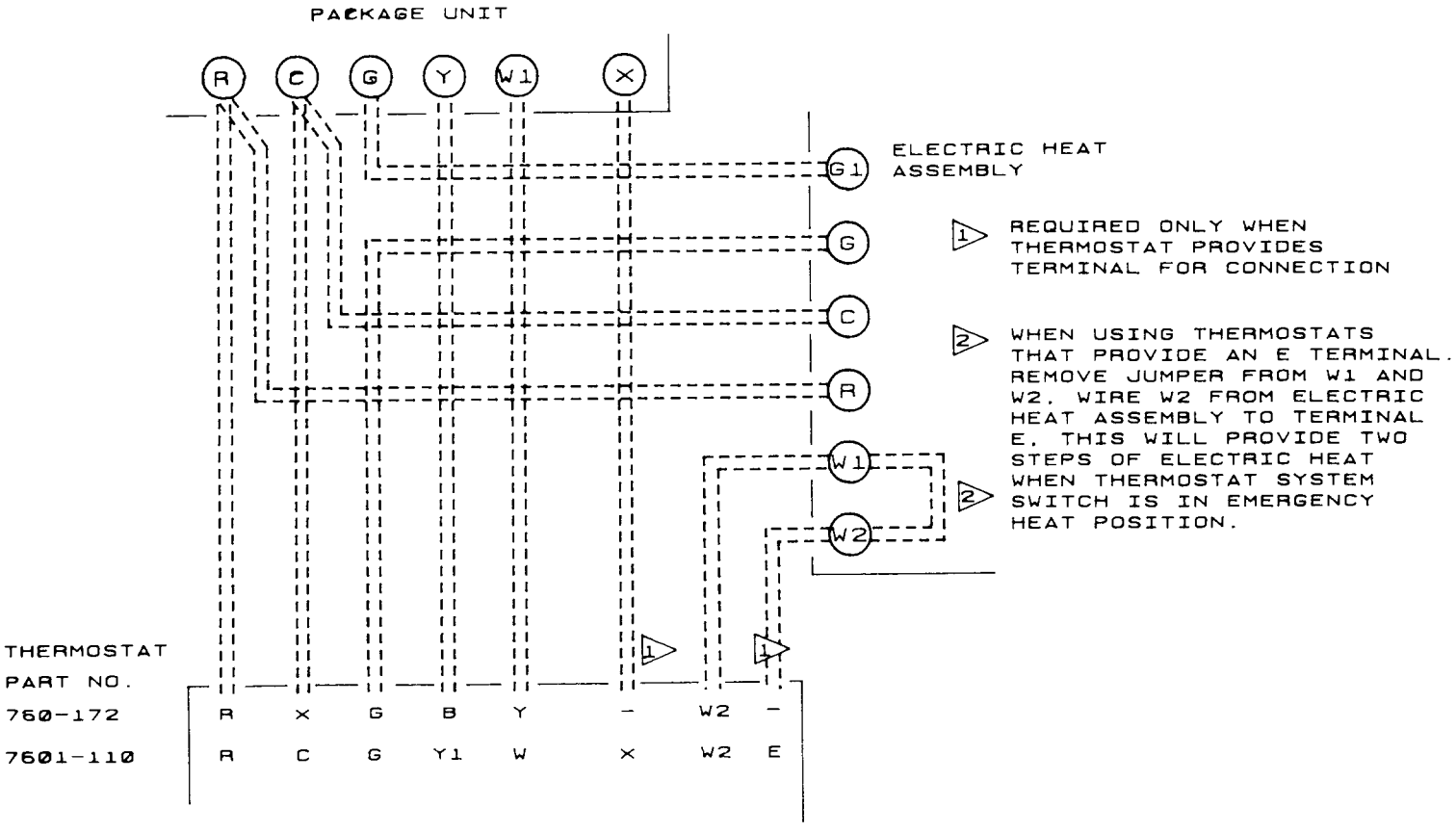
LOW VOLTAGE THERMOSTAT CONNECTIONS

CONNECTION DIAGRAM WITHOUT ELECTRIC HEAT



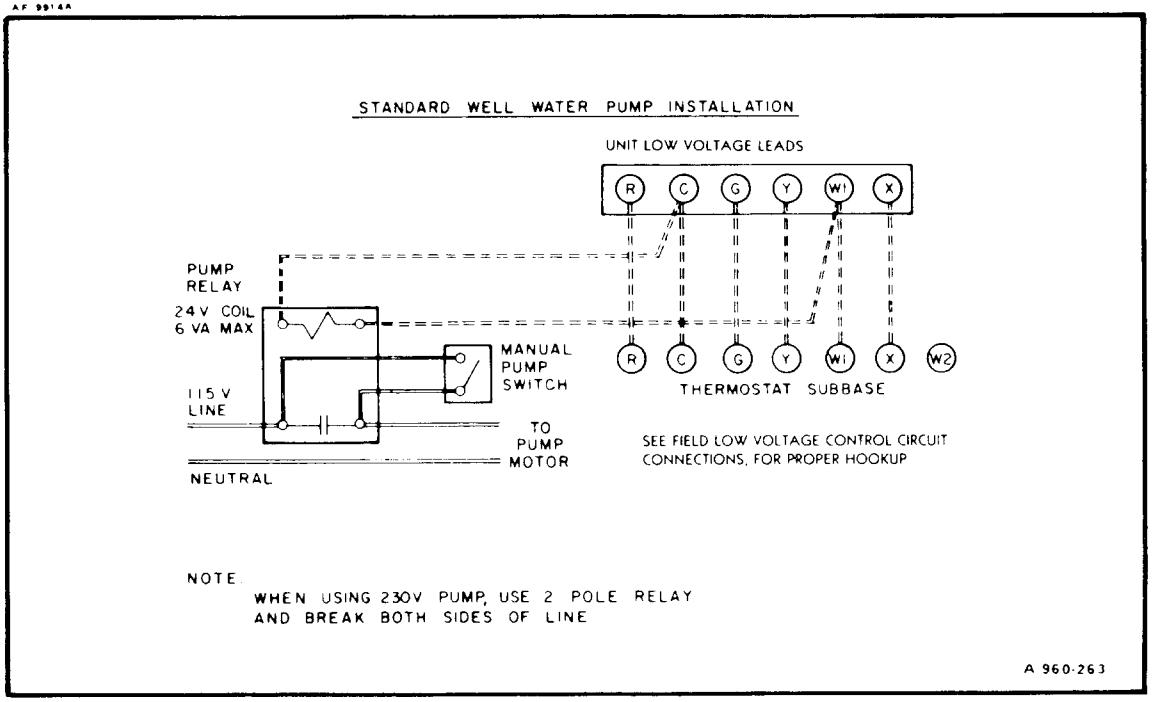
NOTE:
-*- = JUMPER

CONNECTION DIAGRAM WITH ELECTRIC HEAT



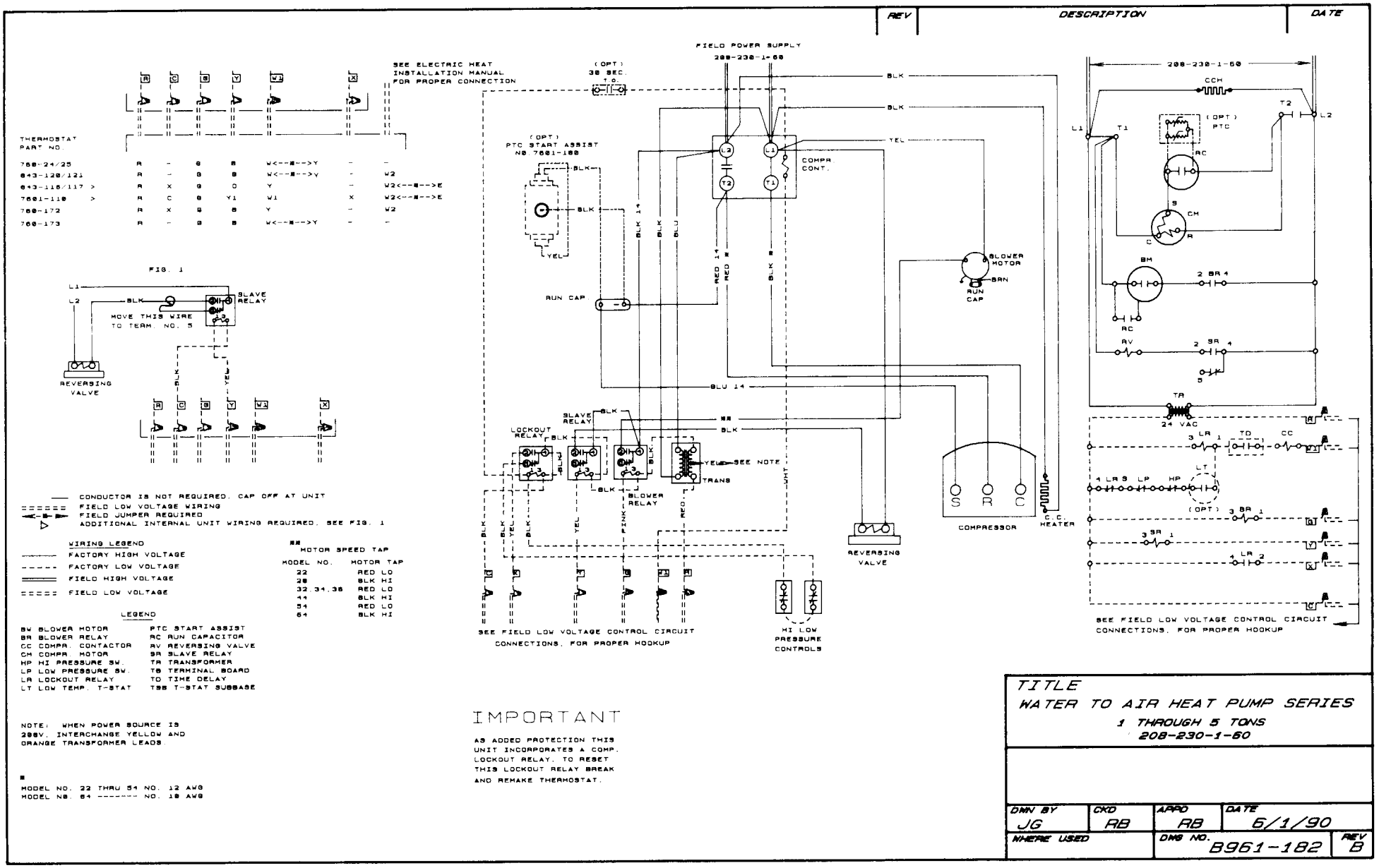
WELL PUMP WIRING

AF 9914A



UNIT WIRING DIAGRAM . . . . . .

SINGLE PHASE MODELS 208/230-1-60

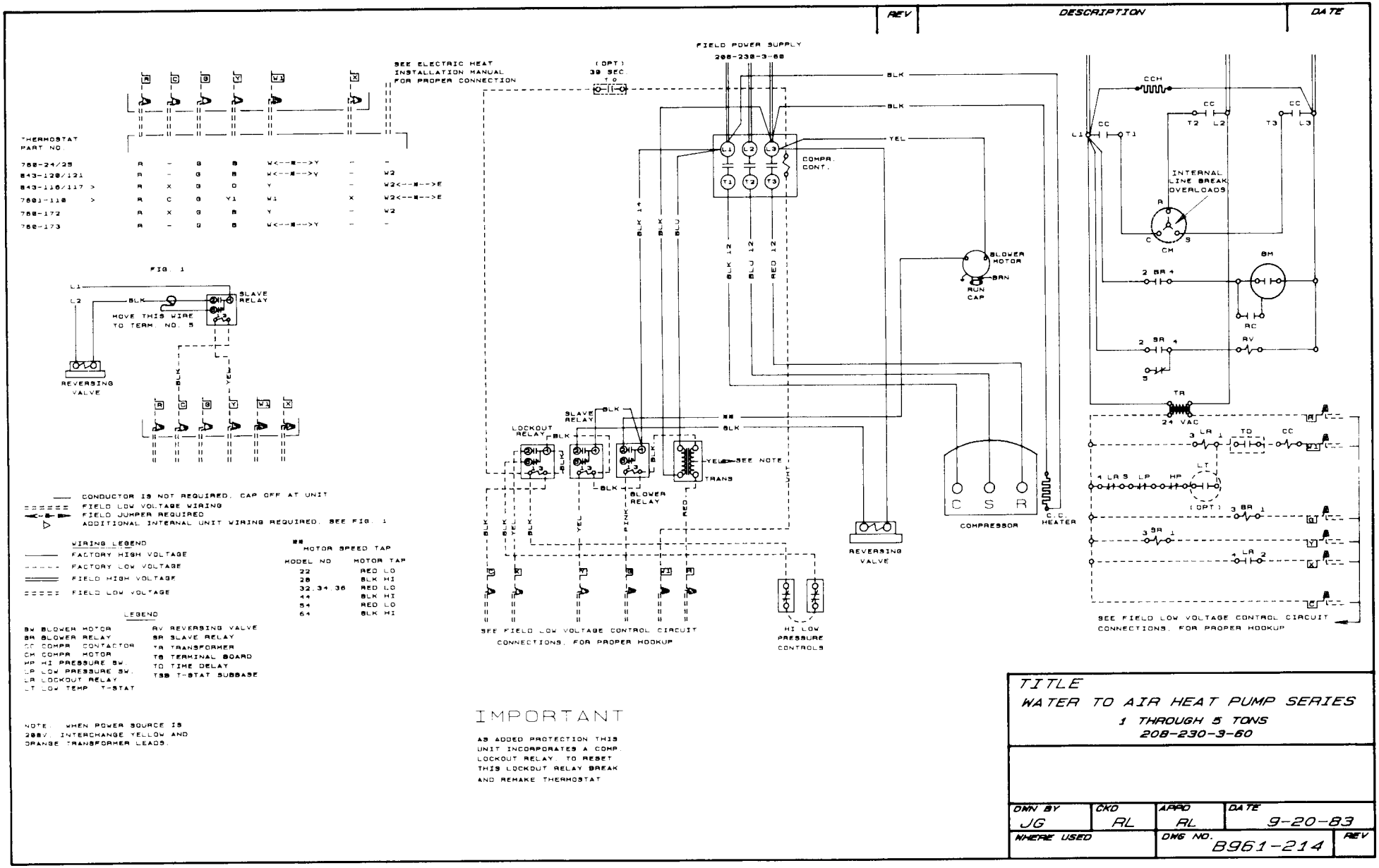


THERMOSTAT PART NO.							
788-24/25	R	-	G	B	W<---B--->Y	-	-
643-120/121	R	-	G	B	W<---B--->Y	-	W2
643-116/117 >	R	X	G	O	Y	-	W2<---B--->E
7661-110 >	R	C	G	Y1	W1	X	W2<---B--->E
788-172	R	X	G	B	Y	-	W2
788-173	R	-	G	B	W<---B--->Y	-	-

TITLE			
WATER TO AIR HEAT PUMP SERIES 1 THROUGH 5 TONS 208-230-1-60			
DWN BY JG	CKD RB	APPD RB	DATE 6/1/90
WHERE USED	DMS NO. B961-182		REV B

UNIT WIRING DIAGRAM . . . . . .

THREE PHASE MODELS 208/230-3-60



THERMOSTAT PART NO.							
788-24/25	R	–	G	B	W<---B--->Y	–	–
843-120/121	R	–	G	B	W<---B--->Y	–	W2
843-116/117 >	R	X	G	O	Y	–	W2<---B--->E
7801-118 >	R	C	G	Y1	W1	X	W2<---B--->E
788-172	R	X	G	B	Y	–	W2
788-173	R	–	G	B	W<---B--->Y	–	–

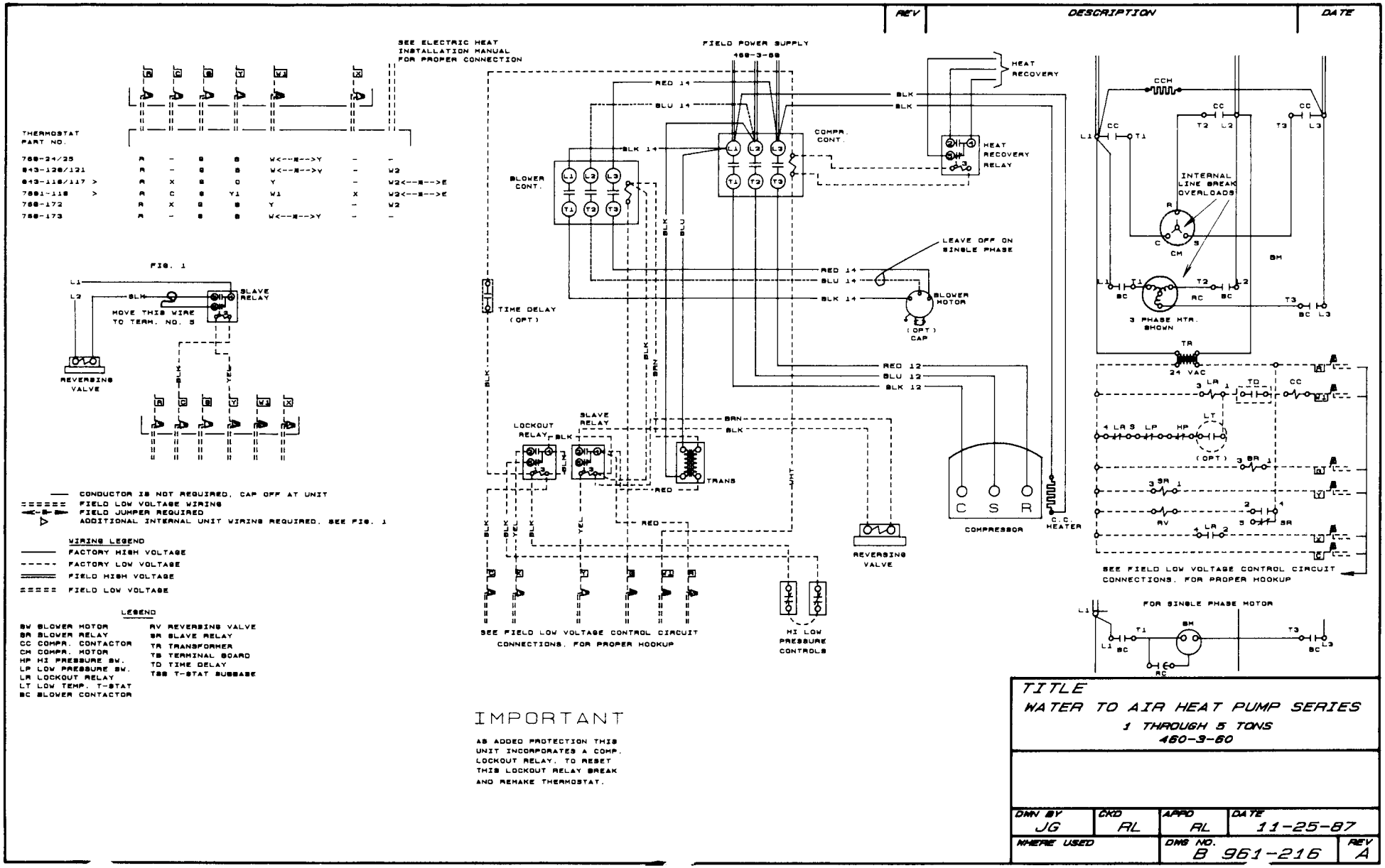
MODEL NO	MOTOR TAP
22	RED LO
28	BLK HI
32,34,36	RED LO
44	BLK HI
54	RED LO
64	BLK HI

BM BLOWER MOTOR	RV REVERSING VALVE
BR BLOWER RELAY	SR SLAVE RELAY
CC COMPR. CONTACTOR	TR TRANSFORMER
CM COMPR. MOTOR	TB TERMINAL BOARD
HP HI PRESSURE SW.	TD TIME DELAY
LP LOW PRESSURE SW.	TSB T-STAT SUBBASE
LR LOCKOUT RELAY	
LT LOW TEMP T-STAT	

TITLE			
WATER TO AIR HEAT PUMP SERIES 1 THROUGH 5 TONS 208-230-3-60			
DWN BY	CKD	APPD	DATE
JG	RL	RL	9-20-83
WHERE USED	DWG NO. B961-214		REV

UNIT WIRING DIAGRAM . . . . . .

THREE PHASE MODELS 460-3-60



THERMOSTAT PART NO.							
768-24/25	R	–	G	B	W<--E-->Y	–	–
843-120/121	R	–	G	B	W<--E-->Y	–	W2
843-116/117 >	R	X	G	O	Y	–	W2<--E-->E
7891-116 >	R	C	G	Y1	W1	X	W2<--E-->E
768-172	R	X	G	B	Y	–	W2
768-173	R	–	G	B	W<--E-->Y	–	–

IMPORTANT

AS ADDED PROTECTION THIS UNIT INCORPORATES A COMP. LOCKOUT RELAY. TO RESET THIS LOCKOUT RELAY BREAK AND REMAKE THERMOSTAT.

TITLE			
WATER TO AIR HEAT PUMP SERIES 1 THROUGH 5 TONS 460-3-60			
DWN BY	CKD	APPD	DATE
JG	RL	RL	11-25-87
WHERE USED		DMS NO. B 961-216	REV A

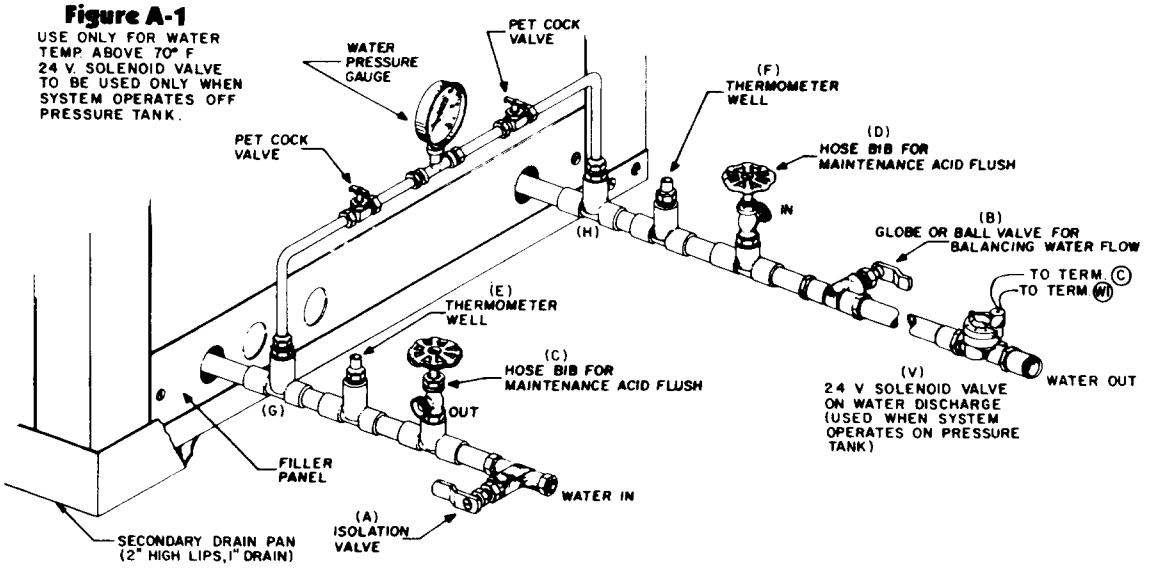
PIPING & WATER REGULATION .....

1. **GROUND WATER FROM 70 F to 85F. (No water pressure tank. Unit and pump cycle together).** Ground water temperatures above 70F. (usually found only in Florida or with artesian wells,) do not require water regulating valves if the water pump supplies only the WPH Unit, and cycles on and off with the unit. See Figure A-1. Two isolation valves (A) and (B) should be used. Valve (B) on the outlet water is a globe valve or balancing cock, and can be used to set correct water flow when the unit is installed. Two hose bibs (C) and (D) should be provided for ease of maintenance by acid flushing when and if required. Two thermometer wells, (E) and (F) should be provided, to read the difference in water temperature in-and-out, to check unit performance. Two Tees (G) and (H) should be provided, to attach a pressure gauge for reading pressure drop across the condenser coil, thus allowing correct water flow to be set. See Pressure Drop Table on page 6. The pressure gauge can be left in the system full time, or it can be installed when the unit is started up, and then only reinstalled for service requiring a check of the water flow.

2. **GROUND WATER from 70F. to 85F. (with pressure tank. Pump cycles on pressure switch.)** The same system as used in (1) above may be used, but a 24v. electric solenoid valve must be used to provide water shut off when the compressor stops. It should be wired to Terminals W1 and C on the low voltage terminal board, so the valve will open when the compressor starts. It is recommended that the valve be put in the water discharge line, as far from the unit as possible. It should be installed outdoors if possible, so that any valve noise will not bother the owner indoors. Putting the valve in the discharge line minimizes the water hammer effect when the valve closes. The valve should be a fast opening, slow closing valve. Since the valve does not prevent water flow out of the lines if a water leak develops, a secondary drain pan should be installed beneath the unit, at least 2" larger than the unit and with lips 2" high, with 1" min. drain line. This will prevent flooding in case a leak develops in the water system inside the unit.

   The 24V. solenoid may be installed in the water inlet line, before the unit. However, water hammer problems may develop, and an expansion tank might have to be installed to prevent them.

Figure A-1

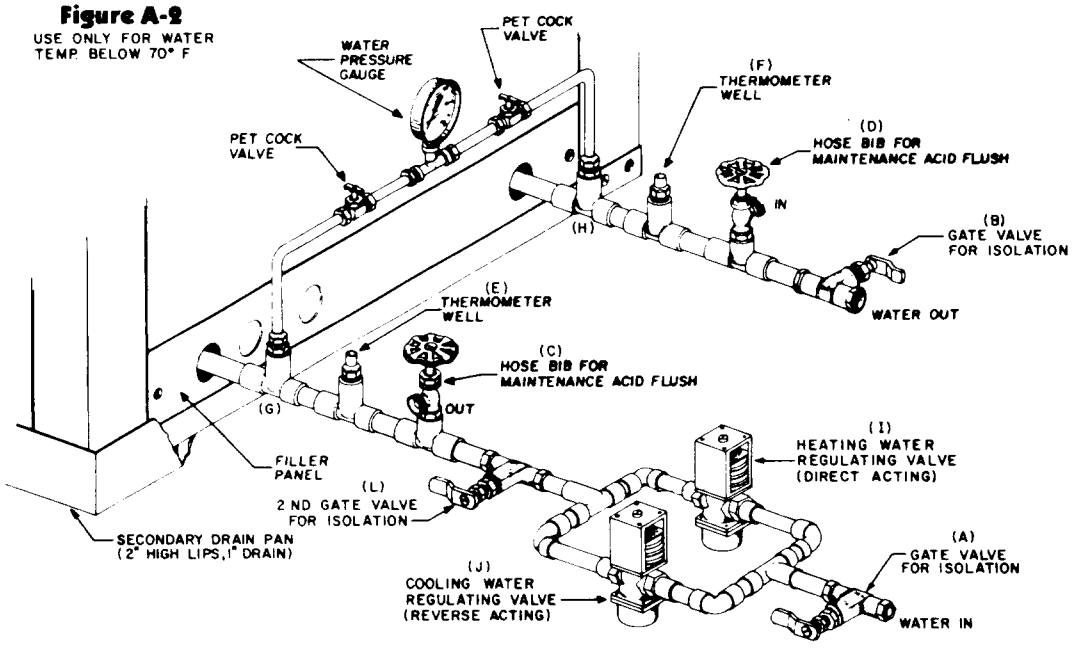


3. **GROUND WATER BELOW 70F. (With or without pressure tank.)** As water temperatures lower than 70F. are used, less water is required on the cooling cycle, and more water is required on the heating cycle. Therefore, automatic water regulating valves should be used. See Figure A-2.

A direct acting valve should be used to control water flow in cooling, by closing to reduce water flow and maintain compressor discharge pressure. See Valve (J) in figure A-2. It should be piped in parallel with a reverse-acting valve to control water flow in heating by opening to keep compressor suction pressure up. See valve (I) in figure A-2. These valves both have refrigerant capillary tubes, which should be piped to a tee (installed in the field) and connected to the special valve located on the common discharge-suction line between reversing valve and condenser coil. A second gate valve, (L) may be installed to isolate the control valves and prevent any damage to them when the system is being acid-flushed. Other piping components are similar to those described above in Section 1 and shown in figure A-1. With a pressure tank system an electric solenoid valve is advisable when water has high dissolved impurities or suspended matter. (SEE *#2)*

See Section 4 for tips on starting after a cold shutdown.

Figure A-2



4. **PRESSURE CUTOUT TRIP ON COLD STARTUP**
Under some conditions on the heating cycle, the low pressure cutout will trip and cause the unit to lock out on its special safety lockout circuit. This generally happens when the unit is installed in a cold space, and can be aggravated by cold water temperatures, failure of the pump to deliver water quickly enough, low water flow, or a combination of these reasons.

Follow these precautions:

a. Install the unit only in a space that will not fall below 65F. If the space is too cold, and if the unit has been shut down and allowed to soak out to the cold temperature, the crankcase heater may not be sufficient to allow the unit to start normally.

b. To furnish more crankcase heat, the wrap-around heater may be disconnected, and the capacitor reconnected to give "Off-Cycle Capacitor Heat". Some models are equipped in this manner from the factory. See applicable wiring diagram.

c. **Always operate the unit with all panels on,** including the **filler plate** in the area where the water piping enters and leaves the unit. This will keep the compressor compartment warmer.

d. If a water storage tank is used, the water may drop to a cold temperature during the night, when the unit is turned off. Then, upon trying to start, the unit sees abnormally cold ground water and the suction pressure dips low enough to trip the safety control. **Insulate the storage tank,** or **move it to a warmer location.** Water lines may also need to be insulated.

e. If the water pump does not deliver the water quickly enough, it may be losing its prime. Have the pump and check valve inspected. If problems still persist, install a time delay to be sure water flow is established before compressor starts.

f. If low water flow is suspected, have it checked and set at the minimum shown for water temperature available and the unit installed.

REMEMBER — The keys to prompt starting on the heating cycle are:

1. **Warm Unit (Min. 65F.)**
2. **Water as warm as possible (Min. 45° - Max. 85°F)**
3. **Adequate water flow**
4. **Compressor compartment panels tight**

START-UP INSTRUCTIONS

The following steps are offered as a general guide to start-up:

a. Before turning power on to the unit, ascertain that the thermostat switch is in the OFF position. Then, turn power on to the unit. All WPH units incorporate crankcase heat and should be allowed to warm up the compressor for about 8 hours before unit operation.

b. Install suction and discharge line gauges on the compressor.

c. Turn the thermostat Fan Switch to the ON position. The indoor blower should operate. Observe that airflow is present. Check the various supply grills in each room, to be sure they are open and properly directed. See that the airflow seems correct, and that no duct dampers are closed to restrict airflow.

d. After being satisfied that airflow is adequate, turn the temperature setting on the thermostat as high as it will go. Then, turn the System Switch to COOL. The compressor should not come on yet. Then, slowly turn the temperature setting down until the thermostat contacts make, calling for cooling. The compressor and water pump should now come on. Check to see that they are operating correctly, with a cold compressor suction line. Let the unit run for long enough to balance out and steady the pressures.

e. Check pressure readings on the suction and discharge gauges. Not until room temperature conditions have been brought closer to normal can you check pressures closer. With rated airflow and return air temperatures of about 80 deg. d.b., 67 deg. w.b., pressures should be approximately as indicated in the following tables:
At above conditions the suction line super heat must be 10°F above saturated temperature.

DEPENDING UPON RETURN AIR CONDITIONS AND AIR FLOW, THE TEMPERATURE DROP ACROSS THE EVAPORATOR SHOULD BE FROM 14° to 20°

In general, pressures will respond to changing conditions as follows:

Return air temp. low
Reduced suction pressure
Low evaporator air flow
Reduced suction pressure
Loss of refrigerant charge
Reduced suction pressure and
Reduced discharge pressure
Reduced water flow
Increased discharge pressure
Restriction in capillary tubes
Reduced suction pressure and
Increased discharge pressure
Reduced entering water temp.
Reduced discharge pressure and
Slight reduced suction pressure
Refrigerant overcharge
Increased discharge pressure
Cold compressor crankcase

f. Always check water temperature rise to ascertain than water flow is correct.

g. After checking the cooling operation, turn the thermostat to the off position for at least 4 minutes. Then, turn the temperature setting to as low as it will go. Switch to the HEAT position. Then, gradually raise the temperature setting until the compressor comes on. See that the unit is providing heat. The unit cannot be properly checked for pressures, etc., on heating until the heating season has started, and room return conditions are in the normal range of 70 degrees dry bulb. However, since the unit was factory operated in both heating and cooling, if you have correct operation in cooling, the heating operation should be satisfactory. Do not run the unit too long in heating with high summer-time return air temperatures. Return at the beginning of the heating season to check the operation.

START-UP INSTRUCTION continued

The Performance Data table will assist in checking water flow; it is good practice to install a thermometer well in both the water-in and water-out lines, in order to check water temperatures. It also includes heat rejection rate, in the event it is necessary to size a cooling tower for the unit (closed loop only).

h. With room return air of 70 degrees dry bulb, on the heating cycle, pressures should be approximately as indicated in the heating table.

A high temperature rise across the evaporator would usually indicate low air flow, due to duct design, grills closed, dampers closed, or dirty filters.

i. With a voltmeter, check to see that the unit is receiving rated voltage. If voltage is high or low, consult the power company.

j. With an ammeter, check to see that the unit is drawing approximately rated current.

k. Check to see the filter is properly positioned and that it is clean.

l. Finally, before leaving the job, check to see that all unit panels are on and correctly positioned, and that the unit seems to be operating normally. INSTRUCT THE OWNER IN THE OPERATION OF THE THERMOSTAT, AND ADIVSE HIM THAT RAPID CYCLING CAN CAUSE THE UNIT TO TRIP ON ITS OVERLOAD. And, check to see that water flow is unrestricted. If sprinklers are to be used, INSTRUCT THE OWNER IN HOW TO OPERATE THE SPRINKLER SYSTEM SO AS NOT TO RESTRICT WATER FLOW. Check to see that the pump cycles correctly.

m. If water regulating valves are used, they must be set as follows:

The cooling valve, (see Valve A on page 5) functions to maintain discharge pressure at the desired level. Following instructions with the valve, adjust it to maintain discharge pressure as given in the cooling performance table in this section.

The heating valve (Valve B on page 5) functions to maintain desired suction pressure on heating. Following the instructions with the reverse acting heating valve, adjust it to maintain suction pressure as given in the heating performance table in this section.

MAINTENANCE PROCEDURES

Proper, regularly scheduled maintenance is important to insure the most efficient operation and longest life for your equipment. The following points are to serve as a general guide. Always consult with your maintenance contractor with regard to the specific requirements of your own installation.

a. Filters — Check the air filters once each month. Wash or change as required.

b. Bearings — Only sealed bearings are used in the evaporator blower motors. Therefore, bearing oiling is not required.

c. Paint Finish — Paint is a three-coat acrylic type giving a durable finish. If paint lifting or peeling occurs, scrape and sand the effected area and touch up with paint obtained from the factory for this purpose.

d. Water system — The pump should be checked whenever filters are cleaned, to assure that it is operating normally. Clogged coils lead to high head pressures and inefficient operation. If coil is limed, acid treatment may be necessary. Condenser coils should be checked yearly for liming or clogging.

e. Refrigerant Pressure — Check at any time unit does not seem to be performing at top efficiency. These should be checked only by a competent service contractor.

f. Contactor Points — Check contactor points twice a year, to be sure they are not burned or pitted as a result of low voltage, lightning strikes, or other electrical difficulties.

g. Condensate Drains — Always check to see that condensate is draining properly from the unit, whenever you check the filters.

h. Evaporator Fans — Be alert for any noise that would indicate blower wheels loose or motors failing.

i. Condensate Drain Pan — Each 6 months, clean and flush evaporator condensate drain pan.

Symptoms:

a. Airflow reduced, leading to poor room conditions.

Possible Trouble & Method of Finding

1. Dirty Filters . . . observe and clean or replace.
2. Loose Blower Wheel . . . observe . . . tighten if necessary.
3. Ductwork Trouble . . . collapsed ductwork, or leaking duct.
4. Dirty coil . . . observe and clean.
5. Dampers Closed . . . check for correct damper position.

b. Intermittent air flow, leading to poor room conditions.

Possible Trouble & Method of Finding

1. Motor overloaded, cutting out on over load protector. Check motor amperage. Check motor relay.
2. Intermittent short in motor. Have motor bench checked at motor shop.
3. Faulty control circuit. Most likely, if contactor is pulling in and out at random. Check thermostat and all control wiring.
4. If on heating, check the thermostat heat anticipator for proper setting.

c. Noisy operation.

Possible Trouble & Method of Finding

1. If noise is blower rotational noise, check blower and motor for faulty adjustment or noisy bearings. Adjust or replace as necessary.
2. If noise is air noise, check for duct restrictions, or for poor ductwork assembly or connections.
3. If chattering contactor, check contactor points, check for adequate control voltage from transformer, and check control circuit for shorts or breaks . . . check thermostat.
4. If noise is in compressor, noise could be broken internal parts, or tubing hits or rattle inside housing, necessitating a compressor change.

d. Compressor will not start.

Possible Trouble & Method of Finding.

1. Loose electrical connections. Check all connections at contactor and compressor terminal box for loose or burned connection or terminal.
2. Refrigerant charge lost, low pressure cutout open. Check for R-22 pressure.
3. No control voltage to the compressor contactor. Check for 24 volts across contactor coil. If no voltage, check for thermostat circuit trouble in the Y circuit, or for compressor safety controls open.
4. Contactor pulled in, but compressor still won't start. Check compressor overload circuit, contactor points, etc.

e. Compressor starts but hums and trips out on overload.

Possible Trouble & Method of Finding

1. If single phase, starting capacitor or accelerating relay could be bad. Check them.
2. If three phase, check current to see if rotor is locked. (It will be drawing LRA amps as stated on nameplate.) Compressor may be seized.
3. Voltage may be low . . . check it.

f. Compressor starts but cuts out on low pressure control.

Possible Trouble & Method of Finding

1. Delayed water flow (heating cycle). Pump may be losing prime on-off cycle.
2. Low on R-22 charge. Add refrigerant.
3. Restriction in liquid line. Check pressures and look for frosting across the restriction.
4. Very low evaporator air flow (cooling cycle). Check for motor direction, dampers closed, insulation off in ducts, etc. Check for dirty evaporator coil.
5. Defective low pressure control. Be sure the control is cutting out at the correct pressure.

g. Compressor starts but cuts out on high pressure control.

Possible Trouble & Method of Finding

1. Condenser coil limed or otherwise restricted. Check it.
2. Air in system. Head pressure will be very high, with approximately normal suction pressure. Purge system and recharge.
3. Defective high pressure control. Be sure the control is cutting out at the right pressure.
4. Reduced water flow or lack of water flow.
5. Reduced evaporator air flow (heating cycle).

h. Compressor runs on heating cycle, but does not heat.

Possible Trouble & Method of Finding

1. Reversing valve may be defective. See that it has shifted.
2. Thermostat may be defective. Check wiring diagram.

i. Unit base pan fills with water.

If base pan fills with water, look for a condensate drain leak, or poorly insulated suction line. Normally, the water that condenses on the condenser coil during the heating cycle will not accumulate in the pan. If it does, contact the factory.

GENERAL SERVICE GUIDE continued .....

j. Running cycle too long, or unit operates continuously, without enough cooling or heating.

Possible Trouble & Method of Finding

1. Leak in system. Check pressures and temperatures. Recharge as required.
2. Dirty or restricted condenser. Check for high head pressure (cooling cycle). Check for visibly reduced water flow. Check for restruction in water lines.
3. Pumps not running correctly. Check for pump operation.
4. Restricted air flow (heating cycle). Check for dirty filters, duct restriction, dampers closed, etc.
5. Air leaks into unconditioned space. Check ductwork.

k. Supply air too hot (cooling).

Possible Trouble & Method of Finding

1. Leak in system. Check pressures.
2. Restriction in liquid line. Check pressures, feel the line.
3. Unit too small for the application. Review sizing methods and cooling load.
4. Coil partially iced or otherwise clogged.
5. Compressor not pumping correctly. Check pressures. Check compressor overloads.

l. Supply air too hot (heating).

Possible Trouble & Method of Finding

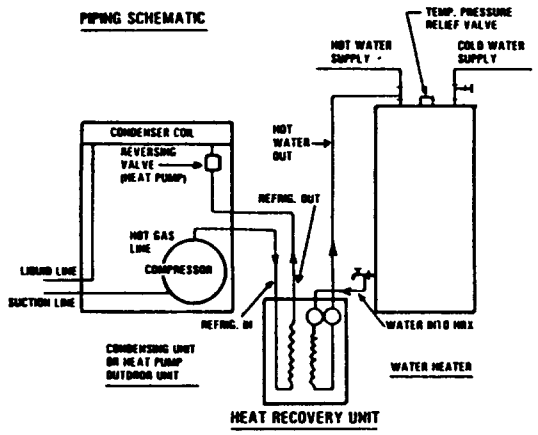
1. Restricted air flow. Check damprs, ductwork, dirty filters, blower wheel and motor operation.

Always remember that the first thing to check is the room thermostat itself. See that the thermostat switches are in the correct position. Turn the unit off at the thermostat, let it stay off for five minutes, and then methodically turn things back on. Follow the startup procedure in Section IX. See what components operate properly, and which do not. For example, if you turn the fan switch on but the fan doesn't start, then you know trouble may lie in the fan relay, the fan motor, or the G circuit controlling the fan. If the compressor doesn't start when the Y cooling bulb makes contact, then you know trouble may lie in the compressor contactor, in safety controls, or somewhere else in the Y circuit controlling the compressor.

Always check the disconnect switch to the unit, the fuses, etc. and the voltage, to see that each phase has good voltage, within 10% of nameplate voltage.

INSTALLATION INSTRUCTIONS FOR WPH-JH SERIES ..... WITH FACTORY INSTALLED HEAT RECOVERY UNIT FOR DOMESTIC WATER HEATING

The WPH-JH has a factory installed waste heat recovery unit on the panel under the return air inlet to the unit. The recovery unit has been factory piped to the refrigeration circuit of the unit. The plumbing to the hot water tank and the power to the recovery pump are to be completed in the field as required.



NOTE: If high pressure switch and/or external muffler are present in the discharge line, they should remain in line between compressor and HRX.

Care should be exercised in plumbing water lines to and from the HRX-5 recovery unit to the hot water tank. The plumbing should be short and hazard free.

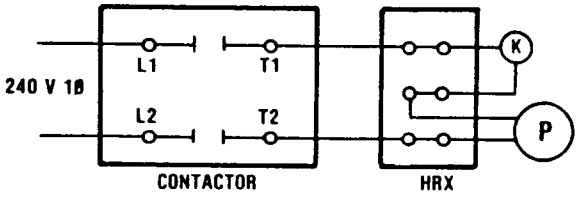
NOTE: It is important that both the water lines be insulated. A run less than 50' one way, use 3/8" OD water lines. A run 50-90' one way, use 1/2" OD water lines.

1. Turn off power to hot water heater (if gas, turn off gas valve).
2. Turn off water supply to hot water heater.
3. Drain tank with hot water faucet open. Make sure tank is completely drained before proceeding.
4. Connect tubing to "water-out" connection of recovery unit. Extend this line to the hot water supply line at the water tank, as close as possible. Attach to hot water supply line with a tee or a saddle valve of not less than 5/16" opening.
5. Connect tubing to "water-in" connection of recovery unit. Extend this line to the drain connection at bottom of the hot water tank. Remove drain fitting and install 3/4" nipple and tee. Re-install drain valve in straight run of tee (across hose bib valve is recommended). Insert a 3/4 MPT x 3/8" or 1/2" adaptor in the other tee opening. Connect "water-in" line of the HRX-5 unit to the hot water tank.

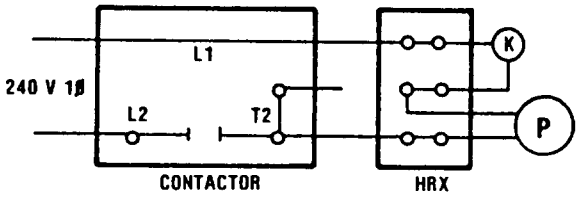
6. Set thermostat as follows:

   Electric; Double element-upper 125 degrees
   lower minimum

   Gas, Oil or Single element - 125 degrees



A—WITH EXTERNAL CRANKCASE HEAT (2 POLE COMPRESSOR CONTACTOR BREAKS BOTH INCOMING LEGS.)



B—WITH INTERNAL CRANKCASE HEAT (1 POLE COMPRESSOR CONTACTOR BREAKS ONE INCOMING LEG, OTHER FEEDS STRAIGHT THROUGH)

7. WIRING:
   Between the HRX-5 and the compressor contractor run two #14 wires with ground wire, in liquid tight cable. Connect to load side of compressor contractor and terminal space in HRX-5 junction box.

8. The piping and wiring is now complete. Turn on water supply to water heater. With an open hot water faucet, allow tank to fill. When filled, turn off faucet, and open bleed port on "water-out" connection of HRX-5 unit. Bleed air from HRX-5 piping. Check HRX and piping for water leaks. Restore power to water heater.

9. On start up of WPH unit, make the following HRX operational checks:

   Check list:

   (1) Pump runs only when compressor runs.

   (2) All air is purged from water lines at tank bib valve and HRX bleed port.

   (3) Verify water circulation to tank, HRX "water-out" line to tank should be hot all the way to the tank.

PARTS LIST — MODEL HRX-5T

Part #	Description
000-035	Taco Pump 00BC3X
000-036	Taco 005-006 Pump Cartridge
000-046	FC050-1 Temperature Flow Control Valve
000-047	Taco Repair Kit (Flow Control Valve)
000-135	36908 Water Shutdown Disc L-150

PARTS LISTS

Standard Replacement Parts — WPH Series J Heat Pumps 1-60-208/230 V.

Unit Model No.	022-1J	028-1J	032-1JA	036-1JC	044-1JA	054-1JC	064-1JC
COMPRESSOR	800-385	800-386	800-387	800-390	800-293	800-464	800-441
MOUNTS	880-11	880-11	880-11	880-11	880-11	880-23	880-23
C.C. HEATER	W/COMP	W/COMP	W/COMP	W/COMP	W/COMP	W/COMP	W/COMP
CONDENSER COIL	512-210	512-211	512-212	512-207	512-207	512-208	512-209
WATER CONNECTIONS	633-2(2)	633-2(2)	633-3(2)	633-3(2)	633-3(2)	633-3(2)	633-3(2)
EVAPORATOR COIL	724-166B	724-167B	724-168B	724-168B	724-169B	724-170B	724-171B
DISTRIBUTOR	564-273	564-314	564-314	564-314	564-314	564-315	564-348
EXPANSION VALVE	564-330	564-330	564-331	564-331	564-332	564-332	564-332
BLOWER W/WHEEL (DIRECT DRIVE)	515-33	515-33	515-13	515-13	515-13	515-28	515-28
MOTOR 2 SPD.	811-213	811-213	811-214	811-214	811-214	811-80	811-80
MOUNT — MOTOR	—	—	—	—	—	704-12	704-12
CAPACITOR — MOTOR	856-15	856-15	856-6	856-6	856-6	856-29	856-29
BOOT — CAP.	165-1	165-1	165-1	165-1	165-1	165-1	165-1
STRAP — CAP.	863-195	863-195	863-195	863-195	863-195	863-195	863-195
HIGH PRESS. CONTROL	844-42	844-42	844-42	844-42	844-42	844-42	844-42
LOW PRESS. CONTROL	844-41	844-41	844-41	844-41	844-41	844-41	844-41
REVERSING VALVE	564-285	564-285	564-411	564-411	564-286	564-286	564-10
REV. VALVE COIL	874-14	874-14	874-14	874-14	874-14	874-14	874-14
SERVICE — SCHRADER	564-241(3)	564-241(3)	564-241(3)	564-241(3)	564-241(3)	564-241(3)	564-241(3)
CORES — VALVE	609-2	609-2	609-2	609-2	609-2	609-2	609-2
CAPS — VALVE	275-2	275-2	275-2	275-2	275-2	275-2	275-2
FILTERS — T.W.	333-32	333-32	333-34	333-34	333-34	333-107	333-107
CONTROL PANEL PARTS							
CONTACTOR — COMP.	841-66	841-66	841-66	841-66	841-66	841-66	841-39
RELAY — BLOWER	821-79	821-79	821-79	821-79	821-79	821-79	821-79
RELAY — SLAVE	821-79	821-79	821-79	821-79	821-79	821-79	821-79
RELAY — LOCKOUT	821-114	821-114	821-114	821-114	821-114	821-114	821-114
TRANSFORMER 24V	846-49	846-49	846-49	846-49	846-49	846-49	846-49
CAPACITOR — RUN	856-110	856-112	856-112	856-114	856-113	856-117	856-79
STRAP — CAP.	797-3	797-3	797-3	797-3	797-3	797-3	797-3
BOOT — CAP.	165-1	165-1	165-1	165-1	165-1	165-1	165-1
WIRING DIAGRAM	B961-182	B961-182	B961-182	B961-182	B961-182	B961-182	B961-182
START ASSIST DEVICE	7601-180	7601-180	7601-180	7601-180	7601-180	7601-180	7601-180

PARTS LISTS continued

Standard Replacement Parts — WPH Series J(B) Heat Pumps 3-60-208/230 V.

Unit Model No.	032-3J(B)A	036-3J(B)C	044-3J(B)A	054-3J(B)C	064-3J(B)C
COMPRESSOR	800-388	800-391	800-393	800-453	800-460
MOUNTS	880-11	880-11	880-11	880-23	880-23
C.C. HEATER	W/COMP	W/COMP	W/COMP	W/COMP	W/COMP
CONDENSER COIL	512-212	512-207	512-207	512-208	512-209
WATER CONNECTIONS	633-3(2)	633-3(2)	633-3(2)	633-3(2)	633-3(2)
EVAPORATOR COIL	724-168B	724-168B	724-169B	724-170B	724-171B
DISTRIBUTOR	564-314	564-314	564-314	564-315	564-348
EXPANSION VALVE	564-331	564-331	564-332	564-332	564-332
DIRECT DRIVE BLOWER W/WHEEL	515-13	515-13	515-13	515-28	515-28
MOTOR 2 SPD.	811-214	811-214	811-214	811-80	811-80
MOUNT — MOTOR	—	—	—	704-12	704-12
CAPACITOR — MOTOR	856-6	856-6	856-6	856-29	856-29
BOOT — CAP.	165-1	165-1	165-1	165-1	165-1
BELT DRIVE BLOWER W/WHEEL	515-1	515-1	515-1	515-18	515-18
PULLEY BLOWER	550-35	550-35	550-35	550-10	550-15
BEARINGS	561-14(2)	561-14(2)	561-14(2)	561-14(2)	561-14(2)
MOTOR BLOWER	811-39	811-39	811-39	811-10	811-10
MOUNT MOTOR	571-521	571-521	571-521	571-515	571-515
PULLEY — MOTOR	551-1	551-1	551-1	551-1	551-1
VEE BELT	549-80	549-80	549-80	549-80	549-80
TAIL PIECE PKG.	571-520	571-520	571-520	571-520	571-520
HIGH PRESS. CONTROL	844-42	844-42	844-42	844-42	844-42
LOW PRESS. CONTROL	844-41	844-41	844-41	844-41	844-41
REVERSING VALVE	564-411	564-411	564-286	564-286	564-10
REV. VALVE COIL	874-14	874-14	874-14	874-14	874-14
SERVICE — SCHRADER	564-241(3)	564-241(3)	564-241(3)	564-241(3)	564-241(3)
CORES — VALVE	609-2	609-2	609-2	609-2	609-2
CAPS — VALVE	275-2	275-2	275-2	275-2	275-2
FILTERS — AIR	333-34	333-34	333-34	333-107	333-107
CONTROL PANEL PARTS					
CONTACTOR — COMP.	841-39	841-39	841-39	841-39	841-39
RELAY — BLOWER	821-79	821-79	821-79	821-79	841-21
RELAY — SLAVE	821-79	821-79	821-79	821-79	821-79
RELAY — LOCKOUT	821-114	821-114	821-114	821-114	821-114
TRANSFORMER 24V	846-49	846-49	846-49	846-49	846-49
WIRING DIAGRAM	B961-214	B961-214	B961-214	B961-214	B961-214

PARTS LISTS continued . . . . . .

Standard Replacement Parts — WPH Series J(B) Heat Pumps 3-60-460 V.

Unit Model No.	032-4J(B)A	036-4J(B)C	044-4J(B)A	054-4J(B)C	064-4J(B)C
COMPRESSOR	800-389	800-392	800-394	800-454	800-461
MOUNTS	880-11	880-11	880-11	880-23	880-23
C.C. HEATER	W/COMP	W/COMP	W/COMP	W/COMP	W/COMP
CONDENSER COIL	512-212	512-207	512-207	512-208	512-209
WATER CONNECTIONS	633-3(2)	633-3(2)	633-3(2)	633-3(2)	633-3(2)
EVAPORATOR COIL	724-168B	724-168B	724-169B	724-170B	724-171B
DISTRIBUTOR	564-314	564-314	564-314	564-315	564-348
EXPANSION VALVE	564-331	564-331	564-331	564-332	564-332
DIRECT DRIVE BLOWER W/WHEEL	515-13	515-13	515-13	515-28	515-28
MOTOR BLOWER	811-151	811-151	811-151	811-154	811-154
MOUNT — MOTOR	704-9	704-9	704-9	704-12	704-12
CAPACITOR — MOTOR	856-6	856-6	856-6	856-29	856-29
BOOT — CAP.	165-1	165-1	165-1	165-1	165-1
BELT DRIVE BLOWER W/WHEEL	515-1	515-1	515-1	515-18	515-18
PULLEY BLOWER	550-35	550-35	550-35	550-10	550-15
BEARINGS	561-14(2)	561-14(2)	561-14(2)	561-14(2)	561-14(2)
MOTOR BLOWER	811-39	811-39	811-39	811-10	811-10
PULLEY — MOTOR	551-1	551-1	551-1	551-1	551-1
VEE BELT	549-80	549-80	549-80	549-80	549-80
TAIL PIECE PKG.	571-520	571-520	571-520	571-520	571-520
HIGH PRESS. CONTROL	844-42	844-42	844-42	844-42	844-42
LOW PRESS. CONTROL	844-41	844-41	844-41	844-41	844-41
REVERSING VALVE	564-411	564-411	564-286	564-286	564-10
REV. VALVE COIL	874-15	874-15	874-15	874-15	874-15
SERVICE — SCHRADER	564-241(3)	564-241(3)	564-241(3)	564-241(3)	564-241(3)
CORES — VALVE	609-2	609-2	609-2	609-2	609-2
CAPS — VALVE	275-2	275-2	275-2	275-2	275-2
FILTERS — AIR	333-34	333-34	333-34	333-107	333-107
CONTROL PANEL PARTS					
CONTACTOR — COMP.	841-39	841-39	841-39	841-39	841-39
RELAY — BLOWER	841-21	841-21	841-21	841-21	841-21
RELAY — SLAVE	821-79	821-79	821-79	821-79	821-79
RELAY — LOCKOUT	821-114	821-114	821-114	821-114	821-114
TRANSFORMER 24V	846-56	846-56	846-56	846-56	846-56
WIRING DIAGRAM	B961-216	B961-216	B961-216	B961-216	B961-216