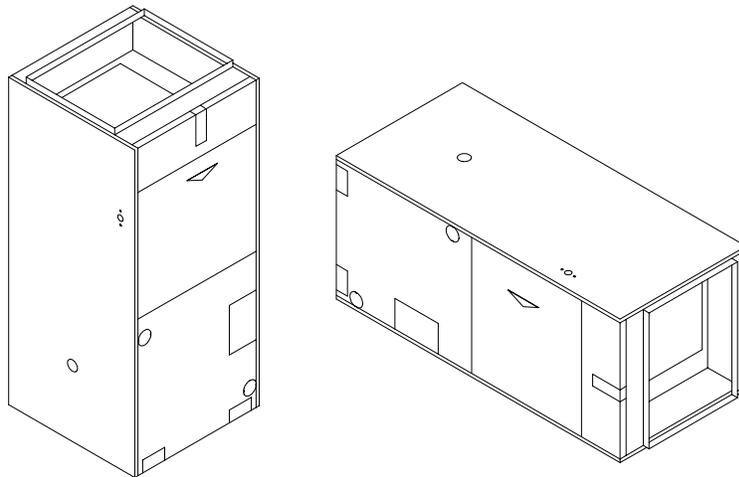




10 & 12 SEER AIR HANDLER

INSTALLATION & SERVICE MANUAL

MODELS: AH1-A, AH2-A



PLEASE READ THESE INSTRUCTIONS PRIOR TO INSTALLATION AND BEFORE PERFORMING ANY SERVICE OR MAINTENANCE. THESE INSTRUCTIONS MUST BE LEFT WITH THE USER AND SHOULD BE RETAINED FOR FUTURE REFERENCE BY QUALIFIED SERVICE PERSONNEL.

⚠WARNING: *Improper installation, adjustment, alteration, service, or maintenance can cause injury or property damage. Refer to this manual. For assistance or additional information consult a qualified installer, service agency, or manufacturer listed below.*

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MADE IN USA

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All installations and services must be performed by qualified personnel.

SAFETY SECTION

This page contains various warnings and cautions found throughout this Service and Installation Manual. Please read and comply with the statements on the cover and the statements below.

⚠WARNING: *Improper installation, adjustment, alteration, service, or maintenance can cause injury or property damage. Refer to this manual. For assistance or additional information consult a qualified installer, service agency, or manufacturer listed below.*

⚠CAUTION: If drilling or screwing into panel or plate is necessary, make certain drill or screw does not penetrate into any part of evaporator coil or hot water coil and cause damage. Personal injury and/or property damage may result.

⚠WARNING: Do not use this system if any part has been under water. Immediately call a qualified service agency to inspect the system and to replace any part of the electrical or control system which has been under water.

⚠WARNING: The cooling and heating coils must be cleaned by a qualified service person.

⚠WARNING: This air handler is not to be used to condition during construction.

⚠CAUTION: When testing electrical equipment, always follow standard electrical procedures and precautions.

⚠CAUTION: DO NOT wet electronic components during hydronic testing. Wetting electronic components may damage circuitry and cause a hazardous situation. Dry moisture from all leads and terminals if wetting occurs. Wait at least 24 hours for the circuit to fully dry before energizing the system.

⚠WARNING: Personal injury or property damage could result from major repair or service of this system by anyone other than a qualified contractor.

⚠WARNING: If you do not follow these instructions exactly an unsafe condition may result causing personal injury, loss of life or property damage.

All installations and services must be performed by qualified personnel.

Installation and service personnel are required by some states to be licensed. Persons not qualified shall not install this equipment nor interpret these instructions.

All local codes and regulations take precedence over the instructions in this manual and should be followed accordingly. In the absence of local codes, installation must conform with these instructions, regulations of the National Fire Protection Association and provisions of the National Electric Code.

AIR HANDLER

Each air handler is capable of operation within a range of evaporator coil sizes. The evaporator size specified is shipped as a separate item and must be installed by the contractor. Model AH2-A will accommodate the 1060-G1, 1242-G1, 1042E, and 1048E. The AH1-A will accommodate the 1024E, 1030E, 1036E, 1224-G1, 1230-G1 and 1236-G1.

The construction of the air handler permits easy knockdown and reassembly. See Figure A.

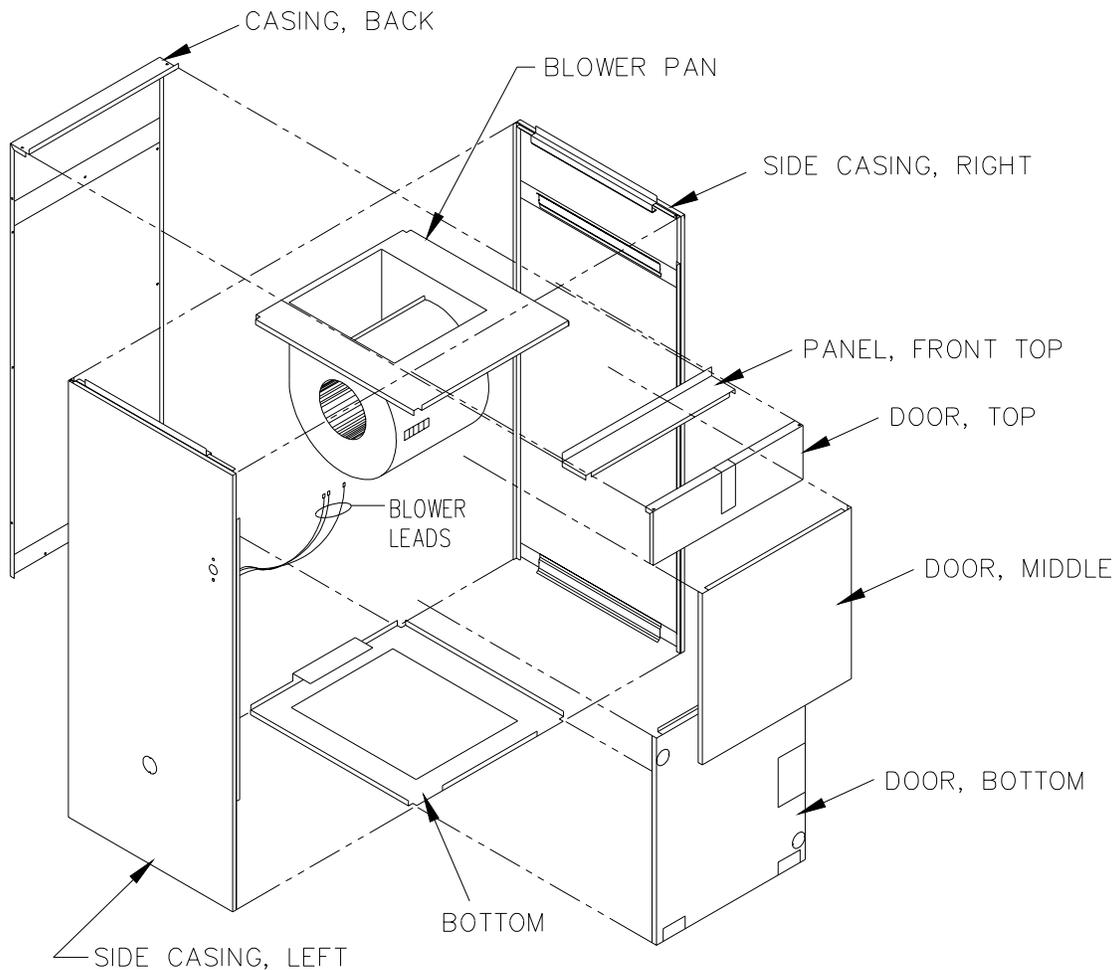


Figure A

All installations and services must be performed by qualified personnel.

FOLLOW THESE STEPS FOR KNOCKDOWN OF AIR HANDLER:

1. Start with unit setting in a vertical position. (Figure A)
2. Remove screws from bottom door, middle door, top door, and top front panel. Remove doors and top panel of air handler.
3. Disconnect blower leads from blower terminal strip.
4. Remove screws that secure the blower pan to the side casings and the back casing.
5. Pull blower sub-assembly up and out the front of the unit.
6. Remove screws from the bottom and the casing back.
7. Remove casing back and side casings from the bottom.

REASSEMBLY OF AIR HANDLER

To reassemble the air handler, reverse steps above starting with number 7.

INSTALLATIONS OF A-COIL IN VERTICAL APPLICATIONS

A standard Thermo Pride A-coil is used in all air handlers. The coil and its attached drain pan are installed in the air handler. See Figure B1.

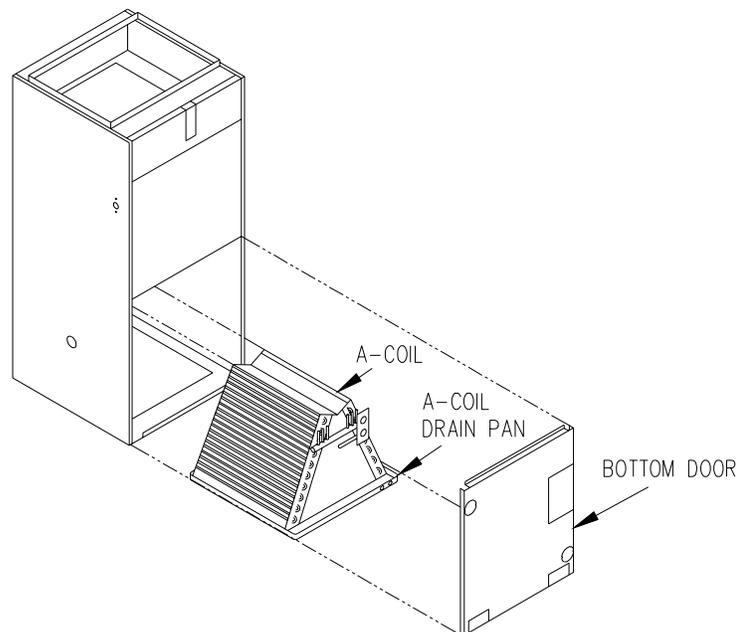


Figure B1

All installations and services must be performed by qualified personnel.

INSTALLATIONS OF A-COIL IN HORIZONTAL APPLICATION

For the AH1-A, in all A-coil applications (1024E, 1030E, 1036E, and 1224-30G1) except the 1236G1, the A-coil spacer must be used.

For the AH2-A, in all A-coil applications the A-coil spacer must be used.

1. Remove bottom door of air handler.
2. Remove middle door of air handler.
3. Slide primary drain pan out of unit.
4. Set A-coil spacer in primary drain pan if needed. See Figure B2, #1 inset.
5. Set A-coil in place on primary drain pan.
6. Secure coil installation strip with aluminum tape as indicated in Figure B2, inset #2. This makes a small ramp to slide the coil up and on the rear pocket brake.
7. Slide pan with coil into air handler making sure that the A-coil plastic pan is properly positioned in the primary drain pan. Insure the plastic coil pan on base of the A-coil slides into rear clip. See Figure B2.
8. Secure front of plastic pan to bottom of unit with supplied pan clip. See Figure B3 inset. An extension for nut driver may be of benefit.
9. Pan should rest on pocket brakes on each side of side casing when properly installed.
IMPORTANT: When air handler is installed in attic above a finished ceiling, it is recommended that a safety overflow pan with its own separate drain be installed under the entire unit.
10. Remove trim plate from A-coil connections.
11. Cut out appropriate holes in insulation, remove appropriate knockouts, and realign coil access panel and secure into place
12. Make appropriate liquid and suction line connections to coil and braze connections.
NOTE: A wet rag makes an excellent heat sink for tubing.

CAUTION: If drilling or screwing into panel of plate is necessary, make certain drill does not penetrate into any part of evaporator coil or hot water coil to avoid personal injury and/or property damage.

All installations and services must be performed by qualified personnel.

13. Position grommets in coil access panel to allow installation of trim plate, secure trim plate in place with screws, and seal connections with duct sealer or equivalent.

NOTE: The air handler is factory assembled for left to right(horizontal) and vertical applications. If a right to left horizontal application is desired, the fan center must be moved to the right side casing which will position it above the primary drain pan.

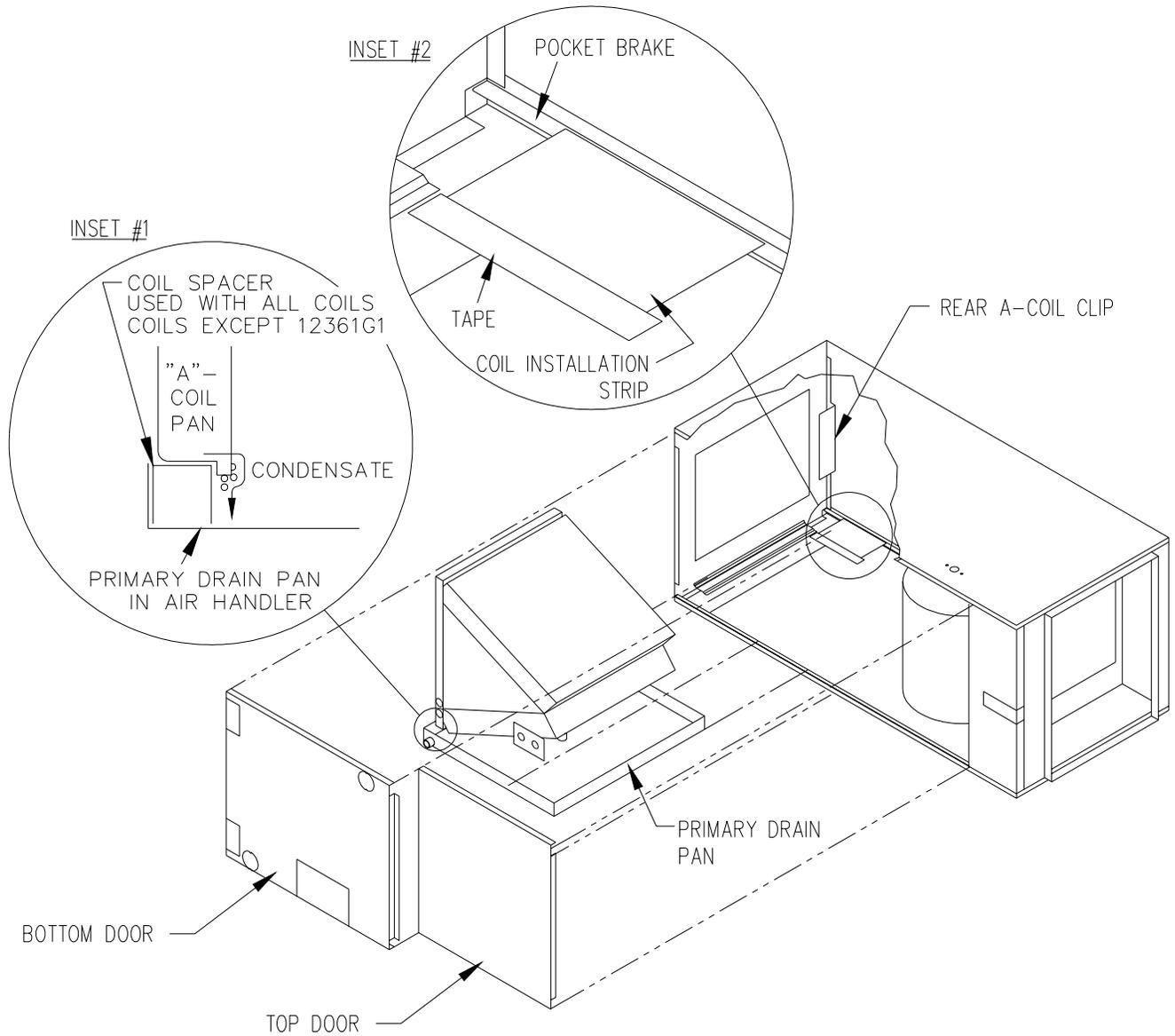


Figure B2

All installations and services must be performed by qualified personnel.

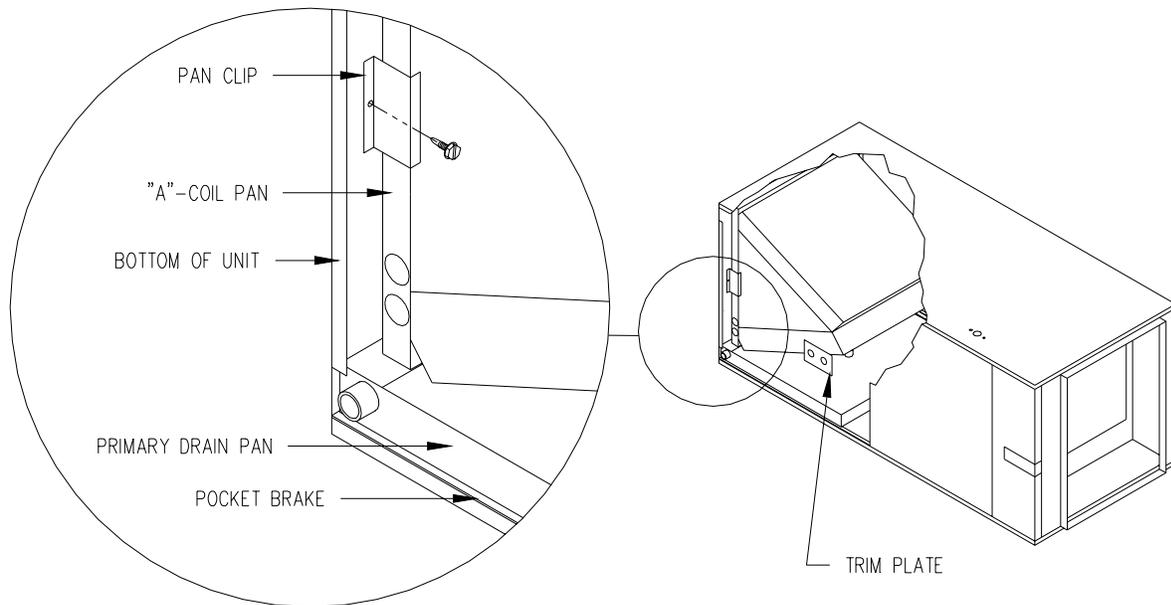


Figure B3

INSTALLATION OF THE HOT WATER COIL:

1. Remove top door of air handler.
2. Slide hot water coil's side hanger brackets into coil channel(retaining channel) in the air handler. See Figure B4 inset.

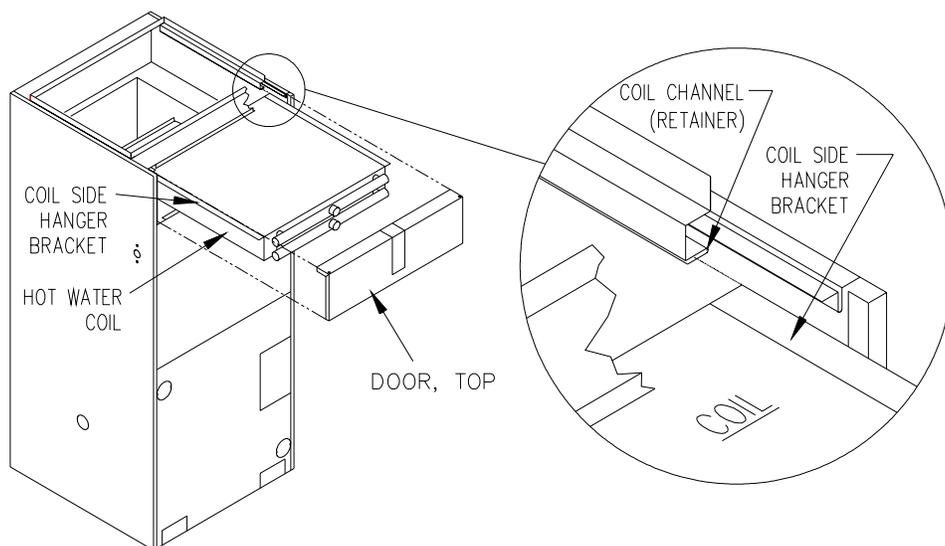


Figure B4

3. Push coil into unit until the coil is stopped by the back casing.
4. Cut out appropriate holes in insulation, realign top door and secure into place.

All installations and services must be performed by qualified personnel.

5. Make appropriate hydronic connections to inlet(blower side) and outlet(duct side) of coil and braze into place.
6. Seal connections through panel with duct sealer or equivalent.

⚠CAUTION: If drilling or screwing into panel or plate is necessary, make certain drill does not penetrate into any part of evaporator coil or hot water coil. Personal injury and/or property damage may result.

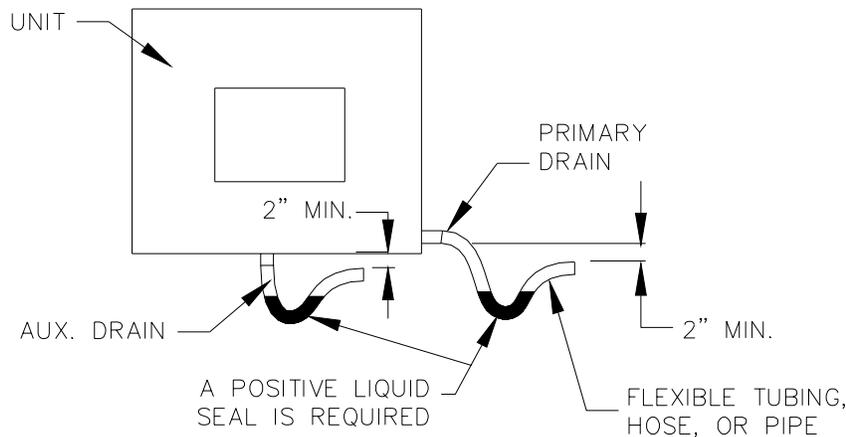


Figure C

NOTE: Drain lines must be pitched no less than 1/4" per foot away from the air handler.

TRIM PANEL INSTRUCTIONS:

Included as a loosely packed part in the condensate drain pan of both air handlers is two trim panels. These panels are to be used in reducing the free area between both the hydronic coil lines and the evaporator coil lines. The hydronic coil panel has two holes which the inlet and outlet lines fit through. This panel is to be secured to the air handler via the prepunched holes and included screws. The evaporator coil panel is a flat rectangular panel measuring 8-1/2" x 3", with a 1/2" brake on one edge. The 1/2" brake is to fit into the pocket brake of the side casing and the larger part of the panel is to be attached to the bottom door via the prepunched holes and included screws. This panel will close the gap that is created between the side of the air handler, and the grommet panel that is installed on the evaporator coil.

BLOWER AIR ADJUSTMENT

The direct drive blower must be set in order to establish proper air movement. Use the following steps to do this:

*For cooling only remove low speed connection to terminal block unless continuous fan is desired.

All installations and services must be performed by qualified personnel.

1. Determine the appropriate blower speed settings listed in tables below.
2. Set the blower motor speed to match air conditioning requirement, connect the red wire(cooling tap) to the appropriate fan speed on the terminal strip located on the blower(see Figure D).
3. Set the blower motor speed to match heating requirement, connect the orange wire(heating tap) to the appropriate fan speed on the terminal strip located on the blower(see Figure D).

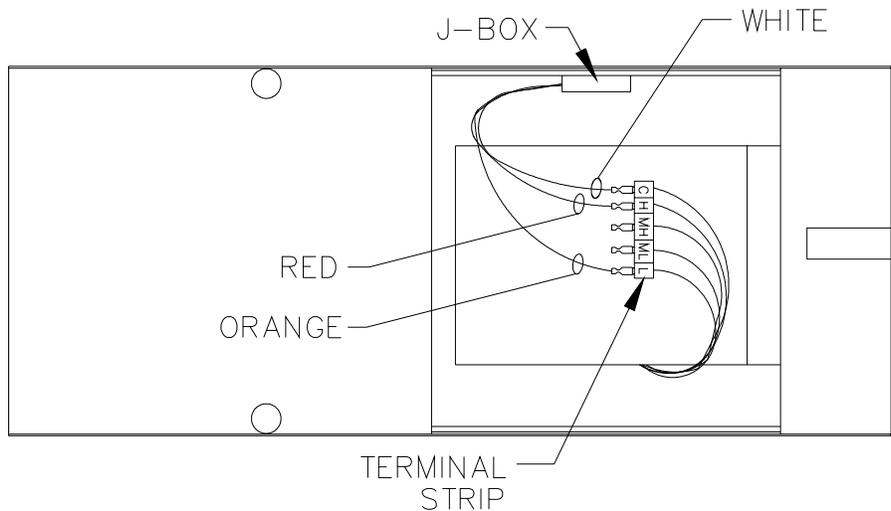


Figure D

	Heating Tap Locations			
Terminal Strip Speed	40,000 (btuh)	60,000 (btuh)	80,000 (btuh)	100,000 (btuh)
C	White	White	White	White
H				
MH				
ML				Orange
L	Orange	Orange	Orange	

	Cooling Tap Locations					
Terminal Strip Speed	2 Ton	2.5 Ton	3 Ton	3.5 Ton	4 Ton	5 Ton
C	White	White	White	White	White	White
H						Red
MH			Red	Red	Red	
ML		Red				
L	Red					

All installations and services must be performed by qualified personnel.

Heating Capacity (btuh)	Recommended Water Flow Rates for Heating (GPM)
40,000	4
60,000	6
80,000	8
100,000	10

DUCT SYSTEM

The duct system and load sizing calculation should follow the design standards of Air Conditioning Contractors of America (ACCA) - manuals D & J - or the American Society of Heating, Refrigeration and Air Conditioning Engineers, Inc. (ASHRAE) Latest Edition Fundamentals Volume.

To aid you in evaluating existing duct systems quickly, review the chart on Page 11 which shows the CFM capacity for square inch areas, based on .10" wc static pressure (SP) loss on the supply systems.

Each of the system's components (trunk lines, take-offs, runs and register and grill-free areas) must be properly sized and matched together to ensure you are obtaining the air handling capacity of the duct system. A 12x8 duct with a 400 CFM capacity, for example, **WILL NOT** flow 400 CFM if the register(s) to which it connects can only flow a total of 200 CFM.

The air handling capacity **MUST BE EQUAL TO** the supply system at a minimum when sizing the return air duct system. It is recommended to follow design parameters set down by ACCA or ASHRAE on the return air duct systems.

All installations and services must be performed by qualified personnel.

CFM CAPACITY CHARTS

AH1-A				
.2 Duct Static Pressure with heating coil				
And applicable Evaporator Coil Model	CFM (HI)	CFM (M. HI)	CFM (M. LOW)	CFM (LOW)
1024E and 1030E	1299	1123	992	821
1224-30G1	1756	1202	1073	880
1036E	1435	1231	1055	861
1236G1	1438	1193	1036	860
.2 Duct Static Pressure and applicable Air Conditioning Coil Only				
1024E and 1030E	1390	1243	1085	905
1224-30G1	1591	1335	986	921
1036E	1575	1307	1092	911
1236G1	1523	1280	1074	913
Heating coil				
.2 Duct Static Pressure	1514	1261	1055	889
.2 Duct Static Pressure + .3 additional load	1294	1109	964	785

AH2-A				
.2 Duct Static Pressure with heating coil				
And Applicable Evaporator Coil Model	CFM (HI)	CFM (M. HI)	CFM (M. LOW)	CFM (LOW)
1060G1 and 1242G1	2052	1632	1326	1034
1042E	1915	1444	1296	1078
1048E	1568	1433	1251	1054
.2 Duct Static Pressure and applicable Air conditioning coil only				
1060G1 and 1242G1	2371	1826	1487	1517
1042E	1794	1580	1377	1132
1048E	1717	1515	1400	1122
Heating coil only				
.2 Duct Static Pressure	2161	1685	1330	1047
.2 Duct Static Pressure + .3 additional load	1977	1459	1200	962

CFM CAPACITY

The CFM at .2 static pressure takes into account the resistance of the internal A-coil. The CFM at a .5 static pressure accounts for the addition of an external hydronics coil which would typically add .3 to the static pressure.

All installations and services must be performed by qualified personnel.

DUCT SIZES FOR HOMES

Velocity Approximately 800 Feet Per Minute

CFM	DIA.	SQ.”	RECTANGULAR DUCT DIMENSIONS ... INCHES							
45	4	12.5								
65	5	19.6								
100	6	28							6x6	9x4
150	7	38							8x6	12x4
200	8	50							10x6	14x4
250	9	63						8x8	12x6	18x4
300	9	63						10x8	14x6	20x4
400	10	78						12x8	16x6	25x4
500	12	113					10x10	14x8	19x6	30x4
600	12	113					12x10	16x8	22x6	38x4
700	12	113					14x10	18x8	26x6	
800	14	154				12x12	15x10	20x8	28x6	
900	14	154				14x12	17x10	22x8	32x6	
1000	16	201				15x12	18x10	24x8	34x6	
1100	16	201			14x14	16x12	20x10	26x8	40x6	
1200	16	201			15x14	17x12	22x10	28x8	42x6	
1300	16	201			16x14	18x12	22x10	30x8	46x6	
1400	18	255			16x14	19x12	24x10	32x8	48x6	
1500	18	255			17x14	20x12	26x10	34x8	50x6	
1600	18	255		16x16	18x14	22x12	26x10	36x8	54x6	
1700	18	255		17x16	20x14	22x12	28x10	38x8	58x6	
1800	18	255		18x16	20x14	24x12	30x10	40x8	62x6	
1900	20	314		18x16	22x14	26x12	32x10	44x8	64x6	
2000	20	314		20x16	22x14	26x12	34x10	46x8		
2200	20	314	18x18	20x16	24x16	28x12	36x10	48x8		

THE INDOOR EVAPORATOR COIL

1. **EVAPORATOR COIL** is a finned coil through which air in the home is circulated. Heat from the air is transferred to the liquid refrigerant inside the evaporator coil. The coils for use in AH air handlers are in an A-shaped configuration (A Models).
2. **CONDENSATE DRAIN PAN** is attached to the bottom of the evaporator coil to collect water condensed out of the air. A drain fitting is provided for connection to a convenient drain point.

All installations and services must be performed by qualified personnel.

TUBING LINE SETS

1. **SUCTION LINE** is an insulated large copper tube connecting the outlet of the A/C evaporator to the suction inlet of the A/C **CONDENSER**.
2. **LIQUID LINE** is a single small tube connecting the outlet of the A/C condenser to the expansion valve inlet on the A/C evaporator coil.

TUBING SIZE REFERENCE CHART

0'-50' TOTAL LINE LENGTH

MODEL	SUCTION LINE	LIQUID LINE
1024 & 1030	3/4"	3/8"
1036 & 1042	3/4"	3/8"
1048 & 1060	7/8"	3/8"

50'-75' TOTAL LINE LENGTH

MODEL	SUCTION LINE	LIQUID LINE
1024 & 1030	7/8"	3/8"
1036 & 1042	1"	1/2"
1048 & 1060	1"	1/2"

75'-100' TOTAL LINE LENGTH

MODEL	SUCTION LINE	LIQUID LINE
1024 & 1030	1"	1/2"
1036 & 1042	1-1/8"	5/8"
1048 & 1060	1-1/8"	5/8"

0'-50' TOTAL LINE LENGTH

MODEL	SUCTION LINE	LIQUID LINE
1224 & 1230	3/4"	3/8"
1236 & 1242	7/8"	1/2"

50'-75' TOTAL LINE LENGTH

MODEL	SUCTION LINE	LIQUID LINE
1224 & 1230	7/8"	3/8"
1236 & 1242	1"	1/2"

All installations and services must be performed by qualified personnel.

75'-100' TOTAL LINE LENGTH

MODEL	SUCTION LINE	LIQUID LINE
1224 & 1230	1"	1/2"
1236 & 1242	1-1/8"	5/8"

NOTES:

For line lengths over 25' adjust charge accordingly per foot of variation from chart.

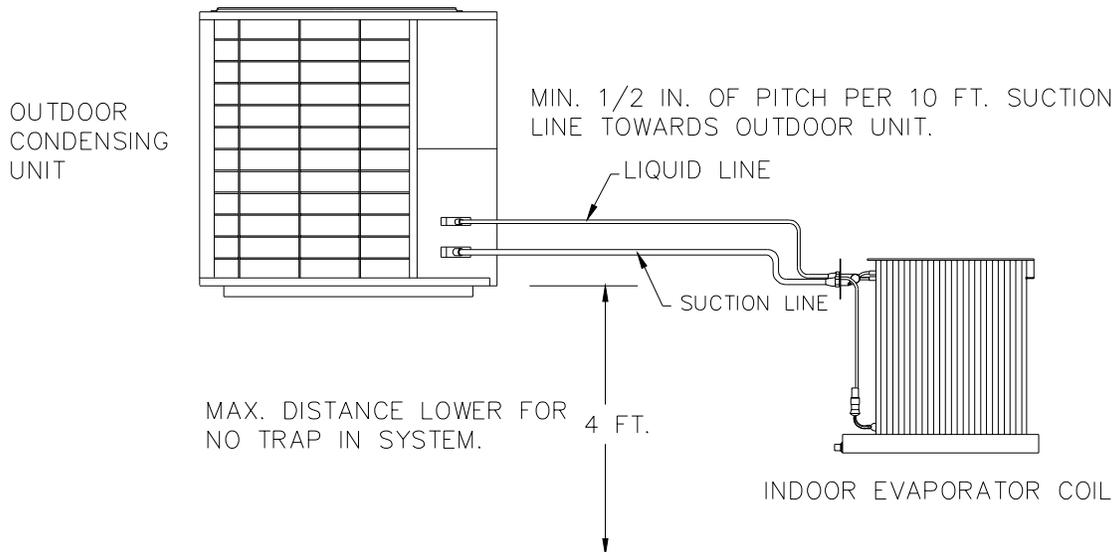
- .65 oz. per foot for 3/8" and 3/4" line set
- .674 oz. per foot for 3/8" and 7/8" line set
- .694 oz. per foot for 1/2" and 7/8" line set
- .72 oz. per foot for 1/2" and 1" line set
- .76 oz. per foot for 5/8" and 1-1/8" line set

These charges are to be used in conjunction with a superheat measurement for best performance.

TUBING INSTALLATION

The compressor oil is constantly pumped through the refrigerant lines in normal operation of an air conditioning system. To ensure proper lubrication of the compressor by avoiding oil accumulation at undesirable points in the system, follow the guidelines listed below:

1. No traps in the suction line are necessary if the outdoor condensing unit is level with the indoor evaporator coil or the indoor evaporator coil is 4 feet or less lower than the outdoor condensing unit. Any horizontal runs of suction line should have minimum 1/2" pitch for every 10 feet of line towards the outdoor condensing unit. See Figure F below.

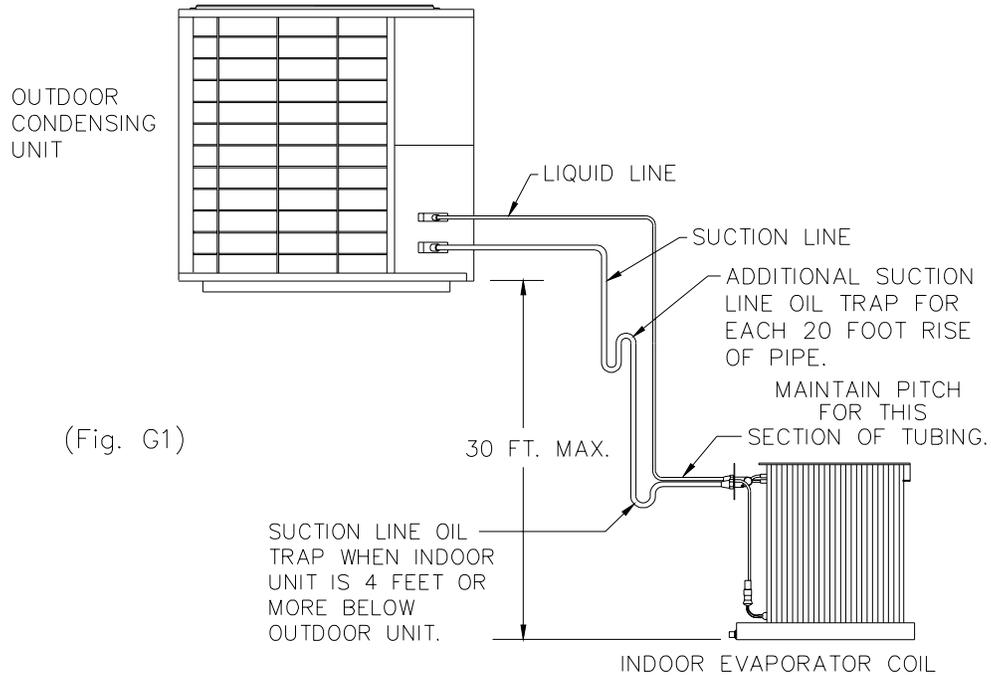


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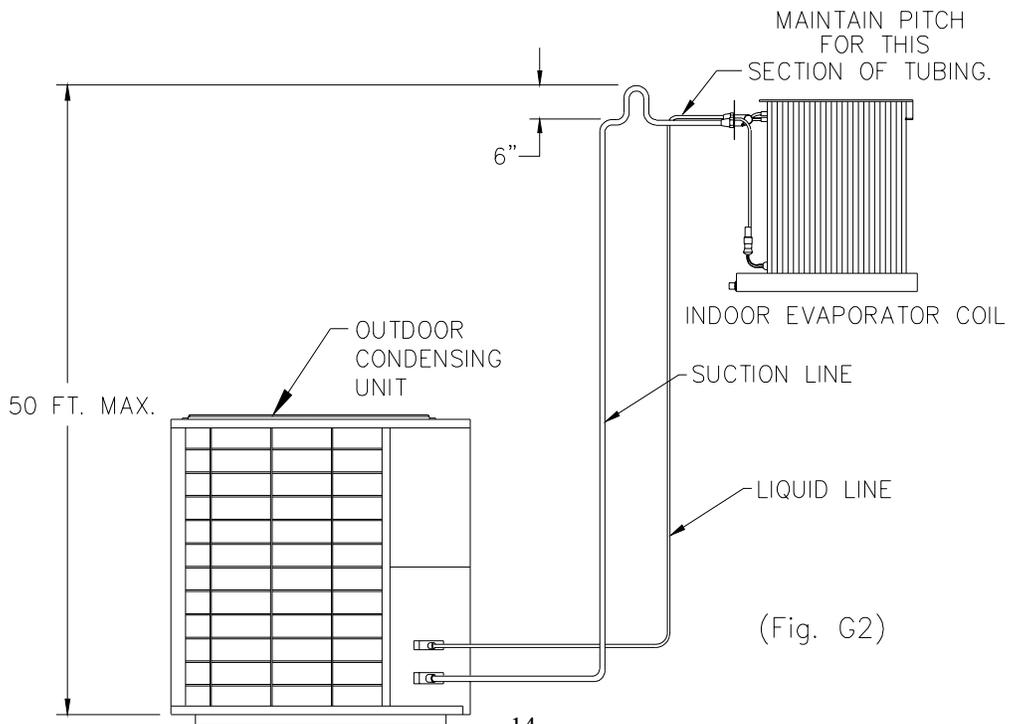
Figure F

2. A trap is necessary in the suction line at the indoor evaporator coil if the indoor evaporator coil is more than 4 feet below the outdoor condensing unit.

NOTE: Multiple suction line traps are recommended for longer or multiple horizontal lines. (See Fig. G1).



An inverted trap should be installed on the horizontal suction line near the evaporator coil to prevent liquid flood back to the compressor (See Fig. G2) if the indoor evaporator coil is located 10' or more above the condensing unit.



All installations and services must be performed by qualified personnel.

A gradual loop in the tubing can be constructed to take up the excess tubing if you find that too much tubing has been brought onto a job. Such a loop **MUST** be kept in a horizontal (flat) plane to avoid trapping the oil.

Refrigerant lines should be inserted into a suitable conduit or raceway when the lines are to be buried between the building and the outdoor condensing unit. The lines must be provided with sufficient protection and support to prevent damage when installed above ground.

When making "on the job" tubing, a solder of 95% tin, 5% antimony or any of the silver solders such as SilFos, Phos-Copper, Easy-Flo 35 or 45, should be used. No attempt will be made here to instruct proper soldering or brazing technique but it is necessary that the installer be properly instructed in accordance with good existing practices.

All joints and fittings must be properly leak tested as per EPA guidelines after "on the job" tubing has been made up. The line set and the evaporator coil must be evacuated to 29.96" Hg (1000 microns) or lower when all joints and fittings are leak free. The service valves on the condenser may then be opened to release the refrigerant to the system. Verify proper system performance. See condensing unit manual for additional performance data.

HOW TO MEASURE SUPERHEAT (NOTE: A good electric resistance thermometer and accurate suction pressure gauge are necessary).

Superheat is measured by taking a temperature and pressure reading. See Figure I. The pressure reading is gauged at the pressure port which is located on the suction service valve. The temperature reading is taken at the evaporator coil on the header assembly in the 2:00 o'clock or 10:00 o'clock position with header assembly tube as the center of the clock.

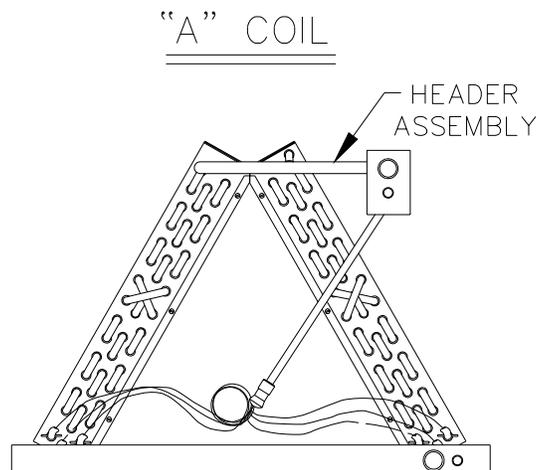


Figure I

All installations and services must be performed by qualified personnel.

Read the temperature at header assembly to calculate the superheat. Then read the suction pressure and then add the line loss of 2 lbs. for 25' of tubing. Then convert pressure into temperature.

Next, subtract the converted suction temperature from the measured coil header temperature and the end result is the superheat.

EXAMPLE:

Measured Temp = 50°F
(Off header assembly at 10:00 or 2:00 position) See Figure I.

Measured Pressure = 71PSI + 2PSI = 73PSI which equates to a 43°F saturation temperature.
(Measured from pressure port)
(Listed temperature for measured pressure according to R-22 temperature scale on manifold gauge or R-22 section of pressure temperature chart)

The difference equals the degrees superheat = 7°F

All 10 SEER models of Thermo Pride air conditioners should have a 3°F to 7°F superheat at an 85°F to 95°F outdoor temperature and a 70°F to 80°F indoor temperature. The superheat temperature will not be accurate if the indoor temperature is not within the 70°F to 80°F range. Therefore, an indoor temperature within the above range must be achieved before an accurate superheat can be measured.

MEASURING TEMPERATURE DROP ACROSS THE “A” COIL:

The temperature drop across the coil should be around 15°F to 20°F difference between inlet and outlet air. This should be measured as close to the air handler as possible, to eliminate duct losses.

ELECTRICAL

All wiring must conform to the provisions of local codes or in the absence of local codes with the provisions of the National Electrical Code, ANSI/NFPA No. 70-Latest Edition and this instruction manual. Equivalent type wire must be used if any of the original wire supplied with the unit needs to be replaced. A 10 amp time delayed fuse or circuit breaker is recommended.

NOTE: Condensing unit is not included in above amp rating.

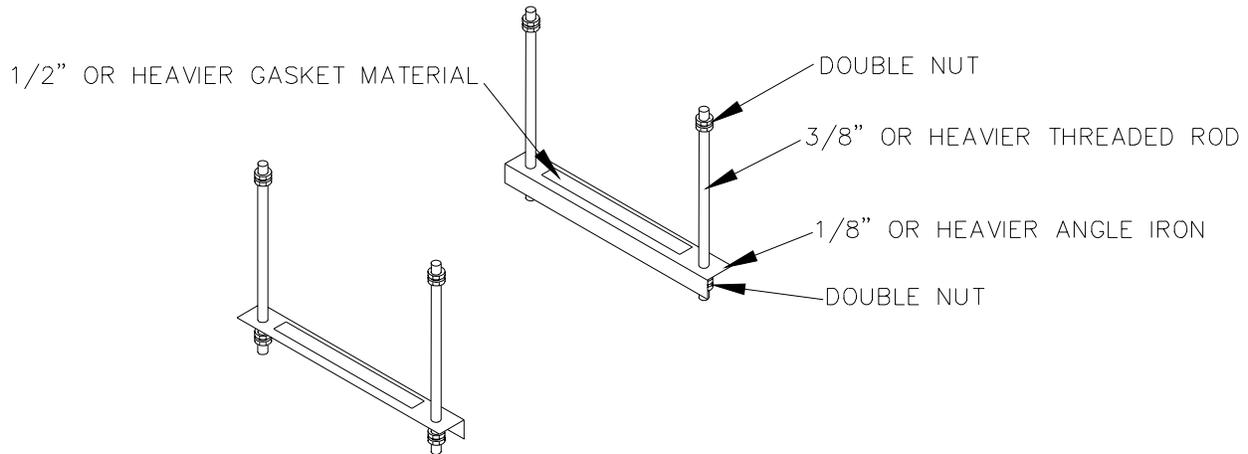
All installations and services must be performed by qualified personnel.

A return air opening can be cut in any of the four sides or the bottom of the UA cabinet. The AH AIR HANDLER is then placed on the UA adapter cabinet, inlet side down. The AH rests on the support angles of the UA adapter cabinet. The UA cabinet is equipped with a permanent washable air filter.

When using the UA air handler, the coil drain and coil drain pan must be utilized in place of the primary drain and primary drain pan found in the air handler.

AH AIR HANDLER RECOMMENDED SUSPENSION PROCEDURE

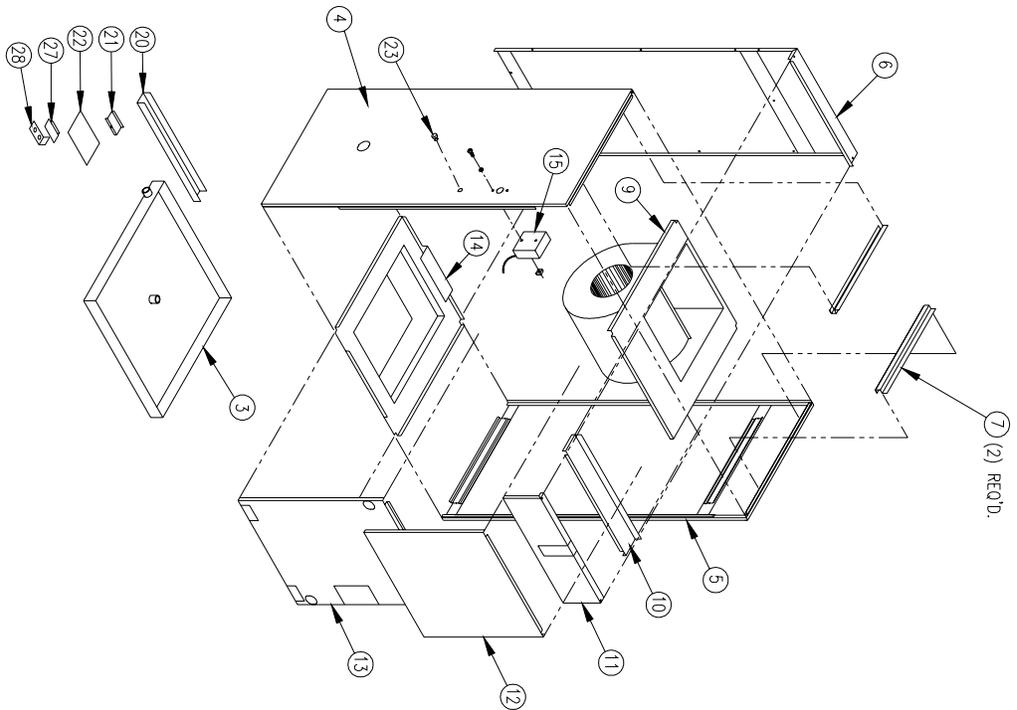
The detail below is the proper and safest way to suspend the AH. These components should be easily found at your local hardware store.



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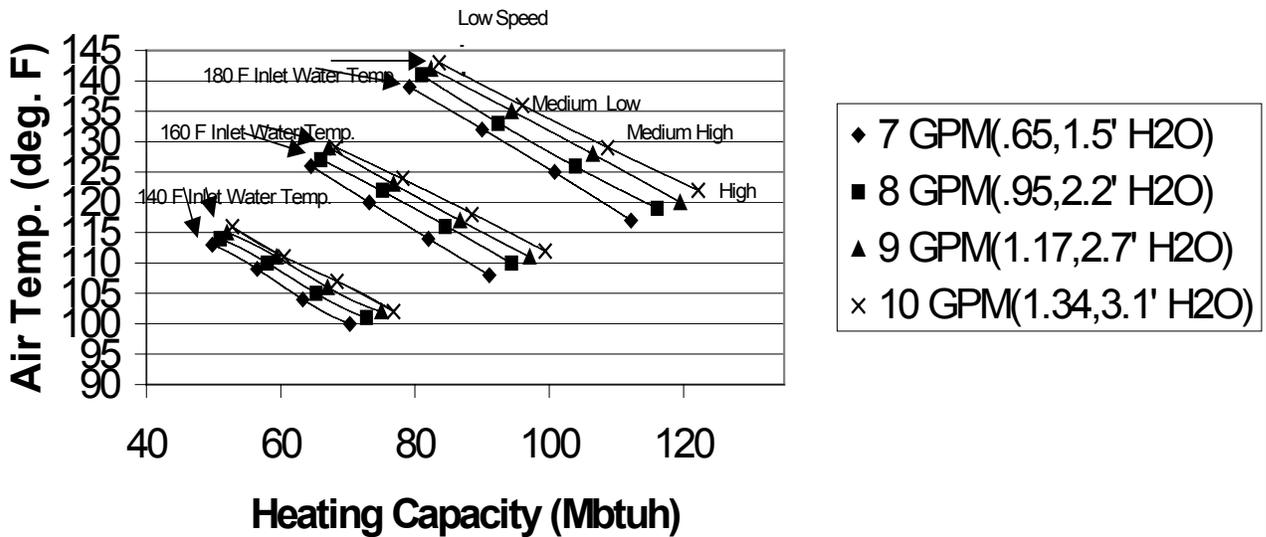
REPLACEMENT PARTS

ITEM	PARTS DESCRIPTION	UNIT		AH1-A		AH2-A	
		PART NO.	QTY.	PART NO.	QTY.		
1							
2							
3	DRAIN PAN	37149	1	37150	1		
4	SIDE CASING, LEFT	27128	1	27139	1		
5	SIDE CASING, RIGHT	27129	1	27140	1		
6	CASING, BACK	17130	1	17148	1		
7	COIL CHANNEL	17135	2	17145	2		
8							
9	BLOWER SUB-ASSEMBLY	S00S4081	1	S00S4082	1		
10	PANEL, FRONT TOP	17131	1	17141	1		
11	DOOR, TOP	17132	1	17142	1		
12	DOOR, MIDDLE	27133	1	27143	1		
13	DOOR, BOTTOM	17134	1	17144	1		
14	BOTTOM	27138	1	27147	1		
15	HARNNESS SUB-ASSEMBLY	S00S4351	1	S00S4351	1		
16							
17							
18							
19							
20	COIL SPACER	17160	1	17160	1		
21	PAN CLIP	17161	1	17161	1		
22	COIL INSTALLATION STRIP	17162	1	17162	1		
23	BUSHING	350018	1	350018	1		
24							
25							
26							
27	TRIM PLATE	14394	1	14394	1		
28	TRIM PLATE	14395	1	14396	1		



All installations and services must be performed by qualified personnel.

AH2-A Air Handler with HC2-A Hydronic Coil Outlet Air Temperature vs. Heating Capacity (GPM,PSI,Coil Drop)



AH1-A Air Handler with HC1-A Hydronic Coil Outlet Air Temperature vs. Heating Capacity (GPM,PSI,Coil Drop)

