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**THIS MANUAL MUST BE LEFT WITH THE HOMEOWNER FOR FUTURE REFERENCE**

### **⚠ WARNING**

The State of California has determined that this product may contain or produce a chemical or chemicals, in very low doses, which may cause serious illness or death. It may also cause cancer, birth defects, or reproductive harm.

### **⚠ WARNING**

Improper installation, adjustment, alteration, service or maintenance can cause personal injury, loss of life, or damage to property.

Installation and service must be performed by a licensed professional installer (or equivalent) or a service agency.

### **⚠ IMPORTANT**

The Clean Air Act of 1990 bans the intentional venting of refrigerant (CFCs, HCFCs and HFCs) as of July 1, 1992. Approved methods of recovery, recycling or reclaiming must be followed. Fines and/or incarceration may be levied for noncompliance.

# INSTALLATION INSTRUCTIONS

## Elite® Series CBX27UH Units

MULTI-POSITION AIR HANDLERS  
506294-01  
10/2012  
Supersedes 7/2012

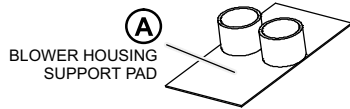
**TP** Technical  
Publications  
Litho U.S.A.

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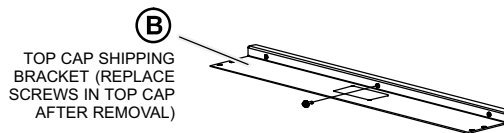
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## IMPORTANT INFORMATION TO INSTALLER

CHECK FOR AND REMOVE THE FOLLOWING ITEMS BEFORE OPERATING UNIT.



**A** BLOWER HOUSING SUPPORT PAD

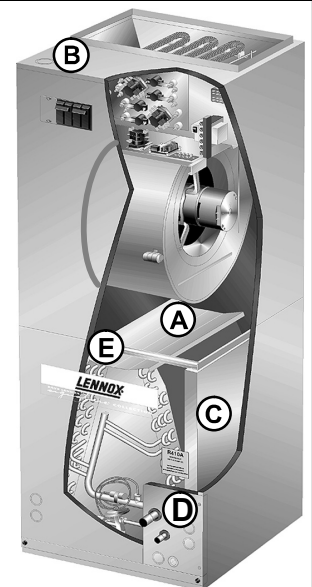


**B** TOP CAP SHIPPING BRACKET (REPLACE SCREWS IN TOP CAP AFTER REMOVAL)

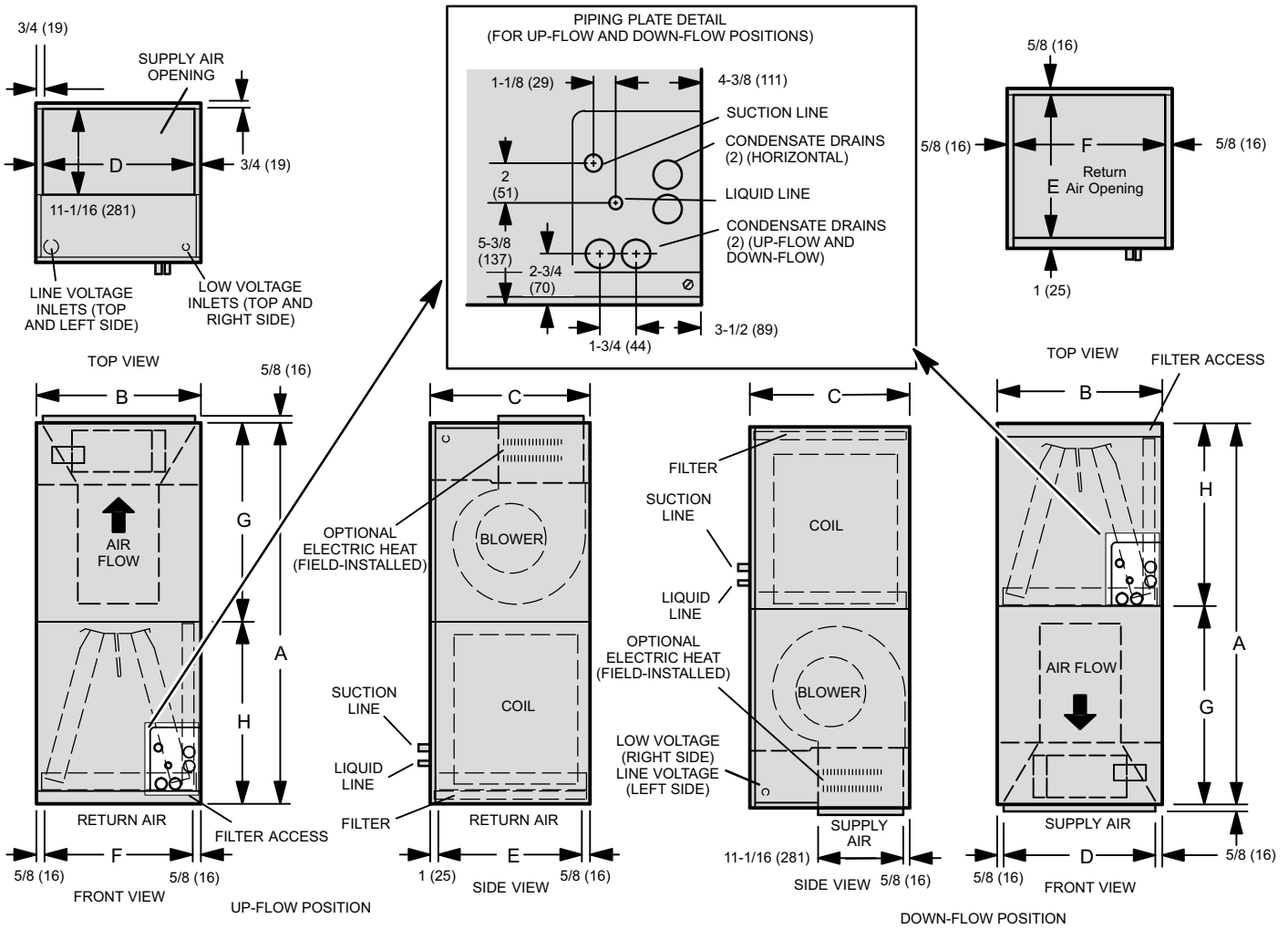
**C** HORIZONTAL DRAIN PAN (SEE PAGES 4 AND 6)

**D** REFRIGERANT LINE PLUGS (SEE PAGE 6)

**E** DRIP SHIELD FOR -060 UNITS ONLY HORIZONTAL APPLICATIONS (SEE PAGE 5).



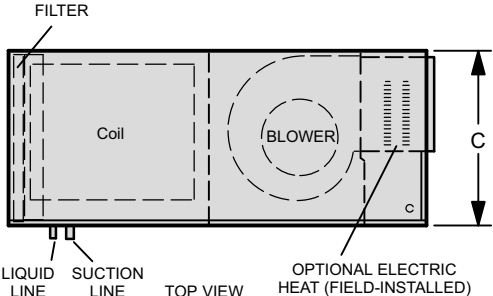
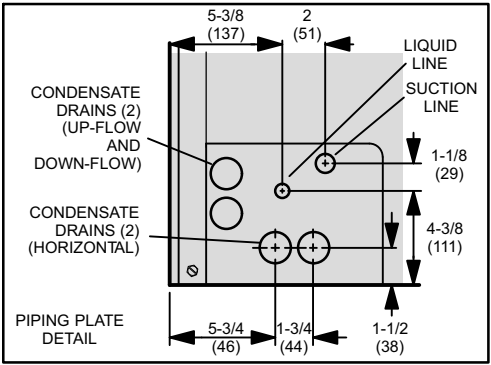
# CBX27UH Up-flow and Down-flow Unit Dimensions - Inches (mm)



**CBX27UH Common Dimensions - Inches (mm)**

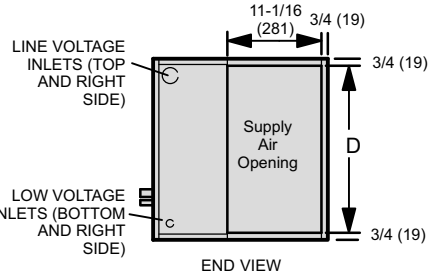
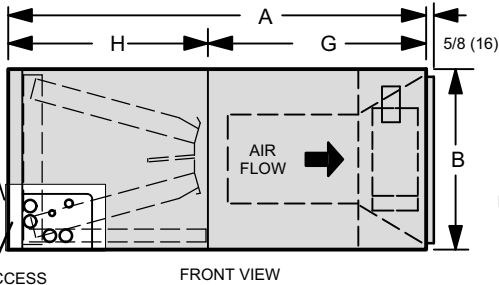
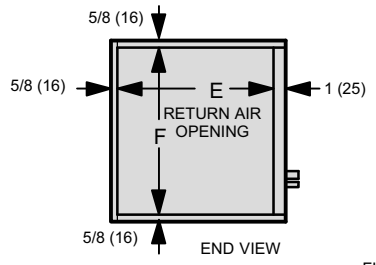
Dim.	-018/-024	-030/-036	-042/-048	-060
<b>A</b>	49-1/4 (1251)	51 (1295)	58-1/2 (1486)	62-1/2 (1588)
<b>B</b>	21-1/4 (540)	21-1/4 (540)	21-1/4 (540)	21-1/4 (540)
<b>C</b>	20-5/8 (524)	22-5/8 (575)	24-5/8 (625)	24-5/8 (625)
<b>D</b>	19-3/4 (502)	19-3/4 (502)	19-3/4 (502)	19-3/4 (502)
<b>E</b>	19 (483)	21 (533)	23 (584)	23 (584)
<b>F</b>	20 (508)	20 (508)	20 (508)	20 (508)
<b>G</b>	24-5/8 (625)	26-3/8 (670)	27-7/8 (708)	27-7/8 (708)
<b>H</b>	24-5/8 (625)	24-5/8 (625)	30-5/8 (778)	34-5/8 (879)

**CBX27UH Horizontal Left- and Right-Hand Unit Dimensions - Inches (mm)**

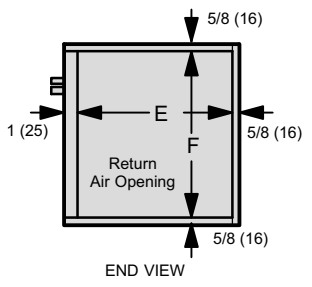
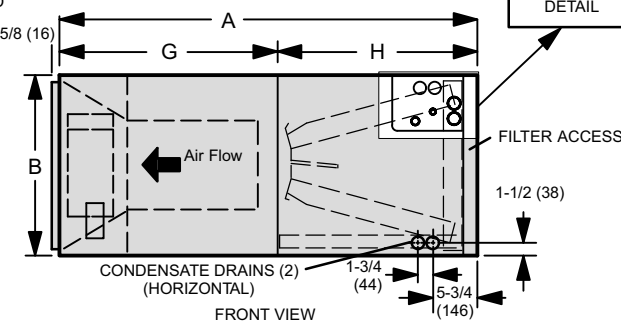
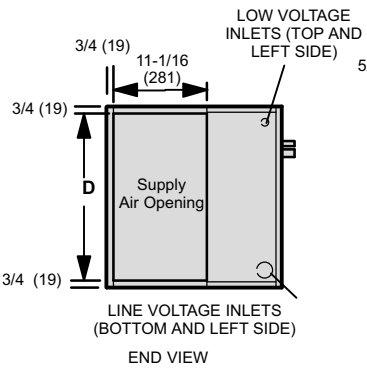
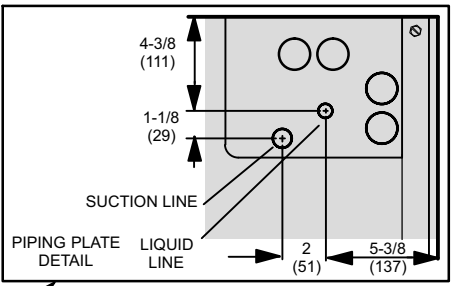
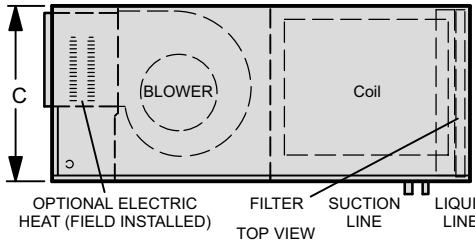


**Horizontal Position  
(Right-Hand Air Discharge)**

FOR DIMENSIONS "A" THROUGH "H", SEE CHART ON PAGE 2.



**Horizontal Position  
(Left-Hand Air Discharge)**



## ⚠ CAUTION

Physical contact with metal edges and corners while applying excessive force or rapid motion can result in personal injury. Be aware of, and use caution when working near these areas during installation or while servicing this equipment.

### General Information

The Elite® CBX27UH series air handler is designed for installation with optional field-installed electric heat and a matching HFC-410A outdoor unit

This instruction is intended as a general guide and does not supersede local or national codes in any way. Consult authorities having jurisdiction before installation. Check equipment for shipping damage; if found, immediately report damage to the last carrier.

### Shipping and Packing List

Package 1 of 1 contains the following:

- 1—Assembled air handler unit
- 1—Horizontal drip shield (CBX27UH-60 only)
- 1 — Pipe nipple (Sch 80, 3/4" I. D. x 5")
- 1 — Warranty card

*NOTE - For down-flow applications, order kit number 83M57.*

### Requirements

## ⚠ IMPORTANT

This unit must be matched with an indoor coil as specified in Lennox Engineering Handbook. Coils previously charged with HCFC-22 must be flushed.

In addition to conforming to manufacturer's installation instructions and local municipal building codes, installation of Lennox air handler units (with or without optional electric heat), shall conform with the following National Fire Protection Association (NFPA) standards:

- NFPA No. 90A - Standard for Installation of Air Conditioning and Ventilation Systems
- NFPA No. 90B - Standard for Installation of Residence Type Warm Air Heating and Air Conditioning Systems

This unit is approved for installation clearance to combustible material as stated on the unit rating plate. Accessibility and service clearances must take precedence over combustible material clearances.

### Installing the Unit

These units are factory-configured for up-flow and horizontal right-hand discharge installation. For down-flow or horizontal left-hand discharge, certain field modifications are required.

#### DISASSEMBLE/REASSEMBLE AIR HANDLER UNITS

The air handler units consists of two factory-assembled sections. It may be necessary to disassemble the sections when positioning the unit for installation.

#### To disassemble:

1. Remove access panels.
2. Remove both blower and coil assemblies. This will lighten the cabinet for lifting.
3. Remove one screw from the left and right posts inside the unit. Remove one screw from each side on the back of the unit. Unit sections will now separate.

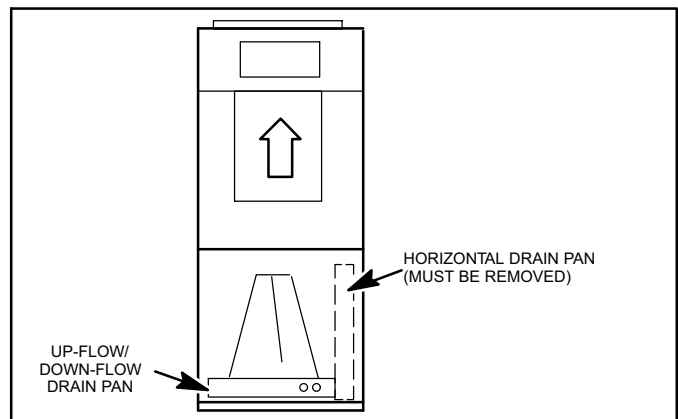
#### To reassemble:

1. Align cabinet sections together.
2. Reinstall screws.
3. Replace blower and coil assemblies.
4. Replace access panel.

#### UP-FLOW APPLICATION

Use the following procedures to configure the unit for up-flow operations:

1. Remove access panels.
2. Remove and discard the horizontal drip shield (-060 model, used only on horizontal applications) and the corrugated padding between the blower and coil assembly.
3. The horizontal drain pan must be removed when the coil blower is installed in the up-flow position. Removing horizontal drain pan will allow proper airflow and increase efficiency.
4. After removing horizontal drain pan, place the unit in desired location. Set unit so that it is level. Connect return and supply air plenums as required using sheet metal screws as illustrated in figure 1.
5. Install units that have no return air plenum on a stand that is at least 14" from the floor to allow for proper air return. Lennox offers an optional up-flow unit stand as listed in table 1.



**Figure 1. Up-flow Configuration**

**Table 1. Optional Side Return Unit Stand (Up-Flow Only)**

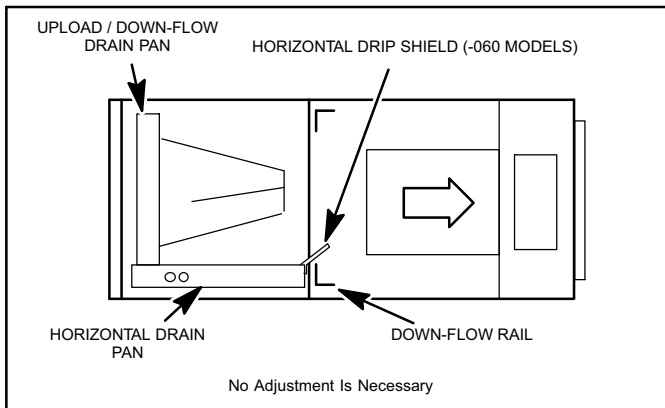
Model	Kit Number
All Sizes	45K32

## HORIZONTAL RIGHT-HAND DISCHARGE APPLICATION

Use the following procedures to configure the unit for horizontal right-hand discharge operations:

*NOTE - For horizontal applications, a secondary drain pan is recommended. Refer to local codes.*

1. Before operating the unit, remove access panels and the horizontal drip shield (-060 model) and the corrugated padding between the blower and coil assembly. Discard the corrugated padding.
2. Install the horizontal shield on the front edge of the horizontal drain pan as illustrated in figure 2.
3. No further adjustment is necessary. Set unit so that it is sloped 1/4" towards the drain pan end of the unit.
4. If the unit is suspended, the entire length of the cabinet must be supported. If you use a chain or strap, use a piece of angle iron or sheet metal attached to the unit (either above or below) to support the length of the cabinet. Use securing screws no longer than 1/2" to avoid damaging the coil or filter as illustrated in figure 3. Use sheet metal screws to connect the return and supply air plenums as required.



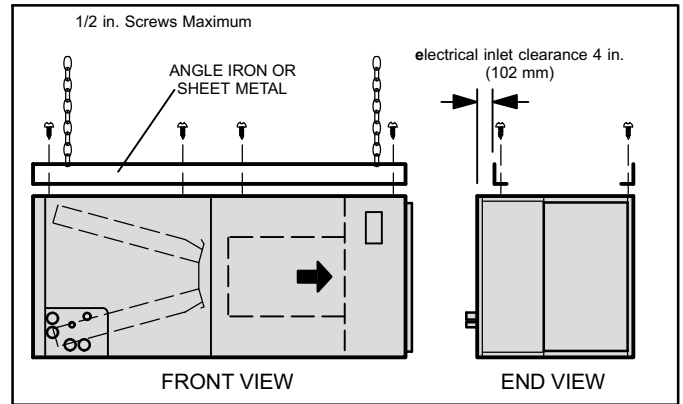
**Figure 2. Right-Hand Discharge Configuration**

## HORIZONTAL RIGHT-HAND DISCHARGE APPLICATION IN HIGH HUMIDITY AREAS

For horizontal applications in high humidity areas remove the down-flow rail closest to the drain pan.

### To remove rail:

1. Remove the screws from the rail at the back of unit and at the cabinet support rail.
2. Remove the down-flow rail then replace screws.
3. Seal around the exiting drain pipe, liquid line, and suction line to prevent humid air from infiltrating into the unit.



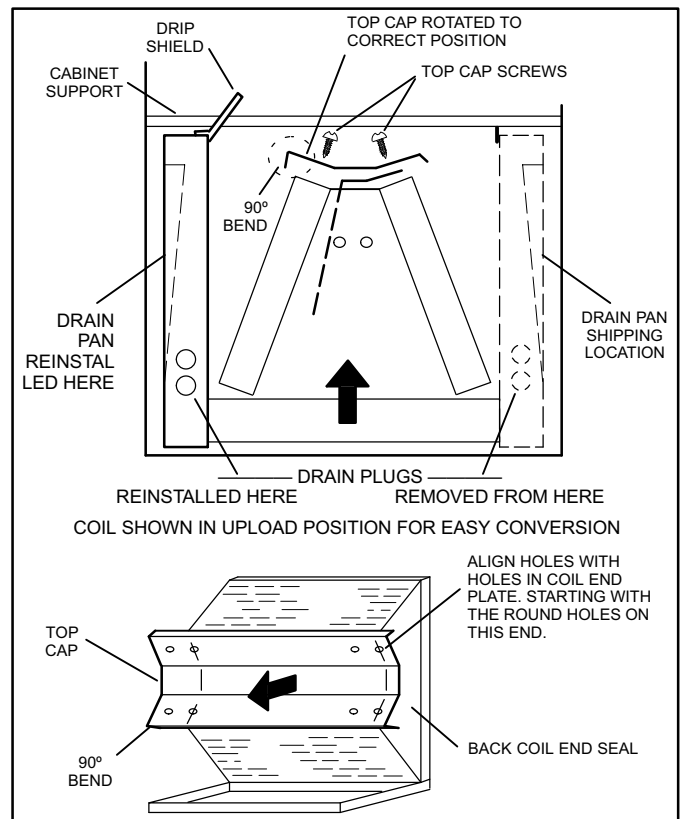
**Figure 3. Suspending Horizontal Unit**

## ! IMPORTANT

When removing the coil, there is possible danger of equipment damage and personal injury. Be careful when removing the coil assembly from a unit installed in right- or left-hand applications. The coil may tip into the drain pan once it is clear of the cabinet. Support the coil when removing it.

## HORIZONTAL LEFT-HAND DISCHARGE APPLICATION

*NOTE - For horizontal applications, a secondary drain pan is recommended. Refer to local codes.*



**Figure 4. Field Modification for Left-Hand Discharge**

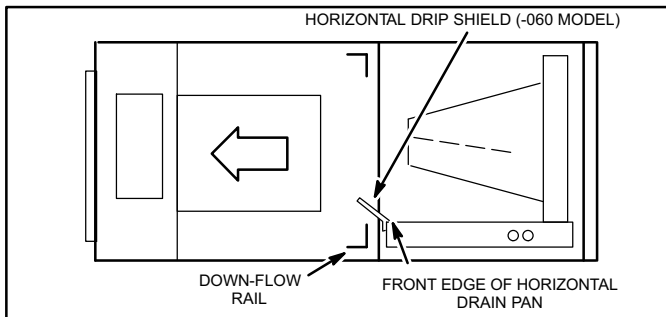
Use the following procedures to configure the unit for horizontal left-hand discharge operations:

1. Before operating the unit, remove access panels and the horizontal drip shield (-060 model) and the corrugated padding between the blower and coil assembly. Discard the corrugated padding.
2. Pull the coil assembly from unit. Pull off the horizontal drain pan.
3. Remove the drain plugs from back drain holes on horizontal drain pan and reinstall them on front holes.

## ⚠ IMPORTANT

After removal of drain pan plug(s), check drain hole(s) to verify that drain opening is fully open and free of any debris. Also check to make sure that no debris has fallen into the drain pan during installation that may plug up the drain opening.

4. Rotate drain pan 180° front-to-back and install it on the opposite side of the coil.
5. Remove screws from top cap. Remove horizontal drip shield screw located in the center of the back coil end seal as illustrated in figure 4 on page 5.
6. Rotate horizontal drip shield 180° front to back.
7. Remove plastic plug from left hole on coil front end seal and reinstall plug in back hole. Reinstall horizontal drip shield screw in front coil end seal. Drip shield should drain downward into horizontal drain pan inside coil.



**Figure 5. Left-Hand Discharge Configuration**

8. Rotate top cap 180° front-to-back and align with unused screw holes. Holes must align with front and back coil end plates. The top cap has a 45° bend on one side and a 90° bend on the other. **The 90° bend must be on the same side as the horizontal drain pan** as illustrated in figure 4 on page 5.

*NOTE - Be very careful when you reinstall the screws into coil end plate engaging holes. Misaligned screws may damage the coil.*

9. From the up-flow position, flip cabinet 90° to the left and set into place. Replace blower assembly. Secure coil in place by bending down the tab on the cabinet support rail as illustrated in figures 4 and 5.

10. Install the horizontal shield (-060 model) on the front edge of the horizontal drain pan as illustrated in figure 5 on page 6.

*NOTE - For horizontal applications in **high humidity areas**, remove the down-flow rail closest to the drain pan. To remove rail, remove screw from rail at back of unit and at cabinet support rail. Remove down-flow rail then replace screws. Also, seal around the exiting drain pipe, liquid and suction lines to prevent infiltration of humid air.*

11. Knock out drain seal plate from access door. Secure plate to cabinet front flange with screw provided.
12. Flip access door and replace it on the unit.
13. Set unit so that it is sloped 1/4" toward the drain pan end of the unit. Connect return and supply air plenums as required using sheet metal screws.
14. If suspending the unit, it must be supported along the entire length of the cabinet. If using chain or strap, use a piece of angle iron or sheet metal attached to the unit (either above or below) so that the full length of the cabinet is supported. Use securing screws no longer than 1/2" to avoid damage to coil or filter. as illustrated in figure 3 on page 5. Connect return and supply air plenums as required using sheet metal screws.

## DOWN-FLOW APPLICATION

*NOTE - If down-flow application is required, separately order kit number 83M57 and install per kit's instructions. Also use metal or class I supply and return air plenums.*

Use the installation instruction provided with the downflow kit.

## ⚠ IMPORTANT

If electric heat section with circuit breakers (ECB29/ECB31) is applied to down-flow and CBX27UH units, the circuit breakers must be rotated 180° to the UP position. See ECB29/ECB31 installation instructions for more details.

## Brazing Connections

## ⚠ IMPORTANT

To prevent the build up of high levels of nitrogen when purging, be sure it is done in a well ventilated area. Purge low pressure nitrogen (1 to 2 psig) through the refrigerant piping during brazing. This will help to prevent oxidation and the introduction of moisture into a system.

All coils are equipped with a factory-installed, internally mounted check/expansion valve.

The air handler's coil line sizes are listed in table 2. Use Lennox L15 (sweat) series line sets (refer to the outdoor unit Engineering Handbook for proper size, type and application). For field-fabricated refrigerant lines, see the piping section of the Lennox Unit Information Service Manual.

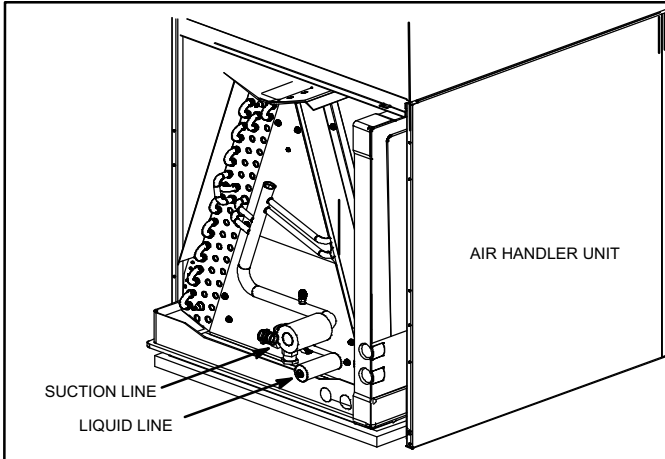
## ⚠ WARNING



Danger of explosion!

Can cause equipment damage, injury, or death.

When using a high pressure gas such as dry nitrogen to pressurize a refrigeration or air conditioning system, use a regulator that can control the pressure down to 1 or 2 psig (6.9 to 13.8 kPa).



**Figure 6. Brazing Connections**

*NOTE - CBX27UH series air handlers use nitrogen or dry air as a holding charge. If there is no pressure when the rubber plugs are removed, check the coil for leaks before installing. After installation, pull a vacuum on the line set and coil before releasing the unit charge into the system.*

*NOTE - See outdoor unit instructions on how to flow nitrogen through line sets.*

1. Remove access panel.
2. Remove the refrigerant line caps from the refrigerant lines.
3. Use a wet rag to protect TXV sensing bulb (or remove it) when brazing suction line connections.
4. Place a wet rag against piping plate and around the suction line connection. The wet rag must be in place to guard against damage to the paint.
5. With the wet rag in place, position a field provided elbow fitting to the air handler's suction line and line set. Start nitrogen flow before brazing.
6. After the procedure is completed then remove the wet rag.
7. Place wet rag against piping plate and around the liquid line connection. Position liquid line elbow to air handler's suction line and to line set. Start nitrogen flow and begin brazing both connections and after procedure is completed then remove both wet rags.
8. Refer to instructions provided with outdoor unit for leak testing, evacuating and charging procedures.
9. Install access panel.

**Table 2. Refrigerant Line Sizes**

Model	Liquid Line	Vapor Line	Line Sets
-018 -024 -030 -036	3/8" (10mm)	3/4" (19mm)	L15 line set sizes are dependent on unit match-up. See Engineering Handbook for outdoor unit to determine correct line set sizes.
-042 -048	3/8" (10mm)	7/8" (22mm)	
-060	3/8" (10mm)	7/8" (22mm)	Field-fabricated

### Installing the Condensate Drain

## ⚠ IMPORTANT

After removal of drain pan plug(s), check drain hole(s) to verify that drain opening is fully open and free of any debris. Also check to make sure that no debris has fallen into the drain pan during installation that may plug up the drain opening.

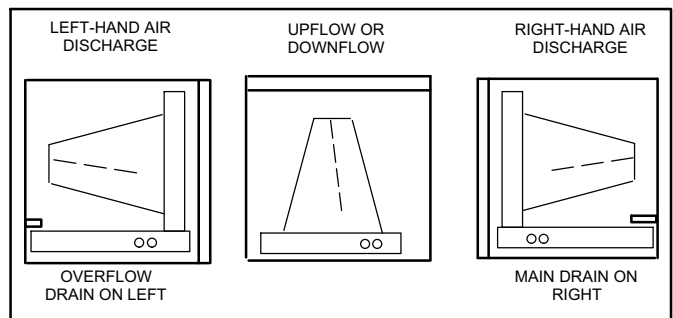
### MAIN DRAIN

Connect the main drain and route downward to drain line or sump. Do not connect drain to a closed waste system. See Figure 8 for typical drain trap configuration.

### OVERFLOW DRAIN

It is recommended that the overflow drain is connected to a overflow drain line for all units. If overflow drain is not connected, it must be plugged with provided cap.

For downflow orientation, the overflow drain **MUST** be connected and routed to a overflow drain line. See Figure 8 for main and overflow drain locations based on coil orientation.



**Figure 7. Main and Overflow Drain Locations based on Coil Orientation**

### BEST PRACTICES

The following best practices are recommended to ensure better condensate removal:

- Main and overflow drain lines should **NOT** be smaller than both drain connections at drain pan.
- Overflow drain line should run to an area where homeowner will notice drainage.
- It is recommended that the overflow drain line be vented and a trap installed. Refer to local codes.

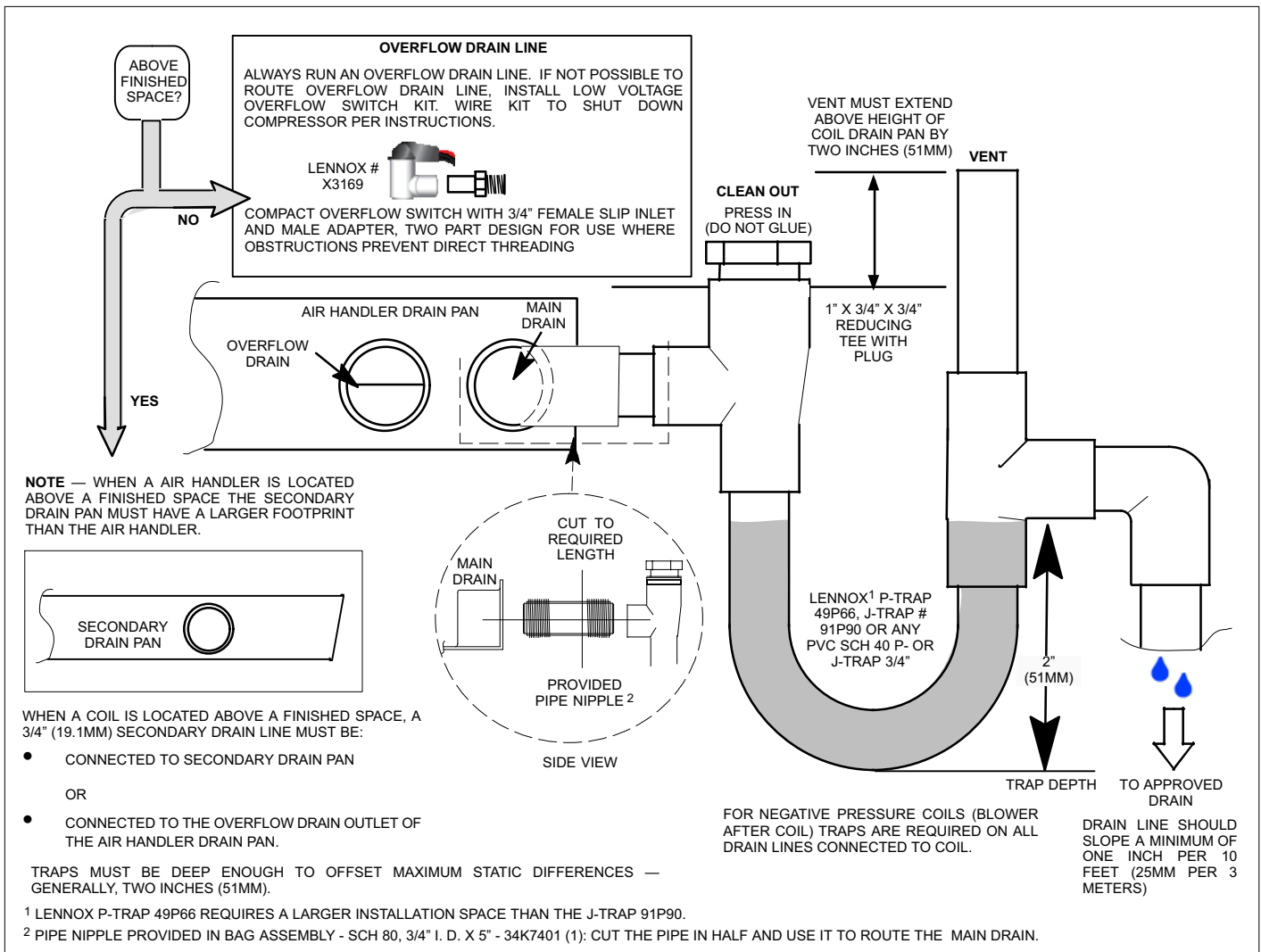


Figure 8. Typical Main and Overflow Drain

## Inspecting and Replacing Filters

### ⚠ IMPORTANT

Filter access panel must be in place during unit operation. Excessive warm air entering the unit may result in water blow-off problems.

Filters may be duct-mounted or installed in the cabinet. A filter is installed at the factory. Note that filter access door fits over access panel. Air will leak if the access panel is placed over the filter door.

Filters should be inspected monthly and must be cleaned or replaced when dirty to assure proper air handler operation.

Reusable filters supplied with some units can be washed with water and mild detergent. Some units are equipped with standard throw-away type filters which should be replaced when dirty.

To remove filter:

- Loosen the thumbscrews holding the filter panel in place.

- Insert new filter and replace panel.

Table 3. Filter Dimensions

CBX27UH	Filter Size - In. (mm)
-018, -024, -030, and -036	20" x 20" (508mm x 508mm)
-042, -048, and -060	20 x 24 (508 x 610)

## Sealing the Unit

### ⚠ WARNING

There must be an airtight seal between the bottom of the air handler and the return air plenum. Use fiberglass sealing strips, caulking, or equivalent sealing method between the plenum and the air handler cabinet to ensure a tight seal. Return air must not be drawn from a room where this air handler or any gas-fueled appliance (i.e., water heater), or carbon monoxide-producing device (i.e., wood fireplace) is installed.

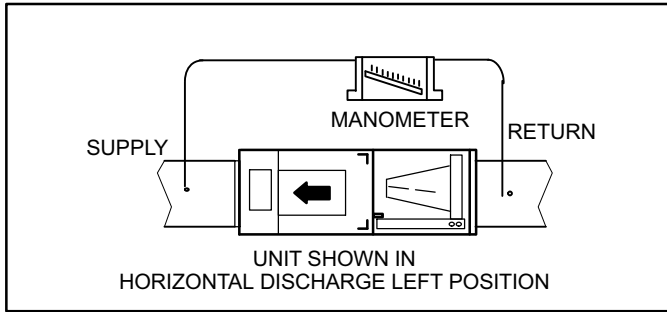
Seal the unit so that warm air is not allowed into the cabinet. Warm air introduces moisture, which results in water blow-off problems. This is especially important when the unit is installed in an unconditioned area.



Make sure the liquid line and suction line entry points are sealed with either the provided flexible elastomeric thermal insulation, or field provided material (e.g. *Armaflex*, *Permagum* or equivalent). Any of the previously mention materials may be used to seal around the main and auxiliary drains, and around open areas of electrical inlets.

### Measuring Static Pressure

1. Measure tap locations as shown in figure 9.



**Figure 9. Static Pressure Test**

2. Punch a 1/4" (6mm) diameter hole in supply and return air plenums. Insert manometer hose flush with inside edge of hole or insulation. Seal around the hose with permagum. Connect the zero end of the manometer to the discharge (supply) side of the system. On ducted systems, connect the other end of manometer to the return duct as above. For systems with non-ducted returns, leave the other end of the manometer open to the atmosphere.
3. With only the blower motor running and the evaporator coil dry, observe the manometer reading. Adjust blower motor speed to deliver the air desired according to the job requirements.
4. For best air performance external static pressure drop must not exceed 0.5" W.C. (1.2 kPa). Refer to blower data tables for cfm and external static.
5. Seal around the hole when the check is complete.

### Adjusting Blower Speed

#### MOTOR SPEED TAPS

*NOTE - Motor is programmed for a 45-second delay off on all speed taps except TAP #1 (continuous fan speed).*

Table 4 lists the recommended factory blower speed tap selections for CBX27UH series units.

**Table 4. Recommended Blower Speed Tap Selection**

Operation	CBX27UH	Outdoor Unit	Tap
Cooling	ALL SIZES	Condensing unit	3
		Heat pump	3
Heating*		Condensing unit with electric heat only	4
		Heat pump with electric heat	4

\* Minimum setting for heat

These settings are for nominal tonnage match-ups with the CBX27UH units. When matched with other sizes, it is recommended that the CFM be adjusted to approximately 400 CFM per ton.

To change blower motor speed tap remove the speed tap from Y2 on the terminal strip and insert the desired speed tap. See table 6 on page 10 for the desired CFM setting.

**⚠ IMPORTANT**

The high-efficiency programmable motor (e.g. X13) features programmed electronic braking. The integral control brakes the motor near the end of the supply blower operation, allowing the motor to maintain a more controlled ramping shut-down.

**Table 5. Motor Speed Taps**

Tap	Operation	Remarks
1	<b>Continuous or low speed fan</b> (for two-speed heat pumps or A/C units)	Continuous fan speed is energized (24 volt input to G) when either G or Y1 has a 24 volt signal (24 volt input from Y1 passes through the room thermostat's Fan Automatic contacts to the G terminal).
2	<b>Low-speed operation on high static system</b>	CFM set at 1/2 ton less than nominal of unit (e.g. 3-ton set at 1000 CFM).
3	<b>Cooling speed setting</b>	CFM set at 400 cfm per nominal ton at ARI minimum static allowed, as follows: 1.5 to 2.0 ton - 0.10 2.5 to 3.5 ton - 0.15 4 to 5 ton - 0.20
4	<b>Heat pump with electric heat</b>	CFM set at 400 cfm per nominal ton at .4 static. Energized when electric heat element has a call for heat.
5	<b>High static applications</b>	CFM set at 400 cfm per nominal ton at .8 static.

**Table 6. CB(X)27UH Air Handler Performance**

[in. w.g. - external static pressure expressed in inches water gauge; cfm - cubic feet/minute; W - watts]

Size	.in. w.g.	Air Volume with Motor Watts at 208V										Air Volume with Motor Watts at 230V									
		Tap 1		Tap 2		Tap 3		Tap 4		Tap 5		Tap 1		Tap 2		Tap 3		Tap 4		Tap 5	
		cfm	W	cfm	W	cfm	W	cfm	W	cfm	W	cfm	W	cfm	W	cfm	W	cfm	W	cfm	W
018	.00	815	80	810	77	835	86	855	89	1010	137	820	82	815	77	835	84	850	91	1010	140
	.10	720	71	700	68	735	76	790	89	980	142	710	71	715	71	735	77	795	89	975	144
	.20	580	59	560	58	665	76	755	99	950	153	570	59	580	60	660	77	755	99	950	154
	.30	500	63	450	55	610	78	710	101	905	157	505	64	440	58	615	80	715	102	910	160
	.40	400	65	350	59	580	87	685	111	870	166	415	67	355	60	575	89	680	112	875	170
	.50	365	74	290	60	505	96	640	114	835	176	355	77	300	64	510	99	630	118	850	179
	.60	315	75	280	68	445	100	580	124	800	179	320	77	270	71	450	102	575	129	805	183
	.70	N/A	N/A	210	71	390	102	515	128	755	187	N/A	N/A	220	72	395	106	525	137	780	192
	.80	N/A	N/A	170	71	355	109	470	136	710	194	N/A	N/A	175	76	365	112	485	144	725	200
024	.00	885	89	885	89	930	97	1035	130	1185	184	890	91	895	90	920	99	1040	130	1190	189
	.10	755	77	760	77	850	98	995	139	1140	193	785	82	770	78	855	100	1000	142	1145	200
	.20	665	73	670	72	820	106	970	148	1100	203	675	76	670	76	820	111	960	152	1110	207
	.30	605	77	600	77	775	112	920	154	1070	213	605	80	605	80	780	114	930	156	1085	219
	.40	560	84	515	88	725	121	885	165	1025	219	570	88	555	88	745	123	890	166	1035	225
	.50	445	95	445	95	675	124	835	171	1000	228	465	99	465	99	670	131	850	172	1010	235
	.60	400	98	395	96	570	137	810	179	960	232	405	101	405	101	595	142	815	183	975	246
	.70	N/A	N/A	345	101	520	143	705	193	920	242	N/A	N/A	350	106	530	151	710	197	935	248
	.80	N/A	N/A	320	106	460	148	625	201	835	254	N/A	N/A	330	112	485	155	660	207	895	260
030	.00	1130	128	1175	142	1230	158	1270	177	1345	208	1145	130	1180	142	1235	161	1280	179	1365	212
	.10	1045	118	1065	126	1140	151	1240	183	1345	219	1030	118	1085	130	1155	154	1245	183	1345	223
	.20	910	103	950	113	1105	160	1205	193	1305	231	915	105	955	116	1120	164	1205	195	1310	237
	.30	730	89	870	117	1050	169	1165	202	1250	238	755	91	885	118	1060	171	1170	207	1265	242
	.40	605	93	825	120	1020	176	1115	209	1205	248	655	92	830	124	1030	180	1125	213	1230	254
	.50	540	101	725	136	980	181	1085	218	1180	257	550	102	745	136	985	184	1090	223	1195	265
	.60	470	106	670	145	930	191	1035	224	1140	262	475	107	670	149	945	195	1050	230	1145	270
	.70	N/A	N/A	605	154	835	207	995	235	1105	273	N/A	N/A	620	159	860	213	1005	242	1110	280
	.80	N/A	N/A	545	159	785	217	950	245	1055	284	N/A	N/A	560	163	805	223	915	258	1050	295
036	.00	1185	136	1225	149	1320	184	1430	234	1545	293	1180	139	1230	152	1330	191	1440	238	1555	299
	.10	1070	125	1125	137	1280	196	1395	244	1515	303	1085	129	1125	141	1195	201	1405	251	1520	313
	.20	960	113	1010	130	1240	201	1360	255	1475	314	955	114	1025	132	1260	213	1365	264	1485	325
	.30	815	101	970	136	1195	214	1310	265	1430	322	805	105	975	142	1210	219	1330	275	1445	337
	.40	750	106	915	148	1155	225	1275	273	1385	334	770	114	930	153	1170	231	1285	283	1405	345
	.50	670	119	870	153	1110	231	1240	284	1345	345	670	128	870	159	1120	243	1250	295	1365	357
	.60	605	130	825	163	1160	242	1190	290	1315	355	605	134	810	173	1080	249	1210	307	1330	367
	.70	555	137	725	177	1125	251	1145	301	1270	359	565	142	725	185	1040	260	1160	313	1285	378
	.80	515	142	670	282	970	262	1100	312	1225	369	525	146	675	195	980	276	1120	324	1245	391
042	.00	1475	198	1530	218	1610	251	1705	295	1805	349	1475	200	1530	222	1615	254	1705	300	1815	350
	.10	1370	183	1420	207	1545	251	1660	307	1780	364	1360	184	1435	207	1545	255	1665	310	1775	368
	.20	1255	172	1305	189	1515	266	1635	322	1750	378	1245	172	1305	190	1515	269	1630	326	1750	384
	.30	1090	153	1250	200	1470	278	1600	336	1705	390	1090	155	1255	203	1470	278	1605	343	1715	395
	.40	1010	164	1190	210	1430	295	1560	346	1685	407	1020	165	1200	213	1420	300	1565	351	1680	408
	.50	955	177	1145	225	1385	310	1510	373	1640	428	955	178	1150	229	1385	314	1520	373	1650	430
	.60	885	183	1090	242	1330	319	1475	384	1590	443	915	183	1095	243	1330	324	1480	390	1595	453
	.70	N/A	N/A	1005	248	1255	341	1430	401	1565	457	N/A	N/A	1000	254	1265	344	1440	408	1565	468
	.80	N/A	N/A	990	260	1200	355	1365	419	1510	473	N/A	N/A	1000	255	1200	362	1375	429	1515	481
048	.00	1440	200	1515	233	1670	304	1690	313	1850	413	1440	202	1525	237	1680	309	1700	319	1860	422
	.10	1370	188	1455	224	1650	318	1670	329	1825	421	1370	189	1465	224	1665	324	1685	331	1840	431
	.20	1260	173	1425	231	1635	327	1660	337	1825	436	1255	177	1425	235	1650	331	1675	342	1840	443
	.30	1120	166	1380	242	1605	343	1630	351	1800	447	1125	167	1380	243	1625	349	1645	358	1815	461
	.40	1055	172	1335	260	1565	352	1595	367	1770	462	1055	177	1335	262	1585	358	1605	373	1780	471
	.50	960	190	1295	273	1530	372	1555	377	1735	479	970	194	1290	278	1535	378	1570	385	1745	490
	.60	895	195	1230	285	1490	389	1510	401	1695	489	890	201	1230	296	1500	396	1525	408	1720	506
	.70	N/A	N/A	1145	304	1445	407	1470	418	1650	513	N/A	N/A	1140	308	1455	415	1490	425	1665	533
	.80	N/A	N/A	1095	317	1385	416	1430	432	1605	530	N/A	N/A	1075	325	1405	435	1430	445	1630	551
060	.00	1490	207	1765	331	1970	455	2010	494	2365	799	1505	212	1775	337	1980	461	2025	497	2365	822
	.10	1395	194	1740	344	1930	466	1985	507	2328	810	1400	198	1745	352	1950	475	1990	514	2345	839
	.20	1320	192	1700	354	1900	480	1955	522	2300	827	1325	196	1705	361	1910	490	1965	532	2310	850
	.30	1275	206	1670	367	1875	487	1915	531	2265	842	1270	211	1675	374	1890	507	1930	540	2285	863
	.40	1220	214	1620	378	1825	504	1890	544	2235	850	1230	224	1635	390	1840	516	1905	556	2255	882
	.50	1170	226	1575	395	1795	519	1850	555	2205	861	1185	231	1590	402	1815	532	1875	573	2225	891
	.60	1135	241	1535	409	1750	529	1810	569	2175	872	1140	239	1545	419	1785	550	1825	585	2190	908
	.70	N/A	N/A	1490	417	1720	543	1775	585	2135	885	N/A	N/A	1510	426	1735	562	1795	602	2155	922
	.80	N/A	N/A	1470	429	1685	557	1730	592	2085	893	N/A	N/A	1480	442	1700	574	1760	619	2120	940

## Making Electrical Connections

### **⚠️ WARNING**

Run 24V Class II wiring only through specified low voltage opening. Run line voltage wiring only through specified high voltage opening. Do not combine voltage in one opening.

### **⚠️ CAUTION**

**USE COPPER CONDUCTORS ONLY.**

This unit is provided with knock-outs for conduit. Refer to figure 12 on page 13 for unit wiring diagram, which includes all field wiring. Separate openings have been provided for 24V low voltage and line voltage. Refer to the dimension illustration on page 2 or 3 for specific location.

Wiring must conform to the current National Electric Code ANSI/NFPA No. 70, or Canadian Electric Code Part I, CSA Standard C22.1, and local building codes. Refer to following wiring diagrams. See unit nameplate for minimum circuit ampacity and maximum overcurrent protection size.

Select the proper supply circuit conductors in accordance with tables 310-16 and 310-17 in the National Electric Code, ANSI/NFPA No. 70 or tables 1 through 4 in the Canadian Electric Code, Part I, CSA Standard C22.1.

The motor speed is set by the speed tap connection to the low voltage terminal strip in the control section. The speed can be increased by swapping wires as shown in figure 10.

### **WIRING CONNECTIONS**

1. Install line voltage power supply to unit from a properly circuit breaker.

2. Ground unit at unit disconnect switch or to an earth ground.

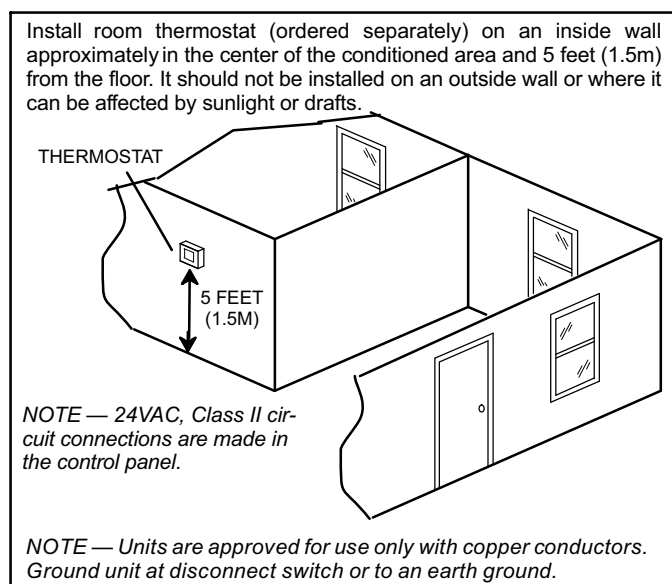
*NOTE* — Connect conduit to the unit using a proper conduit fitting. Units are approved for use only with copper conductors. A complete unit wiring diagram is located on the back side of the unit's access panel.

3. Install low voltage wiring from outdoor to indoor unit and from thermostat to indoor unit.

*NOTE* — For proper voltages, select thermostat wire gauge per the following chart:

**Table 7. Run Length (Class II Rated Wiring)**

Wire Run Length	AWG #	Insulation/Core Types
Less than 100' (30m)	18	Color-coded, temperature rating 95°F (35°C) minimum, solid core.
More than 100' (30m)	16	



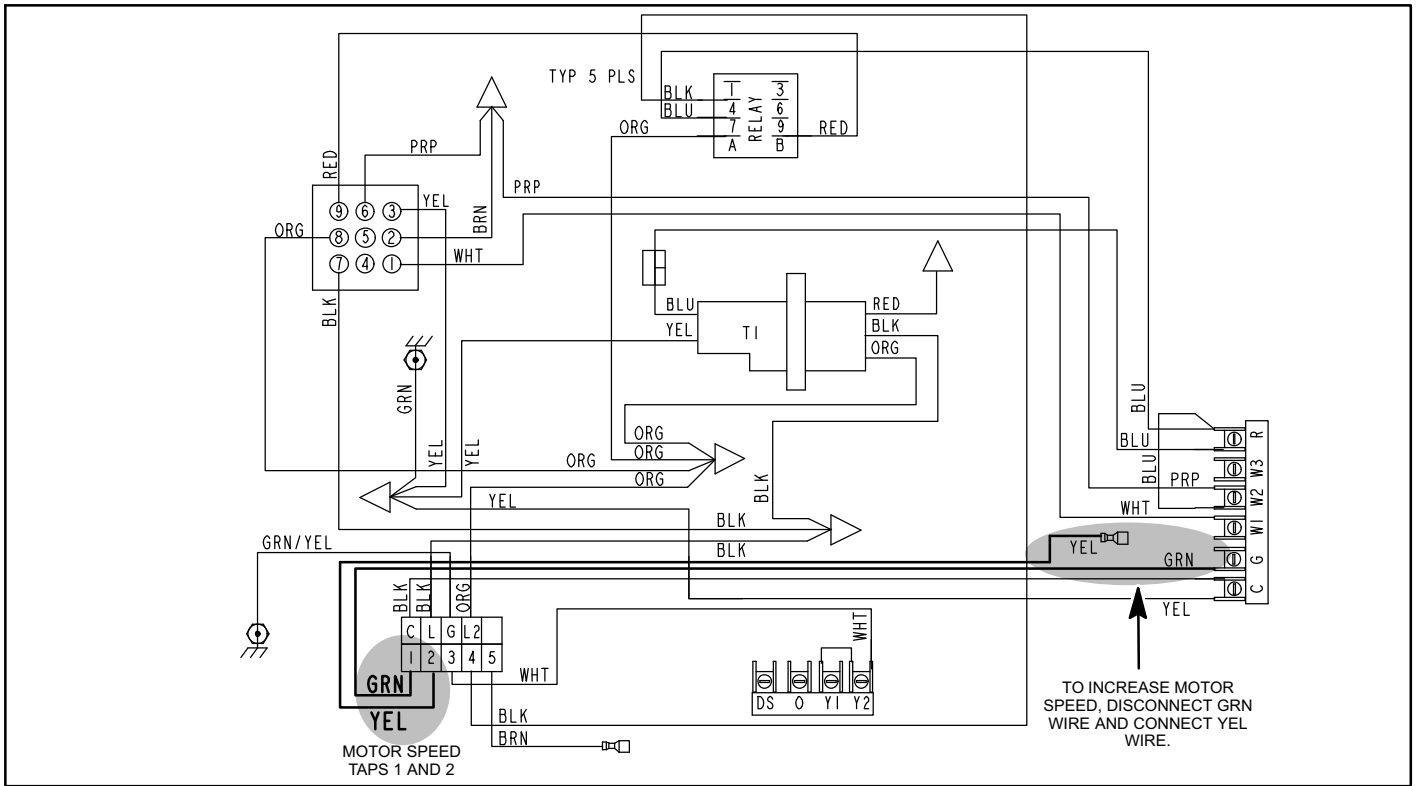


Figure 10. Motor Speed Taps (208/230V, Single Phase)

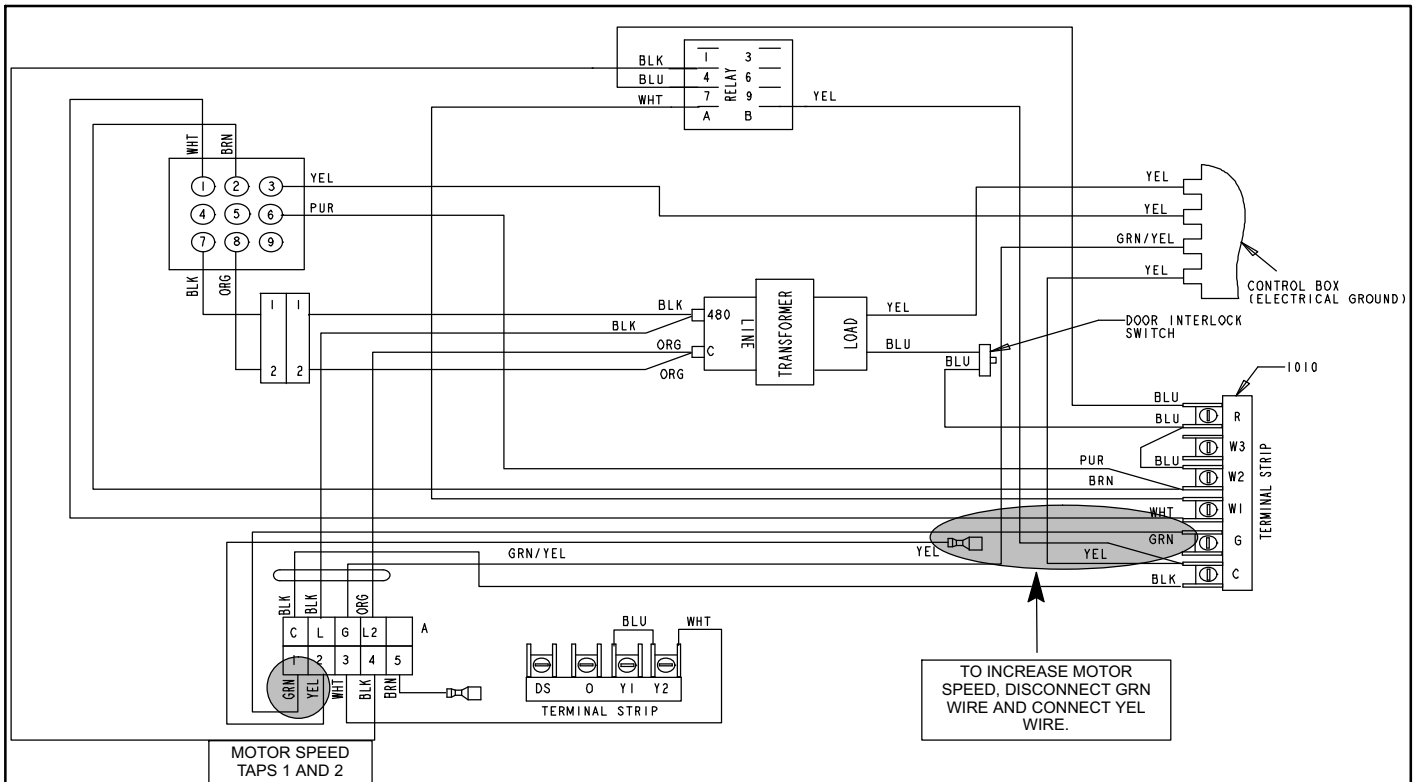
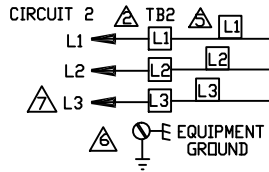


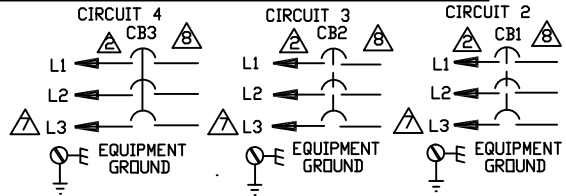
Figure 11. Motor Speed Taps — 460V, 3-Phase, 60Hz — Single Phase (-036, -048 and -060 only)

FIELD WIRING FOR UNITS WITHOUT CIRCUIT BREAKERS



- ⚠ CONNECT POWER WIRES FROM HEATER LABELED L1,L2 ON "P" VOLTAGE UNITS AND L1,L2,L3 ON "Y" VOLTAGE UNITS TO TB2 TERMINAL STRIP IN INDOOR UNIT
- ⚠ EQUIPMENT GROUND LOCATED IN INDOOR UNIT

FIELD WIRING FOR UNITS WITH CIRCUIT BREAKERS



- ⚠ L3 IS NOT PRESENT ON (P) ELECTRIC HEATERS
- ⚠ THE NUMBER OF CIRCUITS VARY ACCORDING TO HEATER MODEL. REFER TO FAN COIL NAMEPLATE FOR ACTUAL NUMBER EMPLOYED

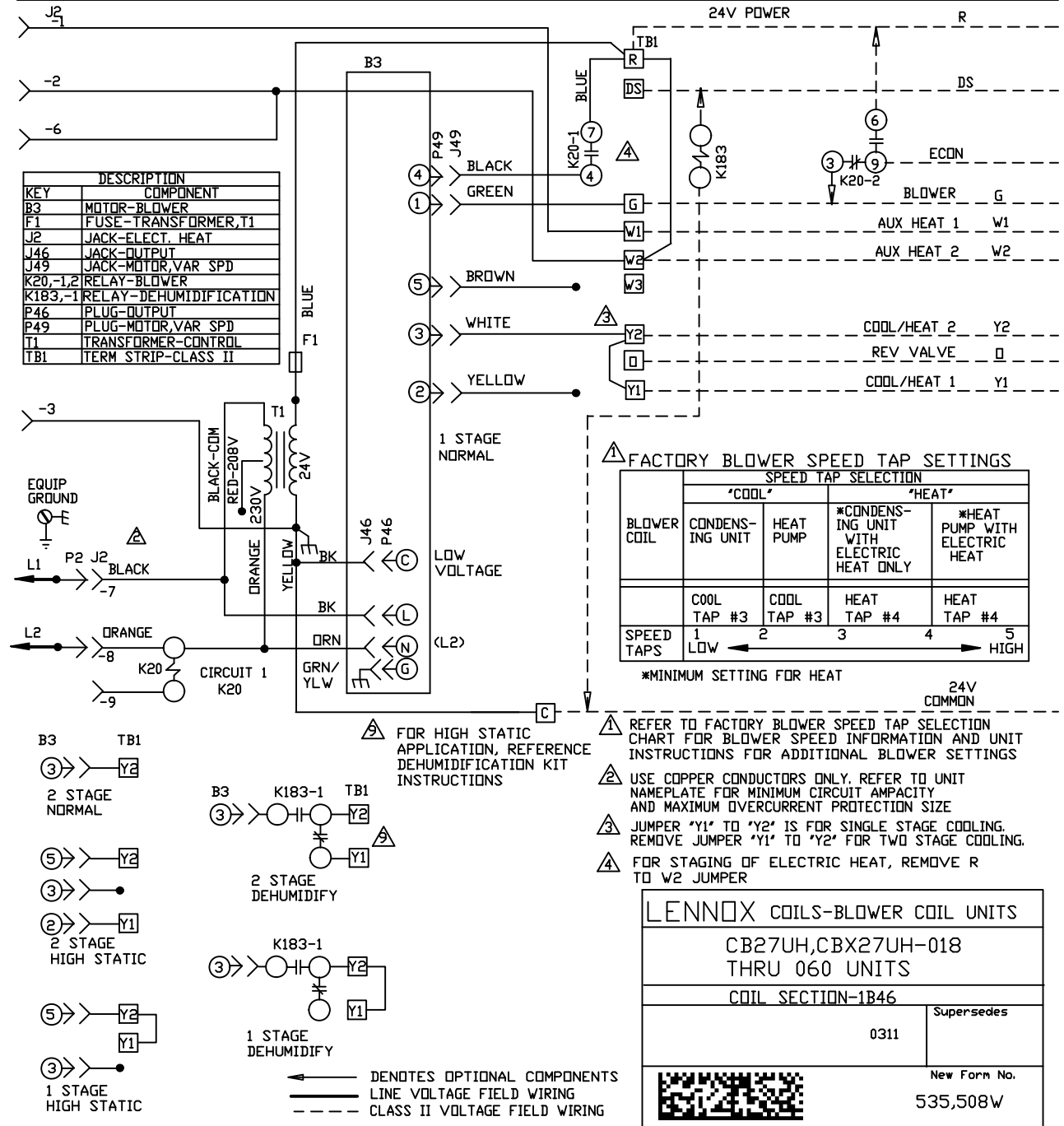
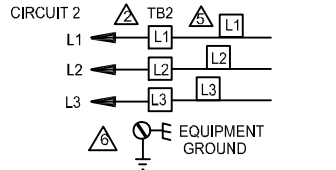


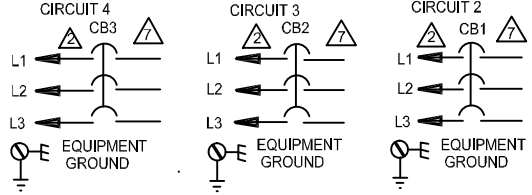
Figure 12. Typical System Wiring Diagram (208/230V, Single and Three Phase)

**FIELD WIRING FOR UNITS WITHOUT CIRCUIT BREAKERS**

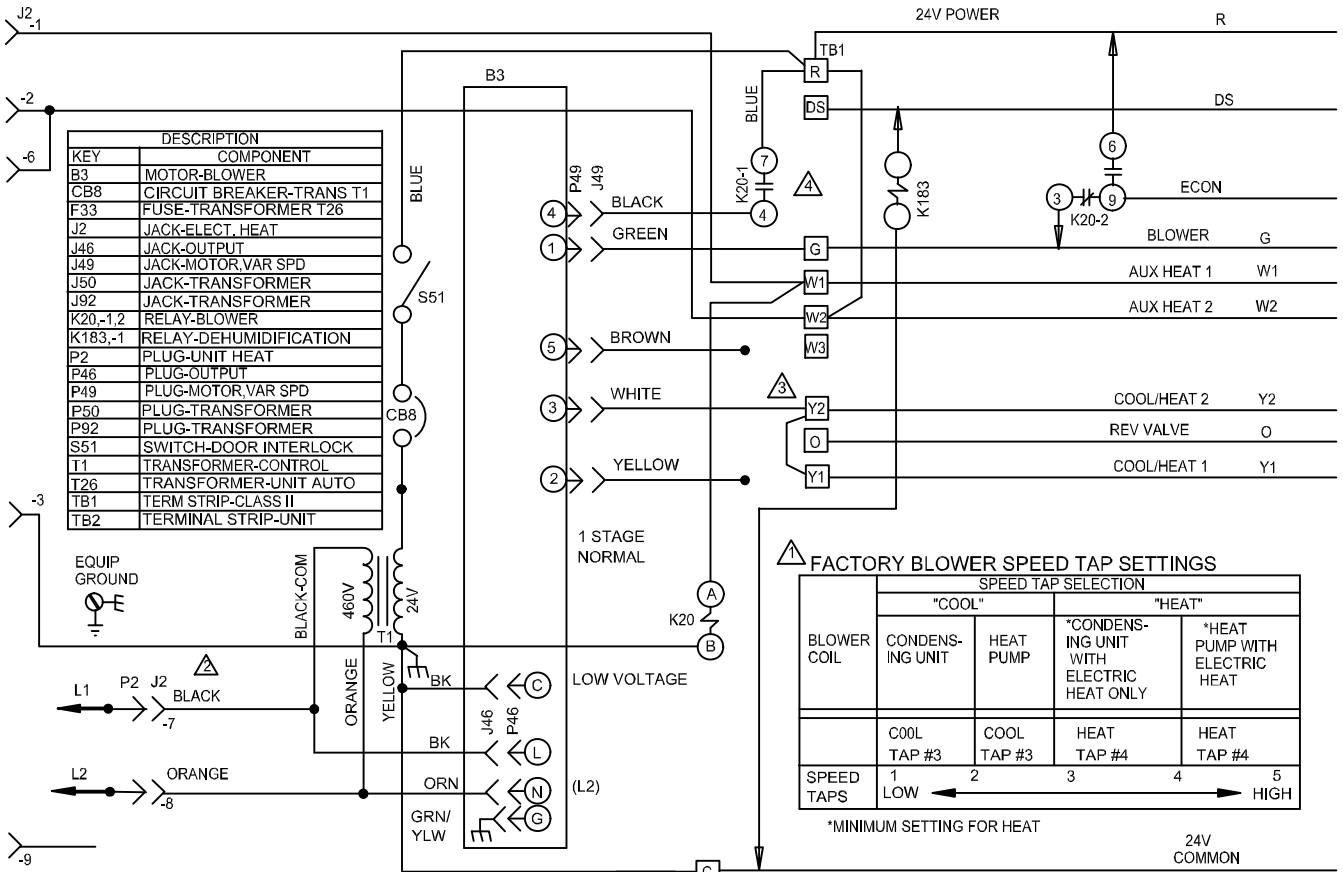


- ⚠ CONNECT POWER WIRES FROM HEATER LABELED L1, L2, L3 ON G VOLTAGE UNITS TO TB2 TERMINAL STRIP IN INDOOR UNIT
- ⚠ EQUIPMENT GROUND LOCATED IN INDOOR UNIT

**FIELD WIRING FOR UNITS WITH CIRCUIT BREAKERS**



- ⚠ THE NUMBER OF CIRCUITS VARY ACCORDING TO HEATER MODEL. REFER TO FAN COIL NAMEPLATE FOR ACTUAL NUMBER EMPLOYED

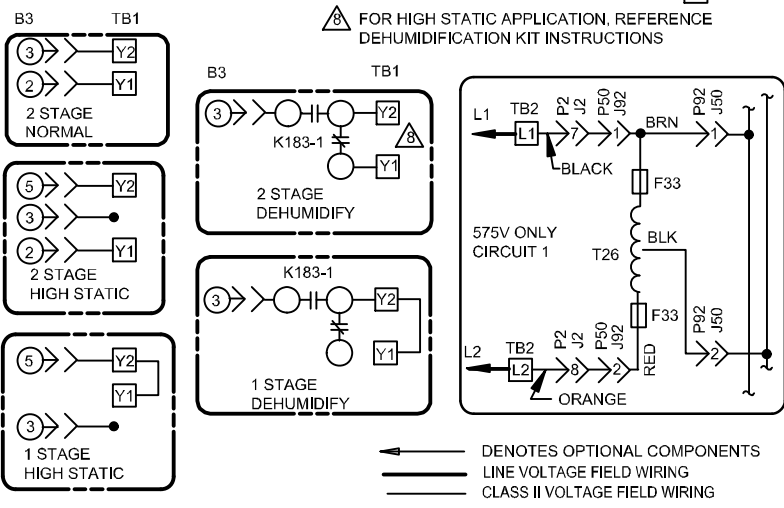


**FACTORY BLOWER SPEED TAP SETTINGS**

BLOWER COIL	SPEED TAP SELECTION			
	"COOL" CONDENS- ING UNIT	HEAT PUMP	*CONDENS- ING UNIT WITH ELECTRIC HEAT ONLY	*HEAT PUMP WITH ELECTRIC HEAT
	COOL TAP #3	COOL TAP #3	HEAT TAP #4	HEAT TAP #4
SPEED TAPS	1	2	3	4
	LOW ← 2 → 3 → 4 → 5 HIGH			

\*MINIMUM SETTING FOR HEAT

24V COMMON



- ⚠ REFER TO FACTORY BLOWER SPEED TAP SELECTION CHART FOR BLOWER SPEED INFORMATION AND UNIT INSTRUCTIONS FOR ADDITIONAL BLOWER SETTINGS
- ⚠ USE COPPER CONDUCTORS ONLY. REFER TO UNIT NAMEPLATE FOR MINIMUM CIRCUIT AMPACITY AND MAXIMUM OVERCURRENT PROTECTION SIZE
- ⚠ JUMPER "Y1" TO "Y2" IS FOR SINGLE STAGE COOLING. REMOVE JUMPER "Y1" TO "Y2" FOR TWO STAGE COOLING.
- ⚠ REMOVE R TO W2 JUMPER ON TWO STAGE NON HEAT PUMP APPLICATIONS

— DENOTES OPTIONAL COMPONENTS  
 — LINE VOLTAGE FIELD WIRING  
 — CLASS II VOLTAGE FIELD WIRING

**Figure 13. Typical System Wiring Diagram — 460V, Single and Three Phase (-036, -048 and -060 only)**

## Repairing or Replacing Cabinet Insulation

### **! IMPORTANT**

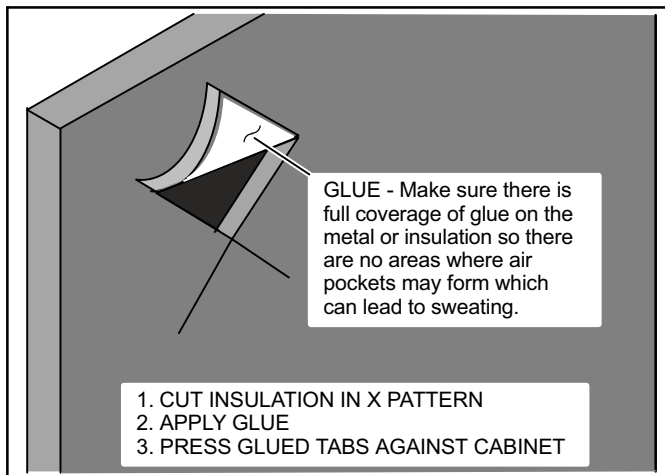
**DAMAGED INSULATION MUST BE REPAIRED OR REPLACED** before the unit is put back into operation. Insulation loses its insulating value when wet, damaged, separated or torn.

Matt- or foil-faced insulation is installed in indoor equipment to provide a barrier between outside air conditions (surrounding ambient temperature and humidity) and the varying conditions inside the unit. If the insulation barrier is damaged (wet, ripped, torn or separated from the cabinet walls), the surrounding ambient air will affect the inside surface temperature of the cabinet. The temperature/humidity difference between the inside and outside of the cabinet can cause condensation on the inside or outside of the cabinet which leads to sheet metal corrosion and subsequently, component failure.

#### **REPAIRING DAMAGED INSULATION**

Areas of condensation on the cabinet surface are an indication that the insulation is in need of repair.

If the insulation in need of repair is otherwise in good condition, the insulation should be cut in an X pattern, peeled open, glued with an appropriate all-purpose glue and placed back against the cabinet surface, being careful to not overly compress the insulation so the insulation can retain its original thickness. If such repair is not possible, replace the insulation. If using foil-faced insulation, any cut, tear, or separations in the insulation surface must be taped with a similar foil-faced tape.



**Figure 14. Repairing Insulation**

### **! WARNING**

**Electric Shock Hazard.**

Can cause injury or death.

Foil-faced insulation has conductive characteristics similar to metal. Be sure there are no electrical connections within a 1/2" of the insulation. If the foil-faced insulation comes in contact with electrical voltage, the foil could provide a path for current to pass through to the outer metal cabinet. While the current produced may not be enough to trip existing electrical safety devices (e.g. fuses or circuit breakers), the current can be enough to cause an electric shock hazard that could cause personal injury or death.

## Homeowner Maintenance

### **! IMPORTANT**

Do not operate system without a filter. A filter is required to protect the coil, blower, and internal parts from excessive dirt and dust. The filter is placed in the return duct by the installer.

- Inspect air filters at least once a month and replace or clean as required. Dirty filters are the most common cause of inadequate heating or cooling performance.
- Replace disposable filters. Cleanable filters can be cleaned by soaking in mild detergent and rinsing with cold water.
- Install new/clean filters with the arrows on the side pointing in the direction of airflow. Do not replace a cleanable (high velocity) filter with a disposable (low velocity) filter unless return air system is properly sized for it.
- If water should start coming from the secondary drain line, a problem exists which should be investigated and corrected. Contact a qualified service technician.

## Check-out Procedures

### **IMPORTANT**

During installation, service or maintenance, make sure that copper tubing does not rub against metal edges or other copper tubing. Care should also be taken to ensure that tubing does not become kinked. Use wire ties to secure tubing to prevent movement.

Do not secure electrical wires to tubing that carries hot refrigerant gas. Heat from the tubing may melt the wiring insulation causing a short circuit.

*NOTE - Refer to outdoor unit installation instructions for system start-up instructions and refrigerant charging instructions.*

#### **PRE-START-UP CHECKS**

- Is the air handler properly and securely installed?
- If horizontally configured, is the unit sloped up to 1/4 inch toward drain lines?
- Will the unit be accessible for servicing?
- Has an auxiliary pan been provided under the unit with separate drain for units installed above a finished ceiling or in any installation where condensate overflow could cause damage?
- Have ALL unused drain pan ports been properly plugged?
- Has the condensate line been properly sized, run, trapped, pitched, and tested?
- Is the duct system correctly sized, run, sealed, and insulated?
- Have all cabinet openings and wiring been sealed?

- Is the indoor coil factory-installed TXV properly sized for the outdoor unit being used?
- Have all unused parts and packaging been disposed of?
- Is the filter clean, in place, and of adequate size?
- Is the wiring neat, correct, and in accordance with the wiring diagram?
- Is the unit properly grounded and protected (fused)?
- Is the thermostat correctly wired and in a good location?
- Are all access panels in place and secure?

#### **CHECK BLOWER OPERATION**

- Set thermostat to FAN ON.
- The indoor blower should come on.

#### **CHECK COOLING OPERATION**

- Set thermostat to force a call for cooling (approximately 5°F lower than the indoor ambient temperature).
- The outdoor unit should come on immediately and the indoor blower should start between **30 - 60** seconds later.
- Check the airflow from a register to confirm that the system is moving cooled air.
- Set the thermostat 5°F higher than the indoor temperature. The indoor blower and outdoor unit should cycle off.

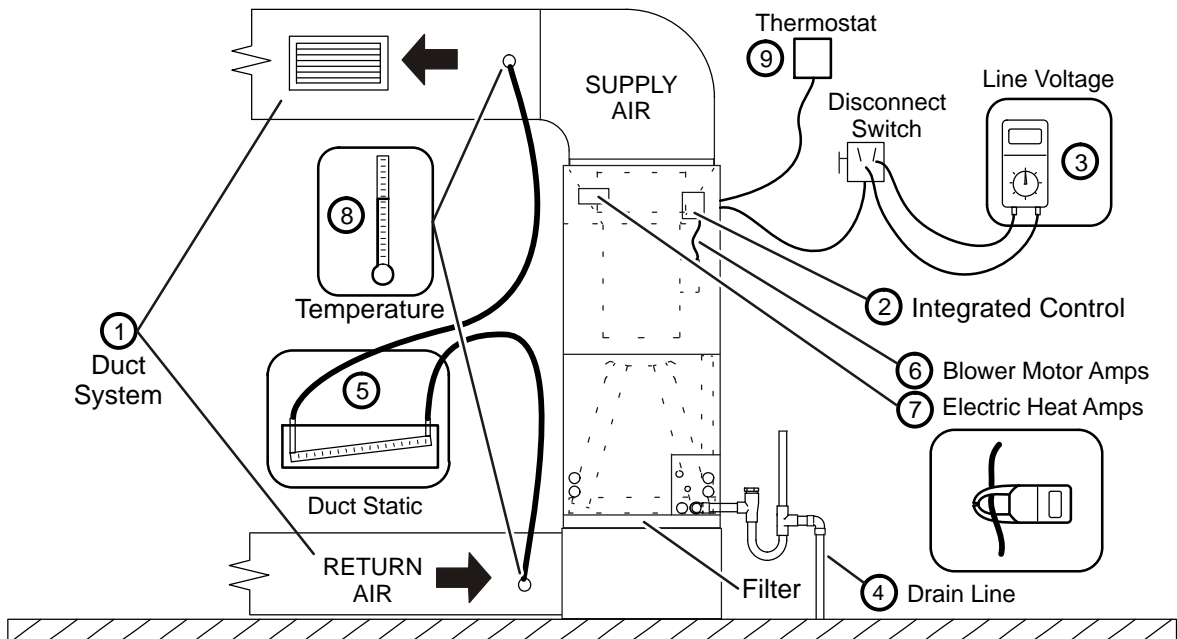
#### **CHECK ELECTRIC HEATER (IF USED)**

- Set thermostat to call for auxiliary heat (approximately 5°F above ambient temperature). The indoor blower and auxiliary heat should come on together. Allow a minimum of 3 minutes for all sequencers to cycle on.
- Set the thermostat so that it does not call for heat. Allow up to 5 minutes for all sequencers to cycle off.



Installing Contractor's Name \_\_\_\_\_  
 Installing Contractor's Phone \_\_\_\_\_  
 Job Address \_\_\_\_\_

Installing Date \_\_\_\_\_  
 Air Handler Model # \_\_\_\_\_



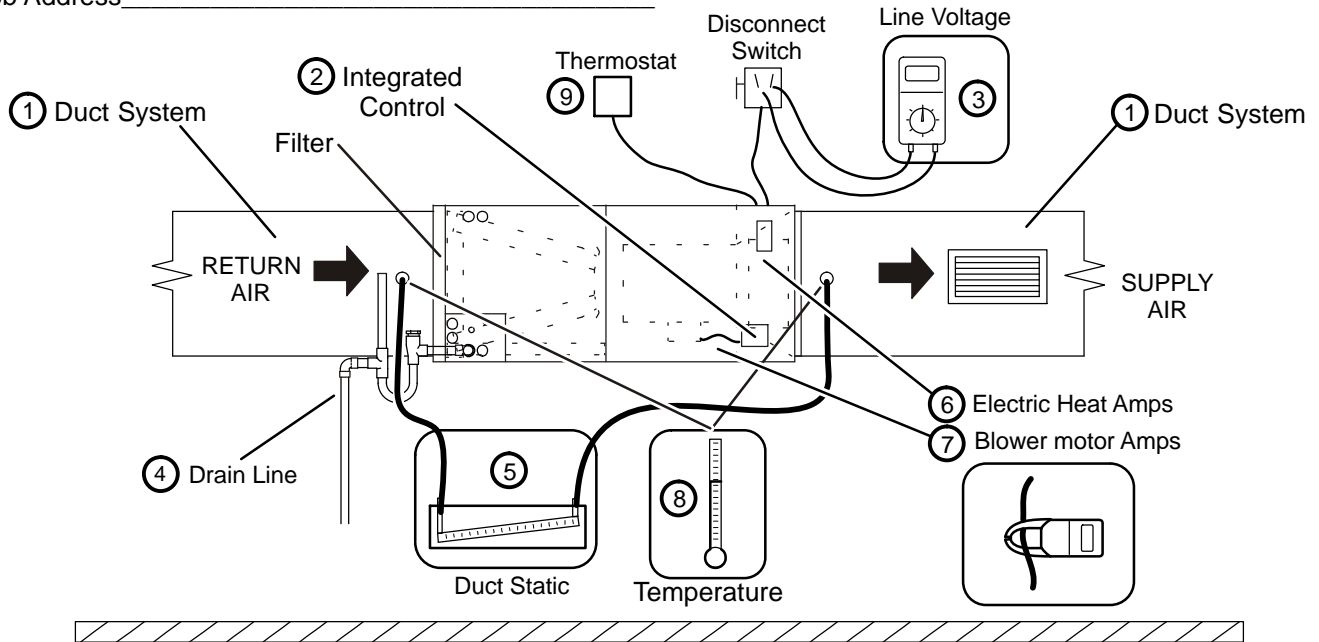
- |  |   |
|--|---|
| <p><b>① DUCT SYSTEM</b><br/>       SUPPLY AIR DUCT</p> <p><input type="checkbox"/> Sealed</p> <p><input type="checkbox"/> Insulated (if necessary)</p> <p><input type="checkbox"/> Registers Open and Unobstructed</p> <p>RETURN AIR DUCT</p> <p><input type="checkbox"/> Sealed</p> <p><input type="checkbox"/> Filter Installed and Clean</p> <p><input type="checkbox"/> Registers Open and Unobstructed</p> <p><b>② INTEGRATED CONTROL</b></p> <p><input type="checkbox"/> Jumpers Configured Correctly (if applicable)</p> <p><input type="checkbox"/> Appropriate Links in Place (if applicable)</p> <p><b>③ VOLTAGE CHECK</b></p> <p><input type="checkbox"/> Supply Voltage _____</p> <p><input type="checkbox"/> Low Voltage _____</p> <p><input type="checkbox"/> Electrical Connections Tight</p> <p><b>④ DRAIN LINE</b></p> <p><input type="checkbox"/> Leak Free</p> <p><input type="checkbox"/> Explained Operation of System to Homeowner</p> | <p><b>⑤ TOTAL EXTERNAL STATIC (dry coil)</b></p> <p style="text-align: right;">dry coil    wet coil</p> <p>Supply External Static _____</p> <p>Return External Static _____</p> <p>Total External Static = _____</p> <p><b>⑥ ELECTRIC HEAT AMPS</b> _____</p> <p><b>⑦ INDOOR BLOWER AMPS</b> _____</p> <p>INDOOR BLOWER CFM _____</p> <p><b>⑧ TEMPERATURE DROP (Cooling Mode)</b></p> <p>Return Duct Temperature _____</p> <p>Supply Duct Temperature – _____</p> <p>Temperature Drop = _____</p> <p><b>⑧ TEMPERATURE RISE (Heating Mode)</b></p> <p>Return Duct Temperature _____</p> <p>Supply Duct Temperature – _____</p> <p>Temperature Rise = _____</p> <p><b>⑨ THERMOSTAT</b></p> <p><input type="checkbox"/> Adjusted and Programmed</p> <p><input type="checkbox"/> Operation Explained to Owner</p> |
|--|---|

Technician's Name: \_\_\_\_\_ Date Start-Up & Performance Check Completed \_\_\_\_\_

**Figure 15. Start-Up and Performance Checklist (Upflow Configuration)**

Installing Contractor's Name \_\_\_\_\_  
 Installing Contractor's Phone \_\_\_\_\_  
 Job Address \_\_\_\_\_

Installing Date \_\_\_\_\_  
 Air Handler Model # \_\_\_\_\_



- |  |   |
|--|---|
| <p><b>① DUCT SYSTEM</b></p> <p>SUPPLY AIR DUCT</p> <p><input type="checkbox"/> Sealed</p> <p><input type="checkbox"/> Insulated (if necessary)</p> <p><input type="checkbox"/> Registers Open and Unobstructed</p> <p>RETURN AIR DUCT</p> <p><input type="checkbox"/> Sealed</p> <p><input type="checkbox"/> Filter Installed and Clean</p> <p><input type="checkbox"/> Registers Open and Unobstructed</p> <p><b>② INTEGRATED CONTROL</b></p> <p><input type="checkbox"/> Jumpers Configured Correctly (if applicable)</p> <p><input type="checkbox"/> Appropriate Links in Place (if applicable)</p> <p><b>③ VOLTAGE CHECK</b></p> <p><input type="checkbox"/> Supply Voltage _____</p> <p><input type="checkbox"/> Low Voltage _____</p> <p><input type="checkbox"/> Electrical Connections Tight</p> <p><b>④ DRAIN LINE</b></p> <p><input type="checkbox"/> Leak Free</p> <p><input type="checkbox"/> Explained Operation of System to Homeowner</p> | <p><b>⑤ TOTAL EXTERNAL STATIC (dry coil)</b></p> <p style="text-align: right;">dry coil    wet coil</p> <p>Supply External Static _____</p> <p>Return External Static _____</p> <p>Total External Static = _____</p> <p><b>⑥ ELECTRIC HEAT AMPS</b> _____</p> <p><b>⑦ INDOOR BLOWER AMPS</b> _____</p> <p>INDOOR BLOWER CFM _____</p> <p><b>⑧ TEMPERATURE DROP (Cooling Mode)</b></p> <p>Return Duct Temperature _____</p> <p>Supply Duct Temperature – _____</p> <p>Temperature Drop = _____</p> <p><b>⑧ TEMPERATURE RISE (Heating Mode)</b></p> <p>Return Duct Temperature _____</p> <p>Supply Duct Temperature – _____</p> <p>Temperature Rise = _____</p> <p><b>⑨ THERMOSTAT</b></p> <p><input type="checkbox"/> Adjusted and Programmed</p> <p><input type="checkbox"/> Operation Explained to Owner</p> |
|--|---|

Technician's Name: \_\_\_\_\_ Date Start-Up & Performance Check Completed \_\_\_\_\_

**Figure 16. Start-Up and Performance Checklist (Horizontal Configuration)**