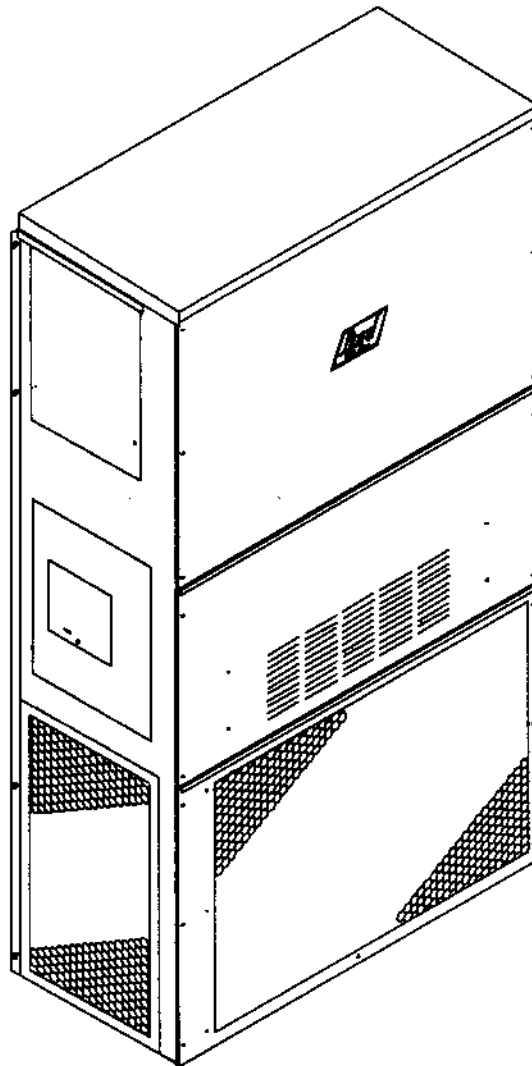

**Installation
Instructions**

**Wall Mounted
Packaged Air Conditioner**

Models: WL301, WL361



MIS-861



Bard Manufacturing Company
Bryan, Ohio 43506

*Since 1914...Moving ahead, just as
planned.*

Manual No.: 2100-272C
File: Volume III, Tab 16
Date: 02-10-97

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Getting Other Information and Publications

These publications can help you install the air conditioner or heat pump. You can usually find these at your local library or purchase them directly from the publisher. Be sure to consult current edition of each standard.

National Electrical Code ANSI/NFPA 70

Standard for the Installation ANSI/NFPA 90A
of Air Conditioning and
Ventilating Systems

Standard for Warm Air ANSI/NFPA 90B
Heating and Air
Conditioning Systems

Load Calculation for ACCA Manual J
Residential Winter and
Summer Air Conditioning

Duct Design for Residential ACCA Manual D
Winter and Summer Air
Conditioning and Equipment
Selection

For more information, contact these publishers:

ACCA — Air Conditioning Contractors of America
1712 New Hampshire Avenue NW
Washington, DC 20009
Telephone: (202) 483-9370
Fax: (202) 234-4721

ANSI — American National Standards Institute
11 West Street, 13th Floor
New York, NY 10036
Telephone: (212) 642-4900
Fax: (212) 302-1286

**ASHRAE — American Society of Heating Refrigerating, and
Air Conditioning Engineers, Incorporated**
1791 Tullie Circle, N.E.
Atlanta, GA 30329-2305
Telephone: (404) 636-8400
Fax: (404) 321-5478

NFPA — National Fire Protection Association
Batterymarch Park
P.O. Box 9101
Quincy, MA 02269-9901
Telephone: (800) 344-3555
Fax: (617) 984-7057

Manufactured under the following U.S. patent numbers:

5,301,744; 5,002,116; 4,924,934; 4,875,520; 4,825,836; 4,432,409

Other patents pending.

Wall Mount General Information

Air Conditioner Wall Mount Model Nomenclature

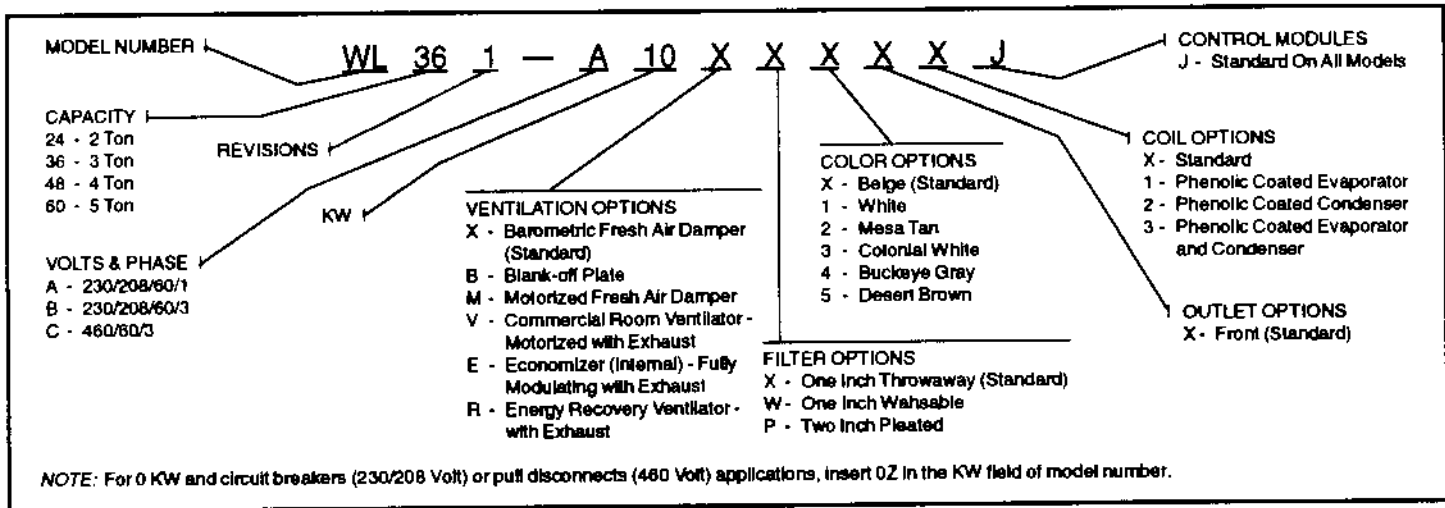


TABLE 1 - ELECTRICAL SPECIFICATIONS

Models	Rated Volts/Phase	No. Field Power Circuits	③ Minimum Circuit Ampacity	① Maximum External Fuse or Ckt. Breaker	② Field Power Wire Size	② Ground Wire Size	③ Minimum Circuit Ampacity		① Maximum External Fuse or Ckt. Breaker		② Field Power Wire Size		② Ground Wire Size	
							CKT. A	CKT. B	CKT. A	CKT. B	CKT. A	CKT. B	CKT. A	CKT. B
							WL301-A0Z A05 A10 A15	230/208-1	1 1 1 1 or 2	24 31 57 83	35 35 60 90	8 8 6 4	10 10 10 8	— — — 55
WL301-B0Z B09 B15	230/208-3	1 1 1	17 32 50	20 35 50	12 8 8	12 10 10	— — —	— — —	— — —	— — —	— — —	— — —	— — —	— — —
WL301-C0Z C09 C15	460-3	1 1 1	10 17 26	15 20 30	14 12 10	14 12 10	— — —	— — —	— — —	— — —	— — —	— — —	— — —	— — —
WL361-A0Z A05 A10 A15	230/208-1	1 1 1 1 or 2	27 31 57 83	35 35 60 90	8 8 6 4	10 10 10 8	— — — 55	— — — 28	— — — 60	— — — 30	— — — 6	— — — 10	— — — 8	— — — 10
WL361-B0Z B09 B15	230/208-3	1 1 1	20 32 50	25 35 50	10 8 8	10 10 10	— — —	— — —	— — —	— — —	— — —	— — —	— — —	— — —
WL361-C0Z C09 C15	460-3	1 1 1	10 17 26	15 20 30	14 12 10	14 12 10	— — —	— — —	— — —	— — —	— — —	— — —	— — —	— — —

① Maximum size of the time delay fuse or HACR type circuit breaker for protection of field wiring conductors.

② Based on 75°C copper wire. All wiring must conform to the National Electrical Code and all local codes.

③ These "Minimum Circuit Ampacity" values are to be used for sizing the field power conductors. Refer to the National Electric Code (latest revision), article 310 for power conductor sizing. **CAUTION:** When more than one field power conductor circuit is run through one conduit, the conductors must be derated. Pay special attention to Note 8 of Table 310 regarding Ampacity Adjustment Factors when more than three conductors are in a raceway.

TABLE 2 – DIMENSIONS OF BASIC UNIT FOR ARCHITECTURAL AND INSTALLATION REQUIREMENTS (NOMINAL)

UNIT	WIDTH (W)	DEPTH (D)	HEIGHT (H)	SUPPLY		RETURN		E	F	G	I	J	K	L	M	N	O	P	Q
				A	B	C	B												
WL301	37-7/8	16-7/8	70-1/2	7-7/8	27-7/8	13-7/8	27-7/8	39-7/8	18-1/4	25-3/4	18	26-3/4	28-3/4	29-1/4	27	2-9/16	39	22-3/4	9
WL361																			

All dimensions are in inches.

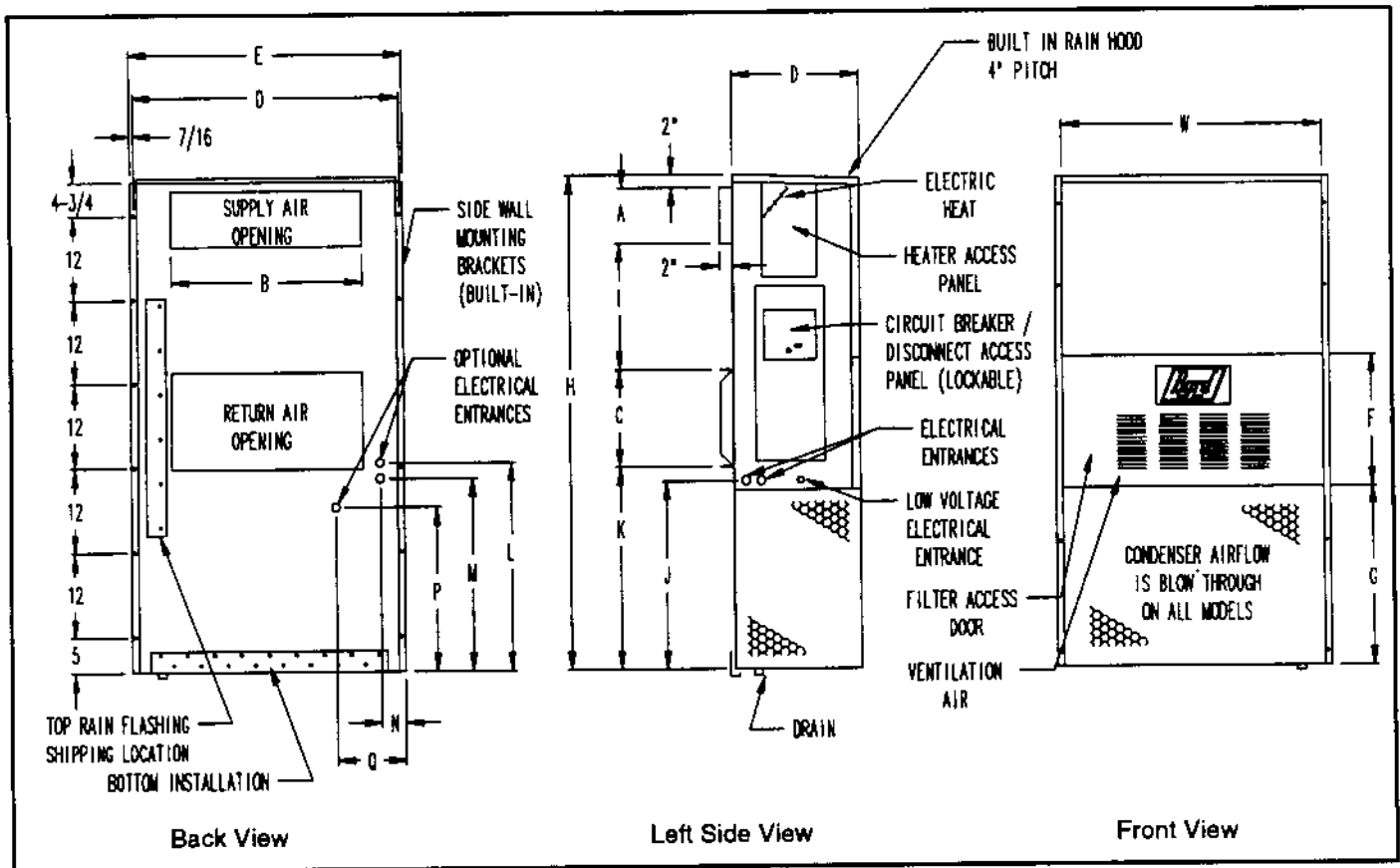


FIGURE 1 – UNIT DIMENSIONS

TABLE 3 - ELECTRIC HEAT TABLE

MODELS	WL301-A, WL361-A				WL301-B, WL361-B				WL301-C, WL361-C		
	240V-1		208V-1		240V-3		208V-3		460V-3		
	KW	AMPS	BTUH	AMPS	BTUH	AMPS	BTUH	AMPS	BTUH	AMPS	BTUH
5.0	20.8	17,065	18.1	12,800							
10.0	41.6	34,130	36.2	25,600							
15.0	62.5	51,200	54.1	38,400							
9.0					21.7	30,600	18.7	23,030			
15.0									18.0	51,200	

Shipping Damage

Upon receipt of equipment, the carton should be checked for external signs of shipping damage. If damage is found, the receiving party must contact the last carrier immediately, preferably in writing, requesting inspection by the carrier's agent.

General

The equipment covered in this manual is to be installed by trained, experienced service and installation technicians.

The refrigerant system is completely assembled and charged. All internal wiring is complete.

The unit is designed for use with or without duct work. Flanges are provided for attaching the supply and return ducts.

These instructions explain the recommended method to install the air cooled self-contained unit and the electrical wiring connections to the unit.

These instructions and any instructions packaged with any separate equipment required to make up the entire air conditioning system should be carefully read before beginning the installation. Note particularly "Starting Procedure" and any tags and/or labels attached to the equipment.

While these instructions are intended as a general recommended guide, they do not supersede any national and/or local codes in any way. Authorities having jurisdiction should be consulted before the installation is made. See Page 1 for information on codes and standards.

Size of unit for a proposed installation should be based on heat loss calculation made according to methods of Air Conditioning Contractors of America (ACCA). The air duct should be installed in accordance with the Standards of the National Fire Protection Association for the Installation of Air Conditioning and Ventilating Systems of Other Than Residence Type, NFPA No. 90A, and Residence Type Warm Air Heating and Air Conditioning Systems, NFPA No. 90B. Where local regulations are at a variance with instructions, installer should adhere to local codes.

Duct Work

Any heat pump is more critical of proper operating charge and an adequate duct system than a straight air conditioning unit. All duct work, supply and return, must be properly sized for the design air flow requirement of the equipment. Air Conditioning Contractors of America (ACCA) is an excellent guide to proper sizing. All duct work or portions thereof not in the conditioned space should be properly insulated in order to both conserve energy and prevent condensation or moisture damage.

Refer to Table 10 for maximum static pressure available for duct design.

Design the duct work according to methods given by the Air Conditioning Contractors of America (ACCA). When duct runs through unheated spaces, it should be insulated with a minimum of 1-inch of insulation. Use insulation with a vapor barrier on the outside of the insulation. Flexible joints should be used to connect the duct work to the equipment in order to keep the noise transmission to a minimum.

A 1/4-inch clearance to combustible material for the first 3 feet of duct attached to the outlet air frame is required. See Wall Mounting Instructions and Figures 3 and 7 for further details.

Ducts through the walls must be insulated and all joints taped or sealed to prevent air or moisture entering the wall cavity.

CAUTION

Some installations may not require any return air duct. A metallic return air grille is required with installations not requiring a return air duct. The spacing between louvers on the grille shall not be larger than 5/8 inches.

Any grille that meets the 5/8 inch louver criteria, may be used. It is recommended that Bard Return Air Grille Kit RG-2 thru RG-5 or RFG-2 thru RFG-5 be installed when no return duct is used. Contact distributor or factory for ordering information. If using a return air filter grille, filters must be of sufficient size to allow a maximum velocity of 400 fpm.

NOTE: If no return air duct is used, applicable installation codes may limit this cabinet to installation only in a single story structure.

Filters

A 1-inch throwaway filter is supplied with each unit. The filter slides into position making it easy to service. This filter can be serviced from the outside by removing the service door. A 1-inch washable filter and 2-inch pleated filter are also available as optional accessories. The internal filter brackets are adjustable to accommodate the 2-inch filter by loosening 2 screws in each bracket assembly and sliding the brackets apart to the required width and retightening the 4 screws.

Fresh Air Intake

All units are built with fresh air inlet slots punched in the service panel.

If the unit is equipped with the fresh air damper assembly, the assembly is shipped already attached to the unit. The damper blade is locked in the closed position. To allow the damper to

operate, the maximum and minimum blade position stops must be installed. (See Figure 2.)

All capacity, efficiency and cost of operation information as required for Department of Energy "Energyguide" Fact Sheets is based upon the fresh air blank-off plate in place and is recommended for maximum energy efficiency.

The blank-off plate is available upon request from the factory and is installed in place of the fresh air damper shipped with each unit.

Condensate Drain

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

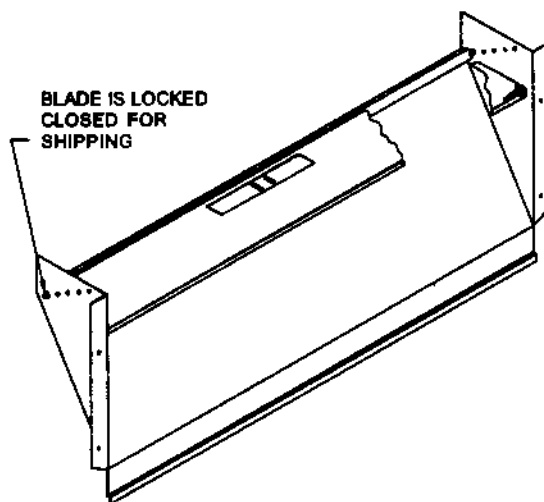


FIGURE 2 - FRESH AIR DAMPER ASSEMBLY

Installation Instructions

Wall Mounting Information

1. Two holes, for the supply and return air openings, must be cut through the wall as shown in Figure 3.
2. On wood-frame walls, the wall construction must be strong and rigid enough to carry the weight of the unit without transmitting any unit vibration.



WARNING

Fire hazard can result if 1/4 inch clearance to combustible materials for supply air duct is not maintained. See Figure 3.

3. Concrete block walls must be thoroughly inspected to insure that they are capable of carrying the weight of the installing unit.

Mounting the Unit

1. These units are secured by wall mounting brackets which secure the unit to the outside wall surface at both sides. A bottom mounting bracket is provided for ease of installation, but is not required.
2. The unit itself is suitable for "0" inch clearance, but the supply air duct flange and the first 3 feet of supply air duct require a minimum of 1/4-inch clearance to combustible material. If a combustible wall, use a minimum of 28-1/2" x 8-1/2" dimensions for sizing. However, it is generally recommended that a 1-inch clearance is used for ease of installation and maintaining the required clearance to combustible material. The supply air opening would then be 30" x 10". See Figures 3 and 7 for details.



WARNING

Failure to provide the 1/4 inch clearance between the supply duct and a combustible surface for the first feet can result in fire.

3. Locate and mark lag bolt locations and bottom mounting bracket location. See Figure 3.
4. Mount bottom mounting bracket.
5. Hook top rain flashing under back bend of top. Top rain flashing is shipped secured to the right side of the back.
6. Position unit in opening and secure with 5/16 lag bolts; use 7/8-inch diameter flat washers on the lag bolts.
7. Secure rain flashing to wall and caulk across entire length of top. See Figure 3.

8. For additional mounting rigidity, the return air and supply air frames or collars can be drilled and screwed or welded to the structural wall itself (depending upon wall construction). Be sure to observe required clearance if combustible wall.
9. On side by side installations, maintain a minimum of 20-inches clearance on right side to allow access to heat strips and control panel and to allow proper airflow to the outdoor coil. Additional clearance may be required to meet local or national codes.

Wiring – Main Power

Refer to the unit rating plate for wire sizing information and maximum fuse or "HACR Type" circuit breaker size. Each outdoor unit is marked with a "Minimum Circuit Ampacity". This means that the field wiring used must be sized to carry that amount of current. Depending on the installed KW of electric heat, there may be two field power circuits required. If this is the case, the unit serial plate will so indicate. All models are suitable only for connection with copper wire. Each unit and/or wiring diagram will be marked "Use Copper Conductors Only". These instructions must be adhered to. Refer to the National Electrical Code (NEC) for complete current carrying capacity data on the various insulation grades of wiring material. All wiring must conform to NEC and all local codes.

The electrical data lists fuse and wire sizes (75°C copper) for all models, including the most commonly used heater sizes. Also shown are the number of field power circuits required for the various models with heaters.

The unit rating plate lists a "Maximum Time Delay Relay Fuse" or "HACR Type" circuit breaker that is to be used with the equipment. The correct size must be used for proper circuit protection and also to assure that there will be no nuisance tripping due to the momentary high starting current of the compressor motor.

The disconnect access door on this unit may be locked to prevent unauthorized access to the disconnect. To convert for the locking capability, bend the tab located in the bottom left hand corner of the disconnect opening under the disconnect access panel straight out. This tab will now line up with the slot in the door. When shut, a padlock may be placed through the hole in the tab preventing entry.

Wiring – Low Voltage Wiring

230/208V, 1 phase and 3 phase equipment dual primary voltage transformers. All equipment leaves the factory wired on 240V tap. For 208V operation, reconnect from 240V to 208V tap. The acceptable operating voltage range for the 240V and 208V taps are:

FIGURE 4 - WALL MOUNTING INSTRUCTIONS

SEE FIGURE 3 - MOUNTING INSTRUCTIONS FOR OPENING SIZES

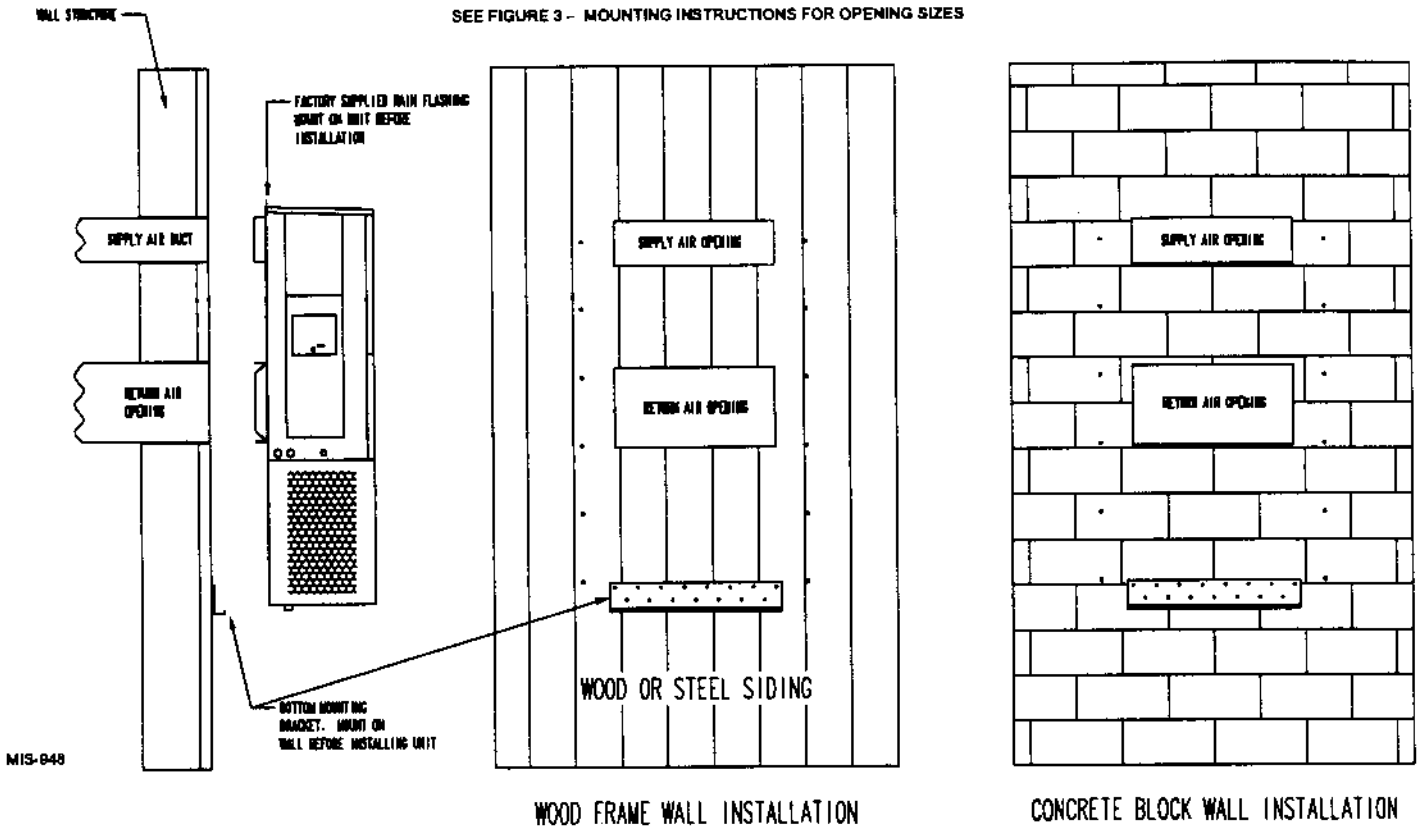


FIGURE 5 - WALL MOUNTING INSTRUCTIONS

SEE UNIT DIMENSIONS
FIGURE 1 FOR ACTUAL
DIMENSIONS

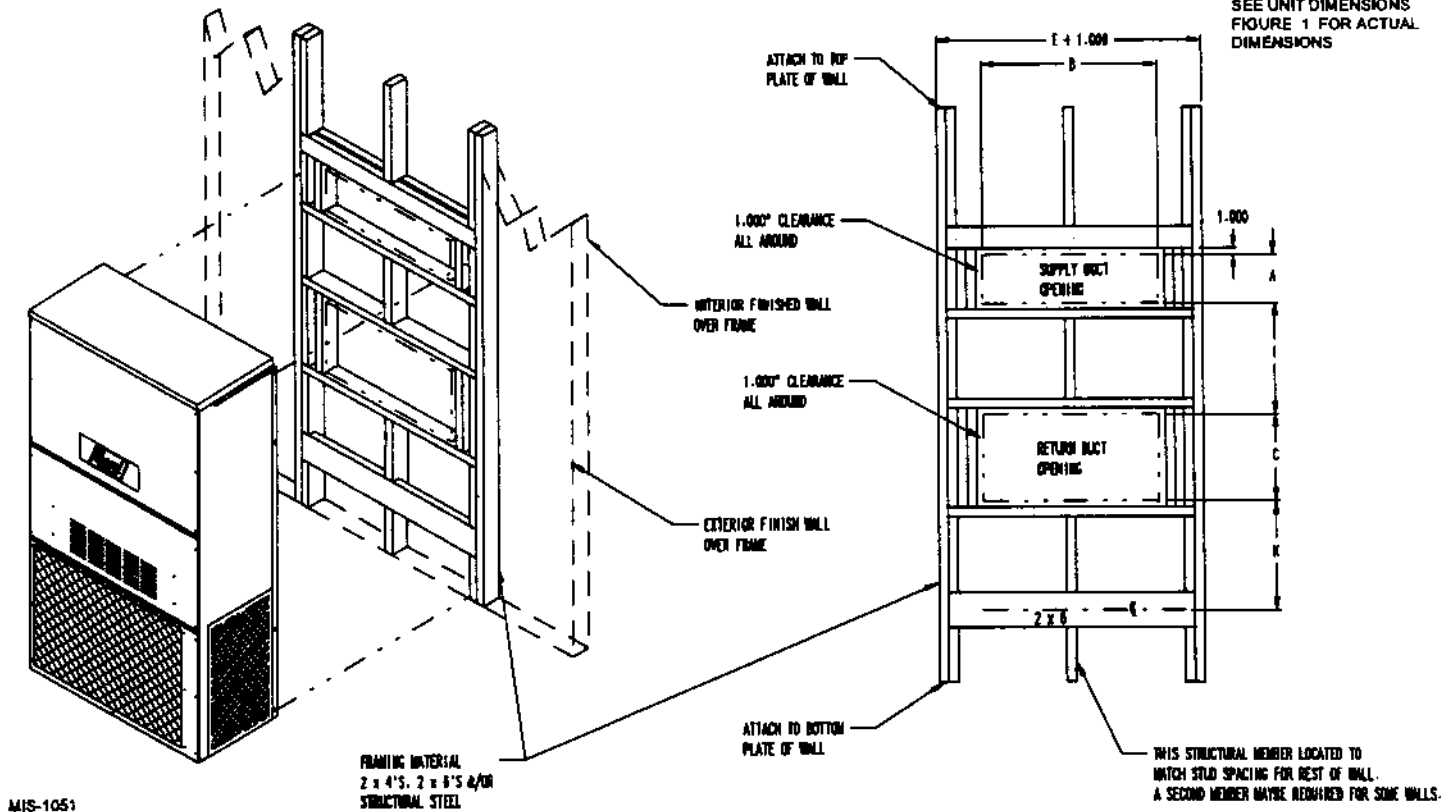
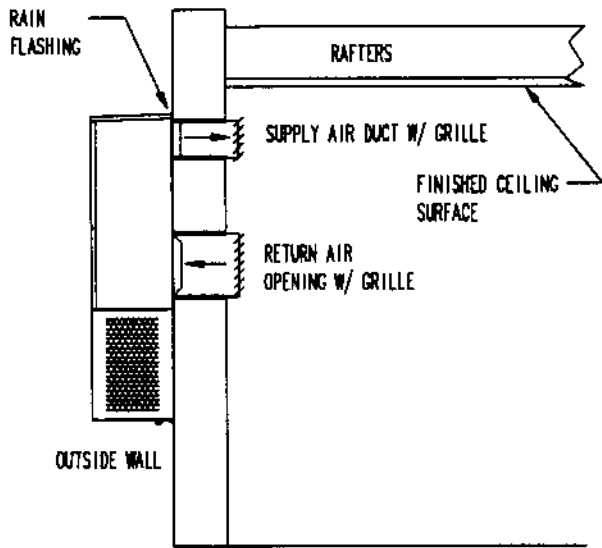
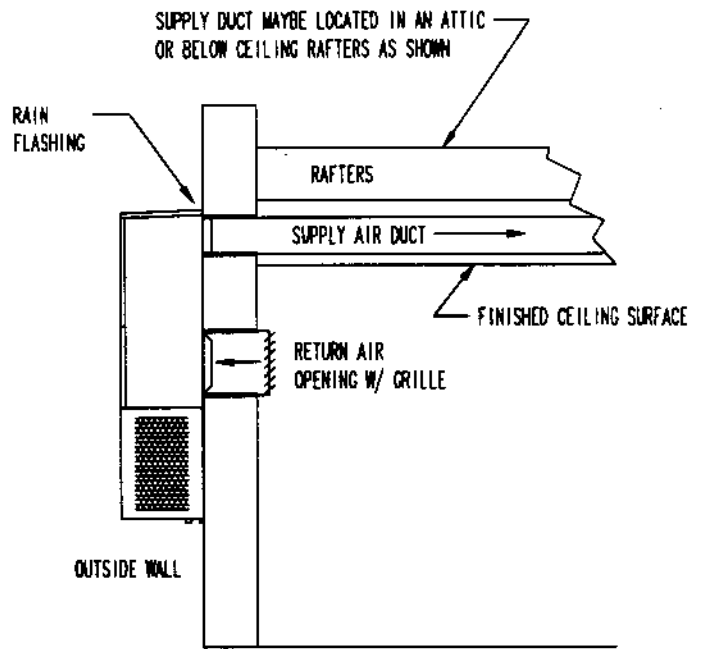


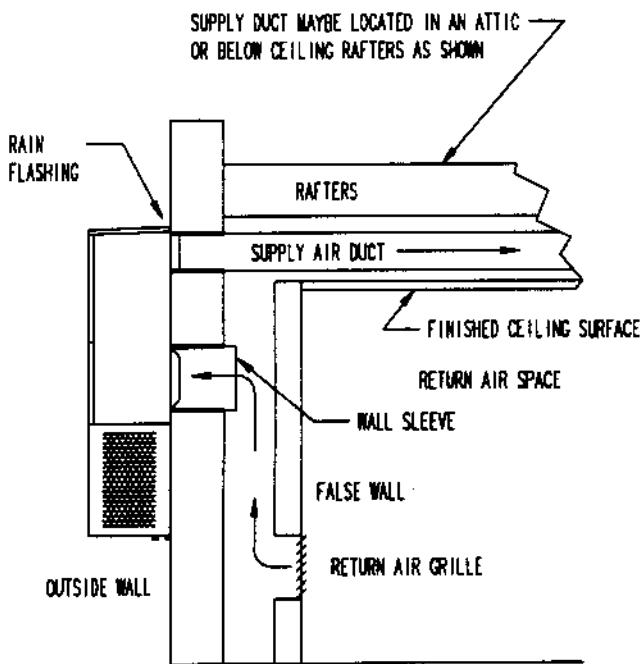
FIGURE 8 - COMMON WALL MOUNTING INSTALLATIONS



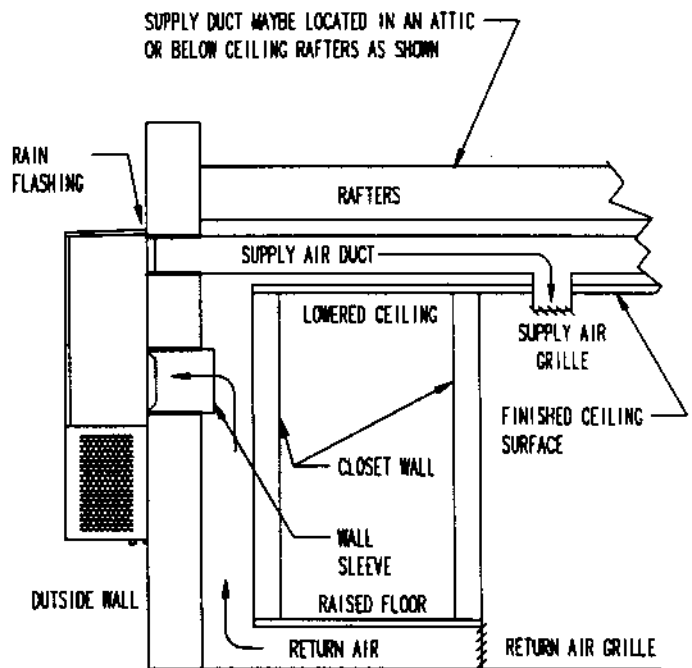
FREE AIR FLOW
NO DUCT



DUCTED SUPPLY
RETURN AT UNIT



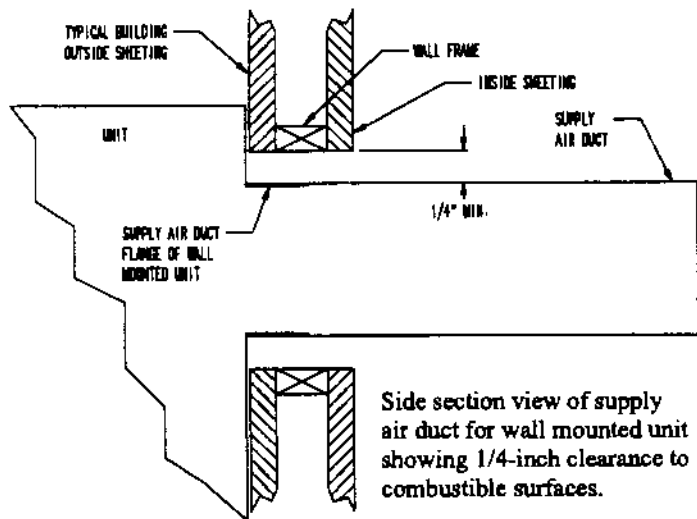
FALSE WALL INSTALLATION



CLOSET INSTALLATION

MIS-1050

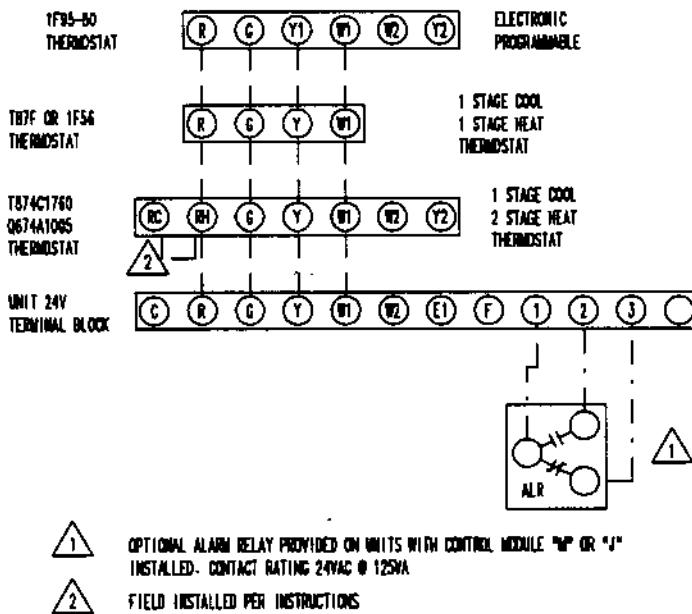
FIGURE 7 — ELECTRIC HEAT CLEARANCE



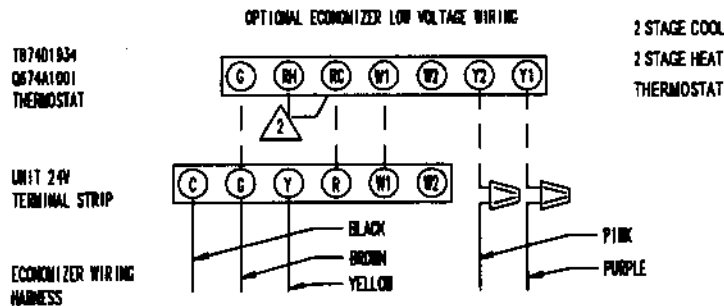
WARNING

- A minimum of 1/4-inch clearance must be maintained between the supply air duct and combustible materials. This is required for the first 3-feet of ducting.
- It is important to insure that the 1/4-inch minimum spacing is maintained at all points.
- Failure to do this could result in overheating the combustible material and may result in fire.

FIGURE 8 — LOW VOLTAGE WIRING



- △ 1 OPTIONAL ALARM RELAY PROVIDED ON UNITS WITH CONTROL MODULE "M" OR "J" INSTALLED. CONTACT RATING 24VAC @ 125MA
- △ 2 FIELD INSTALLED PER INSTRUCTIONS



Start Up

Important Installer Note

For improved start-up performance, wash the indoor coil with a dishwasher detergent.

Crankcase Heaters

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

All single and three phase models have an insertion well-type heater located in the lower section of the compressor housing. This is a self-regulating type heater that draws only enough power to maintain the compressor at a safe temperature.

Some form of crankcase heat is essential to prevent liquid refrigerant from migrating to the compressor, causing oil pump out on compressor start-up and possible valve failure due to compressing a liquid.

The decal in Figure 9 is affixed to all outdoor units detailing start-up procedure. This is very important. Please read carefully.

FIGURE 9 — START-UP LABEL

IMPORTANT

These procedures must be followed at initial start-up and at any time power has been removed for 12 hours or longer.

To prevent compressor damage which may result from the presence of liquid refrigerant in the compressor crankcase.

1. Make certain the room thermostat is in the "off" position (the compressor is not to operate).
2. Apply power by closing the system disconnect switch. This energizes the compressor heater which evaporates the liquid refrigerant in the crankcase.
3. Allow 4 hours or 60 minutes per pound of refrigerant in the system as noted on the unit rating plate, whichever is greater.
4. After properly elapsed time, the thermostat may be set to operate the compressor.
5. Except as required for safety while servicing—Do not open system disconnect switch.

7961-061

Service Hints

1. Caution homeowner to maintain clean air filters at all times. Also, not to needlessly close off supply and return air registers. This reduces air flow through the system, which shortens equipment service life as well as increasing operating costs.
2. Switching to heating cycle at 75°F or higher outside temperature may cause a nuisance trip of the remote reset high pressure switch. Turn thermostat off, then on to reset the high pressure switch.
3. The heat pump wall thermostats perform multiple functions. Be sure that all function switches are correctly set for the desired operating mode before trying to diagnose any reported service problems.
4. Check all power fuses or circuit breakers to be sure they are the correct rating.
5. Periodic cleaning of the outdoor coil to permit full and unrestricted airflow circulation is essential.

Sequence of Operation

Cooling—Circuit R-Y makes at thermostat pulling in compressor contactor, starting the compressor and outdoor motor. The G (indoor motor) circuit is automatically completed on any call for cooling operation or can be energized by manual fan switch on subbase for constant air circulation. On a call for heating, circuit R-W1 make at the thermostat pulling in heat contact for the strip heat and blower operation. On a call for second stage heat, R-W2 makes bringing on second heat contactor, if so equipped.

Pressure Service Ports

High and low pressure service ports are installed on all units so that the system operating pressures can be observed. Pressure curves can be found later in the manual covering all models. It is imperative to match the correct pressure curve to the unit by model number.

Troubleshooting

Fan Blade Setting Dimensions

Shown in the drawing below are the correct fan blade setting dimensions for proper air delivery across the outdoor coil.

Any service work requiring removal or adjustment in the fan and/or motor area will require that the dimensions below be checked and blade adjusted in or out on the motor shaft accordingly.

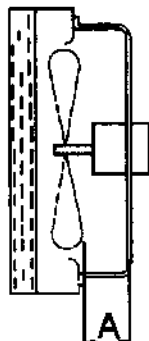


FIGURE 10 – FAN BLADE SETTING

TABLE 7 – FAN BLADE DIMENSIONS

Model	Dimension A
WL301	1.25
WL361	1.25

Removal of Fan Shroud

1. Disconnect all power to unit.
2. Remove the screws holding both grills – one on each side of unit – and remove grills.
3. Remove screws holding fan shroud to condenser and bottom – 9 screws.
4. Unwire condenser fan motor.
5. Slide complete motor, fan blade, and shroud assembly out the left side of the unit.
6. Service motor/fan as needed.
7. Reverse steps to reinstall.

Refrigerant Charge

The correct system R-22 charge is shown on the unit rating plate. Optimum unit performance will occur with a refrigerant charge resulting in a suction line temperature (6-inches from compressor) as shown in the following table:

TABLE 8 – SUCTION LINE TEMPERATURES

Models	Rated Airflow	95° F OD Temp.	82° F OD Temp
WL301	1,100	55-57	84-66
WL361	1,100	57-59	82-64

The above suction line temperatures are based upon 80°F dry bulb/ 67°F wet bulb (50 percent R.H.) temperature and rated airflow across the evaporator during cooling cycle.

TABLE 9 – INDOOR BLOWER PERFORMANCE – CFM AT 230 VOLTS

E.S.P. in H ₂ O	WL301 WL361	
	High Speed Dry / Wet Coll	Low Speed Dry / Wet Coll
.0	1,395 / 1,315	950 / 935
.1	1,340 / 1,270	930 / 915
.2	1,285 / 1,190	910 / 885
.3	1,205 / 1,100	855 / 830
.4	1,100 / 1,000	800 / 755
.5	1,005 / 870	—

TABLE 10 – CFM AND ESP

Model	Rated CFM ①	Rated ESP ①	Recommended Airflow Range
WL301	1,100	.30	930 - 1,300
WL361	1,100	.30	930 - 1,350

① Rated CFM and ESP on high speed tap

TABLE 11 – MAXIMUM ESP OF OPERATION ELECTRIC HEAT ONLY

Model Speed KW	Front Outlet	
	Low Speed	High Speed
A0Z	.50	.50
A05	.50	.50
A10	.45	.50
A15	.35	.40
B0Z	.50	.50
B09	.50	.50
B15	.30	.45
C0Z	.50	.50
C09	.40	.50
C15	.35	.45

Values shown are for units equipped with Standard 1 inch throwaway filter or 1 inch washable filter. Derate ESP by .15 for 2 inch pleated filter.

TABLE 12 – COOLING PRESSURE – OUTDOOR TEMPERATURE °F

Model	Return Air Temperature	Pressure	75°	80°	85°	90°	95°	100°	105°	110°	115°	120°	125°
WL301	75° DB	Low Side	74	77	79	81	82	84	85	85	86	87	88
	62° WB	High Side	218	232	247	262	277	292	306	325	341	357	373
	80° DB	Low Side	80	82	84	86	88	89	91	91	92	93	94
	67° WB	High Side	223	238	253	268	284	300	316	333	350	366	383
WL361	85° DB	Low Side	85	88	91	93	95	96	97	96	99	100	101
	72° WB	High Side	231	246	262	278	294	310	327	345	362	379	396
	75° DB	Low Side	70	72	74	76	78	79	80	81	82	83	84
	62° WB	High Side	224	242	259	275	290	304	316	328	339	351	363
WL361	80° DB	Low Side	75	77	79	81	83	85	86	87	88	89	90
	67° WB	High Side	229	248	265	272	287	311	325	337	348	360	373
WL361	85° DB	Low Side	80	83	85	87	89	91	92	94	95	96	98
	72° WB	High Side	238	257	275	292	307	322	336	349	360	373	386

Low side pressure ± 2 psig

High side pressure ± 5 psig

Tables are based upon rated CFM (airflow) across the evaporator coil and should be found under section titled "refrigerant charge" elsewhere in manual. If there is any doubt as to correct charge being in the system, the charge should be removed, system evacuated and recharged to serial plate instructions.

TABLE 13 — OPTIONAL ACCESSORIES

MODEL	DESCRIPTION	WL301-A	WL301-B	WL301-C	WL361-A	WL361-B	WL361-C
BOP-3	Blank Off Plate	X	X	X	X	X	X
BFAD-3	Barometric Fresh Air Damper	X	X	X	X	X	X
MFAD-3	Motorized Fresh Air Damper	X	X	X	X	X	X
CRV-3	Commercial Ventilator with Exhaust	X	X	X	X	X	X
EIFM-3	Economizer with Exhaust	X	X	X	X	X	X
CMC-15	Start Kit	X			X		

