
INSTALLATION INSTRUCTIONS

WALL MOUNTED PACKAGE AIR CONDITIONERS

MODELS
WL4822
WL4823
WL6022
WL6023
WL602N



Bard Manufacturing Company
Bryan, Ohio 43506

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

Manual : 2100-351C
Supersedes: 2100-351B
File: Volume III Tab 16
Date: 01-26-2000

Contents

Getting Other Information and Publications	1
Wall Mount General Information	2
Air Conditioning Wall Mount Model Nomenclature ..	2
Shipping Damage	6
General	6
Duct Work	6
Condensate Drain	6
Filters	6
Installation Instructions	7
Wall Mounting Information	7
Mounting the Unit	7
Wiring – Main Power	13
Wiring – Low Voltage Wiring	13

Start Up	15
Important Installer Note	15
Crankcase Heaters	15
High Pressure Switch	15
Three Phase Scroll Compressor Start Up	15
Service Hints	15
Sequence of Operation	15
Compressor Control Module	15
Adjustments	16
Phase Monitor	16
Pressure Service Ports	16
Troubleshooting	17
Fan Blade Setting Dimensions	17
Removal of Fan Shroud	17
Refrigerant Charge	17
Pressure Table	18
Optional Accessories	19

Figures	
Figure 1 Unit Dimensions	3
WA602N, WA6023, WA4823	
Figure 2 Unit Dimensions	4
WA6022, WA4822	
Figure 3 Mounting Instructions	8
WA602N, WA6023, WA4823	
Figure 4 Mounting Instructions	9
WA6022, WA4822	
Figure 5 Electric Heat Clearance	10
Figure 6 Wall Mounting Instructions	11
Figure 7 Wall Mounting Instructions	11
Figure 8 Common Wall Mounting Installations	12
Figure 9 Unit 24V Terminal Board	14
Figure 10 Fan Blade Setting	17

Tables	
Table 1 Electric Heat Table	2
Table 2 Electrical Specifications	5
Table 3 Thermostat Wire Size	13
Table 4 Wall Thermostat and Subbase Combinations	13
Table 5 Fan Blade Dimensions	17
Table 6 Indoor Blower Performance	17
Table 7 Refrigerant Charge	17
Table 8 Rated CFM and Rated ESP	17
Table 9 Maximum ESP of Operation Electric Heat Only	18
Table 10 Pressure Table	18
Table 11 Optional Accessories	19

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 Ave. N.W.
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, Inc.**
1791 Tullie Circle, N.E.
Atlanta, GA 30329-2305
Telephone: (404) 636-8400
Fax: (404) 321-5478

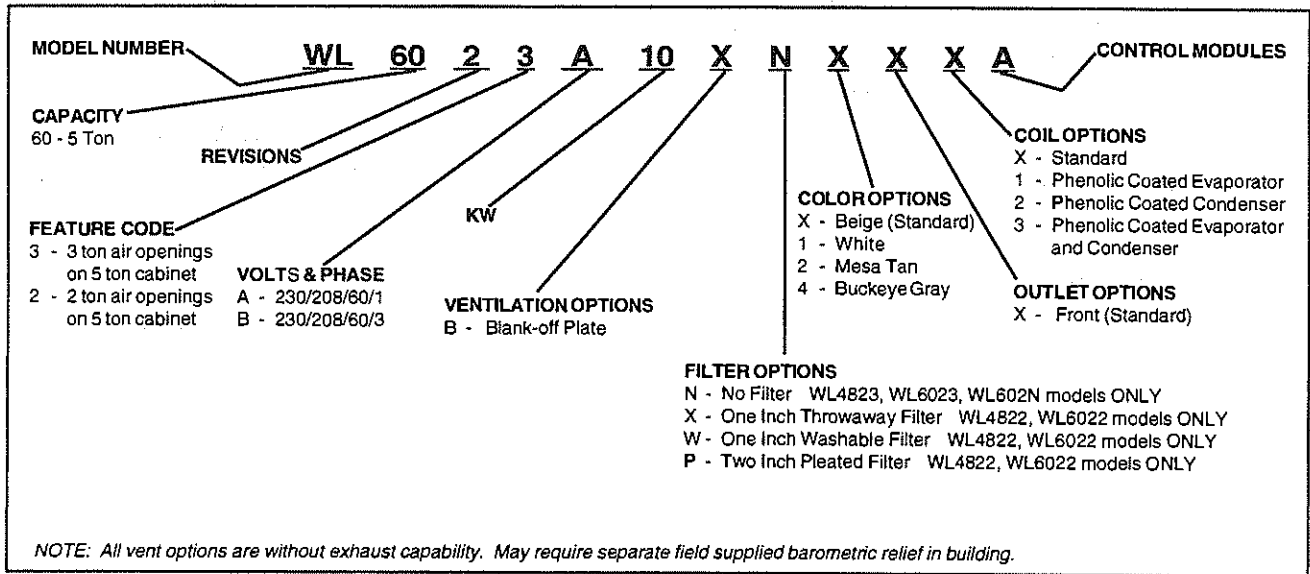
NFPA **National Fire Protection Association**
Batterymarch Park
P.O. Box 9101
Quincy, MA 02269-9901
Telephone: (800) 344-3555
Fax: (617) 984-7057

Manufactured under the following U.S. patent numbers:

5,485,878; 5,301,777; 5,002,116; 4,924,934;
4,875,520; 4,825,936; 4,432,409

WALL MOUNT GENERAL INFORMATION

AIR CONDITIONING WALL MOUNT MODEL NOMENCLATURE



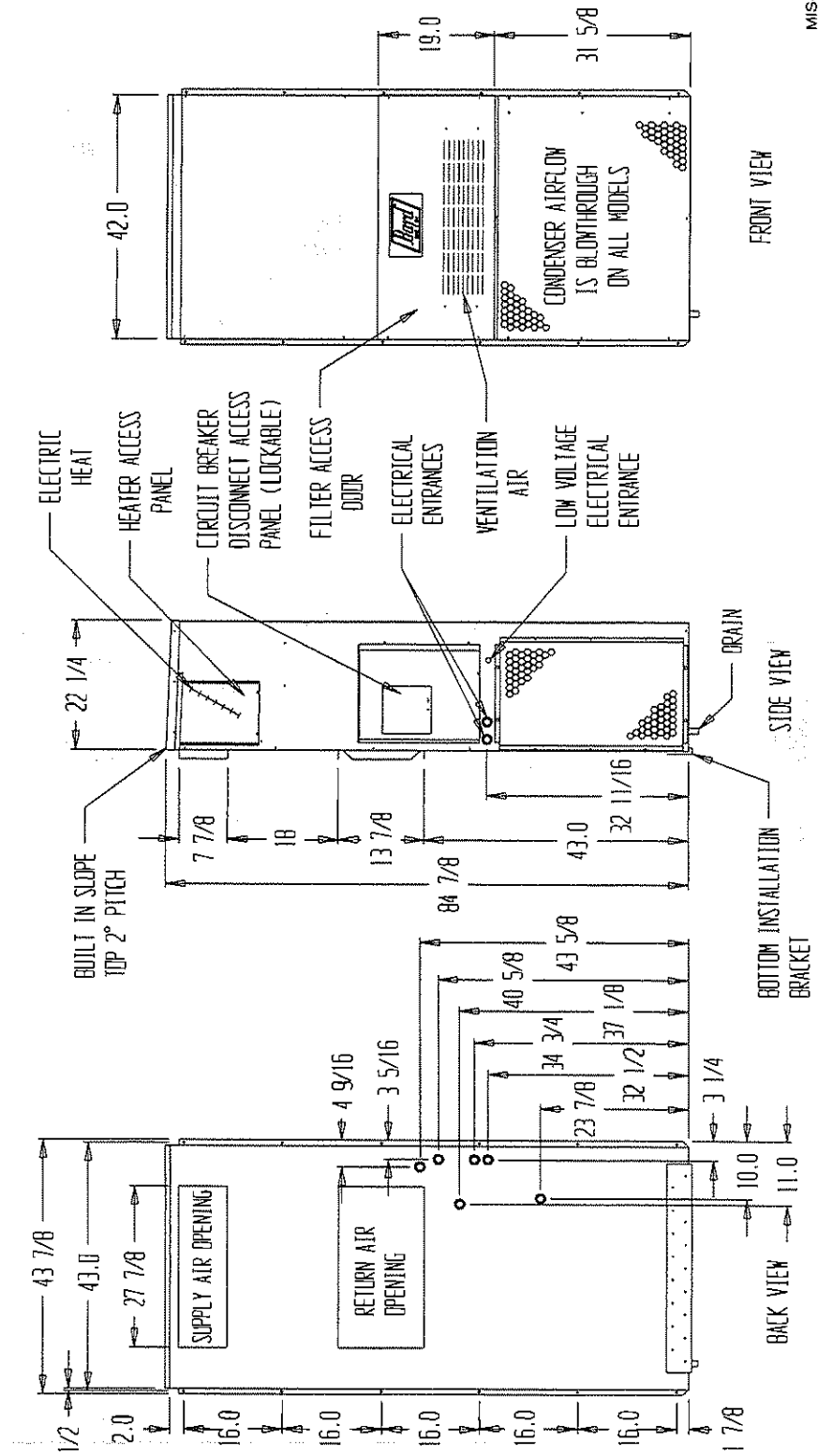
Model WL602N is identical to Model WL6023. All references in this manual to WL6023 apply to WL602N also.

**TABLE 1
ELECTRIC HEAT TABLE**

Models	WL6023A ONLY				WL6023B ONLY			
	240V-1		208V-1		240V-1		208V-1	
	AMPS	BTUH	AMPS	BTUH	AMPS	BTUH	AMPS	BTUH
5.0	20.8	17,050	18.1	12,800	---	---	---	---
9.0	---	---	---	---	21.7	30,600	18.7	23,030
10.0	41.6	34,130	36.2	25,600	---	---	---	---

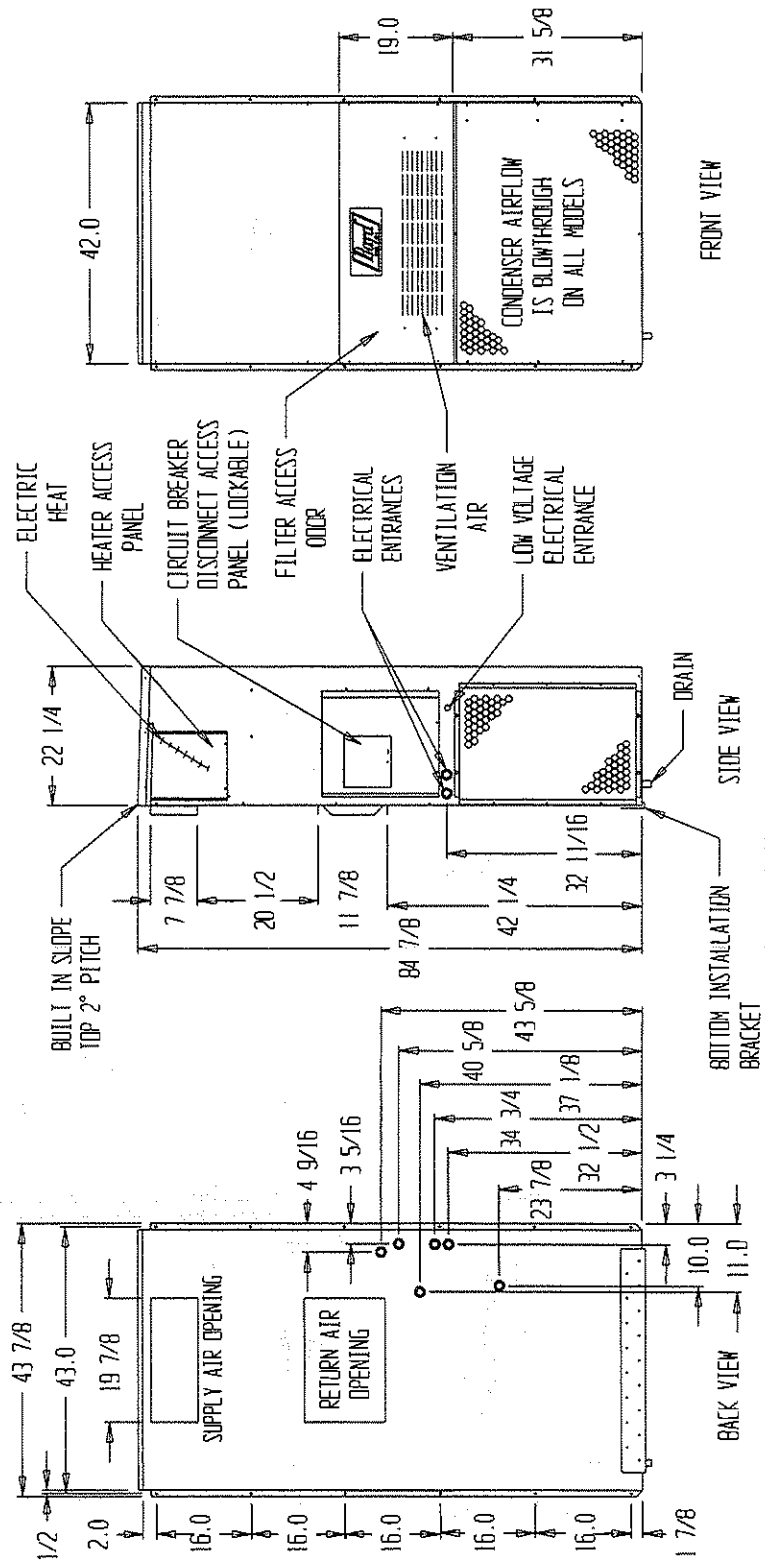
WL4822A, WL4822B, WL4823A, WL4823B, WL6022A, WL6022B are not approved for use with electric heat.

FIGURE 1
UNIT DIMENSIONS
WL602N, WL6023, WL4823 ONLY



MIS-1451

FIGURE 2
UNIT DIMENSIONS
WL6022, WL4822 ONLY



MIS-1452

**TABLE 2
ELECTRICAL SPECIFICATIONS**

Model	SINGLE CIRCUIT						DUAL CIRCUIT							
	Rated Volts & Phase	No. Field Power Circuits	③ Minimum Circuit Ampacity	① Maximum Fuse or Ckt. Breaker	② Field Power Wire Size	② Ground Wire Size	③ Minimum Circuit Ampacity		① Maximum External Fuse		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
WL4822A00, A0Z	230/208-1	1	38	50	8	10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
WL4822B00, B0Z	230/208-3	1	26	35	8	10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
WA4823A00, A0Z	230/208-1	1	38	50	8	10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
WL4823B00, B0Z	230/208-3	1	26	35	8	10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
WL6022A00, A0Z	230/208-1	1	44	60	8	10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A05		1	44	60	8	10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A10		1	55	60	6	10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
WL6022B00, B0Z	230/208-3	1	32	45	8	10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B09		1	34	45	8	10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
WL6023A00, A0Z	230/208-1	1	44	60	8	10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A05		1	44	60	8	10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A10		1	55	60	6	10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
WL6023B00, B0Z	230/208-3	1	32	45	8	10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B09		1	34	45	8	10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
WL602NA00, A0Z	230/208-1	1	44	60	8	10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A05		1	44	60	8	10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A10		1	55	60	6	10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
WL602NB00, B0Z	230/208-3	1	32	45	8	10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B09		1	34	45	8	10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
WL602NA00, A0Z	230/208-1	1	44	60	8	10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A05		1	44	60	8	10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
A10		1	55	60	6	10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
WL602NB00, B0Z	230/208-3	1	32	45	8	10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
B09		1	34	45	8	10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

- 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 NEC 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 3 conductors are in a raceway.**

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.

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

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.

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 any tags and/or labels attached to the equipment.

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 one 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 three feet of duct attached to the outlet air frame is required. See Wall Mounting Instructions and Figures 3 and 3A 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.

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 inch.

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

Any grille that meets with 5/8 inch louver criteria may be used. It is recommended that Bard Return Air Grille Kit RG2 through RG5 or RFG2 through RFG5 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.

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.

FILTERS

WL6022 AND WL4822 ONLY

A one inch throw away filter is supplied with each unit. The filter slides into position making it easy to service. This filter can be serviced from the outside by removing the service door. A one inch washable filter and a two inch pleated filter are also available as optional accessories. The internal filter brackets are adjustable to accommodate the two inch filter by bending the metal tabs holding the 1 inch filter down. There are two tabs on each side of the filter.

NOTE: WL6023 and WL4823 models require the use of a return air filter grille.

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 1 or 2. Figure 1 is for models WL4823, and WL6023. Figure 2 is for Models WL822 and WL6022.
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 installed unit.

WL4822 AND WL6022 ONLY

These units are equipped with adjustable return and supply air flanges. The flanges are adjustable side to side in 1" increments. This allows these units to be adjusted so that in side by side applications these units can replace two 2 Ton units using the same wall openings.

MOUNTING THE UNIT

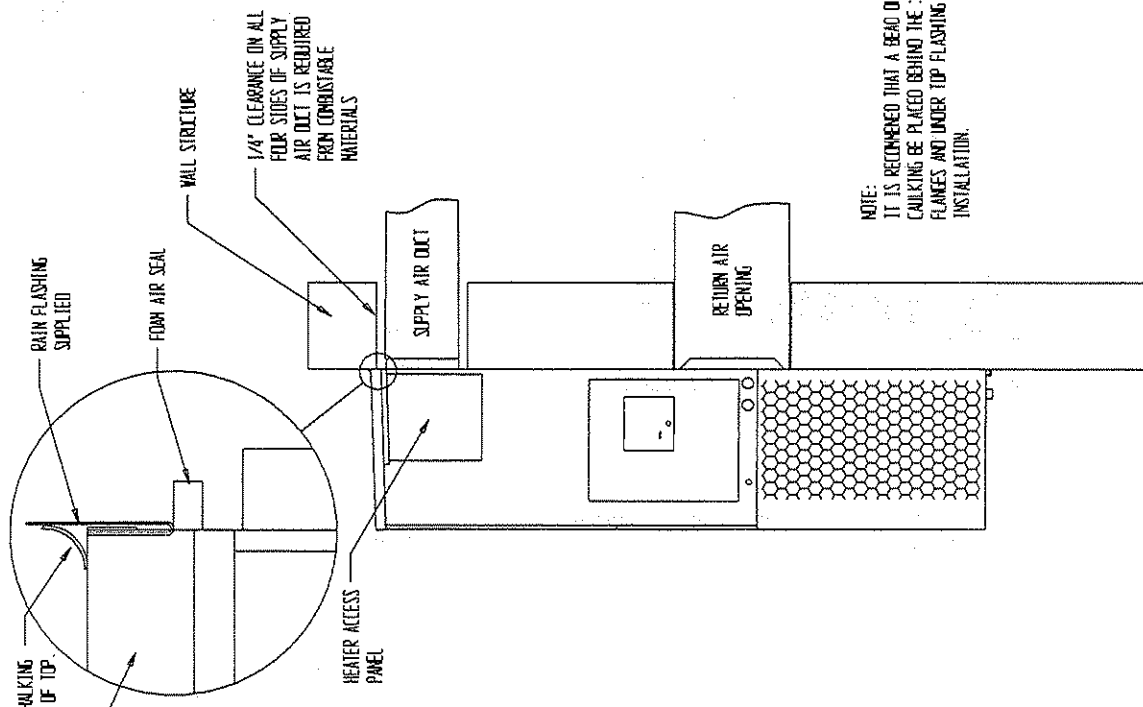
1. These units are secured by wall mounting brackets which secure the unit to the outside wall surface at both sides. A bottom mounting bracket is provided for ease of installation, but is not required.
2. The unit itself is suitable for 0 inch clearance, but the supply air duct flange and the first 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 30-1/2" x 10-1/2" 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 32" x 12". See Figures 2 and 3 for details.

WARNING

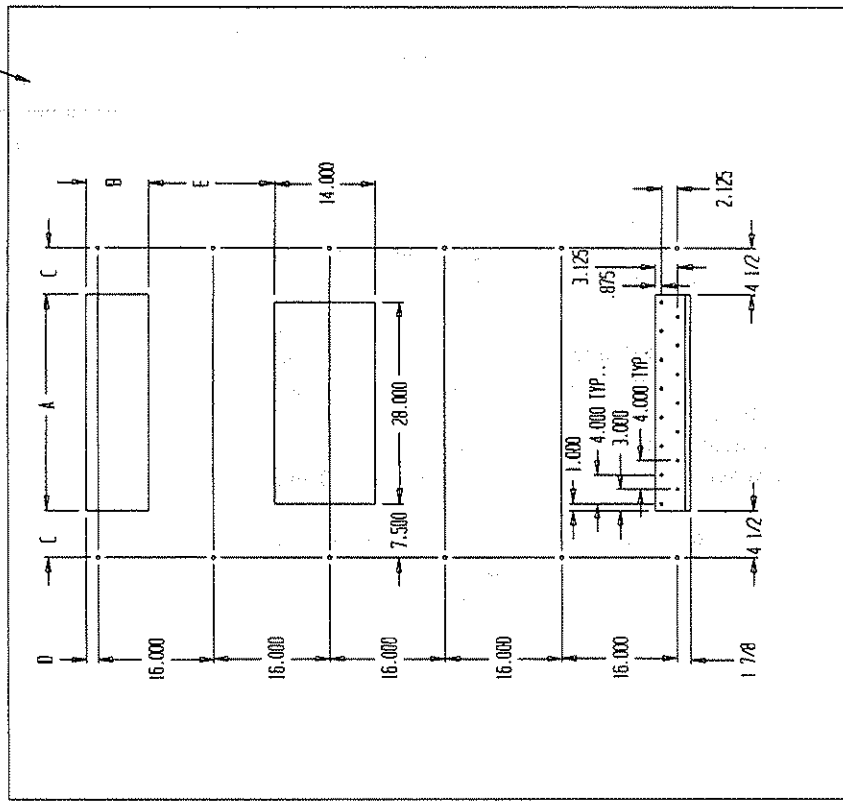
Failure to provide the 1/4 inch clearance between the supply duct and a combustible surface for the first 3 feet of duct can result in fire causing damage, injury or death.

3. Locate and mark lag bolt locations and bottom mounting bracket location. See Figure 2.
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 2.
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 control panel and heat strips, and to allow proper airflow to the outdoor coil. Additional clearance may be required to meet local or national codes.

FIGURE 3
MOUNTING INSTRUCTIONS
WL602N, WL6023, WL4823 ONLY

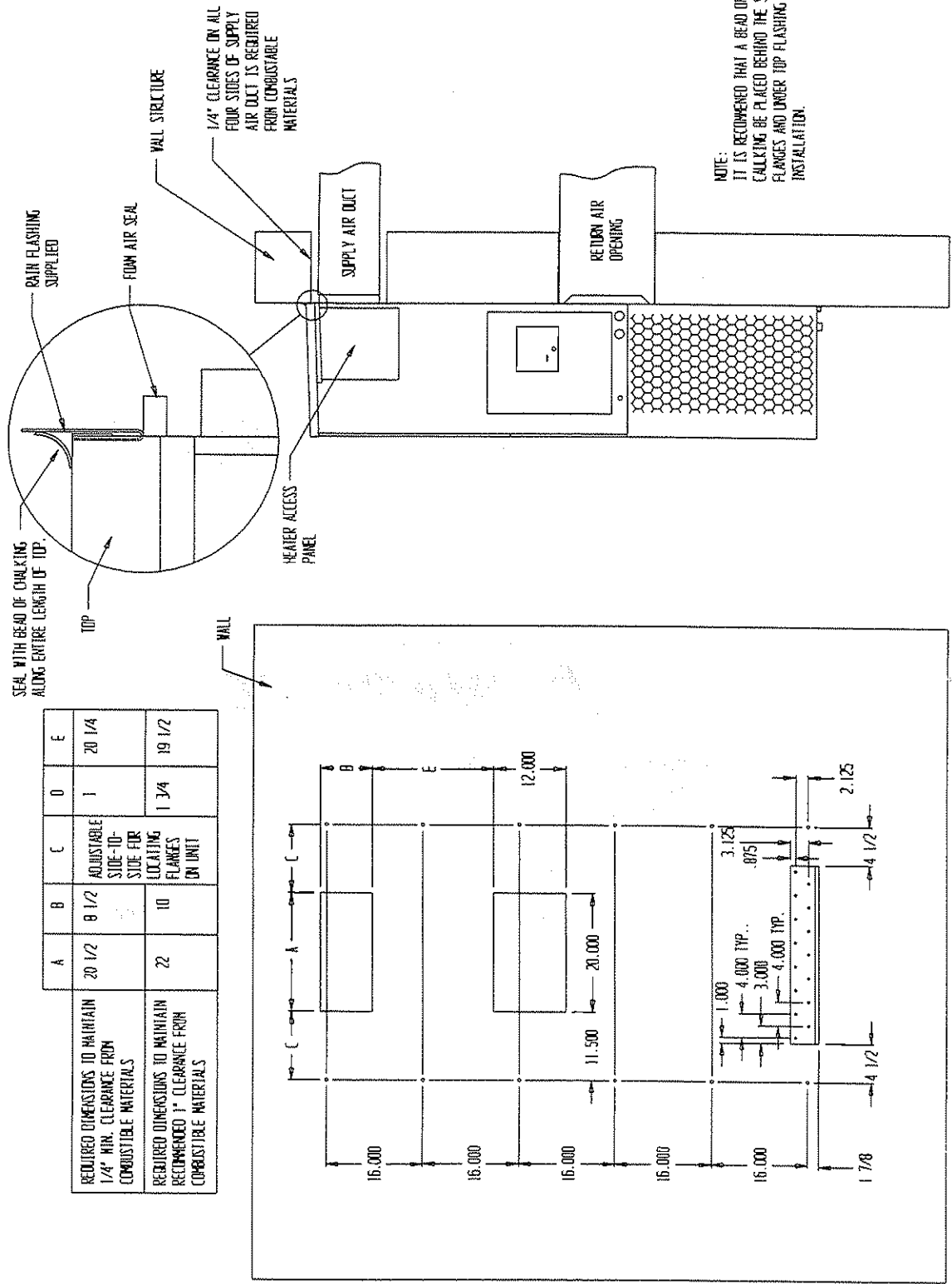


	A	B	C	D	E
REQUIRED DIMENSIONS TO MAINTAIN 1/4" MIN. CLEARANCE FROM COMBUSTIBLE MATERIALS	28 1/2	8 1/2	7 1/4	1 5/16	17 1/2
REQUIRED DIMENSIONS TO MAINTAIN RECOMMENDED 1" CLEARANCE FROM COMBUSTIBLE MATERIALS	30	10	6 1/2	9/16	16 3/4



MIS-1349

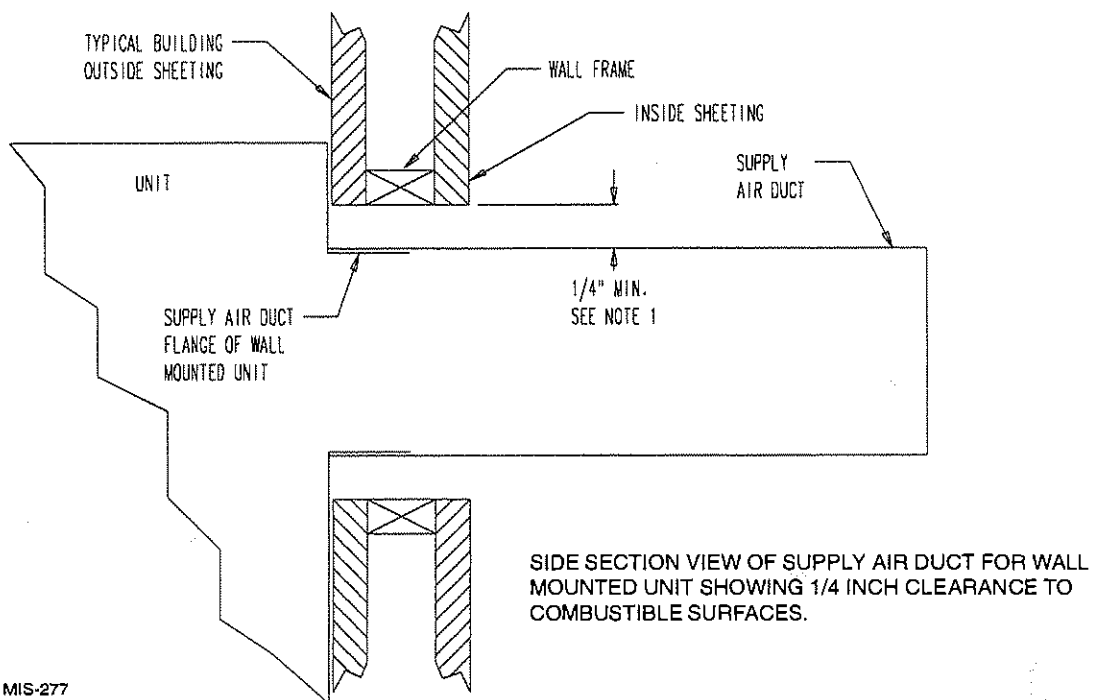
FIGURE 4
MOUNTING INSTRUCTIONS
WL6022, WL4822 ONLY



	A	B	C	D	E
REQUIRED DIMENSIONS TO MAINTAIN 1/4" MIN. CLEARANCE FROM COMBUSTIBLE MATERIALS	20 1/2	8 1/2	ADJUSTABLE SIDE-TO-SIDE FOR LOCATING FLANGES ON UNIT	1	20 1/4
REQUIRED DIMENSIONS TO MAINTAIN RECOMMENDED 1" CLEARANCE FROM COMBUSTIBLE MATERIALS	22	10		1 3/4	19 1/2

NOTE:
 IT IS RECOMMENDED THAT A BEAD OF CAULKING BE PLACED BEHIND THE STIFFENING AND UNDER TOP FLASHING AT INSTALLATION.

FIGURE 5
ELECTRIC HEAT CLEARANCE



MIS-277

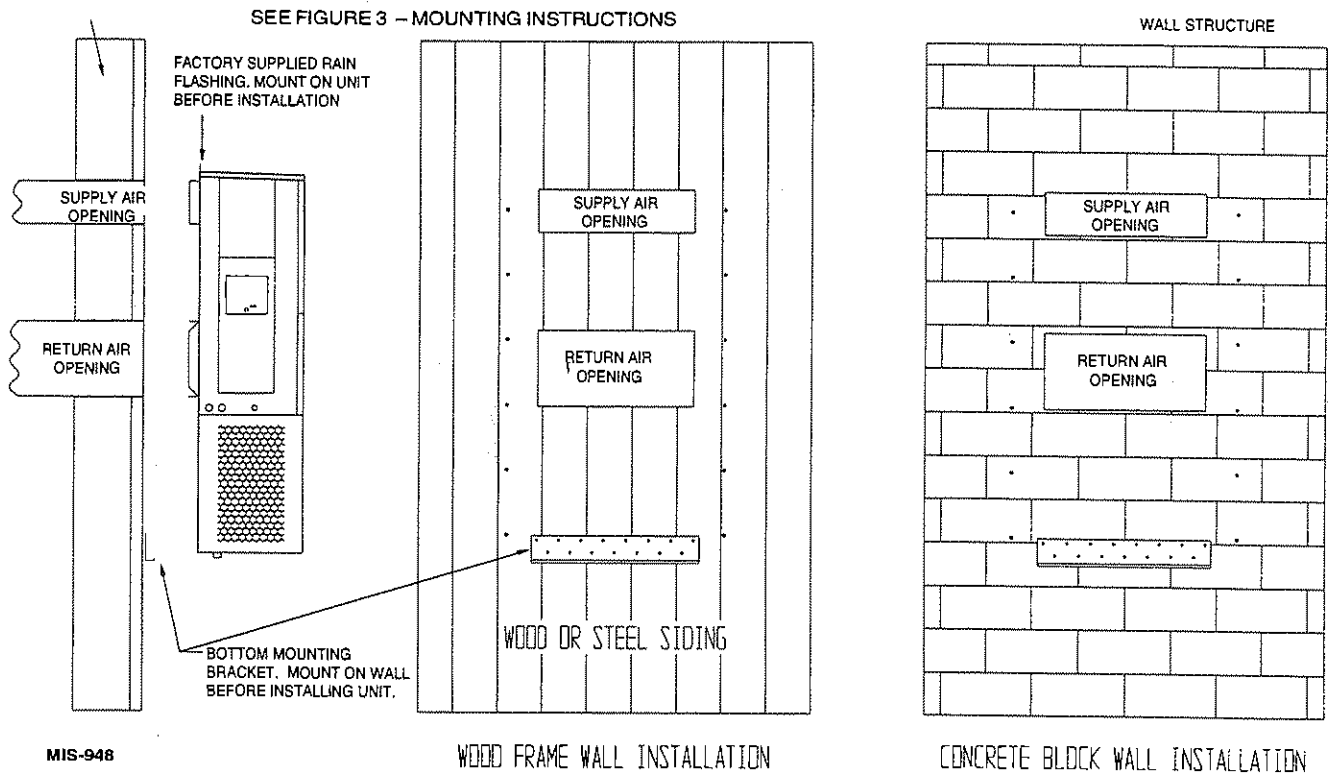
WARNING

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.

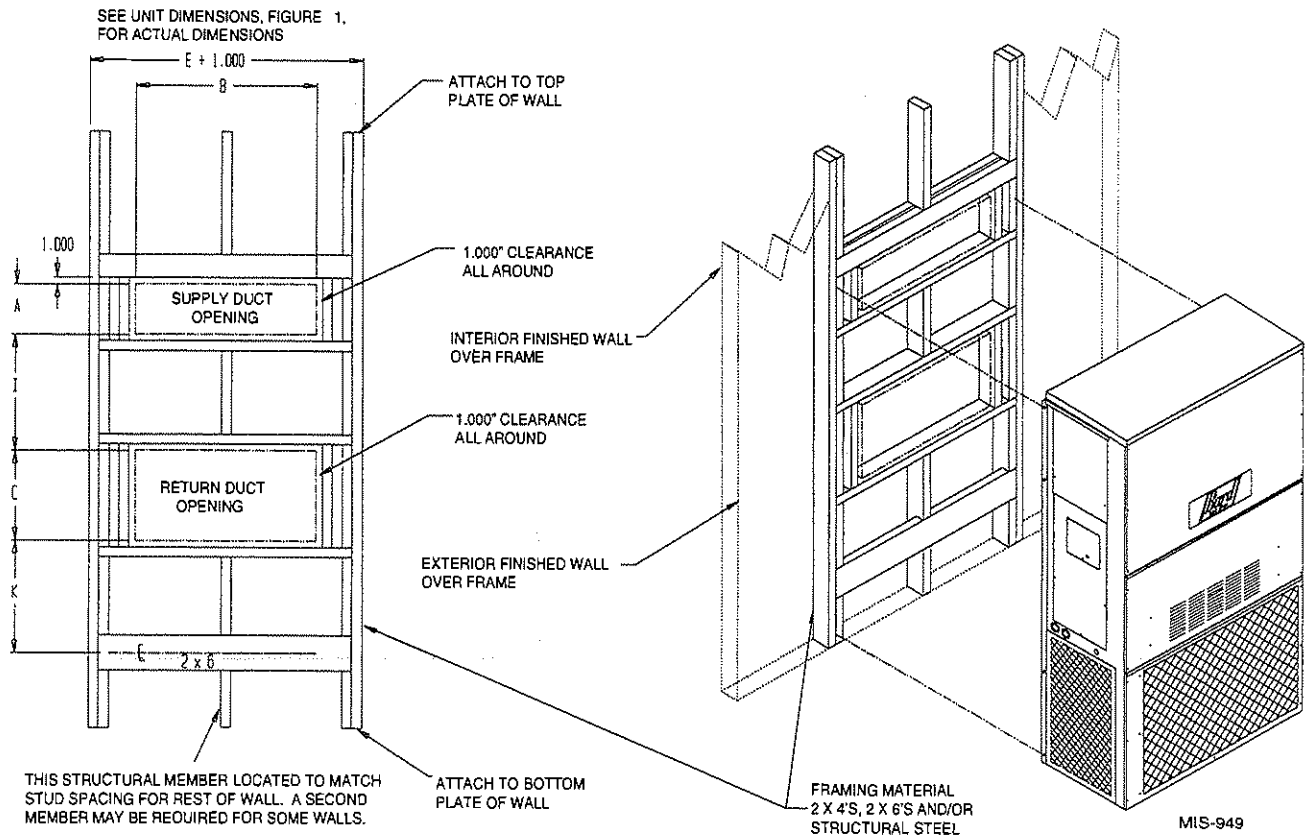
It is important to insure that the 1/4 inch minimum spacing is maintained at all points.

Failure to do this could result in overheating the combustible material and may result in a fire causing damage, injury or death.

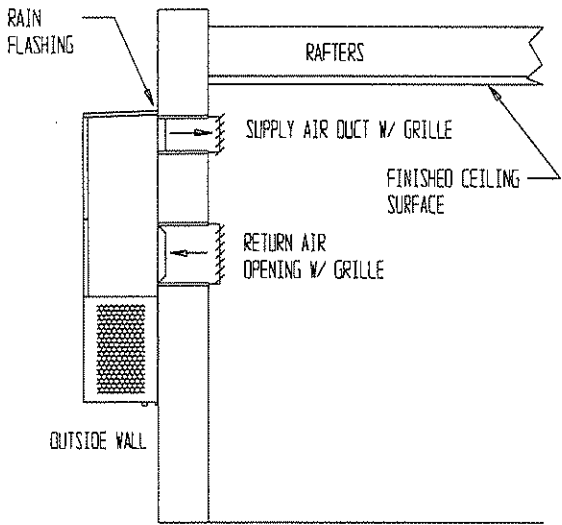
**FIGURE 6
WALL MOUNTING INSTRUCTIONS**



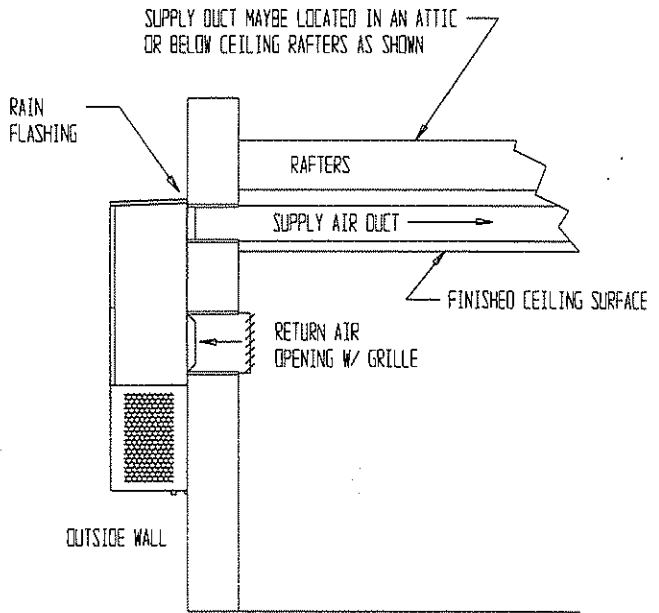
**FIGURE 7
WALL MOUNTING INSTRUCTIONS**



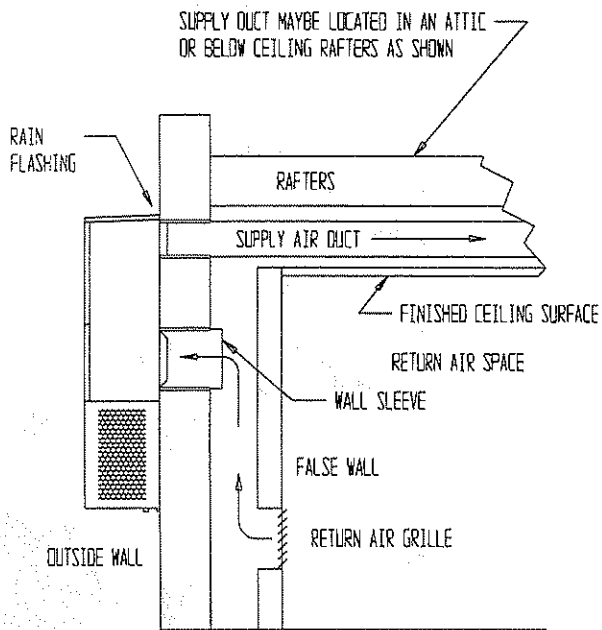
**FIGURE 8
COMMON WALL MOUNTING INSTALLATIONS**



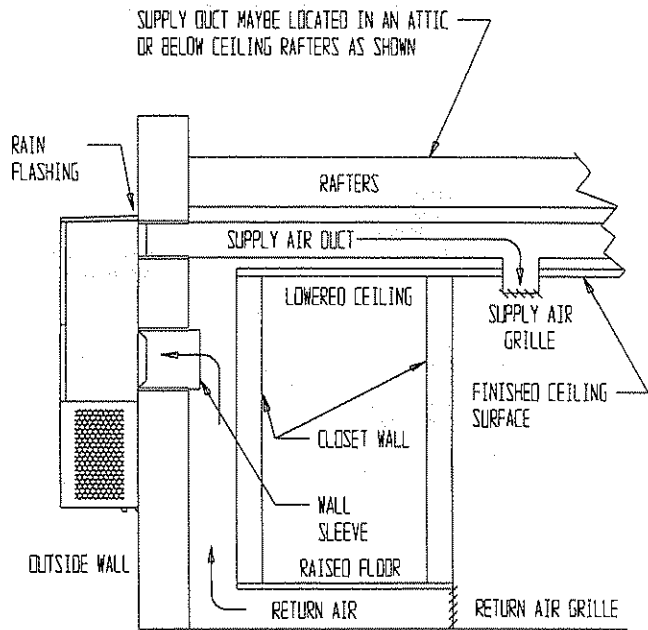
FREE AIR FLOW
NO DUCT



DUCTED SUPPLY
RETURN AT UNIT



FALSE WALL INSTALLATION



CLOSET INSTALLATION

MIS-550

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 locate 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.

See “Start Up” section for important information on three phase scroll compressor start ups.

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 240 and 208V taps are:

TAP	RANGE
240	253 – 216
208	220 – 187

NOTE: The voltage should be measured at the field power connection point in the unit and while the unit is operating at full load (maximum amperage operating condition).

Five (5) wires should be run from thermostat subbase to the 24V terminal board in the unit. A five conductor, 18 gauge copper, color-coded thermostat cable is recommended. The connection points are shown in Figure 9:

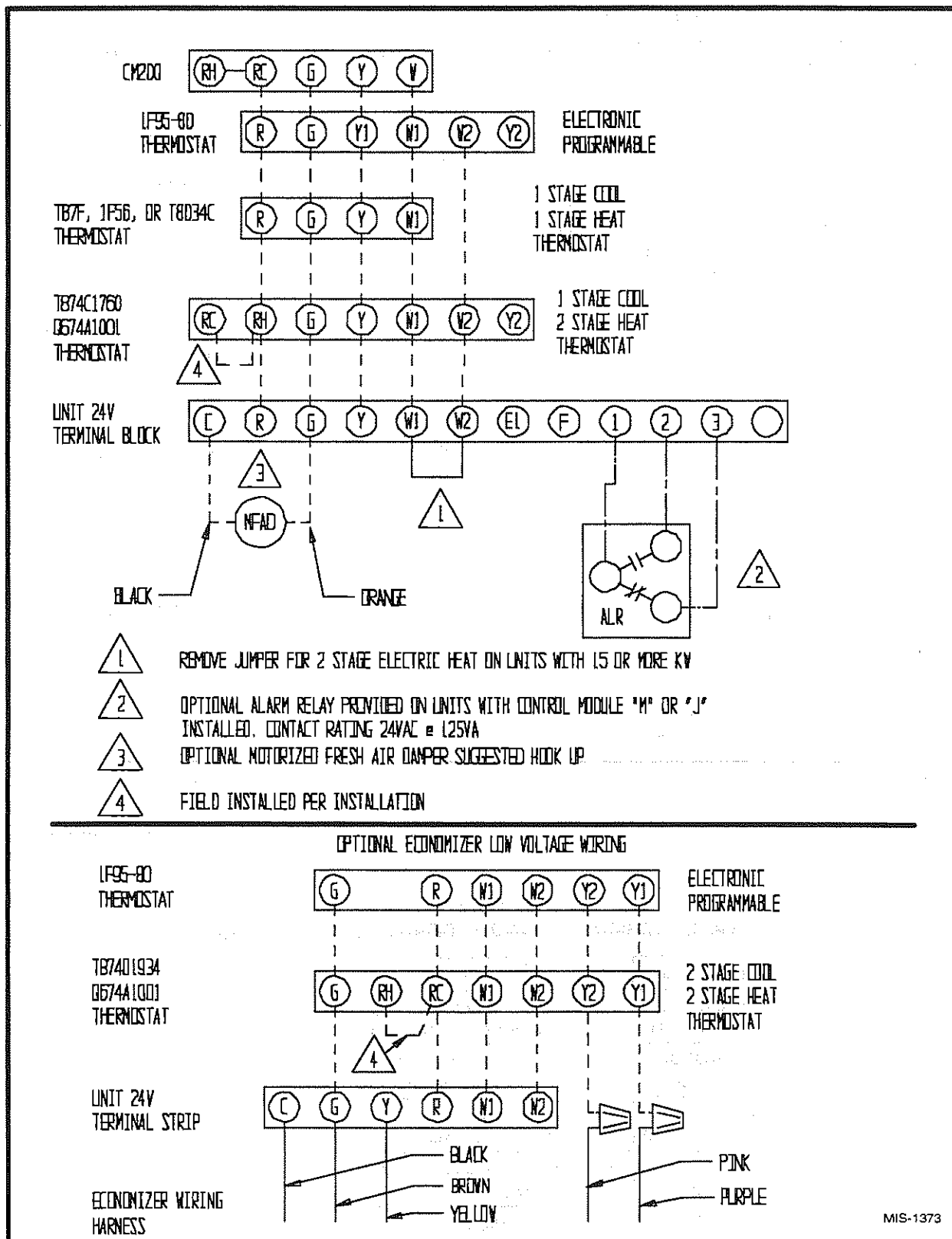
**TABLE 3
THERMOSTAT WIRE SIZE**

Transformer VA	FLA	Wire Gauge	Maximum In Feet
55	2.3	20 gauge	45
		18 gauge	60
		16 gauge	100
		14 gauge	160
		12 gauge	250

**TABLE 4
WALL THERMOSTAT AND SUBBASE COMBINATIONS**

Thermostat	Subbase	Predominate Features
8403-002 T87F3111	8404-003 Q539A1220	1 stage heat, 1 stage cool System: heat-off-cool Fan: auto-on
8403-041 T8034C	---	1 stage heat, 1 stage cool System: heat-off-cool Fan: auto-on
8403-019 T874C1760	8404-012 Q674A1001	1 stage cool, 2 stage heat System: heat-auto-cool Fan: auto-on
8403-021 T874D1934	8404-012 Q674A1001	2 stage cool, 2 stage heat System: heat-auto-cool Fan: auto-on
8403-035 1F95-80	---	2 stage cool, 2 stage heat Electronic 7 day programming
8403-043 CM-200	---	1 stage heat, 1 stage cool System: heat-off-cool Fan: auto-on

**FIGURE 9
UNIT 24V TERMINAL BOARD**



MIS-1373

IMPORTANT INSTALLER NOTE

For improved start up performance wash the indoor coil with a dish washing detergent.

CRANKCASE HEATERS

These units are not provided with crankcase heat. These units utilize scroll compressors which do not require crankcase heat in this application.

HIGH PRESSURE SWITCH

The models are supplied with a remote reset high pressure switch. If tripped, this pressure switch may be reset by turning the thermostat off then back on again.

THREE PHASE SCROLL COMPRESSOR START UP INFORMATION

Scroll compressors, like several other types of compressors, will only compress in one rotational direction. Direction of rotation is not an issue with single phase compressors since they will always start and run in the proper direction.

However, three phase compressors will rotate in either direction depending upon phasing of the power. Since there is a 50-50 chance of connecting power in such a way as to cause rotation in the reverse direction, verification of proper rotation must be made. Verification of proper rotation direction is made by observing that suction pressure drops and discharge pressure rises when the compressor is energized. Reverse rotation also results in an elevated sound level over that with correct rotation, as well as, substantially reduced current draw compared to tabulated values.

Verification of *proper rotation* must be made at the time the equipment is put into service. If improper rotation is corrected at this time there will be no negative impact on the durability of the compressor. However, reverse operation for over one hour may have a negative impact on the bearing due to oil pump out.

NOTE: If compressor is allowed to run in reverse rotation for several minutes, the compressor's internal protector will trip.

All three phase ZR3 compressors are wired identically internally. As a result, once the correct phasing is determined for a specific system or installation, connecting properly phased power leads to the same Fusite terminal should maintain proper rotation direction.

The direction of rotation of the compressor may be changed by reversing any two line connections to the unit.

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. Check all power fuses or circuit breakers to be sure they are the correct rating.
4. 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 of constant air circulation. On all 230 volt units there is a one minute off delay on the blower motor. 460 volt models do not have an off delay.

COMPRESSOR CONTROL MODULE

The compressor control module is standard on the models covered by this manual. The compressor control is an anti-short cycle/lockout timer with high and low pressure switch monitoring and alarm relay output.

Adjustable Delay On Make And Break Timer

On initial power up or any time power is interrupted to the unit the *delay on make* period begins which will be 2 minutes plus 10% of the *delay on break* setting. When the delay on make is complete and the high pressure switch (and low pressure switch if employed) is closed, the compressor contactor is energized. Upon shutdown the delay or break timer starts and prevents restart until the delay on break and delay on make periods have expired.

During routine operation of the unit with no power interruptions the compressor will operate on demand with no delay.

High Pressure Switch and Lockout Sequence

If the high pressure switch opens, the compressor contactor will de-energize immediately. The lockout timer will go into a *soft lockout* and stay in soft lockout until the high pressure switch closes and the delay on break time has expired. If the high pressure switch opens again in this same operating cycle the unit will go into *manual lockout* condition and the alarm relay circuit will energize. Recycling the wall thermostat resets the manual lockout.

Low Pressure Switch, Bypass, and Lockout Sequence

If the low pressure switch opens for more than 120 seconds, the compressor contactor will de-energize and go into a soft lockout. Regardless the state of the low pressure switch, the contactor will reenergize after the delay on make time delay has expired. If the low pressure switch remains open, or opens again for longer than 120 seconds the unit will go into manual lockout condition and the alarm relay circuit will energize. Recycling the wall thermostat resets the manual lockout.

Alarm Relay Output

Alarm terminal is output connection for applications where alarm relay is employed. This terminal is powered whenever compressor is locked out due to HPC or LPC sequences as described.

NOTE: Both high and low pressure switch controls are inherently automatic reset devices. The high pressure switch and low pressure switch cut out and cut in settings are fixed by specific air conditioner or heat pump unit model. The lockout features, both soft and manual, are a function of the Compressor Control Module.

ADJUSTMENTS

Adjustable Delay on Make and Delay on Break Timer

The potentiometer is used to select Delay on Break time from 30 seconds to 5 minutes. Delay on Make (DOM) timing on power-up and after power interruptions is equal to 2 minutes plus 10% of Delay on Break (DOB) setting:

0.5 minute (30 seconds)	DOB = 123 second	DOM
1.0 minute (60 seconds)	DOB = 126 second	DOM
2.0 minute (120 seconds)	DOB = 132 second	DOM
3.0 minute (180 seconds)	DOB = 138 second	DOM
4.0 minute (240 seconds)	DOB = 144 second	DOM
5.0 minute (300 seconds)	DOB = 150 second	DOM

During routine operation of the unit with no power interruptions the compressor will operate on demand with no delay.

Typical Settings for Dual Unit Installation:

Unit No. 1: DOB set at 2 minutes, and DOM is 132 seconds

Unit No. 2: DOB set at 4 minutes, and DOM is 144 seconds

PHASE MONITOR

All units with three phase scroll compressors are equipped with a 3 phase line monitor to prevent compressor damage due to phase reversal.

The phase monitor in this unit is equipped with two LEDs. If the Y signal is present at the phase monitor and phases are correct the green LED will light.

If phases are reversed, the red fault LED will be lit and compressor operation is inhibited.

If a fault condition occurs, reverse two of the supply leads to the unit. Do not reverse any of the unit factory wires as damage may occur.

PRESSURE SERVICE PORTS

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

TROUBLESHOOTING

FAN BLADE SETTING DIMENSIONS

Shown in Figure 10 is the correct fan blade setting dimension 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

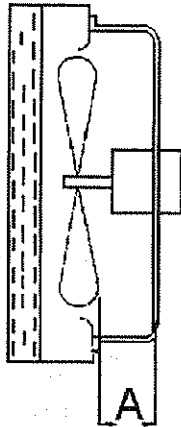


TABLE 5

Model	Dimension A
WL602N	1.75

REMOVAL OF FAN SHROUD

1. Disconnect all power to the unit.
2. Remove the screws holding both grilles, one on each side of unit, and remove grilles.
3. Remove screws holding fan shroud to condenser and bottom. Nine (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" from compressor) as shown in Table 7.

TABLE 7
REFRIGERANT CHARGE

Model	Airflow	95 OD Temperature	82 OD Temperature
WL602	1700	53 - 55	60 - 62
WL482	1550	54 - 56	65 - 67

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

TABLE 8
RATED CFM AND ESP

Model	Rated CFM	Rated ESP	Recommended Airflow Range
WL602N	1425	0.20	1775 - 1425 ①
WL6023	1425	0.20	1775 - 1425 ①
WL6022	1525	0.20	1850 - 1525 ②
WL4823	1350	0.20	1600 - 1350 ①
WL4822	1400	0.20	1700 - 1400 ②

① Rated CFM & ESP on High Speed tap with 14 x 28 return air filter grille

② Rated CFM & ESP on High Speed tap with 20 x 30 filter

TABLE 6
INDOOR BLOWER PERFORMANCE
CFM @ 230V

E.S.P. In H ₂ O	WL602N WL6023		WL6022		WL4823		WL4822	
	High Speed		High Speed		High Speed		High Speed	
	Dry Coil	Wet Coil	Dry Coil	Wet Coil	Dry Coil	Wet Coil	Dry Coil	Wet Coil
.0	1775	1600	1850	1675	1600	1525	1700	1625
.1	1675	1525	1755	1600-	1525	1425	1600	1525
.2	1575	1425	1700	1525	1425	1350	1475	1400

**TABLE 9
MAXIMUM ESP OF OPERATION
ELECTRIC HEAT ONLY**

MODELS		ESP
WL6023 - ONLY	A05	.4
	A10	.3
	B09	.3

Values shown are for units equipped with standard 1" throwaway filters or 1" washable filters. Derate ESP by .15 for 2" pleated filters.

**TABLE 10
PRESSURE TABLE**

COOLING

Air Temperature Entering Outdoor Coil °F

Model	Return Air Temperature	Pressure	75	80	85	90	95	100	105	110	115
WL602	75 deg. DB 62 deg. WB	Low Side	71	72	74	75	76	77	78	78	79
		High Side	233	247	262	278	295	313	331	351	371
	80 deg. DB 67 deg. WB	Low Side	76	78	79	80	81	82	83	84	85
		High Side	237	253	269	285	303	321	340	360	381
	85 deg. DB 72 deg. WB	Low Side	84	85	85	86	87	88	89	90	91
		High Side	245	261	278	296	314	333	353	373	394
WL482	75 deg. DB 62 deg. WB	Low Side	73	74	76	78	79	80	82	83	84
		High Side	204	217	232	248	265	284	304	325	348
	80 deg. DB 67 deg. WB	Low Side	78	79	81	82	84	86	87	89	90
		High Side	210	223	238	254	272	291	312	334	357
	85 deg. DB 72 deg. WB	Low Side	84	85	87	88	90	92	93	95	97
		High Side	217	231	247	264	282	302	323	345	369

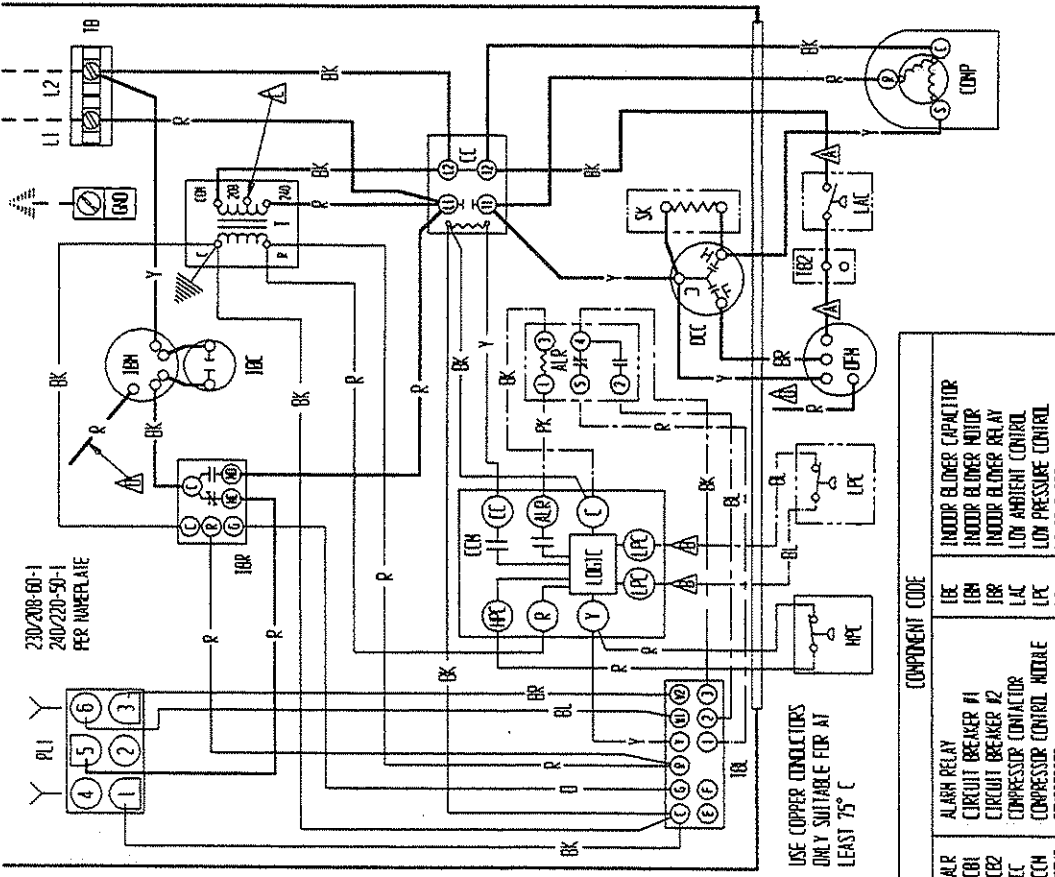
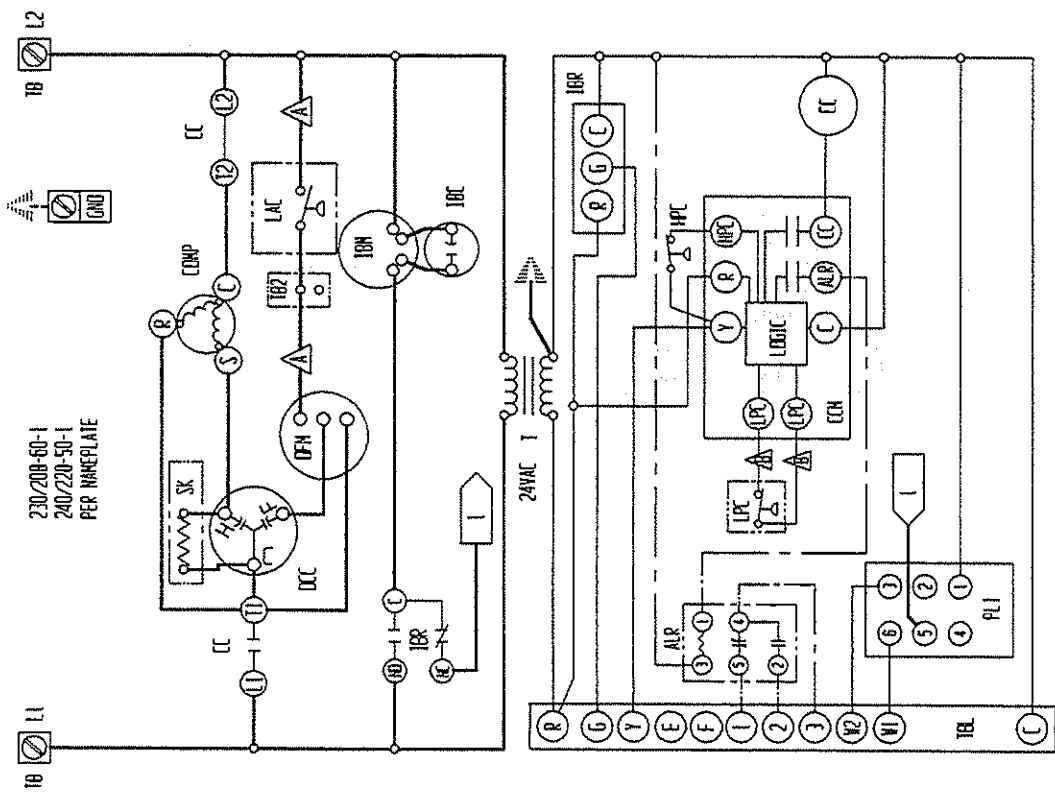
Low side pressure ± 2 PSIG

High side pressure ± 5 PSIG

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

TABLE 11
OPTIONAL ACCESSORIES

Part Number	Description	WL6023A, WL6022A	WL6023B, WL6022B	WL4823A, WL4822A	WL4823B, WL4822B
CMC-15	Start Kit	X		X	
WMCB-09A	Circuit Breaker Kit	X			
WMCB-07B	Circuit Breaker Kit		X		
WMCB-08A	Circuit Breaker Kit			X	
WMCB-05B	Circuit Breaker Kit				X

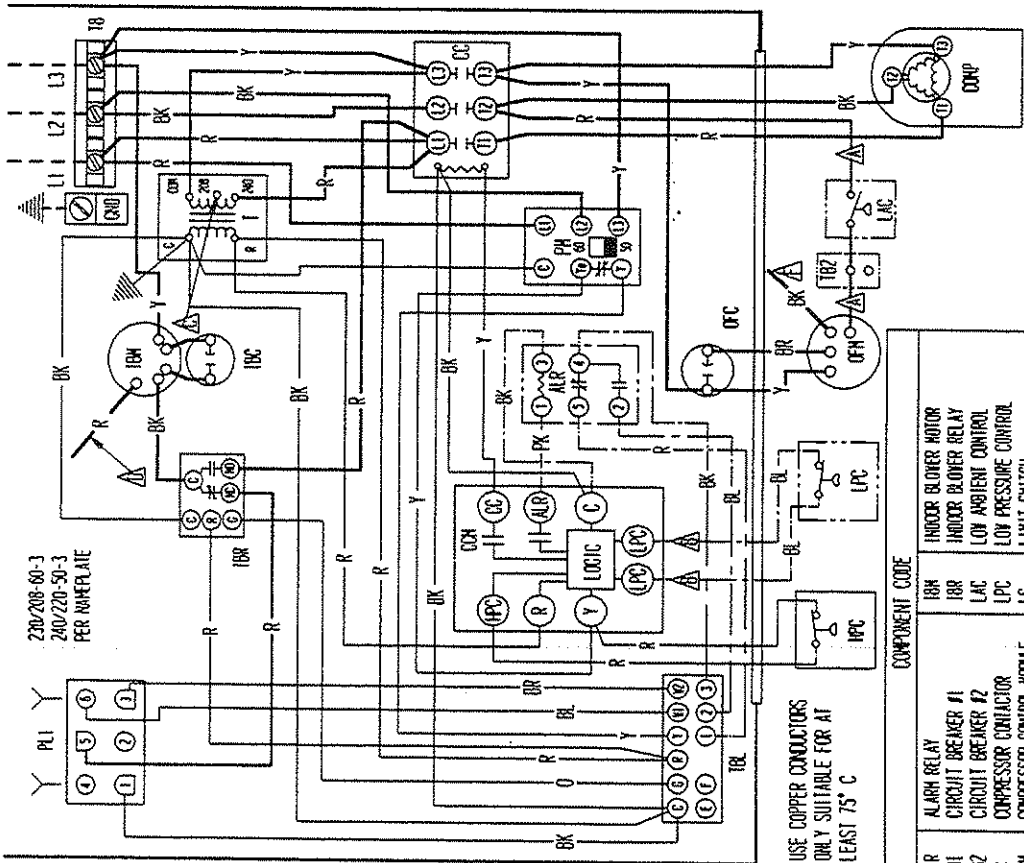
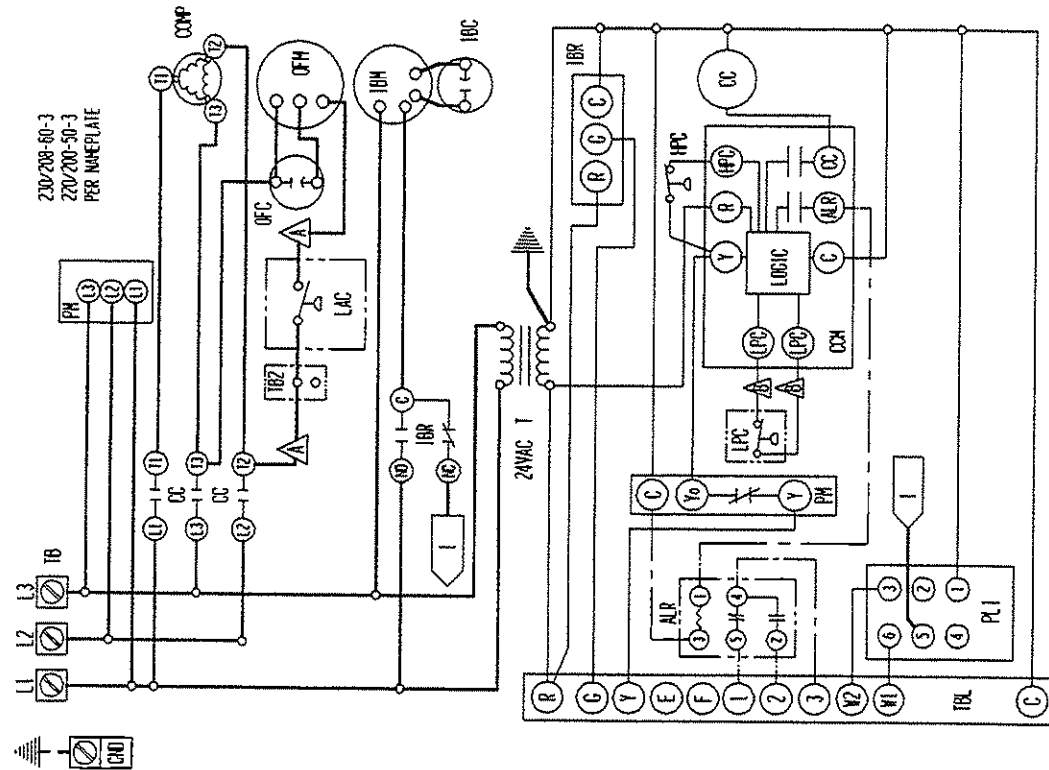


230/208-60-1
240/220-50-1
PER NAMEPLATE

230/208-60-1
240/220-50-1
PER NAMEPLATE

USE COPPER CONDUCTORS
ONLY SUITABLE FOR AT
LEAST 75° C

<p>▲ Labeled wires connect if no options used.</p> <p>▲ NOTE RED WIRE TO 208V TAP FOR 208V OPERATION</p> <p>▲ RED (LOW) BLACK (HIGH) WHERE APPLICABLE</p>	
<p>FACTORY STD. _____</p> <p>HIGH VOLTAGE _____</p> <p>LOW VOLTAGE _____</p> <p>ACCESSORY _____</p>	
<p>OPTIONAL _____</p>	
<p>FIELD _____</p>	
<p>COMPONENT CODE</p>	
<p>ALR ALARM RELAY</p> <p>CB1 CIRCUIT BREAKER #1</p> <p>CB2 CIRCUIT BREAKER #2</p> <p>CC COMPRESSOR CONTACTOR</p> <p>CCM COMPRESSOR CONTROL MODULE</p> <p>COMP COMPRESSOR</p> <p>DCC DUAL CAPACITOR</p> <p>EQD EQUIPMENT GROUND</p> <p>H1 HEAT STRIP #1</p> <p>H2 HEAT STRIP #2</p> <p>HCT HEATER CONTACTOR #1</p> <p>H22 HEATER CONTACTOR #2</p> <p>HPC HIGH PRESSURE CONTROL</p>	<p>IBC INDOOR BLOWER CAPACITOR</p> <p>IBN INDOOR BLOWER MOTOR</p> <p>IBR INDOOR BLOWER RELAY</p> <p>LAC INDOOR AMBIENT CONTROL</p> <p>LPC LOW PRESSURE CONTROL</p> <p>LS LIMIT SWITCH</p> <p>DFM OUTDOOR FAN MOTOR</p> <p>PL1 PLUG #1</p> <p>SK START KIT</p> <p>TR TRANSFORMER</p> <p>TB, IB2 TERMINAL BLOCK</p> <p>IBL TERMINAL BLOCK</p> <p>IBL LOW VOLTAGE TERMINAL</p> <p>ICD TERMINAL CUFF</p>
<p>BK BLACK</p> <p>BR BROWN</p> <p>R RED</p> <p>O ORANGE</p>	<p>Y YELLOW</p> <p>G GREEN</p> <p>BL BLUE</p> <p>W WHITE</p>
<p>T TAN</p> <p>PK PINK</p> <p>L LAUREL</p>	<p>V VIOLET</p> <p>PR PURPLE</p> <p>GY GRAY</p> <p>CS SLATE</p>
<p>COLOR CODE</p>	
<p>YIELD</p>	
<p>IBD BARD MFG. CO.</p>	
<p>4095-128 A</p>	



USE COPPER CONDUCTORS
ONLY SUITABLE FOR AT
LEAST 75° C

COMPONENT CODE	
ALR	ALARM RELAY
CB1	CIRCUIT BREAKER #1
CB2	CIRCUIT BREAKER #2
CC	COMPRESSOR CONTACTOR
CCX	COMPRESSOR CONTROL MODULE
CCP	COMPRESSOR
CND	EQUIPMENT GROUND
H1	HEAT STRIP #1
H2	HEAT STRIP #2
HCL	HEATER CONTACTOR #1
HCL	HEATER CONTACTOR #2
HPC	HIGH PRESSURE CONTROL
IBC	INDOOR BLOWER CAPACITOR
IBH	INDOOR BLOWER MOTOR
IBR	INDOOR BLOWER RELAY
LAC	LOW AMBIENT CONTROL
LPC	LOW PRESSURE CONTROL
LS	LIMIT SWITCH
OFH	OUTDOOR FAN CAPACITOR
OFM	OUTDOOR FAN MOTOR
PL1	PLUG #1
PM	PHASE MONITOR
T	TRANSFORMER
TB	TERMINAL BLOCK
TBL	LOW VOLTAGE TERMINAL BLOCK
TCO	THERMAL OFFT

▲ LABELLED WIRES CONNECT IF NO OPTIONS USED. ▲ MOVE RED WIRE TO 208V TAP FOR 208V OPERATION ▲ RED (LOW) BLACK (HIGH) WIRE APPLICABLE	COLOR CODE		
	BK BLACK BR BROWN R RED O ORANGE	Y YELLOW G GREEN BL BLUE W WHITE	V VIOLET PU PURPLE GR GRAY SL SLATE
HIGH VOLTAGE LOW VOLTAGE ACCESSORY	FACTORY STD. FIELD OPTIONAL	T TAN PK PINK LA LAENDER	BARD MFG. CO. 4095-227 C

1947

1948

1949

1950

1951

1952

1953

1954

1955

1956

1957

1958

1959

1960

1961

1962

1963

1964

1965

1966

1967

1968

1969

1970

1971

1972

1973

1974

1975

1976

1977

1978

1979

1980

1981

1982

1983

1984

1985

1986

1987

1988

1989

1990

1991

1992

1993

1994

1995

1996

1997

1998

1999

2000

2001

2002

2003

2004

2005

2006

2007

2008

2009

2010

2011

2012

2013

2014

2015

2016

2017

2018

2019

2020

2021

2022

2023

2024

2025

2026

2027

2028

2029

2030

2031

2032

2033

2034

2035

2036

2037

2038

2039

2040

2041

2042

2043

2044

2045

2046

2047

2048

2049

2050

2051

2052

2053

2054

2055

2056

2057

2058

2059

2060

2061

2062

2063

2064

2065

2066

2067

2068

2069

2070

2071

2072

2073

2074

2075

2076

2077

2078

2079

2080

2081

2082

2083

2084

2085

2086

2087

2088

2089

2090

2091

2092

2093

2094

2095

2096

2097

2098

2099

2100

2101

2102

2103

2104

2105

2106

2107

2108

2109

2110

2111

2112

2113

2114

2115

2116

2117

2118

2119

2120

2121

2122

2123

2124

2125

2126

2127

2128

2129

2130

2131

2132

2133

2134

2135

2136

2137

2138

2139

2140

2141

2142

2143

2144

2145

2146

2147

2148

2149

2150

2151

2152

2153

2154

2155

2156

2157

2158

2159

2160

2161

2162

2163

2164

2165

2166

2167

2168

2169

2170

2171

2172

2173

2174

2175

2176

2177

2178

2179

2180

2181

2182

2183

2184

2185

2186

2187

2188

2189

2190

2191

2192

2193

2194

2195

2196

2197

2198

2199

2200

2201

2202

2203

2204

2205

2206

2207

2208

2209

2210

2211

2212

2213

2214

2215

2216

2217

2218

2219

2220

2221

2222

2223

2224

2225

2226

2227

2228

2229

2230

2231

2232

2233

2234

2235

2236

2237

2238

2239

2240

2241

2242

2243

2244

2245

2246

2247

2248

2249

2250

2251

2252

2253

2254

2255

2256

2257

2258

2259

2260

2261

2262

2263

2264

2265

2266

2267

2268

2269

2270

2271

2272

2273

2274

2275

2276

2277

2278

2279

2280

2281

2282

2283

2284

2285

2286

2287

2288

2289

2290

2291

2292

2293

2294

2295

2296

2297

2298

2299

2300

2301

2302

2303

2304

2305

2306

2307

2308

2309

2310

2311

2312

2313

2314

2315

2316

2317

2318

2319

2320

2321

2322

2323

2324

2325

2326

2327

2328

2329

2330

2331

2332

2333

2334

2335

2336

2337

2338

2339

2340

2341

2342

2343

2344

2345

2346

2347

2348

2349

2350

2351

2352

2353

2354

2355

2356

2357

2358

2359

2360

2361

2362

2363

2364

2365

2366

2367

2368

2369

2370

2371

2372

2373

2374

2375

2376

2377

2378

2379

2380

2381

2382

2383

2384

2385

2386

2387

2388

2389

2390

2391

2392

2393

2394

2395

2396

2397

2398

2399

2400

2401

2402

2403

2404

2405

2406

2407

2408

2409

2410

2411

2412

2413

2414

2415

2416

2417

2418

2419

2420

2421

2422

2423

2424

2425

2426

2427

2428

2429

2430

2431

2432

2433

2434

2435

2436

2437

2438

2439

2440

2441

2442

2443

2444

2445

2446

2447

2448

2449

2450

2451

2452

2453

2454

2455

2456

2457

2458

2459

2460

2461

2462

2463

2464

2465

2466

2467

2468

2469

2470

2471

2472

2473

2474

2475

2476

2477

2478

2479

2480

2481

2482

2483

2484

2485

2486

2487

2488

2489

2490

2491

2492

2493

2494

2495

2496

2497

2498

2499

2500

2501

2502

2503

2504

2505

2506

2507

2508

2509

2510

2511

2512

2513

2514

2515

2516

2517

2518

2519

2520

2521

2522

2523

2524

2525

2526

2527

2528

2529

2530

2531

2532

2533

2534

2535

2536

2537

2538

2539

2540

2541

2542

2543

2544

2545

2546

2547

2548

2549

2550

2551

2552

2553

2554

2555

2556

2557

2558

2559

2560

2561

2562

2563

2564

2565

2566

2567

2568

2569

2570

2571

2572

2573

2574

2575

2576

2577

2578

2579

2580

2581

2582

2583

2584

2585

2586

2587

2588

2589

2590

2591

2592

2593

2594

2595

2596

2597

2598

2599

2600

2601

2602

2603

2604

2605

2606

2607

2608

2609

2610

2611

2612

2613

2614

2615

2616

2617

2618

2619

2620

2621

2622

2623

2624

2625

2626

2627

2628

2629

2630

2631

2632

2633

2634

2635

2636

2637

2638

2639

2640

2641

2642

2643

2644

2645

2646

2647

2648

2649

2650

2651

2652

2653

2654

2655

2656

2657

2658

2659

2660

2661

2662

2663

2664

2665

2666

2667

2668

2669

2670

2671

2672

2673

2674

2675

2676

2677

2678

2679

2680

2681

2682

2683

2684

2685

2686

2687

2688

2689

2690

2691

2692

2693

2694

2695

2696

2697

2698

2699

2700

2701

2702

2703

2704

2705

2706

2707

2708

2709

2710

2711

2712

2713

2714

2715

2716

2717

2718

2719

2720

2721

2722

2723

2724

2725

2726

2727

2728

2729

2730

2731

2732

2733

2734

2735

2736

2737

2738

2739

2740

2741

2742

2743

2744

2745

2746

2747

2748

2749

2750

2751

2752

2753

2754

2755

2756

2757

2758

2759

2760

2761

2762

2763

2764

2765

2766

2767

2768

2769

2770

2771

2772

2773

2774

2775

2776

2777

2778

2779

2780

2781

2782

2783

2784

2785

2786

2787

2788

2789

2790

2791

2792

2793

2794

2795

2796

2797

2798

2799

2800

2801

2802

2803

2804

2805

2806

2807

2808

2809

2810

2811

2812

2813

2814

2815

2816

2817

2818

2819

2820

2821

2822

2823

2824

2825

2826

2827

2828

2829

2830

2831

2832

2833

2834

2835

2836

2837

2838

2839

2840

2841

2842

2843

2844

2845

2846

2847

2848

2849

2850

2851

2852

2853

2854

2855

2856

2857

2858

2859

2860

2861

2862

2863

2864

2865

2866

2867

2868

2869

2870

2871

2872

2873

2874

2875

2876

2877

2878

2879

2880

2881

2882

2883

2884

2885

2886

2887

2888

2889

2890

2891

2892

2893

2894

2895

2896

2897

2898

2899

2900

2901

2902

2903

2904

2905

2906

2907

2908

2909

2910

2911

2912

2913

2914

2915

2916

2917

2918

2919

2920

2921

2922

2923

2924

2925

2926

2927

2928

2929

2930

2931

2932

2933

2934

2935

2936

2937

2938

2939

2940

2941

2942

2943

2944

2945

2946

2947

2948

2949

2950

2951

2952

2953

2954

2955

2956

2957

2958

2959

2960

2961

2962

2963

2964

2965

2966

2967

2968

2969

2970

2971

2972

2973

2974

2975

2976

2977

2978

2979

2980

2981

2982

2983

2984

2985

2986

2987

2988

2989

2990

2991

2992

2993

2994

2995

2996

2997

2998

2999

3000