

INSTALLATION INSTRUCTIONS

OPERATION & MAINTENANCE

FOREWORD

The following information is to be used by the installer as a guide. Since each installation is unique unto itself, only general topics are covered. The order in which topics are presented may not be those required by the actual installation.

This guide does NOT supersede or circumvent any applicable national, state or local codes.

The installation is to be performed only by individuals whose experience meets or exceeds the requirements of the work involved.

The installer MUST read the entire contents of this guide and develop a thorough understanding before beginning.

Due to a continuing program of product research, MAGIC AIRE reserves the right to discontinue or change without notice, any or all specifications or designs without incurring obligations.

INSPECTION

Thoroughly inspect all packages upon receipt. Ensure carton(s) have not been dropped, crushed or punctured. Inspect all contents for damage. If damage is found, immediately file a claim with the delivering carrier.

SAFETY

The installation and / or servicing of comfort conditioning equipment can be hazardous due to system pressures and electrical devices.

**ONLY TRAINED / QUALIFIED PERSONNEL
SHOULD PERFORM SERVICE AND / OR
INSTALLATION.**

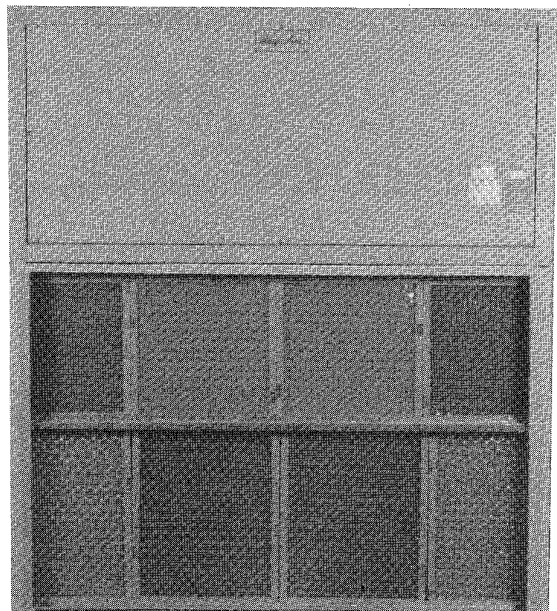
**OBSERVE ALL PRECAUTIONS AND
WARNINGS IN PRODUCT
DATA OR ATTACHED TO THE UNIT.**

Follow all safety codes. Wear eye protection and gloves. Have a fire extinguisher readily available.

**DISCONNECT ALL POWER SUPPLIES
BEFORE ACCESSING EQUIPMENT.**

**DISCONNECTING MORE THAN ONE
POWER SUPPLY MAY BE REQUIRED TO
DE-ENERGIZE SOME EQUIPMENT.**

ELECTRIC SHOCK CAN CAUSE DEATH.



MAGIC AIRE DIVISION OF UNITED ELECTRIC CO., LP

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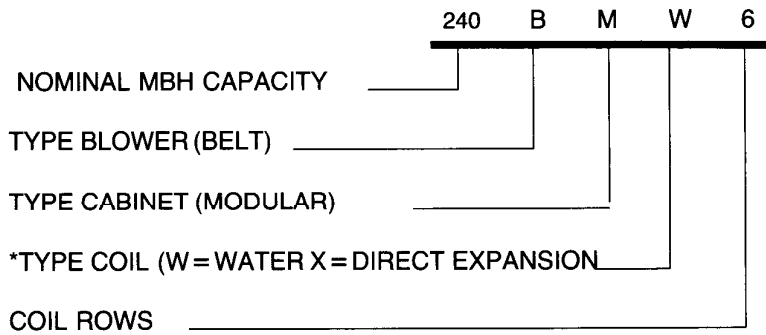
WICHITA FALLS, TEXAS 76301

PN107383

FORM BMW / BMX INST. INSTR

PRODUCT DESCRIPTION

MODEL NUMBER IDENTIFICATION



SPECIFICATIONS

MODEL	NOMINAL RATING IN TONS	BLOWER	FILTER 2"	OPTIONAL FREE THROW PLENUM & GRILLE		
				WT.	HEIGHT	GRILLE SIZE
48 BM*	4	10-10	1-16 X 20 1-20 X 20	24	22	16 X 24
60 BM*	5	10-10	1-16 X 20 1-20 X 20	24	22	16 X 24
90 BM*	7 1/2	15-15	4-16 X 25	30	26 1/2	18 X 48
120 BM*	10	15-15	4-16 X 25	30	26 1/2	18 X 48
180 BM*	15	2 (15-12)	2-16 X 20 2-16 X 25	65	36	4-12 X 30
240 BM*	20	2 (15-12)	2-20 X 20 2-20 X 25	65	36	4-12 X 30

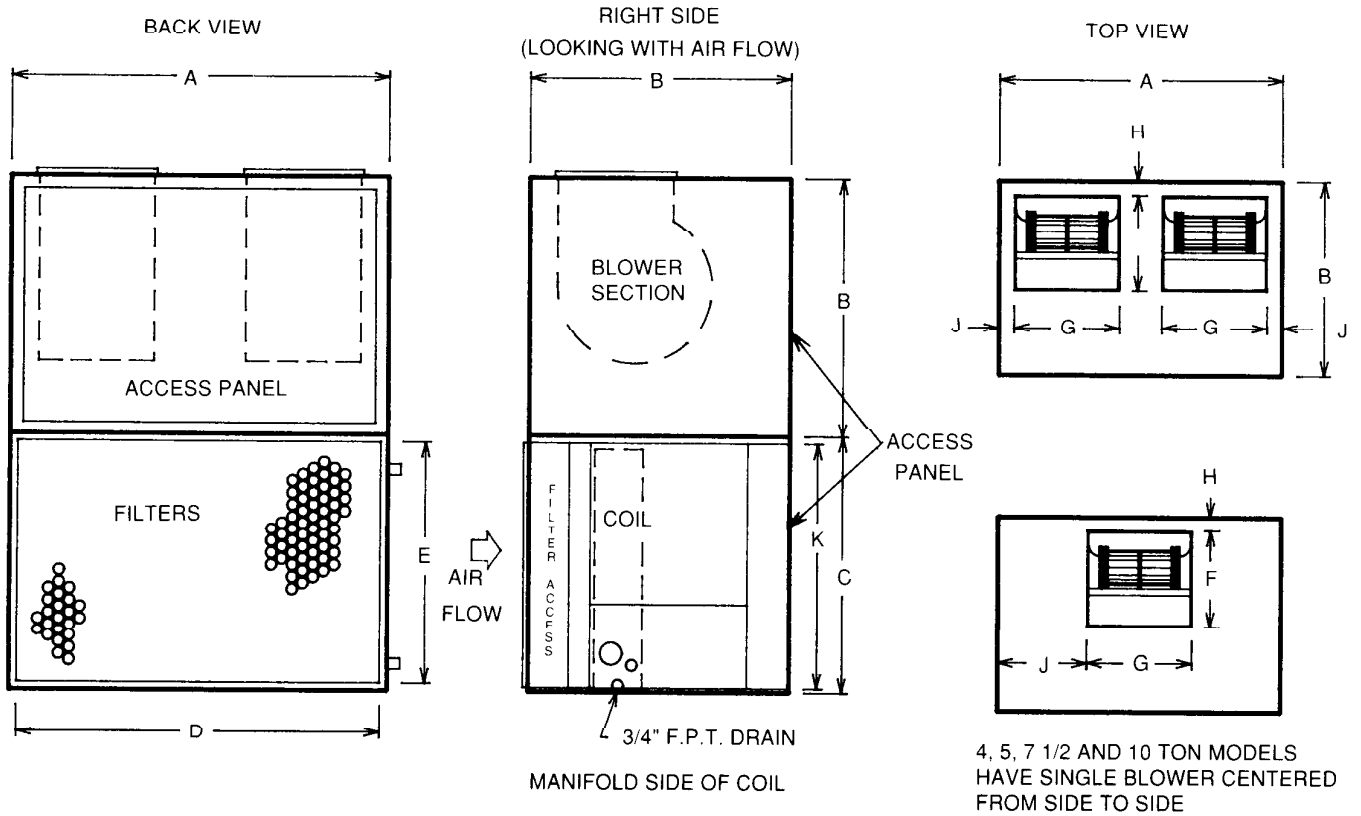
*Type of coil to be indicated

SPECIFICATIONS

MODEL	4 ROW WATER		6 ROW WATER		3 ROW DX			2 ROW WATER	
	COIL CONNECTION	SHP WT	COIL CONNECTION	SHP WT	LIQ LINE	SUCT. LINE	SHP WT	COIL CONNECTION	SHP WT
48BM	7/8" OD SWT	200	1 1/8" OD SWT	227	1/2" OD SWT	7/8" OD SWT	200	7/8" OD SWT	25
60BM	1 1/8" OD SWT	244	1 1/8" OD SWT	263	1/2" OD SWT	1 1/8" OD SWT	244	1 1/8" OD SWT	30
90BM	1 1/8" OD SWT	457	1 3/8" OD SWT	475	5/8" OD SWT	1 1/8" OD SWT	457	1 1/8" OD SWT	41
120BM	1 3/8" OD SWT	512	1 5/8" OD SWT	547	5/8" OD SWT	1 3/8" OD SWT	512	1 1/8" OD SWT	53
180BM	1 3/8" OD SWT	700	1 5/8" OD SWT	787	7/8" OD SWT	1 3/8" OD SWT	700	1 3/8" OD SWT	86
240BM	2-1 5/8" OD SWT	775	2-1 5/8" OD SWT	855	2-5/8" OD SWT	2-1 3/8" OD SWT	775	2-1 1/8" OD SWT	106

PRODUCT DESCRIPTION

DIMENSIONAL DRAWINGS



DIMENSIONS

MODEL	A	B	C	D	E	F	G	H	J	K	L
48 - 60 BM*	40	26	27.5	36	25.25	11.88	13.50	1.13	13.13	21.25	-
90 - 120 BM*	50	34	34.5	48	32.00	16.38	19.13	1.13	15.44	27.88	-
180 - 240 BM*	72	34	47.5	66	45.00	16.38	16.00	1.13	14.00	34.00	-

OPTIONAL EQUIPMENT

1. Discharge grille / plenum.
2. Return air grille.
3. Two row hot water heating coil (reheat or preheat location).
4. Mixing boxes.
5. Motor and drive selections.
6. Steam coils (reheat or preheat)
7. Electric Heat (Field installed)

INSTALLATION

Step 1 - Ductwork

Use accepted industry practices and design guidelines of the ASHRAE FUNDAMENTALS HANDBOOK. Ductwork must comply with all building codes and the NATIONAL FIRE PROTECTION ASSOCIATION's pamphlet 90A and 90B.

Carefully inspect any previously installed ductwork to determine suitability.

Note: Ductwork should be of a size meeting requirements of the installation. Ductwork should transition gradually from a smaller size blower outlet to required duct run size to avoid excessive loss of air velocity.

Step 2 - Check duct insulation and vapor proofing

Previously installed heating supply ductwork may already have adequate insulation against excessive heat loss. This insulation may be satisfactory for protection against heat gain from summer cooling. Depending upon application, it may be required to add more insulation.

Externally insulated ductwork must have adequate vapor seal for summer operation, particularly where duct is exposed to high humidity conditions such as in attic, vented crawl space, unconditioned basement or utility room.

Step 3 - Ductwork.

1. When return air duct connection is smaller than coil inlet opening, construct the transition piece so that vertical and horizontal dimensions of transition do not increase more than one inch for every 7 inches of length.
2. Allow a minimum of 3 feet of straight ductwork preceding equipment inlet.
3. Install unit with $\frac{1}{8}$ inch pitch toward condensate drain opening.

Step 4 - Sound Attenuation

Flexible duct connections should be used between the unit and both the supply and return ducts. Unit vibration isolation will be required for both suspended and base mounted units.

Step 5 - Installation of Condensate Drain

Condensate drain must consist of a minimum of $\frac{3}{4}$ in. copper tubing or $\frac{3}{4}$ in. galvanized iron pipe or PVC-type plastic pipe. (**Fig. 1.**) The condensate drain trap must be properly designed to ensure the removal of condensate (Incorrect trapping can hold water in pan causing overflow.) Be sure drain pitches downward at a slope of one inch every 10 feet.

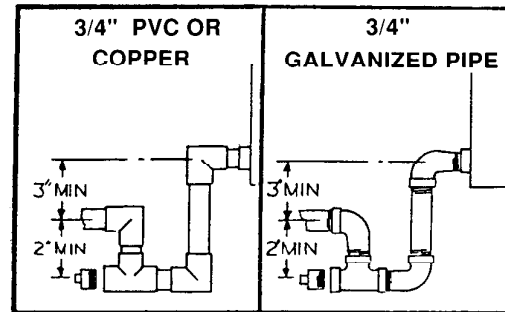


Fig. 1

Note: Consult local codes for additional precautions before installing condensate drain.

Step 6 - Direct expansion refrigerant piping

Always use the condensing unit manufacturer's recommended line sizes. The suction line must be insulated for satisfactory operation. Observe all condensing unit manufacturer's recommendation or requirements. Use refrigerant grade copper only. If unit is to be used when installed as the indoor coil of a heatpump, a by-pass check valve must be used.

Note: It is recommended that a freeze-stat (by other) be installed when a hot water coil is used and is mounted in the reheat position.

(**Fig. 2**) below shows the basic installation of a TXV and the location of the sensing bulb.

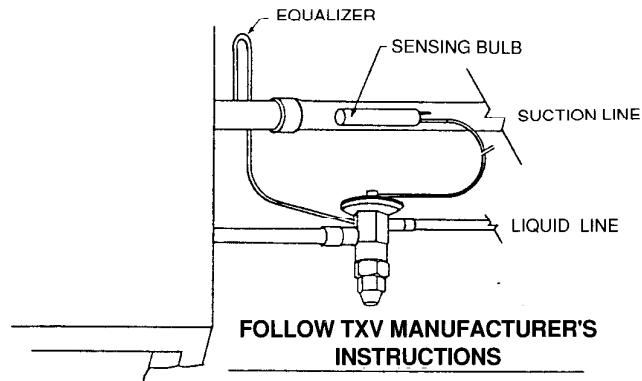
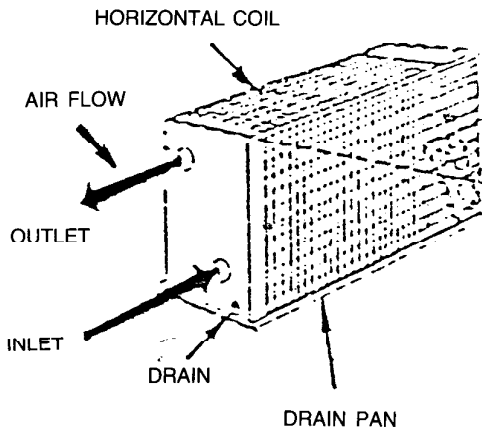


Fig. 2

Step 7 - Water Piping

All piping must be supported independent of coils. Swing joints or flexible fittings must be provided to absorb expansion and contraction strains. Rigid piping reduces the effectiveness of vibration isolators. The water supply should always be connected so that the entering water is on the leaving air side of the coil (**Fig. 3.**) Coils must be adequately vented in order to prevent air binding. Freeze-ups due to low air temps. are not covered under the Magic Aire Warranty.



**COIL CONNECTIONS
(STANDARD RIGHT HAND UNIT)**

Fig. 3

Step 8 - Motors and drives

Units will normally be shipped with motor and drive installed. However, when mounting a motor on the adjustable base in the field, extreme care should be taken to ensure proper alignment and belt tension.

Step 9 - Electrical connections

A control box is mounted on each unit and the motor is to be wired to this box.

Note: Unit must be permanently grounded in accordance with NEC and local codes and ordinances. See typical wiring diagram. (**Fig. 4.**)

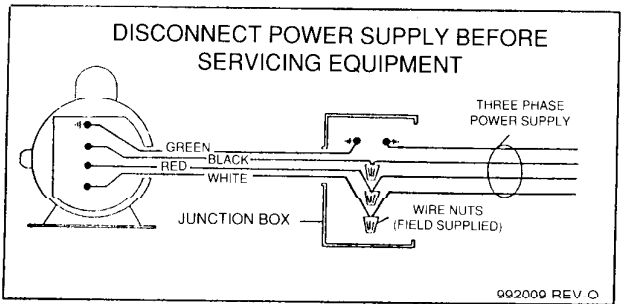
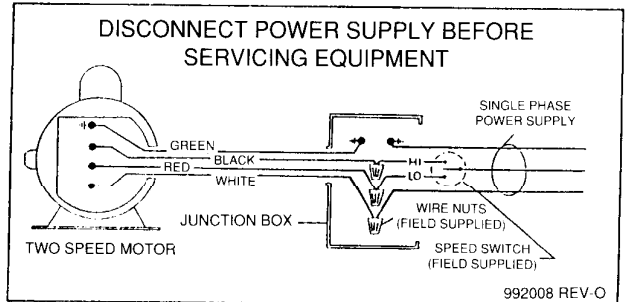
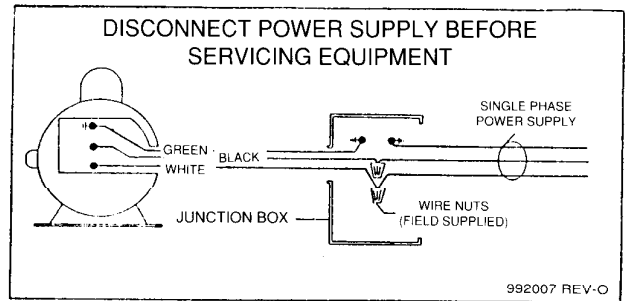


Fig. 4

MIXING BOX INSTALLATION

(Fig. 5)

Before Installation

Note: See dimensions **Table 1** and **Fig. 5**. Inspect desired installation location. Determine if space provides sufficient work and safety clearances. If determined that ample space is available in work area, make all sheet metal connections and attachments prior to moving completed assembly to duct connection site.

1. One side of mixing box has 2 plastic plugs. These may be removed and moved to opposite end to plug unused $\frac{7}{8}$ in. holes in end of cabinet where $\frac{5}{16}$ in. rods do not extend out of cabinet.
2. Choose side of cabinet most accessible for servicing to mount damper motor. Remove bolt for each damper shaft on that end and extend shaft until second bolt hole in shaft lines up with hole in damper blade. Replace bolt. Connect 2 shafts with the 2 crankarms, and the $\frac{5}{16}$ in. linkage rod furnished with mixing box.

3. Mount damper motor on the selected side of mixing box cabinet by drilling necessary holes and securing with either screws or bolts and nuts.

Installation

1. Attach mixing box to unit return-air duct flange. Vertical duct flange connections at rear of unit are prepunched to match prepunched holes in mixing boxes. Mixing boxes may be mounted for top-rear or bottom-rear connections.
2. After vertical flange has been bolted, drill holes in horizontal duct flanges. Secure with screws or bolts and nuts.
3. Use field-supplied hardware to connect motor shaft to one of the damper shafts.
4. Connect duct to the 1" duct flange provided on mixing box for return and fresh air makeups as needed.

Note: Steps 1, 2, 3 above may follow steps 1, 2 under Before Installation if preferred.

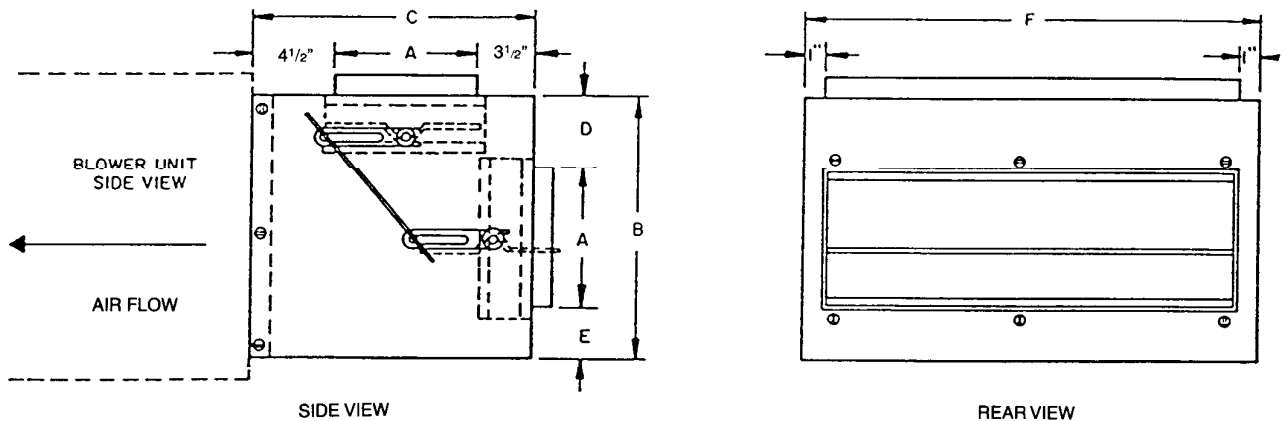
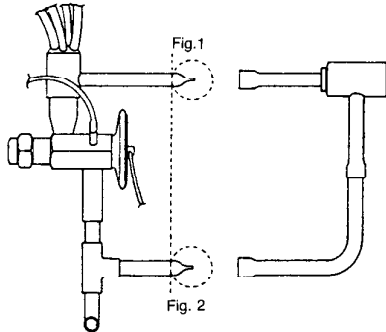


Fig. 5 - Mixing Box Dimensions

DIMENSIONS TABLE 1										
MODEL	A	B	C	D	E	F	DAMPER	SHIPPING WT.	CFM.	S.P.
48-60-MB	8	20	16	8	4	36	2- 34 X 8	63	2000	.07"
90-120-MB	12	32	20	10	10	48	2- 46 X 12	120	4000	.03"
180-240-MB	14	45	22	15	16	66	2- 56 X 14	205	8000	.04"

OPTIONAL HEAT PUMP BYPASS ASSEMBLY FOR BMX SERIES



Expansion Valve
Distributor Assembly
as it appears on
the BMX Units

Check Valve Bypass
Assembly

INSTALLATION PROCEDURE

1. Cut off the ends of the stub-out tubes near the location of the dotted line. (See Figure 1 & 2)
2. Slip the swedged ends of the bypass kit over the open tube ends where the ends were cut off.
3. Make sure the bypass assembly is in the same position as shown above.
4. Braze the two joints and then check to be sure there are no leaks in the welded joints

START-UP

Ensure all shipping bolts / screws are removed and all other bolts and screws are tight. Never assume the voltage and phase on the unit name plate is the same as the motor is wired. Check the sheaves to see if they are in alignment and ensure the set screws are tight. Check for proper rotation of the blower pulley. Three phase motor rotation can be reversed by exchanging two of the three leads at the unit j box. Not all installations will be on starter. The rotation of single phase motors can be reversed by exchanging leads inside the motor junction box. Refer to motor nameplate. Ensure all filters are installed. Do this with all doors, panels, etc. in place. Check the amperage draw of the motor. This should not exceed the nameplate amps shown on the motor serial plate.

OPERATION AND MAINTENANCE

WARNING

Disconnect electrical power to all circuits before servicing unit. Failure to do so may result in personal injury from electrical shock or moving parts.

RETURN AIR FILTERS - Filter access is from either side of unit. Inspect on a regular basis (at least monthly) and clean or replace.

CAUTION

Never operate unit without a filter or with filter access door removed. Damage to blower motor may result.

- Water Piping - All Drain

Coil is easily cleaned when dry. To check or clean, remove unit access panel, filter access door and filters. Use accepted industry methods for cleaning. Remove all foreign matter from pan and condensate drain line. Check for rust and holes.

BELT AND PULLEY - Proper pulley alignment and belt tension must be maintained at all times. Speed is reduced by adjusting pulley faces so they are further apart; speed is increased with faces closer together. Check pulley setscrews and bolts.

MOTOR - Use electric motor oil or SAE20 nondetergent oil. Tighten motor mount bracket and base bolts as required. **DO NOT OVER-OIL!!**

BLOWER - Check bearing for wear. Replace as required. Check wheel for accumulation of dirt and clean as required.



ALL PRODUCT LIMITED WARRANTY

ONE-YEAR WARRANTY — This UNITED ELECTRIC CO. product is warranted to be free from defects in material and workmanship under normal use and maintenance for a period of one year from the date of original installation. A new or rebuilt part to replace any defective part will be provided without charge, PROVIDED the defective part is returned to our distributor. The replacement part assumes the unused portion of the warranty.

THIS WARRANTY DOES NOT INCLUDE LABOR or other costs incurred for repairing, removing, installing, shipping, servicing, or handling of either defective parts or replacement parts.

UNITED ELECTRIC CO. WILL NOT BE RESPONSIBLE FOR:

1. Normal maintenance.
2. Damage or repairs required as a consequence of faulty installation or application by others.
3. Failure to start due to voltage conditions, blown fuses, open circuit breakers, or other damages due to the inadequacy or interruption of electrical service.

FOR SERVICE OR REPAIR, FOLLOW THESE STEPS IN ORDER:

FIRST: Contact the installer.

SECOND: Contact the nearest distributor:

THIRD: Contact:

UNITED ELECTRIC CO., LP
MAGIC AIRE DIVISION
501 Galveston St.
Wichita Falls, Texas 76301
Phone: (817) 767-8333

4. Damage or repairs needed as a consequence of any misapplication, abuse, improper servicing, unauthorized alteration, or improper operation.
5. Damage as a result of floods, winds, fires, lightning, accidents, corrosive atmosphere, or other conditions beyond the control of United Electric Co.
6. Parts not supplied or designated by UNITED ELECTRIC CO.
7. UNITED ELECTRIC CO. products installed outside the United States and Canada.
8. ANY SPECIAL, INDIRECT, CONSEQUENTIAL, PROPERTY, OR COMMERCIAL DAMAGE OF ANY NATURE WHATSOEVER.

LIMITATION OF WARRANTIES — THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES EXPRESS OR IMPLIED. THE REMEDIES PROVIDED FOR IN THIS WARRANTY ARE EXCLUSIVE AND SHALL CONSTITUTE THE ONLY LIABILITIES ON THE PART OF UNITED ELECTRIC CO.

Model _____ Serial No. _____ Date of Installation _____

Effective on products manufactured after July 4, 1975. Supersedes any other warranty certificates supplied with the product.