

MANUAL 2100-004C

INSTALLATION INSTRUCTIONS

**EFC-1 SERIES
ELECTRIC FURNACES**

GENERAL

Units are shipped completely assembled and internally wired, requiring only duct connections, thermostat wiring and external 220-240V power supply. These furnaces have provision inside of unit for installation of a cooling coil (field or factory installed).

<u>FURNACE MODEL</u>	<u>COOLING COIL MODEL</u>
EFC5-1	2ACQ
EFC10-1	2ACQ
EFC10-1-B	3ACQ3, 3ACQ4, 3ACQ5
EFC15-1	3ACQ3, 3ACQ4, 3ACQ5
EFC20-1	3ACQ3, 3ACQ4, 3ACQ5
EFC25-1	3ACQ3, 3ACQ4, 3ACQ5
EFC30-1	3ACQ3, 3ACQ4, 3ACQ5

IN ADDITION TO THE STANDARD CENTRAL HEATING TESTS, THESE FURNACES HAVE ALSO BEEN TESTED FOR MOBILE HOME INSTALLATION. All units are provided with a 24V transformer and 2-speed cooling relay as standard equipment. The Underwriters' Laboratories, Inc. label applies only to the furnace and not to any air conditioner which may be added, or part of the furnace.

INSTALLATION

Size of unit for a proposed installation should be based on heat loss calculation made according to methods of Air Conditioning Contractors of America. 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.

DUCTWORK

Design the ductwork according to methods given by the Air Conditioning Contractors of America. When duct runs through unheated spaces, it should be insulated with a minimum of two inches of insulation. For heating and cooling installation or future cooling, use insulation with a vapor barrier outside the insulation. Flexible joints should be used to connect the ductwork to the furnace in order to keep noise transmission at a minimum.

UNPACKING

When received, carton should be checked for external signs of damage. If damage is found, request for inspection by carrier's agent should be made in writing immediately.

LOCATION AND CLEARANCES

At least 24 inch service access clearance from access panels should be provided. Furnace casing, plenum and warm air duct are suitable for 0 inch clearance from combustible material.

Unit may be installed in utility room, closet, basement, attic, mobile home, or closed crawl space for UPFLOW, HORIZONTAL, or DOWNFLOW APPLICATION.

UPFLOW - No special mounting instructions are required, except when installed in a mobile home. See Figure A.

HORIZONTAL INSTALLATION - When installed in horizontal position (and cooling coil is added later) the electric power entrance side must be located at the top.

Whenever the furnace is installed with a cooling coil, in the horizontal position, an auxiliary water pan is required. See Figure B.

DOWNFLOW INSTALLATION - In downflow installations an EFC MOUNTING BASE is required. Set the EFC MOUNTING BASE in position, mark the floor and cut the hole. After the floor opening has been made, set the EFC BASE in place. Secure the base to the floor with wood screws through the holes provided. Set the furnace in place and secure it to the base with sheet metal screws through the holes provided.

The furnace must be secured at the top. Remove the upper access door and fasten either side of the furnace to a vertical wall partition with wood screws through the holes provided.

MOBILE HOME - See Mobile Home Installation Instructions, Figure A.

EVAPORATOR COIL INSTALLATION - There is a coil cavity built into the furnace cabinet designed to accommodate the following Bard air conditioner coils: Models 2ACQ, 3ACQ3, 3ACQ4 and 3ACQ5.

No special parts are needed for upflow or downflow installation. Simply remove the front panel and insert the coil into position. Re-install the coil door panel after removing the blank-off plate where the tubing connections project out. This panel is reversible and is simply turned over for downflow installations.

For horizontal installation an EFC-1 auxiliary water pan MUST BE used in conjunction with the basic coil assembly.

See Figure 8 for illustrations on all three of the installation options.

FILTER

THIS UNIT MUST NOT BE OPERATED WITHOUT FILTER. Filter is at the intake end of the furnace and the filters are secured in place with an angle cross bar. To remove filters, disengage the angle bar and lift out the filters. Replacement filter should be of the same type that was originally supplied.

Foam or permanent filters can be cleaned by washing in warm soapy water and rinsing clean.

WIRING

All electrical wiring must comply with the National Electrical Code and all local ordinances.

Connect 24V thermostat wires to terminal strip mounted on inside of the unit.

Connect 220-240V power leads to terminal block or fuse panel located inside the unit. One field power circuit is required up through the 15Kw models, and two field power circuits are required on 20Kw models and higher.

Equipment grounding terminals are supplied on the basis of one per each field power circuit.

Internal wiring of the furnace model is shown on the wiring diagram attached to the control panel cover.

FUSING

Models EFC15-1, EFC20-1, EFC25-1 and EFC30-1 are provided with fused sub-divided circuits.

24V TRANSFORMER

A 40VA transformer is built-in and supplies necessary capacity for operation of furnace controls as well as add-on air conditioning unit controls.

HEAT-COOL BLOWER RELAY

A heat-cool blower relay is built-in, providing for each application of add-on air conditioning. No additional wiring is required other than the additional 24V wiring from the outdoor air conditioning unit.

THERMOSTAT

For heat only applications, a heat only thermostat with or without a manual fan switch can be used.

For heat-cool applications with add-on air conditioning, and the air conditioner is some other than produced by Bard Manufacturing Company and happens to include its own 24V transformer, "Use Thermostat With Isolating Contacts To Prevent Inter-connection of Class 2 Outputs."

Bard air conditioners do not have a transformer in the outdoor section, therefore an isolating contact thermostat is not required. An isolating thermostat may be used, but terminals RC-RH must be jumpered together on the subbase.

HEATER STAGING

The Kw rating of the Furnace dictates the number of thermostatic control stages when wired at the factory. Listed below by model number are the heater stages as shipped:

MODEL	KW	STAGES
EFC5-1	5	1
EFC10-1	10	1
EFC10-1-B	10	1
EFC15-1	15	1
EFC20-1	20	1
EFC25-1	25	2
EFC30-1	30	2

- △ Can be changed to 2-stage by removing jumper wire W1-W2 at 24V terminal block.
- △ Can be set up for 3-stage using optional outdoor thermostat and removing jumper W2-P at 24V terminal board.
- △ Can be changed to 1-stage by adding jumper W1-W2.

HEAT ANTICIPATOR SETTINGS

For proper temperature control the thermostat heat anticipator must be set to match the current draw of the electric heater contactors.

MODEL	SET UP FOR 1-Stage	SET UP FOR 2-Stage	
		Stage 1	Stage 2
EFC5-1	.40	--	--
EFC10-1	.40	--	--
EFC10-1 B	.40	--	--
EFC15-1	.80	.40	.40
EFC20-1	.80	.40	.40
EFC25-1	1.2	.40	.80
EFC30-1	1.2	.40	.80

MULTI-SPEED BLOWER MOTOR

The EFC Series furnace is supplied with a multi-speed direct drive motor using either two or three "taps" to provide speed and airflow variation. Models EFC5-1 and EFC10-1 are two speed motors and do not have a motor capacitor. All other models use a three speed motor.

MOTOR SPEED IDENTIFICATION

Yellow	-	Common
Brown	-	Capacitor
Black	-	High
Blue	-	Medium
Red	-	Low

All furnaces are wired Low speed on heating and either Medium or High speed on cooling. The cooling speed is the same as Manual Fan Operation. The following chart is how the speed taps are connected at the factory.

MOTOR SPEED CONNECTIONS

Model	Heating	Cooling
EFC5-1	Low	High
EFC10-1	Low	High
EFC10-1-B	Low	High
EFC15-1	Low	High
EFC20-1	Low	High
EFC25-1	Low	Medium
EFC30-1	Low	Medium

MOBILE HOME INSTALLATION INSTRUCTIONS

A furnace installed in a mobile home shall be permanently mounted.

UPFLOW INSTALLATION

In upflow installations an EPC MOUNTING BASE is not required but the furnace must be secured to the floor. Remove the lower access door and fasten the bottom to the floor with wood screws.

The furnace must be secured at the top. Remove the upper access door and fasten either side of the furnace to a vertical wall partition with wood screws through the holes provided.

DOWNFLOW INSTALLATION

In downflow installations an EPC MOUNTING BASE is required. Set the EPC MOUNTING BASE in position, mark the floor and cut the hole. After the floor opening has been made, set the EPC BASE in place. Secure the base to the floor with wood screws through the holes provided. Set the furnace in place and secure it to the base with sheet metal screws through the holes provided.

In addition to installing the furnace with an EPC MOUNTING BASE, the furnace must be secured at the top. Remove the upper access door and fasten either side of the furnace to a vertical wall partition with wood screws through the holes provided.

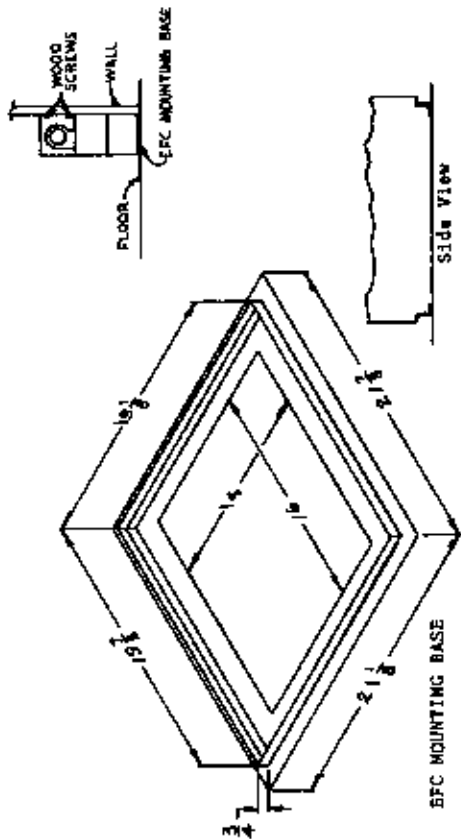
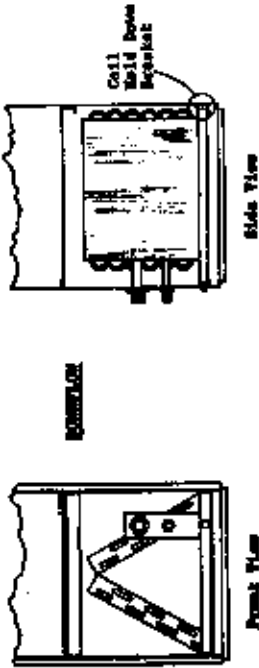
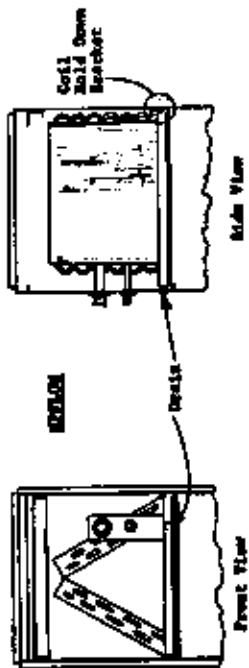


Figure A

ELECTRIC FURNACE EVAPORATOR COIL INSTALLATION



Note: "A" coil assembly in auxiliary water pan and slide into cabinet. When sliding into cabinet make sure that the pan is secured by the coil hold down bracket. This will prevent the coil from dropping down.

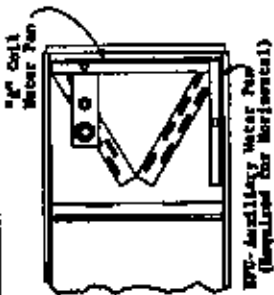
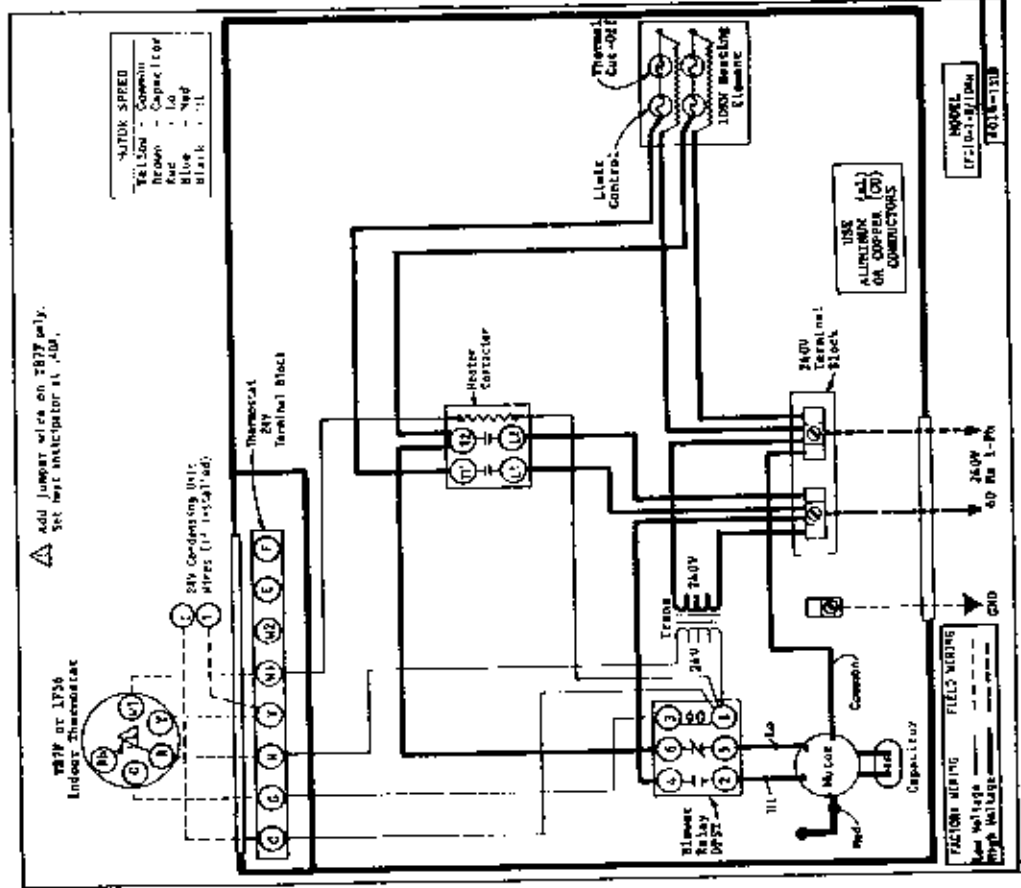
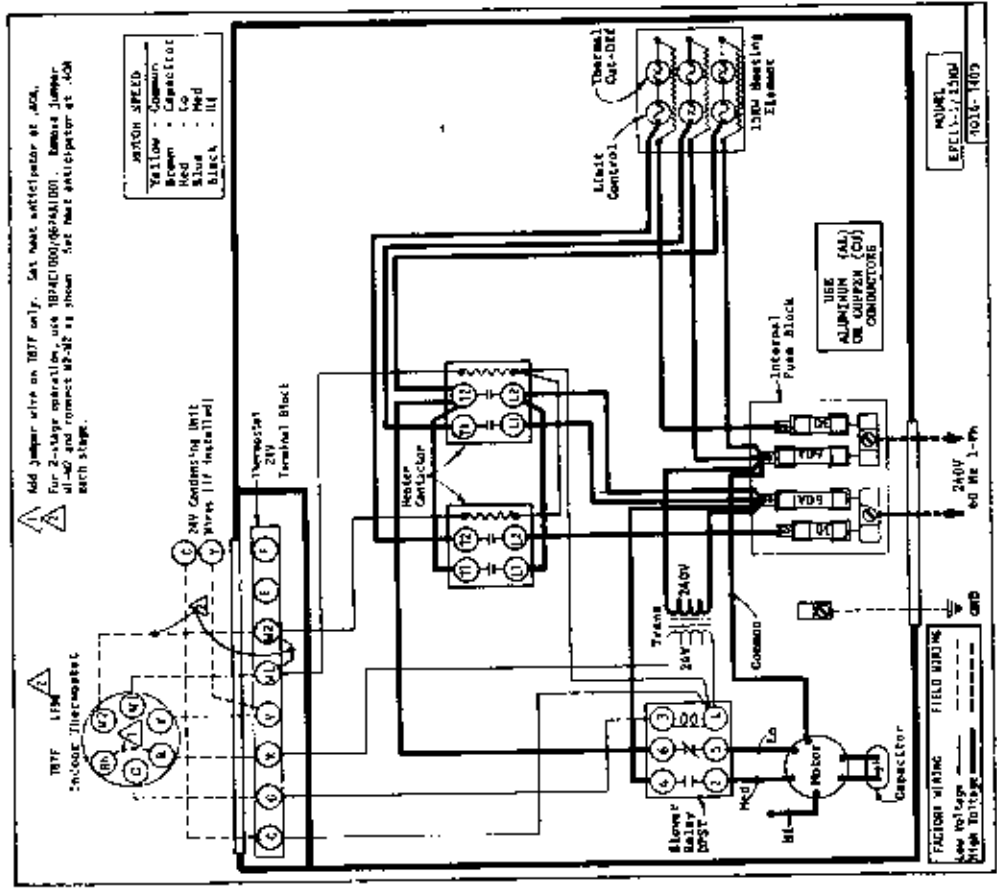
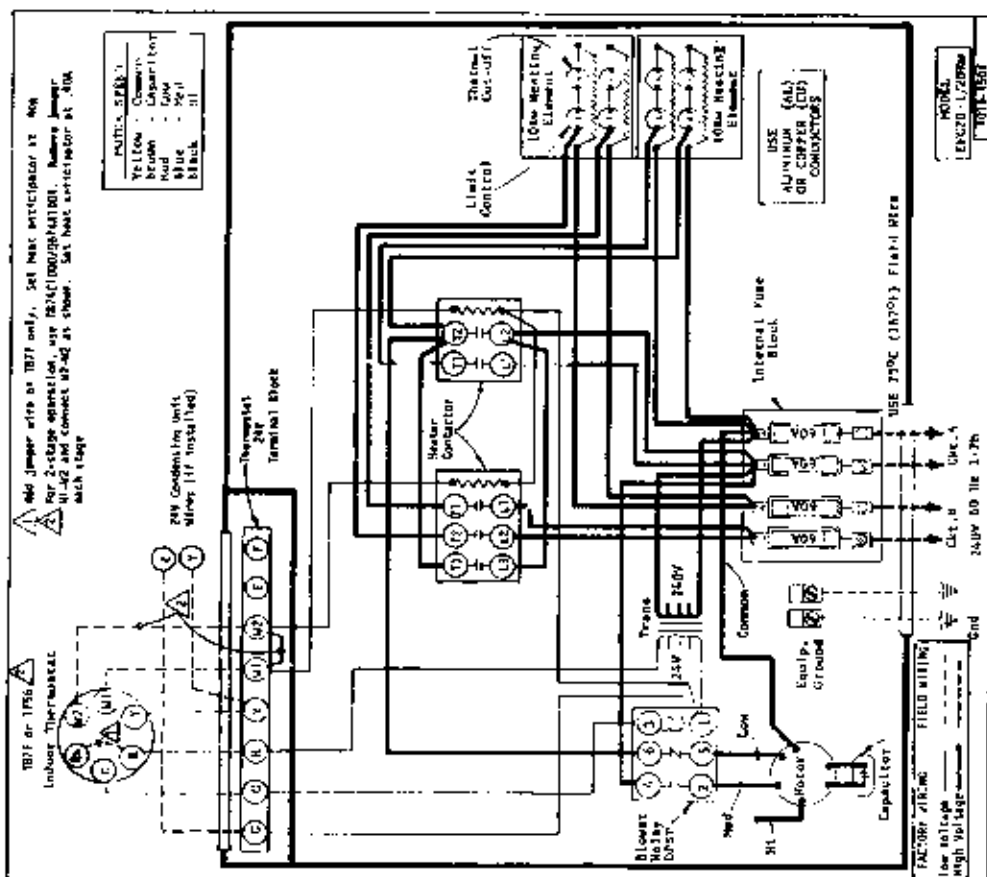
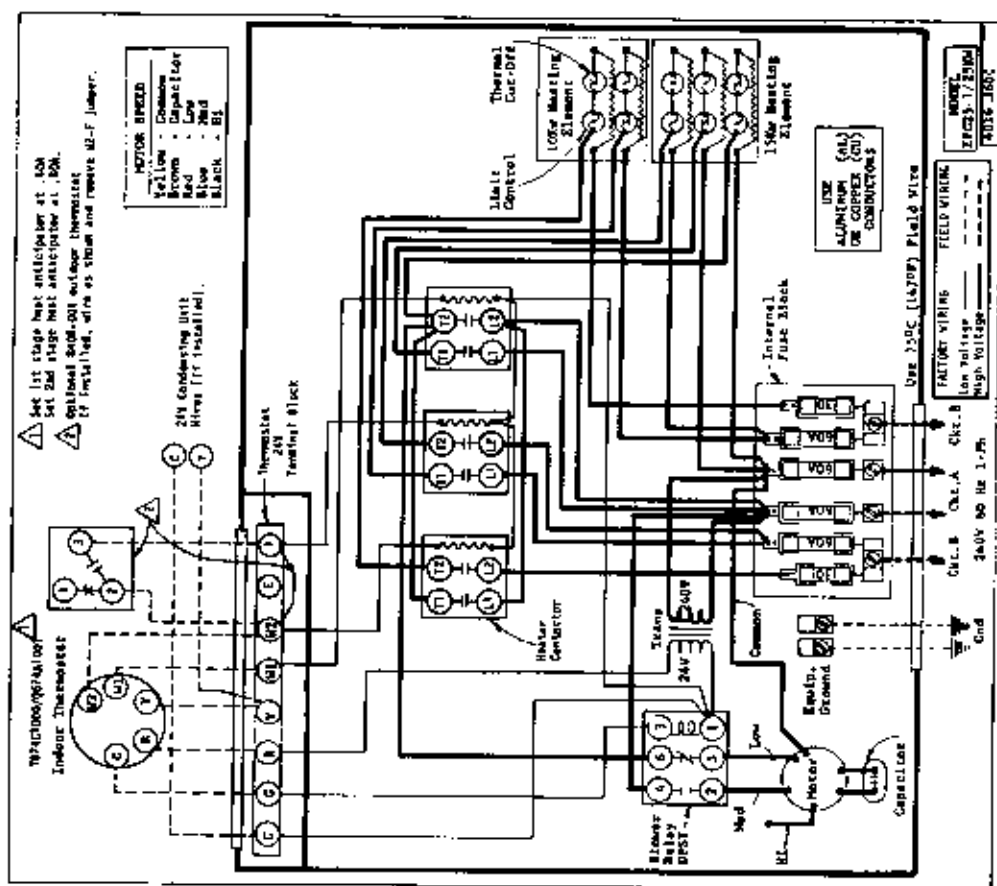
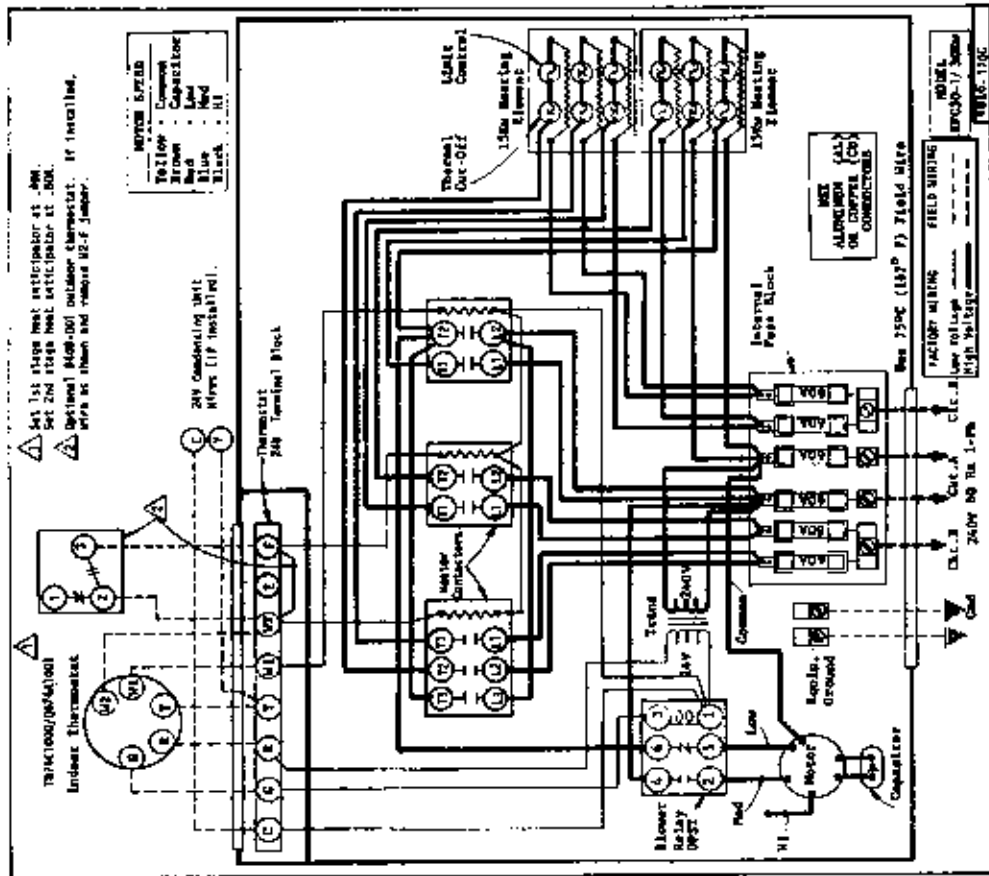


Figure B







PART NO.	DESCRIPTION	EFC10-1	EFC10-1-B	EFC15-1	EFC20-1	EFC25-1	EFC30-1
•	Blower Housing 10-B	X	X	X	X	X	X
•	Blower Housing 10-7						
•	Blower Housing 10-9						
8152-005	Blower Wheel 0035-3A	X	X	X	X	X	X
8152-010	Blower Wheel 0010-7A						
8152-014	Blower Wheel 0010-9A						
1171-011	Cabinet Latch	(2)	(2)	(2)	(2)	(2)	(2)
8552-003	Capacitor 4/370V						
8552-002	Capacitor 5/370V						
8401-006	Contact	(1)	(1)	(2)	(1)	(3)	(2)
1171-002	Door Pull	X	X	X	X	X	X
7004-001	Filter 10x20						
7002-001	Filter 0x20 P	(2)	(2)	(2)	(2)	(2)	(2)
8614-006	Fuse 50A						
8614-017	Fuse 30A						
8614-017	Fuse 150w						
8614-013	Fuse Block						
8614-014	Fuse Block 200w						
8614-014	Fuse Block 250w						
8614-019	Fuse Block 300w						
8604-014	Heat Strip 100w						
8604-015	Heat Strip 150w	X	X	X	(2)	(2)	(2)
8402-015	Limit Switch L130-2.0	(2)	(2)	(3)	(4)	(5)	(6)
8102-003	Motor 1/8 hp						
8105-012	Motor 1/3 hp						
8105-010	Motor 1/3 hp						
8300-003	Motor Mount	X	X	X	X	X	X
8401-011	Motor Mounting Parts	X	X	X	X	X	X
8501-014	Relay - Blower	X	X	X	X	X	X
8607-006	Terminal Board 24V	X	X	X	X	X	X
8602-001	Terminal Block 230V	X	X	X	X	X	X
8402-018	Thermal Cut-off	(2)	(2)	(3)	(4)	(5)	(6)
8407-007	Transformer	X	X	X	X	X	X
8407-015	Transformer						
8401-002	Contactor				(1)		(1)

*Please order by model number.