

EFM / ELB / ELBN Series Air Handlers
Installation Instructions

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**EFM / ELB / ELBN Series
Electric Heating Unit**

Installation – Operation – Maintenance



The EFM / ELB / ELBN series unit is designed for permanent upflow, counterflow, or horizontal left/right airflow installation. Optional DX coils are available that provide for add on DX air conditioning and heat pump applications to meet specific requirements of the outdoor equipment. The EFM / ELB / ELBN series are available in several models ranging from 600 CFM to 2000 CFM of air movement. Electric resistance heat is available from 3 to 30 KW.

Installation Instructions

Installation of this unit shall be made in accordance with the National Electric Code, NFPA No. 90A and 90B, any other local codes or utilities requirements.

Warning: Due to possible damage to equipment or personal injury; Installation, service and maintenance should be performed by a trained, qualified person. Consumer service is recommended only for a filter replacement.

Warning: Insure all power is disconnected before installing or servicing this unit. More than one disconnect device may be required to de-energize the equipment. Hazardous voltage can cause severe personal injury. Make certain all panels are in place before operating this unit.

Unpacking

Carefully unpack the unit and inspect the contents for damage. If any damage is found at the time of delivery proper notification and claims should be made with the carrier who delivered the unit.

Check the unit rating plate to insure model number and voltage, plus any kits agree with what you ordered. The supplier should be notified immediately of any discrepancy or parts shortage.

Location

The blower coil unit should be centrally located and may be installed in an attic, basement or crawl space with 0" clearance from any side, front, rear or duct work

If the unit is located above a finished ceiling or space, an auxiliary safety drain pan must be installed under the unit. A separate drain line must be installed from the safety pan.

The unit must be installed in a level position to ensure proper condensate drainage. Make certain the unit is level in both directions within 1/8"

When the unit is installed in an enclosed area, the room should be large enough, and have an opening large enough to allow replacement of the unit. All Servicing is done from the front and a clearance of 24" is needed for service.

If you are installing the unit in an unconditioned space such as an attic or crawlspace, you must insure that the area provides sufficient air

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circulation to prevent moisture collection on the cabinet during high dew point conditions. A drain pan must be installed under the entire unit when it is installed above a finished ceiling or location in a finished ceiling or location in an unconditioned space.

Ductwork

The duct work should be installed in accordance with the NFPA No. 90A "Installation of Air Conditioning and Ventilating Systems" and NFPA No. 90B "Residential Type Warm Air Heating and Air Conditioning Installation."

The duct work should be insulated in accordance with the applicable requirements for the particular type installation as required by HUD, FHA, VA, the applicable building code, local utility, or other governing body.

Condensate Drain

The unit is supplied with 3/4 inch primary and auxiliary condensate drains. Both drains must be trapped outside the unit and piped in accordance with applicable building codes. Do not reduce the drain line size less the connection size on the drain pan. Condensate should be piped to an open drain or to the outside. All drains must pitch downward away from the unit a minimum of 1/8" per foot of line to ensure proper drainage.

Refrigerant Piping

Refrigerant piping external to the unit shall be sized in accordance with the instructions of the manufacturer of the outdoor equipment.

Metering Device

Optional air conditioning or heat pump coils are shipped with a checkflow piston installed which is designed for air conditioning or heat pump operation. If your application requires a thermal expansion valve or check expansion valve then it is necessary to remove the piston from the distributor assembly and install the proper metering device. Be sure to follow the instruction in the kit to ensure proper installation.

Wiring

Consult all schematic and pictorial wiring diagrams of this unit and the outdoor equipment to determine

compatibility of the wiring connections and to determine specific requirements.

All field wiring to the blower coil should be installed in accordance with the latest edition of the National Electric Code NFPA No. 70 and any local codes.

Check rating plates on unit for rated volts, minimum circuit ampacity and maximum over current protection. Supply circuit power wiring must be 75 degree C. (167 degree F) minimum copper conductors only. Copper supply wires shall be sized to the National Electric Code or local code requirements, whichever is more stringent.

The unit is shipped wired for 230/240 Volt AC 60 HZ 1 Phase Operation. If the unit is to operated at 208 VAC 60HZ, then follow the instruction on the indoor unit wiring diagram to change the low voltage transformer to 208 VAC operation.

Be sure the unit is properly grounded.

Class 2 low voltage control wiring should not be run in conduit with power wiring and must be separated from power wiring, unless class 1 wire of proper voltage rating is used. Low voltage control wiring should be 18 Awg, color coded (105 degree C minimum). For lengths longer than 100ft., 16 Awg wire should be used. Make certain that separation of control wiring and power wiring has been maintained.

Air Filter

An air filter must be installed prior to the air entering the evaporator coil to protect the coil, blower and other internal parts from excessive dirt and dust. The door must be securely fastened in place to ensure proper filtration of the return air. A remote return air filter grille may be used for ducted return air applications. Change the filter every 30 days or as soon as dust or dirt appear on the filter. Failure to change the filter in a timely fashion can result in reduced airflow, increased operating cost and may result in damage to the indoor unit and or outdoor unit.

Thermostat

Select a thermostat that is commonly referred to as a single stage cooling with electric heat subbase. This stat will energize the fan on a demand for heat or cool.

Install the thermostat on an inside wall, away from drafts, lights or other heat sources in a location that has good air circulation from the other rooms being

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controlled by the thermostat. The thermostat should be mounted 4 to 5 feet above the floor.

Blower

This unit is supplied with a multi-speed motor with a direct drive blower wheel which can obtain various air flows. The unit is shipped with the blower connected for high speed. If a lower blower speed is required, disconnect all power to the unit, remove the black indoor fan motor lead from the fan relay, place an insulated cap on the black lead, remove the insulated cap from the red indoor fan motor lead, place a spade connector on the lead and connect it to the fan relay where the black lead was originally connected. Be sure to check the air flow and the temperature drop across the evaporator coil to ensure that you have sufficient air flow.

Start Up

Once all connections are completed, the unit should be started up and a check of the completed system should be performed. Before performing any system test make sure that all grilles, register and dampers are open and set to the correct positions. Also make certain that an air filter is installed in the return air prior to the Air Handler. A performance test should be completed in accordance with the outdoor equipment manufacture's instructions. Airflow test should be conducted in the heating and cooling modes to ensure satisfactory operation.

Maintenance

The system air filter(s) should be inspected, cleaned or replaced at least monthly. If the filter is mounted internal to unit, make sure that electrical power is disconnected before removing the access panels. Make certain that the access panels are replaced and secured properly before placing the unit back in operation. This product is designed for dependable service; however, periodic maintenance should be scheduled to be conducted by trained professional service personnel. This service should be conducted at least annually, and should include testing and inspection of electrical and refrigerant components. The heat transfer surface should be cleaned. The blower motor is permanently lubricated for normal operating conditions.

Warnings

Do not store or use any corrosives or combustibles in the vicinity of this unit. All panels must be in place and properly secured before operating this equipment.

All electrical power servicing this unit must be disconnected prior to removal of any panels. Service of this unit must be accomplished by qualified trained professional personnel only

Sequence of Operation

Cooling (cooling only or heat pump with reversing valve energized in heat mode). When the thermostat calls for cooling, the blower relay is energized. The N.O. contacts will close, after a time delay, the indoor blower will operate. The circuit between R and Y is completed: causing the contactor on the outdoor equipment to close and start the compressor and the outdoor fan motor.

Cooling (heat pump with reversing valve energized in cooling mode). When the thermostat calls for cooling, the circuit between R and G and R and O is completed. Circuit R and O energizes the reversing valve to the cooling position, Circuit R and G energizes blower relay. The N.O. contacts will close, after a time delay, the indoor blower will operate. The circuit between R and Y is completed: causing the contactor on the outdoor equipment to close and start the compressor and the outdoor fan motor.

Heating (electric heat only). When the thermostat calls for heat, the circuit between R and W is completed, the heat sequencer is energized. A time delay will occur: Then the heating element(s) and the indoor blower motor will come on.

Heating (heat pump reversing valve energized in heat mode). When the thermostat calls for heat, the circuits between R and B, R and Y and R and G are completed. Circuit R and B energize the reversing valve switching it to the heat position. Circuit R and Y energized the outdoor unit contactor starting the compressor and outdoor fan. Circuit R and G energizes the blower relay starting the blower motor.

If the indoor room temperature should continue to fall, circuit R and W2 is by the second-stage heat bulb on the thermostat. Circuit R-W2 energizes the heat sequencer. The completed circuit will energize the supplemental electric heat.

Blower Time Delay. This unit is equipped with timed on and a timed off relay. This relay delays the start

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and delays the stopping of the indoor fan motor to maximize the efficiency of the unit.

Defrost. Supplemental heat during defrost can be provided by connecting B on the blower coil to the defrost relay on the outdoor heat pump. This will complete the circuit between R and B (in the blower coil) through a set of contacts in the defrost relay in the outdoor unit when the unit starts the defrost cycle. This circuit, when it is connected, will help prevent cold air from being discharged from the indoor unit during the defrost.

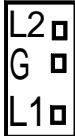
Conforms to UL STD 1995

THIS PRODUCT IS MANUFACTURED IN THE USA
BY:

AllStyle Coil Co., LP
7037 Brittmore
Houston, TX 77041



Models with less than 48 Amps total are equipped with a Terminal Block.



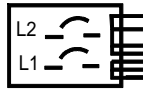
TB-1

USE COPPER CONNECTORS ONLY.
Use Conductors Suitable for 167 Deg F.

MAXIMUM CIRCUIT BREAKER 60 AMP
208/230 VOLTS 21.6/28.8 KW
104/120 TOTAL HEATER AMPS
MINIMUM CIRCUIT AMPACITY 137/157

CIRCUIT NO.2
208-230/60/1

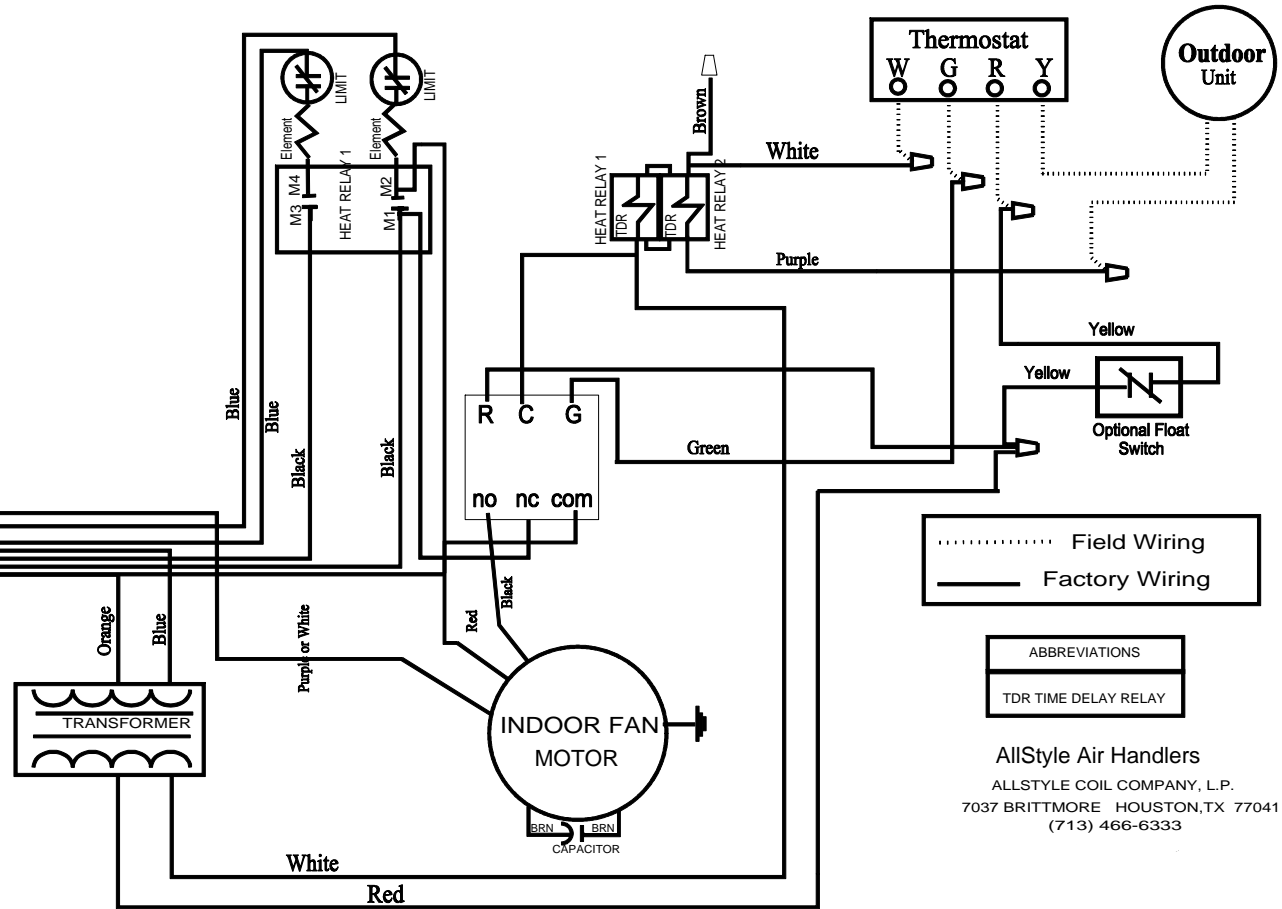
CIRCUIT NO.1
208-230/60/1



Consult National Code for Wire Size

DIAGRAM REPRESENTS THE MAXIMUM NUMBER OF CONTROLS, HEATERS/CONTROLS WHICH MAY BE INSTALLED. FEWER COMBINATIONS WILL RESULT IN LESS WIRING THAN SHOWN.

Wiring change required to convert transformer to 208 Volts. Disconnect power. Disconnect orange high voltage lead from transformer and cap with an insulated terminal. Connect yellow transformer lead where orange lead was originally connected.



230 VOLTS AC 60 HZ SINGLE PHASE

FORM W01-10 Oct 01

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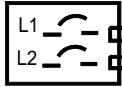
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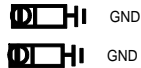
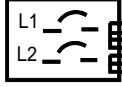
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CIRCUIT NO.2
208-230/60/1



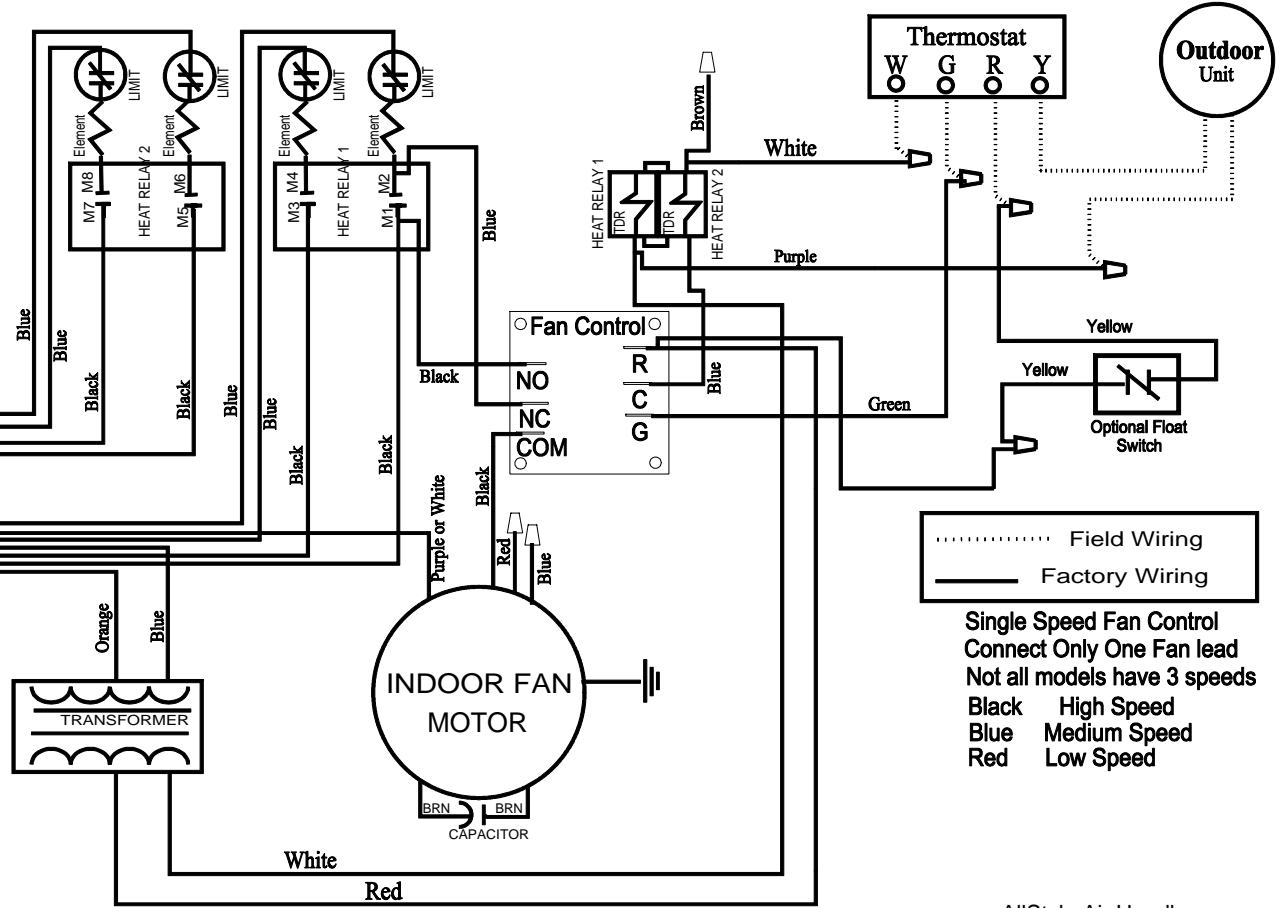
CIRCUIT NO.1
208-230/60/1



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..... Field Wiring
—— Factory Wiring

Single Speed Fan Control
Connect Only One Fan lead
Not all models have 3 speeds
Black High Speed
Blue Medium Speed
Red Low Speed

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230 VOLTS AC 60 HZ SINGLE PHASE

FORM W02-10 SEP02

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MAXIMUM CIRCUIT BREAKER 60 AMP
208/230 VOLTS 21.6/28.8 KW
104/120 TOTAL HEATER AMPS
MINIMUM CIRCUIT AMPACITY 137/157

CIRCUIT NO.3
208-230/60/1

CIRCUIT NO.2
208-230/60/1

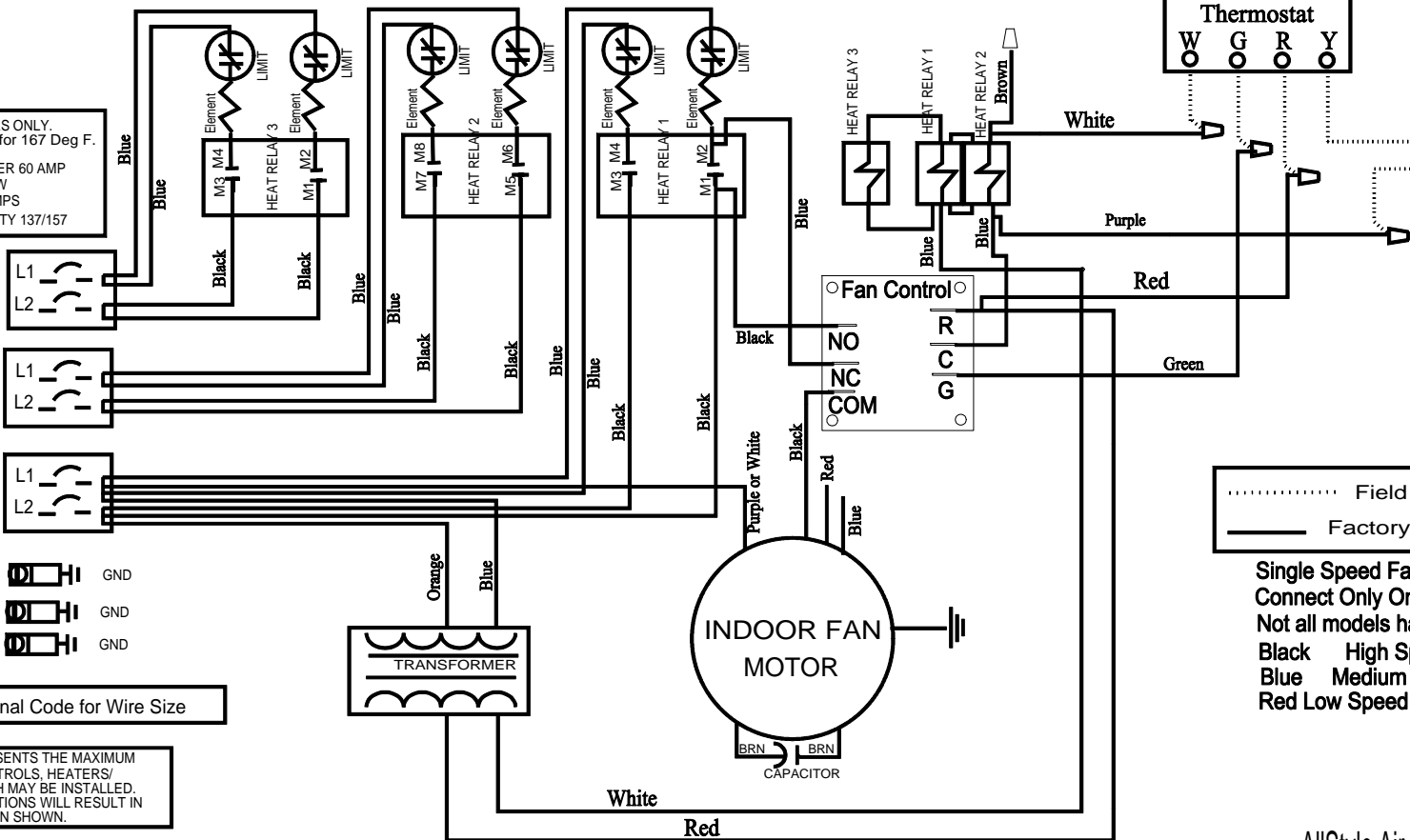
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FORM W02-09 Oct02