

Evergreen IM Motor Power Connections

First things first: Make sure that the Evergreen motor you are troubleshooting is the "IM" variety. The series can be seen after the word "Evergreen" on the motor's nameplate. **The "AH" series is wired very differently, and none of the instructions included below apply to that motor.**

The Evergreen manual is about 40 pages thick, and, although it's pretty comprehensive, it is really necessary to read through it a couple of times if you want to understand how to properly troubleshoot this type of motor. It can be downloaded from the manufacturer's website:

<https://secure.thedealertools.com/p-118-evergreen-im-manual.aspx>

They require you to create a login account to download the manual.

Here is a short summary of the motor's highlights:

- The motor needs three types of electrical inputs to operate! They are:
 - a. Either 120 V or 230 V AC POWER input (selectable by a jumper plug.)
 - b. A HIGH VOLTAGE SIGNAL input; it selects the HP range.
 - c. A LOW VOLTAGE speed selector SIGNAL input, it selects the speed.
- The motor requires all 3 of these signals - at the same time - to operate properly.
- When the motor is first installed, it executes a routine to determine *which direction* it should spin. The load of the fan blower is used, so the motor should not be installed and powered up the first time without a load. The rotation direction is memorized for future starts; but can be changed with a 5-minute procedure found near the back of the manual if necessary.
- The motor features a very slow circulating speed (which helps to avoid air stratification in the conditioned space) when the high voltage POWER and the high voltage SIGNAL are present without a low voltage SIGNAL command.
- The high voltage POWER input must remain powered at all times (except when servicing); the high voltage SIGNAL is supposed to be switched as part of normal cycling operation. The low voltage SIGNAL is also supposed to be switched as part of normal cycling operation.
- The motor usually ships with the 230 V jumper (yellow) installed. If you accidentally operate the motor on 120 V with the 230 jumper installed, the motor will run too slowly. BUT - if you power the motor with 230 V and the 120 V jumper (white) is installed, the motor will be destroyed.
- To properly troubleshoot this motor, it **MUST** have the blower and scroll attached and secured (to provide a load.)

Steps to troubleshoot on a 120 V (not 240 V) workbench:

WARNING: ALWAYS DISCONNECT POWER MAINS FROM UNIT AND FROM MOTOR WHEN SERVICING! VERIFY ABSENCE OF POWER WITH YOUR METER BEFORE TOUCHING OR CONNECTING WIRES. NEVER CONNECT OR DISCONNECT WHEN LIVE BECAUSE OF POSSIBLE ARCING!

1. Make sure the white jumper is installed (near the short connector's location.)
2. Plug in the UZPH4's connector into the power socket on the motor. The connector's tabs are two different sizes, preventing you from inserting the connector improperly.
3. Plug in the UZHMF's (Adapter F for the UZ-1) connector to the signal socket on the motor. A plastic tab prevents plugging this in incorrectly.
4. Connect one (or both) of the connectors on the YELLOW wires of the UZPH4 to the Horsepower selection wires as chosen by the chart below:
 - a. HIGHEST HP: connect one yellow wire's terminal to the BLUE selector wire AND the other yellow wire's terminal to the ORANGE selector wire.
 - b. MID HP Range: connect one yellow wire's terminal to the BLUE selector wire. Place provided dummy terminals (for safety) on the unused wires.
 - c. LOW HP Range: connect one yellow wire's terminal to the ORANGE selector wire. Place provided dummy terminals (for safety) on the unused wires.

The motor will not operate unless you wire the HP selection wires in one of the above schemes. Always cap unused terminals with safety (dummy) terminals.

5. Connect the UZ-1's main harness to the Adapter F's plug. Provide live 24 VAC power to the UZ-1's alligator clip inputs. The UZ-1's blue LED will light.
6. Connect a safety ground wire to the motor: a separate wire run from a securely attached bare metal point on the motor to a safety ground point is required.
7. Check for safety and then provide 120 VAC power to the UZPH4's Black and White wires. This is best done with a fused power plug. (A great way of doing this is by using Zebra's #ZD001 Fused Test Adapter Cord with Lighted 120 V Plug.)
8. If no speed is initially selected on the UZ-1, the motor will operate after a few seconds in a very low speed circulating mode. This is normal with no speed selected. Selecting a speed with the UZ-1 will override this mode, although the built in ramps and delays may take 45 seconds or so for a full speed change.
9. The motor has 4 available speeds (plus the low speed circulating mode.) It should operate in each of them. When troubleshooting, you must allow for up to a 45 second delay and ramp time when changing speeds before getting concerned.