

Sequence of Operation for EMS

- Once all power, lights, and temperature sensor(s) are properly connected and the fans are operating in the correct direction (there is an arrow showing the correct direction for fan rotation at the blower), the “**Power**” light on the control panel should be illuminated. This means that a 120V circuit has been properly connected to the terminal block at H1 and N1.
- Two Functions:
 1. Press the “**Fans On**” switch to energize the variable frequency drives (VFD) and fans. The fans take a few seconds to come up to speed; this setting is programmed into the panel for a soft motor startup to prolong the fan motors. The VFDs should all indicate **48Hz** and the “**Fans On**” indicator light should illuminate on the control panel. This indicates that the fans (whether exhaust or supply) are operating on low speed.
 2. Turn on the cooking appliances and allow them to reach idle temperature. If the fan switch is in the “OFF” position, the fans should automatically be energized as the cooking appliances heat up. The EMS thermostat in the riser is pre-set at 85±F; when the set point is exceeded this will automatically start the fans. This function allows the system to meet the requirements of IMC 507.2.1.1, which require exhaust fans to activate when cooking is occurring.
- The VFDs are factory programmed to operate at 60Hz for high speed and 48 Hz for low speed. This results in a 20% reduction in airflow when operation is in low speed. VFDs are used to adjust the speed of 3 phase motors and frequency is proportional to airflow. There is one VFD for each fan in the system.
- Once the appliances are operating and the cooking process

begins, the VFDs will begin to modulate between 48 Hz and 60 Hz. For every exhaust fan, a digital temperature control will be included in the package. The temperature control is multi-functional and includes input from the duct mounted thermostat, relay contacts driven by programmable alarms and a signal output to speed up and slow down the VFDs. There are two factory settings for the temperature controls: 450± degree rated hoods are programmed to turn on at 85±F and go to high speed at 90±F, while the 600-700 degree rated hoods are programmed to turn the fans on at 85±F and send to high speed at 130±F. All temperature ranges are adjustable if necessary.

- The resistance temperature detector (RTD), located in the riser, measures the temperatures in the duct and gives constant feedback to the temperature control. There is one sensor per exhaust fan in the system.
- A 100% override button is also included in the package and is installed on the front of the panel. If this button is depressed, the fans will automatically be ramped to high speed via the VFDs, and a timer in the package will hold the fans at high speed for a set period of time. Once the time period has expired, the VFDs will operate based on the duct temperature. The time period is factory set at 30 minutes but can be adjusted.
- At the end of the day after cooking is completed, the staff will turn off the fan switch on the front of the panel. If there is any residual heat from the appliances, then the fans will remain on based on the duct temperature until the temperature falls below the set point of 85±F.
- In the event of a fire under the hood, the EMSplus will force all exhaust fans on at full speed and shut off the supply fan.