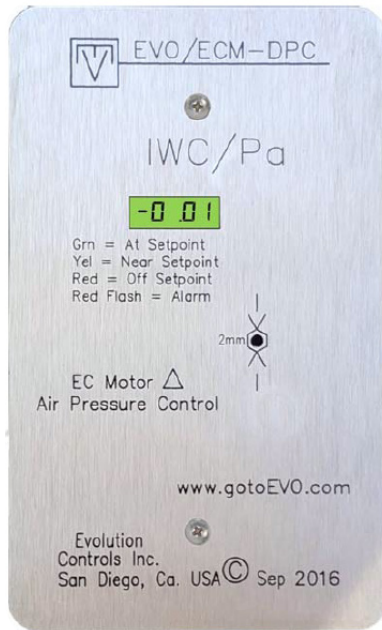




ECM-DPC

Installation, Operation, and Maintenance Manual



READ AND SAVE THESE INSTRUCTIONS

The purpose of this manual is to aid in the proper installation and operation of fans manufactured by S&P. These instructions are intended to supplement good general practices and are not intended to cover detailed instruction procedures, because of the wide variety and types of fans manufactured by S&P.

Installation Instructions

ECM-DPC

EC Differential Pressure Control

1. APPLICATION

The ECM-DPC is designed to control an EC Motor powered fan to maintain an adjustable static pressure set point. The user must set the air pressure set point to the desired pressure, and the control will adjust the fan's speed to maintain the set point.

Possible areas of use:

- Rooftop Exhaust
- Cleanrooms
- Ventilation Systems
- Restaurants
- Multi-family Residential
- Hotels

2. DISPLAY

The display shows the pressure during operation. When the adjustment knob is turned, the display shows the set point.

The display backlight uses color to indicate control loop status. Green indicates the pressure is at set point. Red indicates the pressure is far from set point, and shades of yellow indicate the pressure is near set point.

When a system disturbance or change in set point occurs, the backlight changes from green to yellow or red. As the system works to recover from the disturbance, the backlight graduates from red, to yellow and then to green when the pressure is back to set point.

If the system fails to maintain set point, the display remains red. After remaining red for 6 minutes, the red display flashes and an alarm relay drops out. The alarm relay also drops out when power is removed from the control.

The alarm relay contact may be jumper selected to open on alarm or power fail or close on alarm or power fail.

3. SPECIFICATIONS

Power	~24V \pm 10%, 5VA, 3W
Control Range	0.05 to 1.25 in w.g. (12.5 to 310 Pa)
Accuracy	\pm 0.01 in w.g. (\pm 2.5 Pa)
Adjustment Tool	5/64 inch (2 mm) hex driver or wrench
Pressure Sensor	Thermal bridge Differential piping 3/16 inch (5 mm) tubing
Alarm Contact	Class 2 circuit ~30V / +60V max 1A max
Operating Temperature	32 to 122°F (0 to 50°C)
Storage Temperature	-4 to 160°F (-20 to 70°C)

4. OPTION JUMPERS

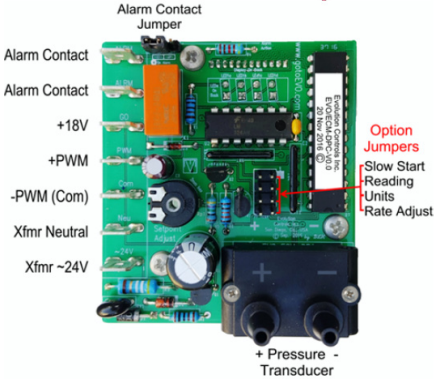


FIGURE 1

Slow Start	On power up or motor start, fan flow is held at minimum for 10 seconds, making it easier for multiple motors to start.
Reading	Insert the reading jumper when controlling a negative pressure. A (-) is displayed when the HI (+) port is higher than the LO (-) port.
Units	Insert jumper to display pressure in Pa. Remove the jumper to display the pressure in in w.g.
Rate Adjust	Insert jumper if integration rate needs adjustment

5. FUNCTIONALITY

Control Loop

The DPC features a proportional/integral control loop that calculates the fan speed needed to maintain the air pressure set point.

The DPC calculates the difference between the measured pressure and set point. This discrepancy continuously adjusts the fan speed to maintain the desired pressure.

Adjustment

Adjustments are made through the front panel. The adjustment point is intentionally unmarked and requires a special tool to discourage tampering with the adjustment knob.

The front panel adjustment is used to set the set point and integration rate. A jumper on the back side of the control switches between set point and integration rate adjustment. The display shows the value selected by the jumper.

Set point

Adjust the set point to display the desired pressure. When adjustment is finished, the system will settle on the set point. Where possible, create a normal disturbance by turning on an appliance connected to a controlled duct, opening a door and etc. Confirm that the fan is adjusting speed to meet the set point.

For “best practice” use a test and balance instrument to adjust the set point. Adjust the set point as described, then adjust as necessary so the test instrument displays the desired set point.

Integration Rate

The integration rate is the speed in which the DPC will adjust the motor speed to compensate for any pressure difference. The default integration rate is 3.0 seconds, fitting many applications. Adjust the integration rate if the default value causes the system to become unstable.

To adjust the integration rate, insert the jumper into the “rate adjust” pins in figure 1. The display will show the current integration rate in seconds. This rate can be set between 0.5 to 25.0 seconds. Increase the integration rate until the system becomes unstable.

6. WIRING

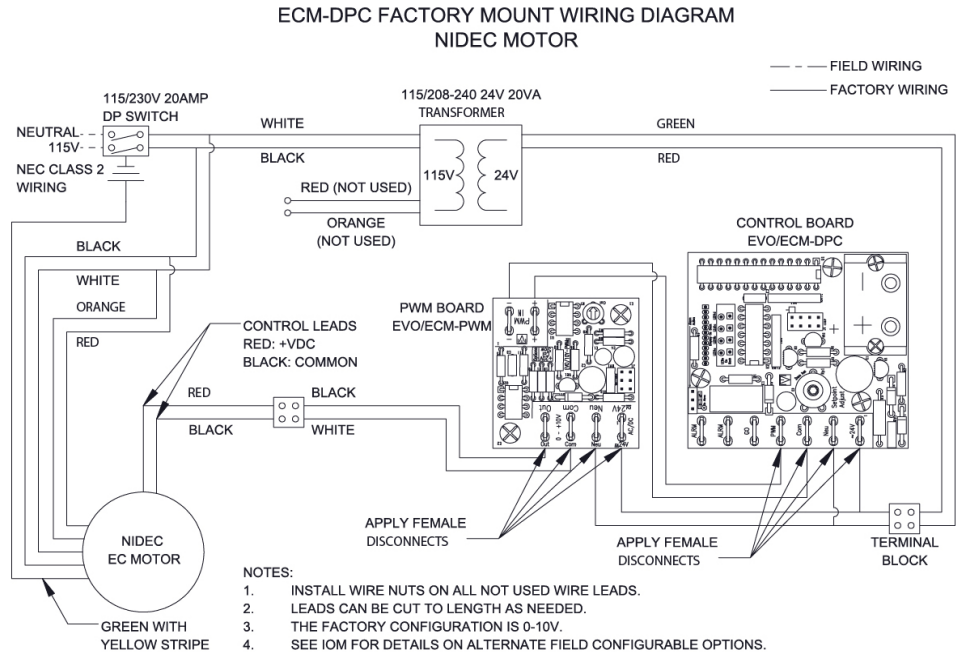
Power the ECM-DPC with a ~24V NEC Class 2 power limited transformer. Observe all code requirements and follow all safety practices regarding low voltage power supplies and circuits to ensure a safe, reliable installation.

Some applications may require an isolated power supply or alternative low voltage electrical safety scheme. Follow code requirements and carefully observe all safety practices concerning ungrounded low voltage circuits.

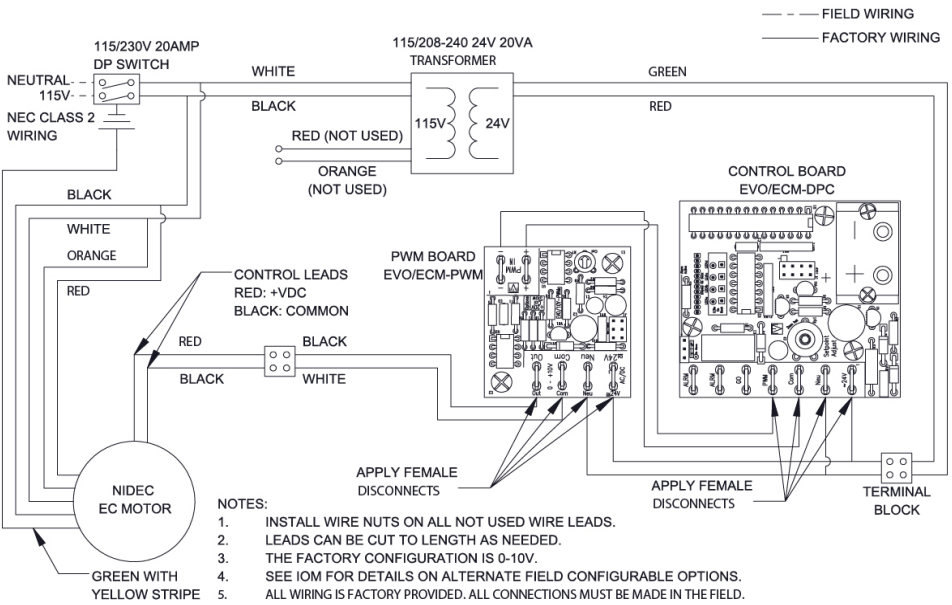
Ground one of the ~24V power transformer leads. Wire the DPC neutral connection to the grounded lead.

Wire the hot side of the ~24V Class 2 power source to the DPC’s ~24V 50/60Hz connection. You may interrupt this connection as a means to stop the EC Motor. Most automation controllers will power the DPC directly from a ~24V on/off output. Automation controllers that switch neutral may require a delay.

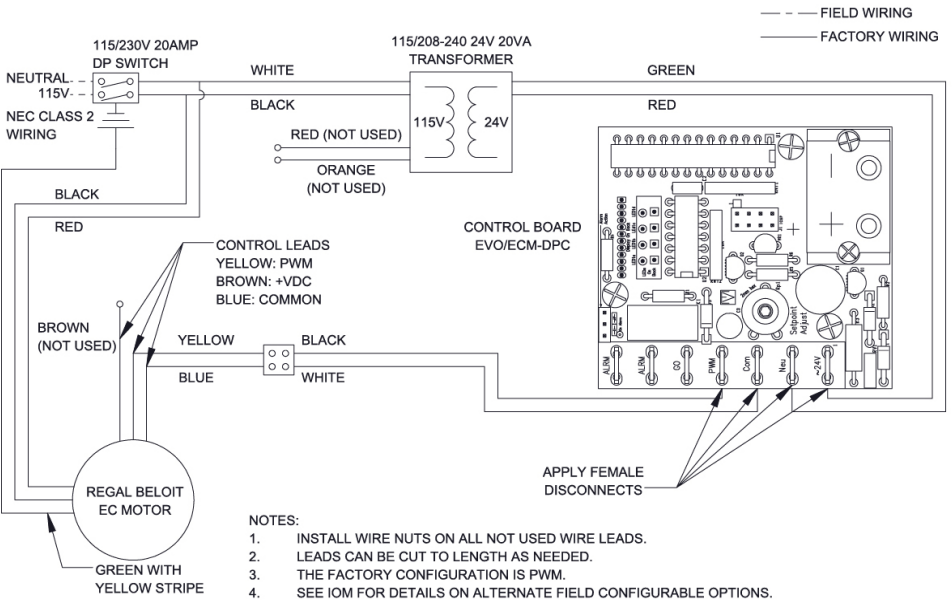
7. WIRING DIAGRAMS



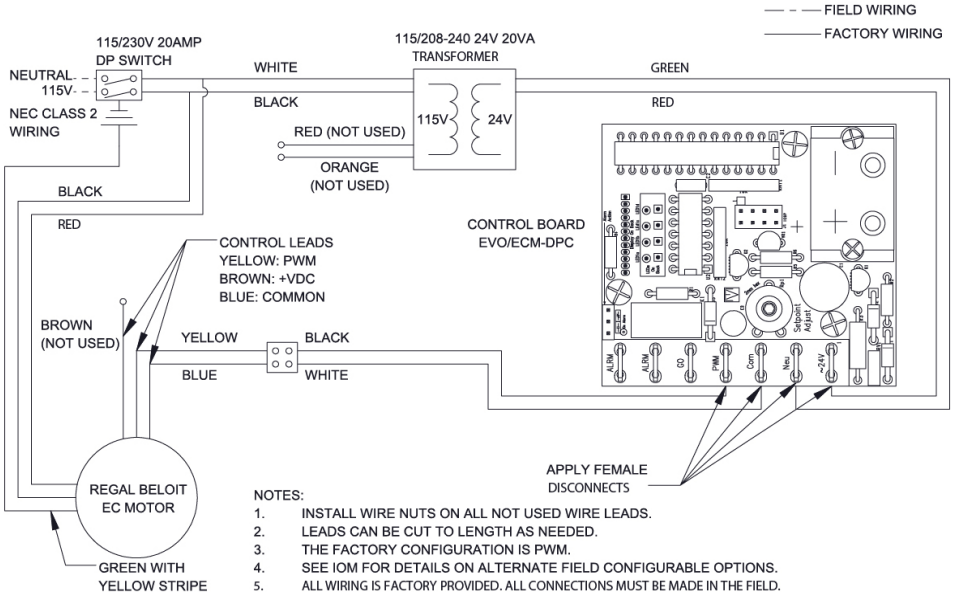
ECM-DPC SHIPPED LOOSE WIRING DIAGRAM NIDEC MOTOR



ECM-DPC FACTORY MOUNT WIRING DIAGRAM REGAL BELOIT MOTOR



ECM-DPC SHIPPED LOOSE WIRING DIAGRAM REGAL BELOIT MOTOR





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