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## ***OPERATING, MAINTAINING & INSTALLING YOUR LIGHT COMMERCIAL HEAT/ENERGY RECOVERY VENTILATOR***

### **IMPORTANT – READ AND SAVE THESE INSTRUCTIONS**

**\* LEAVE THIS DOCUMENT WITH THE BUILDING OWNER**

Specifications, dimensions and ratings may change without notice  
due to ongoing product development and improvements.

***For products using controller NU-HRV Rev F manufactured April 2013 or later***

NU0103, NU0305, NU0406, NU0508, NU0912, NU1316  
NU305, NU500, NU600, NU800, NU1200, NU1600

**INSTALLATION AND WIRING MUST BE IN ACCORDANCE WITH CEC, NEC AND  
LOCAL ELECTRICAL CODES.**

# IMPORTANT

PLEASE READ THIS MANUAL BEFORE YOU INSTALL OR SERVICE UNIT

## NOTE

Prior to integrating this unit with any other piece of mechanical equipment, i.e. furnace, air handler, combustion heating appliance, careful consideration must be given to system design and integration to ensure compatibility and proper operation of both appliances. **Do not** connect the duct system of your H/ERV to any clothes dryer or kitchen exhaust fan duct system.

Whether installing this unit as part of an independent system or to integrate it with a central heating/cooling system, use the procedure in this manual to ensure that the air flows of the H/ERV are balanced. Only a properly balanced H/ERV will deliver maximum performance and energy efficiency.

Although this document contains guidelines for proper HRV sizing and installation, your ventilation system should be installed in conformance to the appropriate provincial or state building regulations or National Building Code and/or ASHRAE “Good Engineering Practices”.

## AVOID RISK OF INJURY, ELECTRIC SHOCK AND FIRE HAZARD

**DO NOT** install this product in an unconditioned space—15° C/59° F ambient temperature is recommended—or in a space/manner where maintenance and service might pose a risk of personal injury or damage to this product.

For indoor installations only.

If your H/ERV is equipped with a 3-prong plug which will fit an A/C electrical outlet in just one orientation. Do not alter this plug or its cord in any way. Grip the plug firmly when removing it from an electrical outlet—**NEVER** unplug this product by pulling or twisting its power cord.

**ALWAYS** unplug an H/ERV before you open or remove its cover (door) to clean the inside of the unit or for any other servicing or repairs.

The **cover to this H/ERV** is removable to ensure ease of access to internal components during cleaning and servicing. **USE CAUTION** when opening or removing the cover of this H/ERV to avoid risk of personal injury or damage to the cover.

**NEVER** attempt to clean the interior of this H/ERV or its components while the unit is plugged in or running.

**ONLY qualified persons** should attempt repair or service of any electrical/internal component of this product.

**NEVER** attempt to repair or service any internal component of this H/ERV while the unit is plugged in or running.

**DO NOT** use your ventilation system to exhaust flammable fumes or gasses.

**ALWAYS** contact your Nu-Air representative if you have any questions or comments about the operation or maintenance of your Nu-Air H/ERV—we are here to help you!

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## 1 How the NU-AIR System Works

This heat recovery ventilator (HRV) or energy recovery ventilator (ERV) provides fresh air to a conditioned space while exhausting an equal amount of stale air. Herein, the term H/ERV will be used in several instances in discussion of general operation and maintenance.

- Two forward curve blowers work to bring fresh air into the space and exhaust an equal amount of stale air.
- Incoming fresh air is filtered before flowing through the heat/energy exchange core.
- Stale, humid air flows through the cross-flow heat exchanger and transfers the heat and cooling (“sensible”) energy to the incoming fresh air with an HRV.
- With an ERV, sensible energy is exchanged, and in air conditioned spaces, moisture (“latent”) energy is transferred from the higher-humidity air stream (typically fresh air from outdoors), and typically expelled outdoors, thereby lowering cooling loads.
- The fresh air is distributed through an independent ductwork system or an existing air distribution system.

## 2 Features and Operation

These models use microprocessor based control technology.

The standard control configurations of these HRV’s consist of two speed settings selectable from a remote control. Connection between the HRV and control is achieved through low voltage wiring.

Features include:

- Powerful transformer
- Intelligent defrost.
- Self-resetting fuse to protect the board against mis-wiring.
- Motor speed control (NU0103, NU0305, NU0406 only) – Motors can be independently adjusted in HRV high and low speeds. Optional setting for 220V/50Hz geographic areas.
- Fan interlock

## 3 Installation Instructions

### 3.1 Installer’s Responsibilities

Installers are responsible for the performance of the ventilation system and for ensuring that all codes and standards are met.

Do not mount the fresh air supply near a source of contaminated air such as automotive exhaust, gas or propane exhaust or oil tanks.

Combustion appliances such as furnaces and hot water heaters must not draw combustion air directly from an H/ERV.

### 3.2 Installation Basics

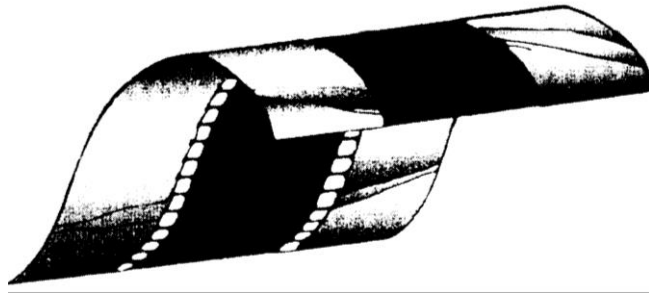
Before installing a **Nu-Air** Light Commercial H/ERV for the first time, please read these instructions.

#### 1. Standard Issue Items

The H/ERV comes equipped with:

Filters  
Heat/Energy Recovery Core  
Drain Kit  
Anti-Vibration straps (NU0103, NU0305)  
Anti-vibration Springs, chain & hanging brackets (NU0406)

### Flexible Duct Connector



#### 2. Other Basic Needs

Control Package	Galvanized Duct	Flexible Duct Connector
Outside Hoods (2)	Duct Fittings	Duct Sealer or Tape
Screws	Diffusers	Duct Hanger
Balancing dampers	Air flow measuring device for balancing	

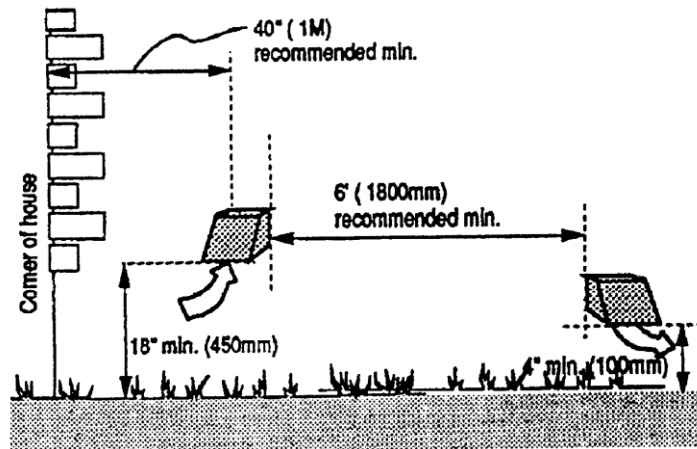
### 3.3 Ductwork

#### Ductwork

Duct runs should be straight with minimum bends and elbows. Joints should be tight fitting and sealed with high velocity, fiber reinforced duct sealant or good quality duct tape.

**RECOMMENDATION:** *An engineer or other qualified person should design the duct system*

Ducting must be supported according to the designers' specified hanger system and intervals.



HRAI-recommended hood location for residential applications.

#### Ducting from the Weather Hoods

Between the weather hoods and the H/ERV it is recommended to use rigid rectangular ducting equal to or larger than the collar size of the machine. These ducts should be wrapped with an insulating duct wrap. The minimum RSI value of insulation should equal that of the local building codes.

### 3.4 Weather Hoods

#### Locating the Weather Hoods (Commercial Installations)

Designers should try to locate the hoods in such a way that there is easy access for cleaning purposes. The H/ERV should be located close to the outside wall(s) containing the hoods, the resulting short duct lines will minimize airflow losses.

There should be maximum separation between the fresh air and exhaust hoods. Supply hoods should be a minimum of 36" (inches) above the ground level. Exhaust hoods should be at least 12" (inches) above the ground level. Fresh air hoods must be min. 10' away from any other appliance exhaust vent or furnace vent.

In addition ASHRAE Standard 62-99 recommends the following:

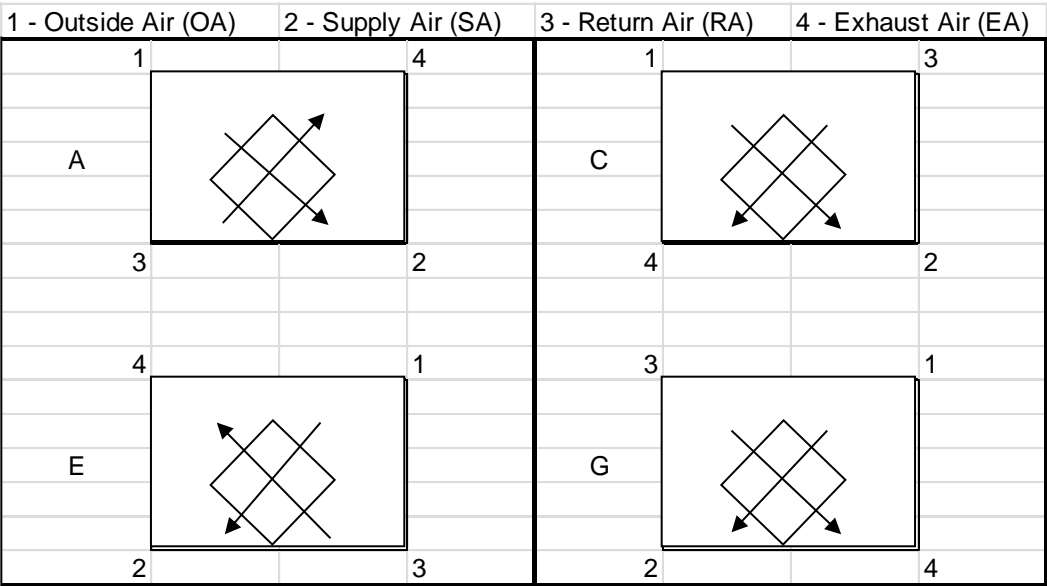
Ventilation systems should be designed to prevent re-entrainment of exhaust contaminants, condensation or freeze-ups and growth of microorganisms. Make-up air inlets and exhaust air outlets shall be located to avoid contamination of the makeup air. Contaminants from sources such as cooling towers, sanitary vents, vehicular exhaust, and street traffic should be avoided.

#### Locating the Weather Hoods (Residential Installations)

There should be a minimum of 6' (feet) of separation between the fresh air and exhaust hoods. Supply hoods should be a minimum of 18 "(inches) above the ground level. Exhaust hoods should be at least 4 "(inches) above the ground level. Holes through the wall should be 1" larger than the collar on the hood. Fresh air hoods must be 3' away from any other appliance exhaust vent or furnace vent.

NOTE: Refer to local code requirements.

### 3.5 Port Configurations



1 - FROM OUTSIDE      2 - TO SPACE      3 - FROM SPACE    4 - TO OUTSIDE

1 & 4 Insulated                      2 & 3 Non-Insulated  
**C or G** for NU0103, NU0305, NU0508, NU0912, NU1316 (NU305, NU500, NU800, NU1200, NU1600).  
**A or E** for NU0406 (NU600).

Collar Sizes (inches)	
NU0103/NU305	8 OVAL
NU0305/NU500	10X6
NU0406/NU600	14X8
NU0508/NU800	14X8
NU0912/NU1200	14X8
NU1316/NU1600	20X10

### 3.6 Mounting and Noise Control

For maximum efficiency, the H/ERV should be installed in a heated area. The HRV is designed to be hung from the ceiling by way of the anti-vibration straps supplied. Attach rubberized anti-vibration straps with machine screws provided to the threaded brass insert in the top corners of the cabinet. Avoid hanging the HRV directly below a bedroom or other quiet area.

NU0103/NU305, NU0305/NU500:

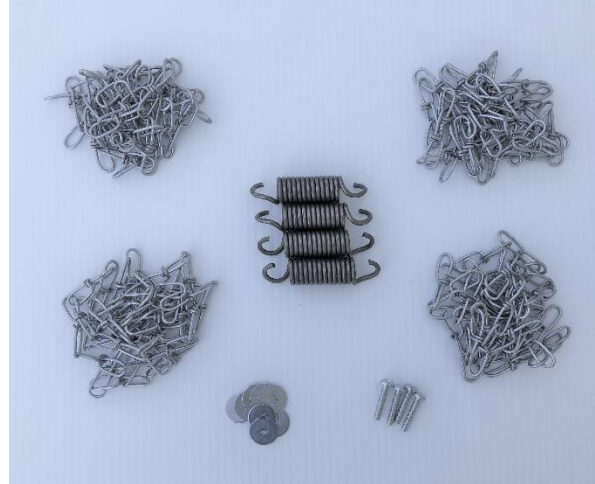
The H/ERV is designed to be hung from the ceiling joist or similar by way of the anti-vibration springs and chain supplied. The following items are included with the H/ERV:

- #10-24 x 1" machine screw (4)
  - 1" washers (8)
  - Suspension springs (4)
  - Double loop suspension chain (4 x 5')
1. Securely fix the chain to the unit, using the machine screws and washers provided, through the H/ERV threaded inserts.
  2. Form a loop in the chain around the suspension springs suitable to allow for spring expansion.
  3. Lift unit into place and fix to its supporting structure.
  4. Make any required adjustments to ensure the H/ERV hangs level.

#### **IMPORTANT**

Use the chain loop around the spring as back-up to the suspension spring.

Use flex connector or similar to help minimize sound and vibration.





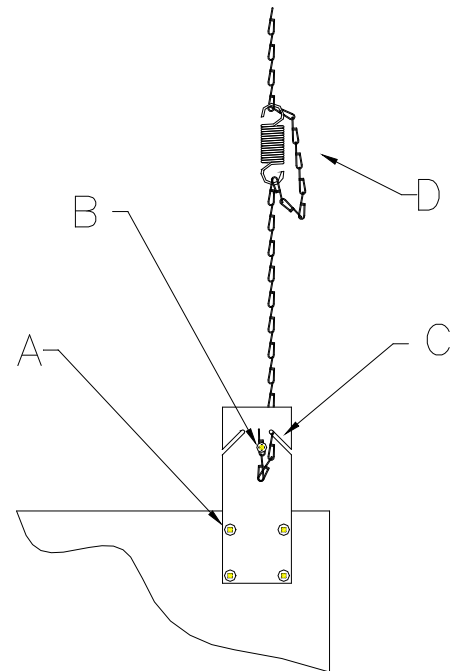
NU0406 – NU1316 & NU600-NU1600:

The H/ERV is designed to be hung from the ceiling by way of the anti-vibration springs and chain supplied. You will also need self-tapping screws. The following items are included with the H/ERV:

- #10-24 x 1/2" machine screw (16)
- 1" washers (16)
- Suspension springs (4)
- Double loop suspension chain (4 x 5')
- Suspension brackets (4)



1. Securely fasten the suspension bracket to the HRV with the machine screws/washers supplied. (A)
2. Use a self-tapping screw to fasten the first complete link of chain to the pre-drilled hole in the bracket. (B)
3. Hook the chain into the grab slot of the bracket. Note that the tension of the chain must pull toward the middle of the bracket. Use the appropriate slot for this effect. (C)
4. Attach the free end of the chain to a structurally sound member overhead. This will vary from site to site.
5. Form a 5" loop in the chain and hook the vibration isolation spring between the slack. (D)



**IMPORTANT:**

Use the chain loop around the spring as back-up to the suspension spring.

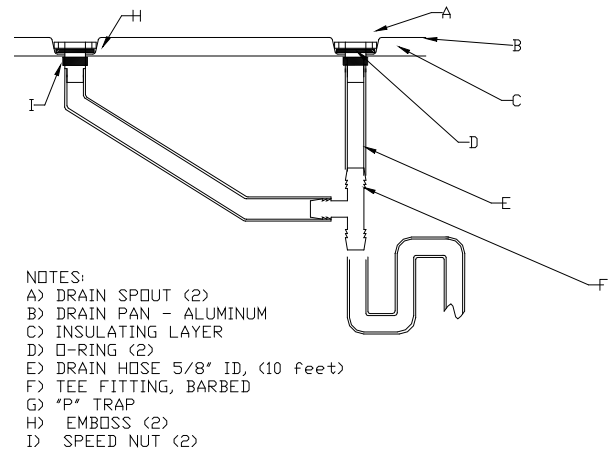
Use flex connector or similar to help minimize sound and vibration.

### 3.7 Drain Connections

Access to a drain is required to handle the HRV condensate. Care should be taken to run the condensate tube where it will not freeze.

For best results, **Nu-Air** recommends the following steps be followed when installing drain kits.

1. Apply the O-ring supplied to the flange of each drain spout. (A)
2. Insert the drain spouts through the holes in the drain pan. (B)
3. Use the speed nut to tightly secure the drain spout.
4. Cut two lengths of drain hose long enough to avoid kinking. (E)
5. Attach the hose to the drain spout by sliding it over the spout until it is tight to the bottom of the speed nut.
6. Secure the hose to the spout with the plastic tie wraps. (D)
7. Install the tee fitting as shown in the drawing below. (F)
8. Attach the free end of the hose to the left fitting. Repeat for the other side.
9. Use the remaining hose to form a "P" trap and terminate at the top of the tee.
10. Pour water into the drain assembly to form an air seal. This prevents gasses from being drawn into the HRV.



#### Note for Single-Drain Units

Your unit might be equipped with just one drain and one drain plug. For these models, use the drain hose to form a P-shape after connecting the hose to the drain plug (the arc of the P should be wide enough so as not to cause a kink in the drain hose). Fix the P-shape with one of the (two) plastic cable-ties provided, taking care not to pinch the hose when tightening the cable-tie.

## 4 Connecting to Other Equipment

In general the H/ERV is not intended to be connected to other equipment or appliances. Connection with a forced air furnace or air handler is common practice but additional controls must be in place.

If the H/ERV is used upstream of an air handler or similar equipment (e.g. fresh air into economizer section), **the start-up sequence must be H/ERV first followed by the air handler.** Starting the air handler first, will rotate the H/ERV's fresh air fan backward. If the motor is unable to overcome the extra load an over amp situation will result.






## 5 External Connections

For electrical hook-up, the H/ERV should be connected to its own circuit using electrical wire and conduit in accordance with code requirements.

Nu-Air H/ERVs are equipped for remote controls. Options include occupancy, humidity and gas sensors, timers, off/on/intermittent-on, and low-high switching.

## 6 Unit Controls: Operation and Wiring

Your unit is equipped with 12 VDC and 24 VAC removable terminal blocks. Use a 2 mm flat-head screwdriver to connect wires to the terminal blocks. Units are also equipped with dry contacts for use with 3<sup>rd</sup> party controls.

				
<p><b>Win-20</b></p> <ul style="list-style-type: none"> <li>- 20-minute LED timer</li> <li>- 3-wire connection, 24 VAC</li> <li>- 1-piece: integral wall plate</li> <li>- Fits standard 2 x 3" wall box</li> <li>- Use up to 6 per installation</li> </ul> <p><b>NAV-460</b></p> <ul style="list-style-type: none"> <li>- 20/40/60-minute LED timer</li> <li>- 3-wire connection, 24 VAC</li> <li>- Fits multiple-switch wall box</li> <li>- Use up to 5 per installation.</li> <li>- Not compatible with EST1 or Win-20.</li> </ul>	<p><b>*M Control</b></p> <ul style="list-style-type: none"> <li>- Touch-sensitive pad</li> <li>- 3 LED's to indicate mode</li> <li>- 4-wire connection, 12 VDC</li> <li>- Fits single, or multi- wall box</li> <li>- Use up to 10 per installation</li> </ul> <p><b>ESM1:</b> Standby, Low, High</p> <p><b>EST1:</b> 20-40-60 minute timer</p>	<p><b>Lumina (p/n NAV-561)</b></p> <ul style="list-style-type: none"> <li>- Full-featured main controller</li> <li>- 4-wire connection, 12 VDC</li> <li>- 1" LED backlit display</li> <li>- Large interface buttons</li> <li>- ON/OFF humidity control</li> <li>- 20-40-60 high speed timer</li> <li>- Programmable service reminder</li> </ul> <p><b>Modes:</b> Standby, Low, High, Intermittent High, 20 Lo/40 Standby, Recirculation, 20 Lo/40 Recirculation (recirculation mode not active with ES095E and NU160E)</p> <p><b>Note: only ONE Lumina per install.</b></p>	<p><b>Win-1</b></p> <ul style="list-style-type: none"> <li>- Simple, with added features</li> <li>- Slider switches to select mode</li> <li>- Dial to set humidity 30-80%, OFF</li> <li>- 4-wire connection, 24 VAC</li> <li>- Surface-mount</li> </ul> <p><b>Modes:</b> Standby, Low, High, Intermittent High</p>	<p><b>*Dstat-1</b></p> <ul style="list-style-type: none"> <li>- Basic humidity control</li> <li>- Dial to set humidity 30-80%, OFF</li> <li>- Full-time high by setting dial to ON</li> <li>- 2-wire connection, 24 VAC</li> <li>- Surface-mount</li> </ul> <p><b>*Can be used with NU2200.</b></p>
<p>Use with M1 Control, NAV-561, Win-1, Dstat-1, 24 VAC 2-wire switch</p>	<p>Use M1 with: Win-20 or NAV-460 or EST1 Use T1 with: NAV-561, Win-1, Dstat-1, 24 VAC 2-wire switch</p>	<p>Use with: Win-20 or NAV-460 or EST1</p>	<p>Use with: Win-20 or NAV-460 or EST1</p>	<p>Use with: Win-20 or NAV-460 or EST1</p>

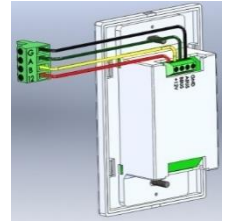
\*M control discontinued. Limited quantities available for replacements only.

## 6.1 Nu-Air Controls 12 VDC & 24 VAC Options

### 6.1.1 12 VDC Control Wiring

Consult Control manual for full installation instructions.

H/ERV TERMINAL BLOCK	NAV-561
G	GND
A	A BUS
B	B BUS
12	+12V



**Crossing the +12V/12 and ground (G) wires might short-circuit and destroy the wall control processor.**

**Note:** If you are using **ONLY** an **ES-T1** to control your unit, you must connect a jumper wire between R and SB do one of the following on the 24V (10-wire) removable terminal block. **Alternatively,** you can operate at continuous low speed with intermittent (ES-T1) high speed by connecting a jumper wire between R and LO. Consult local building code in case a centrally located control with an on/off switch is required.

## 6.2 24 VAC Control Options

24VAC controls (sold separately) connect to the 24V (10-wire) removable terminal block.

### 6.2.1 Terminal Designation/Function

NC	Normally closed – a dry relay contact paired with I that opens when the HRV is running
I	I – interlock – a common relay terminal used with NC or NO. See Sec. 8
NO	Normally open - a dry relay contact paired with I that closes when the HRV is running
R	24 VAC output
C	24 VAC common return
TL	Timer Light – used only with WIN-20
TS	Timer Switch – used only with WIN-20
SB	Stand By – a closed switch across SB- R makes HRV dampers active, fans are off.
Hi	High – a closed switch across Hi-R makes HRV run in high speed
LO	Low – a closed switch across Lo-R makes HRV run in low speed.

### 6.2.2 Building Automation and Control Systems

The HRV does not communicate with BMS. Dry relay contacts from the BMS can be used to enable 3 modes of operation: R-SB (Standby), R-Lo (Low Speed), R-Hi (Hi Speed). If 2 or more modes are called simultaneously, the highest fan speed results.

### 6.2.3 NAV460 20-40-60 Minute High Speed (boost) Timer

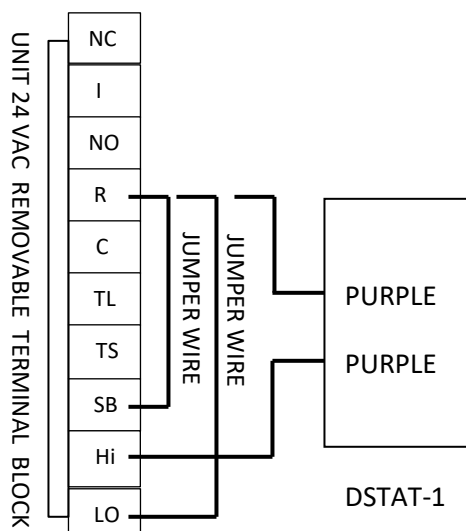
H/ERV TERMINAL BLOCK	NAV-460
R	R
C	C
TS	TS



If no central wall control is used with NAV-460, you must connect a jumper wire between R and SB do one of the following on the 24V (10-wire) removable terminal block. Alternatively, you can operate at continuous low speed with intermittent (NAV-460) high speed by connecting a jumper wire between R and LO. Consult local building code in case a centrally located control with an on/off switch is required.

### 6.2.4 Standard Dehumidistat (Part # DSTAT-1) & 2-wire switches

The dehumidistat switches the HRV to high speed when the relative humidity of the air around it exceeds its set point until indoor humidity falls below the set point.



For intermittent high speed operation, connect Nu-Air PN DSTAT-1, dedicated (RNC) wall switch, CO<sub>2</sub> sensor, etc. to R and Hi terminals.

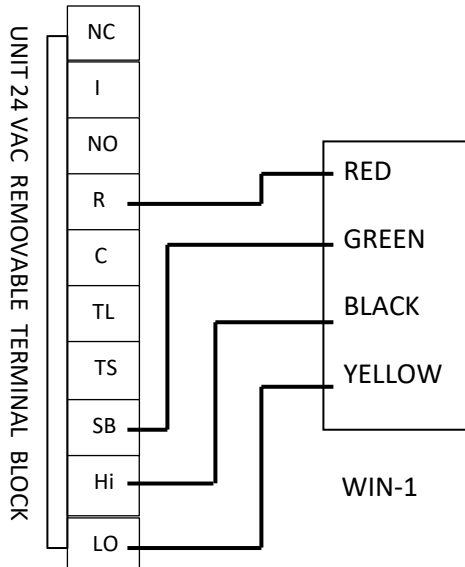
For continuous low speed, connect jumper wire to R and LO terminals.

Where required, C terminal may be used for controls requiring external 24 VAC power source.

For two-wire switching, and where local building regulations permit, Nu-Air recommends a jumper wire between R and SB to engage the unit in standby mode.

### 6.2.5 Windsor Control (Part # WIN-1)

The Windsor Dehumidistat Control provides the same humidity control as the Standard Dehumidistat, with the added functionality of a 3-position switch from which the operator can select three operating modes. The Constant switch can be engaged for full-time high speed.

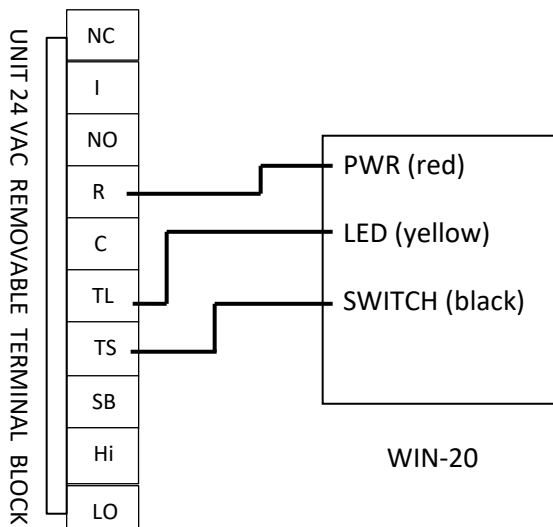


Choose from the following operating modes:

1. Off
2. Standby
3. Continuous low speed
4. Intermittent high speed
5. Continuous high speed

### 6.2.6 Windsor Timer (WIN-20)

Install in bathrooms, kitchens, workstations or other locations where high-speed ventilation control is needed. The machine will run at high speed for twenty (20) minutes and then return to its previous operating condition. Timers can be connected in series or parallel.



#### Win-20 Timer

Up to 6 Win-20 timers may run off of one system.

If using only the Win-20 timer as a means of remote control, connect jumper wire between R and SB.

## 7 Control Board Status LEDs

The control board is equipped with LEDs which indicate the unit's current state of operation.

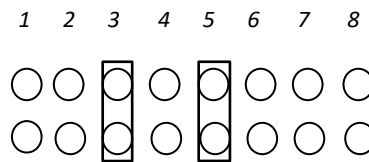
CONDITION	LED AND STATUS
NO LED	UNIT/TRANSFORMER IS NOT POWERED
UNIT OFF	Red is off, Green is blinking slow, every 1 s. Also indicates processor is programmed and running.
STANDBY	Green is OFF. Red led is blinking slow, every 1 s.
EXHCHANGE LOW SPEED	Green ON. Red blinking slow, every 1 s.
EXCHANGE HIGH SPEED	Green ON. Red blinking fast.
DEFROST	Green ON, Red ON. (Appears Yellow)
RECIRCULATION LOW SPEED*	Red led ON, Yellow blinking slow, every 1s.
RECIRCULATION HIGH SPEED*	Red led ON, Green led blinking fast.

## 8 Selectable Furnace/Air Handler Interlock

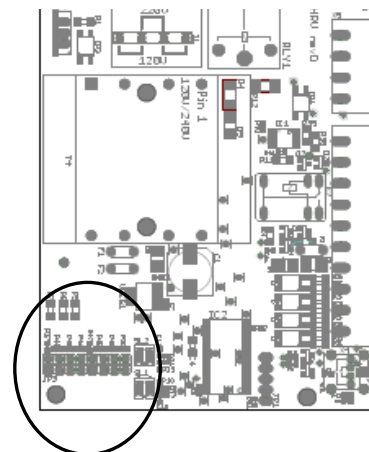
You may choose on the unit control board to interlock whenever the HRV/ERV is operating at any speed, or just high speed. Position 5: interlock at any HRV speed; Position 6: interlock at HRV high speed only.

One jumper must be present in jumper range 1-4 and in jumper range 5-8.

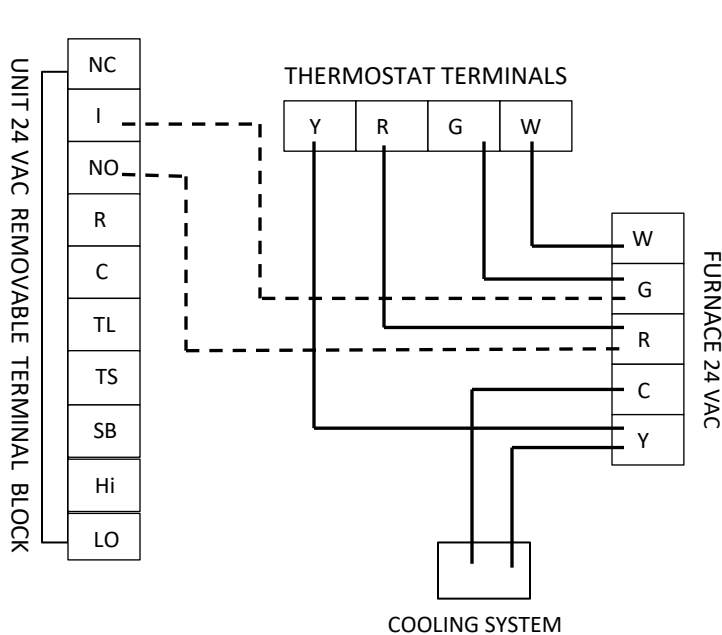
Do not alter jumper set 3.



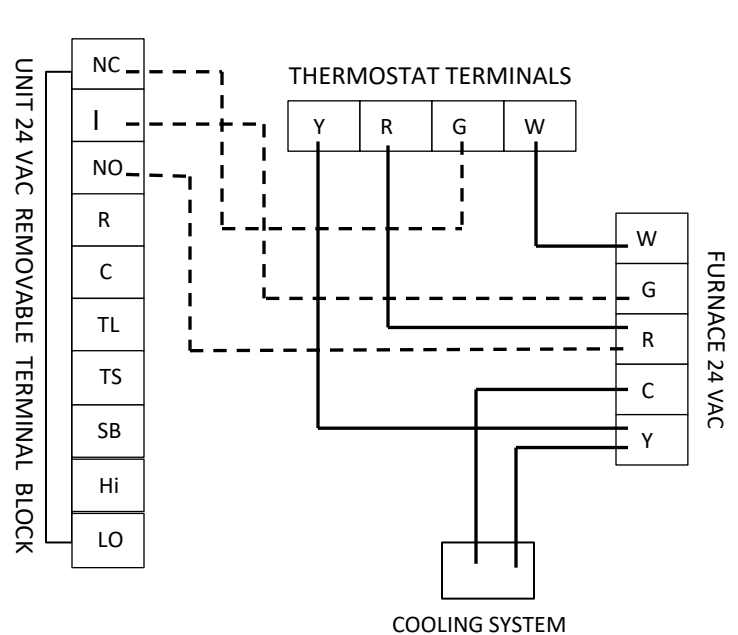
(factory setting shown)



## 8.1 Furnace/Air Handler Interlock Wiring



STANDARD FURNACE INTERLOCK



ALTERNATE FURNACE INTERLOCK

If the standard interlocking method has the unwanted effect of bringing on the AC, i.e. thermostats that do not isolate "G" from "Y", use the alternate method shown above.

## 9 Defrost Operation

### Proportional Defrost Cycles

Your unit will adjust defrost frequency and duration, based on outdoor temperature: -5° C (23° F), -15° C (5° F), -20° C (-4° F) and -27° C (-17° F).

### Circulation Defrost:

When outdoor temperature is below -5° C (23° F), a defrost cycle is initiated for a fixed duration. The fresh air motor will run and the exhaust air motor will shut down. A damper will shut off the cold supply port, directing ambient air through the core for defrosting. The unit will resume normal operation for a fixed duration, then the processor will read outdoor temperature and initiate defrost as necessary. Defrost times and intervals will vary according to temperature below -5° C (23° F).

### Timed Fan Shut-Down Defrost:



The outside air before the core is monitored. When below freezing, a timed defrost cycle is activated. The supply fan shuts down while the exhaust fan continues to move warm air through the core. After a predefined temperature based time cycle, the HRV reverts to exchange mode.

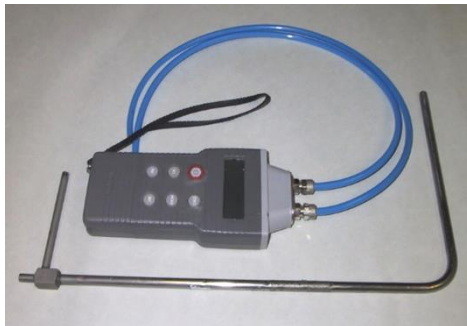
**NOTE:** In circulation defrost mode, this unit will not induce indoor negative pressure nor recycle exhaust air; rather it will redistribute ambient room air.

## 10 Balancing the System

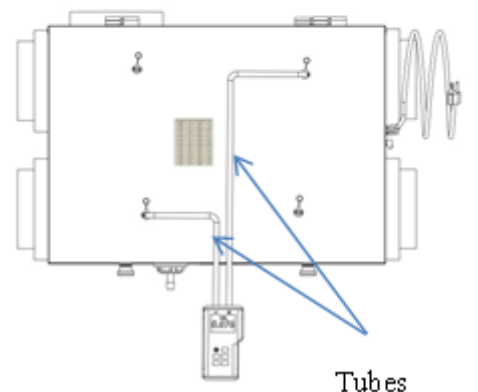
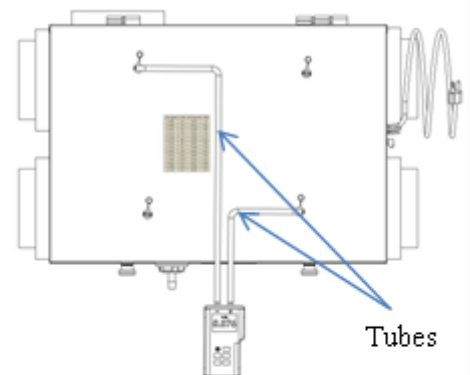
Once the H/ERV system is installed, do the following:

1. Close all windows and doors.
2. Turn off any exhaust only systems.
3. To balance the H/ERV, set the machine on high speed.
4. Make a small hole in the supply duct at least 2 feet down stream of the motor. Insert a Pitot tube in the cross sectional center of the duct.
5. Measure the velocity pressure with a digital manometer or magnehelic gauge.
6. Record the value and repeat the procedure for the exhaust air stream.
7. Use the motor speed control buttons on the side of the unit to reduce airflow until the velocity pressure equals that of the opposite air stream.

To balance the H/ERV, you will need a device to measure air flow. It is recommended to use either a magnehelic gauge or a pitot tube air meter (discussed here). Depending on the device you are using, follow one of the two procedures below.



- Digital Manometer/Pitot Tube (Supplied by Others)
- All H/ERV units equipped with differential pressure ports.

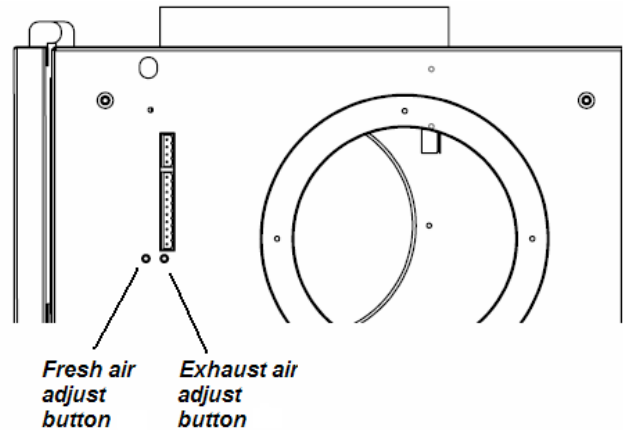


## 10.1 Balancing Procedure: NU0103/NU305, NU0305/NU500, NU0406/NU600

Balanced air flow between the supply and exhaust air streams is essential to the performance of an HRV or ERV. Changing motor speeds or balancing is quick and simple with two buttons recessed slightly into the unit's cabinet. NO BALANCING DAMPERS ARE REQUIRED. Be sure to close windows and doors, and turn off all exhaust fans/appliances during the balancing procedure.

### High-Speed Adjustment/Balancing:

1. Use any means to initiate high speed (e.g. ES-M1 control, R—H jumper wire, or 24V R—H control) may be used. **Remove the jumper wires after balancing.**
2. Press and hold either the FRESH air or EXHAUST air pushbuttons (not both) for 3 Seconds. Releasing the push-button places the unit in SPEED ADJUST MODE.
3. Now press the corresponding pushbutton to adjust the fresh air fan or the exhaust fan, thereby changing the air flow. Each press will reduce motor speed until the default minimum is reached, at which point the motor will return to its peak speed. Allowing a brief pause between presses (about 0.5 seconds), you will press the adjust button about 70 times before reaching minimum speed. During the balancing procedure, you can switch between adjusting the fresh air motor or exhaust air motor.
4. To exit balancing/speed adjust mode, stop pressing buttons for 10 seconds. This will place the unit back in operating mode with the new speeds saved to the circuit board's memory.



### Low-Speed Adjustment/Balancing:

If low speed adjustment is desired, follow the same process to adjust high speed, but use a jumper wire or remote control to put the unit into **low speed** to make low speed adjustments

## 10.2 Balancing Procedure: NU0508/NU800, NU0912/NU1200, NU1316/NU1600

For units with the larger, fractional horsepower motors, electronic speed adjustment using the method described above has been disabled. Instead use mechanical dampers to reduce the airflow to the desired flow rate.

## 11 Maintenance

**Note:** The following are minimal service guidelines. More frequent maintenance will be required depending on service application and conditions. **CAUTION: Disconnect power before servicing.**

### Filters

Dirty filters can reduce ventilation efficiency, result in unbalanced airflow and damage or shorten the life of the motors. Clean at least every three months. Polyester filters should be vacuumed, not washed, and replaced annually. Pleated filters must be replaced. Filters remove easily by opening the front cover.

### Fans

When cleaning the filters, take the opportunity to vacuum any interior surfaces including the fan blades.

### Condensate Drain

Twice per year wipe clean the condensate drain pan. Check the condensate drain and tubing to ensure they are free flowing. The tubing must have an "S" or loop that traps a quantity of water to prevent air from entering the HRV via this tubing.

### Core

The core (heat/energy exchanger) should be removed and cleaned at least once a year. Use a non-corrosive enzyme detergent in cold water for HRV cores. For ERV cores, VACUUM ONLY. To remove the cover of the machine, unlatch and slide the door to the right to release from the hinges. Slide the core forward to remove it from the H/ERV.

### Exterior Hoods

Regularly check the outside vents and clean any obstructions such as grass, leaves or other debris. Do not replace the screen with mesh smaller than 1/4" as this will restrict airflow. During winter operation, ensure snow and frost does not build up and restrict or block openings.

### Diffusers and Ductwork

Clean the diffusers with soap and water when they are dusty or otherwise noticeably dirty. Exhaust diffusers require more frequent cleaning than supply diffusers.

## ANNUAL SERVICING

Your H/ERV should undergo annual general servicing by an accredited contractor. This servicing should include the following:

The six maintenance items above.

- A general check for proper operation. Controls and electrical connections should be inspected.
- Verification that intake and exhaust airflows are properly balanced.
- Re-balancing as necessary.

## 12 Troubleshooting

SYMPTOM	EXPLANATION	ANSWER
Frosting up of H/ERV and/or Duct(s).	H/ERV air flows incorrectly balanced. H/ERV defrost system is not working.	Balance H/ERV. Install dampers. Check defrost system. Note minimal frost build up can be expected especially on HRV cores before unit initiates defrost cycle function.
Supply air feels cool.	H/ERV air flows incorrectly balanced. Improper location of supply grills. Velocity of air is too high. Extremely cold outside temperatures. Heating coil is not working.	Balance H/ERV. Locate grills high on walls or in ceiling. Adjust diffusers, resize duct. Add a duct heater. Call your service contractor.
Outside duct has ice build-up or condensation.	Improperly installed vapour barrier around insulated duct.	Tape all joints. Ensure the vapour barrier is completely sealed and insulated.
Water in the bottom of HRV.	Drain pans are plugged. Incorrect connections of HRV drain lines. HRV is not level. Drain lines plugged. HRV heat exchange core improperly installed.	Look for kinks in the line. Check water drain connections. Ensure that water drains from pan.
Poor air flow(s).	H/ERV incorrectly balanced. Filters need to be cleaned. Hoods needs to be cleaned. Grills are closed. Inline dampers are closed. Low power supply. Wrong size ducting. Under-sized H/ERV. H/ERV is not working.	Tape all joints. Use proper airflow measuring equipment. Open grills. Remove obstructions in duct(s), hoods(s), and grill(s). Balance airflow. Clean filter. Have a professional look at the system.
Humidity levels too low.	Air flows incorrectly balanced. Dehumidistat control set too low.	Balance Air Flow(s). Increase Dehumidistat. Humidifiers may need to be added.
Humidity levels too high.	Air flows incorrectly balanced. Unit is undersized. High humidity areas not ventilated properly or ERV incorrectly selected. Dehumidistat is not working.	Balance airflow. Set dehumidistat.
Controller or timer is not working.	Incorrect connection of outside low voltage wiring between H/ERV and control(s)	Check outside wiring for short. Check wall switch for correct connection. Check wires are connected to proper terminals at the H/ERV.

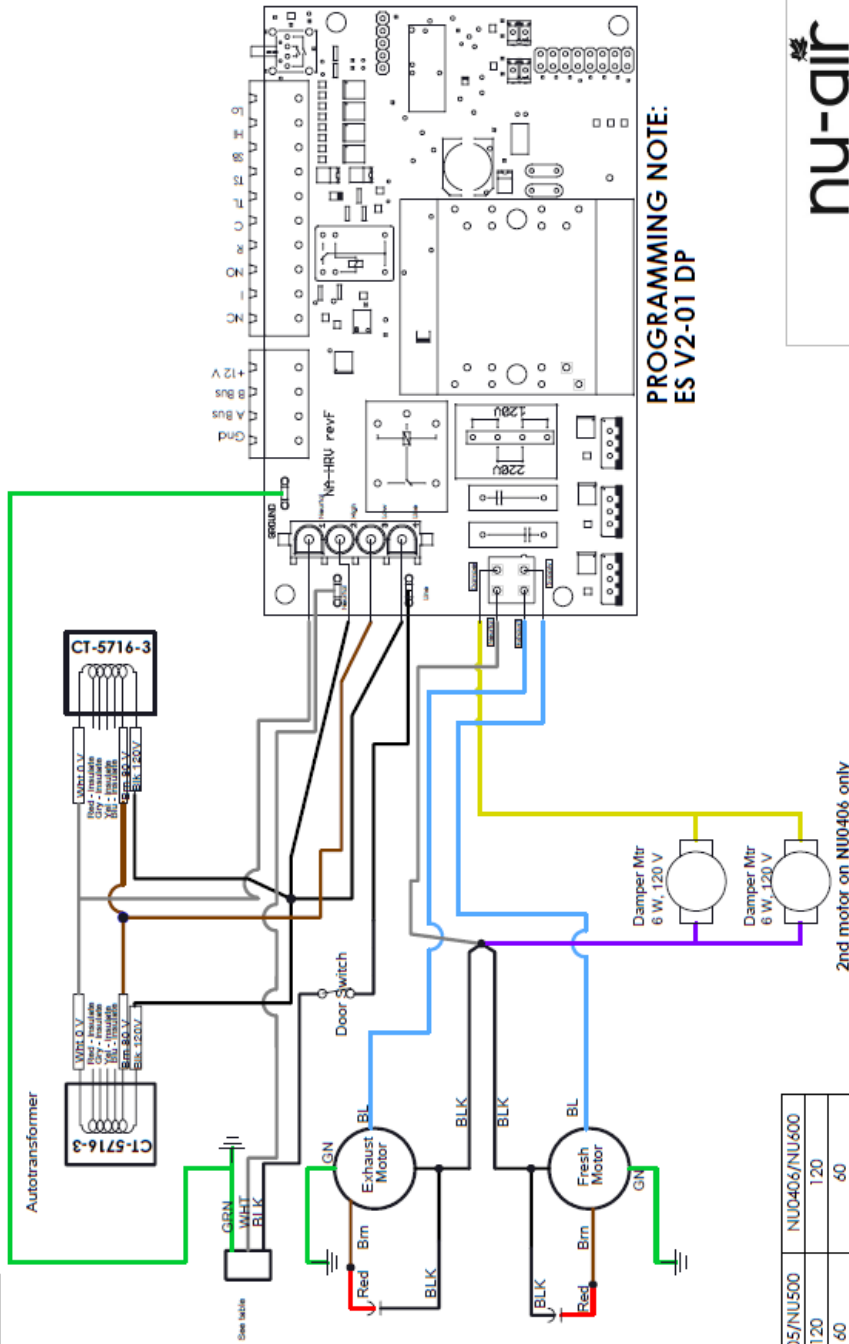
## **13 Electrical Schematics**

There are a number of configurations and options available for these products. The schematic specific to your unit was supplied with the equipment. The following pages illustrate typical, generic, schematics. Your equipment may vary.



12g	
14g	
18g	
22g	

Grey = White



Wire Table	
Mains:	18 Ga
Power:	18 Ga
Control:	22 Ga

	NU0305/NU500	NU0406/NU600
Volts	120	120
Hertz	60	60
Amps	4.5	4.5
Motor	RF4C180	RF4C180
Capacitor (2 @-)	20 uf	20 uf
Connection Type	Cord	Hard wired

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TITLE: NU0305, NU500, NU0406, NU600  
Damper Recirculation  
Rev F Board

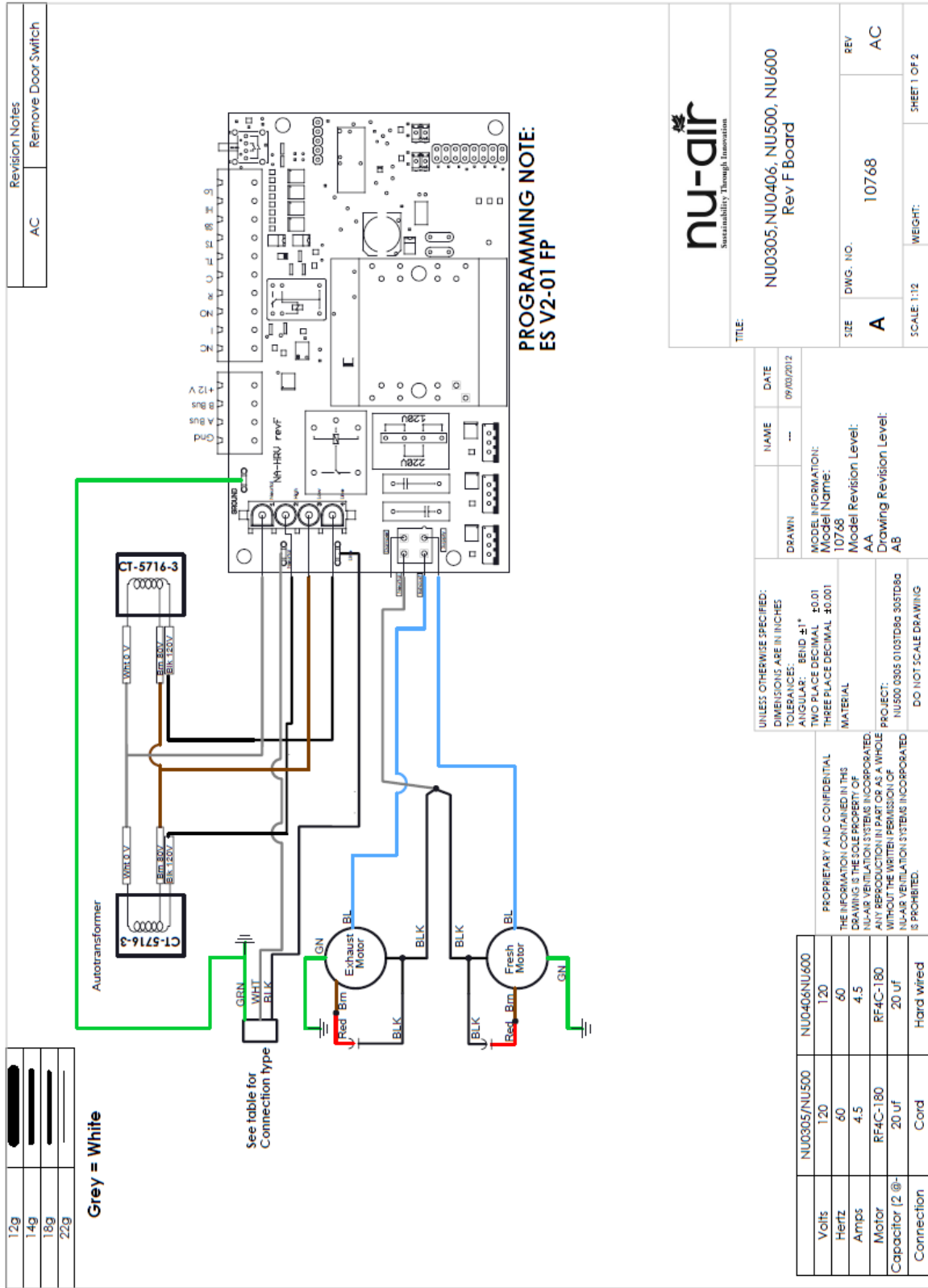
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MATERIAL	Model Name: 10755	BKG	27/06/2016
PROJECT:	Model Revision Level: AA		
DO NOT SCALE DRAWING	Drawing Revision Level: AA		

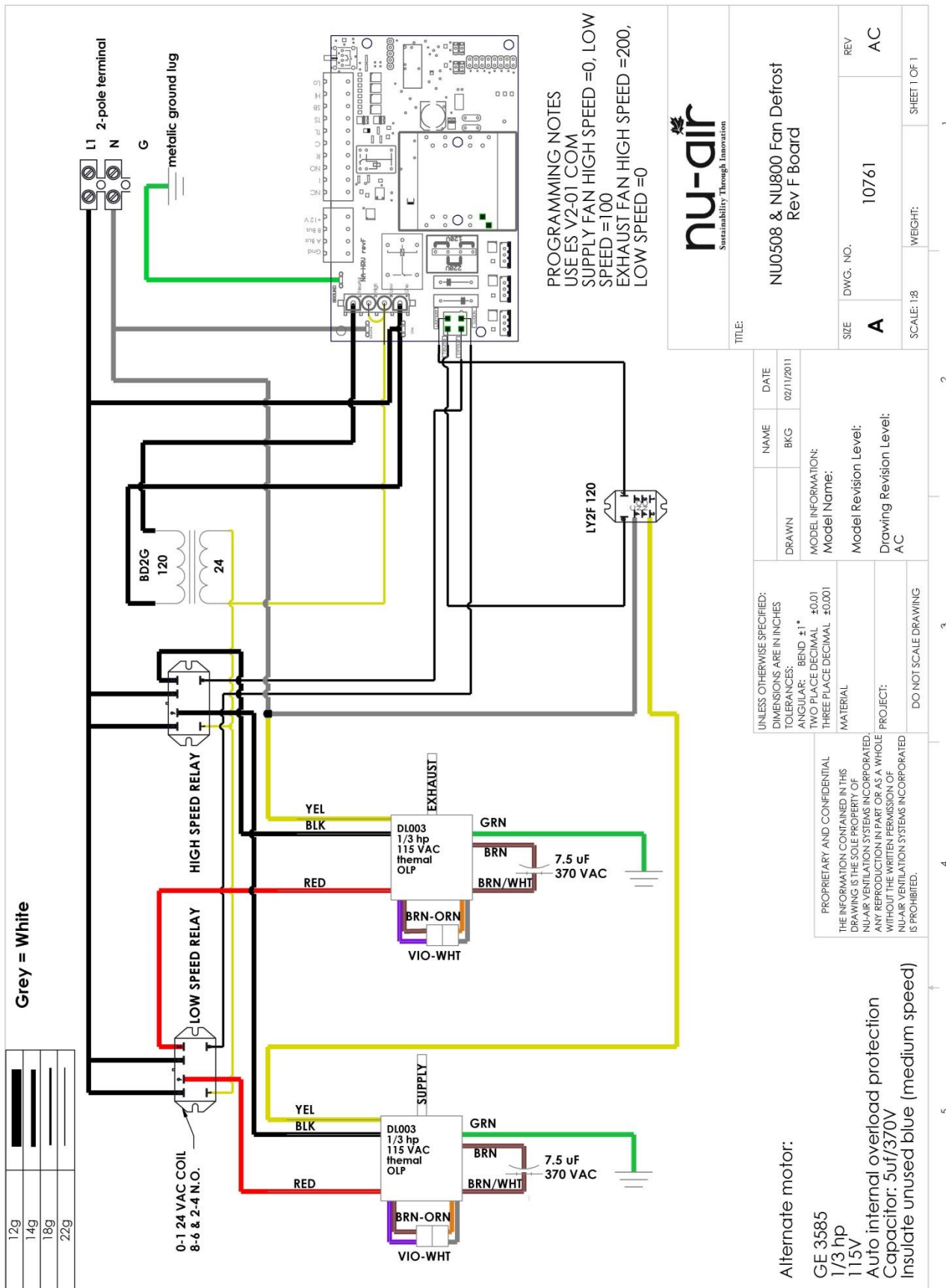
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SIZE	DWG. NO.	REV
A	10755	AA
SCALE: 1:12	WEIGHT:	SHEET 1 OF 6

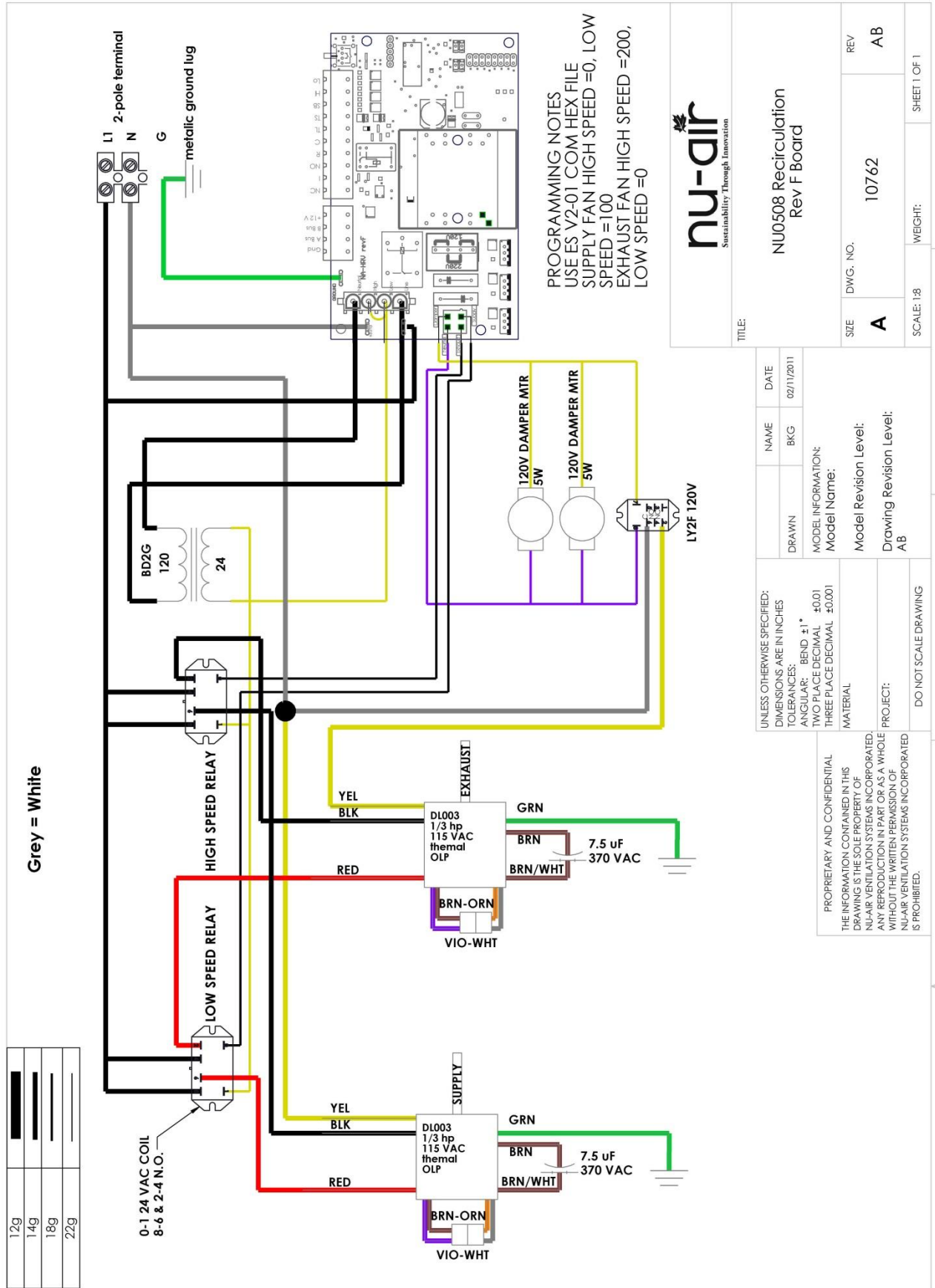


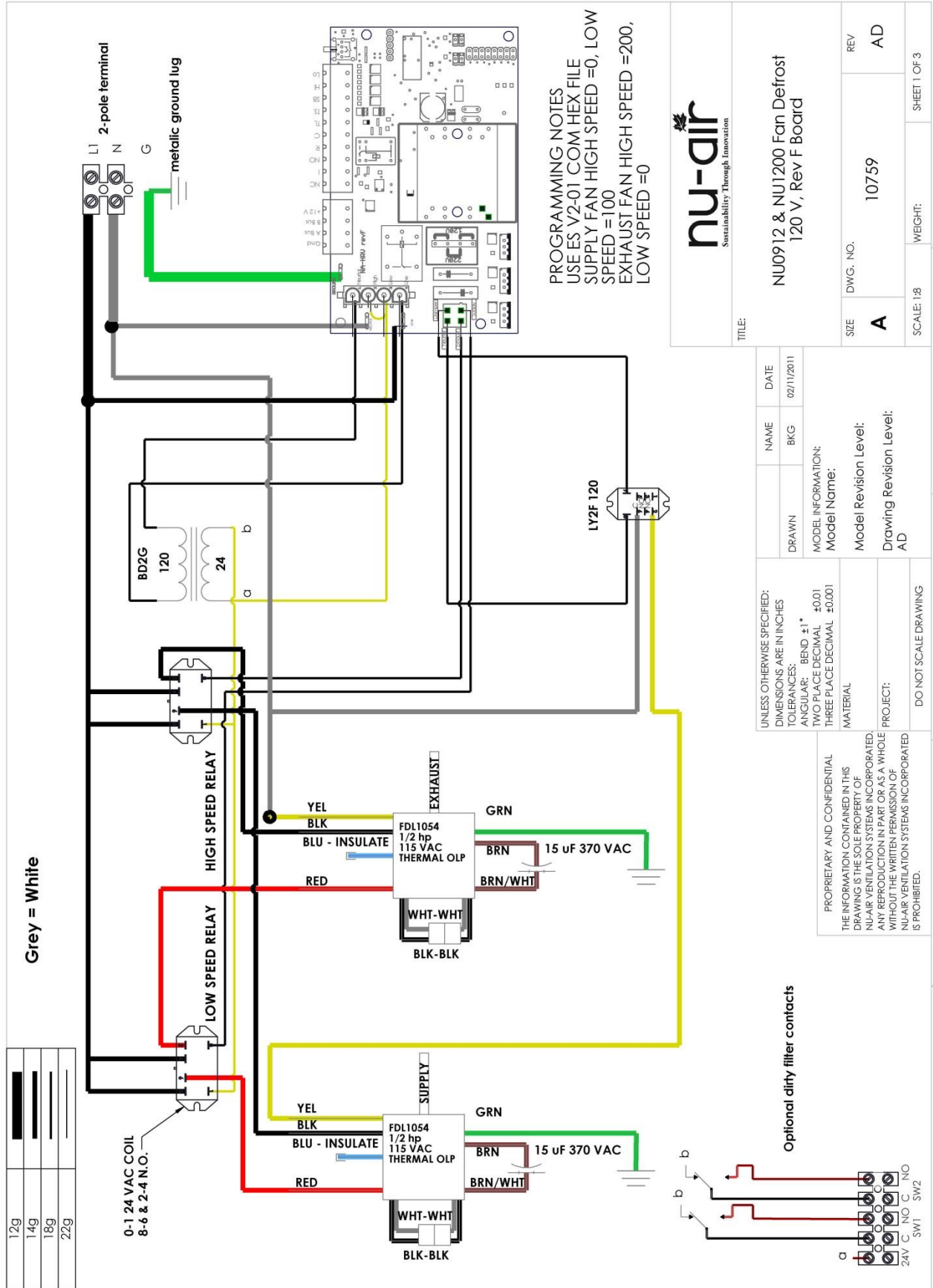




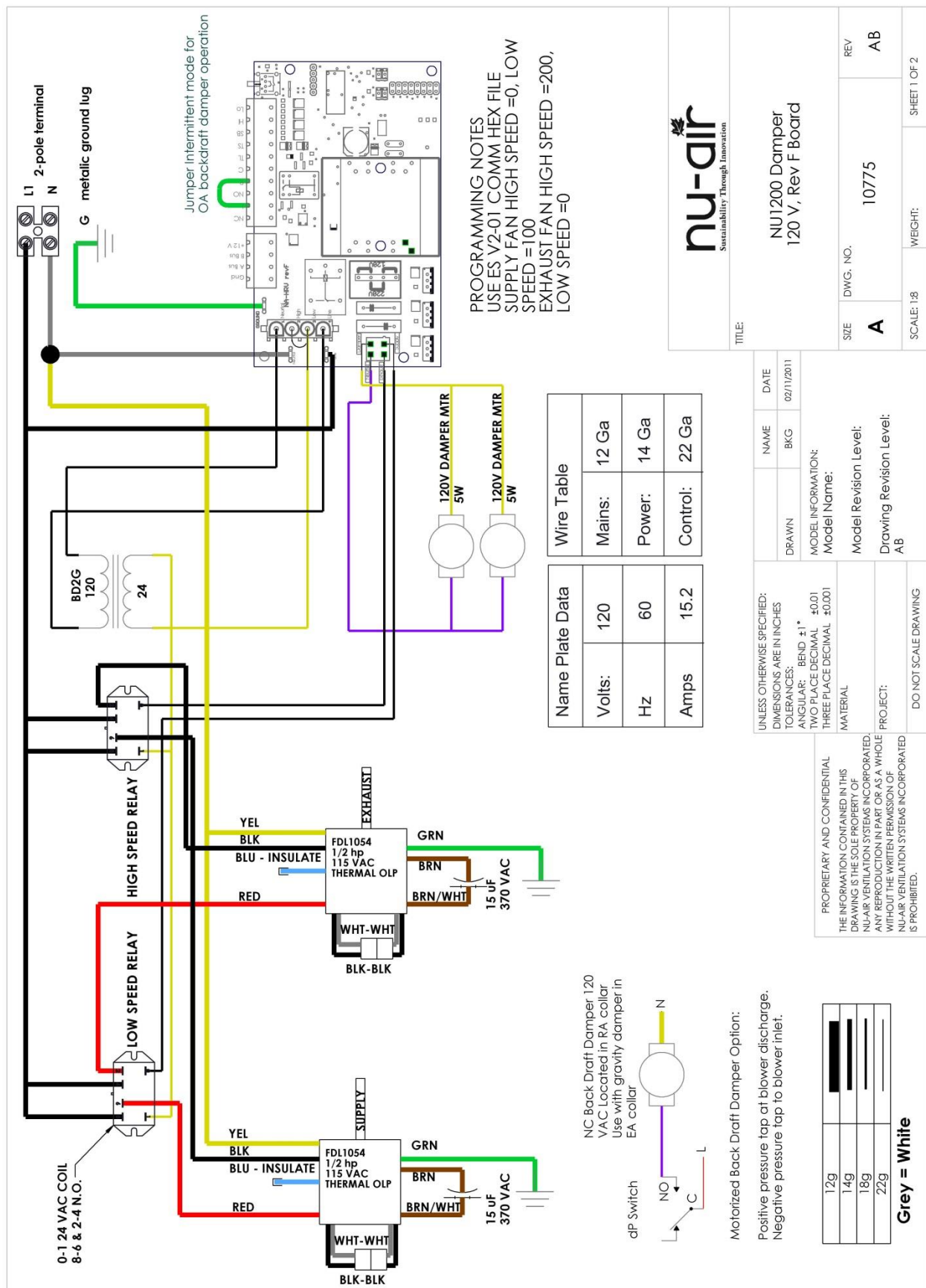


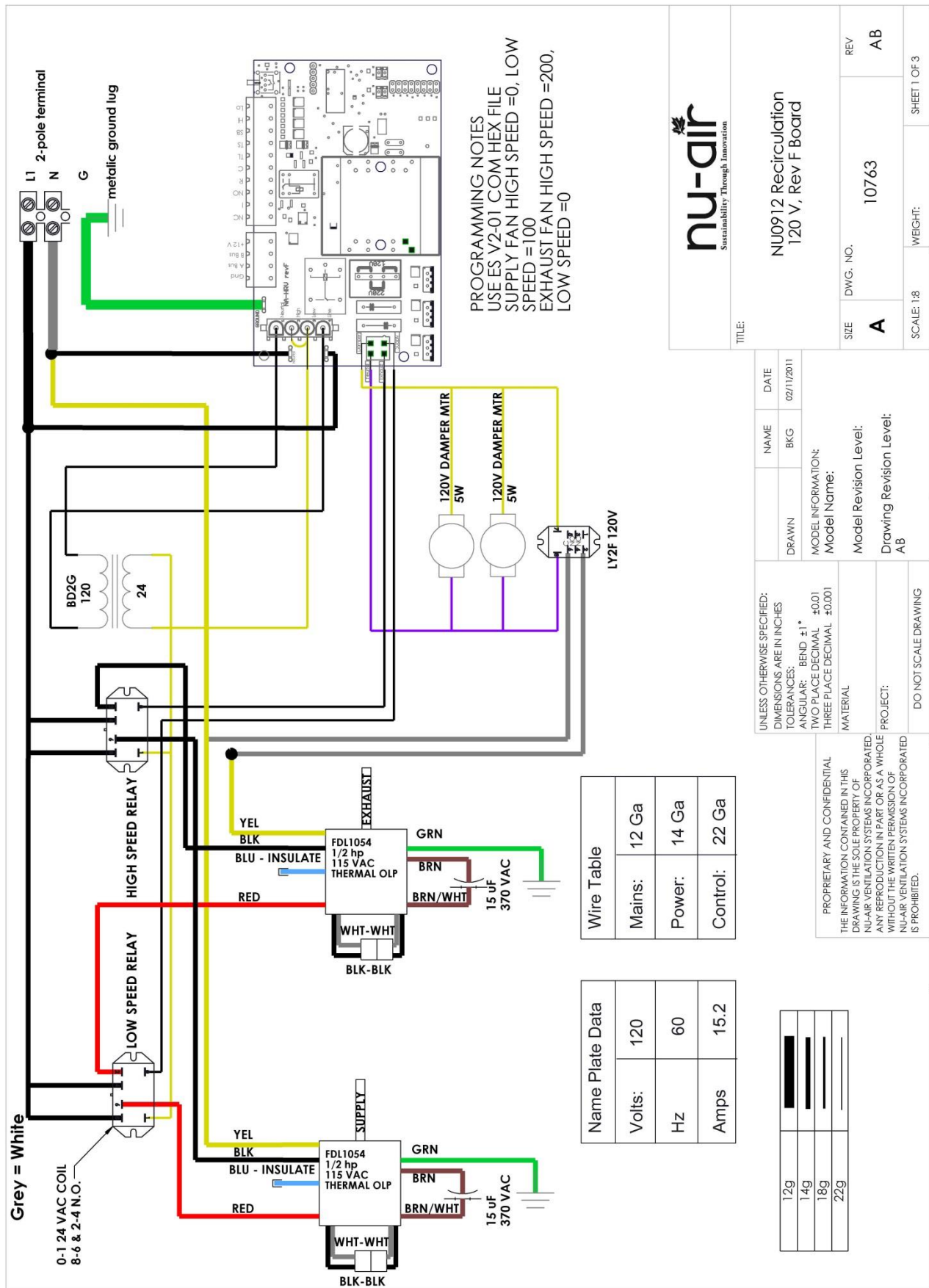


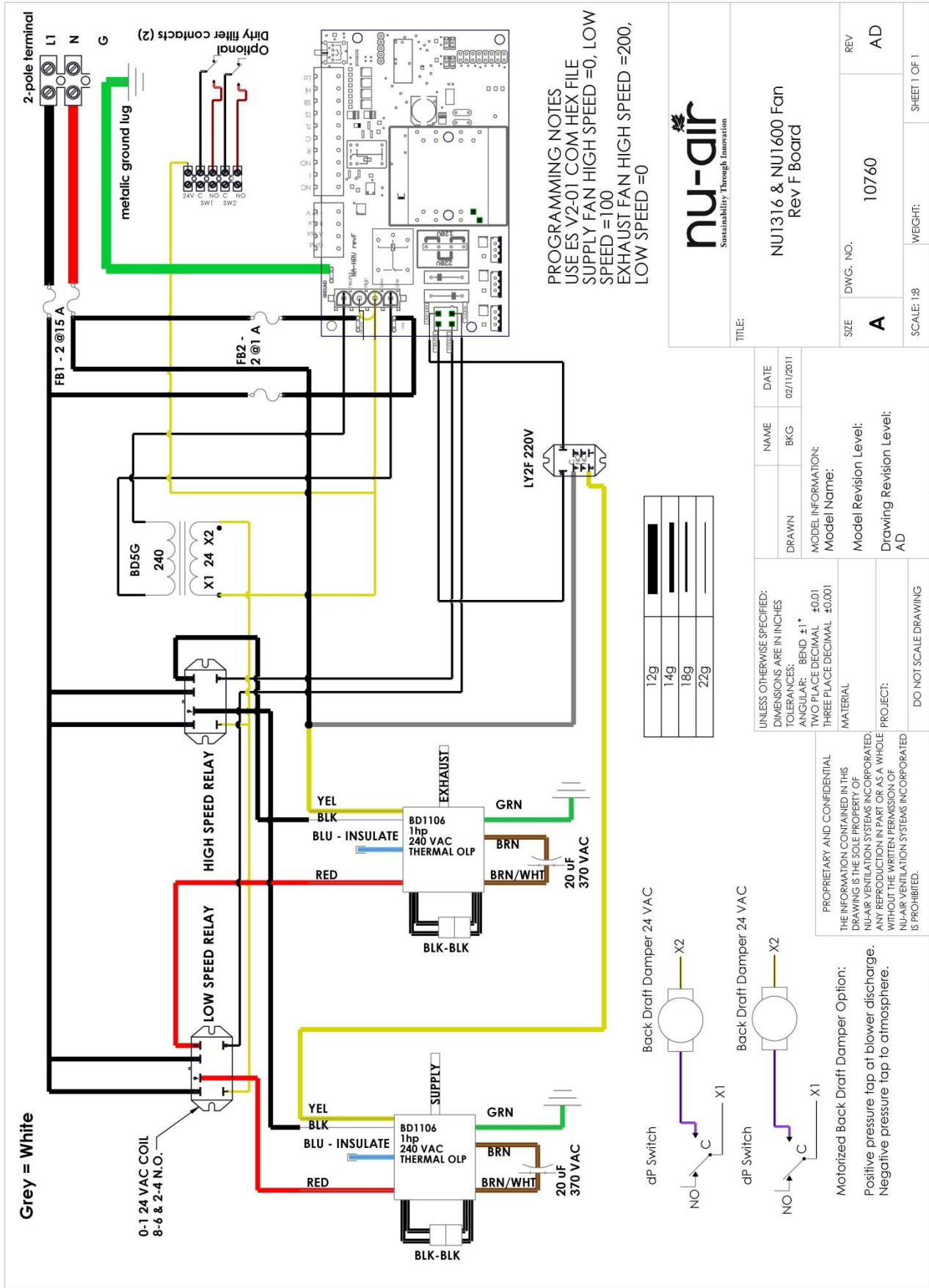






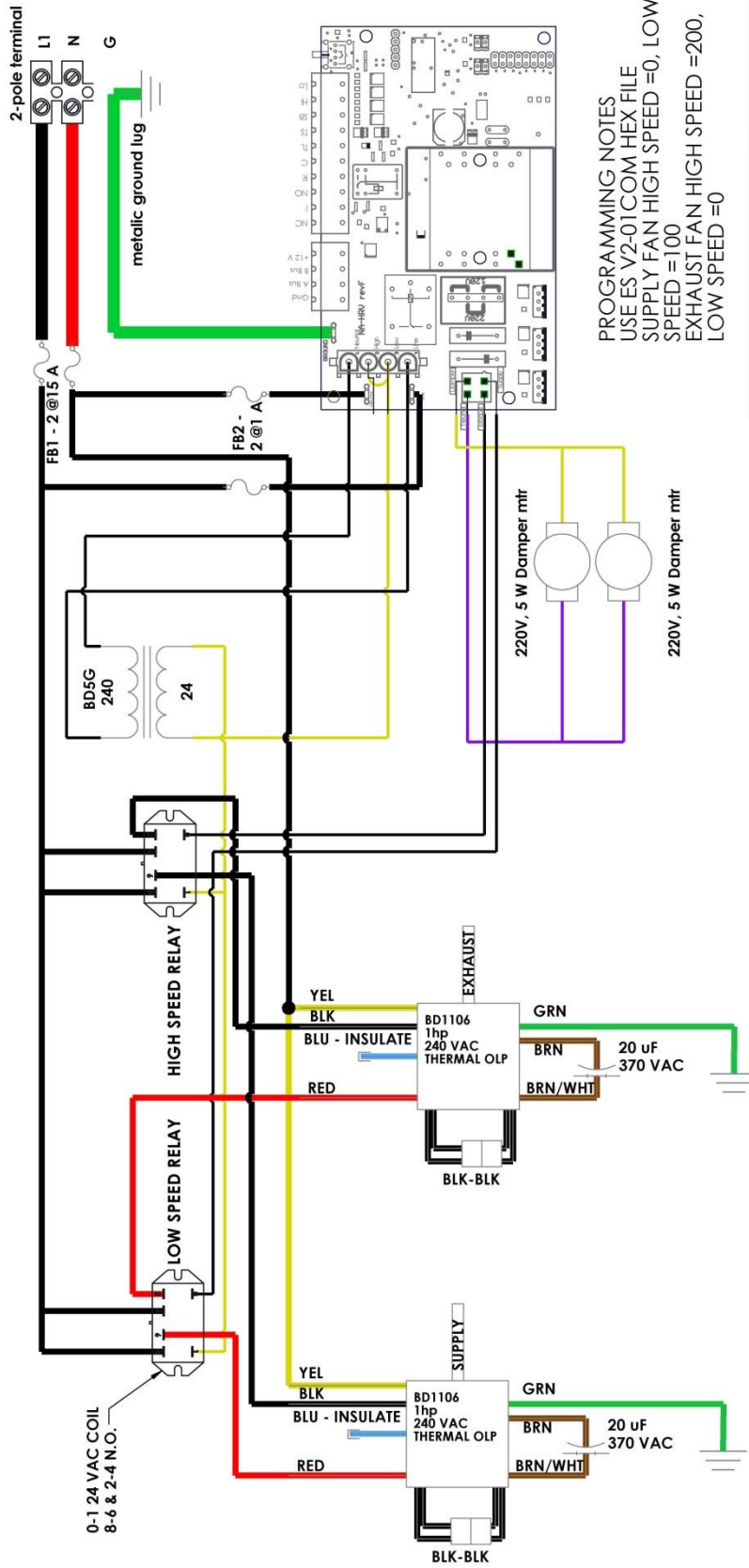








Grey = White



PROGRAMMING NOTES  
 USE ES V2-01 COM HEX FILE  
 SUPPLY FAN HIGH SPEED = 0, LOW  
 SPEED = 100  
 EXHAUST FAN HIGH SPEED = 200,  
 LOW SPEED = 0

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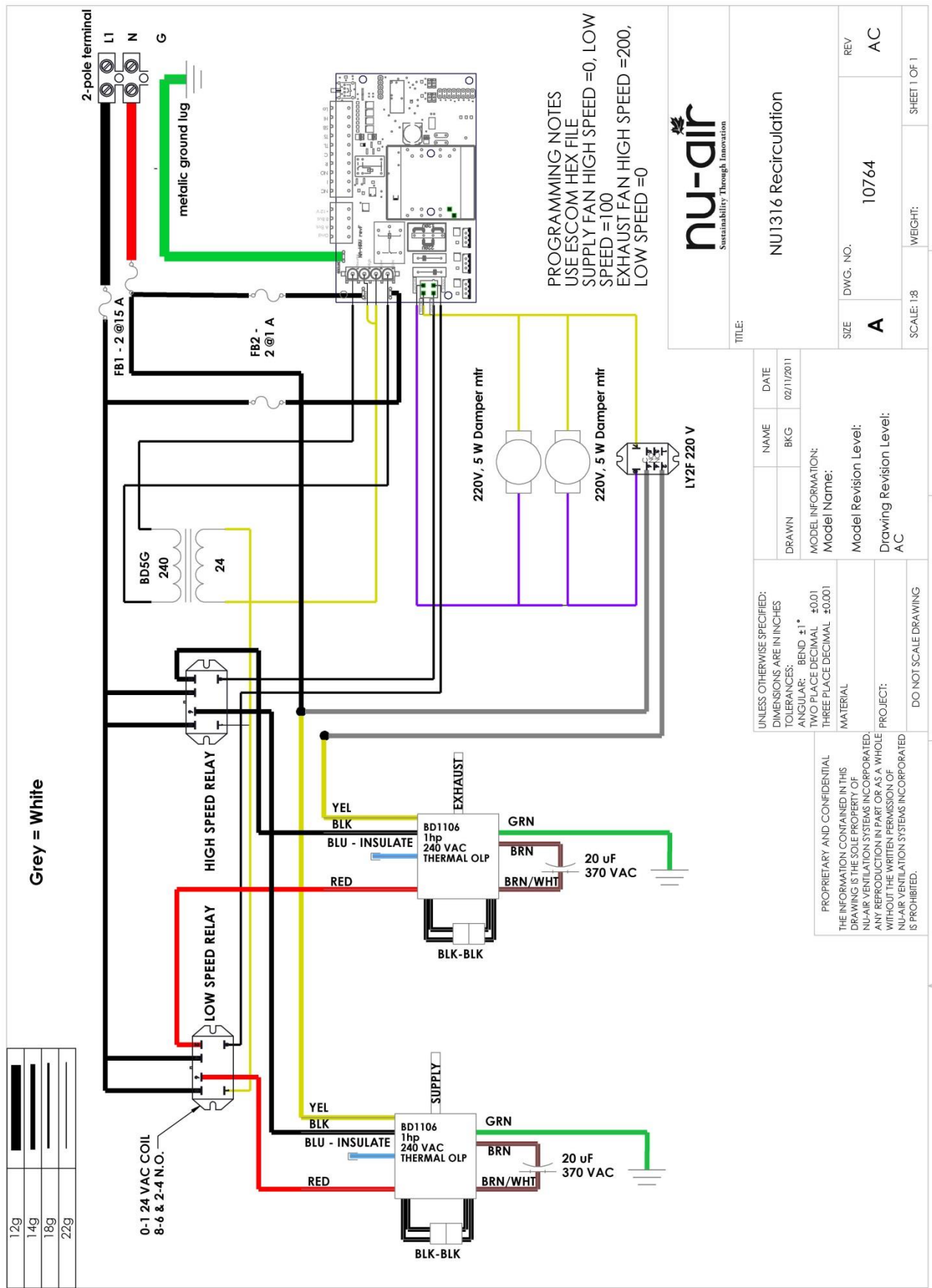
TITLE:

NU1600 Damper  
 Rev F Board

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MODEL INFORMATION: Model Name: Model Revision Level: Drawing Revision Level: AB			
DO NOT SCALE DRAWING			

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12g	14g	18g	22g
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## 14 Warranty

### *NU-AIR* COMMERCIAL HRV's & ERV's

**Models: NU305, NU500, NU600, NU800, NU1200, NU1600, NU0103, NU0305, NU0406, NU0508, NU0912, NU1316**

Nu-Air warrants its Light Commercial Series HRV's and ERV's to be free from defects on all components including motors, circuit boards, transformers, and switches when subject to normal and proper use for a period of two (2) years from the date of purchase. Nu-Air warrants its Light Commercial Series HRV core to be free from defects for a period of 15 years. Nu-Air warrants its Light Commercial Series ERV core to be free from defects for a period of 5 years.

Should a manufacturing defect occur during the warranty period, Nu-Air will supply replacement parts FOB our plant at no charge. Labour costs to remove and reinstall these parts are not covered under this warranty.

This warranty is expressly in lieu of all other warranties or obligations and in no event shall Nu-Air be liable for consequential or incidental damages of any kind, including damage to the building, its contents or any person therein.

This warranty does not cover damage to the unit due to the following: 1) improper installation or unreasonable use of unit; 2) failure to provide reasonable and necessary maintenance.



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