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***OPERATING, MAINTAINING & INSTALLING INSTRUCTIONS
FOR NU-AIR NU2200
HEAT/ ENERGY RECOVERY VENTILATORS***

* LEAVE THIS DOCUMENT WITH THE BUILDING OWNER

Specifications, dimensions and ratings may change without notice
as a result of ongoing product development and improvements.

NU2200

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1 HOW THE *NU-AIR* SYSTEM WORKS

Heat Recovery Ventilator (HRV) – Sensible only heat recovery with polypropylene fixed plate heat exchange core.

Energy Recovery Ventilator (ERV) – Sensible and latent energy recovery with aluminum/polypropylene fixed plate enthalpy recovery exchange core.

The NU2200 HRV or ERV provides fresh air to a conditioned space while exhausting an equal amount of stale air. Heat only or total energy is transferred from one air stream to the other within a fixed plate exchange core.

A belt driven blower is used to supply fresh air and a second belt driven blower to exhaust stale air from the space.

Incoming fresh air is filtered before flowing through the heat recovery core.

Stale, humid air flows through the heat recovery core and transfers the heat to the incoming fresh air.

Warm fresh air is distributed through an independent ductwork system or an existing air distribution system.

2 DEFROST

NU2200 H/ERV's are supplied with an automatic defrost system. Two defrost methods are available:

Timed fan shut down defrost: A temperature sensor shuts down the supply fan when the outside air is cold enough to freeze condensate. The supply fan remains off for a set length of time. The supply fan resumes normal operation for a set length of time and the cycle repeats as long as the outside air temperature is below the set point. Both defrost and run cycles are field adjustable via the unit's control.

Temperature fan shut down defrost: The exhaust air after the core is monitored. When below freezing, a defrost cycle is activated. The supply fan shuts down while the exhaust fan continues to move warm air through the core. When the exhaust air rises above 7 °C (45 °F) the HRV reverts to exchange mode.

3 OPERATING INSTRUCTIONS

The H/ERV motors are controlled and protected by a multi-starter that has an on-off speed switch. A factory installed non-fused disconnect switch is mounted on the unit near the starter. An optional remote station can be used for 24 V control of the HRV from a central location.

3.1 Control Options

A local On/Off switch is supplied with the unit. Provision is made for remote switching. Any customer supplied switch will work. Control voltage is 24 VAC.

An optional end switch/interlock can be supplied at the time of ordering.

3.2 Disconnect

The unit comes complete with a 25 Amp non-fused disconnect.

3.3 Defrost Adjustments

Temperature Fan Defrost – clockwise rotation is cooler (less defrost)

Timed Fan Defrost – increase the ON time or decrease the OFF time for more defrost. Decrease the On time or increase the OFF time for less defrost.

4 MAINTENANCE

NOTE: Disconnect power before servicing.

4.1 Filters

Dirty filters can reduce ventilation efficiency, resulting in unbalanced airflow and damage or shorten the life of the motors. Check at least every three months and replace yearly or when necessary depending on indoor and outside air conditions.

Fresh Air Filter - 16" x 24" x 1" quantity of 2; MERV 8

Exhaust Air Filter - 12" x 24" x 1" quantity of 2; MERV 8

Nu-Air recommends a spare set (4 pcs) of filters be ordered with the H/ERV for maintenance stores.

4.2 Fans (FC DWDI 810 - belt drive)

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

4.3 Motors (2 x 1.5 hp – single speed)

The motors are equipped with permanently sealed and lubricated bearings.

4.4 Condensate Drain

Wipe clean the condensate drain pan every six months. 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.

4.5 Cores

The HRV polypropylene cores (2 cross-flow exchangers) should be removed and cleaned at least twice a year using a non-corrosive enzyme detergent in cold water. In some applications, e.g. smoking rooms, more frequent cleaning with alternative detergents is suggested.

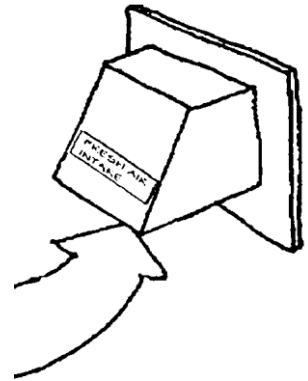
The ERV polymer membrane cores are washable in cold water. Remove core(s) from the cabinet twice annually and rinse with fresh water to remove any contaminants that pass through the filters.

Do not use high pressure water supply.

A **mild** non-corrosive enzyme detergent can be utilized if desired.

4.6 Exterior Hoods

Regularly check the outside vents and clear 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. Ensure leaves, lawn clippings, snow and frost do not build up and restrict or block openings.



4.7 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.

4.8 Belts

The standard belt supplied with this unit is B36.

The belts should be regularly inspected for tension, wear, etc. at regular intervals. A belt maintenance guide has been included at the back of the manual. Nu-Air recommends a spare set of belts be purchased with the HRV for maintenance stores.

5 ANNUAL SERVICING

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

The eight maintenance items above (3.1 - 3.8).

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

6 INSTALLATION INSTRUCTIONS

6.1 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 locate 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.

6.2 Installation Basics

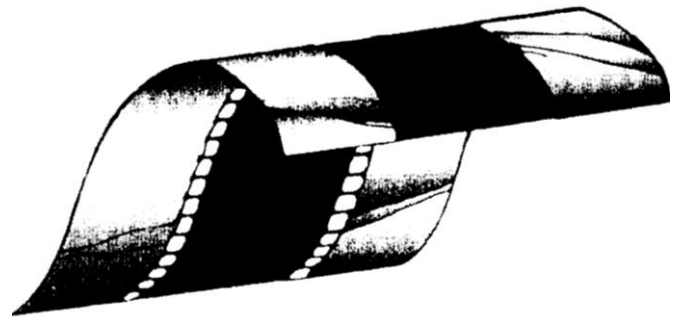
Before installing a Nu-Air Commercial H/ERV for the first time, please read these instructions.

Standard Issue Items

The H/ERV comes equipped with:

- Filters
- Core
- Drain kit
- Controls (if ordered)

Flexible Duct Connector



Other Basic Needs (by others)

- Galvanized Duct
- Flexible Duct Connector
- Outside Hoods (2)
- Duct Fittings
- Duct Tape & sealer
- Screws
- Diffusers
- Duct Hanger
- Balancing dampers
- Isolation and installation fasteners

6.3 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.

6.4 Weather hoods

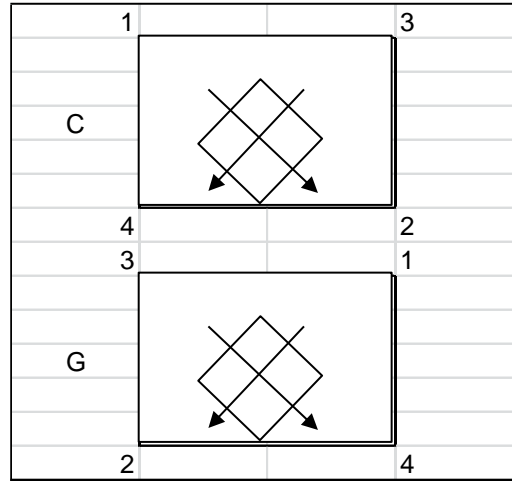
Designers should try to locate the hoods in such a way that there is easy access for cleaning purposes. If the H/ERV can be located close to the outside wall(s) containing the hoods, the resulting short duct lines will minimize airflow restrictions.

6.4.1 Locating the Weather Hoods

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 24" (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-introduction 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.

6.5 Port Configurations



1 – outside air 2 – supply air 3 – return air 4 – exhaust air

All duct connections are 24”x12”.

6.6 Mounting and Noise Control

For maximum efficiency, the H/ERV should be installed in a heated area.

6.6.1 Fastening Nu-Air Commercial H/ERV's in place:

The unit is intended to be floor mounted using typical HVAC isolation methods, such as anchoring bolts and compression springs or a suitable equivalent.

Suspension mounting (by others) using threaded rod, “U” channel, and vibration isolation is permissible, ensure rods do not obstruct access for maintenance and service.

Flexible duct connector (PRO flex or other) should be used at all four collars of the HRV to isolate vibration.

6.7 Connecting To Other Equipment

If the HRV is used upstream of an airhandler or similar equipment (fresh air into economizer section e.g.), **the start up sequence must be HRV first followed by the airhandler.** If the airhandler is started first, the HRV's fresh air fan will rotate backward, and the motor may not be able to overcome the extra load causing an over amp situation.

6.8 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.

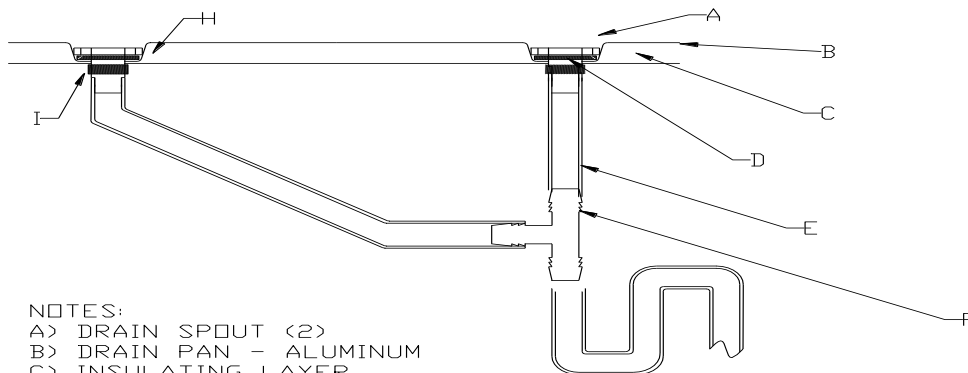
Ducting must be supported according to the designer's specified hanger system and intervals.

6.9 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 (E) long enough to avoid kinking
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. Repeat for the other side
6. Secure the hose to the spout with the plastic tie wraps (D)
7. Install the fitting (F) as shown in the drawing below
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 approximately one cup of water into the drain assembly to form an air seal. This prevents gasses from being drawn into the HRV



- NOTES:
- A) DRAIN SPOUT (2)
 - B) DRAIN PAN - ALUMINUM
 - C) INSULATING LAYER
 - D) O-RING (2)
 - E) DRAIN HOSE 5/8" ID, (10 feet)
 - F) TEE FITTING, BARBED
 - G) "P" TRAP
 - H) EMBOSS (2)
 - I) SPEED NUT (2)

6.10 Balancing the System

Balanced airflow between the supply and exhaust air streams is essential to the performance of an HRV.

The pulleys used on the supply and exhaust fans are a split type pulley that allows some field adjustment of the fan rpm and corresponding air flow. Adjust the pulley in ½ turn increments. **Close to increase rpm, open to decrease rpm.**

Once the HRV system is installed, do the following:

- Close all windows and doors.
- Turn off any exhaust only systems.

To balance the HRV, set the machine on high speed.

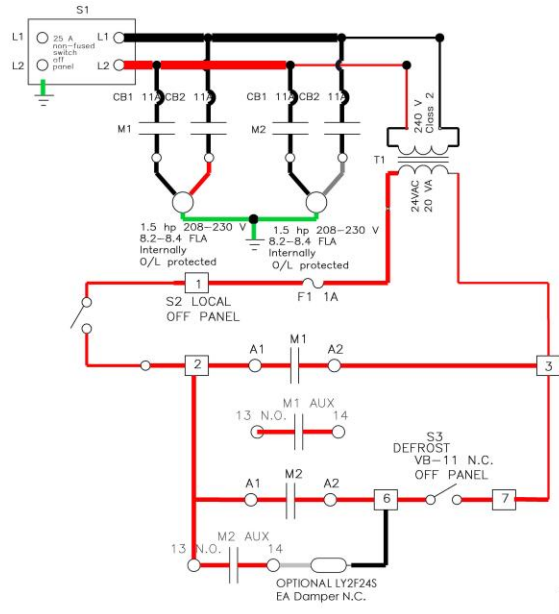
- Make a small hole in the supply duct at least 10 feet downstream of the fan. Insert a Pitot tube in the cross sectional center of the duct.
- Measure the pressure with a digital manometer or magnehelic gauge.
- Record the value and repeat the procedure for the exhaust air stream.
- Install a balancing damper in the air stream with the greater flow and damper back until the pressure equals that of the opposite air stream.

7 ELECTRICAL POWER & CONTROLS

For electrical hook-up, the HRV should be connected to a power source of voltage and phase indicated on the name plate and according to applicable local electrical codes.

7.1 Electrical Schematics

Single Phase Temperature Fan Defrost



| BOM | | | |
|-------------|--------------------------|---------------|----------|
| Item | Description | Part # | Quantity |
| M1,M2 | Contactors | CA8-12-10-24Z | 2 |
| CB1,CB2 | Circuit Breaker | KIA7-25S-10A | 2 |
| Transformer | 240/24-20 VA | BD5G | 2 |
| T1 | Terminal Block | UT6 | 7 |
| T2 | Terminal Block | UT4 | 2 |
| Defrost | Thermostat | VB-7 | 1 |
| MTR | 1.5 hp Motor | C1160 | 2 |
| S1 | Selector Switch Handle | LFS2-E-4-175 | 1 |
| Disc | Disconnect | LE7-32-1753 | 1 |
| F1 | 1A Glass Fuse | BK/AGC-1 | 2 |
| S2 | Selector Switch | D7P-SM 22 | 1 |
| S2 | Contact Block | D7-X10 | 2 |
| S2 | Mounting Collar | D7-ALP | 1 |
| F1,F2 | Fuse Holder | UT6-HES1 | 2 |
| | Ground Terminal | UT4-PE | 1 |
| | Din Rail | NS 35/7.5 | 10 |
| | Din Rail | NS 35/7.5 | 7 |
| | Terminal Block End Plate | D-UT 2.5/10 | 3 |
| | Ground Lug | ADR2 | 1 |
| | Din Rail End Stop | CLIPFIX 35-5 | 8 |

- NOTES
- 1: FOR REMOTE START/STOP REMOVE LOCAL SWITCH S2 FROM 1 & 2
 - 2: ALL LINE WIRES 14 GA, WHITE
 - 3: ALL CONTROL WIRES 14 GA, RED
 - 4: FOR REMOTE OPERATION REMOVE JUMPER AS INDICATED, AT 1 & 2 AND 4 & 5

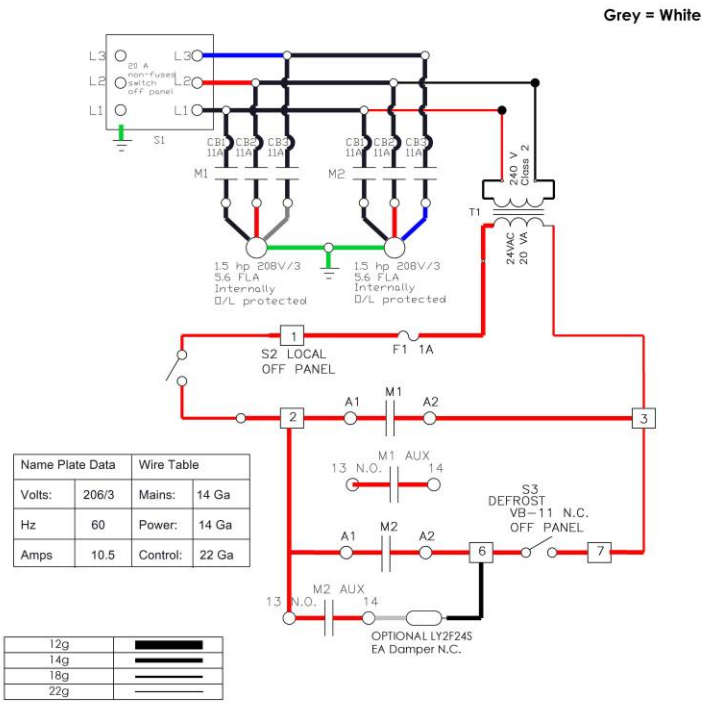
Grey = white

| | |
|-----|--|
| 12g | |
| 14g | |
| 18g | |
| 22g | |



NU1824/NU2200
ELECTRICAL SCHEMATIC
1.5 HP 208-230V

3 Phase Fan Defrost



| BOM | | | |
|-------------|---------------------------------|---------------|----------|
| Item | Description | Part # | Quantity |
| M1,M2 | Contactors | CA8-12-10-24Z | 2 |
| CB1, CB2 | Circuit Breaker | KTA7-25S-10A | 3 |
| Transformer | 240/24-20 VA | BD5G | 2 |
| T1 | Terminal Block | UT6 | 7 |
| T2 | Terminal Block | UT4 | 2 |
| Defrost | Thermostat | VB-7 | 1 |
| MTR | 1.5 hp Motor/Thermal Protection | K1415 | 2 |
| S1 | Selectorswitch Handle | LFS2-E-4-175 | 1 |
| Disc | Disconnect | LE7-32-1753 | 1 |
| F1 | 1A Glass Fuse | BK/AGC-1 | 2 |
| S2 | Selectorswitch | D7P-SM 22 | 1 |
| S2 | Contact Block | D7-X10 | 2 |
| S2 | Mounting Collar | D7-ALP | 1 |
| F1,F2 | Fuse Holder | UT6-HESI | 2 |
| | Ground Terminal | UT4-PE | 1 |
| | Din Rail | NS 35/7.5 | 10" |
| | Din Rail | NS 35/7.5 | 7" |
| | Terminal Block End Plate | D-UT 2,5/10 | 3 |
| | Ground Lug | ADR2 | 1 |
| | Din Rail End Stop | CLIPFIX 35-5 | 8 |

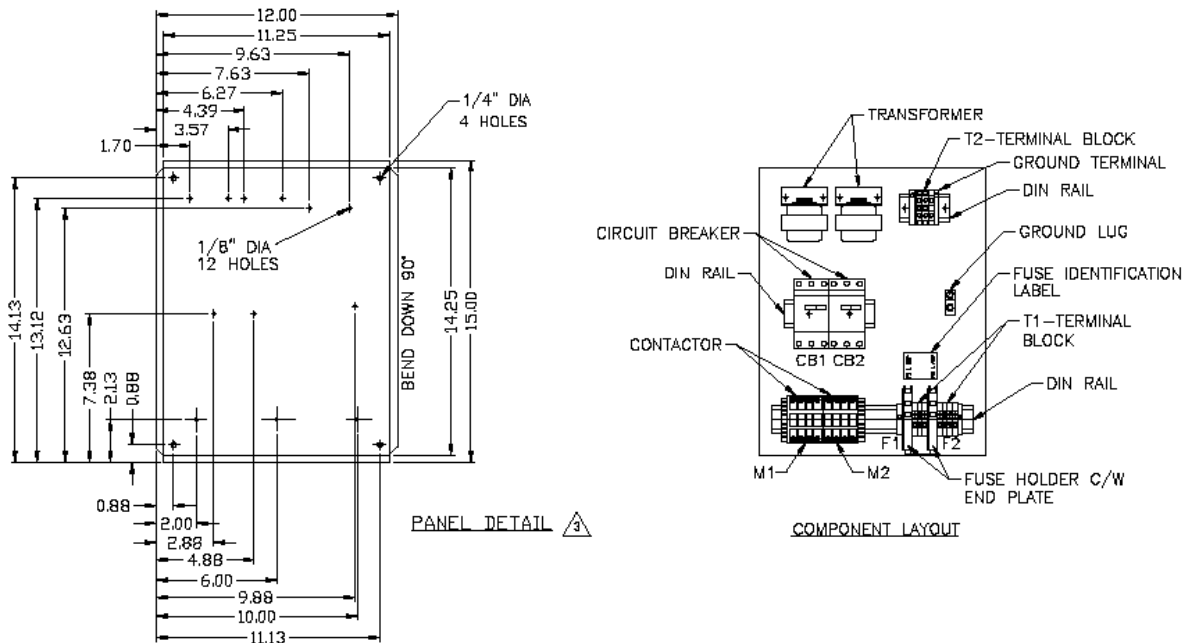


NU1824 / NU2200
1.5 HP 208V, 3 PHASE
ELECTRICAL SCHEMATIC

7.2 Electrical Parts List

| BOM | | | |
|-------------|--------------------------|---------------|----------|
| Item | Description | Part # | Quantity |
| M1, M2 | Contactors | J7KN-10-10 24 | 2 |
| CB1, CB2 | Circuit Breaker | J7MN-12-10 | 2 |
| Transformer | 240/24-20VA | BD5G | 2 |
| T1 | Terminal Block | SAK6 | 7 |
| T2 | Terminal Block | SAK4 | 2 |
| Defrost | Thermostat | VB-11 | 1 |
| MTR | 1.5 hp Motor | C1160 | 2 |
| S1 | Selector Switch | OHY3PH | 1 |
| Disc | Disconnect | OT30ET3 | 1 |
| F1 | 1A Glass Fuse | 312-1A | 2 |
| S2 | Selector Switch | PB-BD | 1 |
| S2 | Contact Block | PB-BE101 | 2 |
| S2 | Mounting Collar | PB-B | 1 |
| F1, F2 | Fuse Holder | 18804300G0 | 2 |
| F1, F2 | Fuse Holder End Plate | 18804500G0 | 2 |
| | Ground Terminal | | 1 |
| | Din Rail | | 10" |
| | Din Rail | | 7" |
| | Terminal Block End Plate | | 2 |
| | Ground Lug | | 1 |
| | 20 Ga Galv Plate | | 12"x15" |
| | Din Rail End Stop | | 6 |

7.3 Component Layout



8 SPECIFICATIONS

| | |
|------------------------------|----------------------|
| Nominal Airflow @ 1327 rpm | 2200 cfm @ 1" ESP |
| Motor Horse Power/speeds/rpm | 2 @ 1.5 hp/1 sp/1725 |
| Unit FLA | 16.4 |
| Blower Pulley | Maska MBL37 |
| Motor Pulley | Maska MVL34x5/8 |
| Bushing | Maska Hx3/4 |
| Blower | DWDI FC 810 |
| Duct Connections | 24x12 |

9 WARRANTY:

NU-AIR COMMERCIAL HRV's & ERV's

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 Compliant Series HRV core to be free from defects for a period of 15 years. Nu-Air warrants its Compliant 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.



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